An update: choice architecture as a means to change eating behaviour in self-service settings
A systematic review
Skov, Laurits Rohden; Perez-Cueto, Armando

Published in:
International Journal of Community Nutrition

Publication date:
2014

Document Version
Accepted author manuscript, peer reviewed version

Link to publication from Aalborg University

Citation for published version (APA):
Published on behalf of the International Association of Community Nutrition

Editor:
Ll. Serra-Majem

Associate editors:
J. Aranceta
A. Gil
L. Ribas
F.J.A. Pérez-Cueto
A. Prentice
N. Solomons

Supplement:
III World Congress of Public Health Nutrition
II Latin American Congress of Community Nutrition
V Congreso Iberoamericano de Nutrición y Salud Pública
X Congreso de la Sociedad Española de Nutrición Comunitaria
International Journal of Community Nutrition®, the official Journal of the International Association of Community Nutrition

D. L. GC 999-2014
ISSN 2386-673X

Editor-in-Chief:
Lluis Serra-Majem
University of Las Palmas de Gran Canaria, Spain.

Deputy Editor:
F.J. Armando Pérez-Cueto
University of Copenhagen, Denmark.

Associate Editors:
Irja Haapala
University of Eastern Finland, Finland.
Rose Harushimana
Burundi University, Burundi.
Gengsheng He
Fudan University, China.
Eliseu Verly Junior
Rio de Janeiro State University, Brazil.

Additional associated editors are being requested:
Researchers and practitioners younger than 45 years with an outstanding academic career in community nutrition.

Advisory Scientific Committee:
Barbara Ainsworth
Arizona State University of USA.
Javier Aranceta
University of Navarra, Spain.
Benjamin Caballero
John Hopkins University, USA.
Adam Drewnowski
University of Washington, USA.
Serge Hercberg
Medical University Paris 13, France.
Carlo La Vecchia
University of Milan, Italy.
Reynaldo Martorell
Emory University, USA.
Andrew Prentice
London School of Hygiene and Tropical Medicine, UK.
Noel Solomons
CESSIAM, Guatemala.
Agneta Yngve
Örebro University, Sweden.

The Journal is going to be published on a quarterly basis.

Information:
nutricion@ulpgc.es
Abstracts of the

III World Congress of Public Health Nutrition

II Latin American Congress of Community Nutrition

V Congreso Iberoamericano de Nutrición y Salud Pública

X Congreso de la Sociedad Española de Nutrición Comunitaria

Las Palmas de Gran Canaria, Spain, November 2014

Organised by:

Special Issue Editor
Lluis Serra-Majem

Special Associate Editors
Javier Aranceta, Ángel Gil, Lourdes Ribas, Armando Pérez-Cueto, Andrew Prentice and Noel Solomons
**International Journal of Community Nutrition**  
**November 2014**

**Contents**

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreword, Lluis Serra-Majem</td>
<td>1</td>
</tr>
<tr>
<td>III World Congress of Public Health Nutrition programme</td>
<td>2</td>
</tr>
<tr>
<td>Speakers abstracts</td>
<td>10</td>
</tr>
<tr>
<td>Speaker curriculums</td>
<td>45</td>
</tr>
<tr>
<td>Oral communications OT</td>
<td>66</td>
</tr>
<tr>
<td>Oral communications OW</td>
<td>81</td>
</tr>
<tr>
<td>Posters communications PM</td>
<td>89</td>
</tr>
<tr>
<td>Posters communications PT</td>
<td>129</td>
</tr>
<tr>
<td>Posters communications PW</td>
<td>170</td>
</tr>
<tr>
<td>Index of speakers and authors of oral communications</td>
<td>217</td>
</tr>
</tbody>
</table>
III World Congress of Public Health Nutrition
II Latin American Congress of Community Nutrition
V Congreso Iberoamericano de Nutrición y Salud Pública
X Congreso de la Sociedad Española de Nutrición Comunitaria

Committees

Honour Committee:

S.M. El Rey Don Felipe VI
Excmo. Sr. D. Paulino Rivera Baute
Presidente del Gobierno de Canarias
Excmo. Sra. Dª. Ana Mato Adrover
Ministra de Sanidad, Servicios Sociales e Igualdad del Gobierno de España
Excmo. Sra. Dª. Isabel García Tejerina
Ministra de Agricultura, Alimentación y Medioambiente del Gobierno de España
Excmo. Sra. Dª. Brigida Mendoza Betancor
Consejera de Sanidad del Gobierno de Canarias
Excmo. Sr. D. Juan José Cardona González
Alcalde del Ayuntamiento de Las Palmas de Gran Canaria
Excmo. Sr. D. José Miguel Bravo de Laguna Bermúdez
Presidente del Cabildo de Gran Canaria
Sr. D. José Regidor García
Rector Magfco. de la Universidad de Las Palmas de Gran Canaria

Organising Committee:

President

Lluís Serra-Majem
Ana Luisa Álvarez Falcón
Eva Elisa Álvarez León
Jacqueline Álvarez Pérez
Inmaculada Bautista Castaño
Itandehui Castro Quezada
Elena Díaz Beritez
Patricia Henríquez Sánchez
Mª Jesús Fernández Rodríguez
Joy Ngo de la Cruz
Mariela Nissensohn
Luis Peña Quintana
Lourdes Ribas Barba
Cristina Ruano Rodríguez
Almudena Sánchez-Villegas
Miguel Ángel Silva del Valle
Mercè Vidal Ibáñez
José Ramón Calvo Fernández
International Executive Committee:

President
Lluís Serra-Majem, Spain
Javier Aranceta, Spain
Rekia Belahsen, Morocco
Elliot Berry, Israel
Benjamín Caballero, USA
Sandro Dernini, Italy
Laura Fernandez, Belgium
María Nieves García-Casal, Venezuela
Ángel Gil, Spain
Manuel Hernández Triana, Cuba
Carlo La Vecchia, Italy
F. J. Armando Pérez-Cueto, Denmark
Carmen Pérez Rodrigo, Spain
Andrew Prentice, UK
Noel Solomons, Guatemala
Walter Willett, USA

Scientific Committee:

María Elena Acosta, Spain
Ana Luisa Álvarez, Spain
Eva Elisa Álvarez, Spain
Jacqueline Álvarez, Spain
Miguel Ángel Martínez, Spain
Victoria Arija, Spain
Inmaculada Bautista, Spain
Erick Boy, Canada
Cristina Campoy, Spain
Ithanduei Castro, Spain
Junshi Chen, China
Estefanía Cuesta, Spain
Liset de Groot, The Netherlands
Tamás Decsi, Hungary
Adan Drewnosky, USA
Johanna Dwyer, USA
Ibrahim Elmadfa, Austria
Rafael Figueredo-Crijala, Paraguay
Paul Finglas, UK
Mirjana Gurinovic, Serbia
Patricia Hernández, Spain
María Jesús Fernández, Spain
Ingrid Keller, UK
Frans Kok, The Netherlands
Marcela Leal, Argentina
José Antonio López, Spain
Emilio Martínez de Victoria, Spain
Reynaldo Martorell, USA
Joy Ngo, Spain
Mariela Nissensohn, Spain
Rosa M. Ortega, Spain
Chandrakant S. Pandav, India
F. Xavier Pi-Sunyer, USA
Isabel Polanco, Spain
Jean Pierre Poulain, France
Jordi Salas, Spain
Almudena Sánchez-Villegas, Spain
Dimitrios Trichopoulous, Greece
Antonia Trichopoulou, Greece
Victor Tutelyan, Russia
Ricardo Uauy, Chile
Helio Vannucchi, Brazil
Jesús Vioque, Spain
Mark L. Wahlqvist, Australia
Yukio Yamori, Japan

Young Committee:

Eva Elisa Álvarez León, Spain
Rui Da Silva, Portugal
Elena Díaz Benítez, Spain
Viktoria Knaze, France
Armando Pérez-Cueto, Spain
Almudena Sánchez-Villegas, Spain
Olga Sarmiento, Colombia
María José Soto, Guatemala

Sociedad Española de Nutrición Comunitaria:

President; Carmen Pérez Rodrigo
First Vice-President; Rosa M. Ortega Anta
Second Vice-President; Emilio Martínez de Victoria Muñoz
General Secretary; Josep Antoni Tur Marl
Treasurer; Gemma Salvador Castell

Board Members;

Gregorio Varela Moreiras
Joan Quiles Izquierdo
Victoria Arija Val
Mercè Vidal Ibáñez
María Lourdes de Torres Aured
Amelia Rodríguez Martín
Francisco Rivas García

Founding President
José Mataix Verdú
Honorary President
Lluís Serra-Majem
Scientific Committee President
Javier Aranceta Bartrina
Foreword

NOW IS THE FUTURE FOR PUBLIC HEALTH NUTRITION WORLDWIDE

I am very proud and honoured to write these lines presenting this first issue of a new Scientific Journal: International Journal of Community Nutrition. This is a great and critical momentum to improve nutrition and health and the environment worldwide, enhanced by the increased understanding and commitment among a very wide range of stakeholders and interdisciplinary experts. Momentum started in 2006 in Barcelona, with the I World Congress of Public Health Nutrition, the first interdisciplinary encounter where public health professionals and nutritionists, including anthropologists, physicians, pharmacists, nurses, dietitians and sociologists, shared their knowledge and experience to build a new discipline in science.

Nutrition has many problems to face on a global level. The rise of obesity has been a rapidly growing issue with severe long-term consequences and in fact has prioritized the nutrition scenario in higher-income countries, where lower-income populations tend to present a greater risk. The economic constraints that these countries are facing, after decades of wealth and development, seem to have paradoxically increased these figures of overweight and obesity, which are in fact linked to poor nutrition. This is due to the reduced access to a balanced diet, the loss of traditional diets and/or lower access to physical activity. However, obesity has probably taken on too much protagonism and has diverted relevance away from other important conditions.

In a worldwide perspective, hunger and undernutrition continue being the most important challenges for public health nutrition. Chronic undernutrition constitutes the main nutritional problem as it is a key obstacle for development, and the window of opportunity for preventing the most critical consequences of stunting is very small: from conception to two years of age. Stunting at two years of age is associated with II health (including infections), poorer school performance, and an increased risk of obesity, diabetes and other chronic diseases later in life. Economic analysis indicates the negative effects of poor nutrition in early life on the overall economic development of nations. Nutrition is therefore a first priority issue to reduce the gap of opportunities among children worldwide.

Prevention of undernutrition requires a nutritious diet. A balanced diet must satisfy the nutritional needs of almost all population groups but it requires a foundation of sustainable agriculture and basic disposable income. A limited access to a safe water supply is often a major barrier for a proper nutrition in developing countries. Solutions for undernutrition vary between those oriented to increase the intake and status of selected nutrients (iodine, vitamin A, Zin), increase the consumption of targeted foods/food preparations or/and enhance the quality of the whole diet by means of sustainable agricultural and food policies. Only the combination of short term and long-term food and nutrition security policies will contribute to reduce stunting in developing countries as part of a sustainable process.

Many United Nations Agencies and NGOs are currently contributing to fight against undernutrition in developing countries in collaboration with national governments; and even if the role and scope of these different stakeholders seem defined, sometimes there is a need for better coordination of the different policies and programmes. The progress in reducing undernutrition usually requires strong governance systems and firm leadership. The empowerment of communities and particularly of their women to lead the nutrition activities in the field is a necessary step towards success. Advocacy is a key tool in the battle against malnutrition, and innovation can also play a role. Collaboration between public and private sectors has just begun to grow in the field of community nutrition: the potential opportunity for harnessing public-private collaboration exists in several forms, including developing food products and systems, scaling up effective nutrition solutions, providing sustainable cost-effective answers for information sharing, and conveying much-needed educational messages to consumers. Finally, the importance of continued prioritization and investment in high-quality research must not be neglected. Generating the best empirical evidence of what works better in what context is needed. Rather than trying to find conflicts of interest with the Private sector, we should try to find solutions of interest. More than 300 young researchers and practitioners have failed to join us these days in Las Palmas de Gran Canaria due to the lack of support from the public and private sector; why haven’t certain food industry representatives supported such an important Conference as this?

Where are those multinational firms that take pride in their support of nutrition internationally? I really thank those that have been supporting this important meeting, which has been very complicated to organize in times of economical constraints and international uncertainties. The solution for undernutrition calls for a way that we should walk together now; without delays and rhetoric. Without so many unexplainable refusals.

The I World Congress of Public Health Nutrition represents an important step to continue this way shared with many others and aims to coordinate our actions for better nutrition in a better World. I am very pleased to welcome all of you to this crucial event and I hope you enjoy these days of working together in Las Palmas de Gran Canaria, Spain, and a few months later in Banjul, The Gambia. The Ebola crisis is certainly not contributing to the progress against undernutrition; the figures of acute undernutrition in the areas most affected by the disease have risen around 23% and the impairment of the GNP will probably deteriorate these figures in the near future. The important meeting scheduled in Gambia just before the Congress in Gran Canaria has been postponed to April-May 2015. It was one of the most unpleasant decisions in my professional life. The organization and infrastructure there were very advanced and The Gambia has been Ebola-free until now. It was really not an objective reason to postpone the event, but the international opinion was so alarming and pessimistic about the Region that it forced us to make this decision.

I am also proud to announce this new integrative and rigorous Organization: The International Association of Community Nutrition (IACON) which will be constructing an international and interdisciplinary framework to coordinate evidence-based sustainable solutions for the most important nutrition related diseases and conditions worldwide. You are very welcome to join us. We need all of you.

Thank you for your active participation and valuable contribution.

Lluís Serra-Majem, MD, PhD
President
III World Congress of Public Health Nutrition

III World Congress of Public Health Nutrition
Sunday Nov 9th

18:00-18:30
SINFÓNICA Official opening - Opening ceremony

18:30-19:30
SINFÓNICA Opening Lectures
CHAIR: Lluis Serra-Majem, Spain
SPEAKERS:
- Isatou Jallow, Italy
- Andrew Prentice, The Gambia

19:30-20:00
SINFÓNICA Welcome reception

Monday Nov 10th

08:00-10:00
SINFÓNICA PLENARY SESSION The achievements in malnutrition
CHAIRS:
- Benjamin Caballero, USA
- Hélène Delisle, Canada
SPEAKERS:
- Irwin Rosenberg, USA
- Per Pinstrup-Andersen, Denmark
- Maria Neira, Switzerland
- M.G. Venkatesh Mannar, Canada
- Alexandre Meybeck, Italy

10:00-10:30 COFFEE BREAK

10:30-11:30 SINFÓNICA PLENARY SESSION Hidden Hunger in the “First World” - how is economic crisis affecting undernutrition?
CHAIRS:
- Carmen Pérez-Rodrigo, Spain
- Noel Salomons, Guatemala
SPEAKER:
- Hans Konrad Biesalski, Germany

11:30-13:00 SINFÓNICA PLENARY SESSION Funding nutrition research in the 21st Century: sharing benefits from public private partnership in nutrition
CHAIRS:
- Ángel Gil, Spain
- Laura Verndández, Belgium
SPEAKER:
- Hans Konrad Biesalski, Germany

POLIVALENTE PLENARY SESSION Cost Effectiveness of Market driven Fortification to address Hidden Hunger
CHAIRS:
- Jörg Spielmann, Switzerland
- Noel Salomons, Guatemala
SPEAKERS:
- Andrew Prentice, The Gambia
- Patrick Detael, Switzerland
- Simon Wieser, Switzerland
NESTLÉ RESEARCH CENTER

13:00-14:30 LUNCH Cheese Tasting
Antonio González Mendoza, Spain

13:30-14:30 POLIVALENTE TRIBUTE: JOSE Mª BENGOA LEADERSHIP:
- Javier Aranceta, Spain
- Lluis Serra-Majem, Spain

14:30-16:30 POLIVALENTE PARALLEL SYMPOSIA Towards the Expo Milan 2015: challenges for dietary patterns sustainability using the Mediterranean Diet as a case study
WELCOME:
- Lluis Serra-Majem, Spain
CHAIR:
- Domenico Laigrignola
INTRODUCTION:
- Sandro Dernini, Italy
- Roberto Capone, Italy
MODERATOR:
- Alexandre Meybeck, Italy
SPEAKERS:
- Elliot Berry, Jerusalem
- Antonia Trichopoulou, Athens
- Felice Adinolfi, Xavier Medina, Spain
- Rekia Belahsen, Morocco

CÁMARA PARALLEL SYMPOSIA Public-Private Partnerships: public nutrition services and private sector engagement – a conflict or reality?
CHAIR:
- Klaus Kraemer
SPEAKERS:
- Eva Monterrosa, Stefan Germann
- Saska de Pee, Ines Reinhard, Shubha Jayaram
FACILITATOR:
- Jane Badham
PANELISTS:
- Mirrödy Demiszo, Anthony Holhr, Samuel Kwaame Ntim Adu

GRAN CANARIA SATELLITE SYMPOSIA Hydration and public health
CHAIRS:
- Ronald Maughan, UK
- Jane Holdsworth, UK
SPEAKERS:
- Ahmed Hi-Sharkawy, UK
- Ronald Maughan, UK
- Ibrahim Elmasafi, Austria
- Maria Kapsokefalou, Athens
EUROPEAN HYDRATION INSTITUTE (EH!)"
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:00-10:30</td>
<td>PARALLEL SYMPOSIAS (SENC-SLAN)</td>
</tr>
<tr>
<td></td>
<td>Sugar in health and disease: need for a new threshold?</td>
</tr>
<tr>
<td></td>
<td>KEYNOTE: Ángel Gil, Spain</td>
</tr>
<tr>
<td></td>
<td>SPEAKERS: Carmen Gómez Candela, Spain</td>
</tr>
<tr>
<td></td>
<td>Dolores Corella, Spain</td>
</tr>
<tr>
<td></td>
<td>Jo Jewell, Switzerland</td>
</tr>
<tr>
<td></td>
<td>John Sievenpiper, Canada</td>
</tr>
<tr>
<td>10:30-12:30</td>
<td>PARALLEL SYMPOSIAS (SENC-SLAN)</td>
</tr>
<tr>
<td></td>
<td>Assessment of body composition for better understanding of infant, child and adolescent malnutrition</td>
</tr>
<tr>
<td></td>
<td>KEYNOTE ADDRESS: Per Pinstrup-Andersen</td>
</tr>
<tr>
<td></td>
<td>SPEAKERS: Parvis Koohafkan</td>
</tr>
<tr>
<td></td>
<td>Isatou Jallow, Italy</td>
</tr>
<tr>
<td></td>
<td>Elliot Berry, Jerusalem</td>
</tr>
<tr>
<td></td>
<td>Alexandre Meybeck, Italy</td>
</tr>
</tbody>
</table>

**Tuesday Nov 11th**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>19:00-20:00</td>
<td>TRIBUTE: RAINER GROSS</td>
</tr>
<tr>
<td></td>
<td>CHAIR: Noel Solomons, Guatemala</td>
</tr>
<tr>
<td>20:30-21:00</td>
<td>PARALLEL SYMPOSIAS (SENC-SLAN)</td>
</tr>
<tr>
<td></td>
<td>Developmental Origins of Health and Disease (DOHaD) and its overarching relationship with nutrition in developing countries</td>
</tr>
<tr>
<td></td>
<td>CHAIR: Ascensión Marcos, Spain</td>
</tr>
<tr>
<td></td>
<td>SPEAKERS: Mauro Serafini, Croatia</td>
</tr>
<tr>
<td></td>
<td>Ibrahim Elmadfa, Austria</td>
</tr>
<tr>
<td></td>
<td>Ascensión Marcos, Spain</td>
</tr>
<tr>
<td>10:00-10:30</td>
<td>COFFEE BREAK</td>
</tr>
<tr>
<td>10:30-12:30</td>
<td>PARALLEL SYMPOSIAS (SENC-SLAN)</td>
</tr>
<tr>
<td></td>
<td>Food systems sustainability: food security and nutrition</td>
</tr>
<tr>
<td></td>
<td>CHAIR: Lluis Serra-Majen, Spain</td>
</tr>
<tr>
<td></td>
<td>KEYNOTE ADDRESS: Per Pinstrup-Andersen</td>
</tr>
<tr>
<td></td>
<td>SPEAKERS: Parvis Koohafkan</td>
</tr>
<tr>
<td></td>
<td>Isatou Jallow, Italy</td>
</tr>
<tr>
<td></td>
<td>Elliot Berry, Jerusalem</td>
</tr>
<tr>
<td></td>
<td>Alexandre Meybeck, Italy</td>
</tr>
<tr>
<td></td>
<td>FAO</td>
</tr>
</tbody>
</table>
GRAN CANARIA  

**Satellite Symposiums**  
Effectiveness and safety of low and non-calorie sweeteners revisited  
**Chair:**  
Pilar Risibó, Spain  
Adam Drewnowski, USA  
**Speakers:**  
Arturo Anadón, Spain  
Carlo La Vecchia, Italy  
Walter Willett, USA  
Adam Drewnowski, USA  

FIN (FUNDACIÓN PARA LA INVESTIGACIÓN NUTRICIONAL) – ISA (INTERNATIONAL SWEETENERS ASSOCIATION)  

TENERIFE  

**Parallel Symposiums**  
Folate-preventable congenital anomalies: using the WHO research strategy to guide effective actions in public health  
**Speakers:**  
Luz María De-Regil  
Elizabeth Tejero  
Juan Pablo Peña-Rosas  
Lisa Rogers  

WHO / CDC  

ATLÁNTICO  

**Session in French**  
Repenser la formation universitaire en nutrition en Afrique  
**Introduction:**  
Hélène Delisle, Canada  
**Speakers:**  
Roger Sodjinou  
Ali Souane Akory  
Gilles Julien, France  
Cheikh M.H. Dehah, Mauritania  
Hélène Delisle, Canada  

12:30-14:00 LUNCH  

13:30-16:30  

**Parallel Symposiums**  
Folate-preventable congenital anomalies: using the WHO research strategy to guide effective actions in public health  
**Speakers:**  
Luz María De-Regil  
Elizabeth Tejero  
Juan Pablo Peña-Rosas  
Lisa Rogers  

WHO / CDC  

**Oral Communications**  
**Moderators:**  
Helmut Schroder, Spain  
Monique Raats, UK  

- Sodium intake is associated with higher blood pressure in children of 4-5 years old. Valero-Gran D., Navarrete-Muñoz EM., García de la Hera M., Rodríguez-Bernal CL., Ballester F., Vicuña J.  
- The effect of malnutrition on the sensory motor development among children from 8 to 24 months, in Mayahi District, Maradi Region, Niger. Rivero E., Aboubacar M.b, Charles F.  
- The Effect of Daily Vitamin B12 and Folic acid Supplementation on Growth in 6-30 Month Old Children in India: A Randomized Controlled Trial. Tor A Strand, Sunitha Tanje, Tivendra Kumar, Mari S Manger, Helga Refsum, Chittaranjan S Vajnok, and Nita Bhussari  
- Effect of n-6 and n-3 polyunsaturated fatty acids intake at 4 years old on body fat patterns at 7 years old in the Generation XXI birth cohort. Santos S., Lopes C., Oliveira A.  
- The effect of socioeconomic and biological factors on infants' weight gain: Brazilian Demographic and Health Survey - 2006/07. Silveira JA, Colugnati FA, Pobaczon AP, Taddei J.A.  
- Dietary patterns and overweight among 4-years-old children. Durdo C., Javero M., Oliveira A., Moreira P., Guerra A., Lopes C.  
- Impact of underweight on pneumonia mortality in children: results from a twelve years national database in Malawi and a systematic review of literature. Sonogo M., Pellegrin M.C., Seward N., Lasseroni M.  
- The contribution of yellow cassava to nutrient adequacy of primary school children; the use of linear programming. Talsma E.F, Borgonjen-van den Berg K.J, Meise-Boostra A, Ferguson E.L, Kok F.J., Brouwer I.D.
• Greenhouse gas emission of diets in the Netherlands and associations with food, energy and macronutrient intakes. Temme EHM, Tsopeus IB, Kramer GFH, Breauens MCC, Drivers JMM, Tyszler M, Ocké MC.

• Intrapersonal, social-environmental, and physical-environmental factors which predict healthy eating practices in Dutch adults. Swan, E., Bouwman, L., Hiddink, GJ PhD, Aarts, N PhD, Koelen, M PhD.

• Manoeuvring between health benefits and health losses by following or neglecting dietary guidelines: where do we stand?: Van Raaij J.M.A., Buchner E.L., van Duijnoven F.J.B., Hoogenveen R.T., Tsopeus I., Hoekstra W.

• Food-choice behavior and coping strategies to deal with food insecurity in low-income Portuguese families: the preliminary results of an exploratory study. Gregório MJ, Nogueira PJ, Graça P.

• Early eating behaviours in relation to fruit and vegetable intake and a healthy diet variety score at 4-5 years of age - a prospective analysis in three European birth cohorts. Lopes C., Oliveira A., Jones L., Lason-Leonard B., Emmett P., Charles M.A.


• The burden of obesity in the population of Cape Verde using different anthropometric approaches. Semedo MRS, Barros H.

• Soy Supplementation: Objective & Subjective Health Markers in Preschool Children in Bukoba, Tanzania. Singh, N.


• Trans-fatty acids in Europe: where do we stand?: Moutratidou T, Livianou A, Saborido CM, Wallgast J, Caldeira S.

• Associations between FTO variants and energy intake in adults: a systematic review and meta-analysis. Livingstone K.M, Celis-Morales C, Lara J, Ashor A., Mathers J.C., on behalf of Food4Me Study.

• Sizing it up: Adherence to the Mediterranean Diet and anthropometric and financial measures of the MEDIS study elderly. Pascop S., Polychronopoulou E, Panagiotakos DB, for the MEDIS study investigators.

• Environmental relevance of human nutrition. Efles S, Strassner C

• Vitamin A stability in Nigerian retailed flour and fortification compliance level. Uchenwa F, Attomo T.
14:00-16:30

TENERIFE

COMUNICACIONES ORALES (SENC-SLAN-GLANC)

MODERADORES:
- Rosa María Ortega, Universidad Complutense de Madrid, España
- Patricia Henríques, Universidad de Las Palmas de Gran Canaria, España

- Nutrientes de Aloe vera. Eliminación de la aloina. Zergi R., Toledo Marante F. J., Toledo Medinavilla J. A.
- Diversidad alimentaria y su asociación con el retraso del crecimiento en niños de 6-23 meses. Perú, 2008-2010. Aramburu A.
- Consumo de calcio en embarazadas puérperas en un Sanatorio privado de la Ciudad de Buenos Aires, Argentina. García S., Benetti Y., Casale F., Chirico L., Leal M., Carrasquero C., Lavanda I.
- ¿Desigualdad en la Educación Física del niño? Diferencias en intensidad y actividad física total en escuelas de distintos niveles socioeconómicos. Cerda Rioseco Ricardo
- Influencia de una intervención nutricional a través de una dieta individualizada sobre el control de la diabetes gestacional en mujeres embarazadas que acuden al Hospital de Clínicas. Argüello RG, Cáceres ME, Alzina S., Bueno ED, Noguera SD, Planas MB, Romero A. Fajardo, Figueredo-Grijalba R.
- Asociación entre el índice de masa corporal pregestacional y patologías durante el embarazo. Silva del Valle MA., Sánchez Villegas A., Serra-Majem L.
- Evaluación del programa “Seis pasos hacia la salud del niño escolar” en el estado de Querétaro, México. Arellano Jiménez de María del Rocio, Rangel Peniche Diana Beatriz, Hernández Gómez Roxana Gabriela, Campos Justo Rodrigo, Sudre Lisa Karen Guadalup, Casamayor María del Carmen
- Influencia de la adherencia a la dieta Mediterránea en el estado de salud autopercebido en población joven. Barrios R., Navarrete Muñoz E., García de la Hera M., González-Palacios S., Valero-Gran D., Vioque J.

17:00-19:00

POLIVALENTE

SATELLITE SYMPOSIUM

Energy balance as a public health drive

MODERATORS:
- J. Alfredo Martínez, Spain
- Gregorio Varela Moreiras, Spain

SPEAKERS:
- Gregorio Varela Moreiras, Spain
- Delores Corella, Spain
- Eva Negri, Italy
- Gregory Hand, USA

THE COCA-COLA COMPANY

PARALLEL SYMPOSIUM

Pobreza y malnutrición en Latinoamérica: desnutrición y obesidad infantil

CHAIRS:
- Luis Peña, Spain
- Reynaldo Marrorell, USA

SPEAKERS:
- Arturo Jiménez Cruz, México
- Montserrat Bacardi Gascon, México
- Míriam Bertran Vilar, México
- Abel Albino, Argentina

GRAN CANARIA

SATELLITE SYMPOSIUM

Vitamin K – new emerging data, the way forward

SPEAKERS:
- Manfred Eggersdorfer, Switzerland
- Peter Weber, Switzerland
- Sebalos Péter, Switzerland
- Maurice W. Dykens, USA
- Keith P. West, USA

DSM

SATELLITE SYMPOSIUM

The challenges of interventions against micronutrient deficiency

CHAIRS:
- Lynnette Neufeld, Switzerland
- Rekia Belachaen, Morocco

SPEAKERS:
- Juan Pablo Peña-Rosas
- Luna Maria De-Regil
- Lynnette Neufeld, Switzerland
- Christine Hota, Canada
- Izzeldin Hussein, Oman & UK
- Reina Engle-Stone, USA

GAIN (GLOBAL ALLIANCE FOR IMPROVED NUTRITION)

ATLÁNTICO

SATELLITE SYMPOSIUM

Eduación y cuidados en nutrición

CHAIR:
- Tensy Calero Fabolo, España

SPEAKERS:
- Carmen Martín Salinas, España
- Ana Domínguez Salinas, España
- Marina Francés Pinilla, España
- Martí Lourdes de Torres Aured

VEGINAT

14:00-16:00

PARALLEL SYMPOSIUM

Nutrición fetal y desarrollo neuroconductual del niño

CHAIR:
- Mabel Carrera, Argentina

SPEAKERS:
- Cristina Campoy, España
- Victoria Arjú, España
- Jordi Jubera, España

SOCIEDAD ESPAÑOLA DE NUTRICIÓN COMUNITARIA

20:30

OFFICIAL DINNER,
Hotel Santa Catalina
Wednesday Nov 12th

08:00-10:30

POLIVALENTE  PARALLEL SYMPOSIA

Reaching the unached: determinants of access to health care and nutrition interventions
CHAIR: Luís Maria De-Regil
SPEAKERS:
- Gerardo Zamora
- Juan Pablo Perla-Rosas
- Jacqueline Kung
- Daniel Albrecht
- Theary Chan, Cambodia

WHO/MI

CÁMARA  PARALLEL SYMPOSIA

Choice architecture (nudging) and public health nutrition
CHAIR: Armando Pérez-Cueto, Copenhagen
SPEAKERS:
- Armando Pérez-Cueto, Copenhagen
- Laurits Rhoden Skov, Copenhagen
- Trine Nørnberg, Copenhagen
- Louise Houlby, Copenhagen
- Laurits Rohden Skov, Copenhagen

GRAN CANARIA  PARALLEL SYMPOSIA

The challenges and opportunities of hydration research
CHAIRS:
- Mariela Nissensohn, Spain
- Ronald Maughan, UK
- Maria José Soto, Guatemala
- Agata Bialecka, Poland
- Ahmed El-Sharkawy, UK
- Marianna Frangeskou, UK and Spain

TENERIFE  PARALLEL SYMPOSIA

Connecting the dots: a global leadership movement for a healthy world
CHAIRS:
- Lluís Serra-Majem, Spain
- Maria Kapsokefalou, Greece
- Umé Rahmida, Jakarta
- Jane Badham, South Africa
- Simone Frey
- Karl Raats

ATLÁNTICO  ORAL COMMUNICATIONS

MODERATORS:
- Miguel Ángel Martínez, Spain
- Ramón Estruch, Spain

- Fruit and vegetable consumption and mortality in Eastern Europe. Steffer D., Pajak A., Malysytina S., Kubnowa R., Babak M.
- The APOB insertion/deletion polymorphism (rs17740441) influences the postprandial triacylglycerol and insulin response in healthy Caucasian adults – insights from the DISRUPT cohort. Vimal K.S., Gill R., Minshane A.M., Lovegrove J.A., Williams C.M., Jackson KG, Yue Li
- Adiposity has a greater impact on hypertension in lean than non-lean populations: a systematic review and meta-analysis. Anabshahi S., Basinge D., Subasinghe A. K., Evans R. G., Ridell M., Thrift A. G.
- Effect of pomegranate extract consumption on CVD risk factors, stress and quality of life in human volunteers - a double-blind, randomised, placebo-controlled trial. Stockton A.E.V; Al-Dujaili E.A.S.; Drummond S. and Davidson I.
- Mediterranean Diet and Invasive Breast Cancer Risk in the PREMEDM trial. Toledo E., Salas-Salvadó J., Corella D., Fito M, Estruch R, Martínez-Gonzalez MA for the PREMED Investigators
- Association between dietary intakes of polychlorinated biphenyls (PCBs) and the incidence of hypertension in a Spanish cohort: the SUN Project. Donat-Vargas C., Gea A., Sayon-Orea C., De la Fuente C, Martínez-Gonzales MA, Bes-Rastrollo M.

10:30-12:30

POLIVALENTE  SATELLITE SYMPOSIA

Public health challenges related to nutrition: the physical activity perspective
CHAIR: Marcela González Gross, Spain
SPEAKERS:
- José Antonio López Calbet, Spain
- Steven N. Blair, USA
- Marcela González Gross, Spain

THE COCA-COLA COMPANY

CÁMARA  SATELLITE SYMPOSIA

Under and over nutrition in children: status and approaches to prevention
CHAIR: Ángel Gil, President, Spain
SPEAKERS:
- Benjamin Caballero, USA
- Jean-Michel Borja, France
- Kathleen Neidy, USA

NESTLÉ NUTRITION INSTITUTE

18:00-18:30  COFFEE BREAK
SATÉLITE SYMPOSIA

Finding opportunities for enhancing research quality and impact, and reducing waste in public health nutrition

CHAIR:
Roes Verstraeten, Belgium
Laura Fernández, Belgium

SPEAKERS:
Jaap Seidell, The Netherlands
Patrick Kolstern, Belgium
Karl Raats

PARALELLE SYMPOSIA

Nutrition, mental health and quality of life

CHAIR:
Almudena Sánchez-Villegas, Spain

SPEAKERS:
Tasmine Akbaraly, UK
Alfredo Gea, Spain
Cristina Ruano, Spain
Ana Rausmusen, Finland

MODERATORS:
Carmen Socolovsky, Argentina
Carmen Pérez-Rodrigo, Spain

• Investigation of the nutritional status of children and the nutrition knowledge of child and youth care workers in residential care settings in Durban, South Africa. Grobbelaar H., Napier C., Oldewage-Theron W.
• Lead and cadmium in maternal blood and placenta in pregnant women from a mining-smelting zone of Peru and transfer of these metals to their newborns. Castro J., López de Romasa D., Bedregal P., López de Romasa G., Chirinos D
• Maternal knowledge and practices of exclusive breast feeding and anthropometric indices of their infants in southeast Nigeria. Ibeau N. V., Uchenna S. C.
• Is dietary diversity associated with biomarkers of micronutrient status among non-pregnant adolescent Mosanambican girls in two different seasons? Korkali L., Brkola M., Heinonen A., Freeze R., Selvester K., Mutanen M.
• Community health workers prevent harmful infant feeding and caring practices among mothers of children under 2 in Palestine. Al-Rabadi H
• Nutritional Status of Primary Schools Children in the Oio and Cachoe Region in Guinea-Bissau. Schossman N. P., Batra P., Balan B., Coglanese N., Wood L., Santos M. V., Pruenswey W., Saltzman E., Roberta S. B.
• School Nutrition Pilot in rural and urban Bangladesh: evaluation of nutritional and cognitive effects. Rift Afrom, Avont Basak Tukun, Zakir Akanda, Julian Wolfson, Greg Garrett, Eline Kolenromp, Rebecca Spohrer
• School based malaria clearance in Mali: impact on anemia and cognition. Diarra S., Roschyn N., Clarke S., Rouhami S., Bamadio M., Sacko M.
• The provision of a free school meal in underprivileged areas of Greece. Petralias A., Lysaou A., Valdoksi A., Haviari A., Zota D., Papadimitriou E., Limos A.

MODERATORS:
Rita Wegmuller, The Gambia
Almudena Sánchez-Villegas, Spain

• The need for global partnership in encouraging the production and utilisation of traditional crops, a perfect way of combating malnutrition. Adedotun. J., Owolabi
• Healthy diet indicator score and metabolic syndrome in the Czech Republic, Russia, and Poland: cross-sectional findings from the Health, Alcohol, and Psychosocial factors in Eastern Europe study. Huangfu P., Peasey A., Pikhart H.
• Nutrient patterns and prospective weight change in adults from 10 European countries: results from the EPIC-PANACEA study. Freising H., Pisa PT., Moskal A., Ferrari P., Byrnes G., Silnani N., on behalf of the EPIC-PANACEA collaborators
• Ten year change in individual monetary diet cost predicts changes in diet quality and weight development in Spaniards. Schröder H., Serra-Majem L., Funtikova A., Gomes SF., Rito M., Elsas R.
• Focused ethnographic Study on Infant and Young Child Feeding Behaviors, Beliefs, Contexts and Environments in three Arid and Semi Arid counties in Kenya. Faith M., Thuita, Gretel H., Felto

DEBATE

Tasting foods as public health measure

MODERATOR:
Beatris González López-Valdecrl, Spain

SPEAKERS:
Guillem López Casasnovas, Spain
Nathan Tefft, USA
**15:30-17:00**

**PLENARY SESSION**

*Nutrition research in the new era*

**CHAIRS:**
Ángel Gil, Spain  
Lluís Serra-Majem, Spain

**SPEAKERS:**
Reynaldo Martorell, USA  
Martin Binks, USA  
Lorraine Brennan, Ireland  
Ángel Gil, Spain  
Andrew Prentice, The Gambia

**17:00-18:00**

**CLOSING CEREMONY**

**CLOSING LECTURE:**
*Celebrating 20 years of the Nutrition Leadership Programmes*

**CHAIR:**
Noel Solomons, Guatemala

**SPEAKER:**
Jean-Michel Antoine, France

**18:00-18:45**

**CLOSING CEREMONY**

**CLOSING LECTURE:**
*The Role of Food and Nutrition in Space Exploration*

**CHAIRS:**
José Ramón Calvo Fernández, Spain  
Lluís Serra-Majem, Spain

**SPEAKER:**
Ellen Baker, USA

**HOSPITALES SAN ROQUE**
SPEAKER ABSTRACTS

Nutrition research and development in Africa
Prentice A.M.
MRC International Nutrition Group, London School of Hygiene & Tropical Medicine, Keppel Street, London, WC1E 7HT & MRC Keneba, The Gambia

It can legitimately be asked whether Africa requires any more nutrition research in order to reach its full development potential. Or do we simply need to effectively implement what is already known? The second parsimonious’s ‘solution’ to intervention’ route has, in its favour for certain nutritional challenges and has been highly effective for iodine and vitamin A. But for other challenges with significant public health implications there are still gaping holes in our basic understanding of the causes, consequences and solutions to diet-related diseases. The potential discovery space remains vast and we now have powerful new investigative tools with which to attack old problems. New knowledge in these fields can accelerate the path to translation. Such challenges often require ‘big science’ collaborations across multiple institutions worldwide, and this generates rich opportunities for African scientists. Africa is home to problems searching for a solution. Technologically advanced nations frequently have solutions looking for problems. The astute fusion of these two ends of the spectrum can be mutually beneficial in generating research funds and driving education, training and discovery. The American scientist with next-generation methods for conducting single cell metabolomics requires training in the ethics and practicalities of conducting clinical studies in the African bush just as much as the reverse. For Africa to succeed in nutrition research we first need to recruit the finest minds with an appetite for discovery science. Physicians, molecular biologists, geneticists, developmental scientists, computer programmers, mathematicians and more will all be welcomed to our field. Horizontal acquisition of intellectual input from these specialities will enrich our discipline. Second we need to maintain the centre of gravity in Africa itself, or at least a healthy equipoise. Africa must not be a research hotel and must negotiate equal partnerships in nutrition research. This requires the strengthening of indigenous institutions at all levels of competencies, and especially in financial management so that grant-giving bodies can have confidence in disbursing funds directly to African universities and institutes, rather than channelling them through Western partners. Africa has enormous untapped potential for nutrition research. The future will be bright.

Food Security Improvements.
Pinstrup-Andersen P.
Cornell University and University of Copenhagen. High Level Panel on Food Security (HLPE).

There are no reliable estimates of global household-level food insecurity. when using the FAO definition of lack of access to a healthy and nutritious diet. Proxies include FAO’s estimates of undernourishment and various indices such as IFPRI hunger index and BLU’s food security index. These provide an important slow rate of improvement during the last 25 years and significant variation among countries, with China accounting for a very large share of the improvements. However, even if these proxies provide reliable estimates of dietary energy intakes (they do not attempt to estimate access), they all ignore non-nutrient intakes, overweight and obesity. They also ignore the very rapid dietary changes currently occurring in most developing countries. Thus, the overall nutritional status of the world population has clearly deteriorated if measured as the number of people who suffer from one or more of the three burdens of malnutrition: calorie deficiencies, nutrient deficiencies, and overweight and obesity. This would be case both globally and for developing countries. There is a need for new and improved metrics to measure progress to achieve good nutrition for all. As the prevalence of overweight and obesity increases rapidly in both developing and developed countries and widespread micro-nutrient deficiencies continue, merely relaying on existing metrics is insufficient to guide future action. A number of alternative metrics have been proposed but none has been scaled up to the global level. It is critically important that appropriate metrics be agreed upon and included in the post-2015 development goals.

The achievements in Malnutrition Micronutrient Malnutrition.
Venkatesh Mannar M.G.
University of Toronto, Canada.

The knowledge and solutions needed to effectively alleviate micronutrient deficiencies and malnutrition more broadly is ready to be applied at a very low cost. Over the past decade there has been significant progress in addressing deficiencies in micronutrients such as iodine, iron, zinc, folic acid and vitamin A in many regions of the world. The Copenhagen Panel of Economists has repeatedly ranked micronutrient interventions among the most cost effective development initiatives. There have also been significant efforts to raise awareness and accelerate action through the Scaling up Nutrition (SUN) movement. This paper traces the progress made over the past decade to address widespread deficiencies – primarily through salt iodination to address iodine deficiency, and administration of high-dose vitamin A capsules to children 6 months – 5 years old, fortification of cereal flours to correct iron and folate deficiencies. Zinc treatment of diarrhea along with oral rehydration therapy is also emerging as a major intervention to treat diarrhea and reduce infant mortality. The paper stresses that these efforts need to be significantly accelerated and expanded through coordinated multisectoral efforts in order to enable all people to reach their full development potential that would support the achievement of the millennium development goals to eradicate extreme poverty, improve maternal health and significantly reduce child mortality.

 Sustainable Food Systems for Food Security and Nutrition
Meybeck A.
FAO, Agriculture and Protection of Consumer Department, Rome.

As the world is debating the post 2015 development agenda it is important to assess what has been achieved in terms of food security and nutrition and to look ahead to measure what has still to be done and the challenges to address. Considerable progress has been. 63 countries have achieved the Millennium Development Goal of halving the percentage of their population who are undernourished. As of 2009, one in every 5 million undernourished persons worldwide. It is less than in 1990; it is still unacceptable. And there are still 2 billion persons malnourished, lacking essential micronutrients. At the same time the number of overweight and obese is increasing. There are now more than 1.4 billion overweight worldwide. Food systems will also be confronted to considerable challenges in the future. Population growth and changing diets towards more animal products are driving demand growth, estimated by FAO at 60% towards 2050, increasing pressure on natural resources, which are also impacted by competition for other uses and by climate change. Urbanization and globalization are profoundly modifying the organization of food systems; which in turn impact the way food is consumed, diets and nutrition. Such challenges call, more than ever, for sustainable food systems, which, as defined by the HLPE, ‘deliver food security and nutrition for all in such a way that the economic, social and environmental bases to generate food security and nutrition for future generations are not compromised’. It requires to better integrate nutrition concerns in agricultural, food, and related policies and actions. This is why FAO and WHO are organizing in Rome this month the second International Conference on Nutrition.

Hidden hunger in the ‘First World’ – how is economic crisis affecting undernutrition?
Biesalski H.K.
Dept Biological Chemistry and Nutrition, Food Security Center University of Hohenheim, Germany.

Hidden hunger is hidden in two ways: 1. because this type of hunger, even despite a full stomach, develops without typical clinical signs or symptoms and 2. due to missing public and political awareness. Hidden Hunger is responsible for impaired childhood development, high maternal mortality and at least for millions of deaths in children before the age of five. Hidden hunger describes chronic inadequacy supply with essential micronutrients through the diet. In particular vitamin A, iron, zinc, iodine and folate. Further essential micronutrients might be absent in the diet but those mentioned above contribute to the majority of cases worldwide. 2 Billion worldwide suffer from iron deficiency, one billion from iodine- and zinc- and 0.2-0.5 billion from vitamin A deficiency. Young females, pregnant women and children aged 1-5 years are primarily affected from hidden hunger. They are placed on a hunger carousel, which they cannot leave, by their own. Hidden hunger during pregnancy results in inadequate supply of the important nutrient impact on early development. Iron deficiency during pregnancy may result in severe cognitive impairment and deafness. Folate deficiency results in neural tube defects and vitamin A deficiency in different malformations and impaired lung function. Malnutrition during the 1000 days from conception to two years of life results in stunting (reduced height for age) with physical and cognitive impairment. Stunting however, is irreversible! The consequences will have a strong impact on later life and reduce the possibility that the vicious cycle of poverty and malnutrition will end for the children and their later descendants.

The major reason for hidden hunger is missing food sources e.g. fruits, vegetables, meat. One third of the human population lives in poverty and needs to cover up to 85% of their daily energy need with grains.

International Journal of Community Nutrition 2014, 0 (suppl)
However, grain (maize, rice, wheat) is a good source for energy and protein and creates satiety but a rather poor source for micronutrients. The mechanism of nutrition interventions to improve the nutritional status of communities is strongly dependent on food systems. Food prices and at the same time food insecurity increase as a consequence of the 2008 economic crisis. The consequences are an increased number of children with a poor nutrition and a strong negative impact on physical and cognitive development.

Sharing benefits from public-private partnerships and collaborations in advancing health and well-being—one industry perspective.


Public-private partnerships and collaborations (PPPs and PPCs) can be very effective in addressing some of the toughest challenges in the world today. Questions that usually follow such a declarative statement often revolve around the ‘Why’ and ‘How?’ In short, it is because such PPPs and PPCs leverage the power of the Golden Triangle of business, government, and civil society organizations, with each sector doing what it does best. Trust, honesty, respect and transparency are essential for any PPP and PPC to succeed—regardless of its size or focus.

There are many examples of such PPPs and PPCs working to drive solutions to the many sector and category challenges facing our global society. With the topic at hand, my presentation will focus on the PPPs and PPCs designed to help people live better lives.

Private industry shares a global responsibility to help develop solutions to the diverse spectrum of nutrition and health challenges. At Coca-Cola, we care about people’s health and well-being, and realize that the success of our company relies on responding to these consumer needs. Consequently, our focus has been on what can be done to ensure healthy energy balance.

With our technical and marketing expertise, our reputation and network of influence, and our global production and distribution system, we are striving to make a meaningful difference in the well-being of the public across each of the more than 200 countries we serve. But we know we cannot do this in isolation. We must work with many public and private sector partners. To that end, we work with industry partners, foundations, NGOs and government organizations to reduce the caloric contribution of our beverages, while also providing opportunities for the public to increase their activity levels and access to healthy foods.

While we continue our efforts to address the issue of over-nutrition, we are continuing efforts to resolve the other global malnutrition burden that impacts nearly 1 in 7 people. With a focus on workable solutions, The Coca-Cola Company has developed Golden Triangle PPPs and PPCs to provide schoolchildren who may be at risk for malnutrition with nutritionally beneficial beverages.

Moreover, Coca-Cola works with government partners and NGOs to help solve broader health challenges. For example, we provide distribution expertise to public health organizations in Ghana and Tanzania, helping to improve the distribution of medicines alongside other partners including USAID and the Bill and Melinda Gates Foundation. The goal is simple—to do what we can to strengthen healthcare systems globally.

Examples of other Golden Triangle PPPs and PPCs will be presented during the panel discussion.

Efficient nutritional programs at national level: challenges and opportunities—the developing world strategies focusing on micronutrient deficiencies.

Detzel P. Nestlé Research Centre, Switzerland.

The latest global hunger index 2014 from IFPRI points at one form of hunger that is often ignored or overshadowed by hunger related to energy deficits and protein deficiency is hidden hunger—also called micronutrient deficiency—which affects some 2 billion people around the world. This shortage in essential vitamins and minerals can have long-term, irreversible health effects as well as socioeconomic consequences that can erode a person’s well-being and development. By affecting people’s productivity through physical weakness or due to long term effects of impaired mental development, it also takes a toll on countries’ economies.

Poor diet, disease, impaired absorption, and increased micronutrient losses during certain life stages, such as pregnancy, lactation, and infancy, are among the causes of hidden hunger, which may “invisibly” affect the health and development of a population.

Possible solutions to hidden hunger include food-based approaches: dietary diversification, which might involve growing more diverse crops in a home garden; fortification of commercial foods; and biofortification, in which food crops are bred with increased micronutrient content. Food-based measures will require long-term, sustained, and coordinated efforts to make a lasting difference. In the short term, vitamin and mineral supplements can help vulnerable populations combat hidden hunger.

Different stakeholders have a role to play. To illustrate this we will focus on the way public health actors and private food manufacturers develop their approach of fortification of packaged or staple food.

The main challenges facing public health actors when it comes to fortification of food products are linked with the financial sustainability of such programs, their capabilities to raise awareness and awareness on micronutrient deficiencies, the issues of compliance of food manufacturers to...
implement these programs but more importantly of the acceptability of the food interventions by the consumers. Market driven fortification programs led by private food manufacturers are in general designed to differentiate a product from its competitors. This more opportunistic approach has compared with the public health approach some advantages. The production and distribution of fortified food is financially sustainable and not dependent on fundings. The costs of fortification and distribution are priced in the product offering. Furthermore the fortified packaged products are normally widely used and known by the consumers. For example, condiments and sauces are widely and frequently used by consumers, including the poorest ones who are the main target of these programs. The challenges of this approach are different. The level of fortification are lower for regulatory and safety reasons, meaning it will help reduce the micronutrient deficiency gaps but in general (with the exception of specific products such as fortified infant cereals) will not be enough to close the gap. Another important challenge is related to the packaging: Although certainly they are based on output, like number of servings sold, measuring or modeling the role of the market driven programs are difficult to assess.

The conditions to better coordinate these two approaches are the strengthening of a common language based on concepts such as global burden of disease, disability adjusted life expectancies, cost-effective methodology. All stakeholders need to further develop a better understanding of the determinants of food choices, nutrient intake via dietary intake assessment and biomarker status of the population. Validated methodologies to estimate the impact of these interventions need to be further developed. This will help the public health actors to be more “consumer” oriented and private actors to better assess their role and contributions to reduce hidden hunger.

Health economic evaluation of market driven fortification programs: the Philippines example.

Wieser S.
Winterthur Institute of Health Economics, Zurich University of Applied Sciences, #401 Winterthur, Switzerland.

Objectives: Micronutrient deficiencies (MNDs) are a major public health problem in the developing world and particularly harmful during early childhood due to their impact on the physical and cognitive development. We estimate the cost-effectiveness of price-based interventions with packaged fortified powdered milk (FFM) for the reduction of MNDs in 6-23-month-old Filipino children.

Methods: We first build a health economic model simulating the consequences of MNDs in childhood over the entire lifetime based on a health survey and a nutrition survey. Health consequences of MNDs are modelled based on information extracted from literature. The cost-effectiveness measurement is based on a survey and marketing experiment conducted in 2013 among 1800 households, combined with the health economic model and the results of a systematic review on the efficacy of food fortification.

Results: Total lifetime costs of MNDs in 6-59-month-old children amounted to direct medical costs of 30 million dollars, production losses of 618 million dollars and intangible costs of 122,138 disability adjusted life years (DALYs). Demand for FFM is considerably more elastic in poor households and a price discount of 20% for the poorest 20% of the population has a cost-effectiveness ratio of 329 USD per DALY saved.

Key findings: MNDs lead to substantial costs in 6-59-month-old children in the Philippines. Costs are highly concentrated in the lower SES and in 6-23-month-old children. Interventions specifically targeting poor households are more cost-effective because of the higher prevalence of MNDs, lower levels of current consumption and higher price elasticity of demand.

The need to revitalize the Mediterranean diet, not just for health.

Demil S.
FAO / Forum on Mediterranean Food Cultures, Rome, Italy.

The Mediterranean diet, scientifically well-characterized in the past as a healthy dietary pattern and acknowledged by UNESCO as an intangible cultural heritage, recently became also object of increasing studies on its sustainability. By considering the increasing non adherence of the Mediterranean diet model in many Mediterranean countries, a new interdisciplinary and intercultural approach is required towards revitalization as a sustainable dietary pattern as well as a sustainable contemporary lifestyle. But it’s not easy to go back, and it’s now necessary to act now to reconstruct, at least partly, for the Mediterranean diet a more appropriate food cultural context, more suitable to the times and for all people.

The main challenge of the cost of diets on the environment, society and public health nutrition. Food consumption and production trends and patterns are among the most important drivers of environmental pressures. The sustainable diets’ concept highlights the role of sustainable consumption as a driver of sustainable food production. The Mediterranean diet has nutritional, economic, environmental and socio-cultural characteristics that make it particularly relevant as a case study for characterizing sustainable diets in different agro-ecological zones.

The 2015 EXPO in Milan can be the ideal place for presenting the Mediterranean diet, not only as a healthy diet, but also as a model for the development of sustainable dietary patterns, a contemporary sustainable lifestyle, a new revitalized dietary model which must include the idea of sustainability.

Since 2015 FAO has been conducting a series of activities on the Mediterranean diet as a case study for evaluating the sustainability of diets and food consumption. Activities which contributed to a definition of the concept of sustainable diet as “low environmental impact diets which contribute to food and nutritional safety and to a healthy life for present and future generations, sustain the quality, and safety and ecosystems, are culturally acceptable, accessible, economically appropriate and convenient; are nutritionally suitable, safe and healthy, and optimise natural and human resources.”

Assessment and valorization of the sustainability of quality products, typical of the Mediterranean diet of the Apulia region, Italy.

Capone, R.
CIEHAE-Bari, Italy.

The project “Agriculture & Quality” is a project of Apulia Region, which is technically and scientifically supported by the Italian seat of the CIHEAM (Centre International de Hautes Etudes Agronomiques Mediterraneennes). Its main objective is the qualification and enhancement of typical food products of the Apulia region, through the creation of the quality scheme “Quality Products of Puglia (QpQ)” that ensures superior quality compared to other products on the market, and it aims to ensure origin and quality of agro-food products from Apulia region by complying with the product technical specification/standard of reference approved by Apulia region authority.

In particular, in the framework of this project, in addition to the issues of quality, CIHEAM-Bari, with Apulia Region authority has started a pilot project to assess and promote the sustainability of the products belonging to the quality scheme QpQ, typical of the Mediterranean Diet. The main objective of this pilot project is to ensure that the products which adhere to the quality scheme QpQ comply not only with the quality requirements defined by the technical specifications, but also with the sustainability requirements.

This pilot project is one of activities started after the international seminar organized by CIHEAM in collaboration with the FAO on “Sustainability of food systems in the Mediterranean Area”, held in Malta in September 2012, on the occasion of the Meeting of Ministers of Agriculture of Mediterranean Countries of the CIHEAM. In this seminar was presented by FAO-Sustainable Food Systems Programme and CIHEAM-Bari a methodological approach to assess the sustainability of the Mediterranean diet, and a set of indicators to assess the impacts in its four dimensions (economic, environmental, socio-cultural and nutritional-health) in different specific territorial contexts from the Mediterranean region. The project “Evaluation and valorization of the sustainability of quality products of Apulia, typical of the Mediterranean Diet” aims to apply the methodological approach proposed in Malta in 2012 to a well-defined territorial context, that of Apulia Region - Italy, to identify and develop the most appropriate indicators to assess and promote the sustainability of the Apulian products adhering to the quality scheme QpQ, typical of the Mediterranean Diet. As a pilot experience, the project aims to contribute to the further implementation of the methodological approach developed by addressing all the critical issues that arise from such an application with respect to a macro-region context as the territorial reality of Apulia region.

The Mediterranean diet in its environment.

Meybeck A.
FAO, Agriculture and Protection of Consumer Department, Rome.

The Mediterranean diet, described from traditional diets in the Mediterranean area in the 1950s, is the result of its environment and of culture. Many of its characteristics contribute to its environmental sustainability. Plant rich and frugal it exerts less pressure on scarce natural resources than diets richer in animal products. The importance of legumes, which directly fix nitrogen from the air, reduces the need for fertilizers. The diversity, in the diet and of the diets, ground the development and preservation of a particularly rich agrobiodiversity. These characteristics are now well known and valorized. Since the description of this model diets are quickly changing, in the Mediterranean area and worldwide. This raises two crucial questions. How are, and can be, preserved in contemporary Mediterranean diets the characteristics that made its environment-
The progressive evolution of the Mediterranean diet towards sustainability.

Berry E.M.
Hebrew University, Braun School of Public Health, Jerusalem, Israel

The position of the Mediterranean Diet (MD) has undergone a progressive evolution over the past 60 years. Historically, the health benefits of the diet in Crete (pre-1960) were recognized by Ancel Keys. These were confirmed in many studies leading to the formulation of the traditional MD pyramid in 1985. Thereafter, socio-cultural and further health impacts led, in 2009-10, to the formulation of a revised pyramid with greater emphasis on “a lifestyle for today”. Since then two further advances have occurred: the recognition by UNESCO of the MD as an intangible Heritage, and the increasing importance of ensuring Sustainability and its four dimensions. In order to monitor the progress in adherence to the MD it is necessary to measure all the determinants involved. Thus it will be necessary to identify the optimal valid indicators for each dimension – nutrition, environment, socio-cultural and economic. Indicators must be also generally available and inexpensive to collect to enable frequency of sampling. The relative weightings of the chosen indicators for each dimension is then calculated. Finally the weightings between the dimensions will have to be decided (not necessarily 25% each) in order to produce a composite index of Sustainability. This may be easily disaggregated to trace the influence of each of the four dimensions to allow policy makers decide where improvements are needed and also to record progress over time. The presentation will consider examples from measuring Food Security and also problems of adherence to the MD.


Towards a definition of economic and social sustainability of food supply chain.

Adinolfi F.
University of Bologna. CHEAM. Italy.

The main aims of the paper is twofold. Firstly, to provide an overview of the methodology carried out in the literature for evaluating sustainability performance of a food regional food system. Successively, particular attention is devoted to measuring economic and social aspect of the concept of sustainability in a broader sense. Since this specific field has been under-exploited until now (Defra, 2010), we are implementing a social and economic sustainability indicator for selected case in Apulia Region, by using the SCOR model. SCOR model describe the involved sub-system processes and the MAUT (Multi Attribute Utility Theory) MACBETH methodology to consistently compute the expected performances.

Sustainable diets in the context of sustainable food systems. Socio-cultural dimensions on Mediterranean diet.

Medina F.X.
Universitat Oberta de Catalunya (UOC) / ICAF-Europe, Barcelona, Spain.

In the developed countries, the large number of industrial processes and transformations of all kinds which food goes through before reaching the consumer, generates in the public mind mistrust towards it. More often than not, people would make a connection between this and eating, and concepts like “traditional”, “home-made” or “Bio” succeed. Until the present, Mediterranean Diet has been observed as a healthy model of medical behaviour. After their declaration as a Cultural Heritage of Humanity at UNESCO, Mediterranean Diet is actually being observed as a part of Mediterranean Culture and opening their concept as an equivalent of Mediterranean Cultural Food System or Mediterranean Culinary System. A new point of view that will be capital in the future discussions about the Mediterranean Diet, their challenges and their future perspectives.

From a local Mediterranean point of view and as apprioximation model consumption, Mediterranean food and diet can be a sustainable resource for the Mediterranean Area. In this context (and as every food system in their own bio-social context), the Mediterranean Diet is an outstanding resource–locally produced in cultural coherent contexts–for the Mediterranean area.

Food consumption pattern in Southern Mediterranean population.

Belasen R.
Lab. of Biotechnology, Biochemistry and Nutrition. Training and Research Unit on Nutrition & Food Sciences. Chouaib Doukkali University, El Jadida, Morocco

Mediterranean diet is a characteristic of the countries populations around the Mediterranean basin. However, the dietary pattern is not homogeneous among these countries and even in the same country. This resulted in a wide variation of the dietary patterns within the Mediterranean region. On the other hand the diversity and nature of the foods that characterizes the diet have been reported to be nutritionally healthy with lower nutritional disorders and associated mortality than western diet. A change in the trend of food consumption in all these countries has been noted over the past decades in the region including in southern Mediterranean countries. This is characterized by a regression of the traditional dietary pattern that is based on diversity and preservation of local products; and a trend towards a homogenous and standardized dietary model with a decreased adherence to Mediterranean diet. In parallel to the similarity of trends characterizing the food consumption pattern, there is also a gradual Nutrition transition associated with increased obesity and non-communicable diseases. This paper examines the trends of food consumption across the southern Mediterranean area. The data are discussed considering the accompanying changes in health profile.

Meeting half way - PPP engagement for Nutrition Outcomes.

Monterroso E.
Sight and Life.

It is generally agreed that significant reductions in malnutrition will not be achieved by the public sector alone, and that this requires a broad group of stakeholders working across sectors towards a common goal. The private sector has a largely underestimated ability to reduce malnutrition. One way to leverage the private sector capabilities towards malnutrition is through public-private partnership (PPP). For the public sector, improved nutrition is both an objective and a value, but this is rarely the case for the private sector. It is important to define the terms of engagement by first considering 4 key elements in regards to shared interests.

Most partnership in nutrition often will define a common goal (or a shared interest) but to reach that goal several other factors should be considered including shared values, shared objectives, shared approaches, and shared outcomes. This talk will discuss the implications of convergence and divergence for each and how this may affect the direction of the partnership and likelihood for achieving an impact on nutrition outcomes. Often it is through these considerations where both parties will meet half way, establishing rules for engagement. The talk proposes a framework for transparent engagement among private and public sector parties.

Shared interests encompass declarations of interest and conflicts of interests (perceived and actual). All stakeholders must be clear about why the partnership is needed. Partnering is desirable to leverage the capabilities, and PPP often require significant changes in technical expertise alongside the value chain between partners. If perceived or actual conflict of interest cannot be solved in the partnership, then other arrangements, such as purchasing of the services, could be considered.

Opportunities within Boundaries – Rules of Engagement to leverage the private sector for scaling up nutrition.

Germann S.
World Vision International.

One Goal – (A child nutrition campaign powered by the Asian Football Confederation / World Vision international and partners).

Extreme positions polarize and create often heated but needed debate. However, it is in the ‘middle ground’ where most progress for human and social development is taking place. The extreme view on one end says that ‘the business of business is business’, business is only responsible to its shareholders and to stay within the law and nothing else. The other end states that ‘Capitalism only globalizes poverty, it only globalizes hunger and social injustice’. These extremes show us the range of viewpoints that businesses and civil society organisations need to consider when working in the area of improving global public health and nutrition.

The last decade has seen an increase in Public Private Partnerships, often led by UN, civil society, and businesses who operate in the ‘middle ground’ of that debate. Whilst the current evidence base on the impact of such PPP’s in the field of nutrition is weak or absent, some are making significant advances to
reach the world’s most vulnerable people with improved nutrition. At the same time, the rise in the rate of obesity in many countries is a cause for concern that some food and beverage companies promote ‘leanwashing’ where a firm’s public relations and marketing efforts promote the perception that they help solve the obesity problem that deflates from the fact that they directly contribute to the problem. Similar practices are found in the areas of nutrition, environment, and WHV marketing code violations.

How to navigate these challenges? The most direct solution would be no engagement, promoted by some. However, this easy route fails us today and increasingly will make it impossible to ensure food and nutrition security for the potential 11 billion people by 2100. Hence moving from a combative to a co-creative mode of engagement is imperative. A co-creative mode leverages opportunities for positive impact at scale, but operates within clear boundaries that protect the public health interests, especially of the most vulnerable people in society. Recently developed guidance notes on preventing and managing conflict of interest led by SUN, the Global Hunger Index, or Access to Nutrition index are all nascent efforts to provide organisations working within the ‘middle ground’ with the needed guidance to leverage the private sector for improved nutrition at scale, whilst safeguarding public health interest. This will become even more important in our collective effort to achieve the new nutrition targets in the post 2015 sustainable development goals.

Public-Private Partnerships to ensure availability and access to safe and nutritious foods for preventing undernutrition among 6-23 mo old children.

De Pee S. World Food Program

Background: Meeting nutrient needs is a prerequisite for the prevention of undernutrition (stunting, micronutrient deficiencies, wasting), together with prevention and treatment of illness. Meeting nutrient requirements of children aged 6-23 months requires consumption of a certain amount of animal source and fortified foods, but access to these foods is constrained by income and availability. With increasing urbanisation and access to markets for smallholder farmers, the proportion of households that purchases a substantial part of their diet increases. Purchased foods can be fresh or processed. Processing serves several purposes, including extending shelf-life, pre-cooking and adding value (nutrition, flavor, etc.).

Issue identification: In order to ensure adequate nutrition for young children, foods need to be made available for this age group that are safe and nutritious, affordable, and appropriately marketed. Potential solutions: Public-private partnerships are required that have as common goal increasing access to safe and nutritious foods for young children. The public sector sets requirements for nutritional value, safety, and marketing, monitors compliance, and commits to purchase a specific quantity for distribution to the poorest of the population. The private sector sets a production capacity that ensures production of safe and nutritious foods according to agreed specifications, and sells to middle- and high-income consumers. Dialogue and coordination between public and private sector partners is essential in order to a) set achievable goals for product composition (nutritional value, palatability, shelf-life and cost), b) design distribution options, including ‘market size’ of the product, and c) develop a realistic business model for the required investment.

Conclusions and way forward: Due to lack of shared goals, distrust, and limited demand, there are few of such public-private partnerships. However, this is changing and promising models will be described.

Promoting nutrition as a sustainable business case for local food processors- a case from Ghana.

Reinhard I. Department for Agriculture and Food, German Development Cooperation (GIZ), Germany.

This presentation will describe the pilot project ‘Affordable Nutritious Foods for Women’ (ANF4W), implemented by GIZ. ANF4W is a testing ground for innovative approaches within the food fortification framework, to which it is very well tailored. One goal is engaged with the private sector: The presentation will showcase ANF4W’s strategy in Ghana to increase the supply of affordable nutritious foods (through product development) and demand of these foods (by raising awareness), while involving local stakeholders such as food producers and retailers. The project is aimed at increasing access, availability, and consumption of new and affordable fortified food products designed to bridge the gap between the nutritional needs and current intake of women of reproductive age (WRA). ANF4W in Ghana identifies two main challenges in its approach. First is the promotion of ‘nutrition’ as a sustainable business case for local food producers and processors. The project recognizes that this stems from weak infrastructural and technical capacities and limited access to financial services, as well as creating a sustainable private market for the product, where such a market has not yet been established. Secondly, with scarce data on dietary intake and nutritional status of WRA, an impact analysis of the project is difficult.

To address these challenges, the project will conduct studies on different local conditions/elements that play a role in a local stakeholder’s ability to create and supply an affordable nutritious product. Studies will assess: women’s eating habits and beliefs around foods, locally available and affordable food commodities, capacities of local food industry, and potential distribution channels. Increased awareness on the importance of nutrition for WRA will enhance the private market demand for these products.

The on-going studies and results will be used to determine various food prototype options. ANF4W together with selected local food processors will develop the food products and subject them to an acceptability test. The project will then raise funds to conduct dietary intake and nutritional status assessment for WRA, in order to access the success of this innovative approach.


Jayaram S. Results for Development Institute (R4D), Washington, USA.

Public-Private Partnerships (PPPs) in nutrition are still evolving, and there is a lack of evidence on how such PPPs contribute to nutrition. Given this context, Results for Development Institute (R4D) developed an evidence-based case study that reviews the activities and outcomes of the DSM-WFP partnership over the past seven years. Through a combination of literature research and in-depth interviews with key stakeholders, we explore the partnership’s achievements and how each organization has contributed as a result of the collaboration. We study two product classes (Super Cereal (SC) and Micronutrient Powders (MNP)) in detail, and discuss achievements and lessons learned from the partnership’s work. Our emerging findings indicate that alignment on goals and vision is crucial for a PPP’s success, and that the DSM-WFP partnership benefited from the deep involvement of senior management from both sides. Both organizations have also individually grown over the past few years: WFP has become increasingly focused on nutrition quality, and DSM has now greater influence in the nutrition arena. The joint work of collaboration has led to packaging and product innovations: MNP packets and boxes have been redesigned to take account of the local context and end users, while product improvements led to SC/SC+ reformulations. In-country advocacy efforts are also being strengthened via both top-down and bottom-up approaches, and the partnership has recognized that regionally focused approaches on specific topics are effective in mobilizing capacity and interest.

Going forward, there is an opportunity to further improve systems to institutionalize and share knowledge: this will enable staff to better communicate with each other and share experiences for greater impact. Lastly, there is a need for increased access to markets which will allow the partnership to better measure its impact and influence. There is scope to further disaggregate beneficiaries and track whether they are receiving the right nutrition; in addition, formal program evaluations to assess beneficiary reach, program delivery, replicability, and scalability could be conducted, and indirect outcomes (such as education attainment) could be tracked. By doing so, the DSM-WFP collaboration and other nutrition-focused PPPs can indicate their broader outcome and impact, and showcase how such partnerships can play an important role in meeting nutrient needs.

Public private partnership – a broad based reality approach to tackling maternal, infant and young child malnutrition in Ghana.

Kwame Nith Ano S. Yedent Agro Group of Companies Limited.

The World Bank defines Public Private Partnerships (PPPs) broadly, as arrangements, typically medium to long term, between the public and private sectors whereby part of the services or works that fall under the responsibilities of the public sector are provided by the private sector, with clear agreement on shared objectives for delivery of public infrastructure and/or public services. These arrangements usually help create added value through synergies between public sector authorities and private sector companies, in particular, through the integration and cross-transfer of public and private sector skills, knowledge and expertise. The quest for applying PPP as an effective broad based approach/strategy in tackling developmental and public health problems such as maternal, infant and young child malnutrition is increasingly becoming a growing
phenomenon among developmental and governmental stakeholders. Maternal, infant and young child malnutrition has become a major and developmental issue in developing countries such as Ghana. The impact of maternal, infant and young child malnutrition has diverse negative consequences to a country’s economy and its citizenry. The brunt of malnutrition among mothers makes them susceptible to pre and post natal dangers, infant and young child malnutrition makes them susceptible to early childhood illnesses (morbidity) and death (mortality). Malnutrition also causes devastating mental and physical effects such as stunting, which affected children carry into adulthood. There are also attendant long term effects on the health of the population, human capital and sustainability into development agenda of the country. In Ghana, the statistics of maternal deaths of 350/100,000 live births renders it among the least safe countries for maternal and infant survival (ranked 150 out of 178 countries). This is a serious public health issue. The status of Ghana as one of the 30 most dangerous countries for children in the world is very alarming. With regard to infant and young child malnutrition, statistics show that 32% of children in Ghana between the ages 0-59 months in rural and periurban areas suffer from chronic malnutrition, 28% of children under 5 years are stunted, 14% are underweight while 9% are wasted. Additionally, 78% of children aged 6-59 months have some level of anaemia. These statistics are very alarming as far as public health is concerned and need a broad based approach to tackle.

In tapping into PPPs evidence as a result-oriented approach in tackling developmental issues, Yedent, an SME private sector player in the food processing industry in Ghana, has collaborated with the Global Alliance for Improved Nutrition (GAIN) to tackle infant and young child malnutrition in Ghana. Yedent’s strength in local capacity, understanding of the local human skills and infrastructure have been leveraging with GAIN’s technological know-how and capital to develop, produce and market a convenient, affordable and nutritious cereal based complementary food for infants and young children between the ages of 6-24 months. Aside the collaboration with GAIN, Yedent has also collaborated with Agriculture and their partners such as IICA, USAID, CARE, University of Ghana-Nutrition Department, etc. to develop a food supplement for malnourished children in Ghana.

In conclusion, PPP is a realistic broad based approach to dealing with striking challenges that confront the world and must be embraced for scale ups especially in the fight against maternal, infant and young child malnutrition in our world today.

The impact of hydration on health.
El-Sharkawy A.M.1, Sahota O.2, Lobo D.N.1
1Division of Gastrointestinal Surgery Nottingham Digestive Diseases Centre NIHR Biomedical Research Unit, University of Nottingham, Nottingham. 2Department of Orthogeriatric Medicine, Nottingham University Hospitals NHS Trust, Queen’s Medical Centre, Nottingham, United Kingdom.

Background: Maintenance of fluid and electrolyte balance is essential to healthy living as dehydration, overhydration and fluid overload are associated with morbidity and mortality. The aim of this review is to present the current evidence for the impact of hydration status on health.

Methods: The Web of Science, MEDLINE, PubMed and Google Scholar databases were searched using relevant terms. Randomised controlled trials and large cohort studies published over the 20 years preceding August 2014 were selected. Older papers were included if the topic was not covered by more recent work.

Results: Studies show an association between hydration status and disease, however, in many cases there is insufficient or inconsistent evidence to draw a firm conclusion. Dehydration has been linked with many conditions including; urological, gastrointestinal, circulatory and neurological disorders. Overhydration and fluid overload have also been linked with cardiovascular disorders, hypoaetraemia, generalised oedema, gastrointestinal dysfunction as well as deep vein thrombosis.

Conclusion: There is a growing body of evidence supporting the link between state of fluid imbalance and disease. However, in some cases the evidence is largely associative and lacks consistency with limited number of randomised trials.

Hydration, functional capacity and the promotion of physical activity.
Maughan R.
Loughborough University, United Kingdom.

Hypohydration, if sufficiently severe, will adversely affect physiological function and there is good evidence that both cognitive and physical performance can be impaired by moderate levels of hydration. It is also well recognised that hydration status is one of the many factors that affect the subjective perception of effort during exercise. This is important in the promotion of active lifestyles: if the exercise feels too hard, adherence will be poor. In prolonged exercise, the rating of perceived exertion (RPE), which is usually measured using either the 10 point or 15 point rating scales of Borg, tends to increase over time. It also tends to be greater under conditions of environmental (high heat, humidity) stress. Many investigations into the responses to manipulation of hydration status during exercise also report the effects on the RPE. A systematic review of the literature has established that, regardless of whether hypohydration was invoked prior to or during exercise, 15 trials (54%) reported the overall mean RPE to be significantly higher when exercising in a hypo-hydrated state compared to when euhydrated. A meta-analysis of the data from 23 trials revealed overall mean RPE to be significantly higher when hypohydrated compared to when euhydrated (MD = 1.01; 95% CI = 0.72, 1.31; p < 0.001). The results demonstrate a graded response in RPE to the degree of dehydration and suggest that those who exercise for enjoyment or health benefits should ensure good hydration before exercise and should limit the degree of hypohydration incurred during exercise.

Water and total fluid intake in the European Union.
Eimadfs I., Meyer A.L.
Institute for Nutritional Sciences, University of Vienna, Austria.

Water is among the most essential diet components and a sufficient supply is crucial for health and wellbeing. While in Europe there is generally no shortage in drinking water of good quality, the actual fluid consumption patterns differ between countries and population groups. Although preformed water contributes the most to total fluid intake, the EFSA European Food Consumption Database 2008 shows a higher consumption of tap water in the northern participating countries (Finland, Denmark) as well as Austria, as opposed to a preference of bottled water in other regions and especially in Germany that was also leading in fruit and vegetable juices and soft drinks.

The average total fluid intake in Europe as reported in nutrition surveys considered in the European Nutrition and Health Report generally lies within the recommended range of 1500-2000 ml/d and is increasing with a higher frequency of intake. There are, however, differences between population groups. Elderly persons, for instance, tend to drink less often than younger people at risk of dehydration in light of the age-related increase in urinary fluid losses.

On the other hand, physically active individuals as well as those on a health-conscious diet have a higher fluid consumption.

Identifying differences in drinking patterns and quantities across countries and population groups in Europe together with the influencing factors is important to optimise the hydration status.

Barriers to good hydration practices.
Kaspokefalous M.
Unit of Human Nutrition. Department of Food Science and Human Nutrition. Agricultural University of Athens.

Euyhidration, defined as the state of being in water balance, is linked with optimal physical and cognitive performance, while dehydration or hyperhydration, i.e. deviations from water balance, have important health implications. Therefore maintaining good hydration is water balance of individuals or of population groups is of public health interest.

To achieve water balance, the adequate water intake for adult men and women is estimated at 1 and 2.5 L/day, respectively. However when water needs are higher, e.g. at sickness or hot temperature conditions or of physical activity levels, water intake must be augmented to adequate level. Water, in the context of adequate level estimation, is considered a nutrient; thus adequate water intake may be achieved from consuming a variety of water sources, including drinking water, beverages and solid and fluid foods.

Quenching thirst and adopting a daily hydration scheme are the physiological and conscious mechanisms that trigger water intake; however several barriers may block at least partially water intake.

Thirst may be altered by various physiological conditions, including age. However, at an individual basis, the main barrier to good hydration practices is the limited ability to access, purchase, prepare and consume a variety of hydration sources. An integral vision is required when observing barriers, here are a few examples extracted from the literature and from our research work: physical disabilities may constitute the con-
suppion of foods and beverages difficult or undesirable; restrictions in the work environment may limit beverage intake; family budget issues may limit purchasing of hydration sources, particularly of beverages; lack of social support may affect the ability to purchase while limited social interaction may discourage consumption of various hydration sources; cognitive or mental problems may limit communication of the desire to drink or eat. Models that allow the systematic observation of various barriers to good hydration, such as an assets-based approach, are helpful in organizing solutions that lead to better hydration. Moreover, educational efforts that increase awareness on the benefits of hydration (and on the risks of dehydration) and on the availability of a variety of hydration sources is expected to accelerate lifting of barriers to hydration.

References
2. EFSA. EFSA Journal, 2010; 8(9):1459.

Vitamin D and mortality: meta-analysis of individual participant data from a large consortium of cohort studies from Europe and the United States.

Schöttker B.
Division of Clinical Epidemiology and Aging Research, German Cancer Research Center, Heidelberg, Germany

Objectives: Low serum 25-hydroxyvitamin D concentrations (25(OH)D) have been linked to mortality in several studies but age, sex, season and country specific results from a large consortium of cohort studies have not been presented.

Design: Individual data meta-analysis of eight prospective cohort studies from Europe and the USA

Setting: General population

Participants: 25,018 men and women, aged 50-79 years

Main outcome measure(s): All-cause, cardiovascular and cancer mortality.

Results: 25(OH)D concentrations varied strongly by season (higher in summer), country (higher in USA and Northern Europe) and sex (higher in men when no consistent trend with age was observed). During follow up, 6,695 study participants died, among whom 2,624 died of cardiovascular diseases and 2,227 died of cancer. For each cohort and analysis 25(OH)D quintiles were defined with cohort and sub-group specific cut-off values. Comparing bottom vs. top quintiles resulted in a pooled risk ratio (95%CI) of 1.15 (1.36-1.81) for all-cause mortality. Risk ratios for cardiovascular mortality were similar in magnitude to that of all-cause mortality in subjects both with and without a history of cardiovascular disease at baseline. With respect to cancer mortality, an association was only observed among subjects with a history of cancer (risk ratio, 1.70 [1.00-2.88]). Analyses using all quintiles suggest curvilinear inverse dose-response curves for the aforementioned relationships. No strong age-, sex-, season- or country- specific differences were detected. Heterogeneity was low in most meta-analyses.

Conclusions: Despite strongly varying 25(OH)D levels by country, sex and season, within each cohort, the association between 25(OH)D level and all-cause and cause-specific mortality was remarkably consistent. Targeted long-term randomized controlled trials are needed to explore whether vitamin D supplementation in those individuals with the relatively lowest 25(OH)D concentrations of a population can reduce their mortality from cardiovascular diseases, cancer and other causes.

Reference: Vitamin D and mortality: meta-analysis of individual participating data from a large consortium of cohort studies from Europe and the United States. Schöttker B et al. BMJ. 2014 Jun 17;348:g3656. doi: 10.1136/bmj.g3656.

The research leading to these results has received funding from the European Union Seventh Framework Programme (FP7/2007-2013) under grant agreement no. HEALTH – F3-2010-242244.

Folate and vitamin B12 in relation to total and cardiovascular mortality in older persons in Central and Eastern Europe.

Bobak M.
Department of Epidemiology & Public Health, University College London, London, United Kingdom. On Behalf: The CHANCES Consortium and the HAPIEE study

Purpose: Despite plausible biological mechanisms, epidemiological evidence on the link between folate and vitamin B12 and cardiovascular risk remains inconsistent. We investigate the relationship between plasma concentration of folate and vitamin B12 and the risk of fatal and non-fatal cardiovascular disease (CVD).

Methods: The data come from the Health, Alcohol and Psychosocial factors in Eastern Europe (HAPIEE) prospective cohorts based in Krakow (Poland), Kaunas (Lithuania) and 6 Czech towns that followed up random population samples of men and women aged 45-69 since baseline in 2002-06. After median follow up of 6.5 years, all 495 incident cases of CVD (including 198 deaths) and 4,884 controls sampled from disease free cases were included in a nested case-control study. Plasma concentrations of folate and vitamin B12 were analysed in a central laboratory. Odds ratios (OR) of fatal and non-fatal CVD by cohort-specific quintiles of plasma concentrations were estimated by logistic regression models controlling for potential confounders (age, sex, cohort, smoking, education and material deprivation). Since results were consistent across study centres, results of pooled analyses are presented.

Results: After adjustment for covariates, folate concentrations were inversely associated with mortality from all causes (OR for highest vs. lowest quartile 0.78, 95% CI 0.65-0.93 (p-value for trend by quartile 0.009). For CVD, the association was similar for non-fatal OR for highest vs. lowest quintile 0.69, 95% CI 0.53-0.90, (p for trend 0.005) and fatal CVD (OR 0.72, 95%CI 0.55-0.94, p for trend 0.022). For the combined fatal and non-fatal CVD, the ORs quintiles 2, 3 vs quartile 1 were 0.79 (0.63-0.95), 0.76 (0.62-0.92) and 0.70 (0.57-0.86), respectively, p for trend <0.001. Adjustment for further covariates did not change the results. We found no association of vitamin B12 with total mortality or with fatal or non-fatal CVD. Results were similar after excluding events in first 2 years of follow up.

Conclusions: In this large population based study, we found consistent and significant inverse associations of total and CVD mortality and non-fatal CVD with plasma folate but not with vitamin B12. The association with folate may be due redox and methylation status, although previous studies have not confirmed the role of homocysteine; alternatively, our finding of an apparently protective effect of folate may at least partly reflect higher intakes of foods associated with plasma folate, such as fruit, vegetables or cereals. The research leading to these results has received funding from the European Union Seventh Framework Programme (FP7/2007-2013) under grant agreement no. HEALTH – F3-2010-242244.

Repeated measures of body mass index and C-reactive protein in relation to all-cause mortality and cardiovascular disease: results from the Consortium on Health and Ageing Network of Cohorts in Europe and the United States (CHANCES).

O’Doherty M.G.
UKCRC Centre of Excellence for Public Health, School of Medicine and Dentistry, Queens University Belfast, Belfast, United Kingdom

Obesity has been linked with elevated levels of C-reactive protein (CRP), and both have been associated with increased risk of mortality and cardiovascular disease (CVD). Previous studies have used a single ‘baseline’ measurement and such analyses cannot account for possible changes in these which may lead to a biasing of risk estimates. Using four cohorts from CHANCES which had repeated measures in participants 50 years and older, multivariate time-dependent Cox proportional hazards was used to estimate hazard ratios (HR) and 95% confidence intervals (CI) to examine the relationship between body mass index (BMI) and CRP with all-cause mortality and CVD. Being overweight (≥25–<30 kg/m2) or moderately obese (≥30–<35) tended to be associated with a lower risk of mortality compared to normal (≥18.5–<25): ESTHER, HR (95%CI) 0.69 (0.58-0.82) and 0.78 (0.63-0.97); Rotterdam, HR 0.86 (0.79-0.94) and 0.80 (0.72-0.89). A similar relationship was found, but only for overweight in Estepur, HR (95%CI) 0.88 (0.76-1.02); and moderately obese in Tromsø, HR (95%CI) 0.79 (0.62-1.01). Associations were not evident between repeated measures of BMI and CVD. Conversely, increasing CRP concentrations, measured on more than one occasion, were associated with an increasing risk of mortality and CVD. Being overweight or moderately obese is associated with a lower risk of mortality, while CRP, independently of BMI, is positively associated with mortality and CVD risk. If inflammation links CRP and BMI, they may participate in distinct/independent pathways. Although the inclusion of repeated measures did not materially change the associations reported where there were no significant measure differences, it may still prove important to account for changes in risk factors over time so as to fully reveal their potential independent effects on mortality and disease morbidity. The research leading to these results has received funding from the European Union Seventh Framework Programme (FP7/2007-2013) under grant agreement no. HEALTH – F3-2010-242244.
Self perceived health and its relation to all cause and cause specific mortality among the elderly: Preliminary results from the Consortium on Health and Ageing Network of Cohorts in Europe and the United States (CHANCES).

Barnia C. Hellenic Health Foundation, Athens, Greece

A common item in questionnaires assessing population health is that referring to Self Perceived Health (SPH). Usually, this is a simple question of the type: "In general, how would you rate your health?" and participants respond from "poor" to "excellent". Many studies in Europe, US and Japan have examined the usefulness of this simple question in assessing overall health by evaluating its association with overall or cause specific mortality. As documented by three meta-analyses, in the United States these SPH being "poor" as compared to "excellent" was associated with increased mortality by 2-fold. Previous studies however differed with respect to the potential confounders used in the analyses. Moreover there was no attempt to simultaneously identify specific patterns of characteristics that are common among those who perceive their health as not good/poor.

Using so far seven cohorts from CHANCES with available information regarding SPH we assessed for participants >65 years at recruitment the association of SPH with all-cause mortality by estimating adjusted hazard ratios (HR) and their 95% confidence intervals (CI) using Cox proportional hazard regression. The estimated HRs from each cohort were then combined through meta-analysis. We also used logistic regression to evaluate in each cohort characteristics of people who perceived their health as "generally good" (good/very good/excellent) rather than "generally poor" (poor/medium/poor). Statistically significant odds ratios (OR) were then estimated through meta-analysis.

There was a consistent trend of increased mortality for those with "moderate" (combined HR: 1.38; 95% CI: 1.10 to 1.73) or "bad" (combined HR: 2.15; 95% CI: 1.45 to 3.20) compared to those with "good/very good/excellent". Adjusting for sex, age, smoking status, body mass index, drinking status, education, marital status and morbidity conditions such as CVD, cancer and diabetes. Results were consistent in sensitivity analyses including subgroup analyses by morbidity status i.e., within each of the indicated morbidity conditions and within those with at least one of the indicated morbidity conditions.

Combined ORs, indicated that being male (as opposed to female), having normal BMI (as opposed to being overweight/obese), not having CVD, diabetes or cancer at enrolment (as opposed to having at least one of the above), consuming less than 1% of their total energy intake from sodium, less than 1% from added sugars and less than 1% from saturated fat have been positively associated with increased mortality.

UK experiences and data on product improvements (salt reduction) and influencing consumers’ choices.

Raats M.M.
Food Consumer Behaviour and Health Research Centre, University of Surrey, United Kingdom.

The United Kingdom initiated a national level salt reduction programme over 10 years ago. The initiative comprised of elements including the formation of an action group; monitoring of salt intake and salt levels in foods; setting a population target salt intake, development of a salt reduction strategy, progressive lowering of salt targets for different categories of food, collaboration with industry to reformulate food; consideration of regulation, nutrition labelling; a consumer awareness campaign; and media activity. This presentation will reflect on the available data regarding the responses to this initiative and also on the lessons learned for this initiative for programmes focusing on saturated fat and sugar.
The Israeli Health Ministry dilemma over FOP labeling and salt reduction.


Background: In December, 2011, Israel launched the National Program for Active & Healthy Living, to address obesity and non-communicable diseases. High blood pressure, high blood cholesterol, and heart diseases. The Ministries of Health, Education and Culture and Sport share leadership; additional ministries, local government, Israel’s four health funds, the private sector and civil society are partners, as well. The program is called Eshkarbari, loosely translated as “It’s possible to be healthy,” but signifies the government’s responsibility to enable citizens to maintain a healthy lifestyle.

Policy goals include removing junk foods from schools; tax breaks on workplace purchases of healthy refreshments; calorie-labeling at restaurants and on vending machines; front-of-package food labeling; limiting junk-food advertisement; reducing sodium content in processed foods; and promoting healthy lifestyle via Israel’s four health funds, public hospitals and well-baby clinics. The Ministry of Health and the Ministry of Finance are exploring economic interventions, like a “soda tax” and regulating the price of whole grain bread.

Methods: The three ministries manage the program through a joint committee. While the Health Ministry originally financed efforts for all ministries, each ministry now manages and finances changes in their own policymaking arenas. For example:

- The Health Ministry initiated a national program to reduce salt intake, including a voluntary collaboration with the industry to reduce salt in prepared and kosher food, as well as a national survey of salt consumption of the population (24 hours urinary collection). The Ministry subsidized group treatment for diabetes empowerment and overweight reduction in all health funds.

- The Ministry of Education declared the first year of the National Program “The year of active, healthy lifestyle,” to catalyze the transition to schools as health-promoting environments for students, teachers and surrounding communities. The Ministry of Culture and Sport shifted its focus toward facilitating opportunities for all citizens to engage in physical activity.

- The program included a pilot in 15 municipalities, and strengthened staff of Israel’s Healthy Cities Network. It also included Israel’s largest ever social marketing program, leading research-based campaigns to promote healthy food choices, tap water consumption, and reduced sodium content in processed foods, and promoting healthy lifestyle via Israel’s four health funds, public hospitals and well-baby clinics. The Ministry of Health and the Ministry of Finance are exploring economic interventions, like a “soda tax” and regulating the price of whole grain bread.

Activities and results of the Global Food Monitoring Group.

Dunford E. The George Institute for Global Health, Australia.

Non-communicable diseases now account for more than 60% of total deaths globally. Alongside the United Nations, regional governments all around the world are calling for population-wide preventive measures based upon an improved food supply. For example, in Latin America alone it’s been estimated that a reduction of 10% in sodium intake yearly would result in >500,000 fewer coronary heart disease and strokes annually. This will only be achieved if there is a definitive data describing the food supply and how it can be improved.

The Global Food Monitoring Group (FMG) aims to collate data on the nutritional composition of processed foods in multiple countries using comprehensive large scale product label surveys with the aim of objectively and transparently monitoring changes in the nutritional composition of processed foods globally. Currently, the FMG has representation from 31 countries, with over 200,000 products (both packaged and processed at the barcode level and food service items) included. LMICS represent two-thirds of the FMG, and most of these are from Central and South America and the Asia Pacific region. The FMG has high-level input and support from the FAO, the World Health Organization, and the Pan American Health Organization, as well as industry groups and governments from a range of countries.

To date, training seminars have been held in several countries to increase the capacity for data collection in LMICS in the Asia Pacific region and Latin America. Advanced technologies to improve data collection have been developed and distributed to eight countries. Data have already been used by public health researchers to demonstrate to both industry and government bodies the wide variation in sodium levels in school food, the lack of consistency in food nutrient content, and to develop new food labels and menu labels both nationally and globally, and the FMG has been directly made and improved by the same countries.

The World Congress of Public Health Nutrition

Ill World Congress of Public Health Nutrition
by FoodSwitch users since launch, and this huge volume of crowd-sourced data has proved to be a low-cost, real-time tracking of the nutritional composition of foods. This information has been shared with both government and industry to try to encourage manufacturers to reformulate their products towards healthier formulations. There appears to be significant opportunity for this approach in many other countries as it will provide greater scalability and offer practical means for industry, public health and government to work together to improve the food supply in multiple countries around the world and combat the growing problem of diet-related NCDs.

**Contribución calórica de los macronutrientes en épocas de debate.**
Socolovsky S
Universidad de Buenos Aires, Argentina.

La valoración de la contribución calórica de los alimentos de la dieta es un tema en constante debate. Dado que la utilización de Bases de Datos de Composición de Alimentos (BDCA), más diversas procedencias se empleen para calcular la contribución calórica de los alimentos reportados en las encuestas alimentarias es imprescindible tomar en consideración los errores que surgen en las valoraciones a consecuencia de la inexactitud de estos datos. Se discutirá extensamente la contribución calórica de los macronutrientes en las dietas modernas, con presencia de los sustitutos del volumen (bulk replacers) de azúcares, que incluyen políols, polidextrosa, inulina, FOS, GOS, IMOs y otros. Asimismo se presentarán los avances en edulcorantes intensivos y se hará referencia a los sustitutos de grasas presentes en múltiples alimentos de nueva tecnología.

**Herramientas para planificar y medir consumo en intervenciones nutricionales: fortificación de alimentos.**
García-Casal M.N.
Instituto Venezolano de Investigaciones Científicas, Canacas, Venezuela.

Para la justificación, planificación y medición de consumo en intervenciones nutricionales, por ejemplo un programa de fortificación de alimentos, se requiere conocer la magnitud del problema nutricional, la especificidad de una determinada intervención (fortificación, suplementación, universal o dirigido), si se requiere incluir uno o más nutrientes y cuál es el alimento que se ha indicado para el programa. Para esta etapa se requieren como mínimo una estimación de consumo de los alimentos y una medición de los déficits nutricionales, que indiquen bajos niveles de ingestas de nutrientes o las probabilidades de desarrollo de algunos déficits debidos a cambios en hábitos de consumo, condiciones sociales y económicas en un determinado momento. En este trabajo se presentará un modelo para estimar el consumo de alimentos y la contribución calórica de los mismos a las dietas de población y los déficits de los mismos. Se presentarán ejemplos de uso de las herramientas.

**El cuestionario como instrumento de valoración de la actividad física.**
Román Vílaz B

El sedentarismo y una práctica de actividad física inferior a las recomendaciones suponen un mayor riesgo de desarrollar enfermedades crónicas y disminuir la esperanza de vida. Para llevar a cabo políticas de promoción de estilos de vida saludables y medir sus efectivos resultados es necesario disponer de instrumentos que midan la actividad física de una manera válida y fiel y que sean sensibles al cambio. En estudios poblacionales los cuestionarios de actividad física son la herramienta de elección, debido principalmente a su bajo coste y fácil implementación. A pesar que existen numerosos cuestionarios validados en este tipo de estudios, la elección del instrumento a utilizar depende del tipo de estudio que se plantea (estudios de prevalencia, de intervención, longitudinales), objetivos del mismo (realizar comparaciones entre poblaciones, evaluar la relación entre actividad física/sedentarismo y salud, evaluar tendencias, etc.), recursos de que se dispone (presupuesto, recursos humanos),
Yogurt and fermented milks in daily nutrition: from science to the guidelines and recommendations.

Salmiinen S. Functional Foods Forum, University of Turku, Finland

Beneficial microbes, such as many lactic acid bacteria, enter the food supply primarily through fermented milks and addition of probiotics. Yogurt among fermented milks is a significant component of the diet of many geographical regions. The fermentation process serves to preserve safety, nutritional quality and palatability of milk providing health benefits. Yogurt is fermented with symbiotic cultures of Streptococcus thermophilus and Lactobacillus delbrueckii subsp. bulgaricus. Yogurt itself has been a nutritious food for centuries. Yogurt bacteria can also enter the human intestine, as well as in vivo animal models. Yogurt bacteria can also be detected in feces of human subjects consuming yogurt suggesting that they may interact with the microbiota. Yogurt consumption has been traditionally used in the management of acute diarrheal disorders. This recommendation is based on the traditional approach in many countries all over the world, as well as on evidence gained in human intervention studies. Yogurt feeding in children with acute watery diarrhea decreased stool frequency and shortened the duration of diarrheal episodes and similar reports have been later published with yogurt supplemented by specific probiotic bacteria. Taken together, yogurt with live cultures has a role in both nutrition recommendations and other health messages. Further studies may be required to include yogurt in to general nutrition recommendations.

Yogurt consumption and metabolic diseases in children and adolescents (including latest results of HELENA study).

Moreno L.A. GENUD research group, University of Zaragoza, Spain

Although there is no clear evidence of the role of dairy consumption on cardiovascular diseases (CVD) risk development in adults, several studies have provided consumption of dairy products with a beneficial effect on type 2 diabetes (T2D) and cardiovascular diseases (CVD), even when adjusted for several confounding factors. This presentation will summarize and highlight both the epidemiological and experimental studies that have investigated the impact of dairy products, and notably yogurt, on cardiometabolic risk factors and whether this may help prevent T2D and CVD in specific populations. I will also discuss the potential factors in fermented dairy products that may underlie their impact on obesity, T2D and CVD. Finally I will discuss some key issues and current gaps that need to be considered when investigating the impact of yogurt consumption on the incidence of these complex societal diseases.
prevalence and the incidence of MetS in epidemiologic studies. Several trials have evaluated the effect of nuts on subjects with MetS and found that they may have benefits in some components. The results of the PREDIMED Study, a multicenter randomized nutrition trial for the primary prevention of cardiovascular disease in 7,447 participants at high cardiovascular risk, have demonstrated that nut consumption could be beneficial for MetS management. Compared with those participants randomized to a low-fat control diet, those in a Mediterranean diet enriched with nuts had a higher reversion of MetS and hyperglycemia component of the MetS after a median of 5.0 years of follow-up. Diabetic participants were more likely to reverse MetS. The protective effects on metabolism could be explained by the modulation of inflammation and oxidation. Further trials are required to clarify the role of nuts in MetS prevention and treatment.

The potential role of nuts in cognitive functions.
Sabaté J.
Loma Linda University, California, USA
Dr. Joan Sabaté will explore the potential role of nuts in cognitive function. Evidence for the potential role of nuts in the prevention of cognitive degeneration will be reviewed. The nutritional factors related to cognition will be discussed, and a currently conducted large, dual-center, clinical trial on walnuts and cognition will be presented.

Nuts and Diabetes Control.
Kendall C.
University of Toronto, Canada
Dr. Cyril Kendall will point out how nuts may exert a protective effect on insulin resistance and type 2 diabetes, including the largest study to date on nuts and diabetes (Jenkins, D.J.A., et al. Nuts as a replacement for carbohydrates in the diabetic diet. Diabetes Care, 2011) and according to which two ounces (57 g) of nuts a day can improve glycemic control and blood lipids in those with type 2 diabetes.

Nuts and mortality.
Bao Y.
Brigham and Women’s Hospital and Harvard Medical School, USA
Dr. Ying Bao will provide insight into the study “Association of nut consumption with total and cause-specific mortality”, published in the New England Journal of Medicine. “We observed significant inverse associations of nut consumption with total mortality and most major causes of death in two large, independent U.S. cohort studies.” The results were similar for peanuts and tree nuts, and the inverse association persisted across all subgroup analyses.

Nutritional epigenetics: the search for mechanisms underlying DOHaD in Sub-Saharan Africa.
Silver M.
MRC International Nutrition Group, London School of Hygiene and Tropical Medicine, United Kingdom
The MRC International Nutrition Group has been exploring links between early life exposures and long-term health outcomes in a rural community in The Gambia, West Africa for many decades. In doing so we are able to exploit an ‘experiment of nature’ in which fluctuations in energy balance and maternal nutritional exposures show a distinct bimodal seasonal pattern. One striking observation is that children born in the rainy season are six times more likely to die between 15-65y than those born in the dry season – a finding that sits squarely within the DOHaD paradigm.

Epigenetics is the study of modifications to the genome that can affect gene expression, without altering the underlying DNA sequence. One class of epigenetic modification, DNA methylation, is preserved during cell divisions, and has been shown in animal models to be influenced by nutritional exposures in early life with consequent life-long effects on phenotype. Human studies looking at babies born around the time of the Second World War Dutch ‘Hunger Winter’ point to similar effects in humans, suggesting changes in DNA methylation as a plausible mechanism by which early nutritional influences can affect health throughout the life course.

We have recently shown that season of conception and blood levels of key maternal nutritional biomarkers relating to one-carbon metabolism (B2, B6, cysteine and homocysteine) predict DNA methylation in infants at a number of metastable epialleses (MeAs). MeAs are genomic regions whose methylation is established stochastically in the early embryo, leading to systemic (cross-tissue) inter-individual variation. Our continuing work in this area is highlighting further interesting candidates, some with known phenotypic consequences in humans.

References:

Nutrition aspect of the Birth-to-Twenty cohort in South Africa.
Nair S.A.
MRC Developmental Pathways for Health Research Unit, Department of Paediatrics, University of the Witwatersrand, Johannesburg, South Africa
The relevance of nutrition pre- and during pregnancy and early infancy and childhood defines both short-term health and survival but also long-term health. This is now large body of literature that shows how early maternal and child nutrition has significant consequences on later health and human capital. The Developmental Origins of Health and Disease paradigm is particularly appropriate in understanding the health and nutrition transition in countries that face the double burden of nutrition-related diseases (acute malnutrition coexisting with obesity and other chronic diseases). The aim is to present African regional prevalence of child stunting and later obesity and discuss the need to prioritise maternal and infant nutrition not only in health and nutrition intervention programs but also in the emerging African research agenda so as to better orient policy decisions.

Sugars and health. Is evidence behind policy?
Gómez Candela C.
Clinical Nutrition Department, University Hospital La Paz. Nutrition and Functional Food Research Group. IDIPAZ. University Autonoma of Madrid, Spain.
A healthy diet should meet individual nutritional needs and also incorporate cultural and gastronomic values that make it enjoyable. However, various studies show that nutritional imbalances are the main cause of the premature development of most chronic or degenerative disease that currently affect today’s society. Changes that have taken place in the population’s lifestyle have caused an increase in the prevalence of metabolic chronic illnesses such as obesity, diabetes and metabolic syndrome which have ultimately led to a rise in cardiovascular morbidity and mortality. Evolving demographic and lifestyle trends, particularly when it comes to the incorporation of unhealthy diets and the absence of physical activity, are behind all this. Fortunately, despite all this, it is preventable.

The prevalence of NCDs, and more specifically obesity and overweight, are certain an area of public health concern whose prevention should be managed effectively taking into consideration all its possible causes and the potential consequences of intervention measures. Obesity and Sugar
The role of carbohydrates and, more specifically, the role of sucrose in developing obesity is more controversial. In spite of the publication of numerous studies on this subject in recent years, there is still many uncertainties about the role that high sugar diets play in the rising incidence of obesity. There is no reliable evidence that sugars affect obesity any more than any other macronutrient. Changes in body weight occur with any change in macronutrient intake that led to an overall excess or deficit of energy compared with requirement for weight stability. For the treatment of obesity the key objective is to reduce energy intake, whereas macronutrient distribution is less important. Once the desired weight has been reached, diets that limit fats and that are high in carbohydrates are the preferred method to maintain the weight lost. Although low carbohydrate diets may have a pathophysiological mechanism in short term weight loss, it is important to point out that the long term effects of continuing to follow these diets are not known.

Sugars and Diabetes
In relation to the nutritional recommendations, based on the evidence for treating and preventing diabetes, the total amount of carbohydrates consumed is more important than the type. Nowadays diabetics can consume sucrose (sugar) and foods that contain sugar as long as they are eaten as part of a healthy diet and there is an appropriate medical supervision. Sugar consumption does not cause the onset of diabetes, however, becoming obese, an unbalanced diet and a lack of exercise can do it.

The relationship between sucrose consumption and Cancer
There is only possible evidence of a positive relation between the intake of monosaccharides (fructose and glucose) and pancreatic cancer. There is possible evidence of a positive association between glycemic index (GI) and colorectal cancer and that there is no association between GI and risk of endometrial cancer, breast cancer and pancreas cancer. More research is needed.

Sugars and Cardiovascular diseases
In this context the nutritional goal is focused on lowering fat and salt intake in order to reduce the incidence of cardiovascular diseases. Even
though the intake of sugar has dropped in recent years in the majority of developed countries (Australia, United States), the possible excessive consumption of sugar has been related only to possible excessive consumption of sugary drinks, mainly in the United States in children and adolescents.

Dental health in developing countries tooth decay has ceased to be a problem due to the widespread use of adequate oral hygiene, exposure to fluoride and regular visits to the dentist. The overall existing key factors impacting dental caries includes the amount of sugars and starches consumption, frequency of intake, oral hygiene, exposure to fluoride and others. Most developed countries have lower caries prevalence than others with low sugars intake. No randomized controlled intervention studies have been reviewed on the effect of reducing the amount of “free sugars” on dental caries incidence or prevalence. Changes in sugar supply do not reliably predict the magnitude or the direction of change in caries prevalence. Sweet foods should be consumed with main meals (meals, snacks) and after that the teeth should be brushed.

The importance of sucrose for cognitive functions: knowledge and behavior Carbohydrates are important for our bodies to function properly and particularly for the brain, as brain cells need a constant supply of glucose from the blood in order to maintain their integrity and function on the (140 g of glucose per day). The consumption of a food or drink containing sucrose is associated with an improvement in mental agility, memory, reaction time, attention and the ability to solve mathematical problems, as well as a reduction in the feeling of sadness, in young and elderly healthy people, and also in Alzheimer patients.

Final considerations

The prevalence of NCDs, and more specifically obesity and overweight and dental health, are certainly an area of public health concern whose prevention should be managed effectively taking into consideration all its possible causes and the potential consequences of intervention measures. Any recommendation on public health policies has to take into consideration a thorough review of the latest scientific evidence.

References:
3. EFSAN Panel on Dietetic Products, Nutrition, and Allergies (NDA); Scientific Opinion on Dietary Reference Values for carbohydrates and dietary fibre. EFSAN Journal 2010; 8 (3).
11. Barclay A, Brand-Miller J. The Australian Paradox: A Substantial Decline in Sugars Intake over the Same Timeframe that Obesity and Obe-
   
   
   behav Rev 2014.

Do genes modify the response to sugar and CHO intake?

Corella D.

Genetic and Molecular Epidemiology Unit. Department of Preventive Medicine and CIBER OBn. University of Valencia, Spain

There is currently much controversy over what is the best recommendation to make on carbohydrate and CHO intake for the prevention of NCDs. This regulation as well as the sub-groups of people suffering from different pathologies such as diabetes, obesity, cardiovascular disease, etc. From the personalized nutrition point of view, the response is simple as, rather than trying to come up with a general recommendation, this approach tends to make specific and personalized recommendations to groups of people based on their genotypes. However, what evidence do we currently have on the importance of genetics in modifying the response to CHO in general and sugar in particular in the different phenotypes?

We shall analyze the most important genes for which significant interactions have been found between their genetic variants and CHO or sugar intake in phenotypes of obesity, glycaemia, plasma lipids, diabetes, cardiovascular disease and other diseases. Among these genes we shall concentrate on the following: the Peri1r1 (PLNT) gene, Transcription factor 7-like 2 (TCF7L2) gene and the Carbohydrate-responsive element-binding protein (ChREBP) also known as MLX-interacting protein-1-like (MLXIP1) gene, for which our group has found relevant gene-diet interactions. We shall also provide variability data on sweet taste perception in the population depending on age, as well as the influence of the sweet taste and function on the consumption of different kinds of food and its association with BMI, fasting glucose, plasma lipids and other cardiovascular risk phenotypes.

Tasting profile, such as sweet liking or superstasting, may also be influenced by genetics, and therefore, may subsequently influence dietary intake. The genes that have an influence on the perception of sweet taste are less well known than those that influence bitter taste. The sweet taste receptor is a heterodimer of 2 protein subunits, T1R2 (taste receptor, type 1 member 2) and T1R3 (taste receptor, type 1 member 3) that are sensitive to sugars and glycoses. Both T1R2 and T1R3 genes locate on the human chromosome 7; T1R2 is the common specific to sweet taste perception. We have found that the polymorphism rs35874116 (Ile191Val) in gene T1R2 is associated with different food intakes and differences in the anthropometric measurements in a Mediterranean population. Taken together all of this suggests that genetic polymorphisms can indeed be relevant in modulating the effects of CHO intake and sugars, so that, in the future, they would have to be taken into account when drawing up specific recommendations on intake for specific population groups.

Rationale for cutting down.

Jewell J.

WHO Regional Office for Europe

The presentation will focus on the context for WHO’s work on sugar. It will provide context on the burden of overweight, obesity and noncommunicable diseases at the global and European levels, followed by an overview of WHO’s role in setting nutrition and dietary guidelines. The recent draft guidelines and recommendations on free sugars intake will be described, followed by a discussion of the implications for policy development in countries.

Rationale for not cutting down sugar goals.

Stevenpiper J.L.

Li Ka Shing Knowledge Institute, Division of Endocrinology, and the Toronto D3 Knowledge Synthesis and Clinical Trials Unit, St. Michael’s Hospital, University of Toronto, Toronto, ON, Canada

Sugars are emerging as important public health targets for their role in the epidemics of obesity and cardiometabolic disease. Like the earlier controversy around the role of dietary fat in obesity, strong positions are being taken on limited data. Parallels are being drawn between fructose-containing sugars and tobacco with the suggestion that fructose-contain-

   ing sugars are to cardiometabolic diseases as tobacco is to lung cancer and cardiovascular disease. Although experimental models offer plausible biochemical mechanisms to support these positions, whether these mechanisms operate in free living people requires careful inspection. Prospective cohort studies have shown a consistent relation of sugar beverages with cardiometabolic outcomes. These associations, however, are small, subject to important collinearity effects from other aspects of a Western lifestyle, and do not hold true at moderate levels of intake or when modeling total sugars. Systematic reviews and meta-analyses of controlled feeding trials have shown that fructose-containing sugars cause an isocaloric exchange for other carbohydrates (even under positive energy balance or in fluid form) do not show evidence of harm. Nevertheless, fructose-containing sugars supplementing diets with excess energy compared with the same diets alone (without the excess energy) increase body weight, fasting and postprandial triglycerides, blood pressure, uric acid, glucose, and markers of non-alcoholic fatty liver disease (NAFLD), effects more attributable to the excess energy than the sugar. Taken together, the evidence suggests that sugar foods and beverages are one of many pathways to overweight and cardiometabolic disease. Setting lower sugar targets is not likely to be of benefit alone, without
targeting other refined carbohydrates along with the other aspects of a Western dietary pattern likely to replace sugars in the diet. Attention needs to remain focused on reducing overconsumption of all caloric foods associated with obesity and cardiometabolic disease, including sugary foods and beverages, and promoting greater physical activity.

**Introduction to Community based actions in public health nutrition.**

Yngve A. OeEbro Universitj, Sweden.

Access to good food and possibilities to physical activity in the local community is essential to population health. Efforts exist to influence city planning and change obesogenic environments in residential areas. Inequalities are very visible in most countries in relation to residential areas and local community setup. This presentation briefly introduces the symposium and tracks the roots and origins of community based environmental monitoring and interventions including the Change approach to community based assessment of health environments.

**Community engagement and social marketing - The FAN project.**

Suggs L.S. Universita della Svizzera Italiana (aka: University of Lugano), Lugano, Switzerland. The FAN (Family, Physical Activity and Nutrition)

Program is a community based social marketing intervention promoting eating and activity behaviors of elementary and middle school children and their parents. It is offered to all families in this target who live in Ticino; the Italian speaking canton of Switzerland. The program was co-created with parents, children, teachers, nutrition experts, cantonal and national authorities, and the research team in Lugano. FAN provides families with tailored communication for eight weeks. Parents get thematic tailored content each week through a website, emails and text messages. Children receive tailored letters by post every week. Outcome measures are taken from three points in time: pre, post and 3 months post intervention, including two, week-long logs of eating behaviors (pre and post). The intervention was a large success in terms of participation and retention and community engagement and behavioral outcomes. This paper presents both formative and summative outcomes of the project, including eating behaviors and the process for achieving community engagement in design, implement and evaluate a technology-based social marketing initiative that was different that typical programs in that community.

**Govermance of healthy living in a local community – the Sol–Bornholm protocol and first results.**

Mikkelson B.E. Aalborg University, Denmark.

The Sol intervention is a multilevel intervention targeting food and nutrition behaviour as well as sedentary lifestyle among children aged 3-8 years and their families being implemented in the three neighborhoods of the city of Bornholm. The approach through is an integrated one where intervention components are delivered in a coordinated manner across supermarket, media, school & kindergarten settings using a supersetting approach. Sol is building conceptually on a partnership between representatives from civil society, community-based associations, businesses and the public administration. A broad range of outcome measures are measured baseline and follow up. This paper present baseline results from the interventions. The paper will discuss perspectives and limitations in engaging citizens, media, front workers and politicians in participatory approaches as well on using a combined action and intervention research approach.

**The health promoting community and schools.**

Gisladottir E. Directorate of Health, Iceland.

This contribution reports on the Health Promoting (HP) Community that The Directorate of Health is undertaking. The HP Community project started with a pilot municipality, Mosfellsbaer, located near Reykjavik. The HP Community project will first and foremost act as an "umbrella" for various other projects, including HP Schools and HP Workplaces projects that are already being run by the Directorate of Health. The pilot community has established a steering group that supervises the project, formulates policy and establishes where special emphases are required. The Directorate of Health supports the community by developing checklists that can be used to evaluate their status, mapping what is being done well and where special emphases are required, and provides the foundation for measuring and evaluating outcomes. The Directorate of Health will provide assistance throughout, via the HP Projects mentioned earlier, as well as by providing a framework of recommendations, based on best practice. Furthermore Reykjavik City and the Directorate of Health have signed an agreement that focuses on health promotion and reducing health inequalities. The agreement contributes to effective public health work in the interest of people of all ages within the municipality.

**Active phytases consumed with food offer a new solution to overcoming phytic acid inhibition of mineral absorption.**

Hurrell R. Department of Health Sciences and Technology, ETH Zürich, Switzerland.

Phytic acid is the major inhibitor of iron and zinc absorption in human diets. It is universally present in cereal grains and legume seeds and is therefore present in all home produced or industrially manufactured complementary foods based on these ingredients. In the developing world, low absorption of iron and zinc from cereal-based products is a major factor in the etiology of the widespread iron and zinc deficiencies in infants and young children.

In industrially manufactured complementary foods, there are several options to ensure adequate iron absorption. Ascorbic acid is commonly used to protect iron from phytic acid. Ascorbic acid converts ferric to ferrous iron and chelates it in an absorbable form. The disadvantage of ascorbic acid is that it is readily degraded on cooking and storage and the complementary food requires expensive packaging. NaFeEDTA can also be used to protect iron from phytic acid, or phytases can be used to degrade phytic acid during processing. Phytic acid degradation can also be used to improve zinc absorption. This procedure however is more expensive than the addition of ascorbic acid as it involves holding the aqueous cereal mixture for around 1h at the pH and temperature optima of the phytase and then drying.

Ascorbic acid and NaFeEDTA included in micronutrient powders or lipid based nutrient supplements added to home-produced porridges can also increase iron absorption, however a new simple approach was introduced recently that was demonstrated to increase both iron and zinc absorption. This is the addition of a phytase enzyme active at gastric pH to the food at the time of consumption. In this approach, phytic acid is degraded during digestion releasing iron and zinc for absorption. This presentation will review the beneficial effects of phytic acid degradation during complementary food manufacture on iron and zinc absorption and then present the recent studies showing enhanced iron and zinc absorption in young children when phytases are included in lipid based nutrient supplements and micronutrient mixtures added to cereal porridges at the time of consumption.

**Application of phytase in foods and supplements.**

Koenders D. DSM Nutritional Products, The Netherlands.

Phytase is a known antinutrient for several essential minerals, especially iron, zinc, calcium. It also stores the majority of phosphorus in plant seeds in a form poorly available for humans. Codex alimentarius recommends lowering antinutrients such as phytate in complementary foods for small children and older infants and mentions phytase as a suitable means. Traditional preparation methods such as fermentation improve bioavailability somewhat by activating endogenous phytases. Not all cereals and legumes contain sufficiently active enzymes and if they do, the preparation process often allows only insufficient phytate degradation. Added phytase has been shown to improve mineral nutrition in numerous trials across various consumer groups. Phytase can be used as food ingredient to degrade phytate in the stomach, or as processing aid to degrade phytate during food manufacturing. In both cases, phytate-bound minerals will become more available for uptake by consumers.

We report here that phytase (ToLeraseTM P) originating from Aspergillus Niger can be safely, as assessed by JECFA, and effectively used in various food categories and supplements. Phytase is cost efficient to achieve balanced mineral nutrition in humans for minerals whose bioavailability is impaired by phytate. The presentation will also show examples of applications and stability.

**Could phytase help reduce stunting in young children? Evidence for improved phosphate bioavailability and growth in pigs and poultry.**

Adeola, O.1 & Cowieson, A.J.1

1Purdue University, Department of Animal Sciences, West Lafayette, IN 47907, USA. 2DSM Nutritional Products, Kaiseraugst, Switzerland

The main source of organic phosphate in the diets of pigs and poultry is phytin phosphorus. Phytin is a mixed salt of phytic acid, usually com-
plexed with Mg, K, and Ca and is the main storage form of phosphorus (P) in plant material. At pH above 1.1, phytic acid is negatively charged, becoming increasingly so as pH rises above 5 (for example in the small intestine). Due to the substantial negative charge on phytic acid at intestinal pH, phytic acid is chelated by various divalent cations such as Zn, Fe, Cu, and Ca. Therefore, if these cations are ingested simultaneously with phytic acid, the phytic acid (anionic) and the chelated cation precipitate and are largely unavailable for absorption. In pigs and poultry, the use of exogenous phytase enhances the retention of phytin P from approximately 25 to 80%, which reduces the need for supplemental inorganic phosphate (a finite global source). These improvements in phytin P retention are associated with dramatic improvements in growth rate, which are partially due to P retention. However, the primary benefit of phytase is its ability to solubilize phytates and release various nutrients in the small intestine. Recent research has also implicated myo-inositol hexakisphosphate (the myo-inositol being generated on complete dephosphorylation of phytic acid), perhaps via insulin-mimicking mechanisms. These effects may also be evident when phytin is consumed in a low calcium diet that promotes the solubility of phytic acid in the small intestine and allows endogenous phytase engagement. It can be concluded that supplementation of phytin-rich foods with exogenous phytase and/or separate consumption of P from inorganic sources are effective strategies in pigs and poultry to improve the retention of phytin P and reduce the antinutritive effects of phytic acid more generally. These effects are consistent and substantial and suggest that similar benefits of phytase may be apparent in young children with low phosphate intake.

**Evidence on the potential benefit of adding phytase to complementary food supplements for prevention of childhood stunting.**

Christian P. Fischer
Center for Human Nutrition, Department of International Health, Bloomberg School of Public Health, Johns Hopkins University, Baltimore, MD, USA.

Childhood stunting is a public health problem of global proportions that requires urgent attention. The recent Lancet Nutrition series estimates that 165 million children may have stunting in low and middle income countries (LMIC). Although childhood undernutrition has prenat al origins, nutritional interventions in the postnatal period that are shown to be effective include improving linear growth rates through appropriate infant and young child feeding practices and complementary food supplements (CFs), increasingly with high-energy and micronutrient dense lipid-based formulations. Among micronutrients known to promote growth in young children, zinc, isobutyl phytate either to lipid-based supplements which include zinc, or to micronutrient powders for home-fortification of traditional complementary foods. Zinc bioavailability is important to consider as iron, calcium and high-phytase diets will inhibit zinc absorption. A few studies have examined adding exogenous phytase to micronutrient powders and found improvements in iron and zinc absorption, reduction in deficiencies, and one study also recorded increases in weight-for-age scores (WAZ) in children. However, no effect was observed on height. There is potential for adding phytase either to lipid-based supplements which include zinc, or to micronutrient powders to improve bioavailability of zinc from the traditional complementary foods but further research on both safety and efficacy is needed to show impact on growth (at least) as high as that on status.

**Evolución de la compra de alimentos de la agricultura familiar para el programa nacional de alimentación escolar de Brasil: resultados nacionales.**

Slater B.1, Schwartzman F.1, Rodrigues Mora C.1, Sicolli I.1, Wenzel D.1, Bicalho D.1, Fischer E.2
Facultad de Salud Pública, Universidad de San Pablo, Brasil.

El Programa Nacional de Alimentación Escolar (PNAE) es una de las más importantes y antiguas políticas públicas de Brasil. En este programa, la alimentación escolar es considerada como un derecho de los estudiantes y una de las estrategias de seguridad alimentaria y nutricional (SAN) del país. Inicialmente será presentado una breve evolución histórica del programa, su base legal, objetivos, directrices y algunos datos de la magnitud y extensión de la atención a sus beneficiarios. Posteriormente, se analizará el porcentaje de compras de alimentos procedentes de la agricultura familiar (AF), según establecido en la Ley 11.947 de 2009, con base en banco de datos oficiales de Fundación Nacional de Desarrollo de la educación del Ministerio de Educación (Fnde-MEC) referente a los períodos 2010 a 2013.

Cabe resaltar que 2010 fue el primer año obligatorio de compra de alimentos de la AF para el PNAE. A cada año, nuevos avances vienen siendo construidos y se espera volúmenes mayores de compra de la AF y que la compra sea realizada en 30% del volumen en todos los municipios del país. Dado el carácter reciente de la legislación, otros aspectos deberán ser profundizados y estudiados. Por otro lado en el municipio de Sao Paulo, el Departamento de Alimentación Escolar (DAE) de la Secretaría Municipal de Educación de Sao Paulo, de interés en el contexto de este trabajo, es el órgano responsable de la gestión, administración y financiamiento del Programa de Alimentación de la Ciudad de Sao Paulo. Actualmente atiende aproximadamente 900.000 (novecientos mil) alumnos con alimentación diaria, obedeciendo los parámetros específicos para cada segmento y respetando sus características individuales. A partir de la Ley 11.947 de 2009, y con los compromisos sociales adquiridos, el DAE viene comprando alimentos de Agricultura Familiar desde 2012, con destaque para el arroz orgánico, jugo de naranja y de uva integrales amb Santos sin adición de azúcar.

Atender la exigencia de calidad de la alimentación escolar norta la compra de alimentos, tanto en el sector de la alimentación, educando en todo momento adecuarse a la regulación de la legislación brasileña. Uno de ejemplo de PNAE sostenible iremos presentar un pequeño video, “Educar con la comida” que tiene como objetivo premiar las acciones de que promueven buenos hábitos alimenticios en los alumnos, a partir de tres directrices: Valorización de las merenderas; Promoción de la discusión sobre alimentación en la comunidad educativa; Participación de los diversos actores de la alimentación en el ámbito territorial de la escuela y de esta forma se espera que la alimentación escolar ultrapase la frontera de la cocina del comedor, entre la sala de aula y llegue a la casa del alumno.

**Vinculación de la agricultura familiar con el programa nacional de alimentación escolar de Brasil.**

Rodríguez CAM1, Schwartzman F1, Sicolli I.I, Slater B1
1Departamento de Nutrición, Facultad de Salud Pública, Universidad de São Paulo, Brasil.

En el año 2009, el gobierno de Brasil aprobó la Ley 11.974, que define los lineamientos del Programa Nacional de Alimentación Escolar (PNAE) y consolida su vinculación con la agricultura familiar (AF). Esta legislación establece que del total de los recursos financieros transferidos por el gobierno federal a los estados y municipios para la alimentación escolar, mínimo 30% deberán ser utilizados en la compra de productos directamente de la AF y que esta adquisición podrá ser realizada dispensando el proceso licitatorio. La puesta en marcha de esta iniciativa es un proceso complejo, ya que involucra diferentes sectores del gobierno y de la sociedad, así como de ayudas locales, los cuales juntos pueden facilitar o dificultar el éxito de esta iniciativa.

Objetivo: Describir la implementación de las compras directas de la AF en el estado de São Paulo, Brasil, en el año 2012.

Metodología: Se trata de un estudio descriptivo de corte transversal donde se analizaron 25 municipios que compraron alimentos directamente de la AF para el PNAE.

Resultados: 40% de los municipios utilizaron 30% o más de los recursos del gobierno federal para la alimentación escolar (PNAE); 100% de los municipios compren los alimentos directamente de la AF; 80% compraron de agricultores del mismo municipio; 36% de los municipios usaron escuelas superiores para la compra de alimentos de la AF; 92% de los municipios, la totalidad de las escuelas recibieron alimentos de la AF; 84% de los municipios compraron a los agricultores en el municipio. La totalidad de las escuelas recibieron alimentos de la AF; los agricultores en el municipio. Los agricultores en el municipio.

Conclusión: Los resultados de la investigación muestran que la implementación de las compras directas de la AF en los municipios del estado de São Paulo está avanzado. Sin embargo, es necesario fortalecer las acciones para que los municipios alcancen por lo menos la metá del 30% establecida en la legislación y puedan mejorar la infraestructura de las escuelas.

**Elementos de sostenibilidad para programas de alimentación escolar.**

Schwartzman F1, Sampaio Barbosa N.V.S.1, Rodriguez C.A.M.1, Sicolli I1, Slater B1
1Facultad de Salud Pública – Universidad de Sao Paulo. 2Organización de las Unidades para la Agricultura y Alimentación (FAO).
Hydration, inflammation and the immune system.

Prado A., Redondo N., Marcos A.

Hydration together with physical activity and exercise, as part of a healthy lifestyle, is a key factor involved in enhancing human health. However, either a little dose of them or an excess can be harmful for health maintenance at any age.

Water is an essential nutrient for human body and a major key to survival has been to prevent dehydration. Water is the medium where biochemical reactions, transport of substrates across membranes, temperature regulation, circulatory function and other physiological processes occur. Nowadays there is still a general controversy regarding the necessary amount of drink water or other beverages to prevent an adequate level of hydration and also the best way of measuring hydration in humans in order to know what extent a person can be at risk of dehydration and how to prevent any situation of dehydration at any age range. In general, provision of water is beneficial in those with a water deficit, but little research supports the notion that additional water in adequately hydrated individuals confers any benefit. Subjects who are more prone to develop dehydration in normal conditions include children, both amateur and professional people who practise regularly physical activity and exercise, as well as elderly people. Water, or its lack (dehydration), can influence several systems and organic functions including physical and cognitive performance, gastrointestinal function, kidney function, heart function and hemodynamic response, and skin status. Furthermore, there is strong evidence showing that low hydration reduces the risk of unilethnic and bronchopulmonary disorders.

Hydration status might affect the immune system, while the involved mechanisms are not fully understood. One mechanism has proposed that intestinal hydration regulates bacterial-epithelial interactions that could have an effect on the immune system. In humans, studies which evaluated this connection between cytokines and the hydration status are scarce. Indeed, dehydrated adults show high concentrations of some proinflammatory cytokines in serum, such as IL-6. The possible hypothesis is that proinflammatory cytokines such as IL-6, IL-1 and TNF-α regulate the hydration status, since they can transform inflammation to the hypothalamus, place where vasopressin (VP) is synthesized. This hormone plays a key role on water homeostasis throughout their function in osmoregulation. In a dehydration and hypomolarity state, renal excretion of water is reduced along with a massive release of VP, which induces the decrease of water lost in urine.

There is evidence that some bacterial strains interact with the host systemic immune system, leading to changes in cytokine production, immunoglobulin titers and lymphocyte counts, which works throughout the body. These systemic responses could be due to dendritic cells (DCs) action, as they can transport luminal antigens to local lymph nodes, presenting antigens to naive immune cells and activate effector responses from T, B helper and Treg cells, which will activate the release of a different profile of cytokines.

In conclusion, since intestinal microbiota could have a role in mucosal homeostasis and systemic immunity, a good balance of bacterial groups in the colon could function as an important factor in the hydration state and immunity of individuals.

This is the reason why the evaluation of this effect under euhydration and dehydration states, may be of a great interest to detect possible changes in dehydration biomarkers with changes in microbiota community and the immune response.

References:

Plant foods as modulators of oxidative stress: the pre-eminence of human evidences.

Serafini M.
Functional Food and Metabolic Stress Prevention Laboratory.
CRA-NUT, Rome, Italy.

A large body of evidence has shown that oxidative stress (OS) plays a significant role in the development of degenerative diseases and chronic inflammatory status. Human body developed a sophisticated and co-operative array of antioxidant defenses to protect cellular district from OS. Despite the high grade of complexity and efficiency of endogenous defenses, the mechanism is not fully clarified. Among the association with the endogenous redox systems of plant foods, the antioxidant action in vivo, the impact of dietary intervention, and the role of homeostatic control over the antioxidative status are considered today as relevant aspects of the synergism between plant antioxidant actions and diet. The antioxidant action in vivo, however, is not clearly associated with a clear deterioration effect of galenic antioxidant overloading in humans. All these unclear and somehow contrasting evidences raise concerns about the role of antioxidant for human health. Therefore, the first systematic evaluation evaluating the impact of plant foods on biomarker of antioxidant status and redox status in more than 230 dietary intervention trials in humans will be presented and critically discussed attempting to unravel the Red-Ox Dilemma.

The immune response as determinant of micronutrient requirement.

Elmadfa I.*, Meyer A.L.
Institute for Nutritional Sciences, University of Vienna, Austria.

At the cellular and molecular levels, many micronutrients act as enzyme cofactors, components of the antioxidative potential and regulators of gene expression. In these functions, vitamins and minerals play an important role for the integrity and optimal function of the immune response against pathogens. This is particularly true for micronutrients involved in cell proliferation as this latter is increased in activated immune cells. Deficiency states of Zn, Fe and Se impair the proliferation and maturation of T lymphocytes and neutrophil granulocytes and reduce the natural cytotoxicity and the ability to kill phagocytosed bacteria. The proliferation of T cells is also reduced under folate and pyridoxine deficiency, while a lack of vitamin C and E particularly affects cellular immunity through impaired phagocytosis and inhibited lymphocyte proliferation. Furthermore, vitamin C and E as well as other antioxidants needed to protect the immune cells from the harmful effects of the free radicals they use in the fight against pathogens. In light of the synergism between many antioxidants, a balanced supply is of particular importance. Vitamin D is another important player with both active forms 25-OH-D3 and 1,25-(OH)2-D3 regulating innate and adaptive immune reactions and gene expression. These examples show that adequate micronutrient supply is mandatory for optimal disease prevention. Not surprisingly, the strongest effect of micronutrient on the immune system is seen in individuals with suboptimal status or in whom the immune function is disturbed and they are also more likely to benefit from micronutrient supplementation than those with adequate body stores. However, high micronutrient intake in amounts beyond the physiological requirements has generally not shown additional benefits in healthy persons and may even be harmful in this group.
Personalized nutrition, obesity and inflammation.

Martínez J.A. 
University of Navarra, Spain.

Individual differences in body weight/composition and adipose metabolism depend on nutrient intake and physical activity, being regulated by the genetic make-up and through environmental interactions. More than 50 putatively implicated genes in obesity phenotypes and adiposity traits have been explored from studies in animal models or within families with adoptees and twins as well as by means of candidate gene or linkage and GWAS investigations, which open the door for personalized nutrition accounting the genetic variety and the phenotypical accompanying complications such as diabetes hypertension, inflammation and related outcomes. The number of entries under the heading Obesity in the online Mendelian inheritance in man (OMIM AT (http://omim.org)) is 516 as accessed on 2nd January 2014. Indeed, inflammation as an associated manifestation of obesity involves the modulation of a number of genes related with this process such as TNFα, IL-6, PAI-1, PON, etc.

In this context, the Nutrigenetics science considers “the effect of genetic variation on the dietary response”, whose advances are based on the understanding that the genetic make-up determine unique nutritional requirements and rely on the sequencing of the human genome and the subsequent analyses of human genetic variation as well as on studies that underline the genetic interaction with diseases. The factors that underpin nutrigenetics are the diversity on the inherited genome and the myriad of interactions with specific foods/nutrients, whose knowledge is contributing to taylorize nutrition. Thus, it is not only important the influence of the genetic background in the onset of obesity, but also the mode that the dietary advice can be individualized and prescribed depending of the genetic background.

International consortia such a Food4Me are describing genetic variants that contribute to obesity in order to characterize nutrient x gene interactions trait-implemented for obesity prevention and management in a customized manner. Indeed, additional nutrigenetics/ nutrigenomics studies are needed concerning personalized nutrition to be clinically prescribed since genotyping and gene expression appraisal on nutrient-sensitive candidate genes contribute to diagnosis, prognosis and therapy purposes in the obese. In this context, weight loss is associated with a reduction in diabetes and cardiovascular risks that may specifically benefit from a focus on inflammatory pathways and related genes. Interestingly, a number of direct-to-consumer genetic tests are being already used and commercialized in diverse countries to implement individualized diets based on the genotype, but ethical issues, as well as a correct interpretation for health professional and economic aspects need to be developed and standardized in the near future for a scientific and systematic application of nutrigenetics on personalized nutrition and understanding the role on inflammatory pathways.

References

Nutrition at the IAEA.


The IAEA's activities in nutrition arise from its mandate to accelerate and enlarge the contribution of atomic energy to health, peace, and prosperity throughout the world. The overall aim of IAEA's nutrition activities is to assist Member States in enhancing their capabilities to combat all forms of malnutrition by providing technical expertise and encouraging the use of nuclear techniques, particularly stable isotope techniques, through its delivery mechanisms (Technical Cooperation Programme and Coordinated Research Projects). The IAEA contributes to global efforts to combat malnutrition, in particular during the first 1000 days of life, and to prevent the debilitating effects of obesity. The IAEA has helped to establish the Red Cross and Red Crescent Society and other organizations in 20 African Countries, 17 countries in Latin America and the Caribbean, and 11 countries in Asia and Pacific, including the Middle East. The work of the IAEA complements the work of other UN agencies, NGOs and other major players in nutrition and health, and actively contributes to improving health globally.

Assessment of body composition for better understanding of infant, child and adolescent malnutrition.

Norris S.A.
MRC Developmental Pathways for Health Research Unit, Department of Paediatrics, University of the Witwatersrand, Johannesburg, South Africa.

Malnutrition, which includes both under-nutrition and obesity, across the life-course is a global public health concern. Growth references/standards for weight, height and body mass index (BMI) have provided the basis for assessment of children's nutritional status. However, these are unable to provide information on the proportions of fat, lean and bone mass. Some charts for children's body composition by techniques such as skinfold thicknesses, body circumferences, bioelectrical impedance analysis (BIA), nuclear techniques, and dual-energy X-ray absorptiometry (DXA) have recently been produced mainly using high-income country data. For public health or clinical research these different techniques offer both advantages and disadvantages. To measure and interpret body composition across the life-course is critical to improve our understanding of the association between growth and development, body composition, health, and disease risk. But also to better develop and evaluate intervention studies.

Lean mass accrual among Kenyan infants aged 6-15 months: effect of insect-based complementary food and associated factors.

Owino V.O.1, Omolisa S. A.2, Koronyo S.O.2, Kinyuru J. N.2, Oweru B.4, Skau J1, Roos N.3, Michaelsson K.7, Fris H.4, Estambale B.B.6
1Technical University of Kenya. 2University of Nairobi, Kenya. 3Uomo Kenyatta University of Agriculture and Technology, Kenya. 4Catholic University of East Africa, Kenya. 5University of Copenhagen, Denmark. 6Jaramogi Oginga Odinga University of Science and Technology, Kenya.

Background: The efficacy on lean mass gain in Kenyan infants receiving a locally managed and prepared insect-based food compared to a locally produced complementary foods based on maize and germinated amaranth grains with (Winfood Classic [WC]) or without termites (Winfood Lite [WL]) was assessed and compared to a standard food aid product (Corn-Soy-Blend plus [CSB+]).

Methodology: In a randomized controlled design, 428 infants received Winfoods for 9 months from 6-15 months of age. Change in FFM was assessed using a stable isotope methodology (deuterium oxide dose-to-increase).

Results: There were no significant differences in lean mass accrual between the infants receiving WC, WL and CSB+. FFM was 6.0±0.8, 5.9±0.8 and 5.9±1.3 kg, respectively, p=0.7 at 6 months of age and 8.2±1.1, 8.3±1.2 and 8.2±1.0 kg, respectively; p=0.7 at 15 months of age. Being a boy, weight for length (WHL) of >0.2 score at 6 months and breastfeeding at both 6 and 15 months were associated with greater FFM accrual.

Conclusions: No significant impact on FFM was detected from feeding a locally produced complementary food with or without termites compared to CSB+. Early WLZ and breastfeeding status strongly predict FFM. These results highlight importance of timely interventions to improve health.

Assessing body composition and its association with cardiometabolic risk: A 12-country study using isotopic dilution.

Vasta F., Slater C. and ARCHAL Latin America Research Group3, Caballe, R.1
1International Health, Human Nutrition, Johns Hopkins University, Baltimore, MD, USA. 2Division of Human Health, International Atomic Energy Agency, Vienna, Austria.

Background: Measuring body composition is critical to assess the adverse health effects of obesity in children, its prevalence and its variability across countries and population groups.
Objectives: To assess body adiposity in 6-12 year old children, to correlate body adiposity with traditional measures of body size, to evaluate the association of these results with indices of cardiometabolic risk, and to compare these indices of risk between stunted (S) and non-stunted (NS) children.

Materials and methods: The present analysis includes data from 1,205 children aged 6-12 years old from 12 Latin American countries (Argentina, Brazil, Chile, Costa Rica, Cuba, El Salvador, Ecuador, Jamaica, Mexico, Peru, Uruguay, and Venezuela). Percent body fat was estimated by deuterium oxide dilution method (%BF-D2O). Anthropometric measurements (skinfolds, waist circumference) and cardiometabolic indices were collected. Multiple regressions were used to model the relationship between cardiometabolic risk indices and adiposity (%BF-D2O). Spearman's correlations estimated the association between %BF-D2O with adiposity by skinfolds equations and BMI. ANOVA and student's t-tests were used to compare mean differences of body composition and cardiometabolic indices between stunted (S) and non-stunted (NS) children, as well as comparing normal weight non-stunted (NWNS), normal weight stunted (NWS), overweight non-stunted (ONS) and overweight stunted (OS) children.

Key findings: Measurement using %BF-D2O demonstrated a wide range of adiposity, with significant differences between countries, age and sex. Multiple linear regressions showed that %BF-D2O was positively associated with TC, LDL-C, TG, Insulin, HOMA-IR, CRP, IL-6, HCT, LDL-HDL ratio, SBP and DBP, and inversely associated with HDL-C (p < 0.05). BF by D2O correlated similarly well with the skinfold equations of Deurenberg (rho = 0.88) and Dezenberg (rho = 0.82), and less so with BMI (rho = 0.69). Stunted (S) children displayed lower adiposity by %BF-D2O measurement and lowest waist circumference (WC) than NS children, yet higher LDL-C (p<0.05) and no difference in waist-to-height ratio (WHtR). Overweight (ONS) children displayed lower %NFS-D2O (p<0.5) and higher TC and LDL-C compared with ONS children, but this was not statistically significant.

Funding Source: Supported by the International Atomic Energy Agency (IAEA) and research centers in each participating country. ARCAL Latin American Research Group: Monica Britz (Uruguay), Elaine Rush (New Zealand), Asma El Hamdouchi (Morocco), Rolando Giovanni Diaz (Mexico), Noorjehan Joonus (Mauritius), Bee Koon Poh (Malaysia), Rebecca Kuriyan (India), Manuel Ramirez Zea (Guatemala), Vladimir Ruiz Alvarez (Cuba), Ailing Liu (China), Camila Corvalan (Chile), Karina Piframer (Brazil), Andrew Hils (Australia), Christine Slater (IAEA).

Sustainable global food security: achieving the potential.

Pinarstrup-Andersen P., Cornell University, University of Copenhagen. High level Panel of Experts on Food Security (HLPE).

Following a period of dramatic fluctuations in food production and food prices caused in part by extreme weather events and government policy, the world has entered a period of falling food prices with little price volatility and large global food surpluses. As climate change proceeds, there is little doubt that extreme weather events will once again cause large production and price fluctuations. Therefore, now is the time for the public and private sectors as well as international institutions to take preparatory action. Such action should be based on the lessons learned during the period 2007-2012 when most governments were unprepared for the large food price fluctuations. As a result, governments scrambled to put in place short-term Band-Aid policies and programs to protect the politically powerful from negative effects. Since then, few governments appear to have put in place longer-term policies that would mitigate the negative effects from future food price fluctuations. Policies to strengthen the low-income population groups’ ability to withstand food insecurity and malnutrition, when food prices increase, are particularly important. The specific policy measures will vary among countries but the following measures are likely to be relevant for many low-income countries: improved rural infrastructure, markets and institutions for agricultural research to increase productivity and mitigate effects of climate change and extreme weather events; access to credit, fertilizers and other inputs; risk and uncertainty management, particularly for smallholder farmers, and a framework for social safety net programs for low-income urban and rural households that can be activated or expanded as needed. The potential for assuring sustainable food security for all exists but will only be achieved if all actors pursue action that prepares for future food price and income volatility and takes into account the health and nutrition impact. Such action must be evidence-based and take into account the High Level Panel of Experts (HLPE) and the World Committee on Food Security (CFS) in providing and disseminating such evidence is critically important.

Feeding the megacities and urban-rural linkages.


Urbanization is one of the key drivers of change in the world today and feeding the humanity, the majority of which now lives in the cities, involves a complex system of ecological, social and economic relationships.

The world’s urban population currently stands at around 3.5 billion and will almost double to more than 6 billion by 2050. This is a challenge not only for urban areas but also for rural areas, because many people, especially the young, are migrating from rural areas continuously. When addressing urbanization challenges, we are also addressing, directly or indirectly, rural and territorial development.

Food and nutrition security in the cities cannot be taken for granted. It is part of a complex system and supporting the most vulnerable groups in urbanizing world demands discussions on food, agriculture and cities in the context of rural-urban linkages. The world community has acknowledged that the human right to food must be progressively realized despite the enormous challenges and inequities that exist in the food systems of both rich and poor countries.

The diverse array of present “food systems” is changing rapidly on a global scale and will be transformed even more rapidly as a result of powerful forces. This transformation has become a major issue for debate amongst traditional and non-traditional actors and institutions engaged. This includes national governments, research institutions, mayors, city managers, producers, private sector, United Nations (UN) agencies, and civil society organizations in high, medium and low-income countries. All parties to the debate are increasingly concerned with the impacts of food price volatility and climate change on food systems. Amidst calls for “sustainable intensification” of production, or
producing more food with fewer non-renewable inputs and less arable land required to growing populations, a new paradigm is emerging for ecosystem-based, territorial food system planning. This new paradigm seeks to build diverse supplies of food geographically close to population centers, not to constrain the global food supply chains that contribute to food security for many countries, but to improve the local management of food systems that are both local and global.

What do we have to do to ensure people’s access to healthy and nutritious food in cities? What do we have to do to produce enough food for urban dwellers? What infrastructures are needed and what kind of food production is possible in cities? How can cities preserve the services of the surrounding ecosystems?

Urban actors have often not considered the food system an important issue when designing, planning and managing cities. The perception has been that the food is there and one can easily buy it in the supermarkets or along the streets and that food will always be there. This perception was altered for many in 2008, when the food production crisis killed more than 20 countries around the world experienced food riots in urban areas. Hunger, now in both rural and urban areas, has become vocal, and this is changing the political scene.

As a result of new multilateral–multi-stakeholder collaborations, urban and rural authorities and their citizens can come to better understand their food and ecosystem resources to adapt to multiple challenges and manage more resilient food systems.

**Towards Sustainable food Systems**

Meybeck A.

FAO, Agriculture and Protection of Consumer Department, Rome.

The High Level Panel of Experts for food security and nutrition has recently coined an integrated definition, whereby “a sustainable food system (SFS) is a food system that delivers food security and nutrition for all in an economically, socially and environmentally based to generate food security and nutrition for future generations are not compromised”. By this definition the global food system is clearly not sustainable. There are more than 2 billion malnourished, 805 million undernourished, 1.4 billion obese; while enough food is produced worldwide, the food produced is wasted or wasted. The majority of the hungry and poor are food producers. At the same time food production and consumption are already exerting a considerable pressure on natural resources and the environment. And demand is projected to increase, by 60% towards 2050 according to FAO, driven even more by changing consumption patterns than by population growth. In other words the global food system does not feed properly a third of the population while using resources in an unsustainable way. Increased urbanization will also profoundly change the very organization of food systems, in an increasingly globalized world. Food systems and diets are interdependent. Diets are shaped by the food made available by a food system. The food system in turn is driven by the sum of the individual diets that constitute the demand. This is why food systems have to be considered only in the context, acknowledging the interdependency of sustainable consumption and production. A sustainable diets approach aims to address at the same time nutrition requirements, both in terms of energy and nutrients and resources used for food production, including local biodiversity, used to produce traditional and local foods with their rich species. Sustainable diets are not an objective but an essential mean to achieve the transformation of food systems which is needed to achieve this objective. It is important to recognize that the state of the food system reversely conditions the diets, and the possibility to have a sustainable diet, given the available spectrum of food choices and incentives. The capacity for populations to be able to choose a sustainable diet, leading to “Healthy life for present and future generations”, or “low environmental impact”, is the result of the action of many, through a system.

**Toxicology of low and non calorie sweeteners: from lab to law.**

Anadón A.

Department of Toxicology and Pharmacology, Faculty of Veterinary Medicine, Universidad Complutense de Madrid, Madrid, Spain

Low and non-calorie sweeteners (LNCS) are ingredients used in a number of foods and drinks which are extremely popular in over the world. The dietary options that such products provide may be especially helpful in the management of obesity or diabetes mellitus. The LNCS are substances with a very intense sweet taste that are used in small amount to replace the sweetness of a much larger amount of sugar. The LNCS currently used include aspartame (Asp K), advantame (A), cyclamate (E952), saccharin (E954), sucralose (E955), and stevia/ steviol glycosides (E960) among others. In some instances, blend of sweeteners are used (eg, cyclamate/saccharin, aspartame/saccharin, aspartame/acecsalame-K).

European legislation on food Additive Sweeteners. The Regulation (EC) No 1333/2008 of the European Parliament and of the Council of 16 December 2008 on food additives (OJ L 354/16; 31.12.2008) requires that food additives are subject to a safety evaluation by the European Food Safety Authority (EFSA) before they are permitted for use in the European Union (EU). In addition, it is foreseen that food additives must be re-evaluated under continuous observation and must be re-evaluated by EFSA. For this purpose, a programme for the re-evaluation of food additives that were already permitted in the EU before 20 January 2009 has been set up under Council Regulation (EU) No 257/2010 of 25 March 2010 (OJ L 80/19; 26.3.2010). The re-evaluation of all sweeteners is foreseen to be completed by the end of 2020. The levels of use in foods are such a way as to ensure that actual daily intakes do not exceed the acceptable daily intake (ADI). The ADI is defined as the estimated substance that people can consume on a daily basis during their whole life without any appreciable risk to health. ADI is expressed in mg/kg bw/day. The ADI is usually set at 1/100 of the maximum level at which no adverse effect was observed in animal experiments. When re-evaluating previously authorized food additives, EFSA may confirm, amend or even withdraw an existing ADI following a review of all available scientific data. The current ADIs for these sweeteners are considered to be safe for the general population and consumer exposures to additives are below the level. EFSA has already re-evaluated aspartame, advantame and steviol glycosides. The experts examined all uncertainties related to the evaluation of aspartame. Aspartame does not cause DNA damage and carcinogenic damage and behavioral effects, or reproductive and developmental effects. The breakdown products of aspartame (phenylalanine, methanol and aspartic acid) are also naturally present in other foods (eg, methanol is found in fruit and vegetables); an ADI of 40 mg/kg bw/day is set as protective for the general population. Advantame is an artificial sweetener derived by chemical synthesis from isovaniolin and aspartame, although its chemical properties are different than those of aspartame; this sweetener and its metabolites are neither genotoxic nor carcinogenic and pose no safety concerns for consumers at the proposed uses and levels. An ADI of 5 mg/kg bw/day was established for steviol glycosides. Steviol glycosides are mixtures of steviol glycosides extracted from leaves of stevia plant; steviol glycosides are neither genotoxic nor carcinogenic and an ADI of 4 mg/kg bw/day was established. The adults and children who are high consumers of foods containing steviol glycosides could exceed the ADI established if the system of use is used as proposed. Overall, the revised exposure estimates for all age groups (toddlers, children, adolescents, adults and the elderly) remain below the ADI.

Risk assessment. All LNCS are subject to comprehensive safety evaluation by regulatory authorities, prior to approval. Scientists evaluate these sweeteners for many attributes including sensory qualities (eg, clean sweet taste, no bitterness, odorless), safety, compatibility with other food ingredients, and stability in different food environments. A risk assessment comprises hazard identification, hazard characterization, exposure assessment and risk characterization. The risk characterization advice given to risk managers needs to provide information on a number of issues (eg, identification of potentially risk groups, duration of exposure relevant to hazard(s), description of uncertainties inherent in the hazard characterization and exposure assessment). Thus, the risk managers should take the form of a descriptive narrative covering all relevant areas, including uncertainties, and should give sufficient information to answer questions addressed in risk characterization. As part of its safety evaluations of food additives EFSA established, when possible (i.e., when sufficient information is available) an ADI for each food additive or group of additives with similar properties. The scientists are working to better explain and outline their risk assessment approaches in their scientific outputs. The scientific committee has opted to use what is known as a “mode of action” (MOA), or “human relevance” approach in its risk assessment of the safety of aspartame. The ADI is expressed in mg/kg bw/day and is 1/100 of the maximum level of phenylalanine, PKU and human risk of aspartame represents a valuable clarification of the reproductive effects reported in animals given large amounts of either phenylalanine or aspartame. With this approach, by using the weight of evidence from experimental observations and scientific criteria, scientists identify “key events” or “biological steps” which are a sequence of reactions triggered by a chemical in a living organism (eg, toxicity, effects on the hormonal system, increased/ decreased cell growth). Observations of these key events in human and animal studies are compared to determine the relevance to human health. The scientific opinion clearly describes the risk assessment approach to facilitate understanding by risk managers, stakeholders and other interested parties and to inform the risk management decisions. The EFSR role is to provide independent scientific advice to risk managers related to food safety and to communicate its advice to the public at large. The EFSR neither authorizes nor bans the use of substances in foods. It is the responsibility of risk managers (European Commission, European Parliament and EU Member States) to define and to agree measures, as and where required, taking into account scientific advice and other considerations.
Epidemiologic perspective: low and no-calorie sweeteners, cancer, and pregnancy outcome.
La Vecchia C.
Department of Epidemiology, IRCCS-Istituto di Ricerca Farmacologica "Mioni", Milan, Center of Clinical Sciences and Community Health, Università degli Studi di Milano, Milan, Italy.

The role of low-calorie sweeteners on cancer risk has been widely debated since the 70s, when animal studies found an excess bladder cancer risk in more than one generation of rodents treated with extremely high doses of saccharin, and a few earlier epidemiological studies found inconsistent associations with bladder cancer risk in humans. This was however confirmed in subsequent studies, and mechanistic data showed different saccharin metabolism in rodents and humans. To provide information on the role of low calorie sweeteners on the risk of cancer at several sites, we considered data from an integrated network of case-control studies conducted in Italy between 1991 and 2008. Cases were 2941 incident, histologically confirmed cancers of the oral cavity and pharynx, 304 of the oesophagus, 1953 of the colorectum, 460 of the larynx, 2569 of the breast, 1935 of the ovary, 1294 of the prostate, and 767 of the kidney (RCC). Controls were 7028 patients (3301 men and 3727 women) admitted to the same network of general and teaching hospitals, for acute non-neoplastic diseases. We also considered 230 patients with cancers of the stomach and 547 controls, 326 of the pancreas and 652 controls, and 454 of the endometrium and 908 controls. We obtained odds ratios (OR) from multiple logistic regression analyses, including allowance for total energy, besides major recognized risk factors. The ORs for saccharin were 0.65, 0.19, and 0.71, and for other sweeteners were 0.86, 1.16, and 1.07, respectively. Other data on breast, brain and haematopoetic neoplasms also showed no association. Data of the Nurses' Health Study (NHS) and of the Health Professional Follow-up Study (HPFS) found some excess of non-Hodgkin lymphoma (NHL) associated with RR = 1.31 for 1 sachet-day and multiple myeloma (RR = 2.02) in men, in the absence of any association in women, nor in both sexes combined. There was a borderline association for leukemia in both sexes combined (Rr = 1.42). Thus, there is now convincing epidemiologic evidence of the absent relevance association between saccharin, aspartame and other sweeteners, and the risk of several common neoplasms.

With reference to pregnancy outcome and specifically to preterm delivery, two cohort studies from Denmark and Norway reported some associations between "artificially" sweeteners beverages and low birth weight. These, however were different in strata of carbonated and non carbonated beverages, and not heterogeneous from those of sugar-sweetened beverages. When the results of these two studies were pooled, the RR was 1.25 (95% CI: 0.91-1.13) for 4 servings/day of low-calorie beverages. However, for lower levels of consumption RR estimates were lower. This is important, as similar risk estimates were found for sugar-sweetened beverages (RR = 1.23, 95% CI: 1.06-1.42 for 4 servings/day). Thus, those two studies provide no convincing evidence that low-calorie beverages have a specific impact on preterm delivery at any variance from that of sugar sweetened ones.

References.

Low and non-calorie sweeteners in weight regulation.
Drewnowski A.
Center for Public Health Nutrition, University of Washington, Seattle, WA 98195, USA.

Sugar sweetened beverages are a major source of added sugars in the typical US diet. Low and non-calorie sweeteners (LCS) can help reduce the amount to zero, providing opportunities for weight control. Laboratory studies have consistently shown that LCS do not over-stimulate taste receptors, provoke hunger, or cause overeating. Diet beverages suppress hunger in the short term, largely due to volume effect, but do not affect food consumption at the next meal.

Larger scale clinical interventions and population-based observational studies have pointed to the effectiveness of LCS in weight control. Even though cross-sectional studies such as the National Health and Nutrition Examination Survey (NHANES) cannot establish causality, data analyses have identified sharp socioeconomic trends in LCS beverage consumption. The consumers of LCS beverages, tabletop LCS and LCS foods were older, richer, and better educated than non-consumers. Women were more likely to use LCS foods and beverages than were men. LCS users had higher-quality diets, as measured using the Healthy Eating Index 2005, and engaged in other positive health behaviors. Although LCS beverage consumers were more likely to be overweight, LCS use was a component of active weight control.

Global burden of neural tube defects and folate status: understanding the magnitude and distribution of the problem.
De-Regil L.M.
Micronutrient Initiative.

Inadequate folate status in women of reproductive age is known to cause adverse health effects in both women and their babies. These include megaloblastic anemia, neuropathy, and higher risk of incomplete neural tube closure during the periconceptional period, when a woman gets pregnant. This presentation will provide an overview of the current knowledge of surveillance systems aimed at monitoring birth defects and folate status among women of reproductive age as well as the methodological and technical challenges that need to be addressed for their improvement, so that they can better serve their purpose and inform the implementation of evidence informed nutrition actions.

Genetic variation in folate metabolism and congenital anomalies.
Tejero E.
Instituto Nacional de Medicina Genómica.

The genetic variation in enzymes involved in folate metabolism has been widely investigated. Some of these polymorphisms seem to modify the enzymatic activity of the encoded protein. The association between these variants and the risk for neural tube defects (NTDs) has been studied, with inconsistent results. The frequency of the risk polymorphisms varies significantly across different geographic regions and populations, suggesting that certain human groups may have higher requirements of folate and other related vitamins. Recent investigations support that maternal methylenetetrahydrofolate reductase (MTFR) C677T, A1298C and methionine synthase reductase (MTRR) A667G polymorphisms may contribute to the risk of neural tube defects (NTDs) in the offspring. The strength of the association between these genetic variants and the risk for NTD seems to vary across geographic regions. These findings suggest that genetic variation may have a significant contribution to the variability in the metabolism of a given nutrient, and with the risk for anomalies related to the affected metabolic pathway.

WHO guideline: blood folate concentrations in women of reproductive age for the prevention of neural tube defects.
Peña-Rosas J.P.
World Health Organization, Geneva, Switzerland.

The World Health Organization (WHO) core functions include setting norms and standards and promoting and monitoring their implementa-
tion, as well as monitoring the health situation and assessing health trends. The systematic approach to update WHO recommendations requires a rigorous process to assure that guidelines are informed by the best quality evidence. These recommendations involve not only interventions but also the use of valid biomarkers for determining the magnitude and distribution of a public health problem, and for monitoring and evaluating the impact of public health interventions. Folate-preventable congenital anomalies require effective actions to reduce this burden. In collaboration with the National Center of Birth Defects and Developmental Disabilities at the Centers for Disease Control and Prevention (CDC), guidance on optimal blood folate concentrations in women of reproductive age that are associated with a reduced risk of neural tube defects has been developed following the rigorous WHO process of evidence-informed guideline development. This process has been finalized with updated recommendations on optimal blood folate levels for women of reproductive age, identifying cut-off values and raising new challenges in their implementation in public health programmes.

Guidelines for improving folate status and health outcomes in populations.

Rogers L. World Health Organization, Geneva, Switzerland.

In 2012, an estimated 270,358 deaths globally were attributable to congenital anomalies during the first 28 days of life (3.3 deaths per 1000 live births among children under 5) and neural tube defects were one of the most serious and most common. Determinants of neural tube defects and other birth defects are complex and multifactorial. Folate insufficiency is confirmed as one of the determinants and improving the folate status of women of reproductive age is one of the strategies recommended for reducing folate-preventable neural tube defects. Nutrition interventions typically fall into the categories of dietary change/education, supplementation and fortification. In 2007, WHO recommended folic acid supplementation (400 µg/d) for all women from the moment they are trying to conceive until 12 weeks gestation, to prevent neural tube defects and other congenital malformations in the fetus. Furthermore, WHO recommends weekly iron and folic acid supplementation (2800 µg/week) for menstruating women. The fortification of staple foods is recommended by WHO to improve the micronutrient status of populations over time. In 2009, WHO recommended fortifying wheat and maize flour with folic acid. Fortification increases the intake of folate by women and can reduce the risk of neural tube and other birth defects. There are a variety of interventions that may be used to improve the folate status of women of reproductive age, thereby reducing the risk of neural tube defects and other birth defects. Choosing the most effective intervention for a particular population requires knowledge of that population’s values and preferences, costs of the intervention, and the infrastructure in place for delivery of the intervention.

Current capacity for academic nutrition training in West Africa.

Sadjiounou, R. UNICEF. Regional Office for West and Central Africa / WAHO.

Background: There is a dearth of information on existing nutrition training programs in West Africa. A preliminary step in the process of developing a comprehensive framework to strengthen human capacity for nutrition is to conduct an inventory of existing training programs. Objective: This study was conducted to provide baseline data on university-level nutrition training programs that exist in the 16 countries in West Africa. It also aimed to identify existing gaps in nutrition training and propose solutions to address them. Design: Participating institutions were identified based on information provided by country-level informants, UNICEF offices or through internet searches. Data were collected through semi-structured interviews on-site visits or through self-administered questionnaires. Simple descriptive and bivariate analyses were performed. Results: In total, 83 nutrition degree programs comprising 32 B.Sc. programs, 16 M.Sc., 33 B.A. programs, and 17 Ph.D. programs were identified in the region. More than half of these programs were in Nigeria. Six countries (Cape Verde, Guinea-Bissau, Liberia, Mali, The Gambia, and Togo) offered no nutrition degree program. The programs in francophone countries were generally established more recently than those in anglophone countries (age: 3.5 years vs. 21.4 years). Programs were predominantly (78%) run by government-supported institutions. They did not provide a comprehensive coverage of all essential aspects of human nutrition. They were heavily oriented to food science (46%), with little emphasis on public health nutrition (24%) or other disciplines. Annual student intake per program in 2013 ranged from 3 to 262, 7 to 40, and 3 to 10, respectively, for bachelor’s, master’s, and doctoral programs while the number of graduates produced annually per country ranged from 6 to 271; 3 to 64, and 1 to 18, respectively. External collaboration only existed in 15% of the programs. In-service training programs on nutrition existed in less than half of the countries. The most important needs for improving the quality of existing training programs reported were teaching materials, equipment and infrastructure, funding, libraries and access to advanced technology resources.

Conclusions: There are critical gaps in nutrition training in the West African region. The results of the present study underscore the urgent need to invest in nutrition training in West Africa. An expanded set of knowledge, skills, and competencies must be integrated into existing nutrition training curricula. Our study provides a basis for the development of a regional strategy to strengthen human capacity for nutrition across the region.

Vers une formation qualifiante en nutrition au Mali. AG Ikene A. Faculté de Medicine, Mali, Institut National de Recherche en Santé Publique (INRSP), Bamako.

Au Mali, la situation nutritionnelle se complexifie car la malnutrition proto-caolinique sous toutes ses formes coexiste désormais avec les maladies chroniques de surcharge (obésité, diabète et maladies cardio-vasculaires). Ces maladies chroniques, en particulier la maladie d'Alzheimer, sont en nette progression. Entre 11,2% et 3,7% des femmes en âge de procréer sont respectivement surpoids et obèses en 2001 contre 12,4% et 5,2% en 2006. Au plan institutionnel, des évolutions successives ont été enregistrées au Mali ces 15 dernières années. Depuis le début du siècle dernier, une division nutrition dotée aujourd'hui de plus de dix agents et des points focaux affectés dans les directions régionales de la santé, les Centres de Santé de Référence, les hôpitaux régionaux et l'Hôpital Gabriel Touré. Les CSREF et les CSCOM mettent en œuvre les interventions de nutrition et promotion de l'alimentation dans le secteur de santé. Il existe cependant un véritable déséquilibre de prise en compte de la nutrition dans les différents secteurs concernés (santé, développement rural, Education, Industrie, Promotion de la Feme, Communication et Protection Sociale). Le secteur de la santé qui a le leadership semble plus avancé que les autres secteurs dans la mise en place de programmes de nutrition et promotion.

Des améliorations ont été observées dans le domaine de la recherche et de l’enseignement intégré de la nutrition dans les institutions de formation de la santé et du développement rural. Cependant dans le domaine de la formation des spécialistes (licences, masters et doctorat) en nutrition, les efforts sont minimes par rapport aux besoins. En effet, 17 nutritionnistes (15 licences et masters et 2 du niveau doctoral) sont recrutés dans le pays contre un besoin de base exprimé par l'OUAOS compris entre 240 et 1200 licences, 24 et 120 masters et entre 12 et 60 doctorats (Global Public Health, supplémentes novembre 2009). Ces séances à la tête de 10 agents et des perspectives doivent être soutenues par une croissance annuelle de 10% pour chacun des niveaux. La politique nationale de développement des ressources humaines pour la santé adoptée en décembre 2009 ne prend pas en compte ces besoins.

La création au sein du DFR de Santé Publique de la Faculté de Médecine d’un Master en Santé Publique depuis 2012 va s’enrichir d’une nouvelle mention consacrée à la nutrition qui vise à réduire le déficit en ressources humaines qualifiées dans le domaine. Cette formation vise à permettre aux futurs spécialistes en nutrition de comprendre et analyser les problèmes de santé et nutrition dans les pays en développement et plus spécifiquement du Mali.

En plus des cours de nutrition administrés dans certaines grandes écoles nationales et facultés, l’ouverture du Master Santé Publique – nutrition au sein de la FMOS avec l’appui de certains partenaires comme l’UNICEF va combler la carence en ressources humaines qualifiées dans ce domaine en vue d’amorcer un véritable développement socio-économique du pays, qui ne saurait se faire sans amélioration de l’état nutritionnel des populations.

Integrated program for professional training in nutrition in Mali

Julien G. Project Coordinator, Institut Bioforce Développement.

Building capacities of regional, national and local actors is a key factor to ensure a timely and appropriate response to nutritional emergencies or to address the challenges of improving access to water in the Sahel. However, the current training offer doesn’t totally match the needs in terms of qualified and rapidly operational experts in the region (both quantitatively and qualitatively).

In September 2014, the Institut Bioforce has launched two French-language trainings in Mali in partnership with UNICEF, Fondation Mérieux, and Action Against Hunger, and in consultation with the West African Health Organization: “Nutrition Project Manager (Nutrition PM)” and “Water, Sanitation and Hygiene Promotion Project Manager” (WASH PM).
There is evidence that early nutrition can influence later mental performance, cognitive development and behaviour. The diet of mothers, infants and children could have an influence on long-term mental performance, has major implications for public health practice and policy development, and for our understanding of human biology, as well as for food product development, economic progress, and future wealth creation. Current evidence on the effect of diet on mental performance (MP) is largely based on animal, retrospective studies, and short-term nutritional intervention studies in humans. NUTRIMENTHE EU Project (www.nutrimethe.eu) has significantly improved this knowledge by studying the role, mechanisms, risks & benefits of specific nutrients & food components to respond to specific needs and influencing positively on the MP of children. The research has included quantification of the nutrient effects of early programming on later cognitive and mental disorders, effects of food on mental state and MP such as mood, activation, attention, motivation, effort, perception, memory & cognition. The research has also shown that children born to mothers who did not use folic acid supplements during the first trimester of their pregnancy had a higher risk in problem behaviour at 18 and 36 months. Furthermore, structural imaging showed that low folate during pregnancy can have long-term effects on brain growth and development. In addition, the NUHEAL follow-up study also proved that folate supplementation during pregnancy improves children's ability to solve response conflicts, giving better attentional abilities. On the other side, The polymorphism of the genes FADS1 and FADS2 were analyzed in “mother-baby pairs” in the ALSpac and NUHEAL studies, demonstrating that FADS gene variants are an important factor determining maternal n-6 and n-3 fatty acid levels and fetal supply with during pregnancy, and so having a long-lasting effects. The ALSpac study also confirmed that adequate intake of long-chain omega-3 fatty acid during pregnancy is important for child cognitive development at 8 years old; this study also demonstrated that eating fish regularly during pregnancy is important for the neurocognitive development of the offspring, supporting the recommendation that pregnant women should consume at least two fish meals a week, one of these being of all species. The analysis of the WISC data from WISC-III obtained in children aged 8, has shown that seafood intake during pregnancy ≥340 g/week and maternal education determine higher mean scores on Verbal Comprehension, Processing Speed, Working Memory and Speed Processing in the offspring at 8 years. The CHOP-study has demonstrated the safety of lower levels of low-birth-weight infant formulas according to long-term mental performance. Within NUTRIMENTHE Project, evidence from ALSpac, CHOP and NUHEAL has been confirmed that postnatal head size is a marker for brain development in healthy, term, children. The NUHEAL children that head circumference (HC) at 4 years predicts long-term (at 9.5y) grey and white matter volumes, total brain volume, total inner surface area and grey matter distribution in the brain. ALSpac data also showed a positive effect of being breastfed on achieving a higher educational outcome at age 16, which remained significant, even after confounding factors. So, successful early nutrition and later health of the brain developmental outcomes may have an enormous preventive potential, given the major public health implications, including opportunities for an improvement of cognition and an effective primary prevention of childhood and adult behaviour and mental diseases.

**This work was supported by the NUTRIMENTHE EU Project, Grant agreement n°: 212652**

### Effect on the child of maternal iron deficiency.


Research Group Nutrition and Mental Health, Rovira i Virgili University, Tarragona, Spain

There is an increased susceptibility to iron deficiency during the periods of tissue growth and differentiation. Thus, the pregnant women and children are the most vulnerable to this deficiency. Iron is essential for normal development of the baby, and especially for the brain development, because it is required for DNA synthesis, neuronal oxidative metabolism, and both myelin and neurotransmitter synthesis. However, despi­te iron being an essential nutrient and a component of many enzymes and proteins, the prevalence of iron deficiency is increasing in developed countries, such as in Spain, there is a shortage of studies examining the association between ID and early brain development. The prevalence of ID in Spanish children aged 9–30 months old is similar to those of USA and range between the 8 and 11%. Infants with IDA show lower motor and cognitive test scores than infants without anaemia. Follow-up studies suggest that effects of chronic, severe ID in infancy on cognitive function persist later in life despite iron treatment.14

### Early nutrition programming of cognition and behaviour.

Campoy C.

Department of Paediatrics. School of Medicine. EURISTIKOS Excellence Centre for Paediatric Research. University of Granada. Spain

There is evidence that early nutrition can influence later mental performance, cognitive development and behaviour. The diet of mothers, infants and children could have an influence on long-term mental performance, has major implications for public health practice and policy development, and for our understanding of human biology, as well as for food product development, economic progress, and future wealth creation. Current evidence on the effect of diet on mental performance (MP) is largely based on animal, retrospective studies, and short-term nutritional intervention studies in humans. NUTRIMENTHE EU Project (www.nutrimethe.eu) has significantly improved this knowledge by studying the role, mechanisms, risks & benefits of specific nutrients & food components to respond to specific needs and influencing positively on the MP of children. The research has included quantification of the nutrient effects of early programming on later cognitive and mental disorders, effects of food on mental state and MP such as mood, activation, attention, motivation, effort, perception, memory & cognition. The research has also shown that children born to mothers who did not use folic acid supplements during the first trimester of their pregnancy had a higher risk in problem behaviour at 18 and 36 months. Furthermore, structural imaging showed that low folate during pregnancy can have long-term effects on brain growth and development. In addition, the NUHEAL follow-up study also proved that folate supplementation during pregnancy improves children’s ability to solve response conflicts, giving better attentional abilities. On the other side, The polymorphism of the genes FADS1 and FADS2 were analyzed in “mother-baby pairs” in the ALSpac and NUHEAL studies, demonstrating that FADS gene variants are an important factor determining maternal n-6 and n-3 fatty acid levels and fetal supply with during pregnancy, and so having a long-lasting effects. The ALSpac study also confirmed that adequate intake of long-chain omega-3 fatty acid during pregnancy is important for child cognitive development at 8 years old; this study also demonstrated that eating fish regularly during pregnancy is important for the neurocognitive development of the offspring, supporting the recommendation that pregnant women should consume at least two fish meals a week, one of these being of all species. The analysis of the WISC data from WISC-III obtained in children aged 8, has shown that seafood intake during pregnancy ≥340 g/week and maternal education determine higher mean scores on Verbal Comprehension, Processing Speed, Working Memory and Speed Processing in the offspring at 8 years. The CHOP-study has demonstrated the safety of lower levels of low-birth-weight infant formulas according to long-term mental performance. Within NUTRIMENTHE Project, evidence from ALSpac, CHOP and NUHEAL has been confirmed that postnatal head size is a marker for brain development in healthy, term, children. The NUHEAL children that head circumference (HC) at 4 years predicts long-term (at 9.5y) grey and white matter volumes, total brain volume, total inner surface area and grey matter distribution in the brain. ALSpac data also showed a positive effect of being breastfed on achieving a higher educational outcome at age 16, which remained significant, even after confounding factors. So, successful early nutrition and later health of the brain developmental outcomes may have an enormous preventive potential, given the major public health implications, including opportunities for an improvement of cognition and an effective primary prevention of childhood and adult behaviour and mental diseases.

**This work was supported by the NUTRIMENTHE EU Project, Grant agreement n°: 212652**

### Effect on the child of maternal iron deficiency.


Research Group Nutrition and Mental Health, Rovira i Virgili University, Tarragona, Spain

There is an increased susceptibility to iron deficiency during the periods of tissue growth and differentiation. Thus, the pregnant women and children are the most vulnerable to this deficiency. Iron is essential for normal development of the baby, and especially for the brain development, because it is required for DNA synthesis, neuronal oxidative metabolism, and both myelin and neurotransmitter synthesis. However, despite iron being an essential nutrient and a component of many enzymes and proteins, the prevalence of iron deficiency is increasing in developed countries, such as in Spain, there is a shortage of studies examining the association between ID and early brain development. The prevalence of ID in Spanish children aged 9–30 months old is similar to those of USA and range between the 8 and 11%. Infants with IDA show lower motor and cognitive test scores than infants without anaemia. Follow-up studies suggest that effects of chronic, severe ID in infancy on cognitive function persist later in life despite iron treatment.
We investigated in a Spanish sample of well-nourished pregnant women low biochemical risk: the relations between maternal iron status during gestation, the different stages of pregnancy and the development of the baby and of the neonatal behaviour. Likewise, we followed this sample during the first year and at the third year of life and we assessed mental and behavioural development. We found relationship between ID during pregnancy and the development of the baby. All these associations are different depending on the time of gestation: ID in the first and second trimesters was related with low birthweight, prematurity and lower general autonomous response of the neonate and ID in the third trimester predicted the motor performance and self regulation capabilities of the newborn. 

References:

Maternal intakes of seafood types and child neurodevelopment: A longitudinal study based on a population with high consumption levels. 


Seafood consumption during pregnancy is thought to be beneficial for child neurodevelopment, but is also a source of neurotoxic contaminants. Guidelines suggest pregnant women balance these risks and benefits by limiting overall consumption or avoiding large fatty fish subtypes, but recommendations have not been assessed using empirical intake concentrations from different populations. Maternal seafood consumption and two time points of child neurodevelopment, at the age of 14 months and 4-5 years among 1,892 and 1,589 mother-child pairs, respectively, in a prospective Spanish cohort. Bayley (14 months) and McCarthy scales (4-5 years) were used for cognitive and motor assessments. A rating scale was used for assessing autistic spectrum symptoms (CAST = Childhood Asperger Syndrome Test). Multivariate linear regression was used to assess associations between neurodevelopment scores and seafood intakes, adjusting for covariates and further analyses adjusting for cord mercury or long chain polyunsaturated fatty acid (LCPUFA) concentrations. Overall, intakes exceeding recommended at different times of 340 g/week were associated with increases in scores, particularly at child age of 4 years. Large fatty fish, consuming 238 g/week (last Quantile) was associated with adjusted increases of +2.29 points of McCarthy-Cast (1.01, 0.13). While most species, including small fatty fish and lean fish were positively associated with test scores, coefficients diminished about 15-30 % after adjusting for mercury or LCPUFA. Results do not support avoiding large fatty fish, but suggest benefits. Such associations embrace a wide range of cognitive functions and protective associations with autistic spectrum symptoms.


Varela-Moreiras G. CEU San Pablo University, Madrid and Spanish Nutrition Foundation (FEN), Spain.

Different studies have previously assessed the global quality of the Spanish diet, identifying food patterns and nutritional status. However, no studies have evaluated energy balance and its determinants. New technologies reveal potential and useful tools to solve some of the common problems derived from methodology to evaluate dietary intake and physical activity.

Therefore, we have carried out the innovative ANIBES study by the use of new emerging tools (i.e. tablet devices for food and beverages recording, and accelerometers for physical activity level quantification, among others) in order to obtain an accurate updating of energy intake, food/dietary habits/behaviour and anthropometric data of the Spanish population (aged 9-75 yr), as well as in the energy expenditure and physical activity patterns, in order to approach the energy balance concept. The specific aims of the ANIBES Study were: to provide quantitative data on the food and nutrient intakes, sources of nutrients, physical activity level and anthropometric measurements; to provide information on trends in food consumption, nutrient intake in different age groups and gender; to describe the individuals with intakes of energy and nutrients above or below the national average; to provide height, weight and other anthropometric measurements and examine their relationship to socio-demographic, dietary, and health data; to monitor the diet of the population and the extent to which the diets of population sub-groups vary from recommendations. The design, protocol, methodology, and main results are presented and discussed.

Energy balance and gene interactions

Corella D., Ordovás J.M.*
1 ‘Genetic and Molecular Epidemiology Unit. Department of Preventive Medicine and CIBER OBN. University of Valencia, Spain.
2 Nutrition and Genomics Laboratory. USDA-Human Nutrition Research Center on Aging at Tufts University, Boston, USA.

Increasing importance is being placed on the study of all the factors that contribute to energy balance instead of focusing only on diet. We may define “Energy balance” as the relationship between “energy in” (food calories taken into the body through food and drink) and “energy out” (calories being used in the body for our daily energy requirements). Depending on the result of this relationship, we will observe whether weight loss is lost, gained, or remains the same. However, besides changes in weight, alterations to energy balance give rise to other health problems that can contribute to the development of type 2 diabetes, metabolic syndrome, an increase in cardiovascular disease risk and cancer. Many factors contribute to energy balance, both genetic and environmental. Among the most important environmental factors are diet and exercise, but hours of sleep, stress, environmental temperature, etc. may also contribute to this balance. All these environmental factors are, in turn, subject to the genetic factors modulating them. We shall here review the main relevant genes in human energy balance, as well as their main gene-gene and gene-environmental interactions with different components of diet and physical activity. We shall present the results both of individual gene analyses and genetic risk scores (GRS) analyses for each gene. Authors will combine several of these genetic authors of energy intake, extending mainly to those of obesity, although the findings may be extrapolated to include various related pathologies. In addition to genetic analyses, great importance has been placed in recent years on the epigenetics involved in energy balance. We shall comment on several examples of epigenetic regulation of energy balance through methylation and microRNAs.

The importance of energy balance in obesity management.

Hand G.A Virginia University School of Public Health, USA

A fundamental principal of sustainable weight management is that maintaining body weight requires equivalent energy consumption and expenditure over time. However, there is little understanding of the determinants of energy consumption and expenditure, and even less understanding of the relationship among energy intake, expenditure and changes in body composition. It is established that these three primary components of energy balance are not discrete variables, but are dynamic and interrelated. The purpose of this session is to gain a better understanding of energy balance as a framework for weight management. This goal will be achieved by discussing the results from the Energy Balance Study – an ongoing observational study of energy intake, expenditure and anthropomorphic changes in a group of young adults. Findings suggest that there is a significant misclassification of weight change on an individual basis even while group estimates of weight change are valid. The results also indicate that the amount of energy flux, the energy that is metabolized from intake to expenditure/storage over time, is critical for understanding the relationship among the primary components of energy balance. And further, these components play a critical role in the composition of body mass that is gained or lost, which can
Determinantes de la obesidad en etapas tempranas de la vida: estudios en México.
Jiménez Cruz A. Facultad de Medicina y Psicología, Universidad Autónoma de Baja California.

Antecedentes: La eficacia de la televisión en la presentación de alimentos en la televisión en Latinoamérica. Bacardí Gascón, cinco años de vida. Facultad de Medicina y Psicología, Universidad Autónoma de Baja California.

El hambre y la desnutrición infantil representan una realidad invisible e injusta en un mundo en el que la publicidad es esencial para la salud pública. El objetivo de esta presentación es analizar a partir de la evidencia de revisiones sistemáticas y de estudios originales realizados en el norte, noroeste y sureste de México los determinantes de la obesidad infantil durante el periodo pregestacional, gestacional y durante los primeros cinco años de vida.

Metodología: Se analizarán revisiones sistemáticas sobre la desnutrición y el consumo de alimentos durante el periodo pregestacional, gestacional y durante los primeros cinco años de vida. Se buscarán estudios realizados en México, enfocados a la salud pública, la diabetes gestacional y la adherencia a los protocolos de diagnóstico y tratamiento de la diabetes gestacional, el peso al nacer, la lactancia exclusiva, la introducción de alimentos antes de los seis meses, la introducción de alimentos chatarra antes de los dos años, las preferencias, rechazo de alimentos antes de los seis años y el nivel socioeconómico asociado a la obesidad. Además, se analizarán las implicaciones de que estos resultados tienen de acuerdo al modelo ecológico de conducta y sus implicaciones para el establecimiento de prioridades de prevención e intervención en las políticas de salud. Asimismo se describirán estudios relacionados con la estigmatización de los niños y adultos mexicanos con sobrepeso con respecto a su peso de acuerdo al modelo ecológico de conducta y sus implicaciones para el establecimiento de prioridades de prevención e intervención en las políticas de salud. El objetivo de esta presentación es analizar a partir de la evidencia de revisiones sistemáticas y de estudios originales realizados en el norte, noroeste y sureste de México los determinantes de la obesidad infantil durante el periodo pregestacional, gestacional y durante los primeros cinco años de vida.

Vitamin E status: an assessment.
Eggersdorfer M. University Medical Center Groningen. Nutrition Science & Advocacy DSM Nutritional Products, Kaiseraugst, Switzerland.

Vitamin E is essential for human health and achieving an optimal status is associated with beneficial health outcomes. Dietary recommendations are established in many countries around the world and refer to the important role of vitamin E in preserving the integrity of the cell membrane. The intake of vitamin E is in general low and very similar over all regions worldwide. Based on a search in the PubMed/Medline database focused on population based studies published between January 1st 2000 and July 30th 2012 for a major part of the population intakes for α-tocopherol and vitamin E are below 15 mg/d, which is the Recommended Daily Allowance (RDA) for men and women in the US. The fact that people in many countries are not meeting vitamin E intake recommendations we assessed serum α-tocopherol. We used 12 μmol/L vitamin E serum levels needed to avoid deficiencies in the human body (F.A.N. Board 2000). Results from a number of observational, prospective studies suggest a serum tocopherol concentration of 30 μmol/L and above to have beneficial effects on human health in the field of cardiovascular disease and some cancers. The data from the 2003-2006 National Health and Nutrition Examination Survey (NHANES) show mean α-tocopherol concentrations below the optimal concentration for the total population and non-supplements users. In addition to differences in α-tocopherol concentration between supplement and non-supplement users subpopulations by gender and race/ethnicity, a higher proportion of younger than older adults had suboptimal α-tocopherol concentrations. As a consequence, despite low incidence of overt vitamin E deficiency many American adults have suboptimal α-tocopherol status when supplementing their diet. Data on vitamin E status worldwide will be discussed.

A dual role for vitamin E - essentiality and beyond.
Weber P. Corporate Scientist Human Nutrition, DSM Nutritional Products, Kaiseraugst, Switzerland.

Dietary intake recommendations for vitamin E are established in many countries around the globe and refer to its important role in preserving the integrity of the cell membrane as a powerful chain-breaking antioxidant. In the US the Recommended Daily Allowance (RDA) for vitamin E is 15 mg α-tocopherol in adults for both men and women, a value derived from the amount needed to prevent peroxide-induced hemolysis in vitamin E deficient subjects. So, the essentiality of vitamin E is well established and the intake needed to meet the RDAs can be achieved by a prudent diet. On the other hand, emerging data suggest that in diabetics carrying the haptoglobin genotype Hp 2-2 a daily intake of 400 mg vitamin E reduced a composite cardiovascular endpoint (cardiovascular death, myocardial infarction or stroke) significantly. In addition, there are several studies reporting an improvement in fatty liver disease (NASH) by daily intakes of 400-800 mg vitamin E in both, children and adults. A recent study found a reduction of functional decline in Alzheimer Disease at an intake of 2000 mg of vitamin E per day confirming earlier findings. Currently, available evidence is limited for a protective role of vitamin E in human health beyond its role as an essential micronutrient. However, there is encouraging data for it which point to specific condi-
Vitamin E in risk reduction for fatty liver disease.

Peters, S.
DSM Nutritional Products Ltd., R&D Human Nutrition and Health, Kaiseraugst, Switzerland

Vitamin E is an essential micronutrient, which is a powerful peroxyl radical scavenger particularly in the lipid bilayer of the cell membrane. The spectrum of non-alcoholic fatty liver disease (NAFLD) associated with metabolic determinants extends from hepatic steatosis through non-alcoholic steatohepatitis (NASH) to cirrhosis. NAFLD is frequently associated with obesity, dyslipidaemia, insulin resistance and type 2 diabetes mellitus (its prevalence can reach 76% in obese persons), but it also can be observed in 16% to 20% of normal weight individuals. Recent studies reported that vitamin E improves pathophysiological and histological status in NAFLD and NASH patients. As oxidative stress acts as a trigger to initiate cellular injury, leading to a chronic inflammatory response, vitamin E might act in NAFLD in different ways: As a chain-breaking, lipid-soluble antioxidant, quenching peroxyl radicals or as an anti-inflammatory compound, antagonizing the production of inflammatory mediators. There are also measurable differences in the profile of chemical processes involving metabolites (metabolomics) of subjects who are likely (vs. unlikely) to respond to vitamin E treatment for NASH and in those experiencing histologic improvement (vs. no improvement) on treatment. At present, there is no approved drug for the treatment of NASH. It has been shown that vitamin E administered at daily dose of 800 IU/day improves liver histology in non-diabetic adults with biopsy-proven NASH. Besides this therapeutic effect, there may be options in a preventory setting as well, which has to be further evaluated.

Vitamin E in reduction of progression of Alzheimer Disease.

Dysken M.W.
Minneapolis VA Health Care System, Minneapolis, Minnesota

Alpha-tocopherol (vitamin E) has been studied in three large clinical trials to determine its benefit in patients with Alzheimer’s disease (AD). Sano et al. (1997; Dysken et al. 2014) and in subjects with mild cognitive impairment (MCI). Petersen et al. (2005). Sano et al. reported that 2000 IU of vitamin E delayed clinical progression by approximately seven months over a two year period in patients (N=341) with moderately severe AD. Dysken et al. reported that 2000 IU of vitamin E delayed clinical progression by approximately six months over two years in patients (N=613) with mild-to-moderate AD. Petersen et al. reported no benefit in delaying the progression of MCI to AD in subjects (N=769) with MCI. These three studies will be reviewed and discussed with emphasis on clinical trial methodology, mechanism of action, and implications for future research.

Frontiers in assessing vitamin E deficiency and its public health consequence in South Asia.

West K.P.*
George G. Graham Professor of Infant and Child Health Center for Human Nutrition and Sight and Life Global Nutrition Research Institute, Department of International Health, John Hopkins Bloomberg School of Public Health, Baltimore, Maryland, USA.

The prevalence of vitamin E deficiency and its public health importance remain poorly characterized aspects of Hidden Hunger in low income countries, arising from assumed low prevalence, difficulty and cost of measurement, lack of evidence on consequence and uncertainty about roles of vitamin E in health. More research is needed to discern prevalence and health effects of vitamin E deficiency. We report here findings from two population studies in South Asia: a case-control study of 1st trimester vitamin E (α- and γ-tocopherol) status and risk of miscarriage in rural Bangladesh and a study among young school-aged children in Nepal to discover a plasma proteome associated with circulating concentrations of α- and γ-tocopherol that could stimulate use of protein biomarkers to assess vitamin E status using lower cost assays in the future. In the first study, among 1605 1st trimester gravidia enrolled in a larger placebo-controlled, maternal vitamin A or β-carotene supplementation trial Bangladesh (JIVITA-I), 72% were vitamin E deficient, with plasma α-tocopherol <12 μmol/L. The odds ratio (adjusted for cholesterol, γ-tocopherol, body mass index, age and gestation age at blood draw) of miscarriage among these women was 1.83 (95% CI:1.04, 3.20) compared to women whose vitamin E status was above this cutoff. A lower plasma γ-tocopherol was associated with lower risk of miscarriage. Interactions were evident with respect to maternal body mass index and iron status. We conclude that vitamin E deficiency may be common and associated with early pregnancy loss in rural South Asia. In Nepal, we measured 982 plasma proteins in >10% of plasma samples of 500 6-8 year old children: 121 proteins were associated with plasma α-tocopherol (q <0.10; defining a plasma α-tocopherome), comprising many proteins involved in lipid transport, cell adhesion, coagulation, intracellular trafficking and transcription. Following multiple imputation of missing values and linear mixed effects regression, we found 7 proteins (gene symbols: APOC3, APOB, PKM, FOXD4, UNCSC, RGS5 and ITGAS) that explain 73% of the variability in plasma α-tocopherol concentration. Plasma proteomics may provide a new approach for assessing population vitamin E status in the future.

Addressing micronutrient malnutrition in public health and development: from global guidelines to implementation tools.

Peña-Rosas J.P.
World Health Organization, Geneva, Switzerland.

Dr. Peña-Rosas will provide a summary of the current scope of the program of micronutrient malnutrition globally and the efforts of the World Health Organization to develop evidence-informed guidance to address these issues.

Zinc supplementation for diarrhea management: increasing demand and coverage.

De-Regil L.M.
Micronutrient Initiative

Dr. De-Regil will then present the experience of the Micronutrient Initiative in zinc supplementation programs for diarrhea treatment in a number of countries around the world, with particular emphasis on the challenges related to demand creation.

Addressing the challenges of assessing performance of large-scale populations based programs.

Neufeld L.M.
Global Alliance for Improved Nutrition (GAIN), Switzerland

Food fortification, as a population based approach presents many challenges to assessing progress and potential for impact. Dr. Neufeld will present GAINs work to generate a body of evidence about the coverage and potential impact of food fortification programs, using an innovative, simple coverage assessment tool.

Challenges for the monitoring of micronutrient programs and evidence needed to adjust policies.

Holz C.

This presentation will focus on the challenge of adapting within countries, the policies and programs related to micronutrient interventions as the epidemiology of the problem shifts. The presenter will draw on the example of vitamin A supplementation in countries where regular dietary intake of vitamin A may now be adequate and the prevalence of deficiency low.

Integrating efforts to reduce sodium while maintaining progress on iodine deficiency disorder reduction: Experiences from the MENA region.

Hussein I.
ICCID, MENA IEMRO Region, Institute of brain Chemistry and Human Nutrition, OMAN & UK

Dr. Izzeldin will then address another important challenge related to micronutrients. In many countries, salt iodization remains a critical intervention to prevent iodine deficiency disorders given that alternative sources of dietary iodine have not been identified. But at the same time, countries are seeking to reduce salt intake for the prevention of chronic diseases. Dr. Alsdiefel will focus on the integration of salt reduction with salt iodization and challenges of this, with focus on MENA region.
An economic model for optimising effective coverage and cost-effectiveness of micronutrient interventions.

Engle-Stone R.
University of California, Davis, USA.

Many countries have multiple interventions for the prevention and control of micronutrient deficiency, but as yet, little attention has been paid to the cost-effectiveness of these interventions. Coordination is critical to ensure efficiency in use of scarce resources but also as a means to ensure that all risks are minimal, both insufficient and excess intake. In collaboration with the Bill and Melinda Gates Foundation, Dr. Engle-Stone and the team at UC Davis have been developing an evidence based model to optimize combinations of interventions for micronutrient deficiency control programs.

Formación en nutrición.

Martín Salinas C.
Grado de Enfermería, Facultad de Medicina, Universidad Autónoma de Madrid.

En los nuevos Grados de Enfermería, la asignatura de Nutrición con una asignación de 6 ECTS, facilita al estudiante el desarrollo de competencias profesionales relacionadas con la nutrición. En este sentido, la formación de Grado afronta con esta asignatura los conceptos y fundamentos necesarios para el manejo de uno de los requisitos de cuidado universal, la alimentación, tanto desde el punto de vista de la promoción de la salud, como de la prevención de la enfermedad y de la atención y cuidados a las personas con problemas de salud. Pero a su vez, la formación de Grado inicia a los estudiantes de Enfermería en la metodología de la investigación como instrumento de progreso científicos destinado a diseñar y desarrollar acciones formativas a distintos niveles y, prácticas en relaciones interpersonales y para el trabajo en equipo. Todo ello necesario para situar al estudiante de enfermería en el uso del proceso enfermero y la alimentación y nutrición.

Por eso es suficiente con la formación de Grado para proporcionar cuidados nutricionales de calidad?

El Aprendizaje de la Nutrición en el Grado Enfermería, junto con las demás materias de la disciplina, permite desarrollar competencias para prestar un cuidado relacionado con los CONCEPTOS, LÍNEAS Y PLANIFICACIÓN Y LA NUTRICIÓN.

Sin embargo, la experiencia nos dice que la formación BÁSICA no siempre es suficiente a la hora de diseñar o planificar cuidados nutricionales.

¿Qué podemos hacer?

El profesional de Enfermería del siglo XXI tiene la necesidad de ampliar los conocimientos científicos y técnicos, con el fin de mejorar la calidad de la atención de salud al proporcionar unos cuidados enfermeros individuales y correctamente planificados. Con la nueva titulación de Grado se abre la posibilidad de continuar la formación académica. Esto permite, además de una futura integración en un equipo multidisciplinar de Nutricionistas, desarrollar en profundidad las competencias específicas de esta área de conocimientos.

Por qué tipo de formación es más adecuada. Podemos elegir entre un Máster Oficial o un Título Propio, en sus diferentes modalidades.

El MÁSTER OFICIAL es el segundo ciclo de las enseñanzas universitarias. Tiene por objetivo realizar que el estudiante adquiera una formación de carácter generalizado, de carácter especializado o multidisciplinar, y orientada a la especialización académica y profesional, o bien a promover la iniciación en temas investigadores. Tiene validez en todo el territorio nacional y en el espacio europeo de educación superior (EEES). Los Másteres Oficiales surten efectos académicos plenos y habilitan, en su caso, para la realización de actividades de carácter profesional reguladas además de permitir el acceso a la realización de la Tesis Doctoral y obtención del título de Doctor.

Los TITULOS PROPIOS o no Oficiales (también llamados Experto Universitario y anteriormente máster) son programas aprobados por la propia Universidad en uso de su autonomía y están orientados a la formación avanzada y especialización profesional, ofreciendo un tipo de formación más flexible y diversificada, acorde a las demandas de la sociedad. Por sus modos y en la planificación de programas, proporcionan destrezas, de carácter especializado o multidisciplinar, y orientadas a la especialización académica y profesional, o bien a promover la iniciación en temas investigadores. Tiene validez en todo el territorio nacional y en el espacio europeo de educación superior (EEES). Los Títulos Propios surten efectos académicos plenos y habilitan, en su caso, para la realización de actividades de carácter profesional reguladas además de permitir el acceso a la realización de la Tesis Doctoral y obtención del título de Doctor.

1. La orientación hacia un Título Propio, tiene que ver con la Formación Continua y la especialización profesional.

2. La elección de un Máster Oficial, debe ir precedida de la intención de continuar con la formación académica para alcanzar el doctorado.

En el marco actual, la investigación de la formación profesional de enfermera, también en el área de Nutrición, y constituye una demanda para el desarrollo profesional, que nos va a permitir pasar a ser productores de conocimientos y no meros consumidores, así como, formar parte de los equipos multidisciplinares de pleno derecho.

En conclusión, las competencias adquiridas con la realización de un Postgrado permitirán a los profesionales de enfermería tener un conocimiento experto para realizar juicios clínicos avanzados, desarrollar habilidades para la toma de decisiones, para el desempeño de funciones de consultor y para trabajar con equipos interdisciplinares en proyectos de innovación y mejora.

Líneas de investigación en cuidados de nutrición.

Domínguez Maseo A.,
Unidad de Gestión Clínica de Endocrinología y Nutrición. Hospital Complejo Universitario de Jaén.

Cuando Florence Nightingale realizó los valiosísimos trabajos de investigación enfermera que les valieron a los ingleses ganar una guerra, tenía claramente qué buscaba demostrar. Pienso que el principal problema con el que nos toparamos las enfermeras especialistas o generalistas (en nuestro caso en nutrición) es no tener esa claridad de ideas, ya que nos hemos investigado en un mundo profesional demasiado técnico y centrado en la ayuda o colaboración a las actividades médicas. Una mala formación universitaria en investigación, hasta hace tres o cuatro años, completan esta situación que debemos que solucionar cuanto antes.

Uno de los temas fundamentales a tratar es la definición de las líneas de investigación propias de los Grados de Enfermería en Salud, en general, son las que hacen referencia al eje temático monó o interdisciplinario en el que confluyen actividades de investigación realizadas por uno o más grupos de investigación, que tengan resultados visibles en su producción académica y en la formación de recursos humanos necesarios para el desarrollo de trabajos de investigación, tesis y la divulgación de su trabajo, es decir con productividad académica.

Para conocer las líneas de investigación en enfermería la Organización Mundial de la Salud (OMS), la Organización Panamericana de la Salud (OPS) y el Comité Europeo de Salud (CEU) emiten un acuerdo en materia de cooperación internacional para la divulgación de sus resultados necesarios para introducir cambios que mejoren la práctica de la Enfermería en el mundo, generando líneas de investigación que basan el cuidado en la evidencia científica (Consejo Internacional de Enfermería, 2010) entre ellas la alimentación, la nutrición, la dietética y la educación para la salud con líneas prioritarias.

He de decir que el volumen de artículos publicados por enfermeras en el ámbito de la nutrición es ciertamente elevado. Al buscar en la base de datos "Cuiden" artículos sobre nutrición o alimentación, aparecen alrededor de 2190 registros (una vez eliminados los duplicados del tema). Sin embargo, la proporción de trabajos de investigación es relativamente bajo (32,6% de las publicaciones). Por otro lado es muy difícil comprobar cuántas enfermeras colaboran en trabajos multidisciplinares liderados por otros profesionales, sobre todo médicos, con los que promueven la colaboración. Aún es más difícil es. Las líneas de trabajos que se circunscriben a investigar sobre cuidados enfermeros y no a temas clínicos o socio-sanitarios en general ¿a qué podría ser debido? En principio los datos sobre la interrelación nutrición-enfermedad son poco concluyentes y casi siempre se circunscriben exclusivamente a las alteraciones por defecto o por exceso. En este estudio en que se ha limitado a los datos, los resultados de estudio epidemiológicos que nos han proporcionado evidencian que las enfermedades alimentarias son una realidad del mundo, es que en la realidad a menudo más importante, ya que es necesario que el ser humano las evidencias son difíciles de hallar dado el importante número de variables en el ámbito de influencia del tema. Estas premisas hacen que la investigación del origen nutricional sea uno de los campos más complejos de la biomedicina. También hay que reconocer que en este momento en que estamos en este momento en que sobre el trabajo estable y posibilidades de realizar investigación en cuidados no hemos adquirido el hábito de hacerlo ni se contempla como una actividad más del trabajo diario.

El Consejo internacional de enfermería –CIE- comentaba en 2009 que “La perspectiva de la investigación en enfermería y el llamado de la lide­re de asociaciones en el mundo, es el trabajo en grupos y redes temáti­cas, como estrategia para que las enfermeras con alto nivel de formación académica, apoyen a las de menor formación y más experiencia clínica, para basar los cuidados en la evidencia científica a través de la investiga­ción cotidiana”.

Desde las asociaciones de enfermeras se marcan líneas de investigación y se crean grupos de trabajo, sirve de ejemplo la actual línea de investigación que se está desarrollando desde el Grupo de Investigación de ASANE (Asociación de Enfermería Comunitaria de Andalucía) en donde se prioriza la investigación sobre el nuevo modelo de gestión de cuidados implantado en la atención primaria andaluza, aunque emergen más lin­neas referidas a la promoción de salud y prevención de problemas de salud en la población en general, niños, jóvenes y población más vulne­rabilizada.

Desde las asociaciones y grupos de nutrición a nivel nacional ADEN- YD tiene definidas sus líneas de interés entre las que destacan la nutri­
ción artificial y la educación nutricional. En Andalucía contamos con el grupo REUSE trabajando en tres líneas principales: a) Prevención y tratamiento de la disfagia, b) Materiales y técnicas de nutrición artificial y c) Educación nutricional.

Es importante destacar que en este momento la universidad ha dado un cambio, apostando claramente por la preparación en investigación de las grados, tanto en Asia como en Europa. En sus trabajos de fin de grado los alumnos escogen con frecuencia temas relacionados, directa o indirectamente, con la nutrición con lo que tenemos la seguridad de que la cantidad de trabajos de investigación está aumentando exponencialmente, y bien es cierto que estos alumnos y profesionales jóvenes e inexpertos necesitan del apoyo de expertos en investigación de cuidados enfermeros y de sus compañeros conocedores de la clínica y sus dificultades. Por tanto, el compromiso de las enfermeras especialistas y/o expertas en nutrición debe ser firme, con la voluntad única de trasmitir a las siguientes generaciones de profesionales los herramientas para construir una profesión digna y prestigiosa, que aporte nueva y mejores métodos de aumentar y proteger la salud de la población. Y en ese compromiso, estamos inmersas las integrantes de este Simposio.

**Estrategias para la promoción de la alimentación equilibrada, desde las consultas de enfermería de Atención Primaria.**

Francés Pinilla M. Dirección Enfermería Atención Primaria. Sector Zaragoza II. AECA.

Dentro de las consultas de enfermería de atención Primaria, la alimentación es un factor fundamental, ya que la base de una buena salud parte de una alimentación saludable, es decir una alimentación equilibrada. Por ello es que les debe informar de las diferentes grupos de alimentos y los nutrientes que comportan para que conozcan cómo afectan al organismo según su edad o su problema de salud.

El objetivo es incorporar a su estilo de vida una alimentación saludable, variada y sabrosa, basada en la cocina mediterránea. Tanto en el Ministerio de Sanidad, como en las diferentes CCAA, se han publicado, planes o guías bien específicas de alimentación o bien guías en las que la alimentación es una parte importante en la educación para la Salud, del usuario o pacientes en atención primaria.

En la exposición del Simposio se hace un recorrido por los planes y estrategias, pues están en marcha en las CCAA, incluida la "Estrategia para la Promoción de Alimentación y Actividad Física Saludables" en Aragón 2011-2016.

**Influencia de la disfagia en el desarrollo de la malnutrición.**

De Torres Aured M.L. Unidad de Dietética y Nutrición. Hospital Universitario Miguel Servet. Observatorio de la Nutrición y el Estudio de la Obesidad de AECOSAN.

La disfagia es la alteración o dificultad en el proceso de la deglución. No es en sí misma una patología por si misma, sino un síntoma que acompaña otras complicaciones, como en ocasiones debe abordarse como una patología. El abordaje de este síntoma requiere actuaciones que abarcan un correcto diagnóstico e intervención terapéutica adecuada y completa, incluida sobre todo la nutrición.

Las personas que padecen disfagia, suelen tener alterado el proceso de la deglución y con ello la capacidad para alimentarse e hidratarse de manera correcta, lo que pudiera acarrear cuadros de desnutrición y deshidratación.

La detección del problema puede pasar desapercibido y enmascarado entre otros signos más llamativos y/o urgentes, por lo que un diagnóstico correcto a tiempo, evita la aparición de complicaciones como la desnutrición, porque permite la instauración de terapias nutricionales adecuadas y personalizadas.

Dentro de las complicaciones de la disfagia, las hay que alteran la eficacia porque ocasionan una merma en la cantidad de alimentarse, con un nivel adecuado de nutrición e hidratación. Otros alteran la seguridad produciendo obstrucción brusca, atragantamiento, asfixia y neumonía.

Cuidados nutricionales en la disfagia.

Uno de los Cuidados enfermeros más importante en la prevención de estas complicaciones es adaptar la alimentación a la capacidad de deglución del paciente, probando las diferentes texturas de alimentos y viscosidades en los líquidos. Para preservar lo más posible las costumbres, hábitos y cultura alimentaria del paciente, debe de adaptarse el tipo de alimentos -que habitualmente ingiere- a una consistencia acorde a las posibilidades deglutitorias individuales y formar sobre los beneficios de seguir esta dieta adaptada, al paciente (si no tiene deterioro cognitivo) y a familia o cuidadores.

¿Qué es el MECV-V?

El método de exploración clínica volumen-viscosidad es un método sencillo y seguro que consiste en utilizar bolos alimenticios de 3 viscosidades diferentes (nectar, líquido y pudín) en 3 volúmenes crecientes cada uno (5ml, 10ml y 20ml) y así se puede evaluar los signos de disfagia en cada deglución, que será de dificultad progresiva. Obligatoriamente, esta prueba se realiza mientras el paciente tiene conectado un pulsioxímetro, para comprobar la saturación de O2 y detectar alguna bronco-aspiración silente.

Con este método se pretende detectar cómo son de seguras las degluciones y si hay signos de aspiración del boi a la vía aérea. Sobre todo indica cuál es el volumen y la viscosidad del alimento adaptado que el paciente deglute con seguridad y riesgos minimizados. Intervenciones enfermeras en el adiestramiento nutricional.

La enfermera tiene una función asistencial con una actividad formativa para usuarios y pacientes. Sus objetivos son:

- Destacar la importancia de la dieta equilibrada.
- Animar al paciente, familiares y cuidadores a participar en la intervención.
- Informar al paciente y/o cuidadores de las dificultades de deglución que presenta.
- Deben estar encaminadas a cubrir las necesidades nutricionales del paciente.

Malnutrición / Desnutrición

Todos los objetivos, cuidados e intervenciones hasta aquí reflejados, sólo busca que los pacientes con disfagia no entren en un estado de malnutrición, llegando incluso a la desnutrición.

La desnutrición relacionada con la enfermedad, constituye un problema sanitario de altos costes por su elevada prevalencia del 20 al 50%.

La evidencia científica muestra en la literatura publicada, todos los beneficios de salud que suponen una adecuada nutrición en cualquier enfermedad, ya que los pacientes desnutridos tienen un consumo mayor de recursos, que tienen el doble de necesidades que los no desnutridos. Metaanalizamos los datos de Cadwood (2010) y Russell (2007) demostrando que el diseño de buenas estrategias para conseguir una adecuada nutrición por vía oral modificada, enteral o parenteral, proporcionan beneficios de salud en los pacientes desnutridos o en riesgo, lo que proporciona un coste-beneficio muy favorable para el SNS.

Protocolos y Guías de procedimiento.

Las enfermeras de nutrición desarrollan las intervenciones en disfagia en pro de erradicar desnutrición, mediante Guías y Protocolos basados en la evidencia científica y la evidencia asistencial.

**Conceptual considerations on equity in access to interventions addressing the double burden of malnutrition from a social determinants of health approach.**

Zanora G. World Health Organization, Geneva, Switzerland.

Equity in health refers to the need of addressing inequalities or differences in health that are judged to be unnecessary and unfair, and which are avoidable by proper action. Malnutrition, one of the most widespread health inequities across and within countries, affects more often those population groups with less power, economic resources and opportunities. Nutrition-specific and nutrition-sensitive interventions are usually designed to target these population groups; however, those who most need it sometimes face barriers to effectively access interventions. Inequities in access to interventions can be framed as an implementation outcome and thus equity-based implementation research can contribute to identify and overcome those barriers. This presentation will put forward the WHO conceptual and operational approach used in nutrition to this matter.

**Equity and implementation issues concerning the six global targets 2025 to improve maternal, infant and young child nutrition.**

Peña-Rosas J.P. World Health Organization, Geneva, Switzerland.

Understanding equity in access to interventions as an implementation outcome allows us to examine concrete operational issues that are sometimes less considered in conceptual frameworks addressing equity and the double burden of malnutrition. The six global targets 2025 to improve maternal, infant and young child nutrition, endorsed by the World Health Assembly, require complex interventions and a multisectoral approach informed by the guidelines recommended by the World Health Organization. The implementation of these interventions faces difficulties across health systems and contexts. Implementation science and research can contribute to assess and overcome these difficulties. This presentation will examine examples of implementation difficulties using an equity lens and offer entry points to enhance access to interventions, especially for the most vulnerable population groups.
A health systems strengthening approach to improve nutrition of pregnant women and newborns in Ethiopia, Kenya and Senegal.

Kung’u J., Ndiaye B., Ndedda C., Bagale G., Gold E., Neufeld L., De-Regil L.M.*

*Micronutrient initiative, †Global Alliance for Improved Nutrition

Coverage of nutrition interventions for pregnant women is poor, but potential for further improvement is limited where health systems are weak. Such is the case of several African countries. We used knowledge, attitudes and practices surveys to identify key individuals and factors influencing antenatal care demand and use in Kenya, Senegal and Ethiopia. Women with children 0-11 months were randomly selected for the interviews and the selected cases were sampled by using mixed methods. The qualitative and quantitative findings were used to assess areas of opportunity and overcome potential barriers. This presentation will outline these findings and how they informed the design of ad hoc country strategies to improve antenatal care seeking and coverage, supply chain management and quality of care.

Addressing the problem of equity impacts of nutrition interventions in India.

Albrecht D.
World Health Organization Country Office for India.

With a population of 1.25 billion people, India is the second most populated country in the world. Almost 50% of Indian children and women in fertile age are affected by anemia. Stunting and wasting are chronic problems that affect most of infant population with irreversible developmental impacts. Evidence shows that inadequate nutrition is one of the most important causes of the lack of progress on key health indicators in the country at the same time. India is going through an epidemiological transition. While communicable diseases constitute 30% of the burden of diseases in the country, around 65% of this burden is related to noncommunicable diseases. Half of deaths in India are related to heart and metabolic conditions (CVD and diabetes). India is the country with the largest number of diabetes patients in the world with around 70 million people affected. This number will increase 50% in the next 20 years. It can be stated that India is not a country but at a continent with different epidemiological realities that vary across its 29 states and union territories. Ambitious nutrition interventions were adopted since the early days of the Republic in 1947. The results of the Integrated Child Development Services (ICDS) scheme, consisting of several interventions for early childhood development including supplementary nutrition, immunization, health check-ups, and referral services to children below six years of age as well as expecting and nursing mothers have been disappointing. ICDS was initiated in 1975 and was expanded in 2005 to cover the entire country. Using the case of the ICDS we will explore some strategic questions to analyse what critical elements could be considered in the future to achieve better results. Are policymakers understanding the complexity of the nutrition problems India faces? Who is being benefited among the population? Is equity in access being mistreatment? Are decision makers adopting innovative systems approaches? Are single, very often vertical, interventions contributing to improve nutrition in India? Are international partners effectively contributing to Indian priorities? Who is setting the questions and who is trying to better define in the future expected results and accountability mechanisms among Indian and international stakeholders working on nutrition in India.

Connecting Public-Private-Civil Society and Community to address the challenges in increasing access to iron fortified fish and soy sauces among rural communities in Cambodia.

Theory C.
Reproductive and Child Health Alliance, RACHA – CAMBODIA.

High prevalence of iron deficiency anaemia among children and women is a major public health issue in Cambodia. Fish and soy sauce are widely consumed by the entire population, and their fortification with iron has been widely introduced and its reach is currently being expanded. With support from Global Alliance for Improved Nutrition (GAIN), this project implemented by Reproductive and Child Health Alliance (RACHA), in collaboration with the National Subcommittee for Food Fortification (NS-CFF) and the private sector, is being scaled up nationwide with the aim of preventing iron deficiencies. Nationwide, 47 private producers involved in the project and production of iron fortified fish sauce and soy sauce has been increasing. Market share of the fortified products at local markets varies from 5% (at very remote) to 90% (at target provincial/ district markets). To reach out the remote communities, RACHA engaged with existing community networks including village shop keepers as outlets of the products, build capacity of local comedians to perform and

not only to inform the communities about the advantage of iron fortified fish sauce and soy sauce but to disseminate other crucial maternal newborn and child health messages. Multi-sectoral collaboration is crucial to ensure institutional and social sustainability like joint advocacy for mandatory legislation and ensuring its enforcement, strengthens community’s capacity to address important issues by weaving together the skills, resources, networks and knowledge of the government, business and voluntary sectors.

The role of choice architecture (nudging) in Public Health Nutrition.

Perez-Cueto F.J.A.
Department of Development and Planning, Aalborg University-Copenhagen.

Objective: Despite large investments performed by governments and societies to tackle the food-related chronic disease epidemiology, very little success has been achieved, particularly in terms of healthier lifestyles (eating, physical activity). Large population campaigns and education programs have been successful in increasing awareness, knowledge, in creating attitudes and values towards healthy eating and healthy lifestyles, but actual behavioural change has not been achieved. This paper aims at providing a theoretical framework for applying specific environmental changes through targeted choice architecture to facilitate healthy food choices, without limiting actual options and variety.

Methods: Critical review of the theoretical models that have been used to support previous interventions (e.g. Theory of Planned Behaviour, Health Belief Model, Stages of change), and contrast them with dual process theory, as an alternative paradigm in the study of public health nutrition.

Key findings: Majority of healthy eating campaigns have attempted to reach the rational and conscious mode of choosing with limited success if measured as healthier eating. Small changes can have positive effects on health, and are easier, cheaper and more practical to implement. Choice architectural (nudging) interventions, directed towards the automatic, unconscious choice have proven effective in laboratory settings, and are promising venues for population based actions.


Skov L.R. & Perez-Cueto F.J.A.
1Department of Health Science and Technology, Aalborg University-Copenhagen. 2Department of Food Science, University of Copenhagen.

Objective: The primary objective of this review was to update the current evidence-base for the use of targeted choice architecture to facilitate healthier eating in self-service eating settings, hence potentially reducing energy intake.

Methodology: 12 databases were searched systematically for experimental studies with predefined choice architectural interventions in the period June 2011 – March 2012. The 12 included studies were grouped according to type of interventions and underwent a narrative synthesis. An update of the review was conducted during the summer of 2014. Results: The evidence indicates that (i) health labelling at point-of-purchase is associated with healthier food choice, whilst (ii) manipulating the plate and cutlery size has an inconclusive effect on consumption volume. Finally, (iii) assortment manipulation and (iv) payment option manipulation was associated with healthier food choices. The majority of studies were of very weak quality and future research should emphasise a real life setting and compare their results with the effect of other more well-established interventions on food behaviour in self-service eating settings.

Key findings: An increasing interest in the topic of choice architecture and nudging has increased the scientific output since the last review. There is a clear limitation in the lack of a clear definitions and theoretical foundation.

Self-estimation vs. self-served vegetable and whole grain consumption.

Nørnborg T., Houbly L., Jørgensen L., He C., Perez-Cueto FJ.A.*
1Integrated Food Studies, Aalborg University-Copenhagen. 2Department of Development and Planning, Aalborg University-Copenhagen. 3Department of Food Science, University of Copenhagen.

Methodology: To compare actual food selection measures with individual estimates of serving sizes an intelligent buffet was used in order to obtain precise measurements on a self-served meal among a convenient sample of 58 participants recruited at a university in Copenhagen, Denmark. The intelligent buffet is a novel device facilitating data collection in a non-intrusive manner. Self-estimated amounts were assessed.
though a self-administered quantitative questionnaire.

Results: The study showed significant differences between self-estimated and actual portion sizes (P<0.001). The mean self-estimated weight of a vegetable serving was 218±134 g, of a whole grain serving it was 36±34 g, while the actual mean weights were 74±44 g and 10±9 g respectively. In addition the data analysis showed that there was no significant difference between estimated and actual weights (P>0.05).

Key findings: The results indicate that the respondents' ability to accurately assess the serving size of vegetables and whole grain in a self-served meal based on the Danish Dietary Guidelines does not correspond with the actual amount. This may have implications for consumer interpretation of dietary recommendations for nutrition interventions in Denmark.

### Choice architectural nudge interventions to promote vegetable consumption based on automatic processes decision-making

Skov L.R.,1,2 Fris R.,3 Andersen P.M.,1 Olsen A.1, Perez-Cueto F.J.A.1,3 1Department of Health Science and Technology, Aalborg University-Copenhagen. 2Human Nutrition Studies, University of Copenhagen. 3Department of Food Science, University of Copenhagen.

Objective: To test the effectiveness of three types of choice architectural nudges to promote vegetable consumption among Danish people. The experiment aims at providing evidence on the influence of automatic processing system in the food choice situation in an all you can eat buffet setting.

Methodology: Experimental cross-over design study in the FoodScape Lab, comparing control to exposure of three nudges. Nudge 1: Natural green – priming vegetable-choosing behaviour. Nudge 2: Having a pre-portioned and pre-mixed salad as default to the main course, and Nudge 3: Presenting each component of the salad separately to increase choice compared to a pre-mixed salad.

Results: A total of 92 people (dropout rate=21%) partook in the study (60.2% female) with an average age of 26.5. Nudge 1 (N=27) found a significant decrease in total energy intake due to high decrease in meat consumption (p<0.001) but no significant change in vegetable intake (p=0.16). Nudge 2 (N=33) found a significant increase in vegetable consumption (p=0.018) while Nudge 3 (N=32) found no impact on vegetable intake (p=0.56) but a decrease in total energy intake due to a decrease in meat intake (p<0.001).

Key Findings: Only the Nudge that had a default portion size of vegetable had an intended impact of increasing vegetable consumption. This emphasises the importance of portion sizes in out of home eating as well as underlines the effect of the one-unit bias. The remaining two nudges were not successful in increasing vegetable intake, but promoted overall health by decreasing total energy intake which suggests that visual variety of fruit and greens prompts a healthy-eater subconscious behaviour.

### Attitudes towards choice architectural nudge interventions to promote vegetable intake among Danish adolescents.

Houby L.1, Nørnborg T.R.1, Skov L.R.2,3, Perez-Cueto F.J.A.2,3 1Integrated Food Studies, Aalborg University, Copenhagen. 2Department of Health Science and Technology, Aalborg University, Copenhagen. 3Department of Food Science, University of Copenhagen.

Objective: The objective of this study was to investigate the attitudes towards choice architectural nudge interventions aiming to increase vegetable intake among Danish teenagers in a school context, and which factors influence these attitudes.

Methodology: Cross-sectional data were collected through an online quantitative questionnaire, which was developed, validated and distributed to assess factors associated with attitude towards choice architectural nudges interventions. Data analysis included descriptive statistics, factor analysis and structural equation modelling. A total of 408 respondents (78% female) with a mean age of 18±13 spread throughout Denmark provided sufficient responses.

Results: The structural equation model revealed that healthy buffet habits and opinions of where the responsibility of healthy eating lies had the strongest positive association with attitude towards choice architectural nudge interventions. Also, social norms were positively associated with the outcome. Perceived vegetable intake and buffet habits affecting adherence to animal welfare and organic food had a negative association.

The descriptive analysis found that the respondents were generally positive towards less intrusive nudges and displayed a more negative attitude towards those targeting their self-image. Furthermore, the respondents considered it to be acceptable for the school to attempt to intervene with their health-related behaviour, but essentially they saw it as neither the school’s obligation nor responsibility.

Key Findings: Healthy buffet habits and opinions of where the responsibility of healthy eating lies were found to have the strongest positive association with attitude towards choice architectural nudge interventions.

In general, the respondents were predominantly positive towards the use of less intrusive choice architectural nudge interventions, while negative attitudes were expressed towards nudges targeting the respondents’ self-image.

### Nudging young Danish men to eat more vegetables – a food laboratory pilot experiment.

Kongbak I.G.1, Skov L.R.2,3, Nielsen B.K.1, Wichmann M.1, Schaldemose H.S.1, Atkinsson L.1, Ahlmann F.K.1, Perez-Cueto F.J.A.1,3 1Integrated Food Studies, Aalborg University-Copenhagen. 2Department of Health Science and Technology, Aalborg University-Copenhagen. 3Department of Food Science, University of Copenhagen.

Objective: This study assessed the combined effect of two choice architectural nudges as a means to increase fruit and vegetable consumption among male university students.

Methodology: This single one-day lunch meal study was conducted in a FoodScape Laboratory. A control group (n=32) and an intervention group (n=33) were recruited to attend an ad libitum self-serve buffet at two different timelogs. Two choice architectural nudges were applied in the intervention group; the fruit and vegetables were placed at the beginning of the buffet and separated in eight separate bowls to increase visual variety. The self-served amount (g) of food components was measured using high intelligence equipment.

Results: The amount (g) of self-served fruit and vegetables was significantly higher in the intervention group (P<0.005). The total energy consumed (kJ) was significantly lower in the intervention group (P<0.01), while there was no significant difference in the total amount (g) of self-served food between the two groups (P=0.326).

Key Findings: This study found convincing evidence for the combined effect of two choice architectural nudges as a means to increase the amount of self-served fruit and vegetables among male university students. Based on these findings it is suggested that nudges could be used as a supplement to already existing strategies in the promotion of public health nutrition.

### Study on the normative state, and inter- and intra-individual variation on hydration status among Guatemalan preschool children with similar dietary intake. Hydration status throughout different measurement methods, equipment and storage systems.

Soto-Menídez M.I.1 Center for the Studies of Sensory Impairment, Aging, and Metabolism – CeSIAAM- Guatemala City, Guatemala. Department of Biochemistry and Molecular Biology II, Institute of Nutrition and Food Technology, Center of Biomedical Research, University of Granada, Granada, Spain.

Insofar as water is the most vital and essential of all nutrients and the greatest constituent of the human body, it is perplexing that the study of hydration has not received a greater emphasis in nutrition research. With financial assistance from the European Hydration Institute and other sources, and through a donation of an osmometer to measure urinary osmolality (Uosm) to CeSIAAM from the Fundacion Interamericana de Nutricion (FINUT) (Löser B15), as well as through access to a similar instrument at the University of Granada (Osmonat 030), and their application in relation to field studies in Guatemala, a series of insights on the process and results of hydration research can be reported.

Experience in the field setting: The osmometer is a stable and user-friendly instrument in the field, providing reproducibility with CVs of 0.9-2.3%. Urine collection is among the most non-invasive of procedures. We gained experience with application assessing Uosm in replicate quantitative 24-h collection samples among 87 preschool children attending three day-care centers offering a common dietary menu cycle. Using a creatinine-excretion-based criterion (Remer T, AJCN, 2003), one is able to obtain complete 24-h urine volume in 57% of the samples from these young subjects.

Key Findings: With Application of urinary osmometry: Within subject CVs on three collections were high ranging, from 1% to 68% with a median of 22%, reflecting day-to-day variance in hydration state. The median Uosm from samples stored at 0°C from 16 to 25 weeks was 484 mOsm/kg compared to 486 mOsm/kg from samples stored at -80°C from 50 to 59 weeks, with r value of 0.893 on the same osmometry equipment in Guatemala. A second aliquot of the -80°C sample was shipped to Spain and measured on the Osmonat 030 equipment (stored from 43 to 52 weeks) and the median Uosm was 430 mOsm/kg, with r value of 0.828. With this same aliquot solvent analyses and urine oxidative biomarkers were measured. The selection of solvents included: Urea, Uric Acid, Ca, Mg, K, Na and P. Concentration of Urea, K and Na determined 84% of the Uosm variance. The oxidative biomarkers F2 115
Isoprostane (8-iso-6,9-12-epi PGF2α), an index of lipid oxidation and 8-Hydroxy-2'-deoxyguanosine (8-OHdG), product of nucleic acid damage, were inversely associated with urine volumes (Uvol) with r values of -0.603 and -0.433 (p<0.001), respectively and with Uosm with r values of 0.541 and 0.782 (p<0.001) respectively.

Interpretation of the initial experience with Uosm assessment: In comparison to the enzyme value reported for Uosm according to the literature, our highlands sample had relatively low median Uosm 484 mosm/kg [range: 158-1080 mosm/kg], i.e. representing a superior hydration state. Freezing and thawing of samples for Uosm is possible, but data cannot be pooled across different makes of instruments without cross-calibration.

Projection to the future: We need to look at children under less favorable dietary situations than the present sample and assess their hydration status. Hydration of lactating women would be another focus, with both urinary and breast milk samples used as tools. Occupational issues of the Guatemalan sugar-harvesting labor-forces represent additional future opportunities.

Funding sources: Hildegard Grunow Foundation, Munich; European Hydration Institute, Madrid and FINUT, Granada.

The association between hydration status and cognitive function among the elderly.

Bialecka A., Pietrucka B.
Department of Human Nutrition, Warsaw University of Life Sciences

Objectives: The objective of the study was to investigate the relationship between hydration status and cognitive function in apparently healthy older adults.

Material and methods: The cross-sectional study was conducted among 60 free-living volunteers, aged 60 years and older. Information about water consumption was gathered based on 3-d records. Daily water consumption was compared with reference values for adequate intake (AI = 2000 ml/24 h for men and 2600 ml/24 h for women). The hydration status was assessed in morning urine samples by evaluating urine specific gravity. Urine density measurement was made using urometer. The cognitive function was tested using the Mini Mental State Examination (MMSE), the Geriatric Depression Scale (GDS), the Babcock Story Recall Test and the Trail Making Test (TMT) questionnaires. The study protocol was approved by the ethical commission in the National Food and Nutrition Institute in Warsaw.

Results: The mean daily water intake from all source was 2441 ml, and as many as 70% of respondents met a reference values for adequate intake (AI). Results indicated that there was not statistically significant differences between the group with water consumption above AI level and below this level in socio-demographic and health-related factors, and cognitive assessment tests. Mean urinary specific gravity amounted 1.013 (range 1.004 - 1.025), which shows that study population was in a good hydration state. Participants were classified into two groups depending on their urine specific gravity: below or equal 1.012 (n=31) and above 1.012 (n=29). We do not detect any significant differences between these two groups, either in demographic and lifestyle factors or results of cognitive assessment tests. The average result of MMSE test was 27.8. The result of 35 % of individuals was in the range of MCI (Mild Cognitive Impairment), and 5% in the range of dementia. Mean result of GDS test (3.5 points) was within "normal" range (≤5 points), while the results of 25 % of individuals were in the range of "suspicion of depression" (≥5 points) and 5% in the range of "depression" (≥10 points).

Key findings: Among elderly volunteers with good hydration status there were no significant differences in cognitive performance in relation to urine specific gravity.

Hydration Amongst Nurses and Doctors On-call (The HANDS On Study).

El-Sharkawy A.M.,1 Bragg D.J., Watson P.J., Maughan R.J.,1 Sahota O.,1 Lobo D.N.1
Division of Gastrointestinal Surgery Nottingham Digestive Diseases Centre NIHR Biomedical Research Unit, University of Nottingham, Nottingham, 2School of Sport, Exercise and Health Sciences, Loughborough University, Leicestershire, 3Department of Orthogeriatric Medicine, Nottingham University Hospitals NHS Trust, Queen’s Medical Centre, Nottingham, United Kingdom

Rationale: Dehydration of as little as 2% of total body weight may impact on physical and mental performance. In view of the prevalence of dehydration in frontline medical and nursing staff over the course of a normal working shift and its impact on cognitive function.

Methods: This was a prospective cohort study on healthy nurses and doctors working on medical and surgical wards at the hospital teaching hospital. At the start of the shift and end of the shift, subjects were weighed and provided blood and urine samples before completing a series of computer-based cognitive function tests including the Stroop Colour Naming Interference Test (attention) and Sternberg Memory paradigm (working memory and basic sensorimotor speed).

Results: 88 doctors and nurses participated in the study, amounting to 130 shifts. 52% participated for one shift, and 48% for two shifts. 36% of subjects were dehydrated (urine osmolality >800 mosmol/kg) at the start of the shift and 43% at the end. P=0.026. Dehydration was associated with a trend towards an increase in the number of errors made, however, this was only statistically significant with the single-number and five-letter Sternberg short-term memory test.

Conclusion: Dehydration is common in nurses and doctors on-call and appears to be associated with impairment in cognitive function.

Dehydration in the elderly: A review focused on economic burden.

Frangiskou M.
University of Bath, UK.

Background: Dehydration is the most common fluid and electrolyte problem among elderly patients. It is reported to be widely prevalent and costly to individuals and to the health care system. The purpose of this review is to summarize the literature on the economic burden of dehydration in the elderly.

Method: A comprehensive search of several databases from database inception to November 2013, only in English language, was conducted. The databases included PubMed and ISI Web of Science. The search terms "dehydration" AND "hyponatraemia" AND "Cost" AND "elderly" were used to search for comparative studies of the economic burden of dehydration. A total of 15 papers were identified.

Results: Dehydration in the elderly is an independent factor of higher health care expenditures. It is directly associated with an increase in hospital mortality, as well as with an increase in the utilization of ICU, short and long term care facilities, readmission rates and hospital resources, especially among those with moderate to severe hyponatraemia.

Conclusions: Dehydration represents a potential target for intervention to reduce healthcare expenditures and improve patients’ quality of life.

The South East Asia-Nutrition Leadership Program (SEA-NLP).

Fahmida U.
SEAMEO TROPMEDE Regional Center for Community Nutrition, University of Indonesian, Jakarta.

The South East Asia-Nutrition Leadership Program (SEA-NLP) is a one-week training designed to empower nutritionists working in government bodies, research institutes, and academic institutions in South East Asia by providing competencies in effective leadership skills. It also aims to provide a forum of networking among nutritionists in the region where information and ideas are exchanged and collaboration projects can be established. The SEA-NLP is part of the ENLP (European Nutrition Leadership Programme) network and is organized by the South East Asian Ministry of Education Organization Regional Centre for Food and Nutrition (SEA-MEO RECONF) at the University of Indonesia since 2002. Since the 1st SEA-NLP in October 2002, the program has been attended by 237 nutrition and nutrition-related professionals from Southeast Asian and neighboring countries. They come from universities and research institutes (57%), government and policy making institutions (40%) and NGO/in­dustry (3%). SEA-NLP has expanded its benefit by having the Re-echo of SEA-NLP which was initiated in the Philippines and will be expanded to other countries. In its 10th year, the SEA-NLP Alumni Award and Country Project Award have been initiated to acknowledge the outstanding achievements of SEA-NLP alumni as individual or as project within the country or across countries. The SEA-NLP alumni have also been involved in policy making, program implementation and capacity building in the health and nutrition program in their countries.

How to increase leadership impact for a healthy world? The African Nutrition Leadership Programme, ANLP.

Badham J., J., Jerling J.,1
1JB Consultancy Johannesburg, South Africa. 2 North West University.

An abundance of evidence exists with regards to the interventions that would be efficacious in alleviating various forms of under-nutrition. In order to scale up many of these interventions, over the last decades, dedicated attention has been given to building capacity with a focus on technical knowledge and skills. At the same time the nutrition community has come to the realisation that the solutions to many nutritional problems lie in a multi-sectoral (trans-disciplinary) approach. To succeed in this scaling-up nutrition, it is necessary to convert well-constructed and costed plans into action, at the programme implementation level. To this
Public health challenges related to nutrition: the physical activity perspective.

Calbet J.A.L.
Department of Physical Education, Research Institute of Biomedical and Health Sciences (UIIBS), University of Las Palmas de Gran Canaria, Canary Islands, Spain

Although during the past centuries the quality, amount and safety of foods were main concerns in Public Health, during the last 50 years the excess of food has become a major concern in most developed countries. The fight against obesity has focused mostly on the control of the diet keeping low the energy intake. Although this strategy is successful short term it fails in most people, if not accompanied by important changes in the lifestyle. Moreover, dieting may be very challenging for children. An alternative that is based on the same principle, i.e. inducing a chronic energy deficit, is to combine diet with exercise adjusting the volume of energy required to keep the body as much energy balance as the target body composition has been reached. Loss of free fat mass (FFM) is a common consequence of prolonged negative energy balance, observed in healthy human undergoing low calorie diet and patients with conditions causing hypercatabolism and or reduced energy intake. Excessive loss of FFM may be detrimental, since lean tissues and, in particular skeletal muscle, account for most resting metabolism and is essential for the preservation of bone mass and exercise capacity. Moreover, loss of lean mass is negatively associated with survival in intensive care, cancer and other emaciating conditions. Exercise while following low-calorie diets attenuates the loss of FFM. The lean mass-saving effect of exercise can be achieved with strength training, but also with low-intensity exercise such as walking or arm cranking. In humans under very low calorie diets this effect depends on the amount of exercise. Although increasing the ratio of protein to carbohydrate and the total amount of protein ingested may reduce the loss of lean mass, the potential anti-catabolic effect of hyperproteic diets remains unclear. Exercise seems to attenuate protein breakdown. In addition, exercise may protect the skeleton from the negative effect of the increased cortisol levels while in negative energy balance. Energy expenditure could also be increased by uncoupling oxidative phosphorylation or by eliciting an increase in serum calcium by, for example, stimulating heat production in brown adipose tissue. Some form of exercise can induce these two effects. How characteristics must exercise have to prevent or treat obesity? An import premise is that exercise should be programmed under the same rules that apply to any medical treatment. Exercise should be scheduled (dosed) considering that there are various forms of exercise (therapeutic forms), the dose and mode depend on the characteristics of the patient and that if exercise is stopped the effect vanishes quite fast. Furthermore, as exercise and drug therapies exercise may interact with nutrition and concomitant medical treatments. This lecture will explain some basic guidelines to follow to schedule exercise for the treatment and prevention of obesity and its co-morbidities.

Physical activity is more than calorie output: benefits of it on health.

Blair S.N.
Departments of Exercise Science and Epidemiology/Biostatistics, Arnold School of Public Health, University of South Carolina, USA

Much of the evidence linking a sedentary way of life to morbidity and mortality comes from relatively healthy populations, but there are data on the effects of physical activity in individuals with health problems or with risk factors for chronic disease. Clinicians, and often the general public, frequently consider the primary value of physical activity as the contribution it makes to control of these other risk factors. This approach underestimates the value of physical activity in the prevention and treatment of numerous chronic health conditions. There is a steep inverse gradient of morbidity and mortality across categories of cardiorespiratory fitness and physical activity in all subgroups—women and men who are middle-aged or older, obese or normal weight, or healthy or unhealthy. The overall death rates vary by these subgroups, older individuals obviously have higher death rates than younger persons, but the pattern of association of fitness or activity to mortality is comparable for the various population subgroups. In fact, fit individuals with another risk factor for often have lower death rates than unfit individuals without the risk factor. Regular physical activity and moderate to high levels of cardiorespiratory fitness provide protection against numerous health problems and inactivity should be given increased attention by physicians and other health care professionals. Recent research on how to use cognitive and behavioral strategies to help sedentary individuals become more physically active has shown promising results. Exercise Is Medicine is a global initiative to address how to implement physical activity into clinical practice and public health initiatives, and thereby help more individuals practice healthful lifestyles and improve their health.

References
2. Blair SN, et al. Influences of cardiorespiratory fitness and other pre­


globin A1c Levels in Patients with Type 2 Diabetes: A Randomized Con­

7. Church TS, et al. Effects of different doses of physical activity on car­

10. Ewing AC, et al. Overview of the Activity Counseling Trial (ACT) Inter­

11. Lavie CJ, et al. Exercise is medicine: The importance of physical ac­

tivity, exercise training, cardiorespiratory fitness, and obesity in the pre­


17. Sui X, et al. Cardiorespiratory fitness and adiposity as mortality pre­


The dual burden of under- and overnutrition: from evidence to response.

Caballerio B.
Johns Hopkins University, USA

The ongoing increase in obesity prevalence in the developing world, combined with the continuing problem of undernutrition has resulted in
many middle-income countries having both under- and overweight as public health problems. While the term ‘dual burden’ (DB) is used in public health in a variety of contexts, nutrition experts have applied it to the situation described above, namely, the coexistence of under- and overweight nutrition within the same household, community or country.

Within the household, the DB usually consists of a child with chronic undernutrition (stunting) and a mother or other adult with overweight or obesity. In the community or in a given region or country, the DB reflects the presence of subpopulations suffering from weight deficit or excess, either in the same or in separate geographic locations.

Another important type of DB is that which occurs in a single or in separate geographic locations. This type of DB is most prevalent in developing countries, and does not often examine, in a longitudinal way, the situation described above, as it has been demonstrated through community based prevention and treatment experiences. In the eight French pilot towns, the prevalence of underweight including obesity decreased between 2005 and 2009 by 10% (p<0.001). In the two Belgium pilot towns, the prevalence of overweight significantly decreased by 22% between 2008 and 2010 (p<0.04). Following an European project, the EPODE European Network, a book of recommendations has been published to enrich the methodology and facilitate the implementation of similar initiatives in other countries. In 2014, the EPODE International Network brings together 44 community based programs from 29 countries around the globe for experience and best practices sharing.

Conclusion: Childhood obesity is a complex issue and needs a multi-stakeholder involvement at all levels to foster healthier lifestyles in a sustainable way as it has been demonstrated through community based programs. The EPODE methodology contributes to this approach.

**EPODE, a multi stakeholder approach to prevent childhood obesity at large scale.**


**EPODE, France.**

Introduction: EPODE is a coordinated, capacity-building approach for communities to implement effective and sustainable strategies to prevent childhood obesity.

Methods: In each community based programme at central level, a coordination team, trains and coaches a local project manager nominated in each town or community by the local authorities by using social marketing and organisational techniques. The local project manager is provided with tools to mobilise local stakeholders through a local steering committee and local networks. The added value of the methodology is based on a scientific input, innovative tools and shared vision of health and social marketing techniques, sustainable resources, public private partnership, brand dynamics and evaluation.

Results: The EPODE methodology is now implemented in nine countries (France, Belgium, Spain, the Netherlands, South Australia, Mexico, Romania, Canada). At child level the prevalence of overweight and obesity in children aged 5 to 12 is monitored. In the eight French pilot towns, the prevalence of children overweight including obesity decreased between 2005 and 2009 by 10% (p<0.001). In the two Belgium pilot towns, the prevalence of overweight significantly decreased by 22% between 2008 and 2010 (p<0.04).

Ensuring evidence based nutrition policies: The EVIDENT network.

Kolsteren P.

Institute of Tropical Medicine, Belgium.

Quite a lot of research is conducted in the field of nutrition. However an important source of research waste is inadequate use of research findings in policy and practice. An analysis of research in Africa shows that nutrition research is not meeting the needs of policy makers. Many studies are descriptive; few provide solid evidence or are not addressing priority questions for decision makers. Priorities for research are not being articulated by decision makers. Much research provides information on quick fix solutions whereas stakeholders would rather see solutions to prevent malnutrition, address lifestyle and behaviour and studies that address nutritional issues in broader strategies. There is overall a great lack need for evidence based recommendations from the perspective of policy makers.

A new framework for evidence based nutrition research is needed, building on transparent and systematic methods. The EVIDENT network proposes to develop a platform of members that can develop policy briefs on questions identified by policy makers. These briefs are made available to all members of the platform and their development is equally open to all interested members. The platform provides training in making a synthesis of available evidence and the development of policy briefs. There is an active stimulation of communication between the scientific community and policy makers to develop questions and briefs. The platform is posted on the platform for all members to respond to. Over time a considerable encyclopaedia of policy briefs will be available with a clear indication of research gaps. Health technology tools can be used and adapted for this purpose. Moreover, the identified research gaps will, over time, create a basis for a research agenda that can move solution forward.

Adherence to healthy dietary guidelines and future depressive symptoms: Evidence from the Whitehall II Study.

Akbaraly T.1,2,3, Sabia S.1,4, Shipley M.J.1,4,15, Baty G.D.1,2,4, Vyncke M.1

1Inserm U 710, Montpellier F-34000, France. 2University Montpellier II, Montpellier, F-34000, France. EPHE, Paris, France. 3Department of Epidemiology and Public Health, University College London, London, United Kingdom. 4MRC Centre for Cognitive Ageing and Cognitive Epidemiology, University of Edinburgh, UK.

Background: It has been suggested that dietary patterns are associated with the future risk of depressive symptoms. However, there is a paucity of prospective data examining the temporality of the relationship. We sought to examine whether adherence to a healthy diet, defined by the Alternative Healthy Eating Index (AHEI), was prospectively associated with depressive symptoms assessed over a 5-year period.

Design: Data came from the Whitehall II Study, a large scale, ongoing, prospective cohort study of UK civil servants (government employees) aged 35 to 55 years at study induction (phase 1:1985-1988). Analyses are based on 4215 participants with complete information on AHEI, depressive symptoms and covariates. A HEI is a dietary index based on intake of 9 components: fruit, vegetable, ratio of white meat (seafood and poultry) to red meat, trans fat, ratio of polysaturated fat to saturated fat, total fiber, nuts and soy, alcohol consumption and long-term vitamin use. AHEI score was computed in 1991-1993 and 2003-2004. Recent depressive symptoms were defined as having a Center for Epidemiologic Studies Depression Scale score >16 or self-reported use of antidepressants in 2003-2004 and in 2008-2009.

Results: After adjustment for a large range of socio-demographic, health behaviors and health status factors, AHEI score was inversely associated with recent depressive symptoms in a dose-response fashion in women (p for trend < 0.001; for 1SD in AHEI score, OR 0.59; 95% CI: 0.47, 0.75) but not in men. Women who maintained high AHEI score or improved...
Alcohol intake and depression: the PREDIMED trial and the SUN cohort.

Gea A. University of Navarra, Spain

High alcohol intake has been widely associated with depression, however the role of moderate alcohol intake and specific types of beverages was unclear. We aimed to prospectively evaluate the role of moderate alcohol intake and the role of wine consumption on the incidence of depression. For this purpose we analyzed the participants of the PREDIMED trial and the participants of the SUN cohort initially free of depression. Then we compared the incidence of depression within different groups of alcohol consumption. Cox regression analyses were fitted over 23,655 and 82,926 person-years respectively.

Results of both studies agreed that alcohol intake in small amounts (5-15 g/d) and especially wine consumption (2-7 drinks/week) was associated with a lower incidence of depression compared to abstainers (adjusted HR 0.49; CI 0.43-0.55) in the PREDIMED trial, and 0.68 (0.47-0.98) in the SUN cohort.

Dietary patterns and health related quality of life.

Ruano Rodríguez C. Nutrition Research Group, University of Las Palmas de Gran Canaria. Las Palmas de Gran Canaria. Spain. Ciber Fisiopatología Obesidad y Nutrición (CIBEROBIN, CB06/03), Instituto de Salud Carlos III, Madrid, Spain

The life expectancy of the population has increased notably in the last years. Population ageing has fostered the general concern for obtaining a better health-related quality of life, as people are living longer, policies and actions that enact “active ageing” are a necessity. Quality of life is a broad concept that refers to the physical, psychological and social domains of health. Quality of life questionnaires have become an efficient way of gathering data about people functioning and well being. Also health status measures have been shown to be a powerful predictor for chronic diseases and mortality over the long term in clinical practice. Several factors are well-known determinants of HRQL, diet together with other aspects of daily life like physical activity, the relation with the environment etc., play a crucial role in our state of health and therefore in our mental and physical quality of life. To identify the determinants of quality of life is an important task from a Public Health perspective, especially those factors that are modifiable like dietary and lifestyle habits results from special interest. The Research Nutrition Group from the University of Las Palmas de Gran Canaria has been working in this research line since 2008 with the aim to establish the associations between nutrients, foods, food groups and/or dietary patterns and quality of life in general population. Result of this research several scientific papers have been published in which the most relevant findings obtained are the protective effect of the Mediterranean diet on mental and physical quality of life (Ruano C, et al. PLoS One, 2013; 8(5): e61490. doi: 10.1371/journal.pone.0061490; Henríquez P, et al. Eur J Clin Nutr, 2012;66:360-68), and on the contrary the harmful effect that the adherence to a Western dietary pattern has on quality of life, specially the intake of trans unsaturated fatty acids seems to play a detrimental role both in mental and physical quality of life (Ruano C, et al. Nutr J, 2011;10:121; Ruano C, et al. Food Nutr Sci 2014; 5,1291-1300).

Micronutrients and depression: Kuopio Ischaemic Heart Disease Risk Factor Study (KIHDS) Study.

Ruuasen A. Department of Psychiatry, Kuopio University Hospital, Finland.

Introduction: Recently, it has been suggested that low intakes of several micronutrients are associated with elevated levels of depression. The aim of this presentation is to clarify the associations between micronutrients and depression in both cross-sectional and prospective analyses in Kuopio Ischaemic Heart Disease Risk Factor Study.

Methods: The Kuopio Ischaemic Heart Disease Risk Factor Study (KIHDS) is a population-based prospective study of ageing men from eastern Finland. Study population included 2682 Finnish men aged 42-60 years at baseline and the follow-up period has exceeded 20 years now. Dietary intakes of micronutrients were quantitatively assessed by 4-day food record and serum concentrations of nutrients were also determined at baseline. Depressive symptoms were assessed with the 18-item Hamilton Depression Scale. Those who scored five or more were considered to have elevated depressive symptoms at baseline. Data of severely depressed participants who received a discharge diagnosis of depressive disorder during the follow-up was obtained through linkage to the national hospital discharge register. Associations between intakes or serum concentrations of micronutrients and depression were investigated.

Results: Low folate intake was associated with an increased risk of depression both in cross-sectional and prospective analyses. No statistically significant associations were detected between intake or serum concentrations of zinc and depression in prospective analyses. We have also preliminary results to show that higher magnesium/zinc (Mg/Zn) ratio may be associated with a decreased risk of depression in prospective analyses, and low serum 25-hydroxyvitamin D is associated with elevated depressive symptoms in cross-sectional analyses.

Conclusion: Low dietary intake of folate and low Mg/Zn ratio may increase the risk of depression, and low serum concentrations of 25-hydroxyvitamin D are associated with elevated depressive symptoms. However, no statistically significant associations were found with other group B vitamins, intake of zinc or serum zinc concentrations and depression.

In favour of taxes.

López Casasnovas G. University Pompeu Fabra, Spain.

With the support of a systematic literature review I will argue to shed more light on the potentialities of unhealthy food taxation in changing eating patterns and life styles and hence combating the obesity epidemic. One remarkable point that emerges when assessing the set of selected papers is the existence of a wide diversity of objectives, methodologies, settings and datasets, policies implemented and results achieved by all these studies, which undoubtedly adds complexity to any attempt to draw a general conclusion on fast food taxation. Most of the examined studies predict a rather modest fiscal impact on unhealthy food and drinks consumption and/or nutrition intake and consequently a poor result on weight loss and obesity, by the interplay of several factors among them the effects of cross-price elasticities. However this may be clearly context dependent. I will try to identify from this those more favourable settings.

Observational Studies vs Experiments in Nutrition and Health Research: Observation.

Willett W. Harvard School of Public Health, Boston, USA.

In theory, diet and health hypotheses are best tested by randomized trials because this design avoids confounding and also allows the investigator to control the differences in exposure. However, in trials that require large numbers of individuals to change their diets, and to maintain these changes for many years, lack of adherence to the assigned diet has often made the results of major dietary trials uninformative or misleading. Assessing changing one dietary factor in isolation is difficult, so confounding by other aspects of diet often remains possible. “Negative” trials are difficult to interpret, especially for cancer, because of uncertainty regarding critical periods of exposure and latency between exposure and clinical outcomes. Randomized trials using nutritional supplements and placebo may result in better adherence and larger contrasts in intake, but these are usually testing a different hypothesis than the relationships examined in observational studies; in typical trials, micronutrient supplements are usually added to existing diets, which may already be sufficient to meet the nutrient being evaluated. Thus negative results may not refute the epidemiologic observations. Some hypotheses are particularly difficult to evaluate in randomized trials, such as the effects of childhood diets on cancer risks later in life. When dietary trials have been successful, this has usually involved endpoints that respond quickly to dietary change, such as diabetes and cardiovascular disease. To ethical considerations that require stopping when statistical significance is achieved, the confidence intervals typically range from minimal to huge effects, precluding any precision in quantification of benefit. Observational studies of diet and disease outcomes also face challenges in measuring dietary intakes, but experience has shown that important effects can be detected with sufficient sample sizes and adequate follow-up. No single methodological approach will be applicable to all hypotheses, but for many issues the best available evidence is likely to come from a combination of replicated findings from observational studies and controlled feeding studies with intermediate endpoints. Identification of trans fat as a serious public health risk provides a recent example.
Beer versus wine: beer is better!
Hendriks H.F.J.
TNO, Zeist, The Netherlands.

Moderate consumption of alcoholic beverages, mainly red wine, has been associated with good health. However, over the last several decades most health benefits like lower risks for mortality, cardiovascular disease and diabetes type II, have been shown to be independent of beverage type. Moreover, several characteristics of beer may make this beverage fitting a healthy lifestyle better than wine. This lecture will summarize these beneficial beer specific characteristics and explain how these may beneficially affect health. Recent scientific data on beer specific health aspects will be presented. These include beer’s relative low alcohol percentage resulting in lower blood alcohol levels, its high water content providing better hydration and its abundance of important nutrients. Some of these nutrients relevant for health include polyphenols, minerals and vitamins. It will be concluded that beer, when consumed responsibly and in moderation, contributes to a healthy lifestyle more than moderate wine consumption.

Wine vs beer: which alcoholic beverage exerts higher cardioprotective effect?
Estruch R.
Dept. of Internal Medicine, Hospital Clinic, University of Barcelona, Spain.

Excessive alcohol consumption is associated with increased morbidity and mortality as well as with labor and traffic accidents. However, current evidence suggests beneficial effects of moderate drinking on cardiovascular events including coronary heart disease, ischemic stroke, peripheral arterial disease and congestive heart failure. The underlying mechanisms to explain these protective effects against coronary heart disease include an increase in high-density lipoprotein cholesterol and an increase in insulin sensitivity, and a decrease in platelet aggregation and circulating concentration of fibrinogen. However, there are discrepancies regarding the specific effects of different types of beverages on the cardiovascular system, and also whether the possible protective effects of alcoholic beverages are due to its alcohol component (ethanol) or non-alcoholic products containing, mainly polyphenols. Recent randomized clinical trials have shown that wine, a polyphenol-rich alcoholic beverage, provides higher antioxidant and anti-inflammatory effects than some spirits such as gin, a polyphenol-free alcoholic beverage. In addition, deacellized red wine decreases blood pressure through a nitric oxide mediated mechanism, suggesting a protective effect of polyphenols on vascular function. Other studies performed in women have observed that daily doses of 15–20 g of alcohol as red wine are sufficient to elicit protective effects similar to those observed in men who consumed higher doses of wine.

When comparing the effects of moderate intake wine, beer or spirits on cardiovascular system, the results of the meta-analysis have shown the wine exert higher cardioprotective effects than other alcoholic beverages.

In conclusion, moderate consumption of wine exerts a protective effect on biomarkers related to the progression and development of atherosclerosis due to its alcoholic (ethanol) and non-alcoholic (polyphenols) content. Since red wine have higher polyphenolic content than other alcoholic beverages such as beer or spirits, red wine seems to have a higher protective effect on cardiovascular system than other alcoholic beverages.

From the alphabet to the bone.
Buit M.
Universitat Rovira i Virgili, Reus, Spain.

The role of calcium and vitamin D in improving bone mineral density and reducing the risk of osteoporosis and fracture risk has been well established. However, increasing evidences have pointed out the potential role of other modifiable nutritional factors, including vitamins, for the maintenance of bone health. Despite a wide consensus in animals, data on vitamin A status in human showed inconsistent results, and only retinol intake seems to compromise bone health. Most, but not all studies, have found a positive relationship between vitamin B complex, vitamin C and E both with bone mineral density at different sites or with a reduced risk of fractures, mainly attributed to their role on homocysteine, hydroxylation of lysine and proline or antioxidant properties respectively. More recently, vitamin K, originally identified as a coagulator factor, has been suggested as a potential protective factor for their role on osteocalcin.

Guidelines for the design, conduct and reporting of human studies in public health nutrition.
Martorell R.
Robert W. Woodruff Professor of International Nutrition, Hubert Department of Global Health, Rollins School of Public Health of Emory University, Atlanta, GA 30322 USA.

A recent 5-paper series in the Lancet carries the title of “Research: increasing value, reducing waste”. A key message of the series is that much research is poorly designed, conducted and reported, leading to incomplete or unusable biomedical research, a waste of resources, in other words. Studies do not always include methodologists or statisticians to design the data and analyses of data, resulting in weak designs and flawed and biased conclusions. While the registry of trials has improved, partly because better journals demand it, the registry or publication of protocols is uncommon and this makes the reproducibility of research, a cornerstone of science, difficult if not impossible. A common problem is that appropriate power analyses are not conducted. Underpowered studies tend to yield null results which are difficult to publish while small studies with positive or negative results are easier to publish. This creates a bias in the literature. Even when appropriately powered studies are conducted, journals have the unfortunate tendency to reject publishing articles with null results.

Many guidelines and checklists exist for reporting studies of varying designs. These include STROBE (Reporting of Observational Studies in Epidemiology) and the CONSORT 2010 checklist (Consolidated Standards of Reporting Trials). The best journals require that such guidelines be used and monitor compliance but despite this, many publications have some missing data.

An important aspect in science is to carefully review the literature when designing studies and when presenting and discussing the results. Lancet recommended that a systematic review should be conducted and the systematic review containing the “Research in Context” be included to highlight what the findings add to the literature. Lower tiered journals are less demanding and many authors do not cite the relevant key literature. It is also the case that citations are more likely to be made to articles appearing in prestigious journals or those written by well-known investigators.

The gold standard in research is the randomized controlled trial (RCT). Individuals or clusters are randomized but not all RCTs have placebo or are blinded, often because these aspects are unfeasible. Systematic studies sometimes include only RCTs but this can leave out important literature.

GRADE (The Grading of Recommendations Assessment, Development and Evaluation) is a sensible and transparent approach to grading quality of evidence and strength of recommendations or conclusions. This permits the inclusion of studies with RCT or observational designs. Some questions are not easily or even possible to address with RCTs and require that well designed observational studies be conducted.

An important distinction is between efficacy and effectiveness research. RCTs are usually best for evaluating the impact or efficacy of clinical interventions, typically these studies are done under highly controlled conditions. Effectiveness refers to assessing impact of public health policies and take into account not only potential efficacy but also potential flaws (whether the services are available, accessible and of adequate quality), utilization and coverage. A landmark publication by Victora, Habicht and Bryce (2004) in the American Journal of Public Health carries the title “Evidence-Based Public Health: Moving Beyond Randomized Trials”. They make the point that causal chains in public health interventions are complex, making RCT findings subject to effect modification in different populations. They point out that observational studies with plausibility designs are often the only feasible option for evaluating large-scale public health interventions.

Research Integrity & the Fallacy of the Ad Hominem
Binks M.
Nutritional Sciences College of Human Sciences, Texas Tech University, USA.

As we consider solutions to the burgeoning obesity epidemic worldwide it is essential to leverage resources from all possible constituencies who are interested in contributing to being part of the solution. Unfortunately, too often, our passion for what we “believe” to be true, can override our willingness to engage in thoughtful scientific appraisal. Such has been the case in the conversations involving potentially valuable collaborations that can be built around industry-academic-public health partnerships in nutrition and obesity research. Increasingly both in the public and professional domains we have seen otherwise well-conducted research, involving fully transparent and appropriate funding, rejected out-of-hand based solely on the source of that funding. Beyond this, we have seen the intellectual contributions of individual researchers with impeccable records of substantial, meaningful and ethical research rejected solely on the basis that these fully transparent relationships
exist. In this presentation, we will address several fallacies related to the issue of perceived bias based on funding source alone; consider the unintended negative impact these attitudes can have on the process of objective scientific discovery and public health; and outline guidelines to promote ethical industry/academic partnerships that can expand our scientific knowledge and improve public health.

**Metabolomics and nutritional applications.**

Brennan L.

UCD Institute of Food and Health, University College Dublin, Ireland.

Metabolomics is the study of metabolites present in biological samples such as biofluids, tissue/cellular extracts and culture media. Combining metabolic data with multivariate data analysis tools allows us to study alterations in metabolic pathways following different perturbations. Examples of perturbations can be disease state, drug or nutritional interventions with successful applications in the fields of drug toxicology, biomarker development and nutrition research.

In recent years, metabolomics has been used to define the metabolic phenotype (metabotype) of individuals. There is an expectation that assigning individuals to a particular metabotype will provide a prediction for response to interventions such as drug and nutritional treatments thus providing a personalisation to treatment. Examples which have been successful include response to supplementation with vitamin D and treatment with acetaminophen and Fenofibrate therapy. However, further work is necessary to establish the true potential of metabolomics in personalised health. Metabolomics can also be applied to the discovery of biomarkers of food intake. To date successful examples include the development of biomarkers for foods such as red meat, fish, citrus fruit and wholegrains. The current approaches used to identify such potential biomarkers and developments in this field will be discussed.

**New tools for the study of microbiota in nutrition research.**

Gil A.

Department of Biochemistry and Molecular Biology II, Institute of Nutrition and Food Technology, Centre of Biomedical Research, University of Granada, Granada, Spain.

Intestinal bacteria promote the early development of the host immune system and contribute to the appropriate balancing of immune responses later in life. Paralleled massive sequencing of intestinal microbiota DNA and other molecular techniques such as fluorescence in vitro hybridization (FISH) provide new tools to identify commensal and pathogenic bacteria in a more precise way. Over the course of evolution, lactobacilli, other lactic acid bacteria and bifidobacteria have been abundant colonisers of the human small intestinal mucosa and coexist in mutualistic relationships with the host. Some members of these groups exert additional probiotic properties that provide health benefits to the host via the regulation of immune system functions. Before testing the potential use of microorganisms as probiotics in humans, a sine qua non condition is to conduct studies in cell and animal models although human clinical trials are the definitive tool for establishing microorganisms functionality. Ideally, cell models should resemble the in vivo conditions; however, in most in vitro experimental models, epithelial and dendritic cells (DCs) are cultivated as monolayers in which the establishment of functional epithelial features is not achieved. Co-culture experiments with probiotics, dendritic cells and intestinal epithelial cells, as well as 3D cell models attempt to reconcile the complex and dynamic interactions that exist in vivo between the intestinal epithelium and bacteria on the luminal side and between the epithelium and the underlying immune system on the basolateral side. Additional models, include tissue explants, bioreactors and organoids. Animal studies may also provide valuable information, such as the mechanism through which probiotics can exert their action. Accumulating evidence demonstrates that commensal bacteria and probiotics communicate with the host by pattern recognition receptors, such as TLR and NOD-like receptors, to enhance or suppress activation and influence downstream pathways, leading to a better tolerance of the host against foreign antigens. Gaining insight into the mechanisms of intestinal microbiome action may contribute to foster the development of novel strategies for the treatment or prevention of gastrointestinal and autoimmune diseases.

**The role of food and nutrition in space exploration.**

Baker E.

University of Texas MD Anderson Cancer Center, USA.

Man has roamed the Earth since the beginning of time – seeking knowledge, satisfying curiosity, searching for new lands, exploring beyond the oceans and over the mountains. This curiosity – this quest for understanding – this exploration to claim territory for the motherland did not – and does not – come without risk. The basic human needs of food and shelter have often been the most difficult challenges, coming at greatest cost. Five hundred years ago explorers set sail in great ships, often spending months to years at sea in horrific conditions, succumbing to dreaded diseases, the most feared of which, for centuries, was scurvy. An estimated 2,000,000 sailors died of scurvy in the two hundred years after Columbus’ voyage.

One hundred years ago explorers turned to the top and bottom of the Earth, believed by many to be the last frontiers. Unimaginably harsh conditions, extreme temperatures, and grueling travel were complicated by the basic needs of food and shelter as well. Properly placed food supplies could, and sometimes did, mean the difference between life and death. Fifty years ago the reachable frontier moved off the planet and explorers today look to the stars. The unique environment of space travel, the constraints of living on orbit, in isolation, and the unique physiologic adaptations to this environment present challenges to maintaining health and high levels of crew performance, both physically and mentally. Nutrition involves not only food intake, but must consider the physiology associated with this environment, the countermeasures employed by crewmembers and the closed food system providing nutrients.
SPEAKER CURRICULUMS

Olayiwola Adeola
B. Agr. in Animal Science (with First Class Honors), 1982, University of Ife, Nigeria.
M. Sc. in Animal Science, 1986, University of Guelph, Canada.
Ph.D in Animal Science (with Distinction), 1989, University of Guelph, Canada.
Professor Adeola is currently a professor in the Department of Animal Sciences at Purdue University. He served as a non-ruminant nutrition section associate editor for the Journal of Animal Science, on the editorial board of Poultry Science, as associate editor for the Canadian Journal of Animal Science. He conducts research in energy, amino acids, and phosphorus utilization of non-ruminant animals for improving the efficiency of lean meat production and minimizing the flow of nutrients through animal waste into the environment. He has authored or co-authored 160 refereed papers, 160 abstracts and book chapters, and several other publications. Professor Adeola received the American Feed Industry Association (AFIA) Poultry Nutrition Research award in 2005, the Maple Leaf Duck Research Award in 2007, the AFIA Nonruminant Nutrition Research award in 2007, the Devon-Degussa Poultry Research Award, Poultry Science Association in 2010, and the National Breeder Chicken Council Research Award, Poultry Science Association in 2012. He served on the National Academy of Sciences - National Research Council Committee that wrote the 11th Revised Edition of the Nutrient Requirements of Swine (NRC, 2012).

Felice Adinolfi
Felice Adinolfi is Professor of Economics and Rural Appraisal at University of Bologna. Since 2014 he is member of the Steering Committee of the EU Scientific Programme for Expo 2015 at European Commission Joint Research Centre. From January 2010 to January 2012 he held the position of Scientific expert assisting the European Parliament Committee on Agriculture and Rural Development. He has published more than 80 papers that have featured in international peer-reviewed journals, and scientific books on the field of agricultural economics and policy. He is reviewer for several agricultural economics journals.

Since 1st of January 2013 is Member of the CHIEAM’s Advisory Board. He has been Member of the Nomisma Scientific Board. Since 2011 he is Co-editor in Chief of the “International agricultural policy” journal on mayor journal.

Tasnome Akbaraly
I am currently a permanent Researcher at INERIM, the French National Institute of Health and Medical Research located in Montpellier (south of France). I am also honorary researcher at University College London and consultant for the Whitehall II team. Having originally studied biochemistry, I found my way to cognitive aging epidemiology. After obtaining a PhD on the impact of nutrients such as selenium and carotenoids on cognitive decline, I wished to learn more on nutritional epidemiology and had several post-doctoral experiences (MRC Human Nutrition Research, Cambridge, UK; Department of Epidemiology and Public Health, UCL, London, UK). I am interested in the determinants of heterogeneity in aging. My current research consisted of:
- Examining the impact of diet on cognitive, physical functioning and mental health using expertise in nutritional epidemiology and neuropsychology.
- Examining the association between type II diabetes biomarkers, cholesterol metabolism and cognitive decline and mental health.

Abel Albino
Medico pediatra, doctor en medicina. Miembro de Número de la Academia Nacional de Educación, Miembro de Número de la Academia Española de Nutrición, Miembro Correspondiente Nacional de la Academia Nacional de Medicina, Fundador de CONIN en Argentina, ha replicado el modelo de Chile en recuperación de la desnutrición infantil y creado el diseño de prevención que ha sido replicado en Argentina, Latinoamérica y África, superando los 60 centros. Desde hace más de 20 años se dedica a la lucha contra la desnutrición infantil, desde sus dos puntos de ataque: prevención y recuperación. Para vencer este terrible flagelo, con una metodología innovadora, a través de un abordaje integral de la problemática social que da origen a la extrema pobreza. Sostiene que el desarrollo del país depende de la unión de los ciudadanos en forma particular, las empresas y el Estado, despreciando la lucha del hombre contra el hombre, al convertirla en una lucha del hombre contra el hambre.

Daniel Albrecht
Mr Albrecht is an international expert with 18 years of professional experience in health policy and processes with emphasis in health systems and equity, nutrition and social protection. He has extensive expertise in international development with over 15 years of direct negotiations and implementation of multi-sectoral health and nutrition projects involving donors, government, and civil society organizations. With a strong academic grounding in health and nutrition policy and social protection, Daniel Albrecht holds a bachelor’s degree in law from the Pontifical Catholic University of Peru and a Master’s in International Development with concentration in Health and Public Policy from The Norman Paterson School of International Affairs at Carleton University in Ottawa, Canada. He also holds a Diploma in project formulation and monitoring from United Nations Institute of Economic and Social Planning (ILPES) - UNECLAC in Santiago, Chile. Daniel has led projects in public health programmes in Peru, Canada, Brazil, Chile, India, Bangladesh, and Switzerland, involving the planning, design, implementation and management of health and social protection projects with focus, among other areas, on nutrition and material and child health focusing on integrated policies and inter-sectoral action to improve equity impacts.

Arturo Anadón
Full Professor and Head of Department of Pharmacology and Toxicology, University Complutense of Madrid. Master n Basic Pharmacology, Faculty of Medicine. University Complutense of Madrid (Spain). Visiting Scientist, Division of Animal Sciences, Center for Agriculture and Public Health, University of California, Davis (USA). Visiting Fellow. US. Medical Research Council, London, United Kingdom. Visiting Fellow, The Departments of Applied Physiology and Surgical Science, and Pharmacology, Royal College of Surgeons, London, England, London, U.K. Fellow Celego Complutense at Harvard University (USA). Member of the Expert Advisory Panel on Food Safety at the World Health Organization, Genève, Switzerland. Member of JECA. Membership of the European Food Safety Authority Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids. Former EMA, EFSA, Organization of American States, International Atomic Energy Agency. Member of the Royal Academy of Doctors of Spain. Corresponding Member of the Royal National Academy of Pharmacy. He is author or co-author of over 200 peer-reviewed research articles and 100 book chapters. Member of editorial board of several journals.

Rhona S. Applebaum
Rhona S. Applebaum, Ph.D. is the Vice President and Chief Science & Health Officer at The Coca-Cola Company where she is responsible for the Company’s global health and well-being strategy on a variety of issues and programs related to food safety, diet, health and an overall active, healthy lifestyle. Dr. Applebaum also serves as the Executive Director of the Company’s Beverage Institute for Health and Wellness.

Dr. Applebaum joined the Company in 2004 as the Chief Scientific and Regulatory Officer, leading Global Scientific and Regulatory Affairs. In 2012, she was elected by The Coca-Cola Company’s Board of Directors as a Vice President of the Company.

Dr. Applebaum serves on numerous committees, boards and advisory boards, including the Centers for Disease Control Foundation’s Corporation Council for Science, the EPODE International Network, Health Connect South, the Harvard Medical School Global Health Advisory Council, and several industry trade groups and science organizations. She is also a member of many industry committees, councils and executive boards. In 2012 she was honored as one of the “100 Women Leaders in STEM,” and in 2013 was named to the Executive Leadership Honor Roll of On-Board. In June, 2014 Dr. Applebaum received the Kosuna Distinguished Lecture in Nutrition.

In 2009-2010, she served on The Center for Strategic and International Studies Commission on Smart Global Health Policy, and from 2008-2011...
as a member of the Science Board to the Food and Drug Administration (FDA). Dr. Applebaum has also been a member of FDA's Food Advisory Committee and USDA's Agricultural Policy Advisory Committee for Trade. Before joining The Coca-Cola Company, Dr. Applebaum was Executive Vice President and Chief Science Officer for the National Food Processors Association. She also held leadership roles with the Distilled Spirits Council of the United States, the Chocolate Manufacturers Association, the American Cocoa Research Institute and the National Confectioners Association.

Dr. Applebaum received her B.A. from Wilson College (history and biology), her M.S. from Drexel University (nutrition and food science) and her Ph.D. from the University of Wisconsin (food microbiology and food safety).

Javier Aranceta Bartrina


Jane Badham

Jane is a registered dietitian and registered nutritionist and also has a Postgraduate diploma in Hospital Dietetics, a Masters degree in Nutrition and a Diploma in Marketing Management.

Jane’s has been running her own health communication and strategy business, JB Consultancy, for 22 years that advises NGO’s, CSOs and the food industry on nutrition issues and trends, food regulations, micronutrient malnutrition and maternal, infant and young child nutrition.

Jane has a passion for transformational leadership development and is actively involved with the African Nutrition Leadership Programme that aims to develop and network young leaders in the field of nutrition in Africa and grow organisational leadership capacity, towards the successful scaling up of nutrition interventions. Jane is well known in the media and regularly comments on nutrition matters. She has co-authored a number of peer reviewed articles, contributed to a number of books and received awards for her nutrition writing and contribution to the dietetics profession.

Ellen Baker

Dr. Ellen Baker M.D., M.P.H., grew up in New York City and attended Cornell University Medical College. Her post-graduate training was in Internal Medicine and Public Health. Following a three year residency in Internal Medicine in San Antonio, Texas, Dr. Baker joined the National Aeronautics and Space Administration (NASA) in Houston Texas as a medical officer. In 1984 she was selected into the Astronaut Corps as a mission specialist and expert in aerospace medicine. Dr. Baker flew on three Space Shuttle missions – STS 34 in 1989 to launch the Galileo spacecraft to Jupiter, STS-50 in 1992, a material processing science mission, and STS-71 in 1995, the first Space Shuttle docking with the Russian Mir Space Station and has logged over 686 hours in space. Dr. Baker retired from NASA in 2011 and is currently a consultant at University of Texas: MD Anderson Cancer Center in Houston, Texas, working in the Cancer Prevention and Population Sciences Division.

Christina Bamia

Christina Bamia has graduated from the National Metsovio Technical University of Athens. She has an MSc in “Statistics with Applications in Medicine” from the University of Southampton, a PhD in Medical Statistics from University of London (LSHTM) and a Diploma in Epidemiology & Population Health from University of London (LSHTM). Since 2011 she is Assistant Professor of Epidemiology and Medical Statistics, in the Athens Medical School. From 2000 –today she has participated as Research Associate and as co-investigator in several EC-funded programs with the EPIC study and CHANCES project. Her main working areas are cancer epidemiology, determinants of healthy aging, and methodology for epidemiological data analysis. To-date she has 93 peer-reviewed publications and 4443 citations.

Ying Bao

Dr. Bao is Associate Epidemiologist at Brigham and Women's Hospital and Instructor in Harvard Medical School. Her research has focused on diet and lifestyle determinants in cancer and other chronic diseases. In the past 10 years, she has published important findings in high-profile journals, rapidly establishing her as a leading young investigator in chronic disease prevention and control. In a landmark paper published in the New England Journal of Medicine in 2013, Dr. Bao demonstrated that regular nut consumers, compared to non-nut eaters, had a 20% reduction in total mortality over a 30-year follow-up.

Rekia Belahsen

Rekia Belahsen is PhD, Professor, Head of the Training and Research Unit on Nutrition & Food Sciences and Head of the Lab. of Biotechnology, Biochemistry and Nutrition at Chouaib Doukkali University in El Jadida (Morocco). Consultant in Nutrition. Obtained several grants, awards and numerous fellowships like the FAO Medal of Merit (Morocco) in 2007 and a grant from Islamic Development Bank in 1998. Fulbright Scholar in 2003. Author of many publications and involved in several journals’ editorial like the Mediterranean Journal of Nutrition and Metabolism. Was/is executive mem-
Elliot M. Berry

Dr Elliot Berry graduated from the University of Cambridge, UK with distinction in medicine. In 1980 he won a Fogarty Research Scholarship at the Rockefeller University to work on fat cell metabolism. His principal research interests are the bio-psycho-social problems of weight regulation from obesity to anorexia nervosa, and the benefits of the Mediterranean diet. His laboratory work focuses on the effects of nutrition on cognitive function. In the medical school he teaches medicine, nutrition and public health, and has been voted many times as an outstanding lecturer. Berry has published over 240 articles and chapters in books. He has been a visiting scientist at the dept of Brain & Cognitive sciences at MIT, a distinguished visiting scholar at Christ’s College, Cambridge and a visiting Professor at Yale University. Berry has chaired national committees for food supplementation and obesity and is an advisor to the Ministry of Health on nutrition. Dr Berry has been a consultant for the FAO, WHO, World Bank and the Serbian Government in Public Health. He was the Director of the Braun School of Public Health & Community Medicine (2003-06), and Head of the WHO Collaborating Center in Capacity Building in Public Health (2007-2013).

Miriam Bertran Vila

Profesora investigadora titular del Departamento de Atención a la Salud de la Universidad Autónoma Metropolitana Xochimilco, a cargo del Programa Alimentación y Cultura de la misma universidad. Es nutricionista con maestría y doctorado en Antropología Social y Cultural. Es autora de “Antropología y nutrición”, “Cambio alimentario e identidad de los indígenas mexicanos”, “Alimentación e incertidumbre en la vida cotidiana en la ciudad de México: narrativas sobre la alimentación saludable” entre otras publicaciones. Además de su docencia en licenciatura y posgrado en la UAM, ha dado clases en diversas universidades de México, España, Francia, Brasil y Guatemala. Ha sido asesora de aspectos socioculturales de la alimentación en proyectos de investigación y desarrollo en la industria de alimentos, así como en instancias del gobierno de México y de la Encuesta Nacional de Nutrición en Colombia.

Agata Bialecka

Agata Bialecka holds a M.Sc. in Dietetics from the Warsaw University of Life Sciences – WULS, Poland. She is currently a PhD student in the Department of Human Nutrition, Faculty of Human Nutrition and Consumer Sciences, WULS, Poland. The subject of her PhD study is “the assessment of the impact of diet, nutrition status and lifestyle on the cognitive function among the elderly”. Her dissertation research focuses on evaluating the importance of nutrition for cognitive function of the elderly. The objective of research is to investigate the association between a healthy diet indicator and the prevalence of cognitive impairment in the elderly. In her research she also wants to determine the impact of dehydration on mental performance. The research are supported by EHL Grant (European Hydration Institute). Her research interests involve nutritional behaviours of different population groups (such as children, pregnant women, the elderly) and eating disorders. Agata has been involved in the European project called NU-AGE. Agata is also an active member of the the Polish Society of Dietetics.

Hans Konrad Biesalski

Head of Department of Biological Chemistry and Nutrition, University of Hohenheim. Lecture: ‘Consequences of hidden hunger in Europe’. The Professor Doctor Hans Konrad Biesalski is one of the most important experts in world nutrition and metabolism, especially in oncology, of the world. He will offer a magistral lecture on Monday November the 10th, at the III World Congress of Public Health Nutrition, speaking about “Consequences of hidden hunger in Europe".

Martin Binks

Martin Binks Ph.D. is Associate Professor, Nutritional Sciences, at Texas Tech University and leads the Behavioral Medicine & Translational Research Lab. He is a clinical psychologist specializing in behavioral medicine and obesity research. Dr. Binks received his Ph.D. in clinical psychology from Fairleigh Dickerson University, trained at the Bronx VA Medical Center and completed pre and postdoctoral training in Behavioral Medicine at the University of South Carolina. He is formerly an Assistant Professor at Duke University Medical Center, Division of Medical Psychology. He was Director of Behavioral Health, Research, and New Business and Strategic Alliances at the Duke Diet & Fitness Center.

Martin has authored many research publications and the book The Duke Diet. He is an outspoken public advocate for obesity research funding, treatment for people with obesity, and scientific integrity. His research interests include: behavioral, pharmacologic and surgical obesity treatment; barriers to treatment adherence (nutrition & physical activity); obesity and comorbidities; smoking and fatty liver disease (NAFLD); pain and sleep in obesity; Sickle Cell Disease; mHealth and technology assisted intervention; health disparities; and neuroscience related to obesity (fMRI). He serves as a reviewer on several scientific journals and as an editorial board member for the International Journal of Obesity and Obesity Science and Practice. Dr. Binks has an ongoing multimedia presence as an internationally recognized obesity expert.

Steven N. Blair

Steven N. Blair is Professor in the Departments of Exercise Science and Epidemiology and Biostatistics at the University of South Carolina. Dr. Blair is a Fellow in the American College of Nutrition, Society for Behavioral Medicine, American College of Sports Medicine, American Heart Association, and American Kinesiology Academy; and was elected to membership in the American Epidemiological Society. Dr. Blair is a past-president of the American College of Sports Medicine (ACSM), National Coalition for Promoting Physical Activity, and the American Kinesiology Academy. Dr. Blair is the recipient of three honorary doctoral degrees—Doctor Honoris Causa degree from the Free University of Brussels, Belgium; Doctor of Health Science from the University of Bristol, U.S., and Doctor of Science Honoris Causa, University of Bristol, UK. He has received awards from many professional associations, including a MERIT Award from the National Institutes of Health, ACSM Honor Award, Population Science Award from the American Heart Association, and is one of the few individuals outside the U.S. Public Health Service to be awarded the Surgeon General’s Medalion. He has delivered lectures to medical, scientific, and lay groups in 48 states and 50 countries. His research focuses on the associations between lifestyle and health, with a
specific emphasis on exercise, physical fitness, body composition, and chronic disease. He has published over 550 papers and chapters in the scientific literature, and is one of the most highly cited exercise scientists with over 31,000 citations to his body of work. He was the Senior Scientific Editor for the U.S. Surgeon General’s Report on Physical Activity and Health.

**Martin Bobak**
Professor of Epidemiology, University College London, School of Life and Medical Sciences, UK.

Martin Bobak is professor of epidemiology at University College London. His research focuses on determinants of health in Central and Eastern Europe and the former Soviet Union, with a broad interest in the effects on health of societal, socioeconomic, psychosocial, cultural, behavioural and environmental factors. At present, Prof Bobak conducts, with colleagues in Russia, Poland, Czech Republic and Lithuania, a large multi-centre longitudinal study (the HAPIEE project) on the influences of social, economic and psychosocial factors, nutrition and hazardous alcohol consumption on cardiovascular disease, other chronic conditions and healthy ageing indicators during societal transition.

**Lorraine Brennan**

Dr Lorraine Brennan graduated from Trinity College Dublin in 1995 and received a Marie Curie Fellowship to carry out her PhD studies in the University of Southampton, UK. In 1998 she commenced a Marie Curie post-doc, in ITQB, Lisbon, Portugal. In 2000 she received a Conacyt Fellowship and returned to Ireland to initiate work in cellular metabolism in UCD. In 2005 she was appointed a lecturer in Biochemistry. In 2007 she joined the School of Agriculture and Food Science and is currently a PI in the Institute of Food and Health in UCD. She currently leads a group whose primary focus is the application of metabolomics in nutritional research.

**Benjamin Caballero**

El Dr. Caballero es Profesor de Salud Internacional y de la Maternidad-Infancia (Facultad de Salud Pública), y Profesor de Pediatría (Facultad de Medicina) en la Universidad de Johns Hopkins, en Baltimore, EEUU. Obtuvo su diploma de médico en la Universidad de Buenos Aires y su doctorado (Ph.D.) en el Massachusetts Institute of Technology (MIT) en Cambridge, EEUU. Comenzó su carrera académica como profesor asistente en la Escuela de Medicina de Harvard, y como Director de la Unidad de Nutrición del Hospital Infantil de Children’s Hospital. Se incorporó al plantel de la Universidad de Johns Hopkins como director del Centro de Nutrición Humana.

Es miembro del Consejo Directivo de la Nevin Scrimshaw International Nutrition Foundation (Boston), de la Nestle Foundation (Suiza), y del International Life Sciences Institute (Washington). Ha sido Presidente de la Society for International Nutrition Research, y de la Fundación Panamericana para la Salud y la Educación. Entre sus reconocimientos más recientes se incluyen su incorporación a la Academia Española de Ciencias en Nutrición y Alimentación, el Premio José Mata de dicha Academia, el Premio Ancel Keys de la Asociación Mundial de Salud Pública y Nutrición, el Thompson-Beaudette Lectureship de la Universidad de Rutgers, y el Medears Lectureship de la Universidad de Harvard.

El Dr Caballero ha participado activamente en comités científicos nacionales e internacionales, incluyendo el Food and Nutrition Board, el Dietary Reference Intakes (DRI) Committee, el Panel on Macronutrient Requirements and Task Force, y el Panel on the Institute of Medicine National Academy of Sciences of EEUU. Ha integrado el panel de expertos que define las recomendaciones dietéticas para la población de EEUU (Dietary Guidelines for Americans), el Consejo Científico del Food and Drug Administration (FDA) y del Departamento de Agricultura de EEUU (USDA), y diversos comités del National Academy of Sciences of EEUU.

Es autor de más de 200 publicaciones científicas. Es editor-en-jefe de la Encyclopedia of Food Sciences and Nutrition, una obra en 10 volúmenes sobre la producción, consumo y efectos biológicos de alimentos. También es editor-en-jefe de la Encyclopedia of Human Nutrition, que recibió el premio al mejor libro del año de la British Medical Association. Su Guía de Dietary Supplements resume los fundamentos científicos para el uso de suplementos vitamínicos y minerales. Su libro The Nutrition Transition: Diet and Disease in the Developing World explora el impacto del desarrollo económico en enfermedades crónicas asociadas con dieta y estilo de vida. En el libro Obesity in China el Dr. Caballero describe su extensa investigación de los factores que resultan en el aumento dramático en obesidad y enfermedades crónicas no transmisibles en áreas rurales y urbanas de China. El Dr. Caballero es asimismo co-editor del recopilatorio de texto sobre nutrición y enfermedad, Modern Nutrition in Health and Disease.

**Cristina Campoy**

Full Prof. of Paediatrics at University of Granada (UGR). Director of the EURLISKO Excellence Centre for Paediatric Research (UGR). Member of the ESPGHAN Committee on Nutrition.Coordinator of the Research Group of “Infant Nutrition and Metabolism” (PAI-CITS187). Secretary of the Early Nutrition Academy (ENA)


More than 180 papers & chapters in National-International Journals and books, more than 560 abstracts and many Conferences in National and International Meetings. Expert reviewer of European Projects at 5th, 6th, and 7th Framework Programmes. Expert reviewer of 15 international journals. Member of different International Societies and Associations and of different expert groups.

**Roberto Capone**

Roberto Capone is an agronomist, who graduated in 1986 from the University of Bologna (Italy). He has been Principal Administrator of CIHEAM Bari since 2008, where he is also the head and coordinator of the Sustainable Agriculture, Food and Rural Development division.

In the period December 2007-April 2008 he was a member of the Italian technical committee and served as a national coordinator for Italy of the Mediterranean Diet nomination for inclusion on UNESCO’s Intangible Cultural Heritage representative list.

In the period February-May 2007 he was a Minister Adviser at MIPAAF in Rome, where he served as a Minister Adviser at MI­PAAF dealing with international affairs in the Mediterranean area.

In the period May 2000-June 2007 he was a Principal Administrator of CIHEAM and acted as the Italian representative at the Secretariat General of CIHEAM in Paris.

His main fields of interest are: Mediterranean food systems sustainability, sustainable food production and consumption, the Mediterranean Diet, food safety and security, traditional and local agro-food products enhancement, and integrated development of Mediterranean rural areas.

**Mabel Alicia Brígida Carrera**


**Parul Christian**

Parul Christian, DPh, MSc, is Professor in the Department of International Health and the Program in Human Nutrition, Johns Hopkins Bloomberg School of Public Health. Dr. Christian’s research over the past 20 years has focused on examining the impact of micronutrient deficiency prevention across the life stages. She has carried out large RCTs in Nepal, and Bangladesh testing the effect of micronutrient supplements in enhancing fetal growth, pregnancy outcomes such as low birth weight, preterm birth and fetal loss, infant mortality, and maternal and reproductive health. Her research interests also expand into the area of the deve
lopmental origins of health specifically examining the effects of early life interventions and chronic conditions on long term cardio-metabo-
lic health in follow-up studies of intervention cohorts. Currently her re-
search in childhood undernutrition, specifically stunting, involves leading a food supplementation trial in rural Bangladesh which aims to test the efficacy of four different complementary food supplements, two of which are locally formulated and produced, in improving child growth and reducing stunting in the first 2 years of life. Dr. Christian is also conduc-
ting an impact evaluation study of a WFP nutrition program in Malawi for reducing childhood stunting and maternal anemia.

Saska de Pee

Saska de Pee has worked in international nutrition for nearly 20 years. Her areas of expertise are, amongst others, micronutrient deficiencies, fortification, including home-fortification, and treatment of moderate acute malnutrition, health and nutrition in the context of crises, and nutrition in relation to HIV/AIDS and Tuberculosis.

Her work at WFP focuses specifically on ensuring that programming is based on the latest scientific knowledge, and using scientific rigor to monitor and evaluate programs. She works in the Nutrition Advisory Office of the World Food Program and is adjunct professor at the Friedman School of Nutrition Science and Policy of Tufts University in Boston and at Wageningen University, the Netherlands.

Luz Maria De Regil

Dr Luz Maria de Regil has 15 plus-year work experience in the public, private, non-for-profit and intergovernmental sectors in the areas of publishing, education, public health research and policy making. With hands-on experience in managing and leading multidiscipli-
nary teams, she has been responsible for leading the Micronutrient Initiative’s strategies for innovation, nutrition surveillance, implementation research and knowledge dissemination, to improve the quality and effectiveness of programs where the Micronutrient Initiative is involved and influence policy and practice worldwide. Through her previous positions in Mexi-
co, USA and Switzerland, Luz Maria frequently combined her knowledge in laboratory techniques, nutrition, food science, epidemiology and international negotiation for different research projects, improving nutri-
tional surveillance and monitoring, and developing global guidelines, to elaborate solutions and support an equitable implementation and evalu-
ation of maternal and infant public health programs addressing malnu-
trition in any of its forms. With multiple publications in English and Spanish, Dr De-Regil is currently member of the Cochrane Collaboration, GRADE working group, American Society for Nutrition, Latin American Society for Nutrition. Formerly, she was a vice-president of the Mexican Society of Nutrition and a member of the WHO Guidelines Review Commit-
tee and the WHO Research and Ethics Committee.

María Lourdes de Torres Aubed

Diplomada Universitaria en Enfermería por la Universi-
dad de Zaragoza. Responsable de U. Dietética y Nutrín-
ción del H. U. Miguel Servet desde 1994 (creación y puesta en marcha). Representante del Consejo General de Enfermería en el Observatorio de la Nutrición de la AECOSAN del Ministerio de Sanidad. Diplomada en Puericultura y Pediatría por la Escuela Nacional de Sanid-
dad (posteriormente Instituto de Salud Carlos III). 1979. Y en Medicina del Trabajo y Salud Laboral por el Instituto Nacional de Higiene y Med-
dad en el Trabajo. 1978. 14 Expertos en temas de Nutrición, Dietética y Dietoterapia; Educación nutricional; Higiene y Seguridad Alimentaria. Posgrado en: Coaching de Salud (adaptado a nutrición). Máster en Die-
tética, Dietoterapia y Nutrición (Título propio sin homologar). Organiza-
dora de 7 Jornadas Argentinas de Nutrición (Anuales). Y presiden-
te y/o miembro de CO de cinco congresos relacionados con la nutrición y uno con la calidad. Y del I Congreso FESNAD.Ponente y participante en Con-
gresos nacionales e Internacionales y Jornadas de diversas Sociedades de Nutrición (con más de 60 ponencias/conferencias y unas 90 comunica-
ciones libres). Organizadora y profesora de cursos intensivos y talleres y/o talleres para profesionales sanitarios de Nutrición Familiar Domicilia-
ria; y Dietética y Dietoterapia, en diversos foros. Integrante del Proyecto NIPE del Consejo General de Enfermería-Ministerio de Sanidad, en cinco líneas de investigación y desarrollo. Autora de más de cuarenta artículos en revistas científicas y diversas conferencias y seminarios. Participa y/o organiza y/o participa en congresos nacionales e internacionales y cursos intensivos y/o talleres para profesionales sanitarios de Nutrición Familiar Domiciliaria; y Dietética y Dietoterapia, en diversos foros.

Cheikh M.H. Deah

Cheikh M.H. Deah, PhD, enseña la nutrición al seno de la Facultad de Ciencias y Technique de l’Université des Sciences de Technologie et de Médecine (USTM) de Nouakchott, Mauritania, donde él dirige el Master de Nutrición y Sanit. Él es de même chargé du cours de Nutrínion au sein du Département de Santé Publique de la Faculté de Médecine de la même Université. Il a ense-i-né à l’Institut Régional de Santé Publique de Ouidah, Benin dans le cadre du Master de Nutrition et Santé. Il est membre du Comité de Rédaction de la revue « Universal Journal of Public Health ». En 2009, il a été chargé par l’UNICEF (sur financement OFDA/USAID) de diriger le processus d’intégration de la Nutrition dans les curriculums des Écoles de Santé Publique et de l’Université (faculté des Sciences et Facul-
té de Médecine), Maurianne. Ce processus aboutira en 2011 par l’élabo-
ration, de modules de formation en nutrition pour le compte des Écoles de Santé Publique (parcours Infirmier d’Etat, Sage Femme et Infirmier Médico-social), de plans de modules de nutrition pour les cycles PCEM et PCES de la Faculté de Médecine et pour la filière Nutrition et Santé de la Faculté des Sciences et Techniques de l’USTM (Licence et Master) en plus de la formation des formateurs.

nutrition Aigue de la Mauritanie en 2000. Il fut le Coordinateur ou faci-
litateur de plusieurs autres initiatives ou études: particuliers : l’initiative « Repositioning children’s right to adequate nutri-

Il est actuellement membre de plusieurs comités techniques dans son pays dont principalement le Comité Techni-
fique International du Programme de Leadership Africain de Nutrition (PLAN) et du Comité Scientifique du Congrès Maghrébin de Sécurité Sa-
ntaire des Aliments (édition 2013).

Petra Dekker

Petra Dekker is one of the leading nutritionists of Fries-
lanCampina. She did a Bachelor in Nutrition & Dite-
tics at the Hague University of Applied Sciences and a Master in Human Nutrition at the Wageningen Univer-
sity in The Netherlands. After former marketing and sales functions she started working for FrieslandCam-
pina within Marketing, R&D and Public Affairs. In the function of Corporate Manager Diet & Health she is responsible for the CSR Health & Nutrition policy of FrieslandCampina.

Hélène Delisle

Hélène Delisle is professor at the Department of Nutri-
tion, Faculty of Medicine, University of Montreal, since 1985. She obtained a Master’s degree in Nutrition at McGill University and a Ph.D. in Clinical Sciences at Uni-
versity of Montréal. She also trained in Law as well as in International Management.

Her current research work is primarily focused on the nutrition transition in developing countries and the double burden of ‘undernutrition’ and ‘overnutrition’. She is head of TRANSNUT (for nutri-
tion transition), a WHO Collaborating Centre since 2003 which is compri-
sed of 10 researchers from the Department of Nutrition and other units of University of Montréal. She is currently in charge of a CIDAn-funded project in Senegal; an international project on food fortification, with the aim of strengthening training, research and advo-
cacy capacity to address the issue (2008-2014).

International Journal of Community Nutrition 2014, 0 (suppl) - 49 -

III World Congress of Public Health Nutrition
Sandro Dernini

Sandro Dernini received his Doctor’s degree in Biology from the University of Cagliari (Italy) and his Ph.D. from the School of Education of New York University. Experience: Coordinator of the Forum on Mediterranean Food Cultures, Rome (2002-present); FAO consultant on sustainable diets activities and sustainable food systems development, Rome (2010-present); International Expert for the Priority 5 “Mediterranean Food Consumption Patterns: Diet, Environment, Society, Economy and Health” of the EXPO Milan 2015 Feeding Knowledge Program, CINEAM-Bari (2013-present); Coordinator of the CIASC-Medical Interuniversity Studies Centre on Mediterranean Food Cultures, University of Sapienza of Rome, University of Granada, University of Tuscia, University of Calabria, University of Parma (2006-2011); Head of the President’s scientific office of the Italian National Research Institute on Food and Nutrition, Rome (2007-2010); FAO consultant for the development of the FAO Network of Centres of Excellence on Food Quality, Safety and Nutrition, Rome (2000-2002); Coordinator of the Consortium for the Well Being in the XXI Century, Rome (1995-2000); Coordinator of the Interdepartmental Well Being Centre of the University of Cagliari (1994-1999); Coordinator of Paxus International, network of scientists and artists (1982-present).

Patrick R. Detzel

Patrick R. Detzel is a Swiss, German and French national. At Nestlé research center, Dr. Detzel is leading the different health economic projects for the alleviation’s prevention. He is also involved in the projects on weight management to reduce obesity and micronutrient fortification in emerging markets of infant cereals and milks to reduce micronutrient deficiencies. Previously at economic affairs, Dr. Detzel was handling different issues on measuring the economic and social impacts of the Nestlé companies in different parts of the world, relations with major economic organizations in Europe and globally such as the OECD, or the ERT, as well as producing different economic analysis on household incomes and future evolutions of the global food and nutrition market. With the Buro Bass, Dr. Detzel spent a number of years in working on economic impact assessments for different public actors such as the SECO, the federal statistical office. Previously he was head of the measurement science department of AC Nielsen Switzerland, the largest data provider in the food industry. Lizzy is a Swiss, fluent in English and German.

Ana Domínguez Maeso

Ana Domínguez Maeso is a Swiss, German and French national. At Nestlé research center, Dr. Detzel is leading the different health economic projects for the alleviation’s prevention. He is also involved in the projects on weight management to reduce obesity and micronutrient fortification in emerging markets of infant cereals and milks to reduce micronutrient deficiencies. Previously at economic affairs, Dr. Detzel was handling different issues on measuring the economic and social impacts of the Nestlé companies in different parts of the world, relations with major economic organizations in Europe and globally such as the OECD, or the ERT, as well as producing different economic analysis on household incomes and future evolutions of the global food and nutrition market. With the Buro Bass, Dr. Detzel spent a number of years in working on economic impact assessments for different public actors such as the SECO, the federal statistical office. Previously he was head of the measurement science department of AC Nielsen Switzerland, the largest data provider in the food industry. Lizzy is a Swiss, fluent in English and German.

Elizabeth Dunford

Elizabeth Dunford (Lizzy) is the Global Database Manager and Research Fellow for The George Institute for Global Health. In 2013, Lizzy and her team joined the Food Monitoring Group Lizzy liaises closely with collaborators from 30 countries. She also works closely with the Pan American Health Organization undertaking work to build capacity in low and middle-income countries in Latin America to monitor the nutritional composition of food. Lizzy received her B.A. from Oberlin College with a major in chemistry and her M.D. from Case Western Reserve University. She completed her residency in psychiatry at the University of Chicago following two years of military service in the Army Medical Corp. Since joining the Minneapolis VA HCS 31 years ago, she spent a summer as a Guest Scientist at the NIH Clinical Center in Bethesda, MD, and also served on the Neurosciences of Aging Review Committee for the National Institute of Aging. In addition, she is a Past President of the Minnesota Psychiatric Society and a Distinguished Fellow of the American Psychiatric Association. Lizzy was the Chairman of a five-year, $4 million clinical trial in Alzheimer’s disease (CSP 8546) that was sponsored by the VA Cooperative Studies Program and published in JAMA 1/1/2014. She is an author on 117 publications, 153 scientific presentations, 16 book chapters, and an editor of one book.

Maurice Dysken

Maurice Dysken, MD, is the former Director of the Geriatric Research, Education, and Clinical Center at the Minneapolis VA Health Care System and is a Professor in the Department of Psychiatry at the University of Minnesota Medical School. Dr. Dysken received his A.B. from Oberlin College with a major in chemistry and his M.D. from Case Western Reserve University. He completed his residency in psychiatry at the University of Chicago following two years of military service in the Army Medical Corp. Since joining the Minneapolis VA HCS 31 years ago, he spent one summer as a Guest Scientist at the NIH Clinical Center in Bethesda, MD, and also served on the Neurosciences of Aging Review Committee for the National Institute of Aging. In addition, he is a Past President of the Minnesota Psychiatric Society and a Distinguished Fellow of the American Psychiatric Association. Lizzy was the Chairman of a five-year, $4 million clinical trial in Alzheimer’s disease (CSP 8546) that was sponsored by the VA Cooperative Studies Program and published in JAMA 1/1/2014. He is an author on 117 publications, 153 scientific presentations, 16 book chapters, and an editor of one book.

Manfred Eggersdorfer

Manfred Eggersdorfer is Senior Vice President at DSM Nutritional Products and Head for Nutrition & Science Advocacy. Professor for Healthy Ageing at the Groningen University, Dr. Manfred Eggersdorfer is Senior Vice President for Nutrition Science & Advocacy at DSM. DSM Nutritional Products is the world leader in vitamins, carotenoids and nutritional ingredients for Human Nutrition, Animal Nutrition and Personal Care.
Prior to DSM, Manfred Eggersdorfer was working for BASF, Ludwigshafen in different positions including Head of Research and Development Fine Chemicals.

Manfred Eggersdorfer studied chemistry at the Technical University Munich and did his PhD in organic chemistry in the field of synthesis and characterization of unusual amino acid. He was post-doc at the Stanford University, California and Dresdner Krebsforschung, Institute for Nutritional and Food Chemistry. He is member of the Advisory Board of the Johns Hopkins Bloomberg School of Public Health, of the Rauscher-Gesellschaft for Curatorial Invention and an affiliate of various other organizations. He is author of numerous publications in the fields of vitamins, innovation in nutritional ingredients, and renewable resources, reviewer for a variety of journals and associate editor of the "International Journal of Vitamin and Nutrition Research".

Ibrahim Elmadfa
Prof. Elmadfa was the director of the Department of Nutrition Science and Dietetics at the University of Vienna from 1990 to 2011. He is the President of the Austrian Nutrition Society and the Past-President of the International Union of Nutritional Sciences (IUNS). He has authored/co-authored several books in human nutrition, food chemistry and health monitoring (Austrian Nutrition Report 1998, 2003, 2008 and 2012; European Nutrition and Health Report 2004 and 2009); and more than 400 original publications in international scientific journals and numerous invited presentations at national / international scientific conferences. He was the Editor of Annals of Nutrition and Metabolism and "Forum of Nutrition" (1999 - 2011). Trained in Human Nutrition and Food sciences, his research interests are focused on nutrient requirements in health and disease (member of the working group Dietary Reference Intake Values for Central European Countries), Monitoring of nutrition and health status, Bioavailability of nutrients, Nutrition and immune function, Food safety and quality. He served as coordinator, partner and work package leader of ten EU-funded projects as well as scientific advisor (1995-2001) to the European Commission as member of the Scientific Committee on Food (vice president) and as member of working groups Nutrition and dietary foods, Novel food, Upper safe limits, Flavourings. Member of Codex Alimentarius Austria (Chair of sub-committee on Novel food / technologies) and member of the National nutrition commission. Member of scientific consulting-groups of the WHO/FAO (Fat & Fatlike materials); NIGAC (Diet & health, Global Non-Communicable Disease Network (NCD-net) and member of the WHO- International Advisory Council (IAC), Scientific leader and UNICEF- Consultant for the Palestinian Micronutrient Survey.

Ahmed El-Sharkawy
Mr El-Sharkawy is now a Clinical Research Fellow at the Department of Gastrointestinal Surgery, part of the Nottingham Digestive Disease Centre, NIHR Biomedical Research Unit. He has a keen interest in human physiology, particularly fluid and electrolyte balance in hospitalised patients. He is currently completing his PhD investigating fluids, hydration and clinical urine output in intensive care, under the supervision of Dileep Lobo's group who have recently been awarded the University of Nottingham's prestigious Knowledge and Innovation award in recognition of their work in this area.

Ronit Endevelt

Ramón Estruch
Professor Ramón Estruch is Senior Consultant at the Internal Medicine Department of the Hospital Clinic (Barcelona) since 2002. He is also Assistant Professor in the School of Medicine at the University of Barcelona since 1996, Member of the Board of Directors of the CIBER Obesity and Nutrition, Institute of Health “Carlos III”, Government of Spain, since 2006 and Member of the Advisory Board of the ERAB (European Foundation for Alcohol Research) from European Union since 2010. The main research lines developed are the following: 1) Cardiovascular effects of Mediterranean diet 2) Mechanisms of the effects of moderate wine and beer consumption on the expression and function of cellular and endothelial adhesion molecules related to development of atherosclerosis; 3) Effects of chronic alcohol consumption on heart, liver and brain; 4) Effects of different alcoholic beverages on immune system; 5) Effects of olive oil, nuts and cocoa in lipid profile and inflammatory biomarkers related to atherosclerosis. In the last years, his group has received grants from the European Commission, National Institute of Health (NIH) from USA, CICYT, Instituto Nacional de Investigacion Agroalimentaria (INIA) of the Spanish Ministry of Education and Science, Fondo de Investigacion Sanitaria, FIS (Spain) and Instituto de Salud Carlos III del Ministerio de Sanidad y Consumo (Spain). In addition, Prof. Estruch is the leader of the Thematic Network “Mediterranean Diet and Cardiovascular Disease” from the ISCIII (Spain). Twenty years ago we started a research program on the toxic effect of alcohol on cardiovascular (N Engl J Med 1989, Ann Intern Med 1994, JAMA 1995, Arch Inter Med 1995 and central nervous systems (Arch Neurol 1995; Arch Neurol 1997). At 1994, a new research program on effects of key foods (alcoholic beverages) on atherosclerosis started. First, we analyzed the effects of alcoholic beverages on adhesion molecules related with the development of atherosclerosis (Alcohol Clin Exp Res 1998 and 1999; Thromb Haemostas 2002). Moderate consumption of red wine reduces serum inflammatory markers related to atherosclerosis (Atherosclerosis 2004), ex vivo adhesion of human monocyties on an endothelial line (Am J Clin Nutr 2004) and oxidative stress parameters (Nutr Metab Cardiovasc Dis. 2010). Finally, in 2003, we have started an ambitious study (PREDIMED) to evaluate the effects of a Mediterranean Diet and its main components on the primary prevention of cardiovascular disease in high-risk patients, which have enrolled near 7,500 patients. The study finished at the end of 2011 and their main results have been published in top journals (NEJM, Lancet 2013, JAMA 2014, Ann Intern Med 2006 and 2014, Arch Intern Med (2007 and 2008), Am J Clin Nutr (2009), J Nutr (2010), Diabetes Care (2011) and PloS One (2012 and 2014). He has published more than 250 manuscripts in peer-review journals.

Umi Fahmida
Umi Fahmida, Ph.D is academic staff at Southeast Asian Ministers of Education Organization Regional Center for Food and Nutrition (SEAMEO RECFON) at the Universitas Indonesia since 1997 and is currently Deputy Director of Program Division at SEAMEO RECFON under which the South East Asian Nutrition Leadership Program (SEA-NL) is coordinated. She earned her Doctorate degree in Nutrition (2003) and MSc in Community Nutrition (1995) from SEAMEO-TROPMED RCCN Faculty of Medicine, Universitas Indonesia and her bachelor's degree from Faculty of Agriculture Technology, Bogor Agriculture University (1995). She was awarded with GTZ Fellowship Awards for both her Master's and Doctorate studies. Her research interests are on the use of Linear Goal Programming (LGP) to develop/evaluate food-based recommendations. She received Post-doctorate Research Award from SPIN-KNAW Netherlands for nutrigenomics/nutritogenetics study on the role of LC-PUFA and iron on young child cognition. She has been working with studies and community-based trial on complementary feeding recommendations developed using LP and is currently expanding its implementation into...
national/regional activity to empower local academe and program implementers to promote local specific food based dietary guideline.

Laura Fernández Celemín
Director Nutrition and Food Safety, Deputy Director General – European Food Information Council (EUFIC). Dr Laura Fernández Celemín holds a degree in Dietetics & Human Nutrition and a PhD in Nutrition & Endocrinology from the Catholic University of Louvain, in Belgium. After joining EUFIC in 2002 she worked in several roles and is currently Deputy Director General and Director of Nutrition & Food Safety. Throughout her career, she has published a number of peer-reviewed papers in scientific journals and magazines. She is also sitting in the Board of Directors of the European Nutrition Leadership Platform, aiming to enhance the impact of nutrition in Europe. EUFIC communicates science-based information on nutrition and health, food safety, and quality, to help consumers to be better informed when choosing a well-balanced, safe and healthy diet. More information on EUFIC’s communication materials can be found at www.eufic.org.

Marina Francés Pinilla

Mariana Frangeskou
I hold a Masters Degree in Health Economics and Policy from Barcelona Graduate School of Economics and a Bachelor in Science in Economics from the University of Cyprus. Before joining Bath Centre for Healthcare Innovation and Improvement, where I am currently doing my PhD in Healthcare Management and Improvement Science I was a trainee at the European Commission in the Cabinet of Education, Culture, Multilingualism and Youth and in the Press Department, DG Communication.

The aim of my PhD research is to investigate the role of modelling and simulation in quality improvement studies in healthcare. My research will be conducted using a number of case studies in the collaborating hospital that will explore the causes of the apparently significant additional risks associated with admission to hospital on certain days of the week, known as the ‘weekend effect’.

Simone K. Frey
Dr. Simone K. Frey is Coordinator of the European Nutrition Leadership Platform (ENLP). ENLP provides three unique tools to nutrition professionals to impact their careers in science, nutrition and health: the ENLP website, Supervised leadership training (ENLP seminar) for young professionals in nutrition and health; 2. A powerful network to connect globally with peers; 3. Advanced leadership training (ENLP Advanced seminar) for mid-career professionals with 6-10 years of experience.
More info: http://enlp.eu.com. Simone has a background in nutritional science and economics and is currently managing director of Bioanalyt, a company developing test kits to measure vitamins on the spot.

Rasmus Friis
Rasmus Friis is a M.Sc. student in human nutrition from the University of Copenhagen. Rasmus has been working on the OPUS project within two workpackages: the SHPUS project which was conducted on adults and on children where they validated a web-based dietary assessment software. Later he had been working with FoodScape Lab in Aalborg University where he conducted data for his master thesis and looking at the food waste of the EAT project for the municipality of Copenhagen in a collaboration with the Danish National Food Institute. Rasmus is also an active board member of the Danish Society of Nutrition.

María Nieves García Casal
Dr. María Nieves García Casal, actual president of the Latin-American Nutrition Society (SLAN), is chief of the research team of the Nutrition Section of the Experimental Medicine Centre at the Venezuelan Institute for Scientific Research (IVIC). For more than 20 years when she initiated her biochemical training in human nutrition and later as a consolidated research, she has developed important research lines related to iron, vitamin A and folates metabolism and wheat fortification. During her productive trajectory, evidenced by her publications in specialized peer reviewed, high impact journals, she has made important contributions of immediate applicability to nutrition-related public health problems. Recently, with her working group that include Master and PhD students, as well as scientific personal from IVIC and other collaborating institutions, they perform research on iron absorption from diets consumed by the Venezuelan population and on food fortification programs, especially those consumed by populations vulnerable to anemia and iron deficiency worldwide. The Nutrition Section under her supervision develops projects related to the consumption of marine algae as iron sources, as well as the use of carotenoids and antioxidants in the prevention and treatment of non-communicable chronic diseases, with special emphasis in type 2 diabetes. During 2013 Dr. García-Casal was on sabbatical license at the Evidence and Program Guidance Unit, Department of Nutrition for Health and Development of the World Health Organization in Geneva, Switzerland.

Alfredo Gea
Alfredo Gea PhD, is a young epidemiologist that work in the field of nutritional epidemiology. He works at the department of Preventive Medicine & Public Health (University of Navarra, Spain). He is involved in the PRE-DIMED trial and the SUN cohort studies. Since 2002, he has been the Deputy Director of the Foundation of University of Granada-Enterprise from 2001 to 2004, President and Chairman of the International Congress of Nutrition 2013. Member of the Spanish Academy of Nutrition and President of the Spanish Scientific Committee of Bread. Associate-Editor of Annals of Nutrition and Metabolism and member of the Advisory Board of a number of selected nutrition journals. More than 350 articles published in peer-review journals and more than 130 book chapters. Editor-in Chief of the “Tratado de Nutrición”, a textbook written in Spanish with 4 volumes and his PhD Thesis by the University of Iceland, a PhD and 16 Master Degree Thesis. Field of research: Infant nutrition, childhood obesity, nutrigenomics, probiotics and its association with prepubertal hormonal and metabolic changes related to early onset of metabolic syndrome.

Angel Gil
Full Professor of Biochemistry and Molecular Biology at the University of Granada, Spain and Head of the Research excellence group CT5-461 on Nutritional Biochemistry. President of the Spanish Society of Nutrition (SEN). President of the Iberomerican Nutrition Foundation (FITENUT). Manager Director R&D Puleva SA and Abbott Lab from 1983 to 1994 and 1995 to 1996, respectively. Former Director of the Foundation University of Granada-Enterprise from 2001 to 2004. President and Chairman of the International Congress of Nutrition 2013. Member of the Spanish Academy of Nutrition and President of the Spanish Scientific Committee of Bread. Associate-Editor of Annals of Nutrition and Metabolism and member of the Advisory Board of a number of selected nutrition journals. More than 350 articles published in peer-review journals and more than 130 book chapters. Editor-in Chief of the “Tratado de Nutrición”, a textbook written in Spanish with 4 volumes and his PhD Thesis by the University of Iceland, a PhD and 16 Master Degree Thesis. Field of research: Infant nutrition, childhood obesity, nutrigenomics, probiotics and its association with prepubertal hormonal and metabolic changes related to early onset of metabolic syndrome.

Elva Gisladottir
Elva Gisladottir, Nutritionist, works at the Directorate of Health in Iceland (former The Public Health Institute of Iceland) in the division of Determinants of Health. Educational background: MSC in Nutrition and BBC in Biology and shorter courses in Public Health, e.g. Problem Solving in Public Health at the Johns Hopkins School of Public Health in Barcelona. Current work: Health promotion and primary prevention in various settings with the aim to promote healthy habits among Icelanders through various channels. Takes part in projects coordinated by The Directorate of Health; Health Promoting pre-, primary and secondary schools, Health Promoting Workplaces and Health Promoting Communities. Took part in-

Carmen Gómez Candela

Degrees
- 1981, Degree in Medicine and Surgery at the Autonoma University of Madrid.
- 1985, Specialization MIR in Endocrinology and Nutrition.
- 1991, Doctor in Medicine (cum Laude) at the Complutense University in Madrid.

2013, Master in Hospital Direction and Clinical Management.

Work experience: From 1988 Head of the Clinical Nutrition and Dietetics Department at the University Hospital La Paz of Madrid.

Dr Carmen Gómez Candela is associated professor at the Autonoma University of Madrid (UAM), and professor at the National University of Education by Correspondence (UNED).

She was the president of Spanish Society of Basic and Applied Nutrition (SEBAN) from 2001 till 2007 and coordinator fundator of the Spanish Federation of Societies of Nutrition, Food and Dietetics (FESNAD) created in July 2002.

Investigation: Head of Nutrition and Functional Foods Research Group at La Paz Health Research Institute (IdiPAZ).

Marcela González Gross

Full Professor for Sports Nutrition and Exercise Physiology at the Department of Health and Human Performance of the Technical University of Madrid, Spain.

She is the Head of the Nutrition, exercise and healthy lifestyle research group (ImFINE). For more than 20 years she has been analyzing the nutritional and physical condition of healthy subjects with different levels of physical activity, especially adolescents and the elderly. Main research aspects include early diagnosis of subclinical vitamin deficiency, optimal hydration, improvement of life quality and health education. She has received several research awards and published over 170 articles in JCR journals.

Beatriz González López-Valcárcel


Gregory A. Hand

Gregory A. Hand, PhD, MPH is Professor of Epidemiology and Founding Dean of the Robert C. Byrd Health Sciences Center School of Public Health at West Virginia University, USA. He previously served as Professor of Exercise and Associate Dean for Research and Practice of the Arnold School of Public Health at the University of South Carolina, USA. He received his PhD degree from the University of Texas, Southwestern Medical Center at Dallas, his MPH degree from the University of South Carolina and a MS degree from the University of Arizona. He received postdoctoral training at the Moss Heart Center, UT Southwestern Medical Center at Dallas. Dr. Hand began his research career examining the neurobiological basis for cardiovascular adjustments to muscular activity. His interest in physical activity and the physiological stress associated with movement led him to begin research on the effects of physical activity on psychological, metabolic and anthropomorphic issues related to infection and antiretroviral therapy in people living with HIV/AIDS. Currently, Dr. Hand’s research is focused on energy balance, weight management and the health outcomes associated with the amount of energy that an individual expends and consumes. He has published over 100 journal articles and book chapters on the role of physical activity and exercise on determinants of health and health outcomes.

Anthony Hehir

Director - Nutrition Improvement Program. DSM Nutritional Products. Anthony Hehir is a South African and Irish national and was born and raised in Zimbabwe and Botswana in Southern Africa. He holds higher degrees in Human Physiology, Nutrition and Dietetics and Business Administration as well as a masters degree in Acting and Musical Theatre. Having first trained in nutrition, Anthony worked as a clinical and public health Dietitian in rural South Africa, rolling out an integrated nutrition programme for at-risk groups as well as overseeing the nutritional support of patients on the national HIV care programme.

Anthony has been with DSM Nutritional Products since 2005, first based in South Africa where he was responsible for the countries in Sub-Saharan Africa, driving co-development of staple food fortification programs. Since then Anthony has held several global and regional marketing, communications and business development roles within DSM, having the opportunity to work globally and across cultures.

Anthony is currently the director of DSM’s Nutrition Improvement Program, a specialist team in DSM whose mission is to positively impact public health by developing and implementing effective nutrition solutions and leveraging their expertise and partnerships to reach and serve the 4 billion people at the base of the pyramid.

Louise Houlby

Louise Houlby has obtained a M.Sc. in Integrated Food Studies from Aalborg University in Copenhagen, Denmark, where her studies primarily has been focused on choice and culture and judging used in health promotion as well as the effectiveness of National health recommendations. Her research interests lies within behavioural nutrition and consumer sciences.

Richard Hurrell

Richard Hurrell graduated in Food Technology from the University of Reading (UK) in 1969 and made his Masters and PhD at the University of Cambridge UK specializing in the effect of food processing on nutritional quality of food proteins. He joined Nestlé Research Centre in Switzerland in 1978 and became head of the micronutrient group focusing on iron bioavailability and fortification in relation to infant foods. He has been involved in absorption studies with stable isotopes as a way to optimize iron and zinc absorption from infant foods. He joined the Institute of Food Science, ETH Zurich in 1994 as full Professor of Human Nutrition, introducing nutrition into the food science curriculum and setting up a research program based on micronutrient malnutrition in the developing world. This focused on iron and zinc absorption in women and children from fortified and biofortified foods, and long term feeding studies in women and children monitoring iron and zinc status so to demonstrate efficacy of fortified foods. He has some 200 peer reviewed publications with recent interest in the influence of infections on iron bioavailability and the influence of added phytases on iron and zinc absorption in infants. He retired as Head of Human Nutrition at ETH in 2012.

Isatou Jallow

Isatou Jallow is from the Gambia and trained as a nutritionist at the University of Oslo, Norway. She has 24 years of field and policy experience in nutrition, gender, women’s issues and advocacy. She now serves as the Chief of Women, Children and Gender Policy for the UN World Food Programme (WFP) based in Rome. In her current position, she is responsible for the development and coordination of WFP’s policy on Gender Equality and the Empowerment of Women. Prior to this, she served as the Executive Director of the National Nutrition Agency in the Gambia where she was responsible for placing nutrition on the development agenda and advocating the same at the global level. Her achievements include the adaptation of the global UNICEF/WHO Baby Friendly Hospital Initiative (BFHI)
into a community initiative – Baby Friendly Community Initiative (BFCI), and engaging men to support and share the responsibility for improved maternal and infant young child nutrition.

**Eugène Jansen**

Eugène Jansen has studied organic chemistry at the Technical University in Eindhoven. He did his thesis in biochemistry at the University of Utrecht. After a 2-yr postdoc period in endocrinology at the Erasmus University in Rotterdam, he entered the National Institute for Public Health in Bilthoven. In this institute he was employed in several disciplines, such as endocrinology, clinical chemistry, analytical biochemistry, toxicology, and aging research. He is currently working in the Centre for Health Protection on several projects on the nutritional status of vitamins and minerals in the Dutch population and in the Dutch Ministry of Public Health. He is also involved in two projects on biomarkers of aging (MARK-AGE and CHANCES), funded by the EC (7th framework). In addition, he is project leader of a strat­egic project on the effects of vitamins and minerals on aging. He runs a bio-analytical laboratory with a specialization on measurements of a broad spectrum of physiological and nutritional biomarkers in epidemiological samples, such as biomarkers of oxidative stress and redox status, lipid and fatty acid metabolism, vitamins, minerals, carote­noids, iron metabolism, inflammation, etc. He is (co)author of more than 180 scientific publications which have appeared in the international press.

**Shubha Jayaram**

Shubha Jayaram is a Senior Program Officer at the Results for Development Institute (R4D). Shubha works on a mix of portfolios, and her work centers around multi-stakeholder partnerships and workforce development. She leads the Partnership to Strengthen Innovation and Practice in Secondary Education (PSIPSE) project and R4D’s skills development initiative (including the Innovative Secondary Education for Skills Enhancement (ISESE) project). Her recent work also includes a review of public-private partnerships in nutrition, and the Think Tank Initiative’s Policy Engagement and Communication project, which supports the capacity of think tanks in Anglophone Africa. Prior to R4D, Shubha worked in both the private and non-profit sectors. She worked as an analyst at IDEAglobal, a macroeconomic research firm, where she supported the fixed income and commodity teams and developed short and medium term outlooks for clients. Shubha has also worked with TechnoServe in sub-Saharan Africa, where she provided business advice and mentorship to entrepreneurs and SMEs in South Africa, Swaziland and Uganda. Shubha holds a Master in Public Policy degree from the Harvard Kennedy School and a Bachelor of Arts degree in Economics and International Relations from Tufts University.

**Jo Jewell**

Jo Jewell is currently working as a Nutrition Policy Officer within the Division of Noncommunicable Diseases and the Lifecourse at the WHO Regional Office for Europe. His previous experience includes roles as Policy and Public Affairs Manager at World Cancer Research Fund International, based in London, and as Policy Coordinator at the European Public Health Alliance in Brussels. He has a background in European politics and has a Masters in Health Policy, Planning, and Financing. His experience and publications mainly relate to food and nutrition policy, including a focus on effective policy design and the role of European and global recommendations.

**Arturo Jiménez Cruz**

Es profesor de la Facultad de Medicina y Psicología de la Universidad Autónoma de Baja California en Tijuana desde 1988 hasta la actualidad, fue profesor adjunto del Departamento de Salud Pública y de la División de Ciencias del Ejercicio y Nutrición en la Universidad Estatal de San Diego. Es miembro de la Academia Mexicana de Ciencias, es investigador nacional nivel 2, fue presidente de la Sección Latinoamericana de la Sociedad Americana de obesidad y miembro del comité científico del Congreso Mundial de Nutrición y Salud Pública (2014). Fue coordinador de la primera encuesta nacional de consumo de alimentos en Cataluña (1985-1988) y en el Departamento de Salud de la Generalitat y fue director de las tablas de composición de alimentos Warner-Sandoz. Ha publicado más de 200 trabajos, ha co-editado siete libros, es coautor de 26 capítulos de libro, ha dirigido más de 30 tesis de maestría y doctorado y cuenta con más de 1000 citas.

**Gaelle Julien**

Gaelle Julien works for the Institut Bioforce, an NGO based in Lyon, France, where she is the coordinator of an integrated vocational training program in Bamako, Mali. “Nutrition Project Manager (Nutrition PM)” and “Water, Sanitation and Hygiene Promotion Project Manager (WASH PM).” This program implemented in partnership with UNICEF, Fondation Mérieux, Action Against Hunger, and designed in consultation with the West African Health Organization, aims at enhancing capacity and capability among local, national and international nutrition and WASH professionals in French-speaking Africa. Gaëlle also has further experiences in humanitarian/development field with the NGO Sidaction, as International Training Programs Manager from 2011 to 2014, and with Fondation Mérieux as Coordinator of a public health project in Mali from 2005 to 2010 (public-private partnership between Fondation Mérieux, the Mali Ministry Of Health, and the European Commission).

**Jordi Julvez**

Jordi Julvez is a research fellow that Works in CREAL since September 2011. His background is neuropsychology and epidemiology. He spent three years as a postdoc fellow at Harvard School of Public Health and learned about developmental neurotoxicity in population studies. He is now in charge of neurodevelopment assessment in CREAL.

**Rebecca Kanter**

Rebecca Kanter, PhD, is a visiting research fellow in the Leverhulme Centre for Integrative Research on Agriculture and Health (CIRAH) and with the Nutrition Group in the Department of Population Health at the London School of Hygiene & Tropical Medicine. Dr. Kanter’s current research focuses on the linkages between public health nutrition and agriculture. She also conducts studies regarding nutrition-related non-communicable diseases and obesity with a great interest on related risk factors such as (obesogenic) food environments and gender disparities, particularly in Latin America. She has previously worked in Brazil, Mexico, and Guatemala and on many multi-Latin American country research studies. In 2012, she participated in the 6th Latin American Workshop in Leadership in Nutrition held by the Latin American Nutrition Society (SLAN). Dr. Kanter is also an International Atomic Energy Agency (IAEA) expert on data management for developing countries.

**Maria Kapsokefalou**

Maria Kapsokefalou is an Associate Professor in Human Nutrition at the Agricultural University of Athens, Greece. Following a BSc in Chemistry at the University of Athens, Maria Kapsokefalou pursued her graduate studies in Food Science and in Nutrition at Cornell University as a Fulbright Scholar. She received her PhD in 1992 and continued her scientific development in Nutrition at Cornell University, as a recipient of the Nutricia Research Foundation International Training Fellowship, at ETH Zurich, and at the University of Crete, where she was a Researcher and Lecturer in Food Science and Nutrition until 2000. In 2001 she joined the Department of Food Science and Human Nutrition at the Agricultural University of Athens. Her scientific work is focusing on hydration and on micronutrient nutrition (bioavailability and bioactivity of iron and phytochemicals). Current interests and activities also include nutrition communication, consumer perception on nutritional issues and evaluation of nutrient intake in the population. Her research is supported by national, private and EU funding. She is the author of 49 research articles, of 70 conference abstracts, monographs and of various professional articles. She is involved in community based projects on elementary and high school student education. Dr Kapsokefalou is a member of several national, EU and international consortia, organizations and committees.

**Sarah Kehoe**

I became interested in global health and nutrition issues while spending time in South America and Asia. I then completed my MSc in Public Health Nutrition in 2006 and was subsequently employed by the University of Southampton at the Medical Research Council Lifecourse Epidemiology Unit where I am currently a Research Nutritionist. My role there involves working on all nutritional aspects of studies investigating the developmental ori-
gins of chronic disease in India. I completed a PhD part time whilst working on these studies and graduated in April 2013. The title of my thesis was ‘The effect of a micronutrient-rich food supplement on women’s health and nutrient status’. Since then I have become interested in the development of interventions to increase consumption of healthy foods among low-income populations.

Cyril Kendall

Dr. Kendall is a Research Associate in the Department of Nutritional Sciences, Faculty of Medicine, University of Toronto, and the Clinical Nutrition and Risk Factor Modification Center, St. Michael’s Hospital. He was educated at the University of Toronto, has over 140 publications in medical journals and has been invited to present at numerous international conferences. His primary research interest is the role of diet in the prevention and treatment of chronic disease (cardiovascular disease, diabetes and obesity). His studies on combining cholesterol-lowering food components (dietary portfolio) have been recognized as creating an effective dietary alternative to drug therapy (statins).

Damiet Koenders

My background is Food Science at Wageningen University with the specialization in Food Physics. I started working for DSM in 2005 at the Biotechnology Center in Delft, the Netherlands. In the past few years, I’ve been working on the applications of functional ingredients and enzymes in a variety of foods. And since 2012, I’m involved in the application of phytase in cereal based foods to improve the nutritional quality of the young child’s diet.

Frans Kok

Frans Kok (1950) is professor in Nutrition & Health and director of the Division of Human Nutrition at Wageningen University, The Netherlands. Kok was trained in human nutrition (MSc, PhD) in Wageningen and epidemiology (MSc) at Harvard University, Boston USA. Kok's scientific research covers topics such as diet in disease prevention, dietary behaviour, and overweight. In emerging economies in Asia and Africa attention is on diet and deficiency disorders. He is author of some 300 international peer-reviewed scientific publications and editor of three nutrition textbooks. From 2006-2010 he acted as Dean Research of Wageningen University being responsible for the quality of academic research and postdoctoral training. He has been member of the Academic Board of Wageningen University for more than 10 years. Kok is member of several (international) scientific committees. He chaired the Dutch National Health Council committee responsible for the 2006 Dietary Guidelines for the Netherlands. Kok presents and lectures on nutrition and health topics at many (popular) scientific international symposia, master classes, and the media.

Patrick Kolsteren

Patrick Kolsteren is a Medical Doctor with a specialisation in Tropical Paediatrics and a PhD in Nutrition. He is currently working as professor at the Institute of Tropical Medicine of Antwerp, Belgium where he is head of the child health and nutrition unit. Dr Kolsteren has worked in Asia as a clinician and paediatrician for nine years before joining the institute. His work focusses on maternal and child nutrition with a particular emphasis on epidemiological aspects and the development of the evidence base. Dr Kolsteren has also an assignment at the Ghest University in international nutrition.

Parviz Kooohafkan

Dr. Parviz Kooohafkan, is the founder of the World Agricultural Heritage Foundation and the UN Partnership Initiative on “Conservation and Adaptive Management of Globally Important Agricultural Heritage Systems (GIAHS)”. He is presently Professor and Senior Research Fellow at Research Institute for Humanity and Nature, Kyoto, Japan. He was born in 11 March 1951 in Iran, obtained an engineering degree in Natural Resources Management from University of Teheran, Iran, he has a Ph.D. in Ecology and Master in General and Applied Ecology from the University of Sciences and Techniques of Montpellier, France. His fields of specializations are: Integrated Natural Resources Management; Biodiversity and Genetic Resources Conservation; Sustainable Livelihood and Climate Change Management; Land Use Planning, Sustainable Agriculture and Rural Development; Environmental Impact Assessment; Dr. Kooohafkan, started his career in Iran as assistant profes- sor in ecology and then as a professor of Forest Ecology in Ecole National du Génie Rural des Eaux et Forêts in Montpellier, France. From 1985 until 2012, he worked in Food and Agricultural Organization of the United Nations, FAO in several countries and held several Senior positions in FAO headquarters in Rome including the role of Land and Water Division, Director of the Climate Change and Bio-energy Division, and the Director of Rural Development Division in Sustainable Development Department of FAO. Fluent in English, Spanish, French and Italian, he is the author of several books and publications on sustainable agriculture and rural development, biodiversity, agro-ecology, natural resources management and climate change.

Klaus Kraemer

Dr Kraemer is the Director of Sight and Life (www.sight­andlife.org), the humanitarian nutrition think-tank of DSM, and Adjunct Associate Professor in the Depart­ment of International Health of Johns Hopkins Bloomberg School of Public Health. Inspired by a vision of a world that is free from malnutrition, Sight and Life helps to improve the lives of some of the world’s most vulnerable populations. It does this by supporting innovations that aim to eradicate malnutrition through education, awareness raising, industry research, share best practices, and mobilize support for the world’s undernourished. As a nutrition scientist with over 25 years of experience in research, advocacy, communication, and strategic and organizational leadership in the fields of nutrition and public health, Dr Kraemer has experience in research and product development, the scaling-up of imple­mentation and evaluation. His interests range from capacity and lea­dership development to enable the scaling-up of nutrition interventions, to food and nutrition security, nutrition communication, and advocacy, among others. As Director, Dr Kraemer provides the leadership, vision, and direction (at all levels), guides a small but efficient global team, inte­acts with funders and partners, and serves as its key spokesperson inter­nally and externally.

Dr Kraemer is editor of Sight and Life magazine, one of the most widely read scientific magazines on micronutrients and health in the developing world. He serves on several editorial boards and has written numerous books and reports (in English and other languages), review for a number of scientific journals, has published many scientific articles, and co-edited 10 books.

Samuel Kwame Ntim Adu

Samuel Kwame Ntim Adu is the Chief Executive Officer of Yedent Agro Group of Companies Limited. He holds a degree in Economics and Geography from the Kwa­me Nkrumah University of Science and Technology (Ghana). In 2002 he started Yedent Agro, a company whose mission is to bring good nutrition, affordability and convenience in consumer products such as cereal and tuber staples through vitamin and mineral fortifi­cation and more efficient production and distribution systems. The products are targeted at the most nutritionally vulnerable populations in Ghana and sub Sahara Africa.

Today from the town of Sunyani, in the heart of the maize producing region of Ghana, Samuel has established the first indigenous micronutrient food fortification packaging company. The established company, Yedent, has attracted the attention and collaboration of some of the world’s lead­ing nutrition organizations. Among them are Global Action on Improved Nutrition (GAIN) and Ajinomoto Company Limited of Japan.

Samuel’s enduring passion is to champion the cause of delivering afford­able nutrition to the most vulnerable. Kwame has championed this pas­sion on many nutrition and health platforms across the globe, from Afri­ca to Europe, to America and to Asia.

Carlo La Vecchia

Dr. La Vecchia received his medical degree from the University of Milan and a master of science degree in clinical epidemiology from Oxford University. He is re­cognized worldwide as a leading authority in cancer aetiology and epidemiology. Presently, he is Professor of Epidemiology at the School of Medicine at the Uni­versity of Milan. Dr. Vecchia serves as an editor for numerous clinical and epidemiologic journals. He is among the most re­nowned and productive epidemiologists in the field with over 1,790 peer-reviewed papers in the literature and is among the most highly cited
medical researchers in the world, according to ISI highly cited.com, the developer and publisher of the Science Citation Index (h index, 119). Dr. La Vecchia is an Adjunct Professor of Medicine at Vanderbilt Medical Center and the Vanderbilt-Ingram Cancer Center and of Epidemiology at the University of Lausanne, CH.

Dr. La Vecchia is a temporary advisor at the World Health Organization in Geneva, and a regular consultant in Milan. He was Adjunct Associate Professor of Epidemiology at Harvard School of Public Health between 1996 and 2001, and was Senior Research Fellow at the International Agency for Research on Cancer (IARC/WHO) between 2006 and 2008. Dr. La Vecchia’s main fields of interest include cancer epidemiology and the risk related to diet, tobacco, oral contraceptives use and occupational or environmental exposure to toxic substances; and analysis of temporal trends and geographical distribution of mortality from cancer, cardiovascular diseases, perinatal and other selected conditions.

Guillem López Casasnovas

Born in Ciutadella, Menorca, married and with three children. Bachelor of Economics (with Honours, 1978) and Law degree (1979) from the University of Barcelona, he earned his Ph.D. in Public Economics from the University of York (United Kingdom, Ph.D. 1984). He has taught at the University of Barcelona, and has been visiting scholar at the Institute of Social and Economic Research (UK), University of Sussex and the Graduate School of Business at Stanford University (USA).

Since June 1992 he is Professor of Economics at the Pompeu Fabra University of Barcelona. He has been deputy rector of Economics and International Relations and Dean of the Faculty of Economics and Business Administration of the same university between 2000 and 2004. In 1999 he co-founded, along with Vicente Ortín, the Centre for Research in Health and Economics (CRES-UPF), an institution that he run until 2006. He is currently Senior Research Fellow and member of the Governing Council of the same centre. He is co-director of the Master of Public Management (UPF-UB -EAPC) and the Master of Health Economics & Policy of the Barcelona Graduate School of Economics (Barcelona GSE). His main research interests include the measurement of the efficiency of the public sector, the changing role of the public sector in general (and in the health sector in particular), fiscal balances, the financing of local government finances, health economics, dependency and intergenerational balances.

Since 2005 he is an independent adviser of the Governing Council of the Bank of Spain and member of the Advisory Council for Economic Recovery and Growth (CAREC). He is a member of the Advisory Board of the Ministry of Health (since 2006) and the Departmental Deans of Health and Economics and the Balearic islands (from 2001). He was President of the International Health Economics Association (IHEA) between 2007 and 2011 and has also served as an expert adviser for the World Health Organization (WHO) on health inequalities in the European Union.

Ascensión Marcos


Dr. André Marette graduated from Laval University in 1990 with a PhD in Physiology and Endocrinology. He is currently full professor in the Department of Medicine and Scientific Director of the Institute of Nutrition and Functional Foods at Laval University, Québec, Canada.

Dr. Marette is an international expert on the pathogenesis of type 2 diabetes and related obesity. His research in the areas of insulin action and insulin resistance, and the mechanisms of inflammation, has advanced the understanding of the cellular/molecular defects leading to diabetes and opened new possibilities for nutritional and pharmacological therapeutic interventions. He has published over 150 papers in high-impact journals (Nature Medicine, PNAS, J Biol Chem., FASEB J, Cell Metabolism, Diabetes, etc.) and 15 reviews or book chapters.

Dr. Marette holds several national and international research grants and awards and a research Chair in the pathogenesis of insulin resistance and cardiovascular diseases. He is also leading international research collaborations with Norway, Finland, Brazil and France. Dr. Marette has received several awards including the prestigious Young Scientist Award of the Canadian Diabetes Association and the Charles Best Lectureship Award of the University of Toronto, both in recognition for his outstanding contribution to diabetes research.

Dr. Marette has organized a number of national and international meetings and symposia and has been invited to speak at more than a 140 national and international meetings. He also serves as internal or external referee to a number of international and national funding agencies.

Carmen Martín Salinas

Máster Oficial en Docencia Universitaria por la Universidad de Alcalá de Henares (FESNAD president 2005-2010). Member of the International Journal of Community Nutrition and Food Sciences (2013-), and 15 reviews or book chapters. Dr. Marette holds several national and international research grants and awards and a research Chair in the pathogenesis of insulin resistance and cardiovascular diseases. He is also leading international research collaborations with Norway, Finland, Brazil and France. Dr. Marette has received several awards including the prestigious Young Scientist Award of the Canadian Diabetes Association and the Charles Best Lectureship Award of the University of Toronto, both in recognition for his outstanding contribution to diabetes research.

J. Alfredo Martínez

Professor of Nutrition, chairman of the Institute of Nutrition at the University of Navarra since 2002. Associate Director of I+D+i at: INIA (Soria). Member of the Scientific Advisory Group for the 7th EU Framework, ILSI, Académico Correspondiente Real Academia de Farmacia (Royal Academy of Pharmacy), Member of the Scientific Committee of the European Union (FENS 2003-2007), Spanish Federation of Nutrition, Food and Dietetics (FENSPEAD president 2005-2010). Member of the IUNS Council (2005-), President-elect of International Union of Nutritional Sciences (2013-), and President of ISNN (2014-).

The research fields in which I have been involved for the last years include: Nutritional control of metabolism, Nutritional utilization of functional foods, Evaluation of nutritional status in different populations; Nutrition and immunity; Obesity: cell, animal and human intervention and epidemiological studies; Consumer survey; Long-distance learning.
Nutrigenomics number of publications with ISBN> Over 500. Books and chapters> Over 50, invited speaker> Over 100 lectures at international and national level (selected forum).

**Miguel Ángel Martínez Gonzales**

Prof. Martínez-Gonzalez, MD, PhD, MPH is Professor and Chair of the Department of Preventive Medicine and Public Health at the University of Navarra. He is the principal investigator of the SUN cohort, which was initiated in 1999 and has already recruited over 22,000 participants with >120 scientific publications. He has been the coordinator of the PREMID MED Network (RD 06/0045) funded by Instituto de Salud Carlos III from 2006 to 2013. He was awarded in 2013 with a 2.1 million Euro awarded Advanced Research Grant by the European Research Council PREMIDPLUS nº 349018 (2014-2019). He has been visiting scholar at Harvard School of Public Health, concretely at the Department of Nutrition lead by Prof. Willett, in 1998, 2001 and 2004. He is associated editor of the British Journal of Nutrition. He has co-authored over 450 peer-reviewed articles and has an h-index of 63 according to google scholar and of 49 according to the web of science. His articles have been cited >20,000 times (average number of cites/article: 17.5). He has been the director and supervisor of 30 doctoral theses. He has been the editor or director of >20 books, two of which are the textbook “Bioestadística amigable” ([Diaz de Santos, 2006, 2 ed]; Elsevier 2014, 3 ed) and the textbook “Conceptos de salud pública y estrategias preventivas” ([Concepts of Public Health and preventive strategies] Elsevier, 2013).

**Reynaldo Martorell**

Dr. Reynaldo Martorell is the Robert W. Woodruff Professor of International Nutrition at the Rollins School of Public Health of Emory University, Atlanta, GA (USA). He was chair of the Department of Global Health from 1997-2009. He obtained a PhD in biological anthropology from the University of Washington, Seattle, in 1973. His research interests include maternal and child nutrition, child growth and development, micronutrient malnutrition, and the emergence of obesity and chronic diseases in developing countries. Previously, he was a scientist at the Institute of Nutrition of Central America and Panama (INCAP, 1972-77, Associate Professor and then Professor of Nutrition, Food Research Institute, Stanford University (1977-91) and Leading Professor, Division of Nutritional Sciences, Cornell University (1991-93). He serves on the Board of Directors, Nevin Scrimshaw Interna­tional Nutrition Foundation and as a member of the Advisory Board, Food For­ti­fication Initiative; and the Board of Trustees, Helen Keller International, among other appointments. His awards include election to the Institute of Medicine of the USA National Academy of Sciences, the Kellogg’s In­ternational Nutrition Prize from the American Society for Nutrition, the Gorgas Oration and Gold Medal Award from the Nutrition Society of India and the Carlos Slim Award for Lifetime Achievements in Research on Health.

**Massimo Massi-Benedetti**

Professor Massimo Massi-Benedetti, MD, former Asso­ciate Professor of Endocrinology and Metabolic Dis­eases, Chair of the School of Podology, of the School of Nursing Sciences and member of the Academic Senate at the University of Perugia (Italy), Chair of the Coordina­tion Office of the Umbria Reference Centre for Diabe­tes; Co-director of the WHO Collaborating Centre for Improvement of Diabetes Care. Chair of the IDF European Region from 2006 to 2010 and President from 2003 to 2009, Chairman of the IDF Science Task Force 2009-2012, Director of Research and Edu­cation at the Dasman Institute for Diabetes Research in Kuwait. At pre­sent he is President and Scientific Director of the HUB for international health ReSearch-HIReS ([www.HIReS-research.eu]) and Senior IDF Programme Advisor. Professor Massi-Benedetti’s areas of interest in the field of diabetes include: pathophysiology; evaluation of new drugs; advanced systems for insu­lin delivery; complications; pregnancy; metabolic monitoring; and epi­demiology. He was a member of the European Union research projects EURODIABETA; DIABCARD 1-4; DIABSTYLE 1-2; ADICOLM, IMMIDIAB and coordinator of the B.I.R.O. Consortium Project leader of the EUIBROD EU Project ([www.euiroid.eu]). Professor Massi-Benedetti is a member of numerous national and international diabetes societies, has organised, chaired and spoken at more than 300 national and international meetings. He was all Founder and member of various EASD study groups. He is the author of approximately 350 publications (full papers, abstracts and book chapters) and has sat on the editorial boards of numerous peer-reviewed journals.

**Ron Maughan**

Ron Maughan is currently Emeritus Professor of Sport and Exercise nutrition at Loughborough University, En­gland. He obtained his BSc (Physiology) and PhD from the University of Aberdeen, and held a lecturing posi­tion in Liverpool before returning to Aberdeen where he was based in the Medical School for 25 years. His research interests are in the physiology, biochemistry and nutrition of exercise performance, with an interest in both the basic science of exercise and the applied aspects that relate to health and to performance in sport. For 10 years, he chaired the Human Physiology Group of the Physiological Society and he has chaired the Nutrition Working Group of the International Olympic Committee since 2001.

**Xavier Medina**

Ph D in Social Anthropology (University of Barcelona). MA in Applied Anthropology (UNED, Madrid). Current Positions: Academic Coordinator and Director, Department of Food Systems, Culture and Society, Co­llege of Health Sciences, Universitat Oberta de Cata­lunya (UOC), Barcelona (Spain) (from 2009). General Coordinator of postgraduate studies, College of Health Sciences, UOC. Member of the Nutrition and Food, Culture and Development. Universitat Oberta de Catalunya (UOC), Barcelona. Associate professor (Humanities and Methodology), Ramon Llull University. Barcelona. Former Positions: Senior researcher and head of projects at the European Institute of the Mediterranean (EIMed), Barcelona (1991-2009). He’s author of more than a dozen books and more than a seventy articles in journals, mainly on food issues.

**Bent Egberg Mikkelsen**

Bent Egberg Mikkelsen holds a M.Sc. of Food Science from the Royal Agricultural University, Copenhagen and a PhD in Social Science, from Roskilde University. He is the author of a large number of publications on public health nutrition and sustainable public food sys­tems. Bent is principal investigator on several research projects and work include several assignments on nu­trition at schools and hospitals for the Council of Europe, food and nutri­tion at work for the Nordic Council of Ministers, healthy eating at school for the European WHO regional office and the EU platform for Health, Diet and Physical activity. He is a Professor of Nutrition and Public Food Systems at the MENU research group at Aalborg University. Chair of EU expert committee for the school fruit scheme (SFS). Member of advisory boards of ProMeals, Glamur and VeggieEat project. Member of scientific panel in the Sapere Taste Education network and the EU FoodLinks pro­ject. He is the Member of the Management committee COST action IS1210 and the vice-president in the Food & Nutrition section of EUPHA.

**Luis A. Moreno**

Luis A. Moreno is Professor of Public Health at the Uni­versity of Zaragoza (Spain). He is also Visiting Professor of Excellence at the University of Sao Paulo (Brazil) and affiliated member at the Johns Hopkins Global Center on Childhood Obesity. He did his training as Medical Doctor and his PhD thesis at the University of Zaragoza. He studied Human Nutrition and Public and Communi­ty Health at the University of Nancy (France). He has participated in sev­eral research projects supported by the Spanish Ministry of Health, and the European commission (HELENA, IDEFICS, EURRECCA, ENERGY, Toy­Box and iFamily). He has published more than 350 papers in peer re­viewed journals. He is the coordinator of the GENU (Growth, Exercise, Nutrition and Development) research group, at the University of Zarago­za. He is a former member of the ESPGHAN Committee of Nutrition, current Vice-President of the Spanish Nutrition Society and President of the Danone Institute of Spain.

**Maria Neira**

Director for the Department of Public Health, Environmental and Social Determinants of Health. Dr Maria P. Neira was appointed Director of the Depart­ment of Public Health, Environmental and Social Determinants of Health at the World Health Organization, Geneva, Switzerland in September 2005. Prior to that, she was Vice-Minister of Health and President of the Spanish Food Safety Agency. She had previously held several senior positions in WHO. Dr Neira began her career as a medical coordinator
working with refugees in the Salvador and Honduras for Médecins Sans Frontieres (Doctors Without Borders).

Dr Neira is a Spanish national, and a medical doctor by training. She specialized in Endocrinology and Metabolic Diseases; and Public Health. Dr Neira has been awarded the Médaille de l’Ordre national du Mérite by the Government of France and is a member of the Academy of Medicine, Asturias, Spain.

Lynnette M. Neufeld
Lynnette M. Neufeld is Director of Monitoring, Learning and Research at the Global Alliance for Improved Nutrition (GAIN) where she leads a team dedicated to the strategic collection, translation, and use of evidence to guide the design and improvement of nutrition programs globally. Dr. Neufeld is Chair of the Steering Committee and Co-Chair of the Micronutrient Forum and is a co-chair of the International Union of Nutritional Sciences (IUNS). Dr. Neufeld has extensive international experience, including 10 years at the National Institute of Public Health (INSP) in Mexico where her research focused on improving the effectiveness of interventions to promote the health, growth and development of children from disadvantaged populations. She continues an active research agenda, including lead researcher on the nutrition impact evaluation of the Oportunidades (Mexico). She continues an active role in research, teaching and student advising through on-going collaborations with Emory and Cornell Universities and INSP in Mexico and has over 80 publications in peer reviewed journals and book chapters. Dr. Neufeld has a Doctoral and Master’s Degrees in International Nutrition from Cornell University and a Bachelor of Applied Human Nutrition from Guelph University in Guelph, Canada.

Mariela Nissensohn
Mariela Nissensohn was born in Buenos Aires, Argentina. She obtained a degree in Nutrition at the University of Buenos Aires, Argentina in 1998. She studied a Master in Clinical Nutrition at the Universidad Autónoma de Madrid, and obtained her PhD in Public Health (Epidemiology, Planning and Nutrition) at the University of Las Palmas de Gran Canaria in 2012. After worked as a Clinical Nutrition consultant in diverse institutions, she has been Associate Professor of Nutrition at the Universidad Autónoma del Carmen, México during 2007 - 2008. Since 2009 she is working in the Nutrition Research Group, at the University of Las Palmas de Gran Canaria, under the direction of Prof. Dr. Serra-Majem, where she has participated in national and international projects. Recently she is member of the Biomedical Research Centre in Physiopathology of Obesity and Nutrition (CIBERobn). She is author and co-author of many nutrition articles.

Trine Nørnberg
Trine R. Nørnberg has obtained a B.Sc in Food Science and Nutrition from Copenhagen University and a M.Sc in Integrated Food Studies from Aalborg University in Copenhagen, Denmark, where he studies primarily have been focused on choice architecture (nudging) used in health promotion, human nutrition and public health as well as the effectiveness and development of National health recommendations. Her research interests lies within behavioural nutrition, sustainable eating and consumer sciences.

Shane Norris
Shane Norris is a Research Professor in the Department of Nutritional Sciences at the University of the Witwatersrand, Johannesburg, South Africa. Shane Directs the MRC/ Wits Developmental Pathways for Health Research Unit. He has extensive research experience in longitudinal cohort studies and epidemiology and his research expertise and interest includes: (i) maternal and child health, (ii) child nutrition, growth, body composition, and development; and (ii) intergenerational transmission and developmental origins of obesity and metabolic disease risk.

Mark O’Doherty
I am currently a postdoctoral research fellow at the UK-CRC Centre of Excellence for Public Health, Queen’s University Belfast. My postdoctoral training to date has been in the field of cardiovascular, diabetes and obesity. I am currently core to the strategic organisation of the cardiovascular disease and diabetes Work Package within the EU 7th framework CHANCES Project: Consortium on Health and Ageing; Network of Cohorts in Europe and the United States. In this present post, I have recently been awarded a three year CARDI Leadership Programme in Ageing Research Fellowship to explore differences in trends in work related disability, and of the differences in the way people report disability between nations and across different national health and welfare service contexts. This will be achieved through the use of the Norwegian Longitudinal Study of Aging (NICO LA). With the support of this Fellowship I will build upon my current ageing research interests, and lay the foundation for a career as a research leader within the NICOLA study.

Victor O. Owino
Dr Victor O. Owino is currently a Senior Lecturer and Chairman, Department of Human Nutrition & Dietetics, Technical University of Kenya. His research focuses on development and testing of efficacious and cost-effective interventions on infant and young child growth. Dr Owino has experience in application of stable isotopes for determination of breast milk intake and body composition. Additionally, he is currently leading work on the impact of maternal HIV-seropositivity on breast milk output among Kenyan mothers. He has previously worked at Valid Nutrition and University of Califonia Davis.

Luis Peña Quintana

Juan Pablo Peña Rosas
Dr Juan Pablo Peña-Rosas currently coordinates the Evidence and Programme Guidance, Department of Nutrition for Health and Development at the World Health Organization (WHO) in Geneva, Switzerland. He oversees the development of evidence-informed guidelines for interventions addressing the double burden of malnutrition for neonates, infants, children and women in stable and emergency settings, under the WHO Research Strategy umbrella. He has been an Adjunct Assistant Professor at Emory University Rollins School of Public Health in Atlanta, United States since 2011. He received his Medical Degree from Universidad Central de Venezuela in his native country and a Master’s Degree in Public Health Nutrition from University of Puerto Rico in San Juan. He holds a PhD in Human Nutrition and Epidemiology from Cornell University, Ithaca, NY. Dr Peña-Rosas is a member of the American Society for Nutrition, Latin American Society of Nutrition, the American Evaluation Association, the Cochrane Collaboration, Grading of Recommendations Assessment, Development and Evaluation (GRADE) working group and the WHO Guidelines Review Committee 2010-2012.

José Luis Peña
José has been a postdoctoral fellow at the University of Helsinki School of Medicine (Finland) and the Johns Hopkins School of Public Health (Baltimore, MD) before joining the Spanish National Centre for Cardiovascular Research (CNIC) in 2008. Since 2011 at CNIC, José has been coordinating the area of lifestyle epidemiology. Currently holding a joint appointment at CNIC, José is a co-investigator in two large cohorts aimed at identifying determinants
of early subclinical atherosclerosis: The PESA (Early Detection and Progession of Early Subclinical Atherosclerosis) study and the Aragon Workers’ Health Study (AWHS). He has a strong background in clinical research and epidemiology methods, including the design, implementation and evaluation of community-based interventions. He is particularly interested in the study of lifestyle determinants of cardiovascular health. He has worked on this topic for the last 10 years, starting a new branch of basic biomedical research to currently working at applying epidemiological methods and advanced bioinformatics to large datasets.

Carmen Pérez Rodrigo

Dr. Carmen Pérez-Rodrigo is President of the Spanish Society of Community Nutrition —Sociedad Española de Nutrición Comunitaria (SENC). MD, Specialist in Preventive Medicine and Public Health, postgraduate diploma in Nutrition, specialized postgraduate training in public health nutrition, nutrition epidemiology, community nutrition and nutrition education. Advanced degree in Communication sciences – journalism. For more than 25 years has coordinated nutrition surveys at the local, regional and national level and has been involved in the design, implementation and evaluation of community nutrition programs at local, national and international level, particularly school based programs. Has been involved in European research projects such as Eureca, Eurobese (Ethics and the obesity and overweight epidemic. Image, culture, technologies and interventions), Pro Children (Promoting and sustaining health through increased vegetable and fruit consumption among European schoolchildren) or Eurodiet, among other. Contributed to the development of a framework for WHO DPAS implementation, monitoring and evaluation; Advisor to the Council of Europe task force on school meals and contributed to the development of the European Network of Health Promoting Schools ‘Healthy Eating for Young People In Europe. A school-based nutrition education guide’. Vice-president of the European Academy of Nutritional Sciences (EANS) (2004-2009); Member of the Executive Committee of the International Society for Behavioral Nutrition and Physical Activity (ISNPA) (2007-2013) and board member for Public Health Nutrition at Sociedad Española de Nutrición Básica y Aplicada (SENBA) (2003-2007).


F.J. Armando Pérez-Cueto

F.J. Armando Pérez-Cueto is Associate Professor of Public Health Nutrition at Aalborg University’s Campus in Copenhagen, Denmark. He has been visiting lecturer at the Faculty of Food and Nutrition Sciences (FCNAUP) of Porto University yearly since 2011. During his career he was part of several EU funded projects, namely, DANCE (Data for Food Networking), EATWELL, Q-PorkChains, ProSafeBeef. Currently, he is Work Package leader of the VeggieEAT Project (IAPP-Marie Curie/ EU grant agreement # 612326), member of the Sino-Nordic Network Food4Growth (Nordic Council of Ministers), and principal investigator of the Danish-Brazilian Network ELIGEBIEN (Danish Ministry of Education and Innovation Funds). Originally a Food Engineer from UNIVALLE, Bolivia, he received his postgraduate qualifications from Ghent University, namely a PhD in Applied Biological Sciences, a MSc in Rural Development Economics, and a Diploma in Food Science & Nutrition. He has consolidated a multi-disciplinary research approach around different aspects of food and health, including postdoctoral work combining nutrition and consumer research. Presently, the focus of his research is on the role that choice architecture (nudging) could play in Public Health Nutrition.

He is author of 46 original articles, co-editor of 1 book, and member of the Editorial Boards of Nutricion Hospitaria (Comité Editorial Iberoamericano), Revista Chilena de Nutrición and Perspectives in Public Health. He enjoys sharing conversations and interchange of ideas with young researchers and students.

Szabolcs Péter

Dr. Szabolcs Péter is a scientist at R&D Human Nutrition and Health of DSM Nutritional Products Ltd. in Switzerland. He obtained his M.D. (general medicine) and Ph.D. (health sciences) degrees at Semmelweis University, Budapest. His doctoral thesis focused on the role of lifestyle in obesity prevention. Simultaneously he was working on childhood obesity at the Department of Nutritional Physiology of National Institute for Food and Nutrition Science. After completing a postdoctoral fellowship on metabolic syndrome at the School for Physiology and Nutrition of North West University in South Africa, he was engaged at Gedeon Richter Plc. in anti-obesity drug development.

Per Pistrup-Andersen

Per Pistrup-Andersen is Professor Emeritus and Graduate School Professor at Cornell University and Adjunct Professor at Copenhagen University. He is past Chairman of the Science Council of the Consultative Group on International Agricultural Research (CGIAR) and Past President of the American Agricultural Economics Association (AAEA). He has a B.S. from Copenhagen University, a M.S. and Ph.D. from Oklahoma State University as well as honorary doctoral degrees from universities in the United States, the United Kingdom, Netherlands, Switzerland, and India. He is a fellow of the American Association for the Advancement of Science (AAAS) and the American Agricultural Economics Association. In addition to his 15 years as professor at Cornell University, he served 10 years as the International Food Policy Research Institute’s Director General and seven years as department head; seven years as an economist at the International Center for Tropical Agriculture, Colombia; and six years as a distinguished professor at Wageningen University. He is the 2001 World Food Prize Laureate, and the recipient of several awards for his research and communication of research results.

Andrew Prentice

Professor of International Nutrition. Director, MRC International Nutrition Group. Andrew Prentice will be one of the lecturers that will be at the III World Congress of Public Health Nutrition. His speech will take place at Sunday November the 9th.

Prentice was dedicated almost his whole life to the work and research about the nutrition. After five years working at the MRC Dunn Nutrition Unit’s rural field station in Keneba, The Gambia, he traveled to Cambridge, where he focused on the study of the regulation of energy balance with a particular focus on obesity, being Head of Human Energy Metabolism at the MRC Dunn Clinical Nutrition Centre of the English city.

Nowadays, he collaborates with The Gambia, Chile, Bangladesh, Kenya and Tanzania in researches focused on the four areas of ING, with special interest in the early life programming of immune function, nutrient-gene interactions and reproductive nutrition.

He has also been member of several international advisory committees and achieve important awards in his investigation fields, as the EV McCallum International Lecturer Award from the American Society of Nutri­ tion 2010/11, and the 5th George G Graham Lectureship 2011 from Johns Hopkins University.

All this large experience of the situation and needs of the international nutrition will provide this Congress a really global and accurate point of view of the world situation of this field.

Monique Raats

Professor Monique Raats is Director of the University of Surrey’s Food, Consumer Behaviour and Health Research Centre. She previously worked at the Institute of Food Research, Health Education Authority and University of Oxford. Her portfolio of research is wide ranging in terms of topics being addressed (e.g. food choice, policy development, food labelling), and methodolo­gies used (e.g. qualitative, quantitative, stakeholder consultation). Since her arrival at the University of Surrey in 2000, she has played a central role in securing research funding for both national and European research projects. She has published over 95 peer-reviewed papers, 19 book chapters, and co-edited two books (The Psychology of Food Choice; Food for the Ageing Population). She is a founding member of the Inter­ national Society of Behavioral Nutrition and Physical Activity. In 2011 Monique joined the UK’s Scientific Advisory Committee on Nutrition and is a member of its Subgroup on Maternal and Child Nutrition.
Ines Reinhard

Dr. Ines Reinhard holds a MSc in Home Economics and Nutritional Science and obtained her a PhD in Nutrition from University of Giessen, Germany. Her research is focused at the impact of food-for-work measures on improving the nutritional status of rural populations in Indonesia. Since 1997 she has been working for the German Development Cooperation (GIZ) in various positions, including long-term assignments in Indonesia, Cambodia, Vietnam and Sri Lanka. In her current position as senior planning officer in the Department for Agriculture and Food in GIZ Headquarters in Germany, she guides and supervises projects aimed at ensuring food and nutrition security. She has a regional focus in West Africa, the Greater Lakes Region as well as South and Southeast Asia. Her responsibilities include the development of innovative concepts and approaches to improve nutrition, as well as advisory services for the German Ministry of Economic Cooperation and Development (BMZ).

Pilar Rióbó Serván


Claudia Andrea Rodríguez Mora

Graduada en nutrición y dietética en la Universidad Industrial de Santander, Colombia. Actualmente cursa la maestría en Nutrición en Salud Pública en la Universidad de São Paulo, Brasil y realiza intercambio académico en el Observatorio de la Alimentación de la Universidad de Barcelona, España. Becaria de la “Fundación de Amapró” Pesquisa do Estado de São Paulo FAPESP” y del programa de mobilidad internacional Santander. Trabajó en Colombia como nutricionista en la Secretaría Departamental de Salud de Santander y en el programa de alimentación escolar de Nariño. Tiene experiencia en el área de salud pública, actuando principalmente en la asesoría de programas y políticas de alimentación y nutrición, alimentación escolar y seguridad alimentaria y nutricional. Graduado en nutrición y dietética en la Industrial University of Santander, Colombia. Currently pursuing a Master's degree in Public Health Nutrition at the University of São Paulo, Brazil and takes academic exchange at "Observatorio de la Alimentación" at the University of Barcelona, Spain. Fellow of the "Fundación de Amapró” Pesquisa do Estado de São Paulo FAPESP” and the program of international mobility Santander. Works in Colombia as a nutritionist in the Health Government Department of Santander and for the school feeding program of Nariño. He has experience in the area of public health, acting in the following subjects: advice of programs and policies on food and nutrition, school feeding and food and nutrition security.

Anu Ruusunen

Anu Ruusunen is working as a post-doctoral researcher and clinical nutritionist in the Department of Psychiatry, Kuopio University Hospital, Kuopio, Finland. She finished her Ph.D. studies on the field of nutritional epidemiology in 2013 with Ph.D. thesis “Diet and depression - an epidemiological study”. She has expanded her education during the last years in epidemiology, psychiatry, public health, behavioral sciences and biostatistics. Now she is continuing post-doctoral research in the field of diet and depression especially concentrating on the clinical dietary interventions. Next year she is going to have a post-doctoral visit in the SMILES trial in Deakin University, Australia. She is a writer of several scientific and popular articles of nutritional topics and is a writer of textbook of nutrition for nursing practices. Her clinical specialties include nutritional counselling especially in psychiatric disorders, including affective disorders, anxiety disorders, psychotic disorders and eating disorders.

Jordi Salas-Salvadó

Prof. Salas-Salvadó has occupied teaching and research posts at the Faculty of Medicine in Reus (UB) since 1984. At present, he is professor of Nutrition and director of the Human Nutrition Unit of the Faculty of Medicine and Health Sciences of the Rosaya i Vigil University (URV), and President of the Federation of Spanish Scientific Societies on Nutrition and Dietetics (FESNAD). Since 1989, he has occupied a variety of medical posts at Sant Joan University Hospital in Reus, and since 1991, is Head of Nutrition of the Internal Medicine Service. He has directed 15 research projects financed by public bodies and 28 projects in conjunction with the pharmaceutical or food industries. He is one of the leaders of the PREDIMED Study and has published more than 250 original articles.

Blanca Román Viñas

Doctora en Medicina, médico especialista en Medicina del Deporte y Master en Nutrición. Trabaja como investigadora en la Fundación para la Investigación Nutricional y es profesora lectora de la Escuela Universitaria de la Salud y del Deporte de la Universidad de la Girona y también de la Universidad Ramon Llull. Ha participado como investigadora en varios proyectos europeos con la temática de la armonización de las recomendaciones nutricionales en toda Europa (EURRECA, EURopean RECommendations Aligned. Harmonising nutrient recommendations across Europe with special focus on vulnerable groups and consumer understanding) o el desarrollo de plataformas basadas en las TIC para promover la actividad física y la alimentación saludables (C4H-Credits for Health, PIPS - Personalised Information Platform for Life and Health Services). Es miembro de la Sociedad Española de Fisiopatología de la Obesidad y Nutrición (SEFON) y la Sociedad Española de Nutrición (SENPE). Ha publicado varios artículos en revistas científicas y conferencias internacionales sobre la relación entre alimentación y salud.
Seppo Salminen
Professor, Degree Program on Health Biobiosciences and Director, Functional Foods Forum, Faculty of Medicine, University of Turku, Turku, Finland.

Studies in Food Science and Nutrition at Washington State University, USA with MS Degree, Food Chemistry and Microbiology at University of Helsinki, Finland with MSc degree, and PhD in Nutritional Toxicology at the University of Surrey, United Kingdom; Visiting Professor (Food Safety) at BOU University, Vienna, Austria; Visiting Professor, Nutritional Toxicology, RMIT University, Melbourne, Australia; Registered toxicologist (Finland and Eurotox), Fellow of the ANZAFA, Professor of the Joint Program of the Life Sciences Faculty and Medical Faculty of University Turku. Research interests: intestinal microbiota and health, probiotics, prebiotics, functional foods, novel foods. Member of the editorial board of British Journal of Nutrition, Journal of Food Protection, Bioscience and Microflora, Marcel Dekker Series in Food Science and Nutrition, Journal of Nutrition Science, Food and Nutrition Research; Member of following specialized societies: ASM, IFT, SOMED, FSNR; Expert member in several regulatory committees on food and health (Finland and EU) including the European Food Safety Authority NDA Scientific Panel, Fellow of the ANZAFA.

Receiver of several international prizes such as Grand Prix du Yoplait, International Award for the European Journal of Clinical Nutrition, Meckinnich Prize. Over 300 refereed publications in food and health, microbiology, probiotics, food safety and functional foods, several book chapters and text books in probiotics, food additives and functional foods.

Almudena Sánchez-Villegas
PhD in Pharmacy (University of Navarra, 2001). Associate Professor of Preventive Medicine and Public Health at University of Las Palmas de Gran Canaria since 2003. Full Professor accreditation from ANECA (the Spanish National Agency for the quality and accreditation of the civil servant academic staff bodies) in 2013. Research Fellow in the Department of Nutrition of Harvard School of Public Health (Boston) during the academic year 2005-2006. She is author of more than 40 book chapters and co-editor of several text books of Public Health (Elsevier 2013) and Bioanalytics (Elsevier 2014). She has authored more than 80 scientific articles, editorials or letters in international peer-reviewed journals such as Archives of General Psychiatry, American Journal of Clinical Nutrition, Diabetes Care or British Journal of Nutrition (h factor in web of science=24). Coordinator and principal investigator of two Spanish Projects sponsored by the Spanish Ministry of Health (PI 04022441 and FIS PI080189) to assess the role of diet and physical activity on mental disorders and quality of life, she also participated in two Spanish or European projects related to nutritional epidemiology such as the PREMIDMED clinical trial analysing the effect of Mediterranean diet on cardiovascular risk or the EURRECA project (European RECommendations Aligned Harmonising nutrient recommendations across Europe with special focus on vulnerable groups and consumer understanding) sponsored by the European Union (FP6-03611962-2). Now part of CIBERobn (Spanish Biomedical Research Centre in Obesity Physiopathology and Nutrition network) collaborating within the PREMIDMED-PLUS trial.

Ben Schöttker
Ben Schöttker was born in 1982 in Celle, Germany. He studied Pharmacy in Marburg (Germany) and Public Health in Dresden (Germany) and obtained a Ph.D. in Human Biology from the Medical Faculty of the University of Lübeck (Germany). Since 2009, he is working as a postdoctoral scientist at the Division of Clinical Epidemiology and Aging Research, German Cancer Research Center, Heidelberg (Germany).

Flavia Schwartzman
Nutritionist, Master in Nutrition and currently pursuing a Ph.D. in Public Health at the University of São Paulo, Brazil. Experience in the areas of Public Health and Nutrition Education, working in the following areas: school feeding and nutrition, food and nutrition security, maternal and child nutrition. From 2006 to 2009, has been involved with the Brazilian National School Feeding Programme (PNAE), conducting research and/or working as a consultant of the program. She has worked as an international consultant for the World Food Programme (WFP) in 2009 and 2010, and the Food and Agriculture Organization of the United Nations (FAO) since 2011, supporting the strengthening of School Feeding Programmes in Latin America and the Caribbean region. She was a member of the International School Feeding Committee (CEIA) to support the implementation of local procurement from family farming for PNAE in the state of São Paulo, Brazil.

Jaap Seidell
Prof. Jaap Seidell was appointed as full professor (2002-present) and head of the Institute for Health Sciences (2003-2013) at the VU University in Amsterdam. Since 2013 he is appointed as one of the two distinguished 'University professors' at the VU University. He obtained his MSc (1983) and PhD (1986) at the Department of Human Nutrition at the University of Wageningen, The Netherlands. He was awarded a senior research fellowship by the Royal Academy of Arts and Sciences (KNAW) for the period 1988-1992. From 1992-2002 he was head of the Department for Chronic Diseases Epidemiology at the National Institute for Public Health and the Environment in Biltoven, The Netherlands. His main research interest is in the role of lifestyle factors in the prevention of chronic diseases but in particular the study of causes and consequences of obesity and body fat distribution. He (co-)authored well over 500 scientific papers and chapters in books on these topics (390 of these covered in ISI Web of Science; h-index: 77; h-index in Google-Scientific: 99). He has served as president-elect and as president (1992-2000) of the International Ad Obesitity for the Study of Obesity and was editor-in-chief of the “European Journal of Clinical Nutrition” (1996-2006) and is currently editor of “Public Health Nutrition”. He is a member of the Royal Academy of Arts and Sciences (KNAW) and the Health Council of the Netherlands. He is a member of the scientific board of the international Obesity Task Force and the International Eponde Network.

Mauro Serafini
Prof. Mauro Serafini is the Head of the Functional Foods and Metabolic Stress Prevention Laboratory at Agricultural Research Council (CRA-NUT) in Rome. He is visiting Professor at the faculty of Food Technology and Biotechnology of Zagreb University. He teaches at the Master of Phytotherapy, Siena University; Master in Obesity prevention, Faculty of Medicine La Sapienza on topics related to functional food and health. He got his degree in Nutrition in 1992 and received his PhD in Experimental Physiopathology, from the University of Pavia. He spent two years as postdoc at the Nutritional Immunology Lab at HNRc at Tufts University working on the role of vitamin E in immune function during ageing. He was Tenu­ re of a grant of the Japan Society for Promotional of Sciences at Kyoto medical University, department of immunology. Prof. Serafini has included by Thomson Reuters in the list of international researchers displaying the greatest numbers of reports designated by Essential Science Indicators as Highly Cited Papers, ranking among the top 1% most cited for their subject field and year of publication (2002-2013). Serafini's research mission is unraveling the link between sustainable dietary behav­ ior and metabolic health with focus on understanding the role of plant foods in modulating antioxidant, anti-inflammatory and cell-mediated immune response in humans.

Luis Serra-Majem
Luis Serra Majem is a medical doctor with a Ph.D. specialising in Preventive Medicine and Public Health Nutrition. In 1988 he became Associate Professor of Preventive Medicine and Public Health at the School of Medicine of the University of Barcelona, where he founded and is the Director of Medicine University Research Centre of the University of Barcelona Science Park. In 1995 he became Full Professor of Preventive Medicine and Public Health at the University of Las Palmas de Gran Canaria, where he also holds the UNESCO Chair for Research, Planning and Development of Local Health Systems (from 1998) as well as serves as Director of the Biomedical and Health Research Institute (from 2013). During the recent years he served on the Steering Committee, among others, of the following European Union Projects: PLANT food supplements: Levels of intake, Benefit and Risk Assessment; Credits4Health; EURRECA: European RECommendations Aligned; BENERIS: Benefit-Risk assessment for food; PIPS: Personalised Information Platform for Life and Health Services and ENHR II: European Nutrition Health Report II. He is also colligated with the Spanish Ministry of Health's Thematic Centre of Obesity and Nutrition Research (CIBER OBN) and participates in the Preventive Study and Network. He has published 61 books and 340 peer reviewed scientific papers with an impact factor over 1100 and an h-index of 41, receiving more than 7000 citations.
In 1989 he founded the Spanish Society of Community Nutrition, of which he served as President from 2000 to 2006, and also created in 1994 the Spanish Journal of Community Nutrition. He is President and founder of the NGO Nutrition without Borders (2005), as well as of the Nutrition Research Foundation (since 1997), he also served as President of the Mediterranean Diet Foundation (from 1996 to 2012) where he was leading the candidacy of the Mediterranean Diet as an Intangible Cultural Heritage by the UNESCO, and currently is President of the International Foundation of Mediterranean Diet (IFMED). He has been honoured with the presidency of the Spanish Academy of Nutrition and Food Sciences (since 2009), and he has been appointed Scientific Director of the CitiesCAM at Sapenza University in Rome. He has received numerous awards and recognitions and serves as visiting professor in several European and Latin-American Universities. He was the Promoter and the President of the I World Congress of Public Health Nutrition held in Barcelona in 2006.

**John I. Sievenpiper**

Dr. Sievenpiper completed his MSc, PhD and Postdoctoral Fellowship training in the Department of Nutritional Sciences, Faculty of Medicine, University of Toronto. He completed his MD at St. Matthew’s University, School of Medicine followed by Residency training in Medical Biochemistry at McMaster University, leading to his certification as a fellow in the Royal College of Physicians of Canada (FRCP). Dr. Sievenpiper is currently a Consultant Physician in the Division of Endocrinology, St. Michael’s Hospital. He also maintains an active research program both as a Scientist in the Li Ka Shing Knowledge Institute and as the Knowledge Synthesis Lead of the Toronto Diet & Knowledge Synthesis and Clinical Trials unit, St. Michael’s Hospital, University of Toronto. His research interests are focused on using meta-analytical techniques and randomized trials to investigate the role of diet in cardiometabolic risk. He is an investigator on several large grants including 4 Canadian Institutes of Health Research (CIHR) grants. Dr. Sievenpiper has been appointed to various international nutritional guidelines committees including those of the Canadian Diabetes Association (CDA), European Association for the Study of Diabetes (EASD) and American Society for Nutrition (ASN). Dr. Sievenpiper has authored 100 scientific papers and 12 book chapters.

**Matt Silver**

Matt Silver (PhD) is a bioinformatician and statistical geneticist with the MRC International Nutrition Group, based at the London School of Hygiene and Tropical Medicine and MRC Keneba, The Gambia, West Africa.

**Laurits Rohden Skov**

Laurits Rohden Skov holds a M.Sc. in public health nutrition from the London School of Hygiene & Tropical Medicine, now a Ph.D. student at the Faculty of Medicine at Aalborg University, Copenhagen campus. Previous academic output has been within: best practice in obesity governance in Europe and setting-based health promotion. Laurits’ current research is within behavioural nutrition employing ‘Nudging’ and choice architecture to promote vegetable consumption. He is also an active member of The European Nudge Network with special responsibilities in the health pillar.

**Christine Slater**

I joined the International Atomic Energy Agency as a Nutrition Specialist in the Division of Human Health in 2009, after working as a consultant for several years preparing handbooks and e-learning modules on stable isotope techniques in nutrition - in particular assessment of body composition, total daily energy expenditure and infant feeding practices. These publications are now available on the IAEA Human Health Campus (http://nucleus.iaea.org/HH/W/Nutrition/index.html). Prior to joining the IAEA, I was a research fellow at the University of Glasgow, UK and manager of the stable isotope facility at the University of Glasgow Department of Child Health, Royal Hospital for Sick Children, Glasgow. My formative experience in using stable isotope techniques in nutrition was gained while in the Stable Isotope Biochemistry Laboratory at the Scottish Universities Environmental Research Centre, where the focus was on developing new techniques to answer clinically important questions. I have always enjoyed the privilege of working as part of a multidisciplinary team and have over 50 peer reviewed publications related to the use of stable isotope techniques to assess important questions related to both public health and clinical nutrition.

**Betzabeth Sclarer**


**Susana Socolovsky**

Susana Socolovsky, PhD, CFS is a Doctor in Chemistry and Food Science from the University of Buenos Aires; she devoted 20 years to scientific research and teaching Organic Chemistry at the undergraduate, graduate and doctoral level at the Exact and Natural Sciences School of the University of Buenos Aires. Dr. Socolovsky has widespread knowledge and expertise in food innovation and regulatory matters in Latin America. For the past 25 years Dr. Socolovsky has done extensive regulatory work for several multinational food ingredient companies throughout South America, Europe, United States, Japan, Canada. In its Food Development and Innovation role and in partnership with food companies throughout Latin America Dr. Socolovsky is responsible for having developed more than 140 innovative, cutting edge food products in the light segment category. Dr. Socolovsky has lectured on nutrition, food technology, nutrition and regulatory topics in more than 80 international conferences and has taught numerous food regulatory and innovation courses in universities in the USA, Canada, UK, México, Chile, Brazil, Uruguay, Paraguay, Ecuador and Argentina. Dr. Socolovsky is an active member of the Technology and Regulatory Committees of various trade associations, acts as a non-governmental representative at Mercosur regulatory meetings as well as adviser to the local Codex Chapter. Dr. Socolovsky is also a consultant for the United States Pharmacopeial Convention, USA. As an expert in Public Policies she has worked in the design of the Law on Obesity and Eating Disorders in Paraguay and in several related projects in other LATAM countries.

Dr. Socolovsky is the Vice President of the Argentine Association of Food Technologists – AATA, a Professional Member of the Institute of Food Technologists USA, and a full member of Argentine Nutrition Society, among others.

**Roger Sodjinou**

Roger Sodjinou works for UNICEF Regional Office for West and Central Africa as Coordinator for the West African Nutrition Capacity Development Initiative (WANCDI) after having served as UNICEF Chair’s Chief of Nutrition for three years. Prior to joining UNICEF, Roger worked for the Millennium Development Goals (MDGs) Centre as Regional Nutrition and for several international NGOs, including Concern Worldwide and Christian Aid. Roger received a BSc in nutrition from the University of Abomey-Calavi (Benin), an MSc in nutrition and health from Wageningen University (The Netherlands) and a PhD in human nutrition from the University of Montreal (Canada). Roger has extensive research experience in the field of international nutrition and has published many scientific papers in refereed journals.

**Noel Solomons**

Noel W. Solomons was born in Boston, Massachusetts. He has worked on the clinical, metabolic and public health issues of nutrition in relation to health in Guatemala since 1975. He has been co-founder and Scientific Director of the Center for Studies of Sensory Impairment, Aging and Metabolism (CESSIAM) in Guatemala for the past 25 years. He received his undergraduate and medical training at Harvard University and his clinical and specialty training at the University of Pennsylvania and the University of Chicago. He has held faculty or visiting professor appointments over his career at the...
The University of Chicago and Massachusetts Institute of Technology in the USA, Universidad "Francisco Marroquín" in Guatemala, Universidad Federal de Rio de Janeiro in Brazil, University of Jakarta in Indonesia, Universidad Agraria "La Molina" in Peru, and University of Manitoba in Canada. Noel has served as chairman of the Committees on Nutrition and Urbanization and Diet, Nutrition and Long-term Health of the International Union of Nutrition Sciences. He is Director for Central America of the Nevin Scrimshaw International Nutrition Foundation in Boston, Board Member of the Hildegard Grunow Foundation in Munich, Advisory Board Member of the Nestlé Nutrition Institute, and a Fellow of the American Society for Nutrition. He is a member of the Guatemalan National Academy of Medical, Physical and Natural Sciences and the Spanish Academy of Nutrition and Food Science. He has over 600 publications including original papers, review articles, books and chapters in books. The current research interests of CeSSIAM include: the safety and efficacy of micronutrient fortification and supplementation: growth and development in her dissertation. Viterior’s work is centered on the resistance to infectious disease and the maintenance of health; and the relation of dietary intake patterns to the resistance to infectious disease and the maintenance of long-term health and function.

Maria José Soto

After studying nutrition at the School of Nutrition, Faculty of Health Sciences at the University Rafael Landívar, Guatemala, María José Soto started her career at CeSSIAM, Guatemala, as a research fellow in 2007. Because of her scientific performance the Hildegard Grunow Foundation (HGF) accepted to promote her future education. In 2007 she participated successfully in the Taller Latinoamericano de Liderazgo en Nutrición, a one-week leadership workshop held in Chile. She completed her MSc in Nutrition Human and Social Sciences at the University of Granada, Spain, and started her doctorate, her dissertation fieldwork was carried out in Quetzaltenango, Guatemala. In November 2012 she presented her dissertation on Guatemalan food intake at the Latin American Society Congress in La Habana, Cuba. In July 2013 she went again to Granada in order to finish the laboratory analyses proposed in her dissertation. She presented preliminary results of her dissertation at the Experimental Biology Congress in Boston, Massachusetts, the International Congress of Nutrition in Granada, Spain and the International Hydration Congress held in Madrid, Spain. In Madrid Maria José was awarded for the best poster and best oral presentation. She is presently finishing the statistical analyses of her data and writes her thesis papers.

Jörg Spieledenner

Jörg Spieledenner joined the Nestlé Research Center, in Lausanne, as Head of the Public Health Nutrition Department in 2012 and is also responsible for the sustainable nutrition research programme.

Before that, he had been working at the Nestlé Nutrition Institute as Global Head of Health Economics. Jörg joined Nestlé in 2009 after a long career in Public Health having held positions as Head of the Directorate of the National Prevention Programmes in Switzerland, Professor at the University of Applied Sciences of Western Switzerland and as Executive Director of a global NGO. He was delegate and adviser to the Minister of Health in a German land and in the Directorate of external relations at the European Commission.

Jörg holds a Doctorate in Medicine, a Master in Health Economics and a Master in Sports Science and has contributed to a number of peer-reviewed publications. He is lecturing at the University of Applied Sciences of Zurich and Lausanne.

L. Suzanne Suggs

L. Suzanne Suggs is an Assistant Professor of Social Marketing and Head of the BeCHANGE Research Group in the Institute for Public Communication, Faculty of Communication Sciences, at the Università della Svizzera italiana in Lugano Switzerland. She is also Director of the USI Sustainability Incubator (USI-SINC). She received a BBA in Marketing at University of North Texas (USA), a MSc and PhD in Health Studies at Texas Woman’s University (USA), and a Post-doctoral fellowship focused on healthy ageing and clinical decision-making at McMaster University (Canada). Suzanne’s research focuses on social and behavior change and information and communication technologies (ICTs). She examines the determinants of behavior, develops and tests the effects of communication strategies, delivered through ICT, on such behaviors. She is a Co-Founder and the Executive Board of the European Social Marketing Association, on the Steering Committee of the Geneva Health Forum (2014), is a member of EUPHA, and is on the Editorial Board for the Journal of Health Communication. She is the principal investigator on several eating and physical activity behavior research projects and consults on various projects around the world focusing on health behaviors and ICT. She is Chair of a policy report about communicating complexity in health for the upcoming World Innovation Summit for Health in Qatar.

Nathan Teff

Dr. Teff’s research focuses on the economics of risky health behaviors and health policy. Using applied microeconomics and econometrics research methods, Dr. Teff is primarily interested in how individuals make decisions regarding health-related behaviors in economics and policy contexts.

Dr. Teff has ongoing research and interests in health and health-related behaviors including obesity, smoking, mental health, alcohol consumption, fatal automobile accidents, and asthma; preventive medical services and physician prescribing behavior; health in the context of labor markets, macroeconomic fluctuations, taxation, and safety net programs.

He has also been involved in interdisciplinary projects that intersect with public health and public policy. Past and current research topics in these areas include early childhood intervention programs related to child health, soft drink tax policies, SNAP participation at farmer’s markets, and appetite suppressants and eating disorders.

Dr. Teff has been an Assistant Professor of Economics at Bates College, in Lewiston, Maine, since 2008. He also spent two years in the Department of Health Services at the University of Washington-Seattle between 2012 and 2014. He received a B.A. in Mathematics from Williams College (MA) in 2000 and a Ph.D. in Economics from the University of Wisconsin-Madison in 2008.

Elizabeth Tejero

Dr. Tejero holds a Bachelor’s degree in Nutrition and Food Science, and a Master’s degree by Universidad Iberoamericana, in Mexico City. She was awarded a Ph.D in Nutritional Sciences by The University of Texas at Austin. She was a postdoctoral scientist at The Texas Biomedical Institute, in San Antonio Texas working on the effect of genetic and environmental factors influencing complex disorders in human populations and animal models.

Dr. Tejero is currently working as a scientist at the Laboratory of Nutrigenetics and Nutrigenomics at Instituto Nacional de Medicina Genómica in Mexico City. Her research interests include nutrigenomics and nutrigenetics, genetics of obesity and related disorders. Her focus is to investigate the effect of genetic variation in the risk for chronic diseases, and the mechanisms involved in the gene-nutrient interactions.

Chai Theary

Theary has been Executive Director of the Reproductive and Child Health Alliance (RACHA) for more than 10 years. She graduated in Midwifery and Nursing and obtained her Master’s Degree in Public Health from the Royal Tropical Institute in Amsterdam, the Netherlands. She has more than 20 years of work experience in Cambodia and internationally, including nine years of management and advisory experience in maternal newborn and child health (MNCH) with HealthNet International and two years working as the visiting resident midwife at Hospital General in Paris and Romans, France. She completed an Advisory Skills Course by the Management for Development Foundation in Ede, the Netherlands, and has attended various international trainings and workshops. Her enthusiasm to promote whole health for MNCH has been sustained as she leads RACHA in implementing broad-based health programmes aiming to help curb maternal and child mortality rates in the country. She has written many research papers in the field of MNCH. She is actively involved in the conceptualization, incubation and the subsequent implementation of the iron Fortified Fish Sauce and Soy Sauce project in Cambodia, which has been funded by GAIN since 2010. As a speaker to national, regional and international conferences and symposiums she addresses MNCH and the iron-fortified fish sauce project, its progress, development and challenges.

Antonia Trichopoulou

MD, PhD, is Executive Vice President of the Hellenic Health Foundation and Professor Emeritus, School of Medicine, University of Athens. She has served as president of the Federation of the European Nutrition Societies (FENS) and as chairperson or key member of numerous Greek, European Commission and World Health Organization Committees. She has received nu-
meritorious honors and awards and was decorated by the President of the Greek Republic with the Golden Cross of Honor for her work in nutrition and public health. In 2011, she received the Federation of European Nutrition Societies (FENS) Award for her “outstanding nutritionist career”. Her scientific work has focused on public health nutrition and nutrition epidemiology, with emphasis on the health effects of the Mediterranean diet and traditional foods.

Barbara Trosch

June ‘14- now: Senior Scientist at DSM Nutritional Products, R&D, responsible for human studies with focus on iron and zinc deficiency, improving mineral bioavailability with phytase.

April ‘11 – May ‘14: Scientist at DSM Nutritional Products, R&D, responsible for human studies with focus on iron and zinc deficiency, improving mineral bioavailability with phytase.

October ‘07 – Dec. ‘10: Dissertation at the Laboratory for Human Nutrition, ETHZ, Zurich on “Correcting iron deficiency with a low iron micro-nutrient powder- A promising approach for malarial areas and beyond.”


Sept ’95 – Aug ’00: MSc Food Science & Nutrition, ETHZ, Zurich.

Ricardo Uauy

Prof. Ricardo Uauy is a renowned Chilean professor of nutrition and pediatrics at INIA (Institute of Nutrition University of Chile) and at the London School of Hygiene and Tropical Medicine. He has served as President of the Chilean Nutrition Society, and is former President of the International Union of Nutritional Sciences (IUNS). He has participated as an expert in various WHO/FAO Expert Consultations, and chaired the WHO/FAO consultation on Diet, Nutrition and Physical Activity Prevention of Chronic Diseases (TRS 916). Prof. Uauy has served on the board and task forces of various health and nutrition organisations and has contributed to over 400 peer-reviewed scientific publications on various aspects of human nutritional needs in health and disease, and has co-edited five books. His present research interests include: obesity and other nutrition related NCDs, international health and nutrition.

Gregorio Varela Moreiras

Full Professor in Nutrition & Food Science at the San Pablo CEU University (Madrid, Spain) where he leads the Department of Pharmaceutical and Health Sciences, and the competitive research group on “Nutrition and Food Sciences”. At present, he is also President of the Spanish Nutrition Foundation (FEN) and past-President of the Spanish Nutrition Society (SEN). Member of the Board of the Spanish Society of Community Nutrition (SECC). He is also member of the Scientific Committee Board of ILSI Europe and EPCDE International Network. He is funding Member of the Spanish Academy of Nutrition and Food Sciences (AEN) and Member of the Board of Directors of the Royal Academy of Gastronomy (SPAIN). He has been involved in more than 30 Research Competitive Grants either international (USA, EU) or national (Ministry of Education and Research of Spain, Ministry of Health and Consumer Issues of Spain, Regional Governments of Castilla-Leon, Galicia and Madrid), as well as over 30 industry contracts as PI. He has published over 180 scientific articles and has published 15 books as editor and over 70 chapters in books.

Florence Vasta

Florence Vasta obtained her undergraduate degree in Neurobiology and Physiology at the University of Maryland. She later received a MSPH, with a concentration in epidemiology in the department of international health at Johns Hopkins Bloomberg School of Public Health (JHSPH). Her thesis focused on adolescent health and chronic disease risk, related to the nutrition transition in Jakarta, Indonesia. While at Hopkins, she also worked with researchers at the Institute of Nutrition of Central America and Panama (INCAP) on projects involving the double burden of obesity and stunting in children residing in urban poor areas of Guatemala. As a consultant, Ms. Vasta worked with the IAEA on a study measuring body composition and association with cardiometabolic risk in Latin American children. She is currently a technical specialist at the Global Alliance for Improved Nutrition (GAIN) in Washington, DC, with an emphasis on maternal, infant and young child nutrition, developmental origins of health and disease, and the double burden of malnutrition. She continues her research studies in collaboration with Dr. Caballero at the JHSPH.

M.G. Venkatesh Mannar

M.G. Venkatesh Mannar is a champion and technology leader in global nutrition with 35 years experience in pioneering effective international nutrition, technology and development initiatives focused on the world’s most vulnerable citizens.

A chemical engineer and food technologist by training (IT Madras, Northwestern University), Mannar served as President of the Micronutrient Initiative (MI) in Ottawa for nearly 20 years until February 2014. In that role Mannar directed the organisation’s mission to develop, implement and monitor cost-effective and sustainable solutions for micronutrient deficiencies. Under his leadership, MI has grown to play a major role in the expansion of supplementation and food fortification programmes to address hidden hunger in Africa, Asia, Latin America and the Middle East.

In 2013, Mannar was appointed an Officer of the Order of Canada, one of the country’s greatest civil honours, for his leadership in the global fight against malnutrition and micronutrient deficiencies.

Through his recent appointment as Adjunct Professor in the Department of Chemical Engineering & Applied Chemistry, University of Toronto, Mannar is pursuing his research and teaching interests in the application of engineering principles to improve nutrition status through nutrient stability enhancement in fortified foods and rapid diagnostic methods for field assessment of nutrient status.

Roos Verstraeten

Roos Verstraeten (*10 October 1981, Belgium) graduated as Industrial Engineer in Biochemistry in 2004. A year later, she obtained a master’s degree in Food Science and Nutrition from Ghent University. She has worked as a junior consultant in nutrition in Vietnam and Burundi. Following her pre-doctoral dissertation, she began working as a doctoral researcher in the Food Safety and Food Quality department of Ghent University, and within the Child Health and Nutrition unit at the Institute of Tropical Medicine, Antwerp. During this period, she developed a school-based health promotion intervention in Ecuadorian adolescents, performed several long stay studies in Ecuador, participated in teaching, and supervised 10 (inter) national thesis students and 5 interns. She completed her doctoral training and obtained her PhD in Bioscience Engineering in 2014. Since 2013, she is a scientific officer at IITM and is currently working on the development of an evidence-based international knowledge network (EVIDENT). Roos is (co-)author of several peer-reviewed articles and has actively participated at multiple (inter)national conferences and symposia. She is Conference Director of the European Nutrition and Leadership Platform and has received the ‘Young Investigators Award for outstanding oral communication.’

Peter Weber

Professor Peter Weber received his Ph.D. in Nutritional Sciences from the University of Bonn, Germany and his M.D. from the University of Münster, Germany. After working for two years at the ‘Research Institute of Child Nutrition’, Dortmund, Germany he trained in internal medicine at the University of Mainz, Germany. He is a Professor of Nutrition at the University of Stuttgart-Hohenheim, Germany and gives lectures in Human Nutrition and Health. He has more than 70 peer-reviewed publications in the field of iodine deficiency and goiter, thyroid diseases, metabolic syndrome, postprandial lipid metabolism, vitamin K, vitamin status of populations, the role of vitamins and polyunsaturated fatty acids in human health and he is a co-editor of a book on vitamins. His scientific interests include the role of micronutrients in the prevention of diseases, nutritional status in risk groups such as elderly and in the emerging tropical diseases. In 1993 he joined Hoffmann-La Roche in New Jersey, USA and in July 2004 he was appointed Corporate Scientist for Human Nutrition & Health in DSM Nutritional Products in Kaiseraugst, Switzerland which includes the responsibility for the DSM Corporate Research Program for Nutrition.
Keith P. West

Keith P. West, Jr., Dr.P.H., R.D. is the George G. Graham Professor of Infant and Child Nutrition and Director of the Center for Human Nutrition and Sight and Life Global Nutrition Rostoch Institute within the Department of International Nutrition at the Johns Hopkins Bloomberg School of Public Health in Baltimore, Maryland. He is a Registered Dietitian and earned his Master’s and Doctoral Degrees in Public Health at the Johns Hopkins University. Early in his career, Dr. West served as a Registered Dietitian in the US Army, reaching the rank of Major. Dr. West has worked in international nutrition for 35 years, conducting nutrition intervention trials and epidemiological studies to prevent vitamin A and other micronutrient deficiencies and their health consequences in children and women. He has worked extensively in Bangladesh, Nepal, and Indonesia. Professor West has over 180 scientific publications and was the 2007 recipient of the American Society of Nutrition’s International Nutrition Prize.

Simon Wieser

Simon Wieser is Professor for Health Economics at the Zurich University of Applied Sciences (Switzerland) and head of health economic research at the Winterthur Institute of Health Economics (www.wig.zhaw.ch). He holds a Master degree in economics from the University La Sapienza in Rome and a PhD in economics from University of Zurich. He previously worked for over ten years as a researcher and lecturer at the Swiss Institute for Business Cycle Research of the Swiss Federal Institute of Technology Zurich (ETH) in Zurich. His current main research interests are in health economic evaluations, with a particular focus on public health and nutrition in developing countries, in the assessment of the overall social costs of diseases and in the development prospective payments systems for inpatient care in Switzerland.

Walter Willett

Dr. Walter Willett is Professor of Epidemiology and Nutrition and Chairman of the Department of Nutrition at Harvard School of Public Health and Professor of Medicine at Harvard Medical School. Dr. Willett, an American, was born in Hart, Michigan and grew up in Madison, Wisconsin, studied food science at Michigan State University, and graduated from the University of Michigan Medical School before obtaining a Doctorate in Public Health from Harvard School of Public Health. Dr. Willett has focused much of his work over the last 35 years on the development of methods, using both questionnaire and biochemical approaches, to study the effects of diet on the occurrence of major diseases. He has applied these methods starting in 1980 in the Nurses’ Health Studies I and II and the Health Professionals Follow-up Study. Together, these cohorts that include nearly 300,000 men and women with repeated dietary assessments are providing the most detailed information on the long-term health consequences of food choices.

Dr. Willett has published over 1,500 articles, primarily on lifestyle risk factors for heart disease and cancer, and has written the textbook, Nutritional Epidemiology, published by Oxford University Press. He also has four books for the general public, Eat, Drink and Be Healthy: The Harvard Medical School Guide to Healthy Eating, which has appeared on most major bestseller lists, Eat, Drink, and Weigh Less, co-authored with Melville Katzen, The Fertility Diet, co-authored with Jorge Chavarro and Pat Skrereet, and most recently Thinfuence, co-authored with Melissa Wood and Dan Childs. Dr. Willett is the most cited nutritionist internationally, and is among the five most cited persons in all fields of clinical science. He is a member of the Institute of Medicine of the National Academy of Sciences and the recipient of many national and international awards for his research.

Agneta Yngve

Professor Agneta Yngve, PhD, MSc, MPH, is a public health nutritionist currently working in the area of culinary arts and meal sciences. She has authored more than 150 papers, whereof 70 original papers, several reviews and editorials. She was the Editor-in-chief for the journal Public Health Nutrition from 2007-2012. During her career she has focused on research on childhood nutrition, and published in the area of breastfeeding, breastmilk composition, fruit and vegetable intake among children and their mothers, overweight and obesity research, professional development and physical activity promotion. She is currently Faculty Professor at the School of Hospitality, Culinary Arts and Meal Science at Örebro University, Sweden. She has previously spent 26 years at Karolinska Institutet, Stockholm, Sweden.

Gerardo Zamora

Gerardo Zamora has joined the Evidence and Programme Guidance (EPG) Unit, Department of Nutrition for Health and Development (NHD), as Consultant. He is working on health equity and implementation research related to the WHO Global Targets 2025 and on developing policy-oriented tools to achieve them. Mr Zamora is a sociologist specialised in public health with over ten years’ experience in development and health-related research at the international level. His main areas of expertise are in social determinants of health, as well as social and health care coordination/integration. Before joining the EPG Unit as consultant, he was Head of Projects of the Etorbizi Programme at the Basque Foundation for Health Innovation and Research (BIOEF), in Spain. Previously, he was Researcher and Deputy Director of Research at Ingerma, a research institute on ageing in San Sebastian, Spain. Mr Zamora has been a consultant to United Nations Educational Scientific and Cultural Organization (UNESCO) and International Labour Organization (ILO) in Europe and Latin America. He holds a Bachelor of Sciences in Sociology from the University of Costa Rica, a Master of Arts in Human Rights and Needs from the Universidad Autónoma de Madrid, and a Master of Science in Health Research from the Universidad Pública de Navarra, where he is also finalising his doctoral dissertation in the Public Health Programme. He is a member of several scientific associations, including the International Sociological Association.
Body fat excess is associated with insulin resistance and inflammation. Main objective was to identify this association in school children. Methods: Case-control study in 2012 with 51 women (30-40 years old). Diet history was adjusted for age, weight, and body mass index. Results: Women with higher BMI were more likely to have higher fat mass (OR=1.6; 95%CI 1.2-2.0) and lower fat-free mass (OR=0.7; 95%CI 0.6-0.8). Conclusion: The association between BMI and body fat mass is consistent with the current study.

Background and Objectives: Current study was carried out in 2012, obesity and overweight among adolescents and girls is continuously increasing. To provide current estimates of the prevalence and trends of overweight and obesity among adolescents in the country, we compared the data of two national surveys conducted in 2001 and 2012 as a national integrated multisectoral monitoring system (NMMS).

Material and Methods: Data of the two national surveys (2001, 2012) were collected for two groups of adolescents (15-19 years old boys and 16-19 years old girls). Both surveys were cross-sectional and the samples were nationally and regionally (eleven regions in the country) representative.

Standard measuring protocols were used in both surveys. Estimates of the prevalence of overweight and obesity were defined as >85th to <95th and >95th percentile of body mass index (BMI) for age and gender.

Results: In 2001, 2.4% of Iranian adolescent boys and 3.2% of girls were overweight and obese. In 2012, the prevalence of overweight and obesity was 19.9% (CI 95%, 18.6%–21.2%) and 24.1% (CI 95%, 23.0%–25.5%) among boys and girls respectively.

Conclusion: Over the 11-year period from 2001 through 2012, obesity showed significant increase among boys and girls respectively (P<0.001) which carries a higher risk for adult obesity and related diseases.

The current study suggests that overweight and obesity are related to the intake of refined foods, carbohydrates, sodium, and animal fat. Our study showed that the 58.33% of children and their mothers were selected in a randomized way for the current project. Inclusion criteria were: children between the age of 8 to 24 months, diagnosis of malnutrition with Z-score < 3 and the mother present during the children's evaluation. A semi-structured interview was conducted with the mothers. In addition, The Ragel psychometric test was used to evaluate object permanence among those children. The latter test involved the division of children according to their age: group 1 (8-12 months), group 2 (12-18 months) and group 3 (18-24 months). Non-biological mothers, children suffering from Kwashiorkor and chronic malnutrition were excluded from the study.

Results: The 58.33% children maintain a good body posture despite their nutritional status. In addition, infant's crawling, walking in four legs, remained stable and strong. However, 64,522 of malnourished children with severe acute malnutrition (SAM) were unable to remain upright in a standing position and 75% lost sight of walking and crawling with support. A more critical finding was the increasing rate of language impairment among 66,67% of children suffering from SAM. In regards to the acquisition of object permanence, it was found that within the group 1, only 10% of children were able to mentally represent and look for the object, and for group 2, 16.67% performed better than their counterparts.

Key Findings: The current study suggests that malnutrition has a negative impact on children between the age of 8 and 24 months. Of special importance, it was found that the widespread effect of malnutrition affects primary on different behavioral dimensions: language, sensory - motor development and memory. The present study was also important in that it revealed that malnutrition was multisectoral actions for children with SAM must be ensured to prevent detrimental effects on their development from happening.

OT-001 Oral communication

Body fat and inflammation in cuban school children.

Hernández-Trinidad M, Ruiz-Alvarez V, Díaz-Sánchez ME, Viera-Cosiñol E, Her­nández-Hernández H, Rta-Rodríguez G

Department of Biochemistry and Physiology Institute of Nutrition. Havana, Cuba.

OT-003 Oral communication


Rahbar FH, Siassi F, Mohammad K, Davod-Ary A1, Dorosty AR, Abdollahi Z1
1School of Nutritional Sciences and Dietetics, Tehran University of Medical Sciences (TUMS), Tehran, Iran, 2 School of Public Health, Tehran University of Medical Sciences (TUMS), Tehran, Iran, 3 Nutrition Department, Ministry of Health & Medical Education, Tehran, Iran

OT-004 Oral communication

The effect of malnutrition on the sensory motor development among children from 8 to 24 months, in Mayahi District, Matra­di Region, Niger.

Rivero E1, Aboubacar M2, Charles P2
1Acción Contra el Hambre, 2Université Abdou Houmouni of Niamey.

Objectives: The sensory-motor development represents an interesting phenomenon yet remains unknown in children. The sensory-motor development occurs in the period from 0-2 years old and leads to the acquisition of different behavioral dimensions. These are body posture, locomotion, categorization, memory, the development of language and most important the development of early attachment with the primary caregiver. The objective of the current study is to evaluate and analyze the impact of malnutrition on language, posture and the acquisition of object permanence.

Material and Methods: A cross-sectional study was carried out in the Therapeutic Feeding Center in Mayahi from October to November 2013. 66 children and their mothers were included in this study. Anthropometry was used to calculate the child's BMI z-score. The anthropometric criteria were: (a) z-score <-25.5% among boys and girls respectively (P<0.001) which carries a higher risk for adult obesity and related diseases. Overweight and obesity were defined as >85th to <95th and >95th percentile of body mass index (BMI) for age and gender.

Conclusion: In 2001, 2.4% of Iranian adolescent boys and 3.2% of girls were overweight and obese. In 2012, the prevalence of overweight and obesity was 19.9% (CI 95%, 18.6%–21.2%) and 24.1% (CI 95%, 23.0%–25.5%) among boys and girls respectively.

Results: In 2001, 2.4% of Iranian adolescent boys and 3.2% of girls were overweight and obese. In 2012, the prevalence of overweight and obesity was 19.9% (CI 95%, 18.6%–21.2%) and 24.1% (CI 95%, 23.0%–25.5%) among boys and girls respectively.

Conclusion: Over the 11-year period from 2001 through 2012, obesity showed significant increase among boys and girls respectively (P<0.001) which carries a higher risk for adult obesity and related diseases.

The current study suggests that overweight and obesity are related to the intake of refined foods, carbohydrates, sodium, and animal fat. Our study showed that the 58.33% of children and their mothers were selected in a randomized way for the current project. Inclusion criteria were: children between the age of 8 to 24 months, diagnosis of malnutrition with Z-score < 3 and the mother present during the children's evaluation. A semi-structured interview was conducted with the mothers. In addition, The Ragel psychometric test was used to evaluate object permanence among those children. The latter test involved the division of children according to their age: group 1 (8-12 months), group 2 (12-18 months) and group 3 (18-24 months). Non-biological mothers, children suffering from Kwashiorkor and chronic malnutrition were excluded from the study.

Results: The 58.33% children maintain a good body posture despite their nutritional status. In addition, infant's crawling, walking in four legs, remained stable and strong. However, 64,522 of malnourished children with severe acute malnutrition (SAM) were unable to remain upright in a standing position and 75% lost sight of walking and crawling with support. A more critical finding was the increasing rate of language impairment among 66,67% of children suffering from SAM. In regards to the acquisition of object permanence, it was found that within the group 1, only 10% of children were able to mentally represent and look for the object, and for group 2, 16.67% performed better than their counterparts.

Key Findings: The current study suggests that malnutrition has a negative impact on children between the age of 8 and 24 months. Of special importance, it was found that the widespread effect of malnutrition affects primary on different behavioral dimensions: language, sensory - motor development and memory. The present study was also important in that it revealed that malnutrition was multisectoral actions for children with SAM must be ensured to prevent detrimental effects on their development from happening.
The Effect of Daily Vitamin B12 and Folic acid Supplementation on Growth in 6-24 Month Old Children in India: A Randomized Controlled Trial.

Strand T.A.1, Tanjale S.1, Kumar T.1, Manger M.S.1, Refsum H.1, Vajnik C.S.1, Bhardani N.1
1 Society for Applied Studies, New Delhi, India. 2 Society for Essential Health Action and Training, New Delhi, India. 3 Inlandated Hospital Trust, Ullensaker and Centre for International Health, University of Bergen, Norway. 4 Centre for International Health, University of Bergen. 5 Department of Nutrition, Institute of Basic Medical Sciences, University of Oslo, Norway, and Department of Pharmacology, University of Oxford, United Kingdom. 6 Diabetes Unit, King Edward Memorial Hospital, Pune, Maha rashtra, India.

Background: Folic acid and vitamin B12 are important for growth. Many children in low and middle-income countries have inadequate intake of these nutrients.

Methods: We undertook a randomized, placebo controlled, double blind trial in 1000 North Indian children, 6 to 35 months of age providing 2 RDA of folic acid and/or vitamin B12, or placebo, daily for six months. In a factorial design, we allocated children in a 1:1:1:1 ratio in blocks of 16. We measured the effect of giving vitamin B12, folic acid, or the combination of the two on linear and ponderal growth. We also identified predictors for growth and effect-modifiers for the effects of our interventions on growth in multiple regression analyses.

Results: Compared to placebo, administration of vitamin B12 in combination with folic acid increased the mean weight and length by 116 g (95% CI: 1.3, 210 to 0.35 cm (95% CI: 0.0, 0.66), respectively. There was no overall effect of giving either of the nutrients alone. Weight for age z scores and height for age z scores increased substantially and significantly following vitamin B12 supplementation in wasted, underweight, and stunted children (P for interaction <0.01). Vitamin B12 status at baseline predicted normal and ponderal growth at the children not receiving vitamin B12 supplements but not in those who did (P for interaction <0.001).

Conclusions: We provide evidence that poor vitamin B12 status contribu­te to poor growth. We recommend local studies to identify the optimal approach for intervention and for confirming our findings.

Source of Support: Thresher Research Fund (grant no Q22R7), and the Research Council of Norway (project no. 172226). South-Eastern Norway Regional Health Authority (grant no. 2012090).

Sodium intake is associated with higher blood pressure in children of 4-5 years old.

Valera-Gran D1, Navarrete-Muñoz EM2, García de la Hera M3, Rodríguez-Bernal CL1, Ballester F2,4, Vique L1
1Universidad Miguel Hernández, Spain. 2CIBERESP. 3FISABIO. 4Universitat de Valencia, Spain

Objective: Sodium intake has been associated with higher risk of high blood pressure among adults. We examined the association between systolic blood pressure (SBP) and diastolic blood pressure (DBP) and usual daily intake of sodium (Na) and the main foods contributing to daily Na among children at the age of 4-5 years.

Material and methods: Participants were 569 children 4-5 years old from the INMA study, a population-based and prospective mother-child cohort study in Valencia, Spain. Blood pressure (BP) was obtained in a sitting position after a 5 minute child rest (three measurements were attempted for all children at intervals of 2-3 min with an OMRON M4-A device). We used the lowest BP measurement for the analysis. Usual daily Na intake and the main foods contributing to Na intake were estimated by a validated Food Frequency Questionnaire (FFQ). Other covariates in the analysis were child and mother age, child gender, body mass index (BMI=kg/m²), energy intake (KCal/s) and usual potassium intake. Multiple linear regression was used to estimate the association between Na intake and SBP/DBP.

Results: The mean Na intake was 2066 mg/day (SD 246.3). The main food sources of Na intake in children were processed meat (cured and cooked ham, 8.04%), processed meats "embutidos", 6.03%; sausages 4.4%, breads (white bread, 13.0%), whole bread, 0.7%; bakery products, 0.8%), breakfast cereals (0.2%), legumes (3.3 %), salt added on the table (2.2%). Every 1000 mg/day increase of Na intake was associated with an increase of 6.02 mm Hg in SBP (95%CI; 1.77-10.27). The SBP also increased significantly (p <0.05) for every 10 g/d of processed meats (β=0.86), bread (β=0.54), breakfast cereals (β=0.64) and per every gram of added salt (β=0.45). The DBP only increased significantly with the increase of consumption of bread (β=0.39). These significant associations found with untransformed data, remained very similar in magnitude and significance when log-transformed and z-scores were used for SBP/DBP.

Key findings: A higher sodium intake and consumption of foods with high sodium content (eg, white bread, processed meats, cereals and processed salt intake) is associated with higher blood pressure among chil­dren 4-5 years old, particularly for SBP. These findings reinforce the importance of implementing strategies to reduce Na intake and Na content in some processed foods frequently eaten by children.

Effect of n-6 and n-3 polyunsaturated fatty acids intake at 4 years old on body fat patterns at 7 years old in the Generation XXI birth cohort.

Santos S.1, Lopes C.1,2, Oliveira A.1,2
1 Institute of Public Health, University of Porto, Portugal. 2 Department of Clinical Epidemiology, Predictive Medicine and Public Health, University of Porto Medical School, Portugal.

Objectives: Maternal intake of polyunsaturated fatty acids (PUFA) during gestation and lactation are believed to alter the adipose tissue development of the offspring (n-6 stimulate adipogenesis; n-3 inhibit adipogenesis). However, the effect of these fatty acids intake during early childhood on later adiposity still needs to be clarified. Our aim was to prospectively assess the effect of n-6 and n-3 PUFA intake at 4 years old on body fat patterns identified at 7 years old.

Material and methods: Generation XXI is a population-based birth cohort assembled during 2005-2006 at all public maternity units of Porto, Portugal. These preliminary analyses include singleton children with 3-day food records at 4 years old and body fat patterns identified at 7 years old (n=1958). The intake of n-6 and n-3 PUFA (g/day) at 4 years old was assessed with 3-day food records filled in by parents and/or caregivers and then was expressed as n-6/n-3 ratio. Body mass index (BMI), waist-to-height ratio (WHtR), waist-to-thigh ratio (WHR), waist-to-thigh ratio (WHR=waist circumference/Weight) and fat mass index (FM=Fat mass from tetra-polar bioelectric impedance/height²) were obtained at 7 years old by trained personnel and then were used to identify body fat patterns by principal component analysis. Regression coefficients (β) and 95% confidence intervals (CI) were obtained from linear regression models.

Results: Two patterns of body fat, similar by sex and explaining 88% of total variance, were identified: a pattern 1 characterized by BMI, FM and WHR and a pattern 2 by WHR, WTR and WMR that allow the study of fat quantity and distribution, respectively (higher scores in each pattern mean higher values of the included measures). For these participants, the median n-6/n-3 ratio was approximately 13/1. In a multivariable regression model (adjusted for child’s sex, total energy intake, BMI (for pattern 1) or WHR (for pattern 2) at 4 years old and maternal BMI), each increase of 0.17 in n-6/n-3 ratio was not significantly associated with pattern 1 (β=0.025; 95% CI: 0.012-0.061), but was significantly and positively associated with pattern 2 (β=0.069; 95% CI:0.012-0.126).

Key findings: A higher n-6/n-3 ratio at 4 years old seems to be linked to the development of central fat distribution at 7 years old. Dietary interventions should target the adequate balance of n-6 and n-3 PUFA intake during early childhood.

Obesity, physical inactivity, and homeostasis model assessment (HOMA) as predictors for prediabetes among Egyptian adolescents.

Clinical Nutrition Department; National Nutrition Institute (NNI), Cairo, Egypt

Objectives: To revise the prevalence of glucose disorders among ado­lescents, to test for the presence of insulin resistance among those with glucose disorders particularly the obese, to clarify the associa­tion between obesity and physical inactivity and dietary fat, and to evaluate HOMA-R and fasting blood glucose as screening and monitoring tests among adolescents with glucose disorders.

Materials and methods: A probabilistic multistage cross-sectional sample representative of Egyptian preparatory and secondary school students was taken. 4251 were assessed by measuring their fasting blood glucose levels. Those were the targets of this study. Three main sources of data were reported to cover topics related to obesity, diabe­tes, hypertension and physical activity. Blood pressure, weight, height, waist and BMI were measured and referred to their corresponding international reference values properly matched for age and sex.
A fasting blood sample was drawn to assess lipid (total cholesterol; TC, and triglycerides, TG), lipoprotein patterns (low density lipoprotein; LDL-c, and high density lipoprotein; HDL-c), and fasting plasma insulin. HOMA was calculated using a computer-derived equation to assess body response to insulin among target groups.

Results: The prevalence of D.M. among Egyptian adolescents is 0.7% with no age, gender, or area of residence predilections. Pre-diabetic state was present among 15.0% of adolescents in the pre-pubertal stage and adolescents in the post-pubertal stage. Fasting lipid and lipoprotein profile were similar in all glucose categories but high blood pressure; of either type, was more prevalent among the pre-diabetic adolescents. Obese adolescents are more to have DM in their families than non-obese. The risk for adolescents with BMI above 85th percentile to have high systolic or diastolic blood pressure, high TG, or high LDL-c was nearly double that for non-obese as reflected by odds ratio. The risk was three times more in presence of central obesity (waist circumference > 90th percentile). Receiving more than 30% of total energy from fat was more prevalent among adolescents with central obesity. Physically inactive adolescents have 1.5 times the risk for obesity, and 1.2 times the risk for hypertensive disorder more than the physically active adolescents.

Conclusion: Type 2 DM in young is serious in terms of morbidity and mortality suggesting that it may be appropriate target for screening. School-based programs promoting healthy eating and increasing physical activity are recommended for prevention of obesity.

OT-009 Oral communication
The effect of socioeconomic and biological factors on infants' weight gain: Brazilian Demographic and Health Survey - 2006/07.
Silveira JA, Colugnati FA, Piacquadio AJ, Tadei JA.
Department of Pediatrics, Universidade Federal de São Paulo – São Paulo, SP, Brazil. Núcleo Interdisciplinar de Estudos e Pesquisas em Nutrologia - Universidade Federal de Jutão de Fora – Jutão de Fora, MG, Brazil.

Objective: To analyze the effects of socioeconomic and biological factors on infants' weight gain.

Methods: All infants (0-23 months-old) with available birth and postnatal weight data (n=1763) were selected from the last nationally representative survey with complex probability sampling conducted in Brazil (CIDADE, 2006). The outcome variable was the Conditional Weight Gain (CWG), which represents how much an individual has deviated from his expected weight gain, given the birth weight. Effects were estimated using simple and hierarchical multiple linear regression, considering the survey sampling design, and presented in standard deviations of CWG with their respective 95% confidence intervals. Hierarchical models were designed considering the UNICEF Conceptual Framework for Malnutrition (basic, underlying and immediate causes).

Results: The poorest Brazilian regions (<0.14-0.25; -0.04) and rural area (-0.14-0.25; -0.02) were inversely associated with CWG in the basic causes model. However, this association disappeared after adjusting for maternal and household characteristics. In the final hierarchical model, lower economic status (<0.10;0.17; -0.04), maternal education <4th grade (<0.16;0.32; -0.03), high food cost (0.00-0.02; 0.00-0.1) and fever in the past 2 weeks (<0.13-0.27; 0.01) were associated with postnatal weight gain.

Key findings: Our results showed that poverty and lower human capital are still key factors associated with poor postnatal weight gain. The approach used in our analyses was sensitive to characterize inequalities among different socioeconomic contexts and to identify factors associated with CWG in different levels of explanation. This knowledge may foster the planning and evaluation of health and nutrition programs and policies.

OT-010 Oral communication
Dietary patterns and overweight among 4-6 years-old children.
Durão C, Severo M*, Oliveira A*, Moreira P*, Guerra A*, Lopes C*
 Instituto of Public Health, University of Porto. 1 Department of Clinical Epidemiology, Predictive Medicine and Public Health, University of Porto Medical School. 2 Faculty of Nutrition Sciences, University of Porto. 1 Department of Pediatrics, University of Porto Medical School

Objectives: To evaluate the associations between children’s dietary patterns and consumption of specific foods with overweight at 4 years of age. Material and Methods: This study involved a sub-sample of 5011 children aged 4 years, enrolled on the Portuguese population-based birth cohort – Generation XXI (Porto, Portugal). Data was collected using structured questionnaires applied by trained interviewers. Children’s dietary intake was assessed with the Food Frequency Questionnaire, administered to their primary caregivers. For each item, consumption was converted into daily frequencies, further categorized into lower (first quintile), intermediate (second-fourth quintiles, aggregated) and higher (fifth quintile). Diets were identified by latent class analysis. Children's and mothers' weight and height were measured using standard procedures. Children's body mass index standard deviation scores were calculated and categorized into normal vs. overweight (≥2SDs vs.>2SDs), according to the World Health Organization's cut-offs. Binomial logistic regression models were used to examine the associations between dietary exposures and overweight, estimating Odds Ratios and 95% Confidence Intervals (OR, 95% CI).

Results: The Bayesian information criteria supported a solution of three dietary patterns: 1. "EDF" - higher in energy-dense-foods and dairy; 2. "LFP" - lower in healthy foods (vegetables, fruit, fish); 3. "Healthier" - higher in healthy foods and lower in unhealthy ones (energy-densefoods, red meat) (pattern 3 used as reference). In the univariate analysis, both healthier dietary patterns were associated with higher odds of overweight prevalence (EDF OR=1.29; 95% CI:1.02-1.63; LFP OR=1.23; 95% CI:1.01-1.54). After adjustment for children’s sex, age, daily screen time, structured physical activity, maternal eating and smoking habits, body mass index characteristics, these associations did not remain statistically significant.

Analyzing the isolated food groups, after adjustment for children’s and maternal characteristics, consumption of milk (higher vs. lower OR=0.62; 95% CI:0.42-0.91), fruit (intermediate vs. lower OR=0.73; 95% CI:0.54-0.97) and vegetable soup (higher vs. lower OR=0.62; 95% CI:0.51-0.75) was significantly and negatively associated with overweight.

Key findings: This study supports a possible protective effect of fruit, vegetable soup and milk consumption on overweight among children in 4 years of age. Composite measures combining foods into patterns did not show any significant association.

OT-011 Oral communication
Impact of underweight on pneumonia mortality in children: results from a twelve years national database in Malawi and a systematic review of literature.
Sonengo M.1,2; Pellegrin M.C.; Seward N.1; Lazzerini M.1,3
1 WHO Collaborating Centre for Maternal and Child Health, Institute for Maternal and Child Health IRCCS Burlo Garofolo, Trieste, Italy. 2 Department of Medicine, Surgery, and Health Science, University of Trieste, Italy. 3 Institute of Global Health, University College London, London, UK

Objectives: About 1.4 million children die every year from pneumonia, most of them in low and middle-income countries. On the other hand, underweight is highly prevalent in these countries: in 2011, 3.3% of children younger than five years were severely underweight and 17.4% moderately underweight. To explore the association between being underweight and pneumonia mortality, we analysed data on children admitted for pneumonia in a 12-years period in Malawi and we conducted a systematic review and meta-analysis of observational studies.

Materials and Methods: - Malawian database: we collected all the individual patients’ charts of children younger than five years admitted for pneumonia in 40 Malawian hospitals during the period 2001-2012. Data were inputted in a database and analysed with STATA 12. We calculated the crude Odds Ratio (OR) and 95% confidence interval (95%CI) for death from pneumonia in severe underweight (weight-for-age z-score <-3 standard deviations) and moderate underweight (-3 to -2 standard deviations). We performed a joint meta-multivariate analysis to calculate the Odds Ratio adjusted for sex and age.

- Systematic Review: we searched Medline, Embase, Lilacs, Web of Science, and Global Health Library for published observational studies reporting the association between underweight and pneumonia mortality in children younger than five years in low and middle-income countries. No date or language filters were applied. Data were meta-analysed using a random-effects model.

Results: - Malawian database: of the 100,936 cases (6,563 deaths) of pneumonia with complete data (89.0% of the total), 11.0% were severely underweight and 12.8% moderately underweight. Univariate analysis showed an increased odds of death in both severe underweight (OR 4.8; 95% CI 4.5-5.1) and moderate underweight (OR 2.2; CI 1.9 2.1-2.4). After adjustment for age and sex the ORs increased to 5.3 (95% CI 5.0-5.9) and 2.5 (95% CI 2.3-2.7), respectively.

- Systematic Review: we identified 26 studies from 11 countries, including 18,890 children. The pooled OR for death from pneumonia was 4.3 (95% CI 3.5-5.4) for severe underweight (17 studies) and 2.5 (95% CI 1.9, 3.3) for moderate underweight (16 studies). Substituting the adjusted ORs to the crude ORs in the meta-analysis did not change the results for moderate underweight but increased the pooled OR for severe underweight (OR 5.2; 95% CI 3.8-7.2).

Key findings: These two different types of data and analysis led to similar results, confirming that underweight remains a major risk factor for pneumonia mortality in children in low and middle-income countries.
OT-012 Oral communication
Sonego M,1 Sagrado MP,2 Rivas E,3 Escobar G4, Martín-Cañavate R5, Custodio E6
1WHO Collaborating Centre for Maternal and Child Health, Institute for Maternal and Child Health IRCCS Burlo Garofolo, Trieste, Italy. 2Department of Medicine, Surgery, and Health Science, University of Trieste, Italy. 3Centro Nacional de Epidemiología, Instituto de Salud Carlos III, Spain. 4Centro de Excelencia para Niños con Inmunodeficiencias, Hospital de Niños Benjamin Bloom, El Salvador. 5Centro Nacional de Medicina Tropical, Instituto de Salud Carlos III, Spain.

Objectives: Dyslipidemia is common in HIV-infected children, due to the infection itself and the anti-retroviral drugs, particularly protease-inhibitors. We aimed to study the prevalence of dyslipidemia and its association with diet and physical activity in children in anti-retroviral treatment in El Salvador.

Materials and Methods: We surveyed 270 children aged 5-18 years in anti-retroviral therapy at a reference centre of El Salvador. Anthropometric measures were obtained and information gathered on socio-demographic characteristics, type and length of therapy, diet and physical activity. Triglycerides, total cholesterol, low-density lipoprotein (LDL), high-density lipoprotein (HDL), viral load, and CD4 concentration were measured.

Abnormal lipid concentrations were defined as triglycerides ≥130 mg/dl in children aged 10-19 years and ≥100 mg/dl in < 10 years; total cholesterol ≥200 mg/dl, LDL ≥130 mg/dl and HDL ≤35 mg/dl. Dietary patterns were identified by principal component analysis and the “high fat/sugar diet” pattern was used as a proxy of unhealthy diet. We performed a descriptive analysis by sex, and adjusted four logistic multivariate models to assess the association of each type of dyslipidemia with diet and physical exercise.

Results: Of the 270 children - 80 of whom taking protease-inhibitors - 128 (47.4%) had high triglycerides and 36 (13.3%) high total cholesterol concentrations. High LDL were observed in 171/176 children (9.7%) and low HDL in 39/183 (21.3%). No differences by sex were found in the lipid profile nor in the adherence to the unhealthy diet, but significantly more boys than girls were doing exercise at least three times a week (81.4% versus 59.2%, p<0.001).

Treatment with protease-inhibitors was associated with high triglycerides (Odds Ratio (OR) 10.9 95% CI 1.5-72.3) and cholesterol (OR 7.3 95% CI 2.9-18.5). After adjustment for the rest of variables, children in the highest tertile for “unhealthy diet” showed a 1.8 increased odds (95% CI 1.1-2.8) for high cholesterol and a 1.9 increased odds for high LDL (95% CI 1.1-3.6) with respect to those in the two lower tertiles. Compared with those exercising less than three times a week, children exercising more often were less likely to have low HDL (OR=0.34 95% CI 0.11-1.1 for 3-6 times a week and OR=0.23 95% CI 0.08-0.67 for more than six times).

Key findings: These results suggest that a healthy diet and exercise habits could be helpful in controlling some aspects of the lipid profile in this population. Girls should be encouraged to exercise more, due to the low frequency of regular physical activity in this group.

OT-013 Oral communication
The contribution of yellow cassava to nutrient adequacy of primary school children; the use of linear programming.
Talma EJ,1 Borogonce-Van den Berg KJ,1 Melse-Boonstra A, Ferguson EL,2 Kok FJ,3 Brouwer ID4
1Division of Human Nutrition, Wageningen University, the Netherlands. 2London School of Hygiene and Tropical Medicine, Faculty of Epidemiology and Population Health, UK.

Background: Biofortified cassava is an promising food to increase vitamin A intake, but it is unknown how this will affect other nutrient gaps. Our objective was to evaluate whether inclusion of a school lunch with yellow cassava, as compared to either no lunch, or a lunch with maize and beans, can theoretically ensure a nutritionally adequate diet for schoolchildren in Kenya by using the OptiFood linear programming tool.

Methods: Dietary intake of 150 school children aged 7-9 years in Kisweti district in Eastern Kenya was assessed using a quantitative multi-pass 24-hour recall. Model parameters were derived, including a list of foods consumed, median serving sizes, distribution of frequencies and cost of diet. Food based dietary guidelines were formulated with the linear programming tool for three models: (1) baseline diet comprising exclusively foods not provided at school but mainly at home, (2) baseline diet complemented with a common school lunch of cooked maize and beans, and (3) baseline diet plus a school lunch of cooked yellow cassava. The target for nutrient adequacy was set at 100% of the recommended nutrient intake (RNI) for the best diet, and this was further modeled with promising (nutrient dense) foods to arrive at the nutritionally most optimal and affordable diet.

Results: Out of 13 nutrients, model 3 (yellow cassava) best met the target for an adequate intake of 5 nutrients as compared to model 1 (4 nutrients) or model 2 (5 nutrients). However, each in the best scenario with addition of promising foods (i.e. small dried fish and oil) the nutrient adequacy of fat, riboflavin, niacin, folate and vitamin A (range 30-64% of the RNI) could not be ensured.

Conclusions: OptiFood is a useful tool to assess the contribution of a biofortified crop to the nutrient adequacy of children. Introduction of yellow cassava should be accompanied by approaches to improve the local diet with fish and oil, and alternative interventions should be formulated to fully eliminate nutrient inadequacy of schoolchildren in Kenya.

OT-014 Oral communication
Greenhouse gas emission of diets in the Netherlands and associations with food, energy and macronutrient intakes.
Temme EHM1,2, Toxopeus IB, Kramer GH, Brosses MCC, Drifters JMM1, Tyzzer M,3, Ocké MC1
1National Institute for Public Health and the Environment (RIVM), PO Box 1, 3720 BA Bilthoven, The Netherlands. 2Bnk Consultants.

Objective: To evaluate the GHGE of diets in Dutch girls, boys, women and men separately and explore associations with diet composition, total (food and energy) intake, energy density and macronutrient intakes.

Methods: GHGE of foods and drinks was calculated with life cycle assessment (LCA). Food consumption data were derived from the Dutch Food Consumption Survey 2007-2010. Habitual environmental load of diets were estimated using both databases. Descriptive analyses were carried out for the total population as well as stratified for gender, age and dietary environmental load.

Setting: The Netherlands.
Subjects: Dutch children and adults aged 7-69 years (n=3818).

Results: The GHGE of daily diets was on average 3.2 kg CO2e for girls, 3.6 kg CO2e for boys, 3.7 kg CO2e for women and 4.8 kg CO2e for men in the Netherlands. Meat and chocolate contributed 40% and drinks (including milk) 17% to daily GHGE. Considerable differences in environmental loads of diets existed within age and gender groups. Persons with higher GHGE diets consumed more (in quantity of food and especially drinks) and diets had a higher energy density than their counterparts of a similar sex and age with lower GHGE diets, especially in males. Major differences between high and low GHGE diets were in meat, cheese and dairy consumption as well as in soft drinks (girls, boys and women) and alcoholic drinks (men). Of those, differences in meat consumption determined the differences in GHGE most. Diets with higher GHGE were associated with higher satiety intake and lower intake of fiber.

Conclusions: GHGE of daily diets in the Netherlands is between 3 and 5 kg CO2e, with considerable differences between individuals. Meat, dairy and drinks contribute most to GHGE. The insights of this study may be used in developing (age and gender specific) food based dietary guidelines that take into account both health as sustainability aspects.

OT-015 Oral communication
Intrapersonal, social-environmental, and physical-environmental factors which predict healthy eating practices in Dutch adults.
Swan E,1 Bouwman L1, Hiddink GP, Aarts M, Koelen M1
1Health and Society Chair Group, Wageningen University, Wageningen, the Netherlands. 2Strategic Communication Chair Group, Wageningen University, Wageningen, The Netherlands.

Introduction: Despite global efforts to make healthy choices, the easiest choices, people’s eating practices are still challenged daily. We can identify multiple challenges in our modern ‘obesigenic’ environment. For instance, the sheer overabundance of food, as well as marketing techniques and pricing strategies which favor the overconsumption and accessibility of sugary and fatty foods. Much of the past research on food choice has focused on it at studying individuals that do not manage these challenges and as a result make unhealthy food choices. However, very little research has focused on the small number of individuals that DO make healthy food choices despite these challenges. What factors enable them to cope with these risks successfully and as a result make healthy food choices? This study aimed to study these enabling factors which support healthy eating in Dutch adults.

Materials and Methods: This research applied Antonovsky’s salutogenic framework for health development. This is a positive-oriented framework which studies factors which enable coping, health-promoting behaviors and good health. We used the framework to develop a survey instrument...
to study intrapersonal, social-environmental, and physical-environmental factors which predict healthy eating practices in a cross-sectional study of Dutch adults. Participants (n=703) aged 18 years and older completed the study's survey in January 2013. Bivariate and multivariate logistic regression analysis was performed to test the association of survey factors on the outcome variable high dietary score. Results: In the multivariate logistic regression model, six factors were significantly (p < .05) related to high dietary score: being female; living with partner; sense of coherence (a construct from the salutogenic framework, relates to one's capability to deal with stress), flexible restraint of eating, and self-efficacy for healthy eating.

Key findings: Our findings support previous studies which found associations between healthier eating practices and sense of coherence. Within the multivariate model, intrapersonal factors were more significant predictors of a high dietary score whereas socio-environmental and physical-environmental factors were not significant. Prevalently predicted factors of food insecurity in low-income; education; employment; and nutrition knowledge were not significant factors in our overall model. Future research should further study these intrapersonal factors identified in our study to better understand their origins and mechanisms in relation to healthy eating practices.

OT-016 Oral communication

Manoeuvring between health benefits and health losses by following or neglecting dietary guidelines: where do we stand?

van Raaij JMA'; Büchner FL'; van Duijnhoven FJBP'; Hoogenveen RT'; Touxpeus F'; Hoekstra JF
1 National Institute for Public Health and the Environment (RIVM), Bilthoven, the Netherlands. 2 Present address: Leiden University Medical Center, Leiden, the Netherlands. 3 Present address: Wageningen University, Wageningen, the Netherlands.

Objectives: To develop well informed nutrition policies it is important to know to what level present and future measures and interventions still hold potential to improve the health status of the population. Aims are to assess the potential health benefits of five dietary factors (fruit, vegetables, fish, saturated fatty acids (SFA), and trans fatty acids (TFA)) for the Dutch population and to place these benefits against the potential health losses on most unpalatable intakes.

Material and methods: Health outcomes such as Quality-Adjusted-Life-Year (QALY), morality rates and life expectancy, were assessed using the RIVM Chronic Diseases Model R5.1 (September 2012 version). The Dutch National Food Consumption Survey 2007-2010 supplied food consumption data. Food composition data were derived from the Dutch National Food Composition Table version 2011. Two extreme scenarios were developed and compared with the current intake scenario: in the best-case scenario 100% of the population adheres to the recommended intake category and in the worst-case scenario, 100% of the population is assigned to the least favourable intake category.

Results: Most health gain can be obtained by increasing fruit and fish consumption, followed by increasing vegetable consumption. Further reduction of SFA and TFA intake results in minor health benefits. Fully following the dietary guidelines for all five dietary factors would result in a reduction of about 3,700 deaths per year [annual mortality rate in the Netherlands is 141,000 including 39,000 for cardiovascular diseases and 43,000 for cancers] and life expectancy would increase by 0.5 year. Following the unhealthiest eating pattern would result in an extra 6,800 deaths per year and a reduction of the life expectancy by 0.8 year.

Key findings: In the Netherlands most of the potential health benefits of the five dietary factors have been realized. Nevertheless, a substantial health gain can still be obtained, especially with respect to increasing fruit and fish consumption, and, to a lesser extent, also by increasing vegetable consumption.

OT-017 Oral communication

Food-choice behavior and coping strategies to deal with food insecurity in low-income Portuguese families: the preliminary results of an exploratory study

Gregório M1, Nogueira P2, Graça P2
1 Faculty of Nutrition and Food Sciences of University of Porto, Portugal. 2 Directorate-General of Health, Portugal

In Portugal as in many other European countries, feeding the family with limited economic resources has become one of the biggest challenges, due to current austerity programs. Actually, food insecurity affect a large proportion of the Portuguese population, a prevalence of 50.7% was found for food insecurity in 2013. Literature shows that economic constraints and, consequently the coping strategies to deal with this situation have a great impact in food-choice behavior of low-income families (LF). Most food and nutrition researches are lacking on understanding the complexity of food-choice behavior in situations of food insecurity. Specially in Europe and other western regions. This study aims to illustrate the complexity of food-choice behavior and its associated factors, providing data on coping strategies to deal with food insecurity in a sample of LF in Portugal.

The study was carried out between May-December 2013 and fieldwork took place at two social housing neighborhoods in Portugal. A sample of 32 households was selected by a systematic random sampling. Households involved in this study were contacted by the municipality social workers. A qualitative approach was used, in which the households were followed along several months in order to complete three in-depth semi-structured interviews by the main researcher of this work.

Data analysis of the individual's narratives living in low-income Portuguese families suggests that food-choice behavior is broadly influenced by economic, social and psychological/demographic determinants. This main theme is supported by the narratives analysis: 1) food-choice behaviors are influenced by social aspirations; 2) socializing needs affects food-choice behavior (eating out as a socialization process) and 3) food assistance and informal social networks (family/friends) were main coping strategies. Our findings also suggested that economic constraints induce large changes on diet quality and reduction of food intake, with a particular impact for female household members.

The understanding of the broad range of determinants of food-choice behavior, as well as coping strategies used to manage food and economic constraints are quite important to develop public health nutrition interventions addressing social inequalities in health.

OT-018 Oral communication

Early eating behaviours in relation to fruit and vegetable intake and a healthy diet variety score at 4-5 years of age – a prospective analysis in three European birth cohorts.

Lopes C1,2,3,4; Oliveira A1,2,3,4; Jones L2,4; Lauzon-Guillain BP2; Emmett P2; Charles MA2
1 Department of Clinical Epidemiology, Predictive Medicine and Public Health, University of Porto Medical School, Portugal. 2 Public Health Institute, University of Porto, Portugal. 3 School of Social and Community Medicine, University of Bristol, UK. 4 Epidemiology of diabetes, obesity and chronic kidney disease over the life course, CESP Centre for research in Epidemiology, and Population Health, U1018, Inserm, F-94807, Villejuif, France and UMR S 1018, Université Paris Sud 11, F-94807, Villejuif, France.

Objectives: Eating behaviours during early childhood could be mediators to a worse health profile. Fruit and vegetables (F&V) intake and overall diet variety are surrogates for healthy diets. This study aims to prospectively relate feeding behaviours at different ages with F&V consumption and a healthy diet variety score of children with 4-5 years of age.

Material and methods: Eating behaviours were assessed in three European cohorts (Generation XXI from Portugal, EDEN from France and ALSAPAC from the UK) at 4-6, 12-15, 24 and 48-54 months, based on caregiver’s perception of child’s eating difficulties, poor eating (defined based on eating small quantities at each meal), food refusal, and establishment of daily food routines. F&V intake and the healthy plate variety score (HPVS) was calculated in each cohort using food frequency questionnaires. HPVS assesses variety of healthy foods within and across the main food groups based on the number of servings recommended for each group in healthy eating guidelines, the maximum score is 5. Associations were tested by logistic regressions (odds ratio and 95% confidence intervals (OR, 95%CI) adjusted for maternal age, education, smoking during pregnancy, any breastfeeding and child’s z-score body mass index.

Results: Children with more eating difficulties, poor eating, food refusal/neophobia, and difficulties in establishing a daily routine at 12-15, 24 and 48-54 months, as reported by parents, had in general lower fruit and vegetable intake at 4-5 years. The association with vegetables was slightly stronger than with fruits. Early eating difficulties were also inversely associated with the variety score at 4-5 years of age. The association with food refusal/neophobia and difficulties in establishing a daily routine were in the same direction, but only significant when eating behaviours were reported after 12-15 months of age.

Key findings: Children with eating difficulties, food refusal/neophobia and difficulties in establishing a daily routine, as reported by their parents, presented a lower fruit and vegetable intake and less dietary variety at 4-5 years of age. These associations were consistent across cohorts, slightly stronger for vegetables than for fruits and most evident when eating behaviours were reported after 12-15 months of age.
Objective: To verify the effect of race independent of socioeconomic status (SES) on obesity in Brazilian adults. 
Methods: We used a sample of 65,645 adults aged between 20 and 50 living in urban areas from the 2008-2009 Brazilian Household Budget Survey. This nationwide survey used a two-stage cluster sampling design. Obese and non-obese people were defined using World Health Organization body mass index classification. We considered a self-declared white, black and mulatto. The factor analysis with principal component extraction to derive SES index. SES was formed by income, education, and food access variables. The interaction term was calculated taking into account the complex sample design.

Results: The prevalence of obesity was 12.8% (11.8% in men and 13.8% in women). In SES analysis, both the Kaiser–Meyer–Olkin index (0.79) and Bartlett’s test (p < 0.01) indicated that the correlations among the variables were sufficiently strong for a factor analysis. The eigenvalue criterion (cutoff in 2.5) allowed for the identification of one factor of SES (52% of variance). The interaction term was statistically significant (p < 0.001). We observed a reduced odds of obesity among mulatto men compared to white men (odds ratio 0.88; 95% CI: 0.79-0.99) and no significant association with other classification of race among men. On the other hand, black and “mulatto” women had an important increased odds of obesity compared to white women, odds ratio 1.63 (95% CI: 1.38-1.92) and 1.13 (95% CI: 1.01-1.26), respectively. Moreover, black women had more odds of obesity compared to mulatto one (odds ratio 1.44; 95% CI: 1.24-1.68).

Key findings: The present population-based study suggests that racial disparities in obesity are independent of SES and gender-dependent. The role of race in obesity is markedly evident in women, in which Brazilian strategies to reduce obesity should focus on mainly in black and mulatto women.

OT-020 Oral communication

The burden of obesity in the population of Cape Verde using different anthropometric approaches.

Semedo MRS, Barros H
Institute of Public Health, University of Porto, Porto, Portugal

Objectives: to assess prevalence and the impact of anthropometric indicators to estimate the obesity and risk factors among Cape Verdean adults.

Methods: a cross-sectional study was conducted with a representative random cluster sample of 1762 adults aged 25 to 64 years in Cape Verde, using the WHO STEPwise approach to chronic disease risk factor surveillance. Information on the socio-demographic characteristics and lifestyle behaviors, as well as physical measurements such as weight, height, waist and hip circumference, and blood pressure were collected using standardized procedures. Overweight were considered when the BMI was between 25 and 29.9 kg/m² or obesity when BMI ≥ 30 kg/m². Abdominal obesity was defined as Waist Circumference (WC) ≥ 88 cm in women and ≥ 102 cm in men, and Waist Hip Ratio (WHR) for women ≥ 0.85 cm for men and ≥ 0.90 cm. Logistic regressions were fitted to study the associations between variables, and odds ratios (OR) and the respective 95% confidence intervals (95% CI) were computed.

Results: Based on BMI the prevalence of overweight and of obesity was respectively, 24.9% (21.3-28.9) and 65.3% (3.9-10.7) among men, and 27.8% (23.0-33.1) and 14.4% (10.3-19.8) among women. The prevalence of abdominal obesity was 4.5% (2.7-7.6) and 30.1% (20.0-42.5) among men and 37.9% (31.1-45.2) and 51.8% (37.7-65.2) among women, according WC and WHR respectively. Both general and abdominal obesity measures were significantly more frequent in urban settings (age adjusted odds ratio, urban men: 2.02, 95%-1.94-2.17 and urban women: 2.47, 95%-1.35-4.52 for general obesity; and age adjusted odds ratio, urban men 12.7, 2.83-56.8; urban women: 2.45, 1.33-4.51 for abdominal obesity). Among men, abdominal obesity increased with age (OR: 6.54; 95%-1.27-15.5 for WC; and OR: 7.04, 95%-1.20-4.9.8) and education years (OR: 18.8; 95%-1.25-22.0 for WC, and OR: 3.02, 95%-1.17-6.74). Among women, general obesity and abdominal obesity increases were associated with age (OR: 2.47; 95%-1.35-4.52 for general obesity; OR: 3.25; 95%-1.50-7.03 for WC; and OR: 4.39; 95%-1.23-9.06 for WHR) and income category (OR: 1.65; 95%-1.06-2.57 for general obesity; OR: 1.59; 95%-1.04-2.33 for abdominal obesity).

Key findings: Weight/obesity and abdominal obesity are a public health problem in Cape Verdean adults, with a significantly different gender and rural-urban distribution.

OT-021 Oral communication

Soy Supplementation: Objective & Subjective Health Markers in Preschool Children in Bukoba, Tanzania

Singh N.
Dept of Nutrition, University of the Incarnate Word, San Antonio, Texas, USA

Throughout the world malnutrition is a primary contributing factor to childhood morbidity and premature mortality. The complexity of malnutrition transcends health issues, impacting children’s growth, development and overall quality of life. Tanzania is ranked eighth in the world for greatest incidence of child mortality resulting from the synergistic interactions between moderate and severe malnutrition and infection.

Objective of the study was to determine effect of Defatted Soy Flour (DSF) on Objective and Subjective Markers of Health and Wellbeing in three selected preschool children in Bukoba, Tanzania.

Materials and Methods: Objective health marker included growth data as height, weight and Body Mass Index. Subjective health markers included variables such as presence of diarrhea, symptoms of respiratory illness and health care access. The evaluation was expected to capture the anthropometric and surface level health benefits of the addition of DSF to uji (porridge) within the participants. The baseline survey and measures were to be conducted on approximately 100 children from three selected preschool prior to the start of soy feeding program with follow-up after six months to determine the changes in nutrition status of the participants.

Results: The results of 6 month trial depicted that linear velocity remained unrelated to other variables in the study. The only correlation was with weight velocity. This can be interpreted as a positive indicator for the growth of the population since both weight and height increased.

Key Findings: Adding DSF as protein sources has positive impact on growth and reduction of childhood malnutrition as presented in this study.

OT-022 Oral communication

The Determinants of Diet and Physical Activity (DEDIPAC) Knowledge Hub.

Jeroen Lakerbeld,1,2,4 Hiddle P van de Ploeg,1 Willemien Kroeg,1 Wolfgang Ahrens,1 Oliver Allais,1 Lene Frost Andersen,1 Greer Cardot,2 Laura Caprini,3 Sebastian Chastin,3 Alan Donnelly,4 Ulf Ekulund,5 Paul Fingas,16 Reiner Rechert-Moores,17 Arlette Hendriksen,18,19 Thomas Kubik,10 Carmen Lanza,14 Anne Luyen,13 Claudia Macedo,4,15 Vitoria Macedo,4,15 Pablo Morsivalls,18 Marie Murphy,17 Ute Nthlinghs,20 Donal J. O’Gorman,21 Britta Renner,22 Gun Roos,23 A. Jantine Schultz,24 Jürgen Steinacker,25 Karsten Strømskag,26 Dorothee Volker,27 Peter van’t Vee,28 Nanna Lien,29 Ilse De Bourdeaudhuij,30 Johannes Brugg,31 on behalf of the DEDIPAC consortium

1EMGO Institute for Health and Care Research, VU University Medical Center, van der Boechorststraat 2, 1081 BT Amsterdam, The Netherlands
2Leibniz Institute for Prevention Research and Epidemiology – BIPS, Bremen, Germany
3INARA, URA3130 ALNESS, F-94205 Ivry-sur-Seine, France
4University of Oslo, Oslo, Norway
5National Institute of Nutrition and Health Sciences, Ghent University, Ghent, Belgium
6University of Rome Foro Italico, Rome, Italy
7Glasgow Caledonian University, School of Health and Life Science, Scotland, United Kingdom
8Centre for Physical Activity and Health Research, University of Limerick, Ireland
9Department of Sport Medicine, Norwegian School of Sport Sciences, Oslo, Norway
10Institute of Food Research, Norwich, United Kingdom
11University of Ulm, Division of Sports and Rehabilitation Medicine, Ulm, Germany
12Netherlands Organisation for Applied Scientific Research (TNO), Leiden, The Netherlands
13Johannes Gutenberg University, Mainz, Germany
14Department of Neurological and Movement Sciences, University of Verona
15Department of Statistical Sciences of the University of Bologna, Bologna, Italy
16Department of Public Health and Primary Care, Institute of Public Health, University of Cambridge, Cambridge, United Kingdom
17Sport & Exercise Sciences Research Institute, University of Ulster, Newtownabbey, United Kingdom
18Department of Nutrition and Food Science, Rheinische Friedrich-Wilhelms-Universi-
Aging, Friedrich-Alexander-Universität Erlangen-Nürnberg. Amsterdam, Amsterdam, the Netherlands.

To address major societal challenges and enhance cooperation in research, the European Commission has initiated and fostered "joint programming." Joint programming is a process by which Member States engage in defining, developing and implementing a common strategic research agenda, based on a shared vision of how to address major societal challenges. Setting up a Joint Programming Initiative (JPI) should also contribute to avoiding unnecessary overlap and repetition of research, and enable and enhance the development and use of standardised research methods, procedures and data management. The Determinants of Diet and Physical Activity (DEDIPAC) Knowledge Hub (KHub) is the first action of the European JPI "A Healthy Diet for a Healthy Life." The objective of DEDIPAC is to contribute to improving the understanding of determinants of dietary, physical activity and sedentary behaviours. DEDIPAC KHub is a multi-disciplinary consortium of 46 consortia and organisations supported by joint programming grants from 12 countries across Europe. The work is divided in three thematic areas: (i) Assessment and harmonisation of metrics for future research, surveillance and monitoring, and for evaluation of interventions and policies; (ii) Determinants of dietary, physical activity and sedentary behaviours across the life course and in vulnerable groups; and (iii) Evaluation and benchmarking of public health and policy interventions aimed at improving dietary, physical activity and sedentary behaviours. In the initial three years, DEDIPAC KHub will organise, develop, share and harmonise expertise, methods, measures, data and other infrastructure. This should further European research and improve the broad multidisciplinary approach to study the interaction between multilevel determinants in influencing dietary, physical activity and sedentary behaviours. Insights will be translated into more effective interventions and policies for promotion of healthier behaviours and more effective monitoring and evaluation of the impacts of such interventions.

OT-024 Oral communication

Associations between FTO variants and energy intake in adults: a systematic review and meta-analysis.

Livingstone, K.M., Celis-Morales, C., Lora, J., Ashor, A., Mathers, J.C., on behalf of Food4Me Study

Human Nutrition Research Centre, Institute for Ageing and Health, Newcastle University, Newcastle upon Tyne, UK.

Objectives: Risk variants of the fat-mass and obesity (FTO) gene are associated with increased obesity. However the evidence for links between the FTO gene and energy intake have not been systematically assessed. Our aim was to evaluate associations between the FTO gene and energy intake in adults.

Material and methods: A systematic literature search in Medline, Scopus, EMBASE and Cochrane identified fifteen studies that reported energy intake and the FTO gene status in adults. Individual study mean intakes and standard deviations, using pooled and non-pooled analyses, were evaluated. The analyses were repeated on an energy intake per kilogram body weight basis and random-effects models were used to derive pooled effect sizes. Meta-regression analyses were conducted to estimate regression coefficients for effect sizes following adjustment for study parameters and participant characteristics.

Result: The studies identified were published between 2008 and 2012 and included a total of 64,304 participants with a mean age and BMI of 52.1 ± 7.0 years and 27.7 ± 3.6 kg/m² respectively. Weight (p<0.001) and BMI (p<0.001) were significantly higher in those carrying two copies of the FTO risk allele than those with no copies. Preliminary findings show that carriage of the FTO risk allele is associated with a 106 kJ/day (995 CI: -191 to 21.9; P<0.001) and 5.3 kJ/kg body weight (93% CI: -7.28, -4.06; P<0.001) lower energy intake compared with non-carriers of the risk allele. Key findings: Perhaps surprisingly, carriage of the FTO risk allele is associated with a 4.9% lower energy intake compared to those with no risk. Further research is needed to determine whether the inverse relationship between carriage of the FTO risk allele and energy intake is independent of mis-reporting dietary intake and of changes in energy metabolism and physical activity.

OT-025 Oral communication

Sizing it up: Adherence to the Mediterranean Diet and anthropometric and financial measures of the MEDIS study elderly.

Piscopo S, Polychronopoulos E, Panagiotakos DB; for the MEDIS study investigators.

Nutrition, Family & Consumer Studies Programme, Recife, University of Pernambuco, Brazil; Department of Nutrition and Dietetics, School of Health Science & Education, Harokopio University, Athens, Greece.

Objectives: This study aimed to evaluate adherence to the traditional Mediterranean Diet (MD) and association with BMI, waist circumference (WC), and health expenditure in a sample of Mediterranean elderly without known cardiovascular disease.

Material and methods: During 2005-2011, 2813 elderly (aged 65-100 years) from 22 Mediterranean islands and the rural Mani region (Peloponnese) voluntarily enrolled in the study. Participants' basic socio-demographic characteristics were recorded and standard procedures were used to determine anthropometric measures. Dietary habits were assessed through a semi-quantitative, validated and reproducible food-frequency questionnaire and level of adherence to the MD was determined using the MedDietscore (theoretical range 0-53). Higher values for this diet score indicate greater adherence to the MD. To measure financial status, participants were asked to report their mean income during the previous three years using a four-point scale (inadequate to cover daily expenses, trying hard to cover daily expenses, adequate to cover daily expenses, more than enough to cover daily expenses).

Results: The MedDietscore ranged from 30 to 34, indicating an overall moderate to good adherence to the MD. Across all regions (apart from Crete), reported intakes of cereals, poultry, meat and meat products, fish, milk and milk products, and sweets were below dietary recommendations, whereas vegetables, potatoes, fruit (apart from Crete), and olive oil intake met and exceeded recommendations. Also across all regions, sweet and fast-food intakes were low (apart from Crete), and leafy green plants (consumed three to four times weekly) and alcohol (consumed daily by 35% to 60% of the sample) played an essential role in the diet. The MedDietscore was positively associated with WHR (rho=0.104, p<0.001), but was not associated with BMI or WC (p=0.5). It should be noted that WHR was within normal limits for the vast majority of the elderly. Adherence to the MD was associated with better financial status (p<0.001) of the study participants.

Key findings: Traditional MD elements, such as vegetables, cultivated and non-cultivated greens and olive oil are still abundantly present in the diet of Mediterranean elderly, although some regional heterogeneity does exist.
with the greatest deviation displayed by Cret. Simultaneously, study results suggest that new food products and habits are increasingly challenging dietary traditions, even among the elderly population. The processes how greater financial status can facilitate MD adherence, and how health outcomes are impacted as a result of the positive association of adherence to the MD with WHR require further study.

OT-026 Oral communication
Environmental relevance of human nutrition. A comparison between a nutritional food pyramid, an emissions-based (CO2e) and a resource-based (virtual water) pyramid.
Eikel S.1, Strassner C.2
1 Zentrum für Nachhaltige Unternehmensführung, Fakultät für Wirtschaftswissenschaften, Private Universität Witten/Herdecke gGmbH, S840; 2 Witten, Germany; 2 IUASM – University of Applied Sciences, Faculty of Home Economics, Nutrition Science & Facility Management, 48149 Deutschland.

Objectives: The aim of this study is to analyse the environmental relevance of human nutrition and to investigate if the nutrition recommendations would change if greenhouse gas (GHG) emissions and virtual water are taken into consideration. For this purpose three food pyramids are compared: A nutritive pyramid, an emissions-based pyramid and a resource-based pyramid.

Material and Methods: An evaluation of existing studies showed that there are already several nutritive pyramids and one food pyramid based on GHG emissions. Furthermore, the desktop research showed that a food pyramid was based on virtual water data. Using publicly available data on the water footprint of foods, a food pyramid was developed within this study.

Results and Discussion: The three-dimensional pyramid of the German Nutrition Society focuses on nutritional aspects and an adequate supply of nutrients based on food standard groups. The GHG emissions-based pyramid, developed in Denmark, refers to the amount of GHG emissions in kg CO2-equivalents per kilogram food, the allocation of which had an effect on the arrangement of the foods in this food pyramid. The virtual water in the form of water footprint in litres per kilogram food, represents the indicator of the resource-based pyramid. A comparison between these three pyramids shows that it is not necessary to give completely different nutrition recommendations if ecological aspects like the CO2-equivalents or the water footprint are considered. There are only some food items that stand out. In general, crop products have a lower environmental impact than animal food, which is consistent with the arrangement in the nutritional pyramid. Looking at crop products, it is particularly preferable to choose regional and seasonally produced food from open land cultivation instead of processed food from greenhouses. That way, water resources can be saved and emissions of carbon dioxide equivalent will possibly be reduced. Some food items are conspicuous, for example coffee, rice and beef, whose position in the nutritive pyramid shifts to a higher position when considering the environmental pyramids. Furthermore, potatoes would shift to the base of a food pyramid next to regional fruits and vegetables, instead of their current position with cereals in the nutritive pyramid.

OT-027 Oral communication
Vitamin A stability in Nigerian retailed flour and fortification compliance level.
Uchendo F., Atinmo I.
School of Health Sciences, National Open University of Nigeria, P.M.B 80067, Victoria Island, Lagos, Nigeria. 1Department of Human Nutrition, University of Ibadan, Ibadan, Nigeria.

Background: Wheat flour has been mandatorily fortified with vitamin A in Nigeria. Vitamin action and quantity in fortified flour at pre and post-production times is not clear. The objective of this study therefore is to determine vitamin A stability in retail flour and assess compliance status.

Methods: Seventeen flour samples were randomly selected from twelve local Government Areas in Lagos, Nigeria. Flour samples were collected from bakeries and stored for 30 days at room temperature. Pre and post-storage retinol analysis were carried out using High Performance Liquid Chromatography method. Stability result was grouped under 1, 2 and 3 months using sample production dates. Fortification compliance was calculated based on three assumptions: All samples were assumed to have been fortified with current Nigerian International standard (NIS) for flour (30IU/g). World Health Organization (WHO) guideline of acceptable range of 30% due to losses during distribution and storage was applied and an acceptable range of 50% was also used to determine if the level of fortification was adequate taken into consideration.

Conclusion: Low stability and compliance were observed. High preimx quality and monitoring should be ensured.

OT-028 Oral communication
Local vs. Global food chain performance in Denmark.
Nyman-Granup A & Perez-Cueto FJA
Aalborg University-Copenhagen, Department of Development and Planning

Introduction: In recent years a small, but growing number of consumers have increased awareness of the complexities of the food systems, and how their choices might affect the health, the environment, local economies and societies, often very distant from the place of consumption. A growing focus on the concept of 'local foods' has generated a myriad of business, civil society and policy initiatives.

Objectives: The aim of the project is to distinguish local and global food chain performance assessment in Denmark by capturing the perceptions and representations of food chain performance in 4 selected spheres: Market, Scientific, Public and Policy. Then to investigate how the spheres cross-cut with the economic, social, environmental, health and ethical dimensions. Finally, to identify which attributes assess the performance of food supply chains.

Methods: A multi-criteria methodology was applied, allowing an integrated characterization of the performance of food chains. A desk research was conducted covering scientific publications, media communications and grey literature. Furthermore, 11 expert interviews were carried out to supplement the review’s findings, and to identify the main attributes, important issues, debates and methods used to analyse food chains at both local and global levels.

Results: Nineteen attributes related to local and global food systems were identified and placed in a Multi-criteria matrix describing the attributes in detail. The most important attributes identified were price, competitiveness and organic foods. Consumer information was also important.

Key findings: A clear distinction between the local and global food system was not possible to make. Attributes such as Food miles, Traceability, Nearness and Food quality play a role in distinguishing the systems. The free global market has a great impact on food systems in Denmark, e.g. forage for Danish livestock is imported from Argentina, while Danish producers are placing some parts of their production outside of Denmark, interlinking the local and global food chains. It is suggested, that if a clear definition of a transparent food system is to be made, another term such as a 'Danish food system' could be developed.

Acknowledgement: This work is part of the EU FP7 ‘Global and local food assessment: a multi dimensional performance-based approach’ (GLAMUR). Grant agreement: 611778.

OT-029 Oral communication
An evaluation of the effects of Food and Health Dialogue targets on the salt content of bread, breakfast cereals, and processed meats.
Trevena H., Wu J., Dunford E., Neal S.1
The George Institute for Global Health, The University of Sydney, PO Box M201 Missenden Road, Camperdown, NSW 2050, Australia.

Objectives: The Australian Government established the Food and Health Dialogue (FHD) in 2009 to encourage food reformulation. Sodium reduction targets for three food categories (breads, breakfast cereals, and processed meats) were scheduled to be achieved in December 2013.

Materials and methods: Sodium levels in packaged foods in Australian supermarkets were collected from product labels each year from 2010-2013. Changes in mean sodium content from baseline to Dec 2013 were assessed by linear mixed models and differences in the proportion of products meeting sodium reduction targets examined using chi-squared tests or McNemar’s tests. We explored whether results differed according to manufacturers’ commitments to participate in the FHD process as declared on the FHD website.

Results: Mean sodium levels of bread products were 454mg/100g in 2010 (n=172) and 415mg/100g in 2013 (n=267) representing a 9% reduction.
OT-030 Oral communication

Validation of a picture book used to estimate food portion to be used in dietary surveys.

Vihla S., Seeroj M., Gulomar S., Rodriguez T., Lopes C.**, Tomás P.**

1 Department of Health Promotion and Chronic Diseases, National Institute of Health, Lisbon, Portugal; 2 Institute of Public Health, University of Porto; 3 Department of Clinical Epidemiology, Predictive Medicine and Public Health of University of Porto Medical School; 4 Institute of Preventive Medicine, Faculty of Medicine, University of Lisbon; 5 Faculty of Nutrition and Food Sciences, University of Porto; 6 Department of Biochemistry (CBF-IC), Faculty of Medicine, University of Porto.

Objectives: This study aims to validate a picture book for estimation portion sizes, among adolescents, adults and elderly, through two approaches: visual perception of food portions by comparison with food photos; and by conceptualization and memory, using the same photos to estimate the amount of served food one hour after self-served food portions.

Material and methods: The present study was performed within the PANEU project, which was the pilot phase of the study EU-MENU, a Pan-European dietary survey supported by EFSA. The goal of this project was to develop, test and evaluate the applicability of tools and procedures for the estimation of dietary risks and identifications of dietary deficiencies in adolescents, adults and elderly in Europe. Each PANEU partner developed country specific picture book based on the picture book of the electronic tool 24h-recall EPIC-SOFT. A sample of adolescents and adults was recruited in each PANEU country (Bulgaria, Finland, Germany, Hungary, Poland and Portugal), ranging from 34 (Finland) to 103 (Bulgaria). Representative food photo series were chosen to cover a wide range of food groups, achieving approximately 25% of the PILOT-PANEU Picture Book (21 photographs). Three portions of each photo series were randomly chosen.

Results: 18% (cheese) to 96% (ratatouille) of the participants chose the correct portion size between 0% and 30% of the participants chose the distant picture. In the perception study the main source of variance in the measurement was the different portion sizes on the plates (67.8%), and not the error of instrument and the individual characteristics. Moreover, the agreement between the real portion and the reported portion was substantial (79.3%) and the bias was very low. Typically, overestimated or underestimated foods in the perception approach were similarly underestimated or underestimated, respectively, in the memory study. Compared with perception results, the variance explained in the memory study by plate was lower and the error was higher, increasing from 0.59 to 0.95. The agreement between the real portion and the reported portion was lower. The agreement seems to decrease as the appearance of the food presented differs from the food in the picture (e.g. fish, slices).

Key findings: In conclusion, the results confirmed that the picture series included in the EPIC-Soft picture book can only be applied in future intake surveys for similar foods as those depicted on the pictures.

OT-031 Oral communication

Standardisation of food selection for portion sizes quantification using photos in pan-Latin American dietary monitoring surveys: Report from Brasil.


1 International Agency for Research on Cancer, Dietary Exposure Assessment Group. 2Federal University of Paraná, Department of Nutrition. 3University of Sao Paulo, Public Health Faculty. Department of Nutrition.

One of the major challenges in measuring diets concerns accurate estimation of food portions consumed/reported. In the perspective of the Latin American Diet project, there is the need to develop/adapt the GloboDiet (formerly EPIC-SOFT) picture book for estimating food portion amounts during 24-h recalls in future surveys in Latin America, one of the starting countries being Brazil. The objective of this work is to present the results of the standard operating procedure to deliver a list of foods that require photos for standardized portion size estimates in pan-Latin American dietary monitoring surveys, with a pilot initiative in Brazil (and Mexico not reported here). Data from adults participating in the latest Brazilian Food Consumption Survey (2002/2003) were used to identify the most consumed foods in the five national macro-regions of Brazil (n=1085 foods). The number of foods (inc. recipes) selected to be quantified by photos was obtained through two approaches. First, variability analysis using stepwise regression was performed to detect between person variation for selected nutrients by region and sex. Foods with over 90% accumulated r-square for the different nutrients in each region and sex were selected. In addition, a top list with 50 most consumed foods was generated by sex and regions. Next, the two approaches were combined (n=379 foods) and each of the consumed foods was evaluated for its inclusion in the photo album, following IARC's guidelines (i.e. recommendations for quantifying a food with photos or rather using other types of quantification methods like standard units or shapes; n=121 selected foods). Foods that were very rarely reported (by <0.01% of the population in each one of the regions) were excluded from the selection process (n=17). Selected foods were then searched in the existing GloboDiet photo albums and divided into two groups (with existing photos and new photos to be created). For the existing photos, the weight ranges between GloboDiet photos and the ones from the last Brazilian survey were also compared. Finally, 45 new photos will be developed and 59 existing photos will be used in the Brazilian photo album. In this regard, this project is being followed for the development of Mexican photo album and a workshop is foreseen in the near future to discuss the main results and harmonization aspects for the development and application of the picture portion size album in other LA countries. Ultimately, this will lead to the development of an IARC-WHO standard operating procedure, which will serve new joining countries and ensure high standardization of food portion size estimates worldwide.

*Laboratory of Human Nutrition, Institute of Food, Nutrition and Health, ETH Zurich, Zurich, Switzerland. 1Department of Basic Medical Sciences Department, College of Medicine, Blantyre University, Blantyre, Malawi.

Objective: In sub-Saharan Africa, children with P. falciparum malaria and anaemia are often given iron supplementation at the time of malaria treatment. Inflammation during and after malaria may decrease iron absorption, thus, absorption might be improved if the start of supplementation is delayed. Our study objective was to measure iron absorption from iron supplements started immediately or delayed by two weeks during recovery from uncomplicated P. falciparum malaria.

Material and methods: Malawian toddlers (n=48; age 12-24 months) were assigned to two groups: group A was provided iron supplements (30 mg iron daily) as an iron sulphate-containing syrup for 8 weeks starting immediately after malaria treatment; group B was given the iron after a two-week delay. Iron absorption from the syrup was measured on the first day of iron supplementation, and after 2 and 8 weeks in both groups. Haemoglobin, iron status and inflammation were assessed every 2 weeks. Fractional iron absorption at each time point and cumulative absorption was quantified by measuring erythrocyte incorporation of 57Fe and compared using mixed models.

Results: Comparing group A and B, geometric mean iron absorption did not differ on the first day of supplementation (9.0% vs. 11.4%; P = 0.213) and cumulative iron absorption from the three time points did not differ (6.0% vs. 7.2%; P = 0.124). Haemoglobin concentration increased in both groups after malaria treatment (P < 0.001) and did not differ after 8 weeks of supplementation (P = 0.542). Inflammation biomarkers were increased directly after treatment, but subsided two weeks after malaria treatment.

Key findings: In uncomplicated malnourished toddlers, a two-week delay in iron supplementation had no benefit in relation to iron absorption or the recovery of haemoglobin concentration. Our findings support the current practice of immediate iron supplementation after malaria treatment, considering that providing supplementation immediately after malaria treatment is generally thought to increase compliance.

GREENHOUSE GAS EMISSIONS FROM PRODUCTION OF FOODS FOR THE AMERICAN DIET. Rose D, Steckel K. School of Public Health and Tropical Medicine. Tulane University.

Objectives: The agriculture, livestock, and forestry sectors accounts for about 30% of worldwide human-induced greenhouse gas emissions, and the United States is one of the top emitting countries. However, unlike European countries, a number of investigators have explored the relationship between diet and emissions, little is known about the contribution of the U.S. diet to this process. This paper estimates greenhouse gases emitted in the production of foods for American consumption, and examines socio-demographic correlates associated with these emissions.

Materials and methods: The study is based on nationally representative 24-hour recall data from the National Health and Nutrition Examination Survey (NHANES) for 2007-2008, which was conducted under the auspices of the U.S. Centers for Disease Control and Prevention. Food intake data for adult individuals (N=5989), aged 16 years and older, were converted to conventional materials, with the use of the U.S. Environmental Protection Agency. Carbon dioxide-equivalent (CO2-eq) emissions from the production of these food commodities, or their nearest match, were determined using published data from the World Wildlife Foundation, and linked to the consumption data. Emissions for the complete diet for two independent observation days on each individual were calculated and averaged. Bivariate analyses, including t-tests and analysis of variance, used survey weights and sample design parameters of the NHANES data. Results: Production of foods that were consumed by U.S. individuals was estimated to contribute 4.43 kg CO2-eq per person per day (95% Confidence Interval: 4.25 – 4.61). Expressed on a 2000-kilocalorie basis, gas emissions from diets were higher for older individuals, men, those with self-rated very good or excellent diets, and those on special diets, such as weight-loss diets. Emissions also varied by the race-ethnicity of the respondent, and were lower for self-described vegetarians. Dietary gas emissions from the production of food for U.S. diets is roughly consistent with previous research on European diets. This research allows for an improved understanding of the consumer’s role in the production of greenhouse gases derived from the agricultural sector, and can further inform policies that seek to reduce the negative environmental impact of the U.S. diet. The methodology developed here also allows for future research on the relationship between sustainability and healthiness of diets.

EMBRACE-ME BOWL: An assessment of a new plate-ware designed to improve nutrition and commensality. Castro JS, Santos OJL, Sorensen BSN, Santos JL. 1Integrated Food Studies, Aalborg University-Copenhagen. 2Institute of Social Medicine, State University of Rio de Janeiro, Brazil. 3Department of Development and Planning, Aalborg University-Copenhagen.

Objectives: The aim of the study was to assess the effects of a new plate-ware – ‘embrace-me bowl’ designed to improve vegetable intake and social interaction (commensality) in a self-served meal by university students in a laboratory setting.

Methods and materials: The investigation was part of laboratory trials based on a pilot study through a ‘cross-over’ experimental design. These were carried out at the Food Science Lab located in Aalborg University Copenhagen in Denmark. Thirty participants took part in the study, between 20 to 30 years (M=23.4 years, SD=2.6), where 25 were male. The treatment was the ‘embrace-me bowl’, whereas the non-treatment consisted of a conventional plastic bowl.

The two dependent variables were food intake – total consumption of soup (grams), vegetable (grams) and energy intake (Kcal) – and social interaction – rated by the participants’ meal experiences through questionnaires. The variables were compared by fitting mixed models in SAS Proc Mixed (SAS version 9.3, SAS Institute, Inc). Preliminary tests for normality of each variable were executed (SAS Proc Univariate). These analyses suggested that all variables were not normally distributed and were transformed with a log function, with the use of the social interaction variable (during and after eating the analysis a score variable was created by merging the original variables on social interaction with the intention to simplify this measurement). The models used considered missing outcome data and included all participants. Results: According to the SAS Proc Univariate results, the ‘embrace-me bowl’ did not exert a significant effect on participants’ consumption of soup (p=0.9106), vegetables (p=0.9829), and caloric intake (p=0.9829). Moreover, the ‘embrace-me bowl’ had no effect in terms of participants’ ratings of social interaction (the score created from different variables has a Cronbach’s Alpha of 0.833), while the plastic bowl had a significant effect instead (p=0.0451).

Key findings: The ‘embrace-me bowl’ fully connects with its user, it is immune enough to the distractions that encompass the meal scenario; capable of provoking full intimacy without posing any risk of under or over consumption of foods. The results might suggest that the object can be useful for purposes different from consumption. For instance, the ‘embrace-me bowl’ may have the potential to benefit health and nutrition in specific persons with eating difficulties like children, elderly and ill people, etc. Still, further research is needed before making a final conclusion on the object’s potential users.
OT-037 Oral communication

Photo voice - a powerful tool for mapping the obesity facilitators in the Arab Israeli women population.

Adler D.1; Saliva S.2; Abed El Raaz M.3; Harari R.4

Nutrition and Dietetic Department Hadassah Medical Center, Jerusalem, Israel.

Photo voice is a process by which people can identify, represent, and enhance their community through a specific photographic technique. In Israel, the highest obesity rates are found among Arab Israeli women. Arab women are at 3.5 times higher risk for obesity than the Jewish women at the same age group. The study is a pilot study.

Objectives: a. To recruit Arab women in their towns that will record and reflect their community’s food environment through photos. b. To record thru the photo voice the major causes of obesity in their villages.

c. To assess the impact of the tool on the awareness of the participating women to their obesogenic environment.

Material and methods: Arab nutrition students at their practicum chose to learn the photo voice technique and to run a pilot study practicing it in their 2 home towns. They recruited 8 women willing to participate in a pilot with cameras with which they photographed any scenario related to obesogenic environment, inside their homes and in the town streets.

Results: the impact of the method on the students was overwhelming. Even though they were nutrition students who lived in the town all their lives, the awareness to the obesogenic environment was striking. Mapping the obesogenic promoters from the photos included: sugary drinks, high fat dairy products, high fat meats, while flour bakery products, cakes, cookies, extensive use of samne (high milk fat product) in cooking, and high use of sugar liquid on top of bakery products.

Key findings: The photos voicing loud: the portion sizes are huge everywhere, at restaurants, at home, and even of traditional foods. Fraying the containers, the possibility of food waste is everywhere; the tables on which the food is served are totally covered with foods and sugary drinks. The environment is loaded with variety of high fat bakery products. There is lack of even basic walking trails. The photos included the very low salaries, taken by the women themselves, voicing the correlation of inequality to obesity. The tool had a striking effect on the awareness of the Arab women to the impact of the environment on their food habits. The lecture will include the photos as the powerful essence of the study, and its public health nutrition potential.

OT-038 Oral communication

The precarious livelihood in waste dumps: a report on food insecurity and health risk environmental factors among Brazilian recyclable waste collectors.

Wallace S.; Santos LMP3; Hoefel MGL4; Guilbert MB5; Camero FF5; Nogueira TQ; Arante E.M.4

1Public Health, University of Brazilian, Brazil. 2Department of Public Health, University of Brazilian, Brazil. 3Department of Nutrition, University of Brazilian, Brazil. 4Public Health, University of Brazilian, Brazil.

Objective: This study aimed to estimate the prevalence of food insecurity and to identify environmental factors associated with food insecurity among workers who work at the open dump close to the central Brazilian capital. Methods: The study area is located in the Federal District, about 20 miles from the civic center. It is named “estrutural open dump” and was created more than 50 years ago, along with the construction of the capital of Brazil. About 6,500 people survive on the collection of recyclable solid waste on this dump. A census was performed of the collectors’ families living on five blocks near the dump. A pre-tested form was used, containing questions about socio-demographic status, social programs, feeding, housing conditions, basic sanitation, work and the environment. Food security was assessed from the short scale, with six questions, used in Brazil and in the United States.

Results: A total of 204 households comprised of 835 residents and 286 collectors was studied. 43.1% of the households had five or more people and 88.3% of the family incomes were below $680.25 United States dollars. 93.1% had piped water and almost all had electricity. However almost half the families reported not treating the drink water in any way. 65% of the households had sanitation. But the presence of rats and cockroaches occurred in 90% of them. Most segregators have had an accident at work (55% of the group of their working environmen of 85%).

Based on the food insecurity scale, 50.0% of the families were classified as food secure. Even though, 55.0% of the study families informed that they eat foods found in the dump. Crossing this information shows that the percentage of families who are indeed food secure drops to 24.5% and 55.0% are exposed to food insecurity.

Key findings: The consumption of food from the garbage and food insecurity are present in the daily life of waste segregators. Their living conditions are poor and do not offer all the resources needed for the representation of a decent housing. In this sense, segregators are in a vulnerable community, not solely from the perspective of the workers’ health, but from the environmental aspect. We will not be capable of eliminating poverty in Brazil while the dump issue is not solved and the work of collectors in these environments in subhuman conditions remain.

OT-039 Oral communication

The effect of iron-fortified complementary food and intermittent preventive treatment of malaria on anaemia in young children: a 2x2 randomized controlled intervention trial.

1De Cesare D, Wegmüller R, Zimmermann MB, Bittermann GM, N’Goran EK, Humrell RF

1Human Nutrition Laboratory, ETH Zurich, Zurich, Switzerland. 2Department of Pediatrics, Columbia University College of Physicians and Surgeons, New York, United States of America. 3Unité de Formation et de Recherche Bio­sciences, Université Félix Houphouët-Boigny, and Centre Suisse de Recherches Scientifiques en Côte d’Ivoire, Abidjan, Côte d’Ivoire.

Objective Iron deficiency and malaria are major causes of anaemia in tropical regions, but the proportion of anaemia attributed to these two causes varies with setting and population group. Because iron deficiency during malaria reduces absorption of dietary iron and systemic iron recycling, inter­mittent preventive treatment of malaria may improve the efficacy of iron fortification. The objective was to investigate the impact of an iron fortification complementary food and intermittent preventive treatment for malaria, on haemoglobin concentration, anaemia and iron status in a nine-month intervention study in young ivorians.

Material and methods We conducted a 9-month cluster-randomised, single-blinded, placebo-controlled 2x2 trial in 12-36-month-old children (n=502) in rural Côte d’Ivoire. The treatments were: a) consumption of an iron-fortified complementary food providing 2 mg of iron per day; and b) intermittent preventive treatment of malaria at 3 month intervals using sulfadoxine-pyrithemi­ne in combination with amodiaquine; c) both iron-fortified complementary food and intermittent preventive treatment; or d) neither. The primary out­come measure was haemoglobin and anaemia prevalence. Secondary outcomes were: plasma ferritin, iron deficiency prevalence and Pa­lcura-palcum malaria prevalence and intensity. Data were analysed with random effect models. Results At baseline, anaemia, iron deficiency and malaria prevalence were 82.1%, 40.8% and 58.7%. Compliance to treatments was 90%. There were no significant treatment effects of iron-fortified complementary food on haemoglobin, plasma ferritin or anaemia, but iron-fortified complementary food reduced iron deficiency prevalence (OR=0.08, 95% CI 0.02-0.38). There was no significant treatment effect of intermittent preventive treatment on haemoglobin, but intermittent preventive treatment significantly reduced malaria prevalence (OR=0.46, 95% CI 0.22-0.97) and anaemia prevalence (OR=0.41, 95% CI 0.19-0.90). There were no significant treatment interactions on any of the primary or secondary outcomes in the 2x2 analysis.

Key findings: Intermittent preventive treatment in young children in Côte d’Ivoire modestly reduced Pa-palcura malaria prevalence and anaemia, while iron-fortification complementary food sharply reduced iron deficiency but did not reduce anaemia. Intermittent preventive treatment did not improve efficacy of iron-fortified complementary food against anaemia. These findings sug­gest that iron deficiency is more important than malaria in causing anaemia and that anaemia is more due to iron defi­ciency alone and that malaria is the major cause of anaemia in this setting in young children. Thus, reducing malaria transmission should be the focus of anaemia control efforts.

OT-040 Oral communication

Incentivising healthier vending options using price discounting: A multi-centre study in central Scotland.

1Mooney ID2, Anderson AS, Graham T, Frank P

1School of Health & Related Research, University of Sheffield, UK. 2Scottish Collaboration Public Health Research and Policy, University of Edinburgh, UK. 3Department of Public Health Nutrition, University of Dundee, UK. 4Abercomry Vending Ltd. Glasgow, UK.

Introduction: Price reductions have previously been demonstrated to increase the uptake of healthier vending machine options in both colleges and workplaces in the US. While higher price sensitivities have been reported for more economically deprived social groups, the extent to which this might impact on the success of workplace interventions remains unclear. We examined the relative effectiveness of a 25% price reduction in increasing the uptake of nutritionally balanced vending machine options across diverse workplaces in Scotland and compared this with the same vending company in England. Methods: Four worksites were selected for their size (min.250 to max 1200 employees), internal workforce homogeneity, diversity of business (From IT to manufacturing) and featuring shift-work. At least 30% of all vending options were classed as nutritionally balanced using FSA-approved software. Weekly average uptake of these healthier options was moni­tored by electronic till receipts over a 12 week baseline period before the introduction of a 6 week long price discount of 25%. Results have been monitored for a further 6 weeks after the discount was withdrawn.

Ill World Congress of Public Health Nutrition - 76 -
Results: “Eat-wise” balanced options were increased in the price discount phase by 34.5% (p<0.001); 1.8% (p=0.42); 12.5% (p<0.001) and 19.6% (p<0.001) for sites A to D respectively. After the discount period, the extent of the increase was reduced but remained statistically significant for sites A (+5.2%; p<0.05) and D (+8.1%; p=0.023), but not for site C (+0.5%; p=0.653). Site B had high uptake at baseline (>70%), which did not change significantly throughout the study.

Conclusion: Price-discounting can be an effective means of improving nutritionally balanced vending options among diverse groups of employees, from white-collar public sector to semi-skilled environments. The apparent maintenance of increased uptake, albeit at a reduced level, offers hope that some of the behavior change was sustained. Interpretation of the variability across sites was complicated by differences in baseline uptake and stocking levels.

(-Note Analysis was by 2-test for changes in mean proportions in STATA release 13).

OT-041 Oral communication Effectiveness of eHealth tailored interventions in achieving weight loss and reducing central obesity in adults: a systematic review and meta-analysis of randomised controlled trials.

Zeni, R., Toledo Marante, F.J., Toledo Mediavilla, J.A.

Inteligencia y Intento

The extent of the increase was reduced but remained statistically significant for sites A (+5.2%; p<0.05) and D (+8.1%; p=0.023), but not for site C (+0.5%; p=0.653). Site B had high uptake at baseline (>70%), which did not change significantly throughout the study.

Conclusion: Price-discounting can be an effective means of improving nutritionally balanced vending options among diverse groups of employees, from white-collar public sector to semi-skilled environments. The apparent maintenance of increased uptake, albeit at a reduced level, offers hope that some of the behavior change was sustained. Interpretation of the variability across sites was complicated by differences in baseline uptake and stocking levels. 

(-Note Analysis was by 2-test for changes in mean proportions in STATA release 13).

OT-041 Oral communication Effectiveness of eHealth tailored interventions in achieving weight loss and reducing central obesity in adults: a systematic review and meta-analysis of randomised controlled trials.

Zeni, R., Toledo Marante, F.J., Toledo Mediavilla, J.A.

Conclusion: Price-discounting can be an effective means of improving nutritionally balanced vending options among diverse groups of employees, from white-collar public sector to semi-skilled environments. The apparent maintenance of increased uptake, albeit at a reduced level, offers hope that some of the behavior change was sustained. Interpretation of the variability across sites was complicated by differences in baseline uptake and stocking levels. 

(-Note Analysis was by 2-test for changes in mean proportions in STATA release 13).

OT-041 Oral communication Effectiveness of eHealth tailored interventions in achieving weight loss and reducing central obesity in adults: a systematic review and meta-analysis of randomised controlled trials.

Zeni, R., Toledo Marante, F.J., Toledo Mediavilla, J.A.

Conclusion: Price-discounting can be an effective means of improving nutritionally balanced vending options among diverse groups of employees, from white-collar public sector to semi-skilled environments. The apparent maintenance of increased uptake, albeit at a reduced level, offers hope that some of the behavior change was sustained. Interpretation of the variability across sites was complicated by differences in baseline uptake and stocking levels. 

(-Note Analysis was by 2-test for changes in mean proportions in STATA release 13).
Material y Métodos: Estudio cuantitativo, descriptivo, transversal. Se han evaluado 204 mujeres en periodo de lactancia pertenecientes al Sanatorio de la Trinidad de Palermo, Buenos Aires, Argentina durante el periodo agosto – noviembre 2013. Las variables evaluadas fueron el consumo de calcio de alimentos de fuentes convencionales y no convencionales, su porcentaje de cobertura en porciones por día según las recomendaciones de las Guías Alimentarias para la población argentina y la importancia otorgada a su consumo.

Resultados: El promedio de edad de las embarazadas fue de 32 ± 5,6 años. El 36,5% de las embarazadas con diabetes gestacional presentaban sobrepeso, siendo el mismo porcentaje para obesidad. La ganancia de peso promedio al final del estudio fue de 10 ± 8,7 Kg. La ganancia promedio en mujeres que partieron de un peso normal fue de 12,5 Kg ± 8,4 Kg, y la ganancia promedio en mujeres obesas fue de 10 Kg ± 8,7 Kg. Hubo una mejora de las glomerulopatías tanto en ayunas como postprandial, en el transcurso de la intervención nutricional (1er control: ayunas 93,4 ± 12 mg/dl, postprandial 129 ± 17 mg/dl, 2do control: ayunas 89,5 ± 7,6 mg/dl, postprandial 122 ± 4 mg/dl, 3er control: ayunas 89,4 ± 4 mg/dl, postprandial 122 ± 4 mg/dl, 4to control: ayunas 88 ± 3,4 mg/dl, postprandial 117 ± 7 mg/dl). El 68,2% de las embarazadas controlaron su glucemia solo con plan de alimentación, sin necesidad de insulina. La ingestión energética antes y después de la intervención nutricional fue de 3747 ± 634 Kcalía vs. 1769 ± 389 Kcalía (p<0,001), la diferencia también fue significativa para los macronutrientes. Los neonatos pesaron en promedio 3,2 Kg ± 0,5 g. El 75% de las embarazadas tuvieron parto por cesárea. Al final del estudio el 95% de las embarazadas consumía una dieta equilibrada, completa y variada.

Conclusión: La dieta prescrita y el correcto seguimiento controló la diabetes gestacional con controles normales de glucemia capilar en ayunas y postprandial, y permitió neonatos de peso normal.

OT-045 Oral communication

¿Desigualdad en la Educación Física Chilena? Diferencias en intensidad y actividad física total en escuelas de distinto nivel socioeconómico.

Cerda Rosesco R.
Escuela de Nutrición y Dietética. Facultad de Medicina. Universidad de Chile.

Introducción: El sistema educativo chileno es uno de los más desigualdades del mundo. Son pocos los estudios que relacionan la educación física (EF) con las características socioculturales y económicas de los escolares, junto a mediciones objetivas de la actividad física total (AFT) y de la intensidad desplegada.

Objetivo: Analizar de manera contextualizada las diferencias en intensidad y AFT de escolares de sexto básico durante la clase de EF de tres escuelas de distinto nivel socioeconómico.

Metodología: Se seleccionaron aleatoriamente 10 escuelas Índice de centrof de conglomerados del sistema de medición de la calidad de la EF 2011 derivadas de un estudio previo. Se visitaron 2 de las 10 escuelas Índice. Las escuelas fueron seleccionadas según nivel socioeconómico alto (A), medio (B) y medio bajo (C). En las escuelas de clases sucesivas de 6 básico, se utilizaron acelerómetros Actigraphy GT3X en niños y tres niñas al azar. Durante 90 min aproximadamente se registraron a 100 Hz y épocas de 10 s la actividad realizada. Los acelerómetros se usaron a nivel de cadera ilíaca. Los vectores de magnitud (VM) fueron expresados en cuentas por minuto (cpm) e intensidad según categorías de Freedson et al. Los datos fueron analizados utilizando el programa ActiLife v6.11 y posteriormente SPSS v19 para realizar las pruebas de Anova y Kruskall-Wallis.

Resultados: La media total de cpm fueron de 2,399 ± 653,3 entre las escuelas. La escuela C presentó 2234,7 ± 500,69, la B 2217,1 ± 730,3 y la A 2745,56 ± 596,32 (p=0,019). Los niños presentan mayores cpm v/s las niñas principalmente en el nivel de intensidad, con diferencias significativas (p=0,000) tanto entre grupos como en el tiempo. En ninguna de las clases los escolares de las escuelas B y C pudieron expresar intensidades vigorosas (V) y muy vigorosas (MV), ocupando entre el 37-55,6% de la clase en actividades sedentarias y 8,6 y 14,2 en actividades ligeras. La escuela A mostró entre un 1 y 2,5% de actividades MV y 12,2 % de actividades V.

Conclusión: Los resultados muestran las diferencias entre clases de EF de estas escuelas. La explicación debe considerar además del efecto de la clase de EF como tal, el efecto de la vida extracscolar de los niños, la cual está conectada de manera indisoluble con su condición física, estilo de vida y condiciones arquitectónicas diferenciadas que se dan en la RM de Chile.

OT-046 Oral communication

Influencia de una intervención nutricional a través de una die­ta individualizada sobre el control de la diabetes gestacional en mujeres embarazadas que acuden al Hospital de Clínicas.

Facultad de Ciencias Médicas, Universidad Nacional de Asunción.

Objetivos: Analizar la influencia de una intervención nutricional a través de una dieta individualizada sobre el control de la diabetes gestacional. Materiales y métodos: Ensayo clínico, ciego experimental, prospectivo, efectuado en 41 mujeres embarazadas con diabetes gestacional del Hospital de Clínicas San Lorenzo, entre enero de 2013 a 2014. Se les indicó una dieta de 1800 a 2000 Kcalía con 52% de carbohidratos, 18% de proteínas y 30% de grasas, y se evaluó en cada control la ingesta dietética, la ganancia de peso, los controles de glucemia capilar en ayunas y postprandial, registrándose el peso del neonato al nacer.

Resultados: El promedio de edad de las embarazadas fue de 32 ± 5,6 años. El 36,5% de las embarazadas con diabetes gestacional presentaban sobrepeso, siendo el mismo porcentaje para obesidad. La ganancia de peso promedio al final del estudio fue de 10 ± 8,7 Kg. La ganancia promedio en embarazones que partieron de un peso normal fue de 12,5 Kg ± 8,4 Kg, y la ganancia promedio en mujeres obesas fue de 10 Kg ± 8,7 Kg. Hubo una mejora de las glomerulopatías tanto en ayunas como postprandial, en el transcurso de la intervención nutricional (1er control: ayunas 93,4 ± 12 mg/dl, postprandial 129 ± 17 mg/dl, 2do control: ayunas 89,5 ± 7,6 mg/dl, postprandial 122 ± 4 mg/dl, 3er control: ayunas 89,4 ± 4 mg/dl, postprandial 122 ± 4 mg/dl, 4to control: ayunas 88 ± 3,4 mg/dl, postprandial 117 ± 7 mg/dl). El 68,2% de las embarazadas controlaron su glucemia solo con plan de alimentación, sin necesidad de insulina. La ingestión energética antes y después de la intervención nutricional fue de 3747 ± 634 Kcalía vs. 1769 ± 389 Kcalía (p<0,001), la diferencia también fue significativa para los macronutrientes. Los neonatos pesaron en promedio 3,2 Kg ± 0,5 g. El 75% de las embarazadas tuvieron parto por cesárea. Al final del estudio el 95% de las embarazadas consumía una dieta equilibrada, completa y variada.

Conclusión: La dieta prescrita y el correcto seguimiento controló la diabetes gestacional con controles normales de glucemia capilar en ayunas y postprandial, y permitió neonatos de peso normal.
Asociación Sil'!a-de/ Valle

Introducción: Se estima que durante el 2011 se han generado en Europa 89 millones de toneladas anuales de residuos alimentarios. En Cataluña se pro-

OT-049 Oral communication

Objetivos: La inseguridad alimentaria es una de las 3 principales causas de la malnutrición y a la vez causa subyacente de la desnutrición infantil. En cooperación con la Fundación Prosegur, la ONG Nutrición Sin Fronteras desarrolló el Proyecto “Pueblos Colorados” para hacer un estudio de los efectos producidos por la inseguridad alimentaria y mejorar la situación nutricional de los niños de las escuelas de la fundación Prosegur en Argentina, Paraguay, Uruguay y Colombia.

Objetivos: La inseguridad alimentaria es una de las 3 principales causas de la malnutrición y a la vez causa subyacente de la desnutrición infantil. En cooperación con la Fundación Prosegur, la ONG Nutrición Sin Fronteras desarrolló el Proyecto “Pueblos Colorados” para hacer un estudio de los efectos producidos por la inseguridad alimentaria y mejorar la situación nutricional de los niños de las escuelas de la fundación Prosegur en Argentina, Paraguay, Uruguay y Colombia. Material y métodos: Para el análisis de la situación nutricional se utilizaron parámetros antinutricionales: talla para edad (desnutrición crónica), peso para talla (desnutrición aguda) y peso para edad (bajo peso). La diversidad alimentaria como indicador de posibles deficiencias alimentarias se analizó a través de los datos del recordatorio de 24 horas y el cuestionario de seguridad alimentaria. Para evaluar la seguridad alimentaria se utilizó la encuesta Household Food Insecurity Access Scale (HFAS).

Resultados: Hasta el momento, se han muestreado un total de 786 niños de edades comprendidas entre 5 y 15 años de un total de 22 escuelas. Un total de 154 niños (29%) presentaban desnutrición crónica. Se observaron diferencias significativas entre países, ya que en Argentina se observó un 11% de los casos, porcentaje similar a Colombia (13%), pero diferente a Uruguay (36.5%) y Uruguay (42.5%). Por el contrario, también se observaron porcentajes moderadamente altos de obesidad y/o sobrepeso en Argentina (21%), Uruguay (12%), Paraguay (20.7%) y Colombia (19%).

Lograr la diversidad alimentaria y de seguridad alimentaria revalidaron uno Índices elevados de inseguridad alimentaria moderada y/o severa (41.6% y 52.5% en Uruguay y Paraguay respectivamente) y un porcentaje importante de dieta pobre en diversidad (39.1%). Entre los hogares con un grado moderado y/o severo de inseguridad alimentaria, existe un porcentaje significativo de niños con obesidad (16.8%). Además se ha observado que entre los niños y niñas con baja talla, un 51.2% presentan inseguridad con hambre severa.

Conclusiones: Las escuelas de Pueblos en Argentina, Uruguay, Paraguay y Colombia reflejan el fenómeno de la “transición nutricional” con cam-

Introducción: Se estima que durante el 2011 se han generado en Europa 89 millones de toneladas anuales de residuos alimentarios. En Cataluña se pro-

OT-050 Oral communication

Proyecto “BCN contará con el menú”: implementación de una red de aprovechamiento de alimentos elaborados exces-

OMG Nutrición Sin Fronteras “Dept. Salud y Acción Social, Universidad de Vic”

Examen de la relación entre el índice de masa corporal pregestacional y el riesgo de patologías durante el embarazo.

Resultados: El 23.1, 65.1 y 11.8% de los participantes reportaron una muy buena, buena y regular/mala/muy mala salud alimentaria respectivamente. Los factores asociados con buena salud autocertificada fueron ser fumador (OR vs no fumar es 1.84; IC 95%: 1.29-2.65) y menos activo (OR= 0.69; IC 95%: 0.19-0.30-0.55). El perfil de los participantes con regular/mala/muy mala salud autocertificada fue ser fumador (OR vs no fumar es 5.19; IC 95%: 3.12-8.63), tener exceso de peso (OR vs no peso es 2.19; IC 95%: 1.17-4.07) y ser menos activos físicamente (OR activo vs menos activo es 0.19; IC 95%: 0.12-0.32). Los participantes que tienen una adherencia media a la dieta mediterránea tienen un menor riesgo de tener una buena salud autocertificada (OR= 0.81; IC 95%: 0.87-0.97) o regular/mala/muy mala salud autocertificada (OR = 0.70; IC 95%: 0.59- 0.85) y los que tienen una adherencia alta tienen un menor riesgo de tener una buena salud (OR = 0.69; IC 95%: 0.61-0.79) y regular/mala/muy mala salud (OR= 0.68; IC 95%: 0.65-0.72).

Hallazgos claves: La mayoría de los participantes indicaron tener un buen estado de salud. Los participantes con adherencia media a dieta mediterránea indicaron tener mejor estado de salud. Los universitarios que indicaron buena o regular/mala/muy mala salud presentaron mayor consumo de tabaco, menor actividad física y exceso de peso. Estos hallazgos podrían formar parte de las estrategias de intervención en universidades saludables para mejorar la salud de los universitarios.
bios de patrones de alimentación, modificaciones de las necesidades nutricionales de la población y una creciente importancia que tiene algunas enfermedades nutricionales como el retraso crónico de crecimiento (talla corta), la obesidad, las enfermedades crónicas no transmisibles y las carencias de nutrientes específicos. Se observa específicamente en los escolares la coexistencia de la talla corta por edad con el sobrepeso y la obesidad.

OT-052 Oral communication
Evaluación del programa “Seis pasos hacia la salud del niño escolar” en el Estado de Querétaro, México.
1Universidad Autónoma de Querétaro, México. 2DIF Estatal Querétaro, México.

Introducción: En México la obesidad en escolares a menudo conduce a carencias nutritionales y pobreza representa un problema de salud pública complejo. Objetivo: evaluar el impacto de un programa educativo de nutrición en el establecimiento nutricional, hábitos alimentarios (HA) y actividad física (AF) de niños escolares en zona urbana(U), semiurbana(SU) y rural(R) del estado de Querétaro. Métodos: estudio longitudinal con intervención educativa de 7 meses en (N=1338) niños de 6 a 12 años y sus padres, con grupo de intervención GI (n=498) y control GC (n=840). Se evaluó pre y post-intervención: antropometría (OMS,2007), HA y AF (EntKid,2003). Resultados: Inicialmente en población total ZIMC>1 fuese 37% y déficit de peso o talla <2%. Al final ambos grupos incrementaron ZIMC>1 pero el GI mostró 2.1% del incremento del GC (p<0.05). Disminuyeron las medidas Z (95%) de IMC en el GI; ZIMC y cintura en zona SU y R; el GI mejoró el score global de HA(p<0.05); sin cambios en el score global de AF. La zona SU mejoró score de HA y AF (p<0.05). En el GI disminuyó el % de niños que consumían refresco y aumentó el de niños que consumían verduras >1veedía (p<0.05). Discusión: pocos programas semejantes logran impacto en el IMC cambiando solo hábitos. Conclusión: la prevalencia de ZIMC>1 fue mayor a la media nacional; el programa desaceleró el incremento del IMC y la adiposidad central y mejoró el score de hábitos de alimentación, el consumo de verduras y refresco. Su impacto fue mayor en zona semiurbana y rural.

OT-053 Oral communication
Costo-eficiencia de la implementación de la dieta mediterránea en un hospital.
Duchateau M.1, Dorens R1, Amaga M.1, González T1, Zander T1, Cabrera Y1, Navarro R1, Maynar M1.4
1Hospital Group; 2Diagnostic and Therapeutic Endoluminal Center (CDETE), Hospiten; 3Agora Foundation; 4Las Palmas University (ULPGC). Canary Islands, Spain.

Objetivos: Valorar la importancia y dificultades de implantar la Dieta Mediterránea en ambiente hospitalario. Material y Métodos: Dos hospitales del mismo grupo de gestión privada y localizados en el mismo área geográfica, son incluidos en este estudio. El área no tiene tradición en la Dieta Mediterránea y en esta se introduce la dieta. El total de camas de los hospitales son 296 con una rotación de 12000 pacientes año. Se ofrecen a los pacientes ingresados tres menús y uno de ellos es Dieta Mediterránea. Se les explica a los pacientes los beneficios de la Dieta Mediterránea como que dicha dieta: descubre la probabilidad de desarrollar enfermedades crónicas como diabetes tipo 2, enfermedad cardiovascular y cáncer. Se valora mediante encuesta la opinión y calidad de la dieta y los datos son recogidos cada día por la enfermería de planta. Se compara grupos por patologías. Resultados: Los datos recogidos de calidad de comida, opinión del paciente y resultados analíticos son evaluados estadísticamente. El costo beneficio es estudiado no solo por el gasto total de la dieta sino también por el espacio físico que se necesita para su preparación, almacenaje, número de empleados, cantidad, variedad de comida y su distribución. Los datos demuestran una clara diferencia entre las diferentes dietas. Conclusión: Los beneficios que se obtienen con esta dieta son conocidos, sin embargo, se precisa de una mayor educación y esfuerzo para integrar la en el ámbito hospitalario.
Objectives: Diabetes mellitus (DM) is the most common metabolic disorder all around the world. The goal of this study was to assess the effect of turmeric on glycemic status, lipid profile, total antioxidant capacity and hs-CRP in hyperlipidemic type 2 diabetes mellitus patients.

Materials and Methods: This study was a double blind randomized clinical trial in which 80 hyperlipidemic patients with type 2 DM were included. Patients were categorized into two groups each containing 40 individuals. Intervention group received 2400 mg of turmeric powder daily for 8 weeks, while individuals of control group took placebo during this time. In two groups at the beginning and the end of the study, 10 ml blood samples were withdrawn and the average fasting blood sugar, insulin, HOMA-IR, HbA1C, triglyceride (TG), total cholesterol (TC), LDL-c, HDL-c, apolipoprotein A1, and apolipoprotein B, total antioxidant capacity (TAC) and hs-CRP of serum were measured. Food intakes were recorded using 24 h food recall. Anthropometric indices and systolic and diastolic blood pressure were also measured. The statistical analysis was carried out using paired and independent t and chi-square tests.

Results: After 8 weeks of intervention, among the turmeric receiving group, BMI (p=0.000), Systolic and Diastolic Blood Pressure (p=0.000), TG concentration (p=0.000) and LDL-c (p<0.009) were significantly decreased and significant changes were observed between two groups (p<0.05) as well. Total cholesterol, HDL-c and apolipoprotein A1 were significantly different between the two groups at the end of the study (p<0.05). No significant changes were observed with regard to other parameters such as average levels of blood glucose, serum insulin, glycosylated hemoglobin, Insulin resistance, TAC and hs-CRP after the period of the study. No significant difference in dietary intake and physical activity levels were observed in either groups during the study.

Key findings: The result of this study showed that intake of turmeric powder caused improving lipid profiles with type 2 DM patients with type 2 DM. There was no significant effect on glycemic status, TAC and serum hs-CRP.

OW-002 Oral communication

Fruit and vegetable consumption and mortality in Eastern Europe.

Steffler D.1, Pajak A.2, Malyutina S.3,4, Kulinova R.5, Bobak M.1,6,7
1Department of Epidemiology and Public Health, University College London, UK; 2Institute of Internal Medicine and Preventive Medicine, Siberian Branch of the Russian Academy of Medical Sciences, Novosibirsk, Russia; 3Novosibirsk State Medical University, Novosibirsk, Russia; 4National Institute of Public Health, Prague, Czech Republic.

Objectives: According to the World Health Organization's estimates, disease burden due to low fruit and vegetable consumption is higher in Central and Eastern Europe and the former Soviet Union than in any other parts of the World. However, no large scale studies have investigated the association of fruit and vegetable intake and mortality in Eastern Europe yet. The aim of our study was to examine the relationship between fruit and vegetable intake and all-cause and cardiovascular disease (including coronary heart disease and stroke) mortality in Czech, Polish and Russian participants of the Health, Alcohol and Psychosocial Factors in Eastern Europe (HAPPEE) prospective cohort study. Material and methods: Dietary data was collected using a validated food frequency questionnaire. The European Food Safety Authority's FoodEx 2 food classification and description system was used to categorise food items into fruit and vegetable food groups. Participants with existing chronic disease at baseline were excluded. Missing covariate data was imputed using multiple imputation procedures, and Cox regression analysis was applied to analyse the association between fruit and vegetable intake and mortality. Results: From the 19,415 participants, 1,327 died over the average follow-up time of 7.1 years. In the multivariable adjusted model, statistically significant inverse association was found between cohort-specific fruit and vegetable intake quintiles and cardiovascular disease mortality (highest vs. lowest quintile HR: 0.70, 95% CI: 0.51-0.95; p-value for trend: 0.012), but not with total mortality (HR: 0.80, 95% CI: 0.75-1.07; p-value for trend: 0.313). We found that 2.69% of all-cause, 9.21% of cardiovascular disease, 4.16% of coronary heart disease and 15.34% of stroke deaths could be prevented if participants in the bottom three quartiles shifted their intake one quartile upwards. Additional adjustment for mean arterial blood pressure attenuated the associations with all mortality outcomes.

Key findings: The intake of fruits and vegetables was inversely associated with cardiovascular mortality in large, population-based cohorts from Central and Eastern Europe and the former Soviet Union. If fruit and vegetable consumption was increased, the reduction in mortality would be the most substantial for stroke deaths. Blood pressure lowering effect seemed to be an important mediator of the inverse association between fruit and vegetable intake and cardiovascular mortality.
vegetables and fruit is low. The aim of this study was to investigate the associations of greenhouse gas emission (GHGE) and land use of usual diet with mortality risk, and to estimate the effect of a modelled meat substitution scenario on health and the environment.

Material and methods: The usual diet of 40011 subjects in the EPIC-NL cohort was assessed using a food frequency questionnaire. GHGE and land use of usual diet were based on the inverse regression analysis. Cox proportional hazard ratios (HR) were calculated to determine relative mortality risk. In the modelled meat-substitution scenario, one-third (35 gram) of the usual daily meat intake (105 gram) was substituted by other foods.

Results: During a follow-up of 15.9 years, 2563 deaths were registered. GHGE and land use of usual diet were not associated with all-cause or with cause-specific mortality. Highest vs. lowest quartile of GHGE and land use adjusted hazard ratios for all-cause mortality were respectively 1.00 (95% CI: 0.86-1.17) and 1.05 (95% CI: 0.89-1.23). Modelled substitution of one-third of meat with vegetables, fruit-nuts-seeds, pasta-rice-couscous, or fish significantly increased survival rates (6-19%), reduced GHGE (4-11%), and land use (10-12%).

Key findings: There were no significant associations observed between diet-derived and land use and mortality in this Dutch cohort. However, the scenario-study showed that substitution of meat with other major food groups was associated with a lower mortality risk and a reduced environmental burden. Especially when vegetables, fruit-nuts-seeds, fish, or pasta-rice-couscous replaced meat.

OW-005 Oral communication
Adiposity has a greater impact on hypertension in lean than not-lean populations: a systematic review and meta-analysis.

Arabshahi S., Busingye A., Stehouwer C., Hesketh J.

Objective: The impact of obesity on the risk of hypertension was greater in not-lean populations: LMICs. The risk of hypertension as assessed in meta-analyses, was higher in women of rural areas of LMICs.

Materials and methods: We identified 46 studies of meta-analyses, which were being associated with cause-specific mortality.

Results: There were no statistically significant associations for women (RR = 0.83, 95%CI: 0.70-0.97 per 25 puntuat increase; P = 0.032) but for men. Higher Se concentrations were inversely associated with GHGE (RR = 0.89, 95%CI: 0.82-0.98 per 0.806 mg/mL increase; P = 0.009) with the association more prominent in women (RR = 0.82, 95%CI: 0.72-0.94 per 0.806 mg/mL increase; P = 0.004) than men (RR = 0.98, 95%CI: 0.86-1.12 per 0.806 mg/mL increase; P = 0.485). Selenoprotein genotypes are currently being analyzed.

Conclusion: The findings from this large prospective nested case-control study indicate that Se status is suboptimal in many Europeans and suggest an inverse association between CVD risk and higher serum Se status, which is more evident in women.

OW-007 Oral communication
Effect of pomegranate extract consumption on CVD risk factors, stress and quality of life in human volunteers - a double-blind, randomised, placebo-controlled trial.

Stockton, A.E.C.; Al-Dujaili, E.; Drummond, S.; and Davidson, I.

Objective: Pomegranate extract (PE) provides a rich and varied source of biophenols with the most abundant being ellagitannins, tannins, anthocyanins, ellagic and gallic acids. Biophenols can act as powerful antioxidants. We have shown that pomegranate juice consumption may alleviate cardiovascular disease (CVD) risk factors by reducing systolic and diastolic blood pressure (BP) and exercise-induced oxidative stress. This study investigates the effect of pomegranate extract intake on BP, insulin resistance (HOMA-IR), stress hormone levels (cortisol/cortisone) and quality of life in human volunteers.

Materials and methods: Healthy volunteers (7 males and 22 females) participated in a parallel, randomized, double-blind, placebo-controlled study (1 week pre-intervention, 4 weeks intervention, 1 week post-intervention). BiP and cortisol levels (am, noon, pm) were assessed by specific and sensitive ELISAs, and fasting blood was obtained at baseline plus 4 weeks to compare glucose, insulin and insulin resistance parameters.

Results: Salivary BP was significantly reduced following PE from 120.3 ±13.3 to 115.6 ±13.1 mmHg (P = 0.012). There was a reduction in the HOMA-IR levels from 2.22 ±6.2 to 1.61 ± 1.9 (P = 0.045), and glucose, insulin and uric acid all decreased from baseline. No significant changes were recorded in volunteers taking the placebo. Pomegranate extract intake significantly reduced salivary cortisol levels (P < 0.001 and noon; 43.1 ±32.3, P = 0.016). Salivary cortisol/cortisone ratio was also significantly reduced (Am from 1.11 ±0.51 to 0.55 ±0.26, P < 0.001, noon 1.57 ±0.85 to 0.75 ±0.72, P < 0.001 and PM; 1.22 ±0.9 to 0.74 ±0.59, P = 0.011). Physical (P = 0.018) and social functioning (P = 0.021), pain (P = 0.003), general health (P = 0.008) and 84011 quality of life score (P = 0.007) were significantly improved in those taking the pomegranate extract capsules. There was a slight increase in salivary cortisol and cortisone/cortisone ratio in those taking the placebo.

Key findings: These results suggest that pomegranate extract intake increased salivary biophenol levels and reduced cortisol levels and improves health related quality of life. The reduction in salivary cortisol levels may prove to be beneficial for people suffering from chronic stress. The decrease in insulin resistance may improve health outcomes for those who suffer from CVD, type2 diabetes and metabolic syndrome.
Dietary fat, glycemic index (GI) and fibre intakes have been linked to Type 2 Diabetes risk, however few studies have investigated their combined, longitudinal relationships. The objective of this analysis was to examine a high-fat, high-GI, low-fibre dietary pattern across the adult life course and risk of Type 2 diabetes (T2D).

Materials and methods: Participants were 1,180 adults from the 1946 British Birth Cohort. T2D was identified using validated self-report, fasting blood glucose and haemoglobin A1c levels. Dietary intake was measured at age 36, 43 and 53 using a 5-day diet diary. Reduced rank regression was used to characterise dietary patterns. Risk of T2D was followed from age 53 to 64 years (n=106).

Results: Linear trend for changes in T2D risk: per 0.1 unit increase in dietary pattern z-score (per 1 unit increase in age) was associated with a 37% (95% CI: 0.87, 1.74) increased risk of type 2 diabetes independently of simultaneous changes in BMI and waist circumference. Increases in z-scores between 43-53 years showed stronger associations with T2D risk (1.29, 95% CI: 0.91, 1.65) than increases between 36 and 43 years of age (1.21, 95% CI: 0.90, 1.65).

Key findings: A dietary pattern increasingly characterised by high fat, high GI and low fibre over the adult life-course is associated with higher T2D risk in older adulthood independent of weight gain.

**OW-1001**

**Oral communication**

**Mediterranean Diet and Invasive Breast Cancer Risk in the PREDIMED trial.**

Toledo E.1,2, Salas-Salvadó J.1,2,9, Corella D.1,2,3, Fitó M.1,2, Estruch R.4, Martínez-Gonzalez MA.1,2 for the PREDIMED investigators.

1. Department of Preventive Medicine and Public Health, University of Navarra, Pamplona, Spain, 2. CIBER Fisiopatología de la Obesidad y Nutrición (CIBER OBN), Instituto de Salud Carlos III (ISCIII), Spanish Government, Madrid, Spain, 3. Nutrition Department, ISPV, Universitat Rovira i Virgili, Reus, Spain, 4. Department of Preventive Medicine and Public Health, University of Valencia, Valencia, Spain, 5. Cardiovascular and Nutrition Research Group, Institut Municipal d’Investigació Mèdica, Barcelona, Spain, 6. Department of Internal Medicine, Instituto de Investigaciones Biomédicas August P. Sunyer (IDIBAPS), Hospital Clinic, University of Barcelona, Barcelona, Spain.

Objectives: Our objective was to assess the effect of two interventions with Mediterranean diet on the primary prevention of breast cancer in the PREDIMED trial, a randomized controlled trial.

Materials and methods: The PREDIMED study (Prevención con Dieta Mediterránea) is a randomized, single-blind, and controlled trial conducted in Spanish primary healthcare centres. For the purpose of this study, we included 4,282 women aged 60 to 80 years. They were randomly allocated to a Mediterranean diet supplemented with extra-virgin olive oil (n=1478), to a Mediterranean diet supplemented with mixed nuts (n=1288) or to a control diet (advice to reduce dietary fat) (n=1393). Analyses were performed on an intention-to-treat basis. We used Poisson regression models to address the association between the dietary intervention and the incidence of confirmed invasive breast cancer.

Results: After a median time of 4.3 years of intervention, the observed rates (per 1000 person-years) were 1.14 for the Mediterranean diet with extra-virgin olive oil group, 1.82 for the Mediterranean diet supplemented with mixed nuts group, and 2.90 for the control group. The multivariable-adjusted risk ratio (RR) for the group allocated to Mediterranean diet with extra-virgin olive oil versus control was 0.34 (95% CI: 0.14 to 0.83). The multivariable-adjusted risk for the Mediterranean diet with mixed nuts versus control was 0.60 (95% CI: 0.26 to 1.35).

Key findings: Our results suggest that the risk of invasive breast cancer in women 60 years or older may be substantially reduced with a dietary intervention promoting the adherence to the Mediterranean dietary pattern, specifically when it is supplemented with extra-virgin olive oil.
through responses to a mailed questionnaire after at least 2 years from recruitment. Dietary intakes of PCBs, expressed as World Health Organization toxic equivalents, were assessed at baseline through a previously validated 136-item semi-quantitative food-frequency questionnaire. The published concentration levels of PCBs measured in samples of food consumed in Spain were used to estimate intakes. Multivariable Cox regression models were fitted to estimate hazard ratios (HR) and 95% confidence interval for incident hypertension.

Results: During follow-up, 1577 incident cases of medically-diagnosed hypertension were identified. After adjusting for total energy intake and additional adjustment for potential confounders, participants in the fifth quintile of PCB intake were at higher risk of developing hypertension during the follow-up. Nevertheless, further longitudinal studies are needed to confirm our results.

Funding: The SUN Study has received funding from the Instituto de Salud Carlos III, Official Agency of the Spanish Government for biomedical research (Grants P10/002558, P10/02393, P13/00615, RD06/0045, G03/140 and B7/2010), the Navarra Regional Government (45/2011) and the University of Navarra.

OW-012 Oral communication

Investigation of the nutritional status of children and the nutrition knowledge of child and youth care workers in residential care settings in Durban, South Africa.

Grobbelear HH, Napier CE, Oldewer-Theron WH
Durban University of Technology.

The purpose of this study was to investigate the nutritional status of children and the nutrition knowledge of child and youth care workers (CYCWs) in residential care settings to inform the development of reliable and valid nutrition education materials (NEM).

The target population included boys (n = 112), girls (n = 38) (both 5-19 years of age) and CCVs (n = 40). Anthropometric measurements were captured and analysed using the World Health Organisation’s (WHO) AnthroPlus version 1.0.2. statistical software. The WHO growth standards for school-aged children and adolescents were used to compare the anthropometric measurements. Dietary intake measurements were done by a three-day food menu analysis using Food Finder® Version 3 computer software program and comparing the results with the Dietary Reference Intakes (DRIs). Average portion sizes were established by weighed food records, observation of practices and focus group discussions with the CYCWs. Nutrition knowledge of the CYCWs was determined by a self-administered questionnaire developed and tested for reliability and validity.

Seven point ten percent of the boys and 15.8% of the girls were stunted, 3.6% and 2.6% were severely stunted. Fifteen point two percent of boys and 19.2% of girls were at risk of being underweight, while 7.1% of the boys and 15.8% of the girls were overweight. Two point six percent of the girls were obese. Five point four percent of the boys were underweight and 7.7% severely underweight.

The DRIs for girls and boys were met for energy and protein in all the age groups. Energy; 14-18 years in the national intake with the WHO guidelines indicated that the protein (10.78%) and carbohydrate (58.07%) was within the recommendations of 10-15% and 55-75% respectively and fat intake (31.15%) was above the recommended intake of 15-30%. Weighed food records indicated the fruit and vegetable intake was 17% of recommended intake. None of the groups met the DRIs for calcium. Results showed that micro nutrient inadequacies were more prevalent in age groups 9-13 and 14-18 years in both girls and boys. General nutrition knowledge of CYCWs was fair. Knowledge on diet diversity, serving sizes and hygiene practices were very poor.

This study established that malnutrition is prevalent in the establishments and that there were many gaps in the nutrition knowledge of the CYCWs. The NEM developed in this study will address these gaps.

OW-013 Oral communication

Lead and cadmium in maternal blood and placenta in pregnant women from a mining-smelting zone of Peru and transfer of these metals to their new borns.

Castro J.1, López de Romáña D.2, Bedregal P.3, López de Romáña G.3, Chico D.1,2
1Universidad Nacional del Centro del Perú, Huancayo, Perú. 2Instituto de Investigación Nutricional, Lima, Perú. 3Instituto Peruano de Energía Nuclear, Lima, Perú. 4Universidad Nacional Agraria La Molina, Lima, Perú.

Objectives: The cross-sectional study was carried out to determine the lead and cadmium concentration in maternal and umbilical cord blood and placental tissue and breast milk of pregnant women living in a mining-smelting town in Peru.

Material and methods: Forty deliveries with normal evolution of pregnant women of the Oroya city (Junín-Peru, 3,730 maul) were evaluated. Maternal blood and umbilical cord blood samples were taken using tubes with anticoagulant and mineral free. Was taken 200 g of placenta. All samples were coded and stored in a freezer (-18°C). Breast milk samples were taken on the thirteenth day of delivery. Blood and breast milk samples were unfrozen, plaqueal tissue samples were dried (69/70°C) and grinded (lyengar et al., 2001a,b,c). The analyses of lead and cadmium concentration were realized in Peruvian Institute of Nuclear Energy Chemistry Laboratory by atomic absorption with graphite furnace. Analytical blanks were considered. Two reference materials, DORM-2 dogfish muscle and Simulated Diet F were used to ensure the quality data of plasma and breast milk analysis, respectively. Data analysis was done using the statistical software (SPSS V15). Associations between variables were examined by Pearson’s correlation analysis.

Results: Mean lead concentrations in the blood of both women and their neonates were 27.2±15.9 and 18.5±13.0 µg/dl, respectively with 83% of the women and 65% of the neonates having toxic levels. Mean cadmium concentrations in maternal blood were below the safe upper limit, but 45% of women had levels above 10 µg/dl. On the other hand, the mean cadmium concentration in umbilical cord blood was 12.0±17.8 µg/dl, with 38% of neonates having levels above 10 µg/dl. The lead and cadmium concentrations in maternal milk were 108.9±69.4 and 5.6±4.3 µg/l, respectively. In addition, lead and cadmium in cord blood accounted for 67.8% and 136.4% compared to concentrations in maternal blood.

There was no relationship between the concentration of lead in the umbilical cord blood and the birth weight of the neonate (p=0.006).

Key findings: It is evident that lead contamination and to lesser extent cadmium, pose a problem in pregnant women in this region. Although the lead percentage appears to act as a protective barrier to the nutrient intake to these metals to the fetus still persist. The concentration of lead was quite high in maternal milk and could be an important source of contamination to the infant.

OW-014 Oral communication

Maternal knowledge and practices of exclusive breast feeding and anthropometric indices of their infants in Northeast Nigeria.

Biasu, V. N and Uchemba, S. C
Department of Home Science, Nutrition and Dietetics University of Nigeria, Nsukka.

Objective: This study assessed maternal knowledge and practices of exclusive breastfeeding (EBF) and the anthropometric indices of their infants in urban and rural areas of a commercial state in south east Nigeria.

Material and methods: Five hundred (500) out of 1126 lactating mother-child pairs were randomly selected during their postnatal visits to 6 health centers out of 17 in the study area. Ethical clearance and consent were obtained before pre-tested and validated questionnaire was administered to the mothers. Anthropometric measurements of the children (length, weight, head, chest and mid upper arm circumferences) were obtained using standard procedures. Information from the questionnaire were statistically analysed and data obtained were expressed as frequencies, percentages, mean and standard deviation. Analysis of variance (ANOVA) was used to separate and compare means. Anthropometric indices were derived from anthropometric measurements of the children and compared with the new WHO child growth standards for the age group. The nutritional status of the children was subsequently classified as normal or malnourished. The malnourished ones were further classified under different categories of underweight, wasting, overweight, obesity and stunting.

Results: Sixty-eight percent (68%) urban and 53.6% rural mothers had adequate knowledge of EBF; out of these, 24.6% in urban and 20.1% in rural practiced EBF. Only 16.4% urban and 8% rural mothers initiated breastfeeding pre-lacteal feeds were used by 34.8% urban and 57.7% rural mothers. These pre-lacteal feeds included glucose water (16.8%) and plain warm water (20.8%), insufficient milk production (20.8%) and employment outside the home (16% in urban) were among the reasons for non-compliance by the mothers. Rate of EBF of 0-3 month old children varied from 20% to 28% and for 0-6 month olds from 10.8% to 16.8% in rural and urban areas, respectively. Maternal age, education, health facility used for child delivery and mode of delivery affected the rate of EBF. Mean weight of EBF male and female children 0-6 months old in urban area were 9.4±0.5 and 8.3±0.3 kg, respectively and 9.1±0.3 and 7.8±0.4 kg, respectively for their non-EBF counterparts. Similarly, at 0-6 months EBF rural males and females weighed (9.2±1.09 and 8.3±0.6, respectively) more than their non-EBF counterparts (7.8±1.1 and 7.3±1.4 kg, respectively). Moderate and severe were underweight urban and rural non-EBF children, respectively. Moderate wasting was seen in 6.8% rural and 5.8% rural non-EBF children. Family and community support is essential for the success of exclusive breast feeding.

III World Congress of Public Health Nutrition - 84 -
**OW-015**

**Oral communication**

**Nutritional status and risk factors for malnutrition among gruop adolescent and prinicples in Sao Tome and Principe.**

Silva D.1,2, Valente A.1, Dias C.1, Almeida F.1, Cruz H.2, Neves E.2, Almeida MD.2, Caldas-Afonso A.1,2, Guerra A. 1,2, and Study Group.*

Unidade de Nutrição/Hospital Pediátrico Integrado/Centro Hospitalar São João1, Faculdade de Ciências da Nutrição e Alimentação da UP, Serviço de Biostatística e Informática Médica, Hospital Dr Ayres de Meneses2, Instituto Marques de Valbe Flo6, Faculdade de Medicina da UP.

Objectives: to assess the nutritional status as well as evaluate the risk factors that may contribute to malnutrition during infancy in a representative sample from Sao Tome and Principe.

Material and methods: 1285 children aged less than 5 years old were randomly selected from 24704 children enrolled in the vaccination program of 2010. Children’s nutritional status was assessed by weight-for-length (>24 months) and Body Mass Index (>24 months), mothers nutritional status was determined according to the World Health Organization. Birth weight was evaluated based on Olsen growth curves. Catch-up and catch-down growth were defined as a change in standard deviation scores of >0.67 from birth to 2 years of age. Statistical analysis was performed with SPSS®, according to the total sample and by age groups. The study was approved by Ethics Committee of Hospital Dr. Ayres Meneses and Centro Hospitalar São João.

Results: Of the 1285 children, 45.5% were male and the median age 22 months. A high percentage (30%) of malnutrition was observed in the youngest children (0-24 months) vs 22% of the elders (>24 >60 meses). In children older than 12 months there is a lower risk of malnutrition associated with BMI (>z5 kg/m²) [OR=0.476 (0.234-0.968)] (p=0.04) and maternal education (>10 years) [OR=0.448 (0.244-0.825)] (p=0.01). Likewise, it is observed a lower risk of malnutrition in children with adequate birth weight [OR=0.485 (0.299-0.783)] (p=0.003) and catch-up growth in the first 6 months of life [OR=0.476 (0.254-0.900)] (p=0.001), whereas mother pregnancies (>5) negatively influences the nutritional status [OR=1.160 (1,004-2,582)] (p=0.004). At 24 months, only the high educational level of the mother (>10 years) [OR=0.186 (0,064-0,340)] (p=0.002) and the catch-up growth in the first 6 months [OR=0.262 (0,133-0,596)] (p=0.001) showed a protective effect. By the contrary, mother’s number of pregnancies (>5) [OR=2.428 (1,348-4,373)] (p=0.003) and the number of siblings (>1 brother) [OR=1.537 (1,025-2,303)] (p=0.038) increase the risk of malnutrition of children at 24 months.

Key findings: the prevalence of malnutrition observed in the study population seems to be related to social indicators and nutritional markers of the mother. We emphasized the huge importance of mothers information/education, with priority intervention in pregnancy.

**OW-016**

**Oral communication**

**Is dietary diversity associated with biomarkers of micronutrient status among non-pregnant adolescent Mosambican girls in two different seasons?**

Korkalo L.1, Erikola M.1, Heinonen A.1, Freese R.1, Selvester K.2, Mutanen M.1.

1Department of Food and Environmental Sciences, Division of Nutrition, University of Helsinki, Finland. Food Security and Nutrition Association (ANSA), Mozambique.

Objectives: Studies in low-income settings have shown that dietary diversity scores (DDS) are positively associated with micronutrient adequacy of diets. Less is known about whether different DDSs could be used as proxy tools to assess the risk of micronutrient deficiencies on a population level. We studied whether one of the dietary diversity tools proposed by FAC, the Women’s Dietary Diversity Score (WDDS), is associated with low concentrations of haemoglobin, serum ferritin, zinc, and folate and plasma retinol among 14-19-year-old non-pregnant Mozambican girls.

Materials and methods: We used data from the ZANE Study (Estudo do Esco elo Racional de Adolescentes na Zâmbia). The data were collected cross-sectionally in different regions of Zambäquia Province in 2010. Non-pregnant participants with a venous blood sample and 24-hour dietary recall data (n=225 in January-February and n=220 in May-June) were included in the analysis. We constructed the WDDS consisting of nine food groups (WHO DDS and recall dietary data).

We performed logistic regression analyses stratified by season to examine associations between low (<3), and medium/high (>4 food groups) WDDS and low blood concentrations (the lowest quartile in each season). An asset score was created by assigning scores for type of housing and possession of household items, animals and land. Sampling weights were used.

Results: In January-February, a low WDDS was associated with a higher odds of having low serum zinc, compared with a medium/high WDDS. This association remained significant after adjusting for region, age, breastfeeding, BMI-for-age, elevated high-sensitivity C-reactive protein, asset score, and literacy (adjusted odds ratio: 3.35, 95% confidence interval: 1.41-7.94, n=221). No other significant associations were found for either of the seasons.

Key findings: Although we found modest evidence that this simple tool could be used to predict low serum zinc, the finding was not consistent in both seasons. WDDS was not a predictor of low haemoglobin, iron depletion, or low vitamin A or folate status. As a tool, the score might be too simple to capture the different qualities of diets that may predict micronutrient status. Moreover, micronutrient status is affected by factors other than the diet, effect of which we may not have been able to control for. Our data may have precluded us from finding some associations. Our data from Mozambique provide very little evidence supporting the idea that WDDS could be used to assess low micronutrient status when used in a cross-sectional manner.

**OW-017**

**Oral communication**

**Community health workers prevent harmful infant feeding and caring practices among mothers of children under 2 in Palestine.**

Al Rabadi H.

World Vision Jerusalem–West Bank–Gaza

Objective: Infant and young child feeding practices are critically important for children’s survival growth and development. Sub-optimal feeding practices, inappropriate feeding during breastfeeding, and lack of feeding in the early years are critically harmful to children’s nutrition and development. WHO recommended breastfeeding guidelines and tools are being widely used as proxy to evaluate breastfeeding practices. Evidence from these tools is envisioned.

Methods and Materials: An intervention study was carried out by World Vision in eleven villages surrounding Bethlehem. Mothers (n=360) of infants born during the year 2011, 2012 were identified by 17 trained CHWs. The CHWs targeted the mothers with key messages and support for positive infant and young child feeding practices during organizational home visits throughout 14 months. Baseline and endline data were collected through household interviews.

Results: Infant and young child feeding practices were significantly improved after the intervention; exclusive breastfeeding until 6 months increased from 44.7% to 65.7% (p<0.001), duration of breastfeeding above one year increased from 66.8% to 82.5% (p<0.001), timely introduction of the complementary meals increased from 71.5% to 87%, offering the minimum meal diversity increased from 28.3% to 79.8% (p<0.001), meal frequency increased from 4.2% to 35.9% (p<0.001), giving the appropriate feeding during illness increased from 40.7% to 76% (p<0.001), giving regular VIT A supplements increased from 44.6% to 75.6% (p<0.001) and giving regular iron supplementation increased from 38.8% to 76.7% (p<0.001). As per the newborn caring practices, bathing newborns within 24 hours after birth decreased from 65.1% to 34.9% (p<0.001), harmful massage practice decreased from 25.8% to 5% (p<0.001), unsafe and free skin and cord decreased from 41.8% to 11.1% (p<0.001), tight wrapping decreased from 51.2% to 25.8% (p<0.001); recognizing infants’ danger signs and timely referral for health care increased from 25% to 77.8% (p<0.001).

Key findings: Home based interventions by trained community health workers have positively influenced different practices related to infant and young child feeding, feeding during illness supplements intake and newborn caring practices in Bethlehem villages. Due to context similarities in most Palestinian localities scale up plans for this intervention, integrated with early childhood stimulation component, is envisioned.

**OW-018**

**Oral communication**

**Nutritional Status of Primary School Children in the Oio and Cacheu Region in Guinea-Bissau.**

Schloemann N.1,2, Betta P.1, Balan E1, Coglienese N.1, Wood L1, Santos MV.1, Popenko W3, Salomon E1,2, Roberts SB.2

1Global Food & Nutrition Inc. Tufts University. 2International partnership for Human Development.

To date, there has been no survey of nutrition status among primary school children in Guinea-Bissau. To fill this gap and in preparation for a Randomized Control Trial to improve nutrition in the population, we assessed anthropometry and anaemia in 4,807 children in two rural areas, Oio and Cacheu. This research was funded by the United States Department of Agriculture (USDA) Micronutrient Fortified Food Aid Pilot Project and took place in primary schools participating in a Food for Education program run by International Partnership for Human Development.

Methods: Student's weight in light clothing and no shoes was measured using a portable digital scale (Seca model 813) placed on a flat surface and calibrated at regular intervals. Standing height was measured without shoes using a model 213). Hemoglobin was analyzed by HemocueTM from finger stick blood samples. WHO cut-offs for Weight-for-Age Z-scores (WAZ), Height-for-Z-scores (HZA), BMI-for-age Z-score (BAZ), and Hemoglobin (Hb) concentration were used for analysis.

Results: Nutrition status of children in primary school (2,163 girls and 2,647...
boys) warrants concern (23.8% had WAZ < -2, 6.9% WAZ = -3, 16.0% HAZ < -2, 3.8% HAZ = -3, 15.7% BAZ < -2, 3.5% BAZ = -3, 18% mild anaemia, 21.6% moderate anaemia, and 5.5% of severe anaemia), with boys doing worse than girls on all measures. Many children (n = 1633, 40.0% of children surveyed) were older than the expected primary school age range (6-12 years old); the oldest being 18 years of age. These 12-18 year-old boys have a much worse nutrition status (p = 0.03) compared to those aged 6-12 years of age, and all measures and compared to 12-18 year old girls. Nutrition status of 12-18 year old girls was similar to those aged 6-12 years of age. Nutrition status among boys and girls aged 6-12 years was similar.

Conclusions: There is a high rate of malnutrition among children in primary school in rural and urban Bangladesh. Moreover, a larger than expected number of children in primary schools were older than 12 years of age. Those planning nutrition programs for primary school in rural Guine-Bissau should also be prepared to specifically address the special nutrition needs of adolescents. The school platform can be important venue to address nutrition in this age group that is often underserved by the public health system.

evaluation supported the evaluation.

Results: Mothers’ respect of instructions on food purchase, storage, cooking and hygiene improved over the year, as did programme staff's efficiency in dealing with food vendors, mothers and school authorities and in providing varied meals within the fixed budget and without hampering school activities. Students appreciated and finished most school meals, which contributed an average of 14-24% of energy, 18% of protein, 11% of iron, 25% of zinc and 6% of vitamin A, compared to Recommended Daily Amounts. School meals partially replaced students’ eating at home, increasing food availability for other household members. Mothers appreciated their social mobilization, engagement with schools, on nutrition/health/hygiene, and income generated through the program, and thought their children’s school participation, learning and health improved.

Univariate difference-in-difference analysis found no significant effects on school attendance, class completion/pass rates, or cognitive/arithmetic performances.

Key findings: The program improved mothers’ nutritional knowledge and practices, and nutrient intake by students. Enhancing impact requires intensified activities to improve hygiene and sanitation practices and infrastructure, in schools and homes. Longer-term follow-up should assess cognitive and health effects. The pilot helps inform development of a National School Feeding and Nutrition Policy, to strategically guide replication and scale-up of school nutrition programs across Bangladesh.

OW-022 Oral communication
The provision of a free school meal in underprivileged areas of Greece.

Petralias A.1,2, Lykous A1, Velouchaki A1, Lavrias AM1, Zota D1, Papadimitriou E1,2, Linos A1,2
1Institute of Preventive Medicine, Environmental & Occupational Health, Polytech, 7 Fragokiskias str, Marousi, 15125, Greece. 2Department of Epidemiology, Athens University of Economics and Business, 76 Patision str, Athens, 10434, Greece. 3Department of Hygiene, Epidemiology and Medical Statistics, Medical School, National and Kapodistrian University of Athens, Athens, Greece.

Objectives: This is the first study to measure food insecurity among students and their families that participate in a program on food aid and promotion of healthy nutrition, in low socioeconomic status districts in Greece.

Material and methods: The 2012-2013 program was targeting students attending both elementary and secondary schools in underprivileged areas, selected based on income tax data, unemployment and other socioeconomic

III World Congress of Public Health Nutrition
- 86 -
features. 162 schools with 25349 students participated. About half of the schools entered the program in October 2012, the others gradually by May 2013 (post-intervention phase, collecting well-completed 13457 questionnaire), until the end of the school year (June-July 2013, post-intervention phase, collecting 7494 questionnaires). Each student on a daily basis received a lunch box, different for each school day, containing a meal designed by nutrition specialists. Food insecurity levels were measured through the Food Security Schedule Module. A personal id of the respondent’s choice was used to match pre- and post-intervention responses (2886 matched questionnaires), enabling us evaluate the impact on food insecurity at a person level.

Results: In the total sample food insecurity decreased from 64.2% (pre-intervention) to 59.1% (post-intervention), p<0.0001. Food insecurity with hunger decreased from 26.9%, to 23.1%, p <0.001.

In the matched sample food insecurity decreased from 59.6%, to 56.3%, p=0.013, whereas food insecurity with hunger decreased from 22.3%, to 19.9%, p=0.0236. The food insecurity score reduced by 6.5%, p=0.0001.

During the intervention program was a statistically significant predicator after controlling for various socio-demographic characteristics. For each additional month of participation in the program, the odds of reducing the food insecurity score increased by 6% (OR = 1.06, 95% CI: 1.02-1.11).

Students whose father stopped being employed during the program have higher odds of reducing food insecurity (OR = 1.80, 95% CI: 1.18-2.73). Children who are not living with their parents have 2.55 times higher odds to reduce food insecurity (p=0.035). Families that have 5 children or more are twice as likely to reduce food insecurity (OR=2.27, 95% CI: 1.25-4.11). Fathers with secondary level of education are less likely to decrease food insecurity score (OR=0.88, 95% CI: 0.80-0.97).

Key findings: Families residing in low socioeconomic areas of Greece, which were selected to participate in the food aid program, experience high levels of food insecurity. The reduction in food insecurity rates was significant and was found to increase with the duration of participation, indicating the importance of food aid programs among these populations.

**OW-023 Oral communication**

The need for global partnership in encouraging the production and utilisation of traditional crops, a perfect way of combating malnutrition.

Oluwaseun Idado, University of Ibadan, Oyo state, Nigeria.

Background: in the context of establishing priorities for national and international agricultural research, several and indeed contradictory arguments can be used to support and/or to limit support for research on roots and tubers. The objective of this study is to re-enact the conscious recognition and mobilization of foreign investors, donors and partners interest in root and tuber crops research through initiatives and campaigns, designing and implementing pragmatic research program dissemination of the improved technologies, as well as advocacy support for overall development.

Methodology: a district was selected in the western region of Nigeria based on its environmental suitability for root and tuber production and consumption trends. In order to ensure a reasonable representation of root and tubers farming population in the entire district, a two-stage stratified random sampling method was used. A random sampling technique was used to select the required number of communities/Villages from the sampling frame provided by theStatistics, Research and Information directorate. A simple random sample technique without replacement was applied to select a total of 110 producers for interviews. Both qualitative and quantitative data on socio-economic characteristics, agronomic practices, cost and income as well as constraints involved in the production were collected. The survey was essentially participatory using key informant interviews, focus group discussions and one-on-one structured interviews as well as participant observation. Data on socio-economic characteristics, variational differences, scale of production, and costing were analyzed with SPSS version 16.

Result: root and tuber production in western region of Nigeria was discovered to be profitable. For a hectare of root farm, total cost of production, total revenue and net revenue were $669, $1426 and of $757 respectively. From the survey, the majority (92%) of the farmers interviewed cultivate cocoyam, cassava and potato purposely for both the root and leaf. Only eight percent (8%) cultivated purposely for root and corbel only. Production levels of cocoyam were very low. Average acreage cultivated per farmer (for both root and leaf) was 0.8 hectares. The average yield per acre was 2566kg or 0.62 hectares.

Conclusion: the increasing pressure on the use of maize by human population and livestock feed millers coupled with the cost of maize which fluctuates with the time of the year, thus making the cereal grain to be either scarce or expensive, stimulate the use of alternative sources of energy that are locally available, particularly the starchy roots and tubers that abound in many areas of humid tropics. In addition, their by products such as peels, vines and leaves are non competitive feed materials that can be developed as components of poultry and pig feeds. Their development would help diversify agricultural sector development, will create a coalition of partners to create critical mass, improve efficiency and leverage additional resources.

**OW-024 Oral communication**

Healthy diet indicator score and metabolic syndrome in the Czech Republic, Russia, and Poland: cross-sectional findings from the Health, Alcohol, and Psychosocial factors in Eastern Europe study.

Huangfu P.; Peasey A.; Pikhart H.
Research Department of Epidemiology & Public Health, University College London.

Objectives: To estimate the prevalence of metabolic syndrome and to examine the association between healthy diet indicator and risk of metabolic syndrome.

Materials and methods: This cross-sectional study used data from the baseline survey of the prospective Health, Alcohol and Psychosocial factors In Eastern Europe study—21,142 randomly selected adults aged 45-69 years. Metabolic syndrome was defined using the National Cholesterol Education Program’s Adult Treatment Panel III definition (at least three of the following: central obesity (waist circumference >102 cm in men; >88 cm in women), high blood pressure (≥130/85 mmHg), high triglycerides (≥1.7 mmol/L), low high-density lipoprotein cholesterol (<1.03 mmol/L in men; <1.29 mmol/L in women), high plasma glucose (>6.1 mmol/L). Dietary intake was obtained using a self-reported food frequency questionnaire in the preceding 3 months, and the healthy diet indicator was derived using World Health Organisation 2003 recommendations (intake of polyunsaturated/saturated fatty acids, fruit and vegetables, fibre, cholesterol, sugar, and protein; each component has a score ranging from 0 (worst) to 10 (best adherence) and the total score ranges from 0 (worst) to 70 (best dietary quality). Anthropometric data and blood samples were collected during clinic visits, and other data by structured questionnaire.

Logistic regression was used to examine the association between healthy diet indicator and metabolic syndrome (using StaTa 12). All models were adjusted for potential confounders.

Results: Prevalence of metabolic syndrome was high in the Czech Republic (45.8%), Russia (29.1%), and Poland (27.8%). The risk of having metabolic syndrome increased with age in all three countries (P<0.001). Higher healthy diet indicator score was associated with lower risk of metabolic syndrome in the Czech Republic (odds ratio of metabolic syndrome per 10 unit increase in healthy diet indicator=0.91, 95% CI: 0.83-1.00) and Russia (0.92, 0.85-0.99) but not Poland (1.01, 0.94-1.11).

Key findings: In the Czech Republic and Russia (but not Poland), higher adherence to healthy diet indicator was associated with lower risk of metabolic syndrome. Findings provide some support for the beneficial role of diet quality in lowering metabolic syndrome prevalence. Future longitudinal studies should examine whether higher adherence to healthy diet indicator reduces the risk of metabolic syndrome and cardiovascular disease.

**OW-025 Oral communication**

Nutrient patterns and prospective weight change in adults from 10 European countries: results from the EPIC-PANACEA study.

Freidding H. 1, Pisa FT. 1, Moskal A. 1, Ferrari P.1, Byrnes G. 1, Slimani N. 2, on behalf of the EPIC-PANACEA collaborators

International Agency for Research on Cancer (IARC-WHO), Lyon, France 1, MRC/Wits Developmental Pathways for Health Research Unit, Department of Paediatrics, Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa 2

Objectives: We investigated associations between four main nutrient patterns and 5-year weight change in adults from 10 European countries participating in the European Prospective Investigation into Cancer and Nutrition study. Material and methods: This study included 356,485 participants (~70% women) between 25 and 70 years recruited between 1992 and 2000 in 23 centers from 10 European countries. The intake of 23 nutrients was estimated from a country-specific validated dietary questionnaire using the harmonized EPIC Nutrient Database (END). Nutrient patterns were derived from Principle Component Analysis (PCA) of log-transformed nutrient densities using non-alcohol energy intake. Weight was measured at baseline and self-reported during follow-up in most centers. The relationship between each pattern and weight change was examined using linear mixed models with random effect according to center controlling for age, sex, BMI at baseline, total energy intake, and other potential confounders. Results: Four nutrient patterns were identified explaining 57% of the total variance: Principle Component (PC) 1 was characterized by nutrients from plant food sources; PC2 by micro-nutrients and protein; PC3 by polyunsaturated fatty acids and vitamin D; and PC4 by protein, vitamin B2 (riboflavin), calcium, and phosphorus. After exclusion of subjects with chronic diseases at baseline and subjects who were likely to misreport energy intakes, the annual weight change per one SD-unit increase in the pattern scores were as follows. PC1 was inversely associated with weight change in men (-18 g/y; 95% CI: -28 to -7) and women (-15 g/y, 95% CI: -22 to -8). Contrarily, PC4 was associated with a higher weight gain of 45 g/y (95% CI: 9 to 81) and 90 g/y (95% CI: 40 to 140) in men and women, respectively. Associations in opposite directions for men and women were observed for PC2: -23 g/y (95% CI: -44 to -2) in
Ten year change in individual monetary diet cost predicts changes in diet quality and weight development in Spaniards. Schröder H.1,2, Serra-Majem L.1,4, Fumínikova A.1,3, Gomez S.1,3, Pito M.1,4, Eloisa R.4
1Cardiovascular Risk and Nutrition Research Group (CARIN-ULEC), IMIM (Hospital del Mar Medical Research Institute), Barcelona, Spain. 2CIBER Epidemiology and Public Health (CIBERESP), Instituto de Salud Carlos III, Spain. 3Nutrition Research Group, Research Institute of Biomedical and Health Sciences, University of Las Palmas de Gran Canaria, Spain. 4CIBER Physiopathology of Obesity and Nutrition (CIBEROBN), Instituto de Salud Carlos III, Spain. 5Fundación THAO, Spain. 6Cardiovascular Epidemiology and Genomics, GEFEC-ULEC, IMIM (Hospital del Mar Medical Research Institute), Barcelona, Spain.

Objective: A high-quality diet is associated with a healthier weight status but also with higher cost in cross-sectional studies. The aim of the present study was to determine the prospective association between 10 year changes in individual monetary diet cost and changes in diet quality and weight in a representative population of Spanish men and women.

Material and methods: We conducted a prospective population-based study of 2181 male and female aged 25 to 74 years who were followed from 2000 to 2010. Diet and leisure-time physical activity (LTPA) were recorded on validated questionnaires. Weight and height were measured. Average food cost was calculated from official Spanish government data. Diet quality was determined by adherence to the Mediterranean diet and energy density. General linear and multivariate linear regression models were tested.

Results: Individual energy-adjusted (per 1000kcal) monetary diet cost increased by 0.46€ (27%) per day [Range: -4.39 to 6.68; (Range: -66% to 350%)] during the analyzed period. Participants in the first (mean=-0.11€) and third (mean=1.05€) tertile of changes in individual energy-adjusted monetary diet cost and changes in energy density (B = 0.290; p < 0.001) and weight gain (B = 0.594; p= 0.008). In contrast an increase in the adherence to the Mediterranean diet was positively related to an increase in individual energy-adjusted monetary diet cost and changes in energy density (B = 0.250; p= 0.004).

Key findings: Mediterranean diet and energy-adjusted monetary diet cost are negatively affected by increase in individual monetary diet cost. This finding might be particularly important for individuals and families with less economic resources and during economical constraints.

OW-026 Oral communication

Ten year change in individual monetary diet cost predicts changes in diet quality and weight development in Spaniards. Schröder H.1,2, Serra-Majem L.1,4, Fumínikova A.1,3, Gomez S.1,3, Pito M.1,4, Eloisa R.4
1Cardiovascular Risk and Nutrition Research Group (CARIN-ULEC), IMIM (Hospital del Mar Medical Research Institute), Barcelona, Spain. 2CIBER Epidemiology and Public Health (CIBERESP), Instituto de Salud Carlos III, Spain. 3Nutrition Research Group, Research Institute of Biomedical and Health Sciences, University of Las Palmas de Gran Canaria, Spain. 4CIBER Physiopathology of Obesity and Nutrition (CIBEROBN), Instituto de Salud Carlos III, Spain. 5Fundación THAO, Spain. 6Cardiovascular Epidemiology and Genomics, GEFEC-ULEC, IMIM (Hospital del Mar Medical Research Institute), Barcelona, Spain.

Objective: A high-quality diet is associated with a healthier weight status but also with higher cost in cross-sectional studies. The aim of the present study was to determine the prospective association between 10 year changes in individual monetary diet cost and changes in diet quality and weight in a representative population of Spanish men and women.

Material and methods: We conducted a prospective population-based study of 2181 male and female aged 25 to 74 years who were followed from 2000 to 2010. Diet and leisure-time physical activity (LTPA) were recorded on validated questionnaires. Weight and height were measured. Average food cost was calculated from official Spanish government data. Diet quality was determined by adherence to the Mediterranean diet and energy density. General linear and multivariate linear regression models were tested.

Results: Individual energy-adjusted (per 1000kcal) monetary diet cost increased by 0.46€ (27%) per day [Range: -4.39 to 6.68; (Range: -66% to 350%)] during the analyzed period. Participants in the first (mean=-0.11€) and third (mean=1.05€) tertile of changes in individual energy-adjusted monetary diet cost and changes in energy density (B = 0.290; p < 0.001) and weight gain (B = 0.594; p= 0.008). In contrast an increase in the adherence to the Mediterranean diet was positively related to an increase in individual energy-adjusted monetary diet cost and changes in energy density (B = 0.250; p= 0.004).

Key findings: Mediterranean diet and energy-adjusted monetary diet cost are negatively affected by increase in individual monetary diet cost. This finding might be particularly important for individuals and families with less economic resources and during economical constraints.

OW-027 Oral communication

Focused Ethnographic Study on Infant and Young Child Feeding Behaviors, Beliefs, Contexts and Environments in three Arid and Semi Arid counties in Kenya. Thuita FM1, Pelto GH2
1School of Public Health, University of Nairobi. 2Division of Nutritional Sciences, Cornell University, Ithaca, NY, USA.

Introduction and purpose: When designing programs to promote effective public health practices, it is important to respond to the household and community contexts within which families live. This study was designed to provide in-depth information about household behaviors that could be used to guide planning and decision-making regarding interventions aimed at improving infant and young child nutrition in three counties in Kenya. The FES study was undertaken as part of a systematic research plan to support the government led multi-donor effort to identify, integrate and sustain humanitarian investments that prove to be effective in sustaining gains and reducing the need for recurrent humanitarian assistance in the arid and semi arid areas. Improved nutritional outcomes at the household level is one of the program objectives.

Background: In resource-poor settings, childhood malnutrition remains a major health problem. Approximately one-third of children less than five years of age in developing countries have stunted growth, and an even larger proportion are deficient in one or more micronutrients. In Kenya, poor breastfeeding and complementary feeding practices, coupled with high rates of childhood diseases result in high rates of malnutrition and mortality during the first two years of life (UNICEF - ESARO, 2007). Results of the 2008 Kenya Demographic and Health Survey (KDHS) reveal persistently high levels of malnutrition with stunting peaking at 46% among children in the second year of life. Inadequate quantity and quality of complementary foods given, poor child-feeding practices and high rates of infections contribute to poor health and growth during these important years. In response, the Government of Kenya has developed a National Strategic Plan and Food and Nutrition Action Plan that underscores the importance of community based programs targeting improvement of feeding practices of infants and young children.

Methods: The focused ethnographic study approach which integrates classic ethnographic methods and surveys research methods to collect both qualitative and quantitative data was used. Study protocols were adapted to meet the data needs of the landscape analysis and the languages and cultures in the three counties. The studies examined infant and young child (IYC) feeding practices, behaviors and beliefs from a household perspective in three counties. The study explored the determinants of IYC nutrition from a social, environmental, ecological and cultural perspective in order to address specific research questions on what infants 6-23 months consume, sources of those foods, reasons mothers choose them and how they are prepared and fed to young children. The study was conducted in 3 counties targeting pure pastoralists, agro-pastoralists and settled communities. A total of 132 caregivers and 60 key informant caregivers were interviewed for the study. Digital recorders were used for recording interviews with all information uploaded concurrently to a common platform, 'form hub'.

Information was collected on a 24-hour recall for the index child and a 7-day household food record; food preparation and storage; food acquisition and estimated weekly food expenditure; perceptions about value dimensions related to health and food; perceptions about factors that influence IYC feeding; food and feeding-related problems and effects of food insecurity on diets of young children. Data analysis was conducted using ATLAS.ti, a qualitative data analysis software. Quantitative data was analyzed using the Statistical Package for Social Scientists (SPSS).

Key findings: Home fortification and recipe modifications to improve flavor, taste, and/or nutritional value of diets fed to young children is common. There is a large overlap between strategies used to meet nutritional needs of children and those used to meet dietary requirements for adults. Inadequate efforts are being made to involve caregivers in decisions regarding feeding practices. Simultaneous improvement in both quantitative and qualitative feeding-related problems and their potential consequences for IYC nutrition is needed.

Conclusion: Multiple aspects of household function and conditions affect nutritional vulnerability in infants and young children. Integrated planning and coordination across sectors for interventions that affect nutrition of infants and young children are a prerequisite for effectiveness in achieving the program objective of improved nutritional outcomes at the household level. The interactions among the critical determinants of food intake in infants and children have important implications for activities to increase resilience. Simultaneous attention to both “nutrition-specific” and “nutrition-sensitive” investments are required.
PM-001 Poster
Evaluación sensorial de arroz biofortificado, variedad IDIAP Santa Cruz 11, en granjas de El Patronato de Nutrición en la provincia de Coclé.

Mójica E.1, Camargo Buitrago M.1, Vergara de Caballero E.1, Vergara de Henríquez O.1, Espinoza I.2, Montenegro S.1. Estudio Financiado parcialmente por SENACYT Proyecto CCP 017-07. 1Departamento de Tecnología de Alimentos. CRU de Coclé. 2Investigador instituto de Investigación Agropecuaria de Panamá. Departamento de Estadística CRU de Coclé. 3Programa de Asistencia Nutricional en el MINSA. 4Programa Mundial de Alimentos. 5Patronato de Nutrición. 6Estudiante de Tesis Tecnología de Alimentos.

El presente estudio tuvo como objetivo principal determinar el grado de aceptabilidad del arroz mejorado nutricionalmente con hierro y zinc (biofortificado), variedad IDIAP Santa Cruz 11, mediante la metodología de evaluación sensorial. El mismo fue desarrollado en cuatro comunidades rurales de provincia de Coclé (La Martillada, Santa Cruz, Loma Larga y La Chumicosa), en la cual el Patronato de Nutrición desarrolla actividades a través de los grupos autosostenibles como parte de la metodología de evaluación en el estudio se implementó una encuesta socioeconómica a cada uno de los participantes. El arroz se preparó momentos antes de realizar la prueba de análisis sensorial, con el fin de servirlo tibio, de manera que sus características fueran mejor apreciadas. En cada comunidad se presentó el arroz en muestras indicando tres opciones, que se evaluó sensorialmente. Se obtuvieron resultados significativos en la percepción de las panelistas, puesto que se determinó la aceptación del arroz biofortificado por no lograron identificar diferencias sensoriales significativas entre ambos tipos de arroz.

PM-002 Poster
Enteral nutrition in patients with Traumatic Brain Injury admitted in the Intensive Care Unit of a Mexican Hospital.

Ponce y Ponce de León G.1, Mayagaya Withón J.D.I.1, Cornejo Bravo J. M.2, M.3. 1Facultad de Odontología, Universidad Autónoma de Baja California. 2Facultad de Medicina, Facultad de Ciencias Químicas e Ingeniería, Tijuana. Universidad Autónoma de Baja California. 3Facultad de Medicina, Universidad Autónoma de Baja California.

Objectives: Traumatic Brain Injury (TBI) usually occurs in patients who were previously healthy and in good nutritional status. Several studies suggest that TBI is associated with increased risk of malnutrition in patients with TBI in the Intensive Care Unit (ICU) that is initiated in the first 24 hrs after admission is associated with an improvement in clinical outcome, less percentage of infections and a diminished Length of Stay (LOS). The objective was to determine the prevalence of TBI and its relationship with the initiation and type of feeding implemented, morbi-mortality, nutritional markers and LOS in the ICU of a Mexican second level hospital.

Methods: A descriptive, retrospective and correlation study was performed in a medical files of patients admitted in the ICU from January to December 2012. The review was conducted in 3 patients with TBI, who had been admitted in the ICU with the initiation of feeding, morbi-mortality, nutritional markers and LOS in the ICU.

Results: Of 208 patients admitted to the ICU, 15.8% presented TBI, 90% were male and 10% female, with a mean age of 32 ± 13 years. The most common cause of TBI was falls with 36.7% followed by automobile accidents with 30%. Regarding grade of severity of TBI using the Glasgow Coma Score (GCS), 40% presented mild, 36.6% moderate and 23.3% severe. Blended enteral alimented diet was provided to 86.6% of patients, 42.3% during the first 48 hours and 57.6% 72 hours after admission in the ICU. 91.6% developed infectious complications and 20% died. The average length of stay was 7.5 days. Nutritional markers showed a median leukocyte count of 17,139 mm3 at admission and 17,340 at discharge (p<0.000), serum albumin of 3.0 g/dl and 2.6 g/dl at admission and discharge respectively (p<0.000) and total proteins with a median of 5.580 g/dl at admission and 5.413 g/dl at discharge (p<0.000). None of the patients had a nutritional evaluation on admission to the ICU.

Conclusions: A significant association was found (p<0.05) between the initiation of feeding diet with the length of stay and nutritional markers in the population studied at discharge from the ICU.

PM-003 Poster
Impact Evaluation of the TAS Program on eating habits and physical activity levels in a group of Spanish adolescents aged 14 to 15 years.

Roura E., Milá R., Lucía Pareja S., Cinca N. Alícia Foundation (Alícia, Alimentation and Science).

Background: The program TAS (Tu y Alícia por la Salud, www.programas-TAS.com) is a project that evaluates and promotes healthy eating and physical activity habits in Spanish school children in the 3rd year of secondary school (aged 14-15).

Objectives: To promote and improve consumption habits and physical activity levels of Spanish adolescent students. A before and after intervention has been designed and conducted in several implementation phases. A random sample of 2713 students in the third year of secondary education from a total of 103 high schools representing distinct geographic zones in Spain participated in the initial pre-intervention phase. In this second phase of the study (post intervention phase) changes in food habits and physical activity levels were evaluated in a random sample of students (n=1209) in the third year of secondary school who had previously received and actively participated in 9 months of events, classes and cookery workshops in which they themselves had proposed activities to promote and improve eating and physical activity habits. Food intake was assessed by 7 consecutive days of food records and physical activity was evaluated with the validated PAQ-A questionnaire.

Results: The results obtained in the post-intervention period indicate a significant improvement in food and vegetable consumption. In the first phase, the mean intakes of fruit and vegetables were 6.3 and 3.4 servings/week, respectively. In the second evaluation mean intakes were 9.6 and 4.5 servings/week, respectively, which reflect an increase of 11% and 13.8% of participants who met the recommendations for fruit and vegetable consumption. The intake of physical activity also significantly improved, from a mean consumption of 1.6 to 1.9 servings/week. This change represents a 6% increase of students who met the recommendations for legumes consumption. As for fish intake, significant improvement was only seen for white fish and not blue fish. Mean weekly intakes of white fish was 2.5 servings/week, which represents an increase of almost 6% in students who met minimum recommendations for fish consumption. Despite these improvements, it is worth noting that the most important change was the reduced consumption of sugared beverages and of sweet baked goods, cakes and cookies. Mean intakes for these groups were 3.9 and 3.2 servings/week, respectively which represent a reduction of 1.3 and 2 servings, respectively in each group as compared to baseline evaluation. The level of physical activity in study subjects significantly improved. In the first evaluation, 50% of the students showed a low level of physical activity. In the second assessment, this percentage decreased to 35%, reflecting a 15% reduction in adolescent males and females who had a low level of physical activity.

Conclusions: The TAS program, which promotes that adolescent students participate in an evaluation and compare their own habits with eating disorders. However it has been verified that in individuals without eating disorders, body image disorders are also given in the form of body dissatisfaction or perceptual imprecision. Therefore the objective of this work was to assess the perception of body image in a population of 15-35 years of age using a theorectical model of Monterro, Morales and Cabral. It was observed that perception with the actual values of body mass index (BMI) to detect possible changes in self-perception of body image.

Material and methods: Informed participation in a population of young people 15 to 35 years old. Those who accepted were invited to perform the Monterro, Morales and Cabral test for perception of body image. Subsequently underwent measurement of height and weight and they answered a survey of eating habits and lifestyle. Finally it was compared the perceived BMI and the actual BMI and the results were correlated with the results of the lifestyle and eating habits survey, using the R-Sigma Table program for statistical analysis.

Results: The population consisted of 500 young people (250 women and 250 men) with a mean age of 22.5 years, the average of the BMI perceived was 25.92 for men and 25.43 for women, in contrast, the average...
ge actual BMI was 23.91 for men and 23.52 for women, being in both cases significantly different (p < 0.05). Regarding their weight, 22% felt overweight, 31.6% healthy weight and 46.4% felt that they had a few extra kilos, but only 43.6% would like to lose weight. Most of the study population perceived their feeding habits as regulars and only 18.4% have done diets to lose weight. Generally they eliminated carbohydrates to lose weight and explained that to lose weight should eat a variety of food, half of the population has tried dieting with exercise but 16.6% reported that it did not work.

Key findings: Although the mean of the population had a healthy BMI, most of them would like to lose some weight, but only 18.4% has tried through dieting and 22.8% only. The aim of this research study was to determine the effects of adherence to Mediterranean diet on overall cancer risk. Ten randomized controlled trials and nine cohort studies provided convincing evidence that a 2-point increase of adherence to Mediterranean diet score was associated with a significant reduction of overall cancer mortality/incidence (cohort; RR: 0.90, 95% CI 0.86-0.95, p<0.0001; I² = 50%), as well as colorectal (cohort/case-control; RR: 0.86, 95% CI 0.80-0.93, p<0.0001; I² = 62%), prostate (cohort/case-control; RR: 0.96, 95% CI 0.92-0.99, p=0.03; I² = 0%) and aerodigestive cancer (cohort/case-control; RR: 0.44, 95% CI 0.26-0.77, p=0.003; I² = 83%). Non-significant changes could be observed for breast cancer, gastric cancer, and pancreatic cancer. Among the singular Mediterranean diet score components, vegetables showed the strongest cancer-protective effect. Theagger regression tests provided limited evidence of substantial publication bias.

Key finding: Three adherence to a Mediterranean diet is associated with a significant reduction in the risk of overall cancer mortality/incidence (10%), colorectal cancer (14%), prostate cancer (4%) and aerodigestive cancer (56%).

PM-005 Poster Adherence to Mediterranean diet and risk of overall cancer and cancer types: a systematic review and meta-analysis of observational studies. Schwinghackl L; Hoffmann G.

Department of Nutritional Sciences, Faculty of Life Sciences, University of Vienna, Althanstraße 14 (UZA1) A-1090 Vienna, Austria.

Objectives: Meta-analyses of cohort studies provided convincing evidence that a 2-point increase of adherence to Mediterranean diet score was associated with a significant protection against mortality, cardiovascular diseases and major chronic degenerative diseases such as cancer. However, to date, no previous meta-analysis has investigated the effects of adherence to Mediterranean diet on different cancer types. Therefore, the aim of this research study was to meta-analyze the effects of adherence to Mediterranean diet on overall cancer risk and different cancer types. Materials/Methods: Literature search was performed using the three electronic databases MEDLINE, SCOPUS and EMBASE database. Inclusion criteria were cohort or case-control studies. Study specific risk ratios (RRs), hazard ratios, and odds ratios were pooled using a random effect model by the Cochrane software package Review Manager 5.2. Twenty-three cohort studies, including 1,988,600 subjects and twelve case-control studies with 62,725 subjects met the objectives and were included in the meta-analyses. Furthermore, the impact of the singular Mediterranean diet score components on cancer risk were evaluated.

Results. The highest adherence to Mediterranean diet category resulted in a significant risk reduction for overall cancer mortality/incidence (cohort; RR: 0.90, 95% CI 0.86-0.95, p<0.0001; I² = 50%) as well as colorectal (cohort/case-control; RR: 0.86, 95% CI 0.80-0.93, p<0.0001; I² = 62%), prostate (cohort/case-control; RR: 0.96, 95% CI 0.92-0.99, p=0.03; I² = 0%) and aerodigestive cancer (cohort/case-control; RR: 0.44, 95% CI 0.26-0.77, p=0.003; I² = 83%). Non-significant changes could be observed for breast cancer, gastric cancer, and pancreatic cancer. Among the singular Mediterranean diet score components, vegetables showed the strongest cancer-protective effect. Theagger regression tests provided limited evidence of substantial publication bias.

Key finding: Three adherence to a Mediterranean diet is associated with a significant reduction in the risk of overall cancer mortality/incidence (10%), colorectal cancer (14%), prostate cancer (4%) and aerodigestive cancer (56%).


Universidad Nacional del Centro del Perú, Huancayo. Peru

Objective. The aim is to compare the three references used for the classification of the nutritional status of 36 to 60 month-old children in Huancayo province (Peru). For a long time, NCHS-1977 reference has been used for child growth monitoring, recently the new WHO-2006 Child Growth Standards is being used, and CDC-2000 reference usage has been restricted. Material and methods. The study was performed in 25 of 28 districts of Huancayo province (3250-3500 MASI). Data collected from 2640 children over the period 1992 to 2007 served as basis for determining the nutritional children status using Anthro V3.0 and EpiInfo 6.04. The sample was divided into four chronological periods: 1) Baseline, 1992, with 532 children (20.6%); 2) 1993-1997, with 370 children (14%); 3) 1998-2002, with 494 children (18.7%) and 4) 2003-2007, with 1244 children (47.1%). Internationally cutoff points used in every assessed reference system helped to determine the nutritional status and to calculate the Z-scores of height-for-age, weight-for-age, weight-for-height and body mass index differentiated by sex. The information was processed using SPSS V16.0 and Excel. Before anthropometric assessment, mothers were informed about the study and its objectives and signed the consent form. Results. The overweight, stunting and wasting percentages (period 1992-2007), determined with NCHS-1977 were 8.4%, 28.6% and 0.9%; with CDC-2000 were 10.2%, 19.1% and 3.3%, and with WHO-2006 were 6.6%, 23.9% and 1.4% respectively. The overweight and obesity percentages determined with CDC-2000 were 11.4% and 4.20%, and with WHO-2006 were 8.0% and 0.9%, respectively. With respect to the assessment of nutritional status based on height for age, the new WHO pattern determined greater stunting prevalence, increasing by 5.1% compared to the NCHS reference and 14.8% regarding with CDC reference. The new WHO pattern, relative to NCHS, stunting percentages were increased by 17.7% (28.8% vs. 33.9%). This result validates and allows considering the proposed new anthropometric assessment as the most suitable for use in our conditions, as suggested by WHO. With regard to obesity and overweight condition assessed by the BMI, CDC reference detection was 6.6% more than WHO pattern, equivalent to 1.74 times more; this result recommends using CDC reference as intervention strategy to counteract the weight excess problems.

Key findings. A more realistic and accurate detection of malnutrition prevalence in 36- to 60-month-old children was carried out using the new WHO Child Growth Standard, which would be a reliable model for widespread use in the central highlands of Peru. On improving the eating and physical activity habits of this target population over a short and long term period.

PM-007 Poster Content of nitrates, lead and cadmium in fresh and frozen vegetables from montenegrin market. Milena Djurić, Djurić M.; Jan I.; Lazović T.; Injac I.

1University of Donja Gorica, Faculty for Food Technology, Food Safety and Ecology, Donja Gorica, 81000 Podgorica, Montenegro. 2LC Center for Ecotoxicological Research Podgorica, Bulevar Šarla de Golia, 81000 Podgorica, Montenegro

Natural nitrate content in soil, as well as the use of fertilizers for additional nutrition, contributes to the accumulation of nitrates in the vegetable tissues. Also, air and soil pollution with trace elements, particularly lead and cadmium, as well as potentially high content of cadmium in phosphorous fertilizers, may increased content of these elements in vegetables. The aim of this study was to analyze the samples of fresh vegetables from the market and the samples of frozen vegetables from the stores, and to define the content of the mentioned chemical components as potential toxicants. The soil samples do not belong to organic production. Nitrates content was determined by HPLC, while concentration of lead and cadmium determined by using GF-AAS after microwave digestion. These analyzes include 17 samples of fresh vegetables (cabbage, cucumber, chicory, leeks, spinach and celery) and samples of frozen vegetables (4 mixes and single samples of carrots and spinach). Samples of fresh vegetables are mainly produced in Montenegro, with the exception of two samples of carrots that were produced in Serbia. Frozen samples of vegetables were produced in Serbia and Belgium. According to the analysis of fresh and frozen vegetables on the content of nitrates, lead and cadmium, all tested samples comply with the national and EU legislation. The values obtained for nitrates in fresh vegetables are in the range of 309 mg/kg (carrots) to 750 mg/kg (lettuce). Defined average value for this parameter in these products is 1223 mg/kg. The highest values of nitrates were found in lettuce, particularly in the winter harvest from greenhouses (average 1986 mg/kg), and the lowest in carrots (average of 350 mg/kg).

The analyzed products of fresh vegetables are characterized by low lead content (average 0.055 mg/kg) and low cadmium content (average 0.025 mg/kg). Values of nitrates in frozen vegetables are in the range of 133 mg/kg (carrots) to 865 mg/kg (spinach) and the average value was 442 mg/kg. The content of lead in samples of frozen vegetables was below LOQ (0.01 mg/kg), and the average value for cadmium was 0.009 mg/kg. The conclusion of this study is that the content of nitrates in the frozen vegetables is significantly lower (about three times) than the content of nitrates in fresh vegetables. Nitrates content in fresh vegetables in the winter period is much higher (two to five times). This is especially distinct in lettuce. All tested samples are characterized by low content of lead and cadmium (two to ten times below the prescribed limit).

PM-008 Poster Evaluation of patient care hypertensive e, on diabetic in the family health strategy. Papini SJ, Carrega K, Borgato M.H.

Nursing Department, Botucatu School of Medicine, UNESP - São Paulo, Brazil. Support: FAPESP (process 2011/120628-9)

Introduction: The Family Health Strategy, the result of the attempt to reorganize the Basic Attention, aims to strengthen the guidelines and principles of the Unique Health System and answer to the real health needs of the users that seek for this care, among them, the patients with hypertension and/or Diabetes Mellitus, diseases that are exponentially growing, becoming a
great problem of public health, thus, the necessity of running studies that evaluate the quality of the services that attend this population highlights.

Objective: By the former exposed this study was developed to assess the quality of health care for patients with arterial hypertension and/or diabetes with the perception of the patient and family health team, from the analysis of the structure, process and outcome.

Methods: Study presenting a quanti-qualitative approach, focused on the evaluation of the health assistance quality and its relation with the perception of the hypertension and Diabetes Mellitus bearer and the professionals of the family health team from the city of Botucatu, São Paulo, Brazil. The theoretical referential adopted was the one described by Dorronsoro and the methodological referential was the Collective Subject Speech to analyze the qualitative data.

Results: We evidenced expressive precariousness in the structure of the Family Health Unit regarding human resources, obtaining a medium quality score of 65.4, where 77.7% of the units presented insufficient number of Health professionals. We identified deficiencies in the caring process, both in the quality of the organizing process, and patient clinical records related to the anamnesis and physical exams, the medium evaluated score was 43.8. However, the patients and health professionals evaluated the caring as satisfactory despite the related difficulties in the speech of the team regarding the assistance. It was identified a significant positive correlation between the caring process score and the perception of the professionals regarding the UFSC structure.

Conclusion: We noted that the Family Health Strategy is surrounded by fragilities, being necessary a reformulation in the mode of action of the teams that provide assistance to the population, besides, as showed in this study, an adequacy in the Family Health Unit structure to reach improvements in health care.

PM-009

Poster

Association of consumption of sugary, energy and alcoholic drinks with BMI in Mexican adolescents.

Caravall-Meza N.Y.1, Gómez Miranda L.M.2, Bacardi-Gascón M.3, Jiménez-Cruz A.1

1Universidad Autónoma de Baja California. Facultad de Medicina y Psicología. 2Universidad Autónoma de Baja California. Facultad de Deportes.

Objectives: To determine whether there are differences in sweetened, energy and alcoholic beverages intake, milk consumption and calorie intake according to Body Mass Index (BMI) status, age, sex, and waist circumference among 15 to 17yo Mexican children.

Material and methods: This study was conducted in two public high schools from Tijuana. Weight, height, and waist circumference (WC) were measured. A previously designed and validated questionnaire among college student in Virginia Tech was administered. The questionnaire was developed to estimate mean daily intake of 19 beverage categories BMI was calculated and weight status was classified according to WHO. Abdominal obesity according to the NIHDES 90th percentile for Mexican-American was calculated. Z-scores of BMI for age and gender were calculated. Rank differences of drinks and calorie consumption by sex, age, BMI and WC were calculated using the Mann-Whitney test.

Results: 1677, 15 to 17yo students were assessed (55% female). The prevalence of overweight and obesity was 43% in men and 57% in women and the prevalence of abdominal obesity in men was 53% and in women was 47%. The consumption of energy drinks, alcohol, milk and sugar in millions of calories per week, was higher in men than women (p = 0.001). Differences in total weekly consumption of sugar sweetened beverages (p=0.03) and non-sugar drinks (p=0.0001) and water (p=0.001) intake between normal weight and overweight and obese were observed.

Key findings: Men consumed more sugar sweetened, milk, and alcoholic and energy beverages than women. Adolescent who were overweight or obese consume more kilocalories per week than normal weight.

PM-010

Poster

Nutrition policy actions performed in Finland in order to increase the vitamin D intake and serum 250HD concentration in the population.

Raulio S.1, Eldur T.2, Männistö S.1, Sarlio-Lähteenkorva S.2, Sundell J.2, Tapainen H.3, Vartiainen E.4, Virtanen SM.5

1National Institute for Health and Welfare (THL). 2Ministry of Social Affairs and Health. 3University of Tampere.

Objectives: Due to low vitamin D intake and low serum 25-hydroxyvitamin D (250HD) levels, the fortification of liquid dairy products with 0.5 vitamin D/100 g and dietary fats with 10 µg/100 g started in Finland in 2003. In 2007 FINDIT Survey revealed that intake was still below recommendations and in 2010 National Nutrition Council doubled the recommendations. We can talk about vitamin D amount to be added to liquid dairy products and dietary fats.

Aim of this study was to investigate whether the vitamin D intake and the serum 250HD concentration have been improved among Finnish adults as a consequence of these nutrition policy actions.

PM-011

Poster

Does Family income interfere with children’s diet and nutritional status? MUNSI Programme, Portugal.

Ana Rito1, Leonor Melo de Bemardes2, Ana Valente3

1Instituto Nacional de Saúde Doutor Ricardo Jorge, I.P., Av Padre Cruz, 1649-016 Lisboa, Portugal. 2CEIDSS, Sala da Pousada, Fábrica da Pólvora.
Objectives: To evaluate the association between family income, obesity and food intake in children from three Portuguese municipalities (Oeiras, Seixal and Viana do Castelo) within the MUNIS Program (www.mun-si.com). Material and methods: An international cross-sectional study was performed in 1673 children aged between 9-11 years old from 91 elementary schools of Oeiras (n=512), Seixal (n=489) and Viana do Castelo (n=672) municipalities. Family income data were obtained by a self-response questionnaire. Nutritional status evaluation was assessed using BMI according to G O N utrition Recommendations, and to Dietary Recommendations, are established: for energy, total fat, saturated fat, trans fat, sodium, added sugars, fructose and in certain categories nutrients to encourage, such as protein, dietary fiber and vitamins and minerals. The Nestlé Nutritional Profiling System covers 40 food and beverages categories. These categories are based on the contribution to the daily energy recommendation: larger meal components contain between 15-30% of the daily energy recommendation, smaller meal components contain less than 10% of the daily recommendation and accessories contain less than 5% of the daily energy recommendation.

Key findings: The impact from the consumption of fortified products is lower in men and women. 10.9% of the participants from the three municipalities consumed meat 3 to 7 times a week and 35% of them consumed fish with the same frequency. Viana do Castelo was the municipality where the frequency of soup consumption (42.9% consume at least weekly) and vegetables (74% consume at least weekly) was lower, but also where the consumption of fresh fruit was less frequent. Higher prevalence of obesity (16.4% and 19.0%) was found in families with low income (<500 Euros/month and 501-850 Euros/month, respectively) compared to those with high income (>2751 Euros/month). The prevalence of obesity in families was higher, but the frequency of soup consumption was lower in families with low income (21.6%) when compared with Seixal (16.1%) and Oeiras (16.9%). No statistical differences were observed in obesity prevalence (BMI>95%) from the three municipalities (Oeiras: 12.7% vs. Viana do Castelo: 15.0% vs. Seixal: 15.1%). More than 45% of the children have a daily intake of skimmed or semi-skimmed milk. At least 50% of the children consumed, at least 1.5 times a day, flour in the form of products like bread or pasta.

Children and adolescents from families with low income, have lower intakes of animal proteins, as well as iron and folic acid, and 4.2 mg of iron per day. In those with high income (>2751 Euros/month), intake of iron from fortification was the highest and intake of folic acid was also higher, where the frequency of soup consumption was lower in families with low income (21.6%) when compared with Seixal (16.1%) and Oeiras (16.9%). No statistical differences were observed in obesity prevalence (BMI>95%) from the three municipalities (Oeiras: 12.7% vs. Viana do Castelo: 15.0% vs. Seixal: 15.1%). More than 45% of the children have a daily intake of skimmed or semi-skimmed milk. At least 50% of the children consumed, at least 1.5 times a day, flour in the form of products like bread or pasta.

**PM-013 Poster**

**PM-015 Poster**

**PM-014 Poster**

**PM-016 Poster**

---

**International Journal of Community Nutrition 2014, 0 (supp1)**

---
Objectives: Inadequate calcium intakes are an important concern for public health. Dairy products account for 40 to 50% of calcium intakes in France, more than any other food group. The present objective was to assess energy intakes to limit, nutrient costs associated with meeting calcium requirements (15% calcium RDI or 120mg/d) from milk and dairy foods.

Material and Methods: All analyses were based on 837 dairy products available in France. The main subgroups were milk (n=101), fresh dairy products, mostly yogurts and fermented milks (n=326), dairy desserts (n=162) and cheeses (n=248). Products were aggregated into 21 categories by nutrient content and price using clustering analyses. Nutritional composition was obtained from labels or the national CIQUAL database. Retail prices were obtained from Paris supermarkets.

Results: In total, 40 dairy products met calcium requirements at varying levels of energy, nutrient, or monetary cost. Plain milks supplied dietary calcium at the lowest energy and nutrient cost and at lowest price. Plain and light fresh dairy products supplied dietary calcium at low energy and nutrient cost and at low prices. These were followed by sweetened yogurts and flavored milk. With light dietary desserts provided calcium at low energy cost but were more expensive than were fresh dairy products. Cheeses represented a very heterogeneous category, depending on their calcium content. High calcium hard cheeses provided calcium at energy, nutrient and monetary cost comparable to plain yogurts. Soft cheeses (“camembert”) and blue cheese were comparable on all counts to sweetened yogurts and flavored milks. Goat cheese, soft cheese and double cream cheese were less-than-optimal calcium sources.

Key findings: Milk and milk products, including yogurts and cheese, represent a diversified source of calcium in the French diet. The present analysis and the daily consumption of dairy products at minimal cost and without excessive calories, and nutrients to limit. Economic and nutritional considerations play a role in selecting optimal food patterns for children, the elderly, or low income families.
Conclusion: Regardless of ethnicity, young children in Singapore were exposed to diverse foods. The study findings will be a starting point for development of Food Frequency Questionnaire to further assess habitual food intake in a young children from diverse ethnicity.

PM-020 Poster Nutritional status and overweight among preschool children Kenitra city North-Western of Morocco.

Meriem Shal, Youssef Abousaleh Ibn Tofail University Morocco

Objective: The objective of this study was to observe the obesity and nutritional status among preschool children in the Morocco.

Material and methods: This study consists of 247 pre-school children including 120 boys and 127 girls aged from 60 to 84 months. Children were recruited from the private nursery schools. The anthropometric parameters (weight, height, body mass index) were measured. Data were collected using a questionnaire.

Results: The results showed that 14% of preschool children are overweight, while 6% were obese. The weight, size, and the z-score of the weight are significantly elevated in boys than in girls. Most preschool children do not eat dried fruit, legumes, olives and olive oil, tea, and juices. Most preschool children consume pasta, cakes, biscuits and cakes.

Conclusion: The preschool children have a high prevalence of obesity and overweight. Preschool children are at risk of developing obesity-related illnesses that can persist into adolescence and adult age. Several studies on nutritional status will be recommended among preschool children in the Morocco.

PM-021 Poster A baseline evaluation of the front-of-package labels, nutrient content and price of packaged food in Mexico Carriedo A., Nieto C., Mena C., Alcalde J., Barquera S. Instituto Nacional de Salud Pública

Background: Recently, the Mexican government enforced two policies to tackle obesity: tax for soda and snacks (10% and 8% respectively) and a front-of-package labelling system (FOPLS) based on the Guideline Daily Allowance (GDA) criteria defined voluntarily by the industry.

Objective: To assess a baseline dataset of packaged foods regarding the usage of the voluntary FOPLS-GDA, their nutrient profile according to the WHO recommendations, and assess their pricing in urban supermarkets.

Methods: A convenience sample in 14 supermarkets of Mexico City with a two-stage sample selection was performed using geographical income classification. We included 100 products from six food groups defined previously by an expert group: sweet snacks, sour snacks, breakfast cereals, dairy products, corn products and sweetened beverages. Information about critical nutrients (energy, fat, saturated fats, sugars and sodium), type of FOPLS used and price was computed. Nutrient content was compared to a) the World Health Organization (WHO) recommendations; b) the criteria adopted by the FOPLS-GDA regulation; and c) the snacks cut-off criteria (275kcal/100g) for the excise tax.

Results: Of the 1668 products, 45% (n=754) have FOPLS-GDA: At least 13% (n=212) were labeled as “light”, “reduced fat” or “low in sodium.” The average content of energy per 100g was: 292kcal for sweets snacks, 510kcal for dairy snacks and 380kcal for breakfast cereals. Dairy products had on average 94kcal, corn products 318kcal and sweetened beverages 90kcal. The FOPLS-GDA criteria were much higher than the WHO recommendations as follow: For total sugar, sweet snacks had a difference of 29.4%, sour snacks of 2.6%, and breakfast cereals of 23.3%. For saturated fats the difference was 12.6% for sweet snacks, 17.3% for sour snacks, 2.1% for breakfast cereals and 3.3% for dairy products. Regarding price per 100g/100ml, half of the sweetened beverages were less than 2.00MXP (0.015USD), sweet and sour snacks 11.00 MXP (0.84 USD), breakfast cereals 8.00MXP (0.61USD), dairy 2.00MXP (0.15USD), and for corn products less than 5.00MX (39USD). Even with an increase in price on beverages and snacks, they will be on average, half the price of corn products.

Conclusion: Price increase on sweetened beverages and snacks with the tax regulation is still minor compared to prices to other food categories. The nutrient cut-off points outlined in obesity prevention strategies not only overlap between them, but are weak according to WHO recommendations. This information is relevant to understand changes in nutrient profile and prices of packaged food as a result of the new regulations enforced in Mexico.

PM-022 Poster Immunoassay response, serum of gut halb /c immunized and treated sublingual immunotherapy milk cow.

Addou S., Benhatchi S., Titouah Y., Saidi D., Khéroua O. Laboratoire de la physiologie de la nutrition et de la sécurité alimentaire, université d’Oran, Algeria

Sublingual immunotherapy (SLIT) allergens is a treatment that has developed over the past 100 years and whose mechanisms consist of a reprogramming of the immune response. SLIT is to redirect the immune system by administering increasing doses of allergen to induce tolerance to a specific long term. This therapeutic intervention is a major opportunity to improve the quality of life of patients with persistent food allergy especially in children with allergy to cow’s milk protein (CMP). The CMP's milk is actively studied, it is avenues of research.

The aim of our work is improved efficiency of SLIT cow's milk by reducing the duration of treatment with increasing doses of the allergen administered. For this we determined the IgG / serum IgG compared by ELISA serum of BALB / C mice immunized with the bovine protein (EgG and Lact) by intraperitoneal and processed by SLIT cow's milk pathway for 6 months respecting the administered allergen doses (50 and 100 µl). The effect of immunization and treatment on the integrity of the epithelial structure is evaluated by the histological study of the intestinal mucosa.

The results obtained show that:

A rate of IgG and IgA anti- serum proteins (B-G and -Lact) significantly higher in immunized mice. This rate is reduced during processing.

Histological study reveals bowel in mice immunized with the (B-G and -Lact) a decrease in villous height accompanied by infiltration of intraperithelial lymphocytes.

Conclusion: In our experimental model, the duration of treatment can be reduced in a few months while respecting doses of allergen administered without exceeding the threshold reactivity. This is to verify these results in children allergic to cow's milk.

PM-023 Poster Effect of soy milk on biochemical parameters (cholesterol and albumin)

Addou S., Zerrouh I., Mebna H., Saidi D., Khéroua O. Laboratory of Nutrition and Food Safety, University of Oran, Algeria

Aim of the study. - Consider the impact of the consumption of soy milk on fertility Swiss male mice and to assess the consequences of the consumption of this milk on the biochemical assay cholesterol, albumin, urea, creatinine, uric acid, transaminases (TGO and TGP).

Methods. - 40 Swiss male mice aged 4 weeks and weighing an average of 23.27 ± 0.50 g. Are divided into 4 groups (n = 10). Group 1 consists of animals from a mother who is fed only soy milk during the lactation period and receive, after weaning, a standard food and water. The group includes three mice from a mother who consumed a standard diet during lactation and receive, after weaning, as soy milk. The animals in group 4 are the witnesses. The experimental period of 90 days A weekly weight gain, measurement of testosterone, semen analysis, and determination of biochemical parameters are made.

Results. The sperm motility was decreased in all groups who consumed soy milk. Serum testosterone is decreased in group 2 (1.08 ± 0.41 ng / ml) compared to controls (6.21 ± 1.15 ng / ml). The albumin is reduced unlike cholesterol level is higher in the experimental group.

Conclusion: The ingestion of soy milk is not without consequence that seems to cause alterations in some serum biochemical parameters as well as renal dysfunction mice having ingested.

PM-024 Poster Biomarkers of inflammation among Guatemalan preschool children attending daycare centers with a common menu offering.

Soto-Méndez G., ZIEL, Research Center for Nutrition and Food Science, Technische Universität München, Germany

Objective: To describe and compare cellular, fecal, plasma and salivary biomarkers in preschoolers from 3 daycare centers in Guatemala to evaluate whether the site or mini-population of subjects influenced the level of inflammation.

Materials and Methods: We enrolled 80 (2.6-6.0) children (38 F/42 M) attending 3 government-subsidized daycare centers identified by location: rural (72%), suburban (16.2%), and rural (11.8%). All children received a common institutional meal from a 4-day rotating menu supplying over 90% of their estimated caloric requirements. We measured biomarkers of inflammation as: white blood cell count (WBC) by automated cell counter; fecal calprotectin (Calpro kit), plasma and salivary IL-1β, IL-6, IL-8, IL-10 and TNF-α by antibody based fluorescent detection (Luminex).

1. Center for Studies of Sensory Impairment, Aging and Metabolism (CeSAIM), Guatemala City, Guatemala. 2. Department of Biochemistry and Molecular Biology, Institute of Nutrition and Food Technology, Centre of Biomedical Research, University of Granada, Spain. 3. Molecular Nutrition Unit, ZEL, Research Center for Nutrition and Food Science, Technische Universität München, Germany.

Conclusion: Regardless of ethnicity, young children in Singapore were exposed to diverse foods. The study findings will be a starting point for development of Food Frequency Questionnaire to further assess habitual food intake in a young children from diverse ethnicity.
Results: Using the Kruskal-Wallis test to compare across the three day-camp sites, significant differences were found for six indicators: plasma IL-18 (p=0.001); salivary IL-10 (p=0.021); salivary (p=0.009) IL-8; and plasma (p=0.0001) and salivary (p=0.008) TNF-α. No differences were found for: WBC, fecal calprotectin, plasma IL-10; salivary IL-18 and plasma and salivary IL-6 (all p>0.05). By post-hoc inspection, Center C (urban) was the site based on the lowest median of all four indicators, and the most extreme value. The median values that present significant differences between centers have the highest median values for Center B (marginal-urban), followed by Center C (rural) and the lowest value for Center A (semi-urban); with the exception of plasma IL-18, which showed the lowest median value in Center B, followed by Center C and the highest value resulted in Center A.

Key findings: According to our findings, having a common diet — but different environmental conditions — can influence the normative inflammatory pattern.

Funded by: Fundación Iberoamericana de Nutrición (FINUT), Spain and The Hildegard Grunow Foundation (HGF), Germany

PM-025

Poster

Long-term effects of armed conflict induced growth impairment during early life on growth and final height — a longitudinal community study in northern Uganda and Guinea-Bissau.

Schramm S1,2, Ravn M1,2, Jakobsen MS1,2, Sødemann M2,3

1University of Southern Denmark, Centre for Global Health, Denmark; 2Gulu University, Gulu Health and Demographic Surveillance System, Uganda; 3Research Centre for Vitamins and Vitamins, Statens Serum Institute, Denmark

Background: Chronic malnutrition in early life can lead to childhood stunting, shorter adult attained height and is believed play a crucial role in adult mortality and cardiovascular disease risk. Thus, their small size is available from sub-Saharan Africa, where the developmental origin of health and disease theories may apply differently. Populations affected by armed conflict are exposed to multiple stressors to growth. Preliminary findings from northern Uganda indicates unexpected sex-differential effects of exposure to conflict during early life on the risk of being short stunted, suggesting that males are more vulnerable than females. However, people born during the conflict had not yet reached their final height at the time of the study.

Objectives: Examine the long-term, including sex-differential, effects of conflict-induced impairment of nutrition and growth during early life on later growth patterns and final height in two different conflict cohorts: a long lasting armed conflict in northern Uganda and a shorter armed conflict in Guinea-Bissau.

Material and methods. The longitudinal community study will be conducted in 2014-17 within two health and demographic surveillance systems (HDSS); Gulu HDSS, Uganda and Bandim Health Project, Guinea-Bissau. Exposure groups are defined based on conflict intensities, date of birth and residency at the time of exposure for every participants. Information on exposure (e.g. <3 years), vaccination, breastfeeding, is available in the Guinean cohort. Outcome measurements: adult final height, height, leg length, knee-heel length, weight, arm-, waist- and hip-circumference. Biannual measurements of children and adolescents (<23years) will be obtained. Trained field assistants will administer questionnaires and carry out the anthropometric measurements.

Output: The study will provide unique growth monitoring data beyond childhood, which is rare in sub-Saharan Africa, and build a foundation to study early life exposures, growth, height, nutrition and chronic diseases in later life in low-income settings.

PM-026

Poster

Field training camp — energy expenditure at the beginning of the training of future Polish fire service officers.

Bertrandt J1,2; Klos A1; Szmytowska W1; Adamski A1

1Military Institute of Hygiene and Epidemiology, 4 Kozleńska St. 01-163 Warsaw/Poland; 2Department of Health, the Ministry of Internal Affairs, Warsaw/Poland; 3The Main School of Fire Service, Warsaw/Poland;

Prospective officers of the Polish State Fire Service must complete their studies at the Main School of Fire Service. After being qualified to the Main School of Fire Service, in the first days of August, candidates begin fire protection training that is carried out in the field conditions. The first two, three weeks of the stay in the training camp are the hardest. It is adaptation to new reality. In the seventh and eighth weeks candidates adapt to the training cycle. The last stage of the training is exercises to get used to work together requiring maximum efforts from the candidates. Time, precision and safety of performed tasks were subjects to the assessment. The amount of energy expenditure associated with the training candidate for firefighter undergo in the field conditions, is an important determinant of the daily energy expenditure.

The aim of the work was to assess energy expenditure of candidates for officers of the State Fire Service during the field training camp on the training ground in years 2011 and 2012. In studies of daily energy expenditure, including participation in the scheduled training classes, use of leisure time and rest a night was attended by 32 candidates for the students Measurements of energy expenditure were collected at frequency of heart contractions, registered by the Polar Sport Tester 810 heart rate monitors. The following parameters were determined in all examined students: body height, body mass, Body Mass Index, percentage fat content and lean body mass. The mean age was 19.5±0.9 years, height and weight of the tested candidates for firefighters amounted 170.2±4.7 cm and 73.5±5.9 kg. Value of Body Mass index was on average 22.8±1.3 kg/m2. The percentage of fat ranged from 8.2% to 18.8%, representing on average 12.9±2.4%, while the lean body mass mean 64.8±6.2 kg. The average value of daily energy expenditure in the examined years was very similar and amounted to 4188 kcal and 4118 kcal respectively.

The average value of daily energy expenditure of candidates for firefigthers during the field training shows that the work load of these young men is a heavy one.

PM-027

Poster

Assessment according to number of days of within and between variations of food intake among children in Japan.

Yuki Sato1; Mototoyki Yusa2; Hirohide Yokokawa2; MihO Mizoi; Reiko Suzuki1

1Rakoku Medical Megabank; Organization, Tachoku University, Miyagi, Japan; 2Juntendo University School of Medicine, Tokyo, Japan; 3Sagami Women's University, Kanagawa, Japan; Tokyo Healthcare University, Tokyo, Japan

Objectives: The adequate number of days to assess habitual dietary intake has been discussed in many reports, most of which were from Western countries. The questions are not necessarily applicable to Japan. We examined the within and between variations in food intake by the number of days among Japanese children.

Materials and methods: Data from the Children's Dietary Survey, conducted by the National Institute for Environmental Studies in Japan, were used for this study. Mothers, and/or guardians along with their 2–6-year-old children from 13 prefectures were enrolled by the network of professional dieticians and public health centres between March and June 2012. The participants' background characteristics were collected through a questionnaire survey. Detailed dietary information was collected into weighted dietary record for a week, four times in a year. We used the data of participants (n=97, 50 boys and 47 girls) with complete 7-day dietary records in the first time, collected from four areas, namely Shinshidaka-Hokkaidou, Iwate, Miyagi, and Sagamihara-Kanagawa.

We assigned the foods consumed to 18 food groups and compared the food intake distribution and the intra- and inter-individual differences for each food group between the 3- and 7-day dietary records.

Results: The median age of the participants was 4 years. Of the participants, 78% spent half or all day at preschool, 42% attended private lessons, 83% had nutrition status and supplementation restrictions. Outstanding ratios of intra- to inter-individual difference were 0.6 and 0.9 for dairy product intake on the 3- and 7-day dietary records, respectively. Similar low values were obtained in the 'sweets and snacks' food group. High values of 14.3 and 7.1 were obtained for meat products intake on the 3- and 7-day dietary records, respectively.

Key findings: The participants frequently consumed dairy products such as yogurt and milk but seldom consumed meat products. Further studies are needed to determine the minimum and/or adequate number of days required to estimate children's food and nutrient intakes.

Acknowledgement: This study was supported by research grants from Advanced Research Programs in National Institute for Environmental Studies, Japan.

PM-028

Poster

Eating habits at school children with normal and excess weight/obesity.

Milan-Smitmans P; 1Universidad Catolica Argentina 2FAO (consultant); 3World Bank (consultant)

Background: Childhood obesity is a serious public health concern worldwide. Dietary behaviors, physical activity and sedentary lifestyle, which includes television viewing, working or playing games on the computers are independent risk factors for increased BMI (increasing weight).

Methods: The aim of this study was to explore dietary habits, physical activity and lifestyle associated with overweight and obesity among children 8–14 years of age, in Hradec Kralove, Liberec and Pardubice district.

Target population was elementary school children in the 2nd, 4th, 6th and 8th grade. All monitored parameters (skipping meals, total energy intake, food and beverage preferences ...) were evaluated by frequency (%) in the group, by gender and according to body weight. Children completed 24-hour recall and of food frequency questionnaire.
Dietary intakes were analyzed using nutrient analysis software NUTRIDAN (82003 Danone Institute). Results: The majority of children are not meeting recommendations for energy intake. Much of this deficit is attributed to changing beverage consumption patterns, characterized by declining milk intakes and substantial increases in soft-drink consumption. On average children are not eating the recommended amount of fruits and vegetables. Overall children consumed a larger portion of their total daily energy from fat. Boys consumed a higher portion of energy derived from fat and girls consumed more energy from carbohydrates.

PM-029 Poster
Dietary intake of acrylamide and risk for endometrial and epithelial ovarian cancer in the European Prospective Investigation into Cancer and Nutrition (EPIC) cohort.
Odoña-Santacruz M', Kaaks R, Peeters PH', Duell E'.
On behalf of the acrylamide, and endometrial and ovarian cancer working groups, and EPIC PIs.
1 Institut für Umweltmedizin und Cancer Epidemiology, Research Program, Catalan Institute of Oncology (ICO-IDIBELL), Barcelona, Spain. 2 Division of Cancer Epidemiology, German Cancer Research Center (DKFZ), Heidelberg, Germany. 3 Department of Epidemiology, Julius Center for Health Sciences and Primary Care, University Medical Center Utrecht. 4 MRC-PHE Centre for Environment and Health, Department of Epidemiology and Biostatistics, School of Public Health, Imperial College, London, UK.

Background: Acrylamide, classified in 1994 by IARC as 'probably carcinogenic', was discovered in some heat-treated carbohydrate-rich foods. Three prospective studies have evaluated the association between acrylamide intake and endometrial cancer (EC), and the association between acrylamide intake and epithelial ovarian cancer (EOC) has been studied in one case-control and three prospective cohort studies with inconsistent results.

Objectives: 1) Evaluate the association between acrylamide intake and EC risk: for overall EC, and for Type I EC: 2) Evaluate the association between acrylamide intake and EOC risk: for overall EOC, and for different histological EOC subtypes. Secondary objectives were to determine whether these associations differed by smoking status (smoking is a source of acrylamide), oral contraceptive use (OC use: strong protective factor for EC and EOC risk), and other baseline participant characteristics.

Methods: This study was carried out in the European Prospective Investigation into Cancer and Nutrition (EPIC) sub-cohort of women with a mean follow-up of 11 years of observation. Multivariate Cox proportional hazards models were used to assess the association between questionnaire-based dietary acrylamide intake (corrected by energy intake using the residual method) and EC or EOC risk. Acrylamide was evaluated both as a continuous variable (per 10μg/day) and as categorical variables. Dietary acrylamide intake was estimated from the EU acrylamide monitoring database which was matched with EPIC questionnaire-based food consumption data. Results: No associations were observed between acrylamide intake and overall EC (n cases=1,942) or Type I EC risk (n cases=627). We observed increasing relative risks for Type I EC with increasing acrylamide intake among women who both never smoked and were non-users of OCs (HR(95%CI): 1.08-3.62; likelihood ratio test P-value: 0.01, n cases=203). No associations, and no evidence for a linear dose-response trend were observed between dietary acrylamide intake and EOC risk (HR10μg/day: 1.02, 95% CI: 0.96-1.09; HR(90μg/day): 1.02, 95% CI: 0.79-1.31, n cases=1,191). No differences were seen when invasive EOC subtypes (582 serous, 118 endometrioid, and 79 mucinous tumors) were analyzed separately.

PM-030 Poster
Nutrient intake of School Children (6 - 15 years) in a rural Nigerian community.
Nnam Ngozi, NNAM NM and AYOGBU RNB
Department of Home Science, Nutrition and Dietsics, University of Nigeria, Nsukka, Enugu State,Nigeria.

Objectives: The objective of the study was to assess the nutrient intake of school children (6-15 years) in Ede-Oballa, Nsukka area of Enugu State, Nigeria.

Material and methods: Ninety school children aged 6 - 15 years in Ede-Oballa, Nsukka area of Enugu State, Nigeria were randomly selected for household 3-day weighed food intake study. All ingredients and the cooking pot were weighed with kitchen scales prior to cooking of the food and their values recorded. After cooking, the pot containing the food was weighed and the weight of the empty pot subtracted from it to obtain the total weight of the cooked food. A weighed portion of food was served to each child. Plate wastes and leftovers were subtracted and the actual quantity (g) of food consumed was obtained. Snacks and foods bought and consumed outside the homes were estimated using household measures and the values recorded. The ingredients were translated into nutrients with food composition table. Nutrient contents of Nigerian foods were also used where some of the foods could not be found in the food composition tables. The results were compared to the recommended nutrient intake (RNI) of the children to determine the adequacy of intake.

Results: The 6 - 9 year old males mean energy intake of 2322Kcal supplied more than 100% (106%) of their energy requirement. The children in the other years did not meet the energy requirement. Male and female children (6 - 9 years) had mean protein intake that provided 194.2% and 115% each of their daily protein requirement. The mean iron intakes of the 12 years (6-9 and 10 - 15 years) and thiamin of 10 - 12 years was met up to 100% of their daily iron RNI. Children of 6 - 9 and 13 - 15 years had more than 100% of vitamin A RNI for their ages and sex. Thiamine, vitamin C and zinc intakes contributed more than 100% of the RNI. The intakes of carbohydrate, calcium and niacin were much more below the children's RNI for the nutrients, especially calcium. This shows that there are nutrient deficiencies. This predisposes the children to infections and nutritional problems like anaemia and chronic health problems in later life.

Key findings: The nutrient intakes of the children were generally low in relation to their RNI. Nutrition education to improve consumption of nutritionally adequate diet should be encouraged.

PM-031 Poster
K. van der Horst1, V. L. Fulgoni2, A. L. Eklund1.
1 Public Health Nutrition, Nestle Research Center, Lausanne 26, Switzerland. 2 Nutrition Impact, LLC, Battle Creek, MI, USA.

Dietary patterns of US children are similar to the problematic eating habits of adults. To understand the development of dietary patterns in children and adolescents, data from the National Health and Nutrition Examination Survey 2007-2010 were analyzed to identify food sources of solid fat, sodium, added sugars, calcium, vitamin D, and dietary fiber intake in children (2-8) and adolescents (9-18). The What We Eat in America 150 Food Categories were used to define food sources. Children consumed 32g of solid fat and 2501mg of sodium, with pizza the main contributing food source (6.7% solid fat; 5.6% sodium). In adolescents, pizza was also the main food source of solid fat (11.1%; 40g total) and sodium (8.3%; 343mg total). Dietary fiber intake was 12g in children with yeast breads (5.7%) as main food source. For adolescents, fiber intake was 14g and the main contributing food source was pizza (6.8%). Fruit drinks and soft drinks were the main sources of added sugar in the diets of children (29%) and adolescents (40%). Various types of milk and flavored waters were the most important food sources of calcium (41%) and potassium (24%) in 2-8 year old children. Milk consumption decreased in adolescents, but milk sources were still the most important source for vitamin D (57%), calcium (28%), and potassium (16%). Other important food sources included French fries for potassium (3.8%) and pizza for calcium (8.6%). The data highlights that unhealthy eating habits become more pronounced from childhood to adolescence.

PM-032 Poster
Body mass index among a sample of college students: environmental and genetic factors.
1 Department of nursing and physiotherapy, University of Castilla-La Mancha, Albacete Spain. 2 Nurse management head-office. Community of Castilla La Mancha Albacete. Spain. 3Dietetics and nutrition department. Florida International University. Miami. Florida. USA.

Objectives: During the past decades an important increase in obesity and obesity-related disorders, such as metabolic syndrome, has occurred among people in their teens and 20s, due to a combination of environmental and genetic factors which favor excessive energy intake and deficient energy expenditure. The aims of this contribution were to describe body mass index (BMI) among college students at the Florida International University and to study the influence of some genetic and environmental factors.

Material and methods: Ninety-seven students (71 women and 26 men) who were enrolled during the academic year 2012/2013 were recruited for this pilot sample. For each volunteer, a questionnaire including the following features was used: gender, age, anthropometric measurements (weight, height), race, lunch place, lifestyle smoking habit. BMI (kg/m2) was calculated from anthropometric data and used to classify individuals into 4 categories: underweight (BMI <18.5), normal range (18.5< BMI <25), overweight
(25±4.0 BMI <30) and obese (BMI ≥30). Statistical analysis was performed with IBM SPSS 19 (SPSS Inc Chicago, IL, USA). Mann-Whitney U test and Kruskal Wallis test were used. Level of significance was established as a p-value <0.05. Results: Mean age was 26.60±8.01 years and mean BMI was 25.78±6.19. Approximately, 46% of individuals were classified as overweight or obese. Obesity was higher in male (30% of men) than female (16% of women) and only 4% of women were underweight. Mean BMI by ethnicity in our pilot sample showed: 15% of non-Hispanic black (BMI 27.39±9.29), 9% of non-Hispanic white (BMI 26.50±7.74), 69% of Hispanic (BMI 25.53±S.28), 2% of Asian (BMI 21.41±3.40) and 4% of others (BMI 24.56±4.20). Significant differences were found in BMI by age; individuals aged equal or lower than 24 showed mean BMI 24.44±5.93 while students aged 25 or older showed BMI 27.45±6.16. Our results also indicated that students which lunch place was fast food restaurant (25%) were overweight (BMI 28.33±6.18) while students which lunch place was home or family (60%) showed normal weight (BMI 24.25±5.80). Besides, only 7% of individuals were smoker and their BMI was close to obesity (30 kg/m2).

Key findings: Almost 46% of college students were overweight or obese. Obesity is twice in male than in female. Being 25 years old or older and non-Hispanic black increase overweight and risk for obesity. Having lunch at home or family home protects overweight. Smokers have their BMI nearly obesity.

PM-033 Poster
Fortified condiments and noodles to improve health problems in children and adults – a literature review and meta-analysis
Hese, T. Eckelkemper L, Eicher K
Winterthur Institute of Health Economics, Zurich University of Applied Sciences, 8401 Winterthur, Switzerland
Objectives: Micronutrient deficiencies imply a considerable burden of disease and low income in many countries. Examples are the growth, high anemia prevalence or increased infection rates. Several strategies have shown to be effective in improving micronutrient deficiencies in different target populations and with different nutrient carriers. However, the impact of fortified condiments as well as fortified noodles is less well investigated in nutrition and health. Our objective was to assess the impact of micronutrient fortified condiments and noodles on patient relevant outcomes in children and adults.

Material and methods: We conducted a literature review in electronic databases (Medline and Cochrane-Library; from inception to December 2013) in addition to screened homogenous of relevant organisations (e.g. Global Alliance for Improved Nutrition, United Nations) and relevant journals with developing country focus. We included randomised controlled trials which assessed the impact of micronutrient fortified condiments or noodles on patient relevant outcomes (e.g. anemia rates, morbidity, cognition in children and adults). We defined condiments as salt seasonings, soy sauce, fish sauce, bouillon, sprinkles and powder. Two reviewers extracted data and assessed risk of bias. Data was pooled with meta-analysis.

Results: 1046 retrieved studies, 14 RCT were included for analysis. Micronutrient fortification of condiments and noodles increased haemoglobin levels by 0.68 g/dl (95%-CI: 0.51 to 0.85; 15 comparisons in 14 RCT with 8845 included children and adults). Thus, micronutrient fortification led to a reduced risk of having anemia (risk ratio 0.39 [95%-CI: 0.44 to 0.80]; data of 11 comparisons in 10 RCT). Morbidity and cognition were rarely assessed in the primary studies. Due to poor reporting, the risk of bias is unclear. However, two RCT with low risk of bias led to similar results for the investigated outcomes haemoglobin change and anemia rates to those of the main analysis.

Key findings: Micronutrient fortified condiments and noodles can be a strategy to improve health problems in children and adults due to micronutrient deficiencies, beyond supplementation programs and fortification of staple food. Risk of bias in the included studies is unclear and should be considered in the final conclusion.

PM-034 Poster
Dietary polyunsaturated fatty acids intake modulate the association between IL-6 genetic variants and systemic inflammatory pattern.
Norre, M.M.; Kvi, E.; Fidberg, R.M.; Marchioni, D.M.; Castro, I.A.; Rogen, M.M.
1Department of Nutrition, School of Public Health, University of Sao Paullo (SP, Brazil); 2Department of Food and Experimental Nutrition, Faculty of Pharmaceutical Sciences, University of Sao Paullo (SP, Brazil)
Objective: To investigate the association of three genetic variants of the interleukin (IL)-6 gene, polyunsaturated fatty acids (PUFA) intake and systemic inflammatory pattern.

Material and Methods: Data were obtained from the population-based cross-sectional study, with a random sample of residents of the city of Sao Paulo, Brazil, aged between 20 and 59 years (n=262). Dietary intake was estimated by two 24-hour dietary recalls. Single nucleotide polymorphisms (SNP) in IL-6 gene (rs1800795, rs1800796 and rs1800797) were genotyped by Taqman® Open Array® system. The chi-squared test was used to determine whether genotype distribution followed the Hardy-Weinberg equilibrium. Linkage Disequilibrium between SNP was calculated using Haploview software. Cluster analysis was used to group individuals according to similarities based upon eleven plasma inflammatory biomarkers. The relationship between SNP and clusters (called inflammatory and non-inflammatory), as well as the relationship between PUFA intake and clusters and gene-PUFA interaction effects were derived from a generalised linear regression, with Poisson distribution and robust variance, adjusted for age, body mass index, gender, smoke status, alcohol consumption, physical activity and skin color, and are presented as Prevalence Ratio (PR) (95%-CI).

Results: All SNPs were in Hardy-Weinberg equilibrium. The SNP rs1800795 and rs1800797 were in strong Linkage Disequilibrium (p=0.93). The inflammatory cluster presented higher age, body mass index and prevalence of smoke habits in comparison with non-inflammatory cluster. No significant differences related to PUFA intake or genotype frequencies were observed between clusters. Individuals in upper percentiles of total PUFA, n-6 and n-3 PUFA, expressed in percentage of total energy intake, showed a higher prevalence of GC+CC genotype for SNP rs1800795 and inflammatory cluster (PR (CI95%)=1.53 (1.02–2.31), 1.60 (1.06–2.43), 1.80 (1.20–2.69), respectively, which remained significant after adjustment. When n-6 and n-3 PUFA percentages were expressed in grams, the results were opposite – individuals in lower percentiles showed a higher prevalence of GC+CC genotype into inflammatory cluster (PR (CI95%)=1.76 (1.12–2.76), 1.78 (1.32–2.81), respectively, which remained significant after adjustment. The n-3 PUFA-cluster interaction was statistically significant (p=0.047) when PUFA intake was expressed in percentage of total energy intake. These results suggest that dietary PUFA intake may modulate the association between IL-6 genetic variants and systemic inflammatory pattern.

Key findings: polyunsaturated fatty acids; single nucleotide polymorphism; inflammation; interleukin-6
Acknowledgments: FAPESP (n°2013/01740-8)

PM-035 Poster
CLYSMBOL European survey of nutraceutical and health claims prevalence – classification issues.
Brown KA; Heie S; Kaur AY; KuliJanic NP; Pravat I; Rayner M
1Food, Consumer, Behaviour and Health Research Centre (FCBH), Surrey University, UK; 2European Food Information Council (EFIC), Brussels, Belgium. 3British Heart Foundation Health Promotion Research Group, University of Oxford, UK; 4Centre for Technological Innovation, University of Ljubljana, Slovenia and Nutrition Institute, Ljubljana, Slovenia
Objectives: Health claims state, suggest or imply a relationship between a certain food product or one of its constituents and health. To ensure a consistent consumer protection and fair industry practice EC developed regulation on the use of nutrient and health claims on food (No. 1924/2006) and a register of authorised nutrition and health claims on food (No. 432/2012).

The aim of this study was to design a protocol that could aid the classification of nutriment and health claims using EFSA and EC documentation on nutrient content, nutrient comparison, function, disease risk-reduction and child development/health claims. This was carried out as part of a larger study, which surveyed the prevalence of nutrient and health claims in Europe six months after the release of the EU register.

Material and methods: EC documentation was qualified and adapted to develop a classification protocol. This was used in a survey to assess the prevalence of health and nutrient claims (symbolic and non-symbolic) on pre-packaged food available to purchase in five European countries (Germany, the Netherlands, Slovenia, Spain and the UK) during Jun-Aug 2013. Each country surveyed three stores: large retailer (~60%), discount store (~20%) and neighbourhood store (~20%). A weighted random sampling procedure based upon store product categories and store map/product lists was used to sample products (Germany, n=399, Netherlands, n=299, Slovenia, n=416, Spain, n=405, UK, n=398). Non-food products, alcohol, food supplements and unpackaged products were excluded. A sample of products (~5%) was re-coded and inter-coder differences assessed qualitatively by a sub-section of researchers. Difficulties in classification were discussed and amendments made to the protocol where necessary.

Results: A minority of protocol amendments were required following initial data extraction. Firstly, consistent claim frequency identification was ensured by the standardised separation of multiple claims on a single product. For example, “contains calcium and vitamin D to help build strong
bones and teeth" was classified as two nutrient content claims and two function health claims. Second, the "health-related ingredients claim" category was created as a type of nutrient claim content to avoid misclassification with claims related to a non-nutrient that had a nutritional, physiological effect, etc., fruit and or vegetables. Lastly three categories were created to aid the identification and classification of symbolic health and nutrient claims: published criteria symbolic claim; non-published criteria symbolic claim or non-claim imagery context.

Key findings: Amendments to the CLIMBOY survey protocol highlight areas of potential claim misclassification.

Acknowledgments: This project is supported by the European Commission "To the Food, Agriculture, and Fisheries, and biotechnology theme of the 7th Framework Programme for Research and Technological Development (Contract No. 311963). We would like to acknowledge the contributions from Bernadette Egan, Azucena Gracia, Andrea Groeppel, Marja Koppic, Ziva Korosec, Anita Kozar, Anita Laser-Reuterd, Stephanie Leick, Anja Mladrik, Stewart Palmer, Matthew Peacock, Katja Pfeifer, Monique Raats and Violeta Stefan for all their contributions to this body of work.

PM-036 
Poster

Estimation of benzoic acid (E 210) and benzoates (E211-E213) intake by Polish population.

Traczyk I, Wojda B, Godlewski M, Surwillo A, Oltarzewski M. Department of the Nutrition and Dietetics with the Metabolic Diseases Clinic and Gastroenterology, National Food and Nutrition Institute, Warsaw, Poland.

Objectives: the aim of the study was to estimate the intake of benzoic acid (E 210) and benzoates (E211-E213) as food additives by Polish population and the assessment of risk for human health resulting from the intake of that substance with diet.

Materials and methods: data on food consumption (24-hour recall) was collected in 2000 under the FAO project "Household Food Consumption and Anthropometric Survey". The survey covered 4134 individuals from all over Poland, aged 1-96 years. Maximum permitted levels usage of benzoic acid (E 210) and benzoates (E211-E213) were taken into consideration according to the European Union regulation. There was also conducted analysis recipes of food products containing ingredients to which can be added additional tested substances and the food labels (market analysis).

Statistical analysis were performed in Statistica ver. 6 - on the basis of a nonparametric test of Mann - Whitney U. Health risk assessment was based on the acceptable daily intake (ADI) of 5 mg/kg b.w.

Results: the average intake of benzoic acid (E 210) and benzoates (E211-E213) by Polish population amounted to 99.7 mg/person/day (33.4% ADI). Taking into account P95 the intake of those preservatives accounted for 139% ADI. The highest exposure to those substances was found in the group of children and teenagers (aged 1-17); mean - 43% ADI, P95 183%. Benzoic acid (E 210) and benzoates (E211-E213) may be added to various products including: fine vegetable products, soups, beverages (at children) which can become the significant source of that preservatives in Polish diets.

Key findings: taking into account the food market development with increased use of additives, including preservatives, it is necessary to educate population on the selection of foodstuffs in the daily diet. Adherence to the principles of proper nutrition and where possible the use of unprocessed foodstuffs can support lower intake of food additives from diet.

PM-037 
Poster

Changes in the Composition and Content of Volatile Compounds of Marrone Cultivar Fresh and Processed Products.

Mujčić I.*, Živković J.2, Jugić T.3, Alibabic J4, Ćukic H.S., Savić V5. 1Collegium Fluminense Polytechnic of Rijeka, Croatia. 2University of Niš, Department of Chemistry, Faculty of Medicine, Serbia. 3Chamber for Agriculture and Forestry of Slovenia, Agricultural and Forestry Institute Nova Gorica, Slovenia. 4University of Bihać, Biotechnical Faculty, Bosnia and Herzegovina. 5University of Niš, Department of Pharmacy, Faculty of Medicine, Serbia.

Objectives: Fresh chestnut fruits are rarely consumed raw. They are processed in various ways, at home (mainly boiling or roasting) or on an industrial scale. This study was conducted using SPME-GC/MS to evaluate the volatile profiles of the fresh and processed chestnut. The objective was to determine if volatile profile patterns of compounds are different due to mode of processing.

Material and methods: Fresh chestnut sample of Lovan's marrone cultivar was collected in the area of the Istria (Croatia), in 2011. The amount of 4 g milled fresh chestnut (FC), boiled chestnut (BC) or roasted chestnut (RC) sample was put in 20 mL vial. All experiments were performed at least in triplicate. The samples were analysed using solid phase micro-extraction (SPME) kit.

On the solid phase SPME device (Supelco, Bellefonte, PA, USA), the 20 mm 50/30 µm divinylbenzene / carboxen / polydimethylsiloxane fiber was mounted. Samples were conditioned for 45 min at 37 ± 1°C and then exposed another 45 min to the SPME fiber under the same conditions. Afterwards the device was introduced in a gas chromatograph with mass selective detector (GC-MS - Agilent 6890 Series GC System with Agilent 5973 Mass Selective Detector). The total volatile production was estimated by the sum of all peak areas in the chromatogram. Relative volatile abundances were obtained by dividing each individual peak with the total volatile produced.

Results: in the FC esters were prevalent volatiles (66.90% of the total area) with the main constituents ethyl acetate (49.4%) (pineapple, ethereal aroma), followed by alcohol (17.6%) with most abundant compound 1-octanol (5.2%) (fruity-flowery, sweet soap, orange, waxy, sweet). The main volatile compounds found in BC were alcohols (61.5%) with the most abundant 1-octanol (29.8%), followed by ethanol (16.1%) (alcoholic aroma). On the other hand, the most represented volatiles in RC were furfural (12.1%) (bready) and 4-cymene (6.6%) (turpentine like, cola beverage aroma).

Key findings: This study showed that there was huge differences in the peak areas. This agreed with the results in Spices analysis, based on the "health-related claims related to a non-nutrient that had a nutritionallyphy­

PM-038
Poster

Determinants of food consumption during pregnancy among Portuguese pregnant women.

Abreu S, Santos PC2, Moreira P3, Santos R4, Moreira C, Mota I1
1Research Centre for Physical Activity, Health and Leisure, Faculty of Sport, University of Porto, Porto, Portugal. 2Department of Phytotherapy - Escola Superior de Tecnologias da Saúde do Porto, IPB Portugal. 3Faculty of Nutrition and Food Science, University of Porto, Porto, Portugal. 4ISGAI Institute of Higher Education

Objectives: to investigate maternal determinants of food consumption during pregnancy.

Material and Methods: A prospective study was conducted with 105 pregnant women aged 18-40, from the city of Porto, Portugal between 2010 and 2012. Socio-demographic characteristics, pre-pregnancy weight and height were assessed via questionnaire in first trimester. Physical activity (PA), self-esteem and anxiety were evaluated by validated questionnaires in each trimester (mean score of the three trimester was used in the analysis).

Food consumption during pregnancy was assessed via an interviewer administered food frequency questionnaire in the immediate post-partum period. For the present study, we defined 14 food groups: (i) dairy; (ii) meat; (iii) seafood; (iv) eggs; (v) fats and oils; (vi) starches and pastries; (vii) vegetable soup; (ix) legumes; (x) fruits; (xi) nuts; (xii) sweets and pastries; (xiii) fast food; and (xiv) sugar-sweetened beverages. Linear regression analysis was used to explore the maternal determinants of (age, parity, education, body mass index (BMI), self-esteem, anxiety, PA, educational level (12 years), marital status (single/divorced), nutritional attendance (yes), employment status (unemployed), monthly income (785 Euros) of food consumption during pregnancy. Each food group entered as dependant variable in linear regression model.

Results: After mutual adjustment for all potential maternal determinants in multiple regression models, pre-pregnancy BMI was negatively associated with dairy (< -13.4, P=0.002) and sweets and pastries (< -2.9, P=0.003) consumption. Vegetable consumption was significantly and positively associated with PA (r = 0.4, P=0.03), self-esteem (r = 0.8, P=0.005) and monthly income (67.9, P=0.030). Positive correlation was positively associated with meat and seafood (P<0.05, for all). Starchy food consumption was significantly and positively associated with parity (r = 54.2, P=0.003), self-esteem (r = 3.6, P=0.023) and negatively associated with age (r = -4.5, P=0.031). Higher dairy and fruits consumption was significantly associated with higher PA (r = 0.7, P=0.001; r = 1.0, P=0.009, respectively). Higher sweets and pastries, sugar-sweetened beverages and vegetable soup intake were significantly associated with monthly income (r = 20.2, P=0.025), employment status (r = 337.9, P=0.004) and nutritional attendance (r = 232.8, P=0.006, respectively).

Key findings: Maternal age, parity, pre-pregnancy BMI, PA, employment status, monthly income and nutritional attendance, were all determinants of food consumption during pregnancy. The higher consumption of energy-dense-nutrient-poor foods seems to be related to socio-demographic characteristics as monthly income and employment status, and lower pre-pregnancy BMI.
PM-039
Poster
Compliance with the dietary recommendations in the Norwegian Fit for Delivery study.
Hillsund ER1, Bente E1, Sagedal LR1, Visdal I1, Øverby NC1. 1Research Unit of Sports Science, Aarhus University, Denmark; 2Fortlandet Hospital HF, Serviceboks 416, 4004 Kristiansand, Norway.

Objectives: Maternal diet and lifestyle during pregnancy may influence long term maternal and child health. As part of the life style intervention package in the Norwegian Fit for Delivery study, dietary advice confined to ten specific recommendations was conveyed to nulliparous pregnant women with the goal of promoting healthy dietary habits and optimizing weight gain during pregnancy. The aim of the present study was to assess change in dietary behavior as measured by a summative diet score developed to reflect degree of adherence to the study-specific dietary recommendations.

Material and methods: The Fit for Delivery study is a randomized controlled trial of a lifestyle intervention carried out among nulliparous pregnant women in the Southern part of Norway between 2009 and 2013. Nulliparous women who consented to participation were randomly assigned to either lifestyle intervention or standard pregnancy care. A questionnaire including a 43-item food frequency questionnaire concerning selected dietary aspects was completed at baseline. The dietary intervention consisted of a postal pamphlet describing the dietary recommendations reinforced by two scheduled telephone contacts of 20 minutes duration soon after inclusion, one month apart. The 43-item food frequency questionnaire was repeated in gestational week 36 to monitor potential dietary changes. The diet score was constructed from ten dichotomized subscales reflecting adherence to the ten dietary recommendations. A score comprised values from 0 to 10 with increasing score indicating higher compliance with the recommendations. For analysis the score was used as a continuous measure quantifying adherence to the recommendations at baseline and gestational week 36. Difference in score according to intervention status was measured by independent sample t-test.

Results: Of 538 eligible women 487 (91.5%) equally distributed in intervention and control group had completed the food frequency questionnaire in gestational week 36 and were included in the present analyses. There was no difference in dietary score between the intervention and control group at baseline, mean score 4.7 (SD 2.0) vs 4.6 (SD 2.0), p=0.511. At gestational week 36 there was a significant difference favoring the intervention group, with mean score 5.1 (SD 2.1) vs 4.6 (SD 2.1), p=0.002, indicating behavioral dietary change in the intervention group.

Key findings: Women in the intervention group in the Fit for Delivery study increased their dietary score from inclusion to intervention gestational week 36. A similar level of intervention could be feasible as part of routine pregnancy care. More details concerning the dietary changes will be presented.

PM-040
Poster
Coverage of High-dose Vitamin A Capsules, Factors Associated with the Coverage and Serum Retinol Status of Indonesian Children 12-59 Month Old.
Sandjaja1, Ernawati E1, Budiman B1, Parikh P1, Khouw 11. 1PesatuanAllergi Indonesia (PERSAGI), Jakarta, Indonesia. 2Friesland-Campina, the Netherlands

Objectives: Vitamin A deficiency is still a public health problem in Indonesia. We, therefore, have a twice yearly (February and August) national vitamin A supplementation program for 6-59 month old children. Evaluation of the coverage can be used to measure the progress or success over time in a targeted province or in a whole nation. This study aimed to assess the coverage of high-dose vitamin A capsule, its associated factors, and serum retinol status of Indonesian children 12-59 month from the South East Asian Nutrition Surveys (SEANUTS).

Material and methods: SEANUTS was conducted in Indonesia, Malaysia, Thailand and Vietnam in a country representative sample of 16,744 children aged 0.5-12 years. In Indonesia, 7,211 children were randomly selected from 48 districts from January-December 2011. In a sub-sample of 3,595 children, coverage of vitamin A capsule in the last six months and its associated factors were assessed using interviewer-administered questionnaires. Serum retinol was measured in 504 children using high pressure liquid chromatography. Data were analyzed using SPSS16.0.

Results: The overall coverage of vitamin A capsule was 83.0 percent. Monthly cohort and the children at posyandu center were significantly associated with the coverage (p=0.000). Vitamin A capsule coverage for children who did not visit posyandu, visited 1-3 times and visited 4-6 times in the last 6 months was 56.6, 81.0 and 91.9 percent, respectively. Other factors associated with vitamin A capsule coverage were birth attendance by the mother (p=0.000), high mother’s education, age 30-49 year, high socio-economic status, living in urban areas (p=0.05). Child’s age, gender, father’s age and father’s education were not associated with the capsule coverage. Serum retinol was significantly higher in children who received vitamin A capsule in the last 6 months compared to those who did not (1.1±0.53 vs. 1.37±0.47 μmol/L). Children who received capsules had the highest serum retinol in the first two months after supplementation (1.58±0.62 vs 1.79±0.45 μmol/L) and the levels declined towards the fifth and sixth month (1.21±0.45 vs 1.28±0.40 μmol/L), prior to the next supplementation.

Key findings: Overall vitamin A capsule coverage is good and is strongly associated with the monthly weighing program at posyandu among children 12-59 month old. Program of high-dose vitamin A capsule supplementation also improved serum retinol status by 0.41-0.58 μmol/L, albeit only in the first 2 months after distribution. Therefore, to have a continued or sustained benefit, options of dietary diversification and food fortification should be considered.

PM-041
Poster
Analysis of carotenoids in microsamples of human faeces.
Hernandez, E1, 2; Blanco-Navarro, F3; Pérez-Sacristán, B3; Donoso-Navarro, E1; Silvestre-Mardomingo, R1; Granado-Lorencio, F2, 3. 1Servicio de Bioquímica Clínica. 2Unidad de Vitaminas. Hospital Universitario Puerta de Hierro-Majadahonda, Madrid. 3Spain.

Introduction: The human colon is continuously exposed to a complex mixture of gut luminal compounds of dietary origin or digestive and microbial processes. Carotenoids have a chemopreventive action against colonic carcinogenesis and they may be essential for its function and structural integrity of the gastrointestinal epithelium.

Human stools consist of a mixture of undigested food residues, colonic microflora, and cellular components. Thus, to monitor the potential action of bioactive dietary compounds, it is essential to assess their availability and bioactivity in target tissues. In this context, analysis of faeces represents a useful, non-invasive approach to assess the availability of bioactive compounds in colon.

Objective: To assess the carotenoid profile in human faeces after intervention with b-carotene and b-cryptoxanthin-enriched beverages.

Methods: As part of a feasibility study within the Microcapspectra project (NCT 02000204), two beverages were developed: 1) b-Cx-enriched milk-based drink, 2) milk-based fruit drink containing b-carotene (ca. 50% as cis-isomer). Post-menopausal women supplemented their diet with 1 x 250 ml juice/day for six weeks. The study protocol was approved by the Research Ethics Committee of the Hospital Universitario Puerta de Hierro-Majadahonda (Madrid, Spain).

Faeces collection and carotenoid analysis: Micromasses of faeces (10 mg) were collected at start and at the end of the intervention using OC-Auto sampling bottles containing HEPES buffer (Biogen Diagnostica) and frozen at -20°C until analysis. Individual carotenoids, ester forms, somers and metabolites in faeces were compared to those present in the beverages consumed. Aliquots were simultaneously analyzed, with and without sonication, and identification was performed on two LC systems.

Results: Beverage A contained mostly b-carotoxanthin (free and ester forms), 50% as cis-carotene and other xanthophylls. Beverage B contained b-carotene (50% as cis-form) and minor amounts of xanthophylls. No b-cryptoxanthin was present. Carotenoids in faeces after beverage A; Minor amounts of free b-cryptoxanthin were detected while b-cryptoxanthin esters were absent. All-trans, cis-b-carotene, lutein and two unidentified xanthophylls, not provided with the beverage, were also present. Lycopene, not provided with beverage, was clearly found. Carotenoids in faeces after beverage B; All-trans and cis-b-carotene with a relative proportion similar to that found in the beverage were present. Lutein and two unidentified xanthophylls, as observed with beverage A, were also present. No b-cryptoxanthin was detected.

Conclusion: Carotenoid profile in human faeces may provide relevant information regarding stability, metabolic changes during digestion and availability of bioactive compounds for colonicocytes from gut lumen.

Funding: Ministerio de Economía y Competitividad (AGL2012-39503-C02-02).

PM-042
Poster
b-cryptoxanthin modulates the response to plant sterols in post-menopausal women carrying NPC1L1 L272L polymorphism: An exploratory study.
Granado-Lorencio, F1, 3; de las Heras, L1, 3; San Millán, C1; García-López, F1; Pérez-Sacristán, B1; Domínguez, G3; Blanco-Navarro, F1, 3. 1Unidad de Vitaminas. 2Servicio de Bioquímica Clínica. 3Servicio de Oncología Médica. Hospital Universitario Puerta de Hierro-Majadahonda, Madrid. Spain. 4Centro Nacional de Epidemiología, Instituto de Salud Carlos III, Madrid. Spain.

Introduction: Numerous clinical trials have shown that plant sterols (PS) are effective in reducing circulating cholesterol levels in humans when included in a broad range of food matrices, although the presence of non-responders is well known.

On assessing the potential functional effect of a doubly modified beverage containing b-cryptoxanthin (b-C) and phytosterols (PS), we found that
**Objective:** To compare contrast body measurements and indices of adolescents of two ethnic groups (Afro-Caribe and Mayan-indigenous) of an adolescent age, reared in a common, tropical geographic zone and to relate the arterial blood pressure to physical dimensions of body size.

**Materials and Methods:** The setting was the Izabal Province along a 43 km stretch of the Río Dulce, which flows from Lake Izabal into the Bay of Almacue of the Caribbean Sea. The inland, lake-side region is inhabited by the Kekchi-speaking indigenous Guatemalans (MK), displaced from the northern highlands. The original inhabitants of the coastal, seaside area are of African-Caribe (AC) ascent. We recruited 44 adolescents (median age: 12.0 y), 48% males in the MK group and 46 adolescents (median age: 14.0 y), 41% males in the AC group. Their height was measured to the nearest 0.5 cm on a wall-mounted sphygmomanometer, weight was measured in kg to the nearest 0.1 kg on a calibrated portable digital scale (Model BF-522, Tanita, Japan). Arterial blood pressure (ABP) was measured using a sphygmomanometer (4.6 mmHg) and its conversion to cDNA in 19 standard procedures (LymphoprepTM) and stored in liquid nitrogen. Genetic polymorphisms were assayed from RNA material and its conversion to cDNA in 19 volunteers. Primer pairs for NCPL1 (L272L) were designed using Primer Express version 2.0 (Applied Biosystems). The protocol was approved by the Ethical Committee of the Hospital Universitario Puerta de Hierro-Majadahonda (Madrid, Spain).

**Results:** Based on the prevalence of polymorphisms, subjects were pooled for comparisons. A significant and inverse response was observed upon intake of PS depending on the NCPL1 polymorphism. Subjects carrying the CC variant (n=9) showed, on average, a net increase in total (mean SE), +14.6 (11.4) mg/dL and LDL-cholesterol (13.0 (10.0) mg/dL) while volunteers carrying CG/GG (n=10) showed a net decrease (-1.1 (3.4) and -7.0 (4.6) mg/dL for total and LDL-cholesterol, respectively). Interestingly, CC subjects showed a significant decrease in both lipid fractions after consuming the beverage containing PS plus-b-Cx (9.3 (7.3) and -10.4 (4.6) mg/dL for total and LDL-c), reaching on average a similar reduction as those with CG/GG polymorphism (change not significant according to the genetic variant).

**Conclusions:** Our findings suggest that the polymorphism of NCPL1 L272L is associated with a lower or non-response to PS and that b-Cx cancels out partly this effect when simultaneously supplied with PS. Further prospective studies are needed to confirm the results of this study.
Objectives: To determine the folate intake of the Canadian population (> 1 y) post folate fortification by form (naturally occurring, the dietary folate equivalent from folic acid food fortification and dietary supplements) as well as by gender. From the gene intake and to identify any potentially genetic who are consuming folic acid at levels above the tolerable upper intake level established by the Institute of Medicine.

Materials and Methods: Secondary data analysis was performed using data from the Canadian Community Health Survey, Cycle 2.2 (N=32776), which utilized a complex cross sectional and health status design to represent the Canadian population. Folate intake from foods and food fortification sources of the Canadian population was examined using the 24 hour dietary recall component. Prevalence of folate inadequacy as well as prevalence of tolerable upper intake levels were calculated based on intake of naturally occurring folate alone, as well as with food fortification sources, supplements and potential threshold factors.

Results: Based on unfortified food sources, Canadians struggle to consume adequate intakes of folate. When folate intakes from all food sources are considered, the overall prevalence of folate inadequacy was low across all age/sex/gender groups, with the exception of females > 70 y and non-supplement using women of child-bearing age, whose inadequacy levels ranged from 16.5 to 28.8%, compared to <1.6% of supplement using women. Almost 18% of supplement users were above the tolerable upper intake level.

Key Findings: Results from this study suggest that insufficient dietary intakes of folate in Canadians have been ameliorated due to the fortification policy. However, the general population should also be informed of the potential risks of folic acid overconsumption resulting from supplement use. It may be prudent to consider removing folic acid from supplements targeted towards men and children.

PM-047 Poster Higher level of saturated fatty acid intake has a higher prevalence of systemic inflammatory pattern among subjects with -238 G/A polymorphism in the tumor necrosis factor-a gene. Ok, E.; Norde, MM; Fisberg, RM; Marchioni, OML; Sousa, JMV; Rogero, MM*

1Department of Nutrition, School of Public Health, University of Sao Paulo (SP, Brazil). 2Department of Public Health, School of Public Health, University of Sao Paulo (SP, Brazil).

Objectives: To investigate the association between tumor necrosis factor (TNF)-a polymorphism, saturated fatty acid (SFA) intake and systemic inflammatory pattern. Material and Methods: Data were obtained from the population-based cross-sectional study, with a random sample of residents of the city of Sao Paulo, Brazil, aged between 20 and 59 years of both sexes (n=262). Dietary intake was estimated by two 24-hour dietary recalls. The information about living style was obtained from a questionnaire. Anthropometrics measures were collected and blood samples were drawn after 10-12 h fasting. Eleven plasma inflammatory biomarkers were determined by multiplex immunoassay and the genomic DNA was extracted for genotyping by TaqMan® Open Array® System for the TNF-a (rs361525) polymorphism. Multivariate Cluster Analysis (K-means) was performed to group the individuals according with eleven inflammatory biomarkers to generate inflammatory profiles. The chi-square test was used to determine whether genotype distribution followed the Hardy-Weinberg equilibrium. Subjects were separated into two clusters, representing Low (Lj; n=169) and High (Hj; n=93) level of inflammation. To determine the prevalence ratio (PR) between the single nucleotide polymorphism (SNP) and genotypes, a general linear model using Poisson distribution and robust variance was performed, adjusted by confounders factors included age, body mass index, smoking status, alcohol consumption, hypertension, physical activity and skin color. The interaction between SNP and SFA intake were tested with SFA as dichotomous variable (cut off by the median levels intake). A 2-tailed p-value of <0.05 was considered significant.

Results: Genotype distributions did not deviate from Hardy-Weinberg equilibrium (p>0.05). The IL cluster had significantly difference in age, waist circumference, inflammatory biomarkers and smoking status in comparison with Li cluster. No difference in SFA intake was observed between clusters groups, neither in SNP genotypes. Among subjects in the highest 50th percentile of saturated fatty acid intake, GGA+AA genotypes had a higher prevalence of systemic inflammatory pattern than GG genotypes (adjusted PR=2.32; 95%CI=1.12-4.83; p=0.024). No interaction was observed between SFA and SNP (p=0.18). These results suggest that TNF-a (rs361525) gene polymorphism among subjects with high saturated fatty acid intake is associated with a systemic inflammatory pattern.

Financial support: FAPESP (Grants: 2012/20401-7 and 2013/1741-4).

Key findings: Tumor necrosis factor-a, single nucleotide polymorphism, saturated fatty acid intake, inflammation.

PM-048 Poster Narratives of mother's feeding practices during the traditio­nal 40-day post-partum “Quarantine” period in urban and rural areas of Guatemala. Garcia Mesa R., Vosenaar M. and Solomons N.W.

Center for Studies of Sensory Impairment, Aging and Metabolism (Ce-SIAM), Guatemala City, Guatemala.

Objectives: The study aimed to describe narratives of mother’s feeding practice perceptions during the early post-partum period known as the Cuarentena (which translates into the English word of “quarantine”), meaning roughly the first 40 days after birth. It was conducted among Mayan women in urban and rural areas in the Western Highlands of Guatemala.

Material and methods: The reported findings are from a larger study. This part of the study was held at 2 urban public health clinics in the urban area of Quetzaltenango and 2 rural communities in the rural area of San Juan Ostuncalco, Quetzaltenango. Participation was voluntary and no compensation was given. A total of 39 mothers (22 rural and 17 urban) participated in 4 focus groups, with 7-13 participants each. Open question guides were used to start discussions. Focus groups were recorded, transcribed verbatim and translated from Mayan Mam language to Spanish. Data were coded using predetermined domains using Hyper­search® software.

Results: Participants’ age was 16-55 y, and mothered 1-10 children. Urban respondents reported less time for “resting” than their rural peers. Mothers identified intergenerational changes in Cuarentena duration and maternal care practices. Participants reported changes in mother’s eating pattern during the “Cuarentena” in both settings. “Hot and cold” perceived properties of food and drinks gained a special value during this period. The consumption of perceived “hot” properties food and beverages such as guayusa and herbal infusions is associated to greater breast milk production. The consumption of food and drinks with “cold” properties is associated with maternal illnesses and conditions and consequently “weaker” newborn’s health. Duties such as newborn care, care of older siblings and household food preparation for members are supported by neighbors, close family and traditional midwives.

Key Findings: These narratives describe variability in the observance of the “Cuarentena” as a variable period depending on mother latitude to rest. Special feeding practices are undertaken during the period in response to the perceived newborns’ fragility and susceptibility to adverse effects of mothers’ dietary intake. Recent generations, especially among urban mothers, tend to diminish observance of the Cuarentena care during post partum.

Funded by: HormelTM Food Corporation of Austin, MN.

PM-049 Poster Glycemic index, glycaemic load and insulinaemic index of five different Spanish breads. Gonzalez-Anton C1, RCO MC1, Sanchez-Rodriguez E1, Ruiz-Lopez MDP, Gil AI, Mesa MD1

1 Department of Biochemistry and Molecular Biology II, Institute of Nutrition and Food Technology “Jose Mataix”, Biomedical Research Centre, University of Granada, Granada, Spain. 2 Department of Nutrition and Food Sciences, Institute of Nutrition and Food Technology “Jose Mataix”, Biomedical Research Centre, University of Granada, Granada, Spain.

1Objective: To evaluate the glycemic index (GI), the glycaemic load (GL) and the insulinaemic index (II) of five different Spanish breads: ordinary white bread, precooked white bread, Afflaca white bread, Candela white bread and organic whole-grain bread. 2. Subjects and methods: Twenty-two healthy adults were randomly assigned to a sequence of the five different breads. Likewise, 50 g of glucose were administrated twice. The study was performed during seven weeks (1 Selected period = 1 week). Blood samples were taken at 0 (fasting), 15, 30, 45, 60, 90, 120 and 180 min after the intake of the bread or the glucose. Postprandial glucose and insulin curves were determined in order to calculate the GI, GL and II, according to the FAQO protocol. 3. Results: GI, GL and II for each bread were: ordinary white bread 111, 85±12, 18±3 and 76±5, respectivelly; precooked: 192±16, 20±3 and 76±5, respectivelly; Candela: 108±17, 23±4 and 77±5, respectivelly; Afflaca: 85±12, 18±3 and 78±4, respetively and organic white-grain: 73±8, 11±1 and 79±5, respectivelly. 4. Key findings: There were neither significant differences in GI between the different tested breads nor compared to glucose control. Organic whole-grain bread GI tended to be lower compared to glucose control (P=0.068) and was significantly lower compared to precooked and Candela white breads.

All breads in the present study had a GI significantly lower than glucose control (GI<0.001).There were no significant differences among the breads. 4. Key findings: All tested breads have a lower GL in comparison to glucose control and the whole-grain bread has the lowest GI value.

The present work was supported by ORGANIZACION INTERPROFESIONAL AGROALIMENTARIA DE CEREALES PANIFICABLES Y DERIVADOS (contract no. 3714 signed with the Fundacion General Empresa-Universidad de
Granada. We are grateful to Confederación Española de Organizaciones de Panadería (Coepan) and Asociación Profesional de Fabricantes y Distribuidores de Pan de Granada y Provincia (Agrapan) for their implication in this study and to all bakers that daily provided the breads for the study: Panadería Jose Ruiz Caballero, Cooperativa Zafarane of Alimentación “El Panadero Loco”, Panadería Bollería Horno de Gabriel and Panadería Pastelería San Suan S.L.

PM-050

Poster

Coffee consumption is not an important risk factor for low femoral neck bone mineral density.
Parn A-L, Orav A1, Jinmei J, Lätt E, Uiper S, Parn O
Tartu Health Care College; Tartu University, Estonia

Objectives: Aim of study was to evaluate the impact of coffee consumption to blood vitamin D, calcium level, and bone mineral density (BMD) considering other influencing factors as age, sex, and level of school-time physical activity.

Material and methods: Altogether 103 subjects were recruited to the study and average coffee intake in last 3 years was considered. All participants were divided into three groups: no coffee consumption (NCC; n=39; M=33; M=61; average coffee consumption – 1-4 cups per day (ACC; n=36; M=33; M=69); and >5 cups per day (HCC; n=24; F=15; M=9). One cup contained ca 200ml coffee and ca 100mg caffeine. 5 cups (ca 450mg caffeine) is considered in excess of safe limit.

Femoral neck BMD was measured using dual-energy X-ray absorptiometry (DXA, Hologic) method. School-time physical activity level according to World Health Organization recommendations (below and above sufficient level of 60 minutes per week and 7x90 minutes per week, respectively) was calculated. Vitamin D and calcium level were measured by using Elisa analyser and CPC method, respectively. Univariate and multiple linear regression analysis were done.

Results: The average age of participants was 30.8±4.9 years. No differences were found in groups in sex, education level, vitamin D (median 55.6; IQR 41.58-77.13 nmol/l) and calcium (median 2.17; IQR 2.29-2.07 nmol/l) levels. Age, sex and dietary habits were found. School-time physical activity levels were below sufficient, sufficient, and above sufficient, respectively 35%, 28.1%, and 36.9%. NCC had significantly higher body mass index than ACC, probably due to their higher age (p<0.031). ECC had significantly higher femoral neck BMD compared to ACC (0.079; p=0.02). The linear regression model was adjusted additionally to potentially influencing factors as school-time physical activity, age, and sex; school-time physical activity was proved as a significant predictor of femoral neck BMD. School-time physical activity above sufficient level in comparing with levels below sufficient and sufficient had significantly higher BMD (respectively 0.077; p=0.01 and 0.059; p=0.04). Females compared to males had lower BMD (-0.076; p=0.01). Coffee consumption does not affect vitamin D or calcium levels. Key findings: coffee intake is physically more active in childhood have higher BMD in adulthood. Coffee drinking is not an important risk factor for low femoral neck BMD.

PM-051

Poster

Pournaren H, Stasi F1, Mohammad K, Dajaraey A2, Dorosty AR1, Abdollahi Z1
1School of Nutritional Sciences and Dietetics, Tehran University of Medical Sciences (TUMS), Tehran, Iran
2School of Public Health, Tehran University of Medical Sciences (TUMS), Tehran, Iran

Nutrition Department, Ministry of Health & Medical Education, Tehran, Iran

Background and Objectives: Based on many studies in the country, the prevalence of overweight and obesity among adolescent boys and girls is continuously increasing. To provide current estimates of the prevalence and trends of overweight and obesity among adolescents in the country, we compared the data of two national surveys conducted in 2001 and 2012 as a national integrated micronutrient survey (NIMS).

Material and Methods: Data of the both national surveys (2001, 2012) were collected for two groups of adolescents (15-19 years old boys and 14-19 years old girls). Both surveys were cross-sectional and the samples were nationally and regionally (eleven regions in the country) representative. Standard measuring protocols were used in both surveys. Estimates of the prevalence of overweight and obesity were defined as ≥95th percentile of body mass index (BMI) for age growth charts respectively.

Results: In 2001, 2.4% of Iranian adolescent boys and 3.2% of girls were overweight and obese. In 2012, the prevalence of overweight and obesity increased to (C) 95%, 18.6%, 21.2% and 24.1% (C) 95%, 23.0% 25.5%) among boys and girls respectively.

Conclusion: Over the 11-year period from 2001 through 2012, obesity showed significant increase among boys and girls respectively (P<0.001) which carries a higher risk for adult obesity and earlier puberty. It seems that low level of physical activity and excess energy intake are two primary causes and behavior risk factors of adolescent overweight and obesity. Creative approaches must focus on early adolescence to start behavior changes in this group.

PM-052

Poster

Dietary factors and breast cancer: modifications in DNA methylation patterns.
Rodriguez-Miguez C1, Moral R1; Checa T1; Martinez M2; Ferrandez G3; Eschic E1
1Department of Cell Biology, Physiology and Immunology, Medical Physiology Unit, Medicine School, Universitat Autonoma de Barcelona, 08193 Bellaterra, Barcelona, Spain.
2Medical Oncology, IDOC Centre Medic (Institut d'Oncologia Corneran), 08017 Barcelona, Spain.

Objectives: Among the molecular alterations that occur during neoplastic transformation, epigenetic disruption, such as abnormal DNA methylation profile, has a key role. Epigenetic changes are reversible and may be modified by environment, especially dietetic factors. The aim of this work is to determine if nutritional factors may modify epigenetic patterns in healthy volunteers and breast cancer patients.

Material and Methods: In this initial phase we have selected genes with an important role on estrogen. We have included a neoplastic cell acquires: sustaining proliferative signaling, evading growth suppressors, activating invasion and metastasis, enabling replicative immortality, inducing angiogenesis, resisting cell death and avoiding immune destruction. We have determined their methylation status by methylation-specific PCR (MSP) in samples of blood obtained from healthy volunteers and locally advanced breast cancer patients and in biopsies of mammary gland and tumor of such patients. Additionally, the global DNA methylation has been determined through the study of repetitive DNA elements (LINE-1) by bisulfite pyrosequencing. We also have analyzed biochemical markers of lipid metabolism in samples of blood of healthy volunteers and breast cancer patients by chromatography.

Results: The analysis of these genes showed a different DNA methylation pattern among blood and mammary tissues. Differences on DNA methylation were observed in blood from healthy volunteers and breast cancer patients, but results did not reach statistic significance. Gene methylation was always increased in tumor compared to mammary gland, such increase being statistically significant for most of the studied genes. The global DNA methylation showed a significant progressive decrease in blood, mammary gland and tumor of breast cancer patients. Moreover, significant differences were detected in fatty acid composition of erythrocyte membrane phospholipid between healthy volunteers and breast cancer patients: a decrease in C16:0, C17:0, C10:0-C17:1, C9-C18:1, C18:3n6, C20:0 and an increase in C15:0, C9-C18:2, C20:2, C30:6n3, C24:4, C20:5n3, C22:6n3 were detected in breast cancer patients compared to healthy volunteers.

Key findings: The study of methylation of specific genes in human samples showed hypermethylation in most of them in tumor respect mammary gland, accompanied by a decrease in global DNA methylation. On the other hand, several statistically significant differences were observed in erythrocyte membrane phospholipid fatty acids, suggesting different dietary habits between healthy volunteers and breast cancer patients.

PM-053

Poster

Key challenges of implementing multi-sector nutrition plan in Nepal.
Bhandari J1,2
1College of Public Health, Chulalongkorn University, Thailand. 2Public Health Nutrition, Nepal Coalition for Global Research, Nepal.

Introduction: Forty-one percent of Nepalese children suffer from chronic malnutrition. The process of stunting occurs between conception and two years of age, and is an irreversible process. Furthermore, the population of Nepal, especially women and children, are affected by major micronutrient deficiencies. Nepal has been part of the global movement on nutrition and is committed to improve the nutrition status of all people. Under nutrition is caused by a number of interrelated factors, which call for a multi-disciplinary approach. Therefore, multi-sector nutrition plan is an attempt to address the issue of nutrition in a systematic and coordinated manner, adopting a multi-sector perspective.

Objectives: The purpose of this research is to explore the key challenges faced during the implementation of multi-sector nutrition plan in Nepal.

Materials and methods: It is a descriptive study which utilized qualitative research methodologies such as focus group discussions, in-depth interview, key informant interviews and participatory observations for data collection and analysis.

Results: The multi-sector nutrition plan is envisaged as an important approach to address the problems and challenges of malnutrition in Nepal. There are capacity gaps within sectors to effectively plan and integrate both nutrition specific and nutrition sensitive interventions in sector
policies, strategies and programmes at all levels. Multi-sector coordination across a range of stakeholders is challenged by several factors. The political transition in the country, and the emerging needs for strong political will and commitment from sectors for multi-sector approach to nutrition have profound impacts on nutrition governance. The decentralization of multi-sector nutrition plans at local levels is another challenge to meet the unmet needs of nutrition services in the community.

Key findings: Multi-sector approach to nutrition is a newly emerging priority which needs more efforts for advocacy and capacity development to a range of stakeholders. Integration of nutrition sensitive interventions across sectors is a key challenge to ensure effective implementation of multi-sector plan in Nepal.

PM-054  
Poster  
Nutritional status among 4 th year medical students.  
Babjakova J., Argalasova L., Junkrkovicova J., Stefanikova Z., Hirosova K., Sevcikova V.  
Institute of Hygiene, Faculty of Medicine, Comenius University, Bratislava, Slovakia

Objectives: Appropriate nutritional and eating habits in childhood, adolescence and young adulthood create conditions for optimal development. Overweight and obesity, major threats to health today, will cause morbidity and mortality in adulthood.

Methods: During the years 2012 and 2013 we obtained data from 713 fourth year medical students; 243 (34%) men and 470 (66%) women, mean age 22.9 ± 1.88 yrs. There were 555 Slovak and 158 foreign-born students in this group. Anthropometric measurements (BMI, WHR, body fat percentage measured by means of Caliper, Near-infrared and Bioimpedance methods), blood lipid levels, cholesterol, LDL-C, HDL-C, TAG, food intake data (24-hours recall, food frequency questionnaire) and energy balance were assessed as outcomes.

Results and key findings: Students’ food consumption did not meet the recommended dietary allowances. Poor eating habits were recorded.

The average values of the anthropometric parameters in the groups of foreign men and women were slightly above the recommended limits (the mean value of body fat percentage in females was 25.58±5.12; the mean BMI of males was 25.79±4.52).

BMI above 25 was observed among 8.3% of Slovak females compared to 18% of foreign female students (p=0.006). 42.2% of Slovak males and 42.7% of foreign male students were overweight or obese according to BMI (p=0.94). A larger WHR (≥1.0 in men, ≥0.8 in women) was observed in 16.3% of Slovak female students vs. 31.3% of foreign female students (p=0.003) and in men 3.3% vs. 2.4, respectively (p=0.5). Increased body fat (>20% of body weight) and high body mass index (BMI >30) was observed in 25.6% of Slovak females vs. 53.6% of foreign females (p<0.0001), and 21.6% of Slovak males vs. 42.7% of foreign males, respectively (p<0.005).

In multivariate analysis, BMI was positively associated with body fat percentage, previous reduction diet, male gender, higher age, and negatively associated with an energy balance (AOE=0.54; 95%CI=0.34-0.85).

Conclusion: Foreign students had higher occurrence of being overweight and obese for different reasons. Adjustment for age and gender there were no significant differences between foreigner-born and Slovak students. Important standpoint of overweight and obesity is necessary to focus higher attention on primary prevention. The education of medicine students in public nutrition may play an important role in this process.

PM-055  
Poster  
Estimation of water balance in elderly people living in Greece.  
1Unit of Human Nutrition, Department of Food Science and Technology, Agricultural University of Athens, 11855, 75 Iera Odos St., Athens, Greece.  
Department of Nutrition, Lakan General Hospital, Athens, Greece.

Objectives: Elderly people are at greatest risk for dehydration and its potentially life-threatening consequences. Unrecognized and untreated dehydration can also complicate chronic medical problems and increase morbidity. The objective of the study was to estimate water balance, water intake and water loss in elderly people living in Greece using the validated Water Balance Questionnaire (WBQ).

Material and methods: The WBQ was administered in winter in the area of Athens, Greece to 108 independents aged 65-81 y (54 males) (Group A), 94 aged 82-92 y (45 males) (Group B) and 51 hospitalized aged 65-92 y (34 males) (Group C). In addition, a database from previous study with common tool, area and season, of 335 adults aged 18-65 y (167 males) (Group D) was revisited and used for comparison.

Results: Mean estimates of water balance, intake and loss were respectively, for Group A -749 ±1386 ml/day, 2571±729 ml/day and 3320±1216 ml/day, for Group B -38±993 ml/day, 2571±739 ml/day and 3320±1216 ml/day, for Group C the 64±1399 ml/day, 256±1071 ml/day and 2552±1048 ml/day and for Group D -253±1495 ml/day, 291±1025 ml/day and 349±2099 ml/day. Significant differences were detected in water balance (p<0.01), water intake (p<0.01) and water loss (p<0.01) amongst the four Groups. In particular, water balance and water intake in Group A was the lowest of all the other groups. For Groups A, B, C or D, the contribution of solid foods to water intake was 36%, 29%, 32% and 25%, contribution of drinking water was 32%, 48%, 45% or 47%, while contribution of beverages was 32%, 23% and 28% respectively. There were differences in the contribution of drinking water (p<0.01) and in the contribution of beverages (p<0.01).

Key findings: The study delivered data on the estimation of water balance, intake and loss in the elderly. Sources of water intake were reported in detail. Independents aged 65-81 y had lower estimated water balance, water intake and water from drinking water than independents above 81 y or hospitalized aged 65-92 y. These later groups had lower water intake from beverages.

PM-056  
Poster  
Consumer perceptions of plant food supplements- a focus group study in three European countries.  
Egan MB 1, Peacock M 2, Bruno P3, Badea M 4, Buzesa C, Ratsi M 5.  
1Department, Consumer Behaviour, Centre for Alternative and Complementary Medicine, University of Surrey, UK. 2Dipartimento di Scienze Farmacologiche e Biomolecolari, Universita degli Studi di Milano, Milano, Italy. 3Transylvania University of Brasov, Brasov, Romania

Objectives: With a growing trend in the consumption of plant food supplements it is important to understand consumers’ perceptions of these products and in particular to gain insight into why these products are used or not used.

The aim of this study was to elicit and compare perceptions of plant food supplements between groups of consumers and non-consumers, in three European countries. More specifically we wanted to explore what assumptions and beliefs consumers and non-consumers hold about the role and efficacy of these products and the basis of this knowledge.

Method and methods: Two focus groups were conducted in each of the three countries (Italy, Romania and the UK); one with users and one with non-users of plant food supplements. The study was designed and piloted in the UK and the questions subsequently translated for use in the other countries. The discussions were moderated by members of the local research teams and the sessions recorded digitally. The recordings were transcribed verbatim and subjected to thematic analysis in each of the countries with a summary of the findings translated into English to allow comparison across the three countries.

Results: Users in the UK perceived plant food supplements as natural products, provided hence unlike pharmaceuticals for water intake was 32%, 48%, 45% or 47%, while contribution of beverages was 32%, 23% and 28% respectively. There were differences in the contribution of drinking water (p<0.01) and in the contribution of beverages (p<0.01).

Key findings: The study observed the changes occurring in the diet structure of French households and their impact on nutritional quality during the past 40 years, from 1969 to 2010.

Material and methods: Time series of food purchases were built based on two representative annual surveys on household expenditures for foods at-home: INSEE (1969 to 1991) and Kantar (1991 to 2010). The average quantities purchased per capita each year were calculated for each food item and then aggregated into 18 main food groups and 80 sub-groups. Food quantities were also converted in energy and nutrients using a universal food composition database (i.e. Ciquel) dating from 1995. The nutritional quality of food purchases was estimated by the macronutrients energy share, and by the Mean Adequacy Ratio, i.e. the mean percentage of daily recommended intakes for 15 key nutrients (namely proteins, fiber, retinol equivalents, thiamine, riboflavin, niacin, vitamin B-6, vitamin B-12, ascorbic acid, vita-
min E, vitamin D, calcium, potassium, iron, magnesium), calculated on a 2000 kcal basis.

Results: The purchases of several food groups increased during the last 40 years: in particular ready-to-eats dishes increased by 17.1kG/person, year, fruit juices by 19.3kG, yogurts by 11.2kG, dairy desserts by 6.5kG, soft drinks by 14.9kG, and sweets by 5.1 kg. During the same period the purchases of sugar decreased by 13.8kG, as well as the purchases of fresh meats by 11.1kG, oils by 6.8kG and butter by 4.7kG. Fresh vegetables decreased by 12.0kG and fresh fruit by 8.0kG. A slight increase of caloric purchases (alcohol excluded) was observed from 2084kcal to 2222kcal (+138kcal/person/day). The energy provided by proteins increased (from 13.5% to 15.7%), that of carbohydrates decreased (from 47.4% to 45.3%) while fats remained quite stable at 39%. The Mean Adequacy Ratio increased (from 69.9% to 82.8%), showing an overall improvement.

Key findings: The structure of purchases for food-at-home changed from 1969 to 2010 in France. Processed foods such as ready-to-eats dishes, processed dairy products and soft drinks strongly increased, while raw products, in particular sugar and added fats, decreased. These substitutions had a moderate impact on the macronutrients balance and were associated with an overall improvement of the nutritional quality of food purchases.

PM-058 Poster Maternal vitamin D status and Infant Outcomes in Rural Vietnam: A Prospective Cohort Study.

Hai Nhi T. Tran, Thao H.T., Simpson J.A., Tran T.D., Fisher J.A., Biggs B.A.*
Affiliations: 1 Department of Medicine, University of Melbourne, Royal Melbourne Hospital, Parkville, Victoria, Australia; Research and Training Centre for Community Development (RTCCD), Hanoi, Vietnam; 2 Centre for Molecular, Environmental, Genetic and Analytic Epidemiology, Melbourne School of Population and Global Health, University of Melbourne, Parkville, Victoria, Australia; 3 The Jean Hailes Research Unit, School of Public Health and Preventive Medicine, Monash University, Clayton, Victoria, Australia; 4 The Victorian Infectious Diseases Service, Royal Melbourne Hospital, Parkville, Victoria, Australia.

Objectives: Vitamin D deficiency affects 1 billion people globally. It has an important role in bone homeostasis, brain development and modulation of the immune system and yet the impact of antenatal vitamin D deficiency on infant outcomes is poorly understood. We sought to assess the association between 25-hydroxyvitamin D levels in late pregnancy with early infant growth and developmental outcomes in rural Vietnam.

Material and methods: A prospective cohort study of 894 infants, born to women who had previously participated in a double-blind cluster randomized controlled trial of antenatal micronutrient supplementation in rural Vietnam was undertaken. Maternal vitamin D concentration was measured at 32 weeks gestation, and infants were followed until 6 months of age. Main outcome measures were cognitive, motor, socio-emotional and language scores using the Bayley Scales of Infant Development, 3rd edition, and infant length-for-age z scores at 6 months of age.

Results: 20% (200/894) of women had vitamin D levels <75nmol/L at 32 weeks gestation. Infants born to women with 25-hydroxyvitamin D deficiency (< 37.5nmol/L) had reduced developmental language scores compared to those born to women who were vitamin D replete (>75nmol/L) (Mean Difference (MD) -3.48, 95% Confidence Interval (CI) -5.67 to -1.28). For every decrease of 25nmol in 25-hydroxyvitamin D concentration in late pregnancy, infant length-for-age z scores at 6 months of age decreased by 0.08 (95% CI -0.15 to -0.02). Key findings: Low maternal 25-hydroxyvitamin D levels during late pregnancy are of concern in rural Vietnam, and are associated with reduced language developmental outcomes at 6 months of age. Our findings strengthen the evidence for giving vitamin D supplementation during pregnancy.

PM-059 Poster Fasting blood glucose associated with adherence to nutritional intervention to promote consumption of fruits and vegetables based on Transtheoretical Model.

Mendonça RD; Lopes ACS.
Universidade Federal de Minas Gerais.

Objectives: Evaluate the level of adherence to nutritional intervention to promote consumption of fruits and vegetables based on Transtheoretical Model (TTM) and associated factors.

Material and methods: This was community trial randomized controlled with adults using the Program Academia da Saúde – PAS (public service to promote health). Participants were randomly divided into three groups.

Results: Among the participants, the stage most commonly reached was precontemplation. Adequate adherence was observed in 35% of the population.

Conclusions: The adherence to the intervention was greater in those with higher scores for the Transtheoretical Model stages of change.
responses were presence of anemia and of VAD, while the explanatory variables were analyzed socioeconomic, environmental, maternal, of safety and food consumption and biological characteristics of the child. The strength of association between variables was evaluated by odds ratio (OR), with a significance level of 5%.

Results: Determinants of anemia: The prevalence of anemia in the Country was 20.5%. In multiple analysis, remained associated with anemia living in the Northeast [OR:3.45; CI:2.1-5.40], Southeast [OR:2.55; CI:1.60-4.06] and South [OR:2.2; CI:1.39-3.55], in urban area [OR:2.01; CI:3.5-3.00], and having severe food insecurity [OR:1.78; CI:1.00-3.16], highlighting as protection having a mother with 5 to 8 years of study [OR:0.19; CI:0.09-0.40] and as protection consuming meat at least once a week [OR:0.19; CI:0.09-0.40] resulted in protection. Key findings: The prevalence of child anemia and VAD in Brazil reduced significantly, although, continue as a moderate public health problem. Despite different have some common determinants (living in macro-regions less and more developed and in urban areas), reaffirming the trans-social character of these deficiencies. Have determining food insecurity and as protection consuming meat at least once a week reinforces the social determination of these deficiencies, although food insecurity was not associated with VAD. It is evident that government strategies have contributed to the reduction of these nutritional deficiencies in the Country, but it is signalized the need for expansion of the government's strategy for prevention and control of VAD, so far restricted to high-risk areas Northeast and poor areas of the Southeast.

PM-062  Poster
Results for open access competency test for food service students and staff are very similar.
Merttanen E;a Nissinen K;b Oll M;c Lahliti-Koski M;d JAMK University of Applied Sciences; Senaajuoki University of Applied Sciences; The Finnish Hearth Association

Objectives: Finnish Heart Association in collaboration with two UAS in Finland created an open access nutrition educational material and competency test. The aim of the whole project was to increase the nutrition competences of food service staff nationwide. The test and the learning material were created via studies (6) and thesis of students in co-operation with nutritionists in Finnish Heart Association and two UAS.

The aim of the present study was to assess if there is differences between students and food service staff groups passed the test, and if the test results varied by age or student groups.

Material and methods: The data from accepted tests (passing limit112/120) from October 2012 to November 2013 were evaluated (n=3387). The data consist of the scores together with the job title and age of the person passed the test. The job titles were classified to six groups (students, food service managers, teachers, nutritionists). The data about not passed tests was not available. The results are described in number of passed test (SD) and differences between groups.

Results: The average score reached was 113.9±2.7. Test was accomplished by 1191 students (average score 113.9 ± 2.9) and 76 teachers (113.7±1.6) of catering and related fields, 1491 food service worker (113.8±1.8), 394 food service manager (114.0±1.9) and 31 nutritionists (114.3 ±2.1). The differences between groups passed the test are minor. However, results hint that when analyzed by age groups, the older groups got less high points both in students (p=0.058) and food service staff (p=0.064). The service staff got lower points than those working in kitchen (p=0.115). The teachers got lower points than students (p=0.712), which should not be the case. Food service managers got slightly better points than food service staff (p=0.375).

Key messages: can be improved by increasing the nutrition competency within food services. For that purpose easily feasible open access nutrition educational material with competency test is a new innovative method. The results can be used in developing the test and material, and developing the next phase of test, which is targeting managers and teachers. The results show that continuing education for teachers is in most importance, the results of the test should be better than those of students.

PM-063  Poster
Consumer research on commercial fortified rice program in Brazil provides insight on marketing messages for nutrition.
Spencer R; Carnahan E; Milani P; Ellison C; Garrett G; Moenck-Pflanzer R.
1Global Alliance for Improved Nutrition (GAIN), Geneva, Switzerland. 2PATH, Seattle, Washington.

Objectives: Rice fortification has vast potential to address micronutrient deficiencies; however a large-scale commercial model for fortified rice has never been implemented. Brazilian consumer rice-purchasing behavior and decision drivers were analyzed in order to inform a replicable market development model for scaling fortified rice through commercial channels.

Material and methods: Qualitative and quantitative randomized consumer responses and data were collected at point of sale. Consumer over age 18 who contribute to household rice purchasing decisions were individually interviewed from 30 January - 7 February 2014. Thirty qualitative interviews were conducted in 3 stores in São Paulo, 200 quantitative interviews were conducted in 5 stores in São Paulo, and 200 quantitative interviews were conducted in 5 stores in João Pessoa. Information collected included general rice purchasing habits, brand and type of rice preferences, household demographics, level of awareness of rice fortification, and reasons for purchase or non-purchase of fortified rice.

Results: Based on the analyzed samples, 73% of respondents consider women as the primary rice purchase decision makers. Such decisions were driven by brand loyalty (as a protection), and to a lesser extent, price. The two sampled cities showed distinct preferences between package size (5kg vs. 1kg) and type of rice (white vs. parboiled). Based on the 400 quantitative responses, 93% of consumers were not aware of micronutrient malnutrition. However, 78% would be likely to buy fortified rice if it were established to them that it can reduce micronutrient malnutrition. Thirty-two percent of consumers were aware of fortified rice, and out of those aware, 13% had purchased it. Those consumers first heard of fortified rice on TV (41%), followed by in-store product packaging (23%). Primary reasons given for not buying fortified rice were that the packaging did not catch consumers’ attention (57%) or consumers were accustomed to other rice types (21%).

Key findings: Initial research with Brazilian consumers indicates a positive attitude towards fortified rice despite current low uptake. While most consumers interviewed were unaware of micronutrient malnutrition, it is claimed they would be likely to consume fortified rice if they understood its benefits. Fortified brand marketing should adapt to local purchase preferences which vary by geographic region. Rice is deeply rooted in Brazilian food culture, therefore any change, such as fortification, requires significant consumer reassurance.
PM-065 Poster
Evaluating the nutritional status of infants and toddlers in the Philippines.
Sauvage V1; Cassard E2; Luagan J1; Tan E.C.; Iloamia A.; Rivero E.1.

Background and objectives: On November 8th, 2013, Typhoon Haiyan, locally known as Yolanda, struck the Philippines. In its wake, 14.1 million people were affected and 4.1 million displaced. Infrastructure, water and sanitation, food security and medical facilities were severely damaged, along with the shelter and security of domestic households. The main objective of this survey was to determine the nutritional status of children 6-59 months in Typhoon-affected areas. In addition, the coverage of vitamin A supplementation, deworming, measles vaccination and feeding programmes; the prevalence of childhood illnesses (diarrhea and acute respiratory infection) and malnutrition among women 15-49 years of age; and information on breastfeeding practices in surveyed households were also assessed.

Methods: A cross-sectional nutritional assessment using the standardized field methodology SMART (Standardized Monitoring and Assessment of Relief and Transitions) was undertaken by ACF in collaboration with the Nutrition Working Group, including UNICEF, WFP, WHO and the National Nutrition Council, from February 3rd-March 14th, 2014. Cluster sampling using a three stage sampling methodology was employed across 3 regions affected by Typhoon Yolanda in the Philippines, with a sample size representing these affected areas. ENA software was used to generate the anthropometric scores. The nutritional status of children was analysed using the Child Growth Standards (CGS) and the WHO's Children Growth Standards (I).

Results: A total of 1,386 households were visited with 645 children aged 6-59 months from 60 different clusters. The main results of the survey found that the overall prevalence of wasting was 4.1% (95% CI: 2.9-5.9), 30.6% (95% CI: 25.6-36.0) and 20.7% (95% CI: 17.3-24.6) respectively. No alarming results were found with regards to child morbidity nor the prevalence of undernutrition among women of reproductive age, based on MUAC. In terms of infant feeding practices, 14% of children aged 0-23 months were never breastfed and 58% initiated breastfeeding within the first hour in the typhoon-affected areas.

Conclusions: Prevalence of acute malnutrition did not raise emergency thresholds and public health concerns for stunting prevention. It will require a comprehensive and long-term approach (outside an emergency context). The survey results suggest that breastfeeding practices are generally suboptimal and inadequate, underlining the need to step up and improve the quality of breastfeeding support systems.

Key findings: The present dietary survey is the first large-scale survey done in many affected typhoon countries. Results indicate that intake of several nutrients are inadequate or excessive in the diets of many infants and toddlers. Further investigations to understand the imbalances of these nutrients are ongoing.

PM-067 Poster
Assessment of diet quality in health staff using the Healthy Eating Index in Kastamonus, Turkey.
Hümeýra Zengin F1, Aktas N2.

1 Dietician, Sinop Ataaturk Devlet Hastanesi Osmanliye Koyu Mekvi, Sinop, Turkey. 2 Seçuk University Faculty of Health Sciences Department of Nutrition and Dietetic, Konya, Turkey.

Objectives: This study aims at determining the food varieties and total diet quality of the health staff using the US Department of Agriculture (USDA) Healthy Eating Index-05 (HEI-05).

Material and methods: The research was carried among total 350 health staff, 282 female and 68 male selected randomly among the health staff in the Kastamonus province, Turkey. Research data was collected by using a questionnaire form, and a face to face interview method by the researcher. The data about daily food consumptions of the health staff was collected using “24-hour dietary recalls”, the energy and nutrient values of the food consumed by the subjects were calculated by using the “Nutrition Information System (BEBIS) Software Version 4”. Anthropometric measures were taken according to standard methods. Statistical evaluation was held using SPSS 17.0 software pack, and frequency (%) distribution of percentages (%), mean, chi-square significant test (<i>P</i>), Kruskal-Wallis Test (<i>P</i>), Mann-Whitney test (U) and Hollander-Wolfe Test (H) were applied for the independent samples.

Results: The mean age of the health staff was 33.6±7.5 in women and 34.6±8.7 in men. Body Mass Index values of the participants, in the 18.5–24.9 (47.9% of the staff), 25.0–29.9 (26.9%) and ≥30.0 (25.2%) kg/m² range, were 23.1±2.9 in men and 22.8±2.6 in women. The food variety score was 8.5±2.1 and 7.6±1.8 in man (p<0.001). No health staff was found to have 10 (<i>N</i>=16 varieties) food variety score. It was seen that 79.3% of the physicians, 65.6% of the health professional with bachelor's degree (psychologist, dietician, etc.), 77.8% of the nurse-health officers, 61.2% of the nurses, and 93.3% of the health technicians consumed 6-15 varieties of food a day (p<0.05). It was determined that the HEI-05 mean scores of the male health professional was 61.6±8.1, 65.9±8.9 in woman (p<0.000). Ninety percent of the health staff consume “a diet that needs improvement” (HEI score: 81-100 score), and 4.5% consume “a poor diet” (0-50 score).

Key findings: It was concluded that the health staff had lower HEI-05 score and food varieties than the ones recommended by USDA. The health staff should be motivated to enrich their food pattern through in-service trainings and certain educational strategies.

PM-066 Poster
Evaluating nutrient intakes of infants and toddlers from 8 cities in China.
Cai L1; Yu K1; Vinyes Parés G; Zhang Y1; Wang P1; Denney L2.
School of Public Health, Peking University, Beijing, China1; Nestlé R&D Centre, Beijing, China2; Nestlé Research Centre, Lausanne, Switzerland.

Objectives: The knowledge on dietary status in young children in China is scarce. The objective of the study was to evaluate the nutrient intakes of infants and toddlers from urban areas in China.

Material and methods: A cross-sectional, population study of Maternal Infant Nutrition Growth (MING) was conducted to investigate the nutrient intakes and nutrition status of pregnant and lactating women and young children from 8 cities in China. Subjects of present report were a total of 2481 infants and toddlers from MING study in five age groups as 0-5 months breastfeeding and non-breastfeeding, 6-11, 12-23 and 24-36 months. Dietary information was collected by using one-single 24-hour dietary recall via a face to face interview referencing a standard picture book of common food to estimate the amount consumed. Nutrient intakes from food were analyzed based on China Food Composition 2002 (China CDC). The estimated average requirements (EARs) or adequate intake levels (AIs), and upper intake level (ULs) recommended by Chinese Nutrition Society were used to assess the nutrient intakes from food and supplements.

Results: Average intakes of energy and macro nutrients meet recommendations but with lower than recommended energy contribution from fat in 40-50% of infants and toddlers diets. Mean calcium intakes exceeded AI, but an intake lower than the AI was found in 25% of infants and 50% of toddlers. Mean iron intakes met the AI in toddlers, but not in older infants and iron intake lower than the AI was found in 75% of the infants of 6-11 months. Zinc intakes were low, about 50% of infants and 50% of toddlers below the EAR. Also, 20% of infants and 10% of toddlers had vitamin A intakes below the EAR. Although, neither IU is defined for vitamin A in China, a subset of infants and toddlers may be at risk of excessive intake. Sodium intakes exceeded AI significantly in toddlers. While there is also no IU for sodium in China, over 50% of toddlers have intake above the UL set by the Institute of medicine in the US.

PM-068 Poster
Prejudices of health workers on the rural population in the rural Peruvian Andes.
Rivero E1; Vargas A1; Ferandández A1; Gonzales R1; Gutiérrez A1.
1 Action Against Hunger/Health Micro Network Vilcas Huaman.

Objectives: To identify health workers' prejudices to rural families that can result in cultural barriers between supply and demand for health care and nutritional counseling at Vilcas Huaman health centers, Ayacucho, Peru.

Methods: This is a descriptive research developed in 8 districts at Vilcas Huaman Province. The target population is 55% of the staff working in 20 health facilities. 60 surveys were administered to health workers (45 % to health technicians, 20 % to nurses, 13% obstetricians, 10% to medical doctors and 12% to other professions).

Results: The health workers evaluated were between 35 and 45 years old; 95% were Quechua speakers and have over 1 year working in the health centers. 87 % of health workers affirm that “rural families are lazy and simplistic”, 84 % said that “rural families do not concern about the health care and feeding of their children and take more care about their agricultural activities”; 61 % reported that “rural parents senselses act according to their beliefs and customs” other 61 % believe that “parents are not interested in the education and the future of their children”; 82 % perceived that “mothers do not understand the nutrition and health counseling”; 90% affirm that “mothers bring their children to the health facilities because they are obligated”; and 63 % said that “rural parents have enough time and never are busy”. It is noted that as younger respondents are more likely to be prejudiced about users.

Main conclusions: The perception of health workers about the culture of this rural population is characterized by a high content of unfounded prejudices; these workers must consider about the health quality processes and health and nutrition counseling in the first care referral.
Objectives: Recently, there has been increased interest in the role of vitamin D in psychological health and wellbeing. Sun exposure is the major source of vitamin D for humans, and thus, in absence of supplementation or suitable fortification, the level of circulating serum 25-hydroxyvitamin D, the main marker for vitamin D status, decreases significantly during winter. Low levels of circulating serum 25-hydroxyvitamin D have been associated with some psychological and neurological wellbeing. However, time spent outdoors has not been taken into account in previous studies of the relationship between vitamin D and wellbeing. We investigated the association of vitamin D and depression in a young adult sample, controlling for time spent outdoors during daylight hours.

Methods: A cross-sectional sample of 615 students (234 men, 37.5%, mean age 19 years, range 17-25) participated in the Daily Life Study, a micro-longitudinal study of student experiences, during southern hemisphere autumn in Dunedin, New Zealand (54°55'). Participants completed an initial questionnaire including demographics (age, gender, and ethnicity) and the Centre for Epidemiological Studies Depression Scale to measure the presence of depression symptoms. Ambulatory assessment of time spent outdoors was conducted using a 2-week protocol where participants reported on their time spent outdoors each day through an online daily diary. Finally, we measured their height and weight, and obtained a venous blood sample for 25-hydroxyvitamin D analysis. Serum 25-hydroxyvitamin D was analysed using isotope-dilution liquid chromatography tandem mass spectrophotometry. 25-hydroxyvitamin D was used to predict depression scores, adjusting for age, gender, ethnicity and time spent outdoors.

Results: Prevalence of low vitamin D was high whereby 32% of participants had 25-hydroxyvitamin D below 50 nmol/L. Mean 25-hydroxyvitamin D was 63.9 nmol/L (SD=26.5 nmol/L, range 2.2-177.0 nmol/L), and women had higher 25-hydroxyvitamin D than men (p<0.001) although they spent less time outdoors. A strong inverse correlation was found as an independent predictor of depression symptoms even after controlling for other predictors including time spent outdoors. Every standard deviation increase in serum 25-hydroxyvitamin D was associated with a 4.5-point decrease in depression score (towards lower scores: p<0.001).

Key findings: The prevalence of vitamin D deficiency was high even in this young community sample. Serum 25(OH)D3 was inversely associated with depression scores in this young community sample. The findings support further investigation through an appropriately designed, randomised controlled trial of supplementation with vitamin D among young adults in the general population.

Key findings: In women, BMI was inversely and significantly associated with BMD.

PM-071
Application of Nutrimetry to the Mexican National Health and Nutrition Survey 2012.
Secretaría de Salud del Estado de Campeche, México. 1Programa PAOY; Secretaría de Educación del Go­bierno del Estado de Yucatán, México. 2Grupo de investigación en ejercicio para la salud, Mérida, Yucatán, México.

Objectives: To run the application of Nutrimetry into a representative da­taset of Mexican children and adolescents, as a way to show how this instrument can help assess malnutrition and decide appropriate public health interventions.

Methods and methods: 20,550 males and 20,451 females aged 0-19 years from the 2012 National Health and Nutrition Survey (ENSANUT 2012) were studied. The calcu of Nutrimetry (Nutrimetria) were applied as explained elsewhere, based on the SD scores of Height-for-age and BMI-for-age after the World Health Organization references.

Results: About 50% of the Mexican children and adolescents are coded as 6 (normal BMI and stature). About 30% of children are coded as 9 (normal height and high BMI, 20-25% in adolescents). The high stature codes (5, 8 and 11) sum no more than 2% within childhood. Code 4 (short stature, normal BMI) is about 8% during early childhood and 0% during childhood. However, there were no differences among patterns during adolescence, with 2.3% and 23.3% of code 4 prevalence respectively. Different patterns were also found for each State. Children in some southern states as Yucatan and Campeche show less code 6 and more code 9 than the Mexican average. Adolescent women from Yucatan state show an increase of prevalence in normal BMI and some northern states may show lower prevalence of codes 4 and 7 than the Mexican average.

Key findings: The generalized high prevalence detected in code 9 children and adolescents should be treated with strict control of weights and physi­cal activity. In some states, where the low stature obesity (code 7) is high, the subjects should follow a differential diagnosis from congenital and genetic syndromes, cardiopathy, endocrinopathy, and nephropathy, to low familial stature as primary cause. The use of Nutrimetry has been shown to be useful to understand intra-group differences among nutritional sta­tus categories. It also allowed us to detect differences between Mexican states that should be considered in public health policies.

PM-072
Challenges in the promotion of healthy nutrition in early life.
Petrowa, S.; Dulcev V.; Rangelova L.
National Center of Public Health and Analyses, Sofia, Bulgaria.

Background: The National Nutritional Survey of Children aged under five years and their mothers (2007) provided data to identify main problems in early life nutrition of Bulgarian children: breastfeeding – short duration, low prevalence of exclusive breastfeeding; complementary feeding – early introduction, low intake of fruits, low iron and n-3 PUFA intake; nutritional status – widespread stunting among infants, overweight in children aged 1-2 years, anemia in children 6-36 months old and mothers. Based on the observed data, national/local nutrition policy measures were initiated. Activities: Variety of tools, approaches and channels for promotion of healthy nutrition were applied: national dietary guidelines were developed for women in child-bearing age, pregnancy and lactation, and for infants; campaigns were carried out annually related to World Breastfeeding Week & National Week for Counteracting Obesity; established were schools for future parents, interactive web sites, training of volunteer consultants on breastfeeding and consultative centers on breastfeeding; media were involved. Manual with Book of Recipes for the feeding of children up to 3 years of age was published and is under implementation in the feeding in the nurseries.

What went well: Promotion of healthy nutrition on national / local level with focus on risk population groups (infants, children in different age, pregnant and lactating women), regularly provided from experts by means of national campaigns, improved community. Promotion of exclusive breastfeeding was widespread among child-bearing age /pregnant women was implemented by multichannel and multilateral approach. Promotion of breastfeeding by Consultative Centers on Breastfeeding involving personal consultancies and training of mothers was conducted very well. Through the national campaigns against obesity the population became familiar with the problem and the interest for healthy nutrition was increased. Implementation of nutrition regulation/meal stan­dards in nurseries is promising.

Challenges and lessons learned: There is no harmonization in the recommen­dations given from health professionals on exclusive breastfeeding and complementary feeding of infants. Pediatricians, GPs, gynecologists,
nurses have no adequate knowledge on early life nutrition and it is necessary such information to be involved in their education. Mothers’ associations are enthusiastic and effective, but are not well informed. The personal contacts of the local known health specialists with people on site are very effective. The schools for future parents and websites often provide incorrect nutritional information and give inadequate recommendations, and need accreditation. Enough and sustainable support from the government is necessary.

PM-073 Poster  
Correlation of serum 25-(OH)-vitamin D levels with the type of obesity in overweight and obese people.  
Nikolova M., Rangelova L.1  
1Medical University-Department of Hygiene, Medical Ecology and Nutrition, Sofia, Bulgaria.2National Centre of Public Health and Analyses, Sofia, Bulgaria.

Objectives: Vitamin D deficiency is widely spread around the world. The relation between the serum vitamin D levels and the body fat distribution in obesity is not sufficiently studied in Bulgarian population. There are no published studies that combine bioelectrical impedance and DXA in the examination of body composition in respect to the serum levels of vitamin D. The aim of the study is to evaluate the body composition and the type of obesity in overweight and obese adults and searching the connection with serum levels of 25(OH) vitamin D (25(OH)D).

Material and methods: Between January - April 2014 a cross-sectional survey on nutrition, nutritional and vitamin D status, including a sample of 120 (n = 120) men and women from the age of 18-65 years was performed. The height, weight and waist circumference, blood pressure were measured. Body mass index (BMI) was assessed by standard methodology. Food consumption was examined by 24-h recall, food frequency questionnaire (FFQ), and the physical activity level (PAL) by PAQ. Body fat distribution and type of obesity were evaluated using two methods: bioelectrical impedance on the device Titanica BC 420 MA and dual-energy X-ray absorptiometry (DXA) on the GE Lunar Prodigy PRO. The serum levels of 25(OH)D were measured by an immunoassay for quantitative in vitro measurement of 25(OH)D (Roche Diagnostic). Also fasting blood glucose levels, total cholesterol, HDL, LDL, TG were measured.

The results were collected and will be compared with reference values for healthy adults defer from age, gender and PAL. The factors associated with vitamin D levels, namely age, sex, milk consumption, supplement use, exposure and BMI were also assessed.

Results: The relative rate of adults with overweight was 32.1% (BMI 25-29.9 kg/m2), obesity was 67.9% (BMI ≥ 30.0 kg/m2). The gender distribution revealed that the prevalence of obesity among men was 76.3% and among women was 60.2%.

Vitamin D status, current number of studied adults was impaired: 35.7% had insufficient levels of vitamin D (25(OH)D < 50 nmol/L) and 53.6% had vitamin D deficiency (25(OH)D < 30 nmol/L). The prevalence of Vitamin D deficiency was the highest among obese women (39.7%).

Key Findings: The results will be a basis to establish the relationship as between levels of 25(OH)D and the quantity of fat and fat-free tissue in overweight and obesity as the type of obesity - visceral or subcutaneous in adults.

PM-074 Poster  
Can gamification influence food behavior in adolescent athletes?  
Vespalainen H1, Lehtovirta M2, Aistrich N3, Quarshie M4, Fagelholm M1, Erkkola M4.  
1Department of Food and Environmental Sciences, Division of Nutrition, University of Helsinki.2Department of Public Health, Hjelt-institute, University of Helsinki.3Wellness Foundry Holding Ltd., Helsinki, Finland

Objectives: We aim to determine if the eating habits of adolescent athletes could be influenced using a game-like smartphone application.

Material and methods: A total of 53 adolescent basketball (34%) and soccer players (66%) were recruited to the study. They were randomized to a game (n=24, 45%) and tutorial (n=29, 55%) groups. The game group members kept visual food journals during a four week study period using a smartphone application. The meals uploaded to the application were given scores by a nutritionist if specific food items defined in the rules were present. The tutorial group members were given a tutorial and each get their personal food journal feedback. A small group meeting discussing healthy diets. Food intake was measured at baseline and after the intervention using a food frequency questionnaire (FFQ) specifically designed for the study. The changes occurring during the intervention were examined within and between the game and tutorial groups.

Results: Altogether 40 participants (77%) completed the FFQ after the intervention. Baseline characteristics of the participants were similar in both groups. Among the female athletes, the gamified application triggered a more substantial increase in the consumption of wholegrain porridge compared to the tutorial group (p = 0.028). Among the male athletes, the tutorial group increased the consumption of vegetables, fruits, and berries more than the game group (p = 0.005), whereas changes in the consumption of milk were more apparent in the game group (p = 0.009). Among the male athletes within the game group, the consumption of milk with 1% or more fat and that of total milk decreased 2.2 (SD 1.9) and 1.5 times/day (1.9), (p for both = 0.028), respectively. The male athletes within the tutorial group increased their consumption of vegetables, 0.25 times/day, fruits, and berries 1.4 times/day (SD 1.9, p = 0.024) and nuts 1.5 times/week (SD 2.2, p = 0.019). The smartphone application was thought to be fun, challenging, and educational.

Key findings: During the intervention period, the male athletes showed more changes in their diets compared to the female athletes. Among the male athletes, both the gamified and the more conventional interventions were effective. In the future, the two intervention methods could be combined to enhance the role of social support and to enable individual tailoring.

PM-075 Poster  
From wasting to thriving: Community-based feeding counseling improved feeding and growth in rural Bangladesh.  
Guldan G.S., Islam T, Begum, A.  
Asian University for women, Chittagong, Bangladesh

Objectives: Only 21% of Bangladesh infants and young children aged 0 to 29 months are fed adequate complementary food, perhaps indicating a lack of caregiver feeding knowledge. Stunting and underweight rates are around 40%, and urban/rural growth disparities make the scenario more problematic. This study, conducted in rural Chittagong, tested the feasibility of an intervention featuring weekly counseling home visits by four local community health educators aiming to improve IYCF, energy and nutrient intake and growth of children <30m.

Material and methods: After a needs assessment, a culturally tailored complementary feeding intervention was designed and women educators trained. Following intervention implementation from mid-2012 to mid-2013, a cross sectional survey was conducted to evaluate the intervention outcomes, comparing the counseled (n=60) group to a control group without counseling (n=45).

Results: After intervention, the counselling group had significantly fewer wasted (17% vs. 32%; p=0.04) participants than the control group. Also, the caregivers from the counseling group had significantly higher positive responses about what they did when the infant asked for more food (82% vs. 42%; p<0.001). The counseling group children had significantly higher intake adequacies of iron (90% vs.72%; p=0.04) and marginally significantly higher zinc intake adequacies (17% vs. 6%; p=0.06) than the control group. Multivariate logistic regression adjusting for various confounders showed the likelihood of being wasted after receiving counseling decreased from 46% to 19% relative to the controls. However, the proximal effect of the complementary feeding on wasting could not be assessed due to lack of significant power.

Key findings: An educational intervention delivered through local health educators improved caregivers’ IYCF and child growth with respect to wasting.

PM-076 Poster  
A comparison of dietary characteristics among adolescents in two neighboring villages in Chittagong, Bangladesh: A trend towards a micro nutrition transition?  
Guldan GS, Islam T, Byadya R  
Asian University for Women, Chittagong, Bangladesh

Objectives: The objective of this geographical nutrition study was to compare nutrition transition characteristics indicated by intakes of energy-dense snacks and sweetened beverages, fat, sugar and dietary fiber consumption, physical activity and the prevalence of under- and overweight among adolescents aged 13-14y in two neighboring, but more and less urbanized villages, in Chittagong, Bangladesh.

Material and methods: We conducted a cross-sectional study using a door-to-door survey method, interviewing all 85 adolescents from the urbanized village and all 68 adolescents from the remote village.

Results: Only 23.5% of the participants in the remote village vs. 9.4% in the urbanized village consumed vegetables at least daily (P=0.008). The reported consumption frequencies of non-homemade savory fried snacks such as singara/amosa, peaju, chaunchar, patara, chila, pickles, sweetmeats and soft drinks, all were significantly higher in the urbanized village than in the remote village (p=0.05). About 80% of the adolescents from each village did not consume adequate dietary fiber, and 30% of all the adolescents exceeded the new WHO-recommended limit for sugar. The urbanized village had both overweight (11%) and obesity (16.5%) participants, mostly males, whereas the prevalence of overweight in the remote village was 13.8%. Physical activity status did not differ by gender or adolescent weight status.

Key findings: Adolescents from both villages had similar reasonable macronutrient energy proportions but low fruit, vegetable and dietary fiber intakes and excessive sugar intakes. The urbanized village adolescents
more purchased energy-dense snacks and beverages from shops. The overweight rates were similar, and a nutritional double burden with underweight also existed. Both villages displayed trends of moving through a nutrition transition, with the urbanized village perhaps a step ahead. Further research with larger sample size is needed to understand the nutrition transition characteristics among rural adolescents and other populations.

**PM-077**

**Poster**

**Association of consumption of soft drink with coronary atherosclerotic burden.**

Chagas P.; Abb R.T.; Caramori P.R.A.; Pelanda L.T.; Schwantes C.H.A. 1

1Department of Food and Nutrition, Universidade Federal de Santa Maria, RS, Brazil. 2Universidade Federal de Pelotas, RS, Brazil. 3Cardiovascular Research Center – Hospital São Lucas-Pontifícia Universidade Católica do Rio Grande do Sul, Brazil. 4Postgraduate in Cardiology – Fundação Universitária de Cardiologia, RS, Brazil. 5Institute of Geriatrics and Gerontology, Pontifícia Universidade Católica do Rio Grande do Sul, RS, Brazil.

Objectives: To verify the association between soft drink and coronary atherosclerotic burden.

Material and methods: Cross-sectional study. Adult patients referred for coronary angiography were invited to participate of the study. Sociodemographic data (age, education and occupation), the cardiovascular risk factors (smoking, hypertension [HAS], dyslipidemia, diabetes mellitus [DM], and family history of CAD [CAD+HF]) and soft drink consumption were collected through interviews using a structured questionnaire. Soft drink consumption was divided into three categories: not consume soft drinks, consume the regular soft drink and consume diet soft drink. Coronary atherosclerotic burden was assessed using the score Friesinger(ER) on coronary angiography. This score ranges from 0 to 15 and scores separately in each of the three main coronary arteries. All coronary lesions were assessed by blinded interventional cardiologists to soft drink consumption. Data analyzed was performed using the Statistical Package for Social Sciences (SPSS) version 18.0. Chi-square test was used for categorical variables and one-way ANOVA for the three categories of consumption of soft drinks and FFA. Multiple linear regression model was completed with the EF as the dependent variable and the other variables as independent variables. This is an arm in a larger study entitled “Food”. The cardiovascular risk profile and its association with coronary atherosclerotic burden. The research protocol was approved by the Ethics Committee of PUCRS under number 08/0421.

Results: The sample consisted of 310 adult patients with suspected coronary artery disease undergoing coronary angiography (63.1% men). The mean age was 60.03±11.02 years, with the highest prevalence of marriage (69.7%), schooling between 4-8 years of education (42.6%) and retired (51.6%). In relation to cardiovascular risk factors samples showed: 77.4% hypertensive, 53.7% dyslipidemia, 28.2% DM, 20.1% were current smokers, 21.4% HF+DAC. Of the total sample, 23.9% reported not consuming soft drinks, 57.1% reported consuming regular soft drink and 19% diet soft drink. Among the sociodemographic data, the consumption of soft drinks was significantly associated only with the time of study (p<0.001) and betwen cardiovascular risk factors and smoking (p<0.001). The EF average of non-consumers of soft drinks, regular soft drink consumers and diet soft drink consumers, was, respectively, 7.43±3.54, 7.13±4.01 and 7.8±3.88. No significant association of soft drink consumption was found with the EF. Association of the atherosclerotic burden was independently associated with age (p<0.01), gender (p=0.02), hypertension (p=0.025) and smoking (p=0.024).

Key findings: No significant association of soft drink consumption was found with coronary atherosclerotic burden.

**PM-078**

**Poster**

**Efficacy and acceptability of the Lipid Based Nutrient Supplement (LNS)- Nutributter® in the Peruvian Andes.**

Rivero E; Rodríguez, A; Vargas A; Bado R; Aquino O; Novalbas, JP

1Actors Against Hunger. 2Universidad de Càdiz. 3Centro Nacional de Alimentación y Nutrición

Objective: To evaluate the impact on the linear growth and haemoglobin levels and aspects of LNS consumption among children 6 to 11 months of rural communities in Peru.

Material and Methods: A single no blinded trial was conducted in 5 districts with high child hunger under nutrition from the Ambo province, Huanuco Region, Peru. The sample included 147 children aged 6 months attending to the health centres from July 2012 to March 2013. They received monthly 30 sachets of 20g LNS for daily consumption from the 6th to the 11th month of age. After 3 months of nutritional counselling, additionally one monthly home visit was done in order to assess the monthly consumption of the supplement, the length of the child at 6, 9 and 12 months of age and overweight and obesity levels at 6 and 12 months.

Results: The mothers knowledge on the benefits of LNS was high; 89.8% mentioned that serves the child’s growth and 46.9% for intelligence. The level of LNS daily consumption was progressively increased, from 69.1% in children 6 months to 97.3% at 11 months. Regarding the amount of sachet consumed, at the age of 6 months all of them consumed more than half, and at 11 months of age children consumed almost everything. Regarding how the family shared the Nutributter among children of 6 months of age, 94.6% of the mothers reported that they did not share it with other family members and at the age of 11 months, the result reached 98%. 98% of mothers reported that their children had no problems with consuming LNS at 11 months.

When comparing the mean z-score for height for age, at the 6 months (z = -0.98) and at 12 months (z = -1.10) there is a decrease in 0.12 z score (p<0.048); resulting in an increased of the stunting prevalence rising from 13.7% to 17.4%.

When comparing the mean values of the haemoglobin concentration, there is a significantly increase of 0.66 mg/dL (p=0.008) between 6 months (10.26 mg/dL) and 12 months (10.93 mg/dL) and the anaemia prevalence decreased significantly in 27 percentage points from 80% to 53% at the age of 6 and 12 months respectively.

Key findings: Mostly, the consumption was at daily bases, there was a good tolerance and the product was little shared with the rest of the family members. The anaemia levels decreased and the linear growth levels remain almost the same in the second semester of life.

(1) Action Against Hunger; (2) Universidad de Càdiz; (3) Centro Nacional de Alimentación y Nutrición.
Results: Our results show that energy intake was significantly different between the different locations for all the meals from weekday 1 (breakfast: p = 0.031; lunch: p = 0.040; dinner: p = 0.033) and for lunch (p = 0.011) and dinner (p = 0.001) from weekday 2. The energy intake on breakfast was only significantly different between home and school for weekday 1 (p = 0.006), with school meals having a higher energy content, but no differences were found on breakfast from weekday 2. It should be noted that no statistically significant differences were found on the energy content of meals between the different locations on the weekend day reported.

Key findings: In general, energy intake was lower in meals consumed at home than at other locations. The most evident differences were found on breakfast. There was not a single meal from the weekend that presented significant differences on the energy content between the various locations. The highest energy value of meals was found for those consumed at restaurants and fast-food restaurants, but despite these two places no significant differences were found. Moreover, household meals had, in general, the lowest energy value and meals consumed at school were usually lower in calories than those from coffee shops, restaurants supported by fast and fast-food restaurants. Generally, meals consumed outside of home and school environments had a higher energetic value.

PM-083 Hospitality meal serving practices as means to improve hospital meals.
Asjesen L.
Department of Rehabilitation and Nutrition, Metropolitan University College, Pustervig B, 1126 Copenhagen K, Denmark.

Objectives: This study aims at exploring hospitality meal serving practices among kitchen professionals serving meals in hospitals. Hospitality has recently been introduced as a concept to improve hospital meal experiences and to address that 30-40% of hospitalised patients are at risk of being undernourished.

Material and methods: The study is based on a six month ethnographic study in a Danish Hospital in 2012 at a gynaecology and cardiology ward. Meal serving practices were explored using a multi-disciplinary approach applying visual ethnography and participant observation. Further, 22 semi-structured interviews were conducted with professionals and patients. In addition one focus group interview were conducted with hospital administration. These data were collected through an implicit and explicit analysis of daily experiences among kitchen professionals which remained at 67.4% of the population. Fruit intake was reduced by 0.04 percentage points, from 76 % in 2009 to 73 % in 2013. Meat consumption also declined, from 84 % in 2009 to 74 % in 2013; with a coefficient of variation of -0.11 percentage points. Regarding vegetables, it was found that in 2009 the habit of watching television while eating was observed in 46 % of children and decreased to 34 % in 2013, a decrease of -0.26 percentage points. Have the habit of consuming home-made food increased from 87 % in 2009 to 90 % in 2013, reaching an increase of 0.03 percentage points in the period.

Conclusions: Based on these results and considering the population studied, we conclude that the consumption of vegetables, fruits and meals should be encouraged, since these foods are essential for the growth and development of children, particularly in indigenous populations representing population groups at social risk. The reduction in the habit of eating and watching television and the increased consumption of homemade food at dinner, may indicate improvements unhealthy life related to physical inactivity and snacking.

PM-084 Food waste: compositional and organoleptic analysis of fruits and vegetables.
Rodriguez P1, Ruiz E2, Valero T3, del Pozo S1, Ávila J M1, Fajardo V1, Carrera E2, Varela-Moreiras G2,1, Martin M1,1
1Spanish Nutrition Foundation (FEN), Madrid, Spain; 2University CEU-San Pablo, School of Pharmacy, Department of Pharmaceutical & Health Sciences, Madrid (Spain); 3Arabil Agri-Food Laboratory, Departments: Food stuff, Special analysis and spectroscopic techniques, Madrid, Spain.

Introduction: Hispacopo data (2012) show that in Spain are discarded 32.2kg of food per person/year. Fruits and vegetables are the food group most wasted after bread and cereal group. This waste is due to deterioration by a poor preservation, storage, an over time, or ignoring the lifespan (including the nutritional aspects) of the product. Objectives: To know the changes in nutritional value and consumer preferences in vegetables and fruits with different times and types of conservation in order to minimize food waste.

Methods: Design: The sample was formed by 45 foods, according to information provided by the MAGRAMA (Agriculture Ministry, Food and Envi...
The present study involved the compositional analysis of vitamin C, thiamin, calcium, iron, zinc and folic acid but we focus on vitamin C and folic acid. Analysis also included organoleptic analysis, based on: hedonic, ordination and triangular tests. The group of subjects consisted of 30 untrained tasters.

Results: Compositional analysis: Kiwi and orange have the highest levels of vitamin C in fresh fruit. In potatoes and onions, vitamin C has significantly different concentrations (p<0.05) between fresh, frozen and stored for 1 month, these decreasing levels. Vitamin C in lettuce has statistically significant differences (p<0.05) between fresh, frozen and stored for 1 month. Finding no differences in folic acid levels. In tomato there are significant differences in vitamin C and folic acid between sterile preserved and preserved for 2 days. As for apples, peaches, bananas and peppers we don’t find statistically significant differences (p>0.05) between fresh fruit and preserved for 5 days at room and fridge. There is a higher level of folic acid in frozen samples of fruits and vegetables.

PM-085 Poster Breastfeeding practices in the first six months of life among infants of Somali- and Iraqi-born mothers living in Norway: The InBaRoost study

Grewal, N.K.*, Sellen, D.I., Torhein, L.E.*
1Fafo Institute for Applied International Studies, Oslo, Norway/Department of Anthropology, University of Toronto, Toronto, Ontario, Canada 2Department of Health, Nutrition and Management, Faculty of Health Sciences, Oslo and Akershus University College of Applied Sciences, Oslo, Norway.

Objectives: To describe breastfeeding practices of Norwegian-born infants (6 months) whose mothers have immigrated from Somalia and Iraq. Materials and methods: We targeted women born in Somalia and Iraq, living in the counties of Oslo, Akershus, during 2013-2014, and who had 6-month-old infants for study inclusion. Several methods were used to approach the target group: health centers, lists over eligible mothers obtained from the National Population Register and the “snowball method.” Data on breastfeeding and feeding practices was collected using standardized questionnaires and previously existing in the national dietary survey among infants of Scandinavian-born mothers living in Norway. Results: The final sample consisted of 107 Somali- and 80 Iraqi-born mothers. Breastfeeding was almost universally initiated after birth in both groups. At 4 months of age, breastfeeding was more common among Somali infants, as compared with Iraqi infants, 94% vs 74%, respectively (p<0.001). Exclusive breastfeeding for 4 months was more commonly reported among Iraqi than Somali mothers, 29% vs 19%, respectively (p=0.06), both lower than national averages (46%). Infant formula was introduced within the first 4 weeks of life among 44% of infants of Somali origin and 34% of Iraqi origin. Further, 62% and 52% of the Somali and Iraqi infants, respectively, were introduced to formula before 4 months of age; higher than the national average of 28%.

At six months of age, 79% of infants of Somali origin and 58% of infants of Iraqi origin were still breastfed, (p<0.001), whereas the national average is 80%. Only one infant of Iraqi and none of Somali origin were exclusively breastfed for six months. A higher proportion of the Somali mothers reported giving infant formula to their child at six months compared to the Iraqi mothers, 79% and 61%, respectively (p<0.01), both groups higher than the national average (36%). More Somali-born mothers gave both breastmilk and formula to their child at six months of age, as compared with the Iraqi-born mothers who either breastfed or gave formula (p<0.001).

Key findings: Breastfeeding initiation was common among both Somali and Iraqi mothers, but exclusive breastfeeding period was shorter than recommended in both groups. Compared to Iraqi mothers in the sample, Somali mothers were more likely to breastfeed for at least six months and less likely to practice exclusive breastfeeding. These findings have implications for the development of strategies for supporting recommended infant feeding practices among Somali- and Iraqi immigrants to Norway.

PM-086 Poster A qualitative study among women to identify current food culture practices in four low-income communities in north Mexico

Grau-Muñoz A., Delgado E., Quirino-Garza A., Cepeda-Lopez A.C.
*Universidad de Monterrey, ‘Universidad de Valencia

Background and Objective: We can identify among the Mexican population an increment in the prevalence of obesity that is simultaneous with a high prevalence of undernutrition. Food transition in Mexico is occurring in a polarized way, northern Mexico is where greater changes have been taking place, eating practices changing in pair with economic and social development. This qualitative study was conducted to identify current food culture and the need for information of the key population considering the context of intervention. This information will enable the research team to design a psycho-educational intervention that expects to respond a salutogenic vision of health promotion, and among many innovative elements, it will be based on the concrete needs concerning dietary knowledge and cooking skills of the target population.

Material and methods: As a pre-phase to the strategy design, a qualitative study with four focus groups was performed, where women (n=50) from marginalized communities from Sinaloa, Mexico participated. The diaries of the discussions were professionally transcribed and analyzed to identify recurring trends and patterns using Atlas.ti® software. Results: Women from these communities still have an important role in family nutrition, therefore they become the key target for food administration. However, dietary patterns now constitute social practices with a symbolic imaginary dimension, and child and teen population are manifesting barriers to the introduction of specific foods. The identity of worried mothers concerned with their homes health has been confronted with their children's posture to new foods called modern dieting. There is an identity distancing from local food, that is often associated with "poor people's food", giving a high demand to precooked and industrial food, "if my daughter sees that the eggs are from our ranch she won't eat them” (GD1). Mothers are trying to overcome economic barriers answering to individual food likes, serving as a strategy to demonstrate a social class that has access to "modern foods". Consuming this modernity serves as a symbol for not being poor and rural.

In conclusion, we can argue that the barriers for healthy food consumption are more often associated with social dimensions than with economic dimensions. This study provides a clear framework for culturally tailoring an intervention increasing its potential to realize the desired outcome of accomplishing appropriate behavioral change in the key population.

PM-087 Poster Dietary and physical activity practices according adequacy of gestational weight gain

Bajpai, S.J.; Gomes C.B.; Malta, M.B.; Carvalhaes, M.A.B.L.; Unidade Botucatu UNESP - Un Estadual Paulista, Brazil

Objectives: Investigate association between diet quality and physical activity levels with the adequacy of gestational weight gain. Methods: We conducted a cross-sectional study involving random sample (n = 212) of pregnant assisted in primary health care. Information on eating habits and physical activity were obtained in the 2nd trimester, in health facilities, in prenatal care day. It was investigated the frequency of consumption of processed foods, fries and soft drinks for the construction of unhealthy consumption score, assigning: 0.00 for foods never consumed; 0.05 eaten up to twice a week; 0.46 for consumed three to four days per week; 0.73 for consumed five to six days a week; and 1.00 for foods consumed daily. Score of healthy consumption was based on frequency of consumption of fruits and vegetables, punctuated in the same way as above. Level of physical activity (sedentary/actively, moderately active, vigorously active) was estimated by questionnaire adapted and validated for the Brazilian population. The adequacy of gestational weight gain was calculated according to the criteria of the Institute of Medicine (2009). The association of the adequacy of weight with categorical variable (physical activity level) was tested by chi-square; with continuous variables (score healthy and unhealthy) by analysis of variance. We considered critical level of p < 0.05.

Results: Approximately half (50.5%) of the women had excessive weight gain, 29.7% adequate, and 19.8% gained weight insufficiently, being 77.4% of the women considered sedentary/actively, 12.2% moderately active and 10.3% strongly active. There was no statistically significant association between adequacy of weight gain and level of physical activity (p=0.680). The mean score among healthy pregnant women with adequate weight gain was 2.0±0.46; with excessive weight gain 2.03±0.50, with insufficient weight gain 2.01±0.94 among those with insufficient gain. Concerning the unhealthy score, the average among pregnant women who gained adequate weight was 0.87±0.60; 0.90±0.50 in women with excessive weight gain and 0.82±0.48 in those with insufficient gain.

Key findings: There was no statistically significant association with adequacy of weight gain and healthy not healthy score (p=0.955 and p=0.715, respectively). There was no association between indicators of diet quality, physical activity level and adequacy of gestational weight gain. Our results suggest that the methodology used to assess physical activity and food consumption may not be the most appropriate, it is recommended to seek more accurate methods for these assessments.

PM-088 Poster Analysis of food advertisement based on Brazilian Law

Pereira, P.; Veltrini, C.P.; Nakashima, A.F.A.; Ribeiro, C.G.S.
Nutrition Undergraduate Program, School of Health and Biosciences. Pontificia Catholic University of Paraná, Brazil

Objective: Obesity is a disease of importance in the global epidemiological scenario since become one of the greatest public health problems. Inside the etiology of obesity, the food media has become an important risk
factor, especially to children and adolescents who have spent more time watching TV (over 4 hours daily). On the other hand, there is greater availability of food with high sugar, salt and saturated and trans fat and food industry through the media has produced increasingly creative advertising campaigns. Based on the above, this study aimed to analyze the quantity and quality of food advertisements transmitted on Brazilian TV.

Materials and method: Descriptive cross-sectional study using data from 64 hours of recording resulting four television channels open between September and October of 2012 advertisements were divided into 15 different groups, and the “foods” category was divided according to the subgroups present in the food pyramid. The analysis of each food. The advertisements were analyzed through a check list based on national legislation. The initial sample consisted of 1707 pieces, and that 81 were on food and 22 were excluded because they were considered healthy and 31 was repeated, ending 28 advertisements for analysis.

Results: Most advertisements accounted for 4.7% of total hours analyzed, but the majority (43%) was represented by foods high in sugar, salt, saturated fat and trans fat, and refrigerant (25%) the most frequent. Most advertisements has a duration less than 30 seconds, sufficient time to influence the food choice of the viewer. According to Brazilian law, none of the advertisements followed the required criteria for placement.

Key findings: Although the participation of food advertisements was small, there was a predominance of foods considered unhealthy, which can negatively influence the desire, stimulating weight gain and possible obesity and thus impairing nutrition and health of viewers. Another fact is the lack of suitability of the food industry on the Brazilian legislation, indicating poor institutions responsible for monitoring advertising in Brazil.

PM-091 Poster Association of whole fat dairy food intake with obesity: findings from ORISCAV-LUX study.
Zając J, Kolarzyk E, Skop-Lewandowska A.
Department of Hygiene and Dietetics, Jagiellonian University, Medical College, Krakow, Poland.

Objective: A lot of was heard about dioxins and dioxins-like compounds, mainly in context of nutrition affairs. Dioxins are classified as molecules carcinogenic to humans. The main source of dioxins in food is - 90% of typical exposition, thus assessment of dioxins intake and monitoring of dioxins levels in foods remains an important matter. The aim of presented work was assessment of dioxins and related compounds intake among adolescents on basis of validated semi-quantitative food frequency questionnaire.

Material and methods: A modified semi-quantitative food frequency questionnaire, taking under consideration products that typically contain dioxins or may contain dioxins after a specific food preparation, was conducted. 55 randomly chosen, 15 year-old, students of secondary school took part in study. For each individual dioxins exposition was calculated in pg of Toxic Equivalent (WHO-TEQ) per kilogram of body weight per day. Results: The mean intake of dioxins and related compounds was: 1.71 pg WHO-TEQ/kg of body weight per day. The main contributors of dioxins intake were: 29% from fish – mainly sardines and tuna, about 25% from smoked or grilled meats, 9% from eggs. Dairy products and fats were the worst sources of dioxins and related compounds.

Key findings: Average intake in analyzed group was lower than Tolerable Daily Intake, set up by WHO as 2 pg WHO-TEQ/kg of body weight per day. In contrast of other countries Polish results remain as one of the highest in a comparable age group. Even though average intake is lower than safe threshold about 30% of adolescents exceeded the limiting value (the highest noted intake was 4.6 pg WHO-TEQ/kg body weight per day). That support the need to control and reduce dioxins and related compounds in food products.

PM-092 Poster Cranberry intervention in patients with localised prostate cancer prior to radical prostatectomy.
Student V1, Vostalova J2, Vidlar A1, Bouchal J1, Kolar Z2, Kral M1, Ulrichova J1, Simanek V1.
1Department of Urology, University Hospital, Olomouc, Czech Republic.
2Department of Medical Chemistry and Biochemistry, Faculty of Medicine and Dentistry, Palacky University, Olomouc. 1Department of Clinical and Molecular Pathology, Faculty of Medicine and Dentistry, Palacky University, Olomouc, Czech Republic.

Background and objectives: Our recent publication showed an inverse association between cranberry supplementation and serum prostate-specific antigen (PSA) in patients with negative biopsy for prostate cancer (PCa) and clinically confirmed chronic nonbacterial prostatitis. In this study, we evaluated the effects of cranberry on PSA values and markers of androgen-receptor inhibition in men diagnosed with PCa before radical prostatectomy. Methods: In a double-blind placebo controlled trial, we evaluated the effects of 1,500 mg daily cranberry powder or placebo 21 to 42 days prior to prostatectomy. Fifty-four patients were randomized to cranberry or placebo groups. The prostate cancer biomarkers were measured in blood, urine and prostate tissue at baseline and on the day of surgery as plasma concentrations of urofusin and oleanolic acids and free/total concentrations of phenolics in urine.

Results: The serum PSA significantly decreased by 22.5 % in the cranberry arm (n=31, P<0.05) and increased by 0.9 % in the placebo arm (n=31, P<0.05). A trend to down-regulation of beta-microsemominoprotein (MSMB) after cranberry supplementation was found. MSMB is reportedly androgen regulated.

Conclusions: Our results show that the commercial cranberry powder
used in this study may contain constituents that regulate the expression of androgen-responsive genes. These data support further studies to evaluate cranberry as a prophylactic against the biochemical recurrence of prostate cancer in patients after surgery.
Key words: Vaccinium macrocarpon, polyphenolics, urolithic acid, prostate cancer, placebo-controlled trial, biomarkers, urinary metabolites.

Acknowledgment: Institutional support of Palacky University is greatly acknowledged.

PM-093
Poster
Factors associated with the risk of eating disorders.
Álvarez-Malé ML1, Baustista-Castaño IP2, Serra-Majem L1
1Department of Preventing Medicine and Public Health University of Las Palmas de Gran Canaria, Las Palmas de Gran Canaria, Spain.
2Association Gulf-Islaque para el Estudio y Tratamiento de la Anorexia y la Bulimia en Canarias, Las Palmas de Gran Canaria, Spain.

Background: lnstitutional means of the European Food Safety Agency recommendations for total fluid intake were higher in individuals with 8 or more points in the Mediterranean Diet adherence questionnaire [OR: 1.94; 95% CI: 1.25-3.01], and in those that practise physical activity 3 or more times/week [OR: 1.71; 95% CI: 1.22-2.39]. Participants with a healthier lifestyle had a lower risk in to exceed World Health Organization recommendations for total sugar intake (>10% total energy intake), only from beverages.

Key findings: participants with a higher adherence to the Mediterranean diet and a higher leisure-time physical activity practise exhibit a healthier fluid intake pattern.

PM-094
Poster
Fluid intake from beverages in Spanish adults: cross-sectional study.
Ferrera-Piño Cl, Babio N1, Fernández-Alvira JP, Iglesia P, Moreno LA, Sales-Salvado F, Almorox J.
1Human Nutrition Unit, Hospital Universitari de Sant Joan de Reus, Faculty of Medicine and Health Sciences, ISFIP (Institut d’Investigació Sanitària Pere Virgili), Biochemistry Biotechnology Department. Universitat Rovira i Virgili (Centre d’Investigació Biomèdica en Red Fisiopatologia de la Obesidad y Nutrición), Instituto de Health Carlos III, Madrid, Spain.

Objective: to evaluate the associations between the consumption of different types of beverages and leisure-time physical activity practise and adherence to the Mediterranean diet and other lifestyle factors. The food intake from different types of beverages was collected using a 24-h fluid-specific diary over 7 consecutive days. Leisure-time physical activity was evaluated with a self-reported questionnaire, and Mediterranean Diet adherence was assessed using a validated 14-item questionnaire.

Results: individuals with higher adherence to the Mediterranean Diet showed a higher intake of water and wine and a lower consumption of sweet regular beverages. Participants with a higher leisure-time physical activity practised consume more water, milk and derivatives, juices and wine and less sweet regular beverages. Compared to the lowest category, the odds of meeting the European Food Safety Agency recommendations of total fluid intake were higher in individuals with 8 or more points in the Mediterranean Diet adherence questionnaire [OR: 1.94; 95% CI: 1.25-3.01], and in those that practise physical activity 3 or more times/week [OR: 1.71; 95% CI: 1.22-2.39]. Participants with a healthier lifestyle had a lower risk in to exceed World Health Organization recommendations for total sugar intake (>10% total energy intake), only from beverages.

Key findings: participants with a higher adherence to the Mediterranean diet and a higher leisure-time physical activity practise exhibit a healthier fluid intake pattern.

PM-096
Poster
Household food insecurity and nutritional status in Korea: Results from the Korea National Health and Nutrition Examination Survey, 2012.
Lee JY, Hyun WO, Jang J, Kim Y, Kyung W O*
Division of Health and Nutrition Survey, Korea Centers for Disease Control and Prevention, Cheongwon, Republic of Korea.

Objectives: We examined the prevalence of household food insecurity and compared nutritional status by food security status in a representative Korean population.

Methods: This study was based on data from the 2012 Korea National Health and Nutrition Examination Survey, firstly adopting the 18-items household food insecurity questionnaire. A total of 3,010 households completed the questionnaire of food security and their 7,159 family members aged 1 yr participated in nutrition survey, composed of dietary habit, 1-day 24-h dietary recall, and semi-quantitative food frequency questionnaire (FFQ).

Results: In 2012, 88.4% of Korean household showed food security. The prevalence of food insecurity without hunger (7.6%) and food insecurity with hunger (13.6%) was 11.4%. The prevalence of household food insecurity was significantly higher in household with children and 10.6% in household without children. Food security status of household was related to socioeconomic status of household and householders. Mean daily intakes of energy, fiber, calcium, phosphorus, potassium, iron, vitamin A, thiamine, riboflavin, niacin, and vitamin C as well as weekly frequencies of consumption of milk and milk products, vegetables, fruits, and seaweeds were significantly lower in family members of food-insecure household compared to family members of food-secure household.

Conclusions: In conclusion, our results revealed that food-insecurity lead to a reduction in dietary intakes of the essential foods, energy, and nutrients for health and growth.

PM-097
Poster
Antioxidant capacities of the traditional fermented vegetable-based foods of Turkey.
Pakel A, Ordemir E, Yildiz Technical University, Faculty of Arts and Science, Department of Chemistry, 34210 Istanbul-Turkey.

Fermentation is a process involving the use of microorganisms to carry out enzyme catalysed transformations of organic substances into the end-products. The production of fermented foods and beverages is one of the oldest manufacturing and preservation methods of human consumption. Fermented foods and beverages, whether of plant or animal origin, play an important role in the diet of people in many parts of the World. Fermented foods not only provide important sources of nutrients but have also great potential in maintaining health and preventing diseases. Many different types of traditional fermented fruits and vegetables are produced at household level, but it is also produced commercially on small scale, in Turkey. Tursu (Pickle) is one of the oldest products of fermentation used
byman in Anatolia. Tursu can be made from a wide variety of different vegetables and fruits. Cucumbers, cabbages, green tomatoes and green peppers are the most popular vegetables used to prepare tursu. Shalgam is a traditional lactic acid fermented beverage in which black carrot, turnip, bulgur flour, sourdough, salt, and water are used for production. It is a red coloured, cloudy and sour soft drink mainly consumed in Southern Turkey. The study investigated the antioxidant capacities of traditional Turkish lactic acid fermented beverage shalgam and fermented food tursu using several antioxidant tests. Shalgam juice and tursu extract were analysed for their radical scavenging capacities, inhibitory activities on linoleic acid peroxidation, reductive potential, β-carotene bleaching effect and chelating activities. Those various antioxidant activities were compared to standart antioxidants. The lactic acid fermented shalgam and tursu samples showed high total antioxidant and radical scavenging activities when compared to the standard antioxidants. These findings is important from a nutritional point of view, because the fermented food have evidence on the potential benefits to human due to its high antioxidant properties, and thus may be used as a dietary supplement for the prevention of diseases.

Objectives: Overweight and obesity are a Public Health problem. The contribution of a healthy and balanced diet as well as the regular practice of physical activity are key factors in its prevention. However, despite this being a widely documented problem, several specific population groups still remain to be evaluated. The purpose of our study was to investigate overweight and association with nutritional intake and physical activity in women inmates of a Prison in the north of Portugal. Material and Methods: 250 women were invited to participate in this study. Accepted 60 and our sample included 47 women. We collect socio demographic and lifestyle data (age, number of children, education, criminal legal status, labour in prison, smoking, body weight and height). We calculate and categorize the body mass index according to the classification of the World Health Organization, and grouped women with overweight and obesity in a single category (overweight) for comparative analysis with the group without overweight. To assess dietary intake we used a semi-quantitative food frequency questionnaire validated for the Portuguese population, and determined the prevalence of nutritional inadequacy based on World Health Organization recommendations (2003) and Food and Nutrition Board. The evaluation of the physical activity of women was taken with accelerometers, used for 7 consecutive days, and categorized physical activity as moderate, vigorous and very vigorous.

Results: For the total energy intake, we note no differences in the amount of the total energy and the prevalence of inadequate depending on the existence of excess weight. Looked high prevalence of Inadequacy for folate, thiamin, riboflavin and vitamin E. Key findings: All women have less than the recommended vitamins D and K intake, and molybdenum. Regarding the inmates daily physical activity, we found no significant differences between the two groups. The prevalence of overweight was high, and there were no significant differences in the groups studied for the characteristics of inadequate nutritional intake and physical activity.

Objectives: Having in mind that inflammation is frequently associated with overweight and obesity and that β-carotene presents antioxidant properties that could reduce inflammatory markers, the aim of the study was to investigate the association between plasma β-carotene and inflammation markers in children with overweight/obesity. Subject/Methods: 564 Spanish schoolchildren between 9-12 years of age, 50.03% with overweight/obesity were studied. Plasma β-carotene levels were assessed in 493 children by HPLC. β-carotene <4.83 µg/dL (0.09 µmol/L) was considered deficient. Plasma tumour necrosis factor (TNF-α) and interleukin-6 (IL-6) were measured by immunoenzyme assay (EIA). Serum high-sensitivity C-reactive protein (hsPCR) was tested by immuno nephelometry. Results: 24.8% of the studied children presented β-carotene deficiency. IL-6 levels were higher in the overweight/obese children with deficient plasma β-carotene than in those with the same weight problem but whose plasma β-carotene levels were adequate. Plasma β-carotene was inversely associated with IL-6 levels in the overweight/obese children (β = 0.049±0.013; p<0.001). TNF-α and hsPCR were not associated with plasma β-carotene in overweight/obese children. Conclusion: It would be desirable to prevent β-carotene deficiency in schoolchildren with overweight/obesity in order to improve the elevated inflammatory status that frequently is associated with this pathology.
Apocynin attenuates testicular ischemia-reperfusion injury in rats.

Objective: Apocynin (4-hydroxy-3-methoxyacetophenone), naturally occurring methoxy-substituted catechol, extracted from the roots of Apocynum cannabinum (Canadian hemp) and Picrorrhiza kurroa (Scrophulariaceae) is well known an inhibitor of NADPH oxidase. This study was designed to examine the possible protective effect of apocynin, a NADPH oxidase inhibitor, against torsion-detorsion (TD) induced ischemia/reperfusion (IR) injury in tests.

Methods: Male Wistar albino rats were divided into sham-operated control, and either vehicle, apocynin 20 mg/kg- or apocynin 50 mg/kg-treated TD groups. In order to induce IR injury, left testis was rotated 720 degrees clockwise for 4 hours (torsion) and then allowed reperfusion (detorsion) for 4 hours. Left orchietomy was done for the measurement of tissue malondialdehyde (MDA), glutathione (GSH) levels, myeloperoxidase (MPO) activity, and luminol, lucigenin, nitric oxide (NO) and peroxynitrite chemiluminescences (CL). Testicular morphology was examined by light microscopy.

Results: IR caused significant increases in tissue luminol, lucigenin, nitric oxide and peroxynitrite chemiluminescence demonstrating increased reactive oxygen and nitrogen metabolites. As a result of increased oxidative stress, MDA levels were increased and antioxidative activity was decreased. On the other hand, apocynin treatment reversed all these biochemical indices, as well as histopathological alterations that were induced by IR.

Key findings: Findings of the present study suggest that NADPH oxidase inhibitor apocynin by inhibiting free radical generation and increasing antioxidative defense exerts protective effects on testicular tissues against IR.

Therapeutic potential of Myrtus communis subsp. communis extract against acetic acid-induced colonic inflammation in rats.

Objectives: Evaluation of the anti-inflammatory potential of Myrtus communis extract against acetic acid-induced colonic inflammation in rats.

Methods: Male Wistar albino rats were divided into sham-operated control, and either vehicle, MC extract 50 mg/kg or MC extract 100 mg/kg-treated groups. In order to induce IR injury, left colon was rotated 180 degrees clockwise for 4 hours (torsion) and then allowed reperfusion (detorsion) for 4 hours. Left colectomy was done for the measurement of tissue malondialdehyde (MDA), glutathione (GSH) levels, myeloperoxidase (MPO) activity, and luminol, lucigenin, nitric oxide (NO) and peroxynitrite chemiluminescences (CL). Testicular morphology was examined by light microscopy.

Results: IR caused significant increases in tissue luminol, lucigenin, nitric oxide and peroxynitrite chemiluminescence demonstrating increased reactive oxygen and nitrogen metabolites. As a result of increased oxidative stress, MDA levels were increased and antioxidative activity was decreased. On the other hand, apocynin treatment reversed all these biochemical indices, as well as histopathological alterations that were induced by IR.

Key findings: Findings of the present study suggest that NADPH oxidase inhibitor apocynin by inhibiting free radical generation and increasing antioxidative defense exerts protective effects on testicular tissues against IR.
children and a follow-up on the implementation and acceptance of the suggested improvements in 35 schools. Objective: to assess compliance to previous suggested improvement recommendations. Methods: after submitting the initial report to the school (prepared by a team of dietitians-nutritionists) a second questionnaire is sent over in order to evaluate the degree of implementation of suggested improvement recommendations. Answers are evaluated as well as the new menus. Results: (n=35) Evaluation report: 97.2 % consider it to be a useful tool. 97.2 % think that the report will lead to improved menus. The report has been released to the direction of the center (88.6%), the head of school (81.8%), the catering company (90.7%) and to the students parents associations (48.6%). Regarding the new menus, the following trends are observed in meeting the recommendations: first course detailed ingredients (11.4 %→45.7 %*), specifying the ingredients of the salad (57.1 %→77.1 %*), presence of fresh fruit desserts (57.1 %→77.1 %*), presence of fresh food (74.3 %→80 %* ) presence of vegetables daily (62.9%→80%*). (p<0.05) Conclusions: the follow up has improved some key aspects of programming menus, such as the presence of fruit, vegetables and fresh foods as well as the recommended frequency. The report with suggestions for improvement is known by different stakeholders and very much appreciated. The growth and evolution of the program has been possible thanks to the involvement of different professional teams working on public health and the Department of Education.

PM-107 Poster How do schoolchildren eat at the Lleida Health Region? The evaluation follow up improves the quality of the menu offer. Casadesús F1, Manera M1, Blanquer M1, Mila R1, Salvador G1 1.Catalan Public Health Agency 1.University of Lleida, Department of Public Health. Faculty of Medicine. University of Barcelona, Spain

Introduction: In 2006, the Public Health Agency of Catalonia started The School Menu Revision Program (PREME), in the framework of the Integral Plan of Health Promotion through Physical Activity and Healthy Eating, in collaboration with the Department of Education. The evaluation follow up food offer is based on the local guide “Alimentació saludable a la etapa es­colar” or Healthy Eating in Schools. The health region of Lleida has made an initial assessment in 20s schools that offer food service to 20.173 children and a follow-up on the implementation and acceptance of the suggested improvements in 35 schools. Objective: to assess compliance to previous suggested improvement recommendations. Methods: after submitting the initial report to the school (prepared by a team of Dietitians-Nutritionists) a second questionnaire is sent over in order to evaluate the degree of implementation of suggested improvement recommendations. Answers are evaluated as well as the new menus. Results: (n=142) Evaluation report: 90 % consider it to be a useful tool. 83.8 % think that the report will lead to improved menus. The report has been released to the direction of the center (81 %), the head of school (71.1%), the catering company (69.7%) and the student parents associations (33.8%). Regarding the new menus, the following trends are observed in meeting the recommendations: first course detailed ingredients (23.7%→45.5%*), specifying the ingredients of the salad (45.3%→78.1%*), presence of fresh fruit desserts (52.9%→87.1%*), presence of fresh food (76.9%→88.8%* ) presence of vegetables daily (44.4%→97.1%*), recommended frequency of different foods (30.8%→58.6%*). (p<0.05) Conclusions: the follow up has improved some key aspects of programming menus, such as the presence of fruit, vegetables and fresh foods as well as the recommended frequency. The report with suggestions for improvement is known by different stakeholders and very much appreciated. The growth and evolution of the program has been possible thanks to the involvement of different professional teams working on public health and the Department of Education.

PM-108 Poster Effect of using repeated measures of dietary Glycemic Index and dietary Glycemic Load on the strength of the association with total mortality. Castro-Quezada I, Sánchez-Villagés A, Estruch R, Salas-Salvadó J, Corella D, Schröder H, Álvarez-Ríos J, Ruiz-López MD, Amiano P, Ros E, Buil A, Covas M, Ruíz-Gutiérrez V, Ruiz-Canela M, Bull-Cosales F, Gómez-Gracia E, Lapetra J, Pintó X, Arós F, Fiol M, Lamuela-Raventós RM, Martínez-González MA, Serra-Majem L, on behalf of the PREDIMED Study Investigators, Nutrition Research Group, Research Institute of Biomedical and Health Sciences, University of the Balearic Islands, Palma de Mallorca, Spain. Ciber Obn Physiopathology of Obesity and Nutrition, Institute of Health “Carlos III”, Madrid, Spain. Objective: The objective of this study was to assess whether using baseline exposure or repeated measures during a 5-year follow-up provided similar associations between dietary Glycemic Index (GI) and dietary Glycemic Load (GL) and all-cause mortality in the PREDIMED study. Material and methods: We followed 3,583 non-diabetic subjects at high cardiovascular risk (55-80 years). Dietary data were collected using a validated 137-item food frequency questionnaire (FFQ). We assessed baseline GI and GL values of the overall diet by a 5-step methodology, using the international Tables of Glycemic Index and Glycemic Load values. Deaths were ascertained through medical records and consultation of the National Death Index. Cox regression models were used to estimate multivariate adjusted hazard ratios (HR) and 95% confidence Intervals (95% CI) for mortality, according to baseline quartiles of GI/GL adjusting for potential confounders. *p<0.05.

Results: After a median of 4.7 years of follow-up, 123 mortality cases were observed. Cox-regression analyses using baseline GI showed that participants in the highest quartile had an increased risk of all-cause mortality (HR=2.22 (95% CI: 1.26 - 3.94) P for trend = 0.002) when compared to the lowest quartile. After adjustment for potential confounders this association remained statistically significant. In the repeated-measures analyses using exposure as the yearly updated information on GI, we observed a stronger association (HR=2.69 (95% CI: 1.50 - 4.84) P for trend < 0.001). No associations were found between dietary GI and all-cause mortality in both analyses.

Key findings: A higher risk of all-cause mortality was found for subjects in the higher third of dietary GI when compared to the first. When dietary GI values were updated yearly in repeated measures analyses, similar associations between dietary GI and all-cause mortality were observed.

PM-109 Poster Association between serum 25(OH)D and insulin resistance in Brazilian adolescents. Novais JF1, Oliveira RMS2, Candido A.P.C. 1, Leite I.C.G. 2 1Federal University of Viçosa, 2Federal University of Juiz de Fora, Brazil

Objectives: The aim of this study was evaluated the relationship of the deficiency of vitamin D with insulin resistance among adolescents.

Material and methods: This is a cross-sectional study with 160 adolescents (euthrophic and overweight) aged between 15 and 17 years of high schools of the city of Juiz de Fora, Minas Gerais, Brazil. Nutritional status was assessed by body mass index (BMI) according to World Health Organization. Biochemical evaluation included analysis of glucose, insulin and calcium [25(OH)D]. Insulin resistance was calculated using HOMA-IR. Results: The mean age was 16 years and 55.6% was male. Higher prevalence of hyperinsulinemia and insulin resistance were observed in the group of overweight (p<0.05). There was no statistical difference in glucose levels between the two groups. Deficiency of vitamin D [25 nmol/L(10 ng/ml)] was observed in 1.25% of adolescents. Insufficiency of vitamin D [25-75 nmol/L(11-30 ng/ml)] was observed in 70.6% of the sample. Adolescents with insulin resistance and hyperinsulinemia showed statistically lower levels of vitamin D (P<0.05). There was an inverse correlation between serum 25(OH)D and insulin values and HOMA-IR (p<0.05).

Key findings: The prevalence of vitamin D insufficiency is high even in sunny countries like Brazil. Furthermore, the results point to extra-skeletal function of vitamin D highlighting the negative association with insulin resistance, even after adjustment for BMI. Randomized clinical trials are extremely important to test the effects of vitamin D in metabolic changes. Support: FAPEN-MG (CDS APQ 01371-09)

PM-110 Poster Association between waist-to-height ratio and adiposity in Brazilian older women. Novais JF, Milagres LC, Martinho KO, Ribeiro AQ, Longo GZ, Tinoco ALA Federal University of Viçosa

Objectives: Evaluate the waist-to-height ratio with anthropometry and body composition in elderly women served by the Family Health Strategy in Viçosa-MG.

Material and methods: This is a cross-sectional study of 243 elderly aged 60-95 years attended by the Family Health Program in the municipality. The participants were weighed and measured using a digital electronic scale and portable stadiometer, respectively, to calculate the body mass index. Inelastic tape was used for the assessment of waist circumference. Body composition was assessed by bioelectrical impedance analysis to obtain the percentage of body fat. Data were analyzed using the STATA 9.1 software. The normality of variables was evaluated by the Shapiro-Wilk test, which were not normally distributed were transformed into log. Student’s t test was used to compare means. The level of significance was 5%.

Results: The mean values of age (72.8 years), body mass index (27.6 kg/m²), waist circumference (95.5 cm) and body fat (40.9%) were observed in the elderly population. Mean of body mass index, waist circumference
and body fat were significantly higher (p<0.001) in the elderly with waist-to-height ratio ≧ 0.5. Key findings: This study indicates that the waist-to-height ratio index, easy to apply and low cost, is strongly associated with adiposity in elderly women, suggesting that this may be useful as a screening instrument in this population. These indices can assist in the practice of health professionals since resources may be scarce for diagnosis.

**PM-111 Poster**

**Effects of vitamin U on valproic acid induced lung injury in rats.**

Tunali Ṡ, Ozatay Ḟ, Kayalar OZ, Yanaragd Ṙ

Istanbul University, Faculty of Engineering, Department of Chemistry, 34320 Avcilar, Turkey. Istanbul University, Faculty of Science, Department of Biology, 34134-Yesilköy, Turkey.

Valproic acid (2-aryl-pentanoic acid, VPA) is an antiepileptic drug. VPA is usually well tolerated, but serious complications including hepatotoxicity, hypoglycemia, hemorrhagic pancreatitis, fetal teratogenicity, bone marrow suppression may occur. Certain vegetables, in particular cabbage contain a nutritional factor which was reported to have antilipemic properties. This factor, 5-methylthienyl sulphonium chloride has also been called vitamin U. In this study, we aimed to investigate the protective effects of vitamin U on VPA-induced lung damage. Female Sprague Dawley rats were divided into four groups. Group I was intact animals. Group II was control rats given VU (50 mg/kg/day, by gavage) for fifteen days. Group III was given only VPA (500 mg/kg/day, by intraperitoneally) for fifteen days. Group IV was given VPA and vitamin U (in same dose and time). On the 16th day of experiment, lungs were removed from rats. The tissues were used for the determination of oxidant/antioxidant parameters such as glutathione, lipid peroxidation levels and glutathione peroxidase, glutathione-S-transferase and superoxide dismutase levels, lactate dehydrogenase and myeloperoxidase activities. Besides, the structural alterations and some protein expressions, such as alpha-smooth muscle actin (α-SMA) and nuclear factor-like 2 (NRF-2) were evaluated by microscopic and immunoblotting analysis in the rat lungs tissue. Lung glutathione levels and glutathione peroxidase, glutathione-S-transferase and superoxide dismutase activities were decreased, while lipid peroxidation levels, lactate dehydrogenase and myeloperoxidase activities were increased in VPA group. Treatment with vitamin U reversed these biochemical results. Also, VPA treatment resulted in the destruction of alveolar structure and increased in number of intestinal cells and collagen, cell proliferation in alveolar ducts (e.g. Pubmed), 16 falls in the rat lung, while it was considerably effective on the NRF-2 protein level. VU treatment was regressed the extended fibrotic areas and reduced α-SMA protein expression and cell proliferation in the alveolar areas of rats which have received VPA. Also, NRF-2 protein level was slightly increased in the lung U. In this study, we aimed to investigate the protective effects of vitamin U on VPA-induced lung damage.

**PM-112 Poster**

**Estimating prevalence of inadequate nutrient intakes in children and adolescents in Greece.**

Benetou V̇, Papadimitriou Ė̇, Lykou Ȧ, Beloglani K̇, Zota K̇ and Linos A.̇

1School of Medicine, National and Kapodistrian University of Athens. 2Institute of Preventive Medicine Environmental and Occupational Health (Propepasia).

Objectives: Identifying nutrient imbalances at the population level is a recommended step in the process of establishing food-based dietary guidelines. The aim of this study was to estimate the prevalence of inadequate micronutrient intakes, in apparently healthy children (older than 5 years) and adolescents in Greece, utilizing existing information from food consumption surveys/studies.

Materials and methods: Studies published until June 2014 and referring to data collected from 2000 and onwards were searched using national and international databases (e.g. Pubmed). Priority was given to studies published on nationally representative samples using validated dietary assessment methods. Nutrient intake data, reporting usual intakes, were selected and the estimated average requirement (EAR) cut-off point method was applied in order to estimate inadequacy of intake of selected micronutrients, e.g. vitamins A and B12, folate acid, calcium and iron. EARs provided by the Institute of Medicine (IOM) were used as reference cut-off points.

Results: No survey assessing micronutrient intake based on nationally representative data for the specific age groups was found. Alternatively, one survey conducted during 2006/7, with representative data from Southern Greece (Chania, Crete) for children aged 6-7 years old (131 boys, 124 girls) and one survey conducted during 2000 with representative data from Northern Greece (Thessaloniki, Macedonia) for adolescents aged 11-14 years (268 boys, 234 girls) were identified. For boys, 6-7 years old, the percentage of (<5th percentile) intake for vitamin A, vitamin C, 23.34% for vitamin A, 29.44% for vitamin B12, 23.53% for folate, 13.77% for calcium and 6.07% for iron. The respective percentages for girls were 8.02% for vitamin C, 14.67% for vitamin A, 9.53% for vitamin B12, 23.67% for folate, 17.96% for calcium and 5.08% for iron. For boys, 11-14 years old, the percent below the EAR was 26.82% for vitamin C, 31.59% for vitamin A, 49.55% for folate, 33.78% for calcium and 15.18% for iron. For girls in the same age group, the percentages were 25.08% for vitamin C, 41.25% for vitamin A, 60.20% for folate, 49.73% for calcium and 21.52% for iron.

Key findings: Folate, vitamin A and B12 were the nutrients exhibiting the highest prevalence (>20%) of inadequacy in children, while folate, vitamin A and calcium the ones exhibiting the highest prevalence (>30%) in adolescents. In spite of the limitations of the data, a useful estimate of micronutrient inadequacy in the Greek young population is provided.

**PM-113 Poster**

**A randomized trial to evaluate the effects of testosterone and a nutritional supplement on hospital admissions in under-nourished, community dwelling, older people.**

Pantadou C, 1 Visvanathan R, 1 Nagarevan V, 1 Hunter R, 2 Lange K, 1 and Youngman M. 1

1Discipline of Medicine, University of Adelaide, South Australia 5005, Australia. 2Centre for Education and Research on Ageing, University of Sydney, Concord Hospital, Concord New South Wales 2139, Australia. 3Alfred Health, Caulfield Hospital, 260 Caulfield Victoria 3162, Australia.

Objectives: Weight loss and under-nutrition among older people are associated with poor outcomes, including increased hospital admissions and mortality rates. In a pilot study we found that one year treatment of undernourished older, community dwelling people with oral testosterone (placebo-controlled) and a nutritional supplement (no control) was associated with a significant reduction in hospitalizations. A larger, multicentre study was conducted to investigate further this exciting, potentially important finding.

Methods: One year, randomized, placebo-controlled, double-blind, trial. Undernourished men and women, age ≥65 years, living independently in the community, were recruited in South Australia (SA), Victoria (Vic) and New South Wales (NSW). Subjects were allocated to either oral testosterone undecanoate (40 mg/day, men; 160 mg/day) and high energy oral nutritional supplement (475 kcal/day) or placebo medication and low energy (50 kcal/day) oral nutritional supplements. Hospital admissions and other variables were assessed.

Results: In subjects receiving testosterone and nutritional supplements (n=28), there were 8 falls and 19 hospitalisations, whereas in the placebo group (n=27), there were 4 falls and 20 hospitalisations. A logistic regression analysis showed that testosterone and supplement compliance were (p=0.995) and (p=0.719). Over 12 months there was no change in in weight (0.67 kg increase, p=0.669), mental (0.3 point increase, p=0.835) or physical health (2.1 point increase, p=0.075) as measured by SF-36, or tablet (p=0.196) and supplement (p=0.486) compliance between placebo and active treatment groups. Key findings: In undernourished older people, treatment with testosterone and a nutritional supplementation did not reduce the occurrence of hospitalisations, or improve physical and mental health.

**PM-114 Poster**

**Health professionals knowledge before and after training in nutritional counseling.**

Fujinori E, 1 Palomo CN'T, Dantas LT, Minagawa ATP, Borges ALV 2

1Department of Public Health Nursing, School of Nursing, University of São Paulo, São Paulo, Brazil. 2Department of Maternal-Child and Psychiatric Nursing, School of Nursing, University of São Paulo, São Paulo, Brazil.

Objective: Evaluate health professionals knowledge before and after training in nutritional counseling.

Methods: Subproject intervention study of type 'before-after', quantitative-qualitative approach, developed in three phases. This study refers to training in nutrition counseling (2nd phase) conducted with 53 health professionals (11 nurses, 14 nursing assistants given to students and 28 community health workers) primary care city of Sao Paulo/Brazil. Four workshops (minimum hours of 16h each) with participatory strategies and focus groups among September/2013 and February/2014 were performed. We applied a knowledge test before and after training. The focus groups were recorded, transcoded and subjected to content analysis. The topics covered were the use of Child Health Handbook as a tool for health promotion; monitoring of child growth and development; monitoring of nutritional disorders; ten steps to healthy eating for children younger than 2 years old; communication techniques and nutritional advice.

Results: Over 90% of participants had no training in infant feeding. Only half of the nurses performed visit on child care daily or weekly, a quarter developed educational groups in health services and only 13 professionals performed home visits every day. Two thirds of the professionals considered their knowledge on nutrition counseling as "good", but 42% used "bad" in the work routine. The knowledge test showed more correct at posttest, with emphasis on nutritional counseling approaches to be taken.

International Journal of Community Nutrition 2014, 0 (suppl)
to date, there has been no survey of nutrition status among preschool-age children in Guinea-Bissau. To fill this gap and in preparation for a Randomized Control Trial to improve nutrition, we assessed anthropometry and anemia in 534 children aged 41-70 months old. This research was funded by the United States Department of Agriculture (USDA) Micronutrient Fortified Food Aid Pilot Project and took place in preschools participating in a Food for Education program run by International Partnership for Human Development.

Methods: Height in light clothing and no shoes was measured using a portable digital scale (Seca model 813) placed on a flat surface and calibrated at regular intervals. Standing height was measured without shoes using a portable stadiometer (Seca model 213). Hemoglobin was analyzed by HemoCueTM from finger stick blood samples. Weight-for-Age Z-scores (WAZ), Height-for-Age Z-scores (HAZ), Height-for-Weight Z-scores (WHZ), and Hemoglobin (Hb) concentration were assessed compared to WHO cut-offs.

Results: Among children in preschool (255 boys and 279 girls, aged 41-77 months old), only 1 case of severe underweight and 1 case of severe anemia were found. No severe wasting was found nor severe stunting was found. Girls had higher rates than boys of moderate (z-scores <-2) underweight (8.6% vs. 3.5%), stunting (7.6% vs. 6.6%), and wasting (5.4% vs. 2.4%, p<0.05). Both boys and girls have similar rates of anemia (mild: 17.0%, moderate: 7.7%, severe: 0.2%). These rates signify a mild public health threat for wasting and moderate public health threat for anemia.

Conclusions: Nutrition programming, especially one addressing anemia, is needed in this population.

PM-116 Poster
Preterm of chord (Beta vulgaris L. var. cicla) extract decreases liver injury induced by antiarrhythmic agent, Amiodarone.

Bolkent S., Turkylizma IB., Sancar-Bas S., Yanardag R.'
'Department of Biology, Faculty of Science, Istanbul University, 34134-Vertnecler, Istanbul, Turkey.'
'Department of Chemistry, Faculty of Engineering, Istanbul University, 34320-Avcilar, Istanbul, Turkey.'

Amiodarone is a cationic amphiphilic drug and belongs to benzofuran class III. This drug is an antiarrhythmic agent and is used to treat various arrhythmic diseases such as cardiac dysrhythmia, ventricular tachycardia, ventricular fibrillation and atrial fibrillation. Amiodarone is extensively metabolized in the liver and has a lot of side effects to this organ. Its action mechanism is very complex and has been poorly understood yet. Chard (Beta vulgaris L. var. cicla) is one of plants commonly used because of its antioxidant and hypoglycemic properties in Turkey. The aim of this study was to investigate the possible protective effects of the chard extract against amiodarone induced hepatotoxicity through morphological and biochemical methods. In this study, 7-9 months old Sprague-Dawley male rats were randomly divided into four groups. Group I: control animals receiving corn oil for 7 days. Group II: animals receiving chard extract (500 mg/kg) for 7 days. Group III: animals receiving amiodarone (100 mg/kg) for 7 days. Group IV: animals receiving chard extract (500 mg/kg) for 7 days 1 h prior to the administration of amiodarone. Amiodarone and chard extract were administered by gavage to rats. On the 8th day, all the animals which were fasted for 12 hours were sacrificed, and liver tissues were taken under anesthesia for histopathological and biochemical studies. Liver lipid peroxidation levels and superoxide dismutase, adenosine desaminase, xanthine oxidase, lactate dehydrogenase activities were increased, while glutathione level was decreased in amiodarone group. The mild degenerative changes such as centrilobular necrotic cells and areas, hepatocytes which has picnotic nuclei and dark eosinophilic reaction, dilation in sinusoids, rupturing in epithelium of central vein and hyperemia were seen in amiodarone-treated rats. Administration of chard extract prevented these effects in amiodarone group. In conclusion, pretreatment with chard extract may decrease liver injury induced with amiodarone treatment.

PM-117 Poster
The effects of combined treatment of amiodarone and chord, on intestinal and salivary gland biochemical parameters of rats.

Alev B.1, Burcu Turkylizma I.2, Kaya S.3, Akyüz S.3, Yanardag R.1, Yarat A.1
1'Department of Basic Medical Sciences, Faculty of Dentistry, Marmara University, Istanbul, Turkey.'
2'Department of Chemistry, Faculty of Engineering, Istanbul University, Istanbul, Turkey.'
3'Department of Clinical Sciences, Faculty of Dentistry, Marmara University, Istanbul, Turkey.'

Chard (Beta vulgaris L. var. cicla) is a popular vegetable, known for a long time for its beneficial health effects. This plant is a member of the Chenopodiaceae. The plant is more robust and easier to grow than spinach and kale. Chard is reported to have antioxidant, anti-inflammation, antineoplastic, anti-viral, antidiabetic, anti-tumor and hepatoprotective effects. Moreover, chard exhibits mineralizing, antiseptic and choleretic activities as well as it contributes to the reinforcement of the gastric mucosa. Phytochemical screenings of Beta vulgaris varieties have revealed the presence of some fatty acids (palmitic, stearic, oleic, linoleic and linolenic acids), phospholipids, glycolipids, polysaccharides, ascorbic acid, folic acid, pectin, saponins, flavonoids, phenolic acids, betalains and apigenin. Chard leaves are a good source of Vitamin A, C, B6, B8 and minerals such as, calcium, potassium, magnesium, iron and omega-3. Amiodarone, which is used for the treatment of arrhythmias, causes many side effects in all organs. Chard may protect against amiodarone's oxidative side effects. In the literature there is no study which focuses on the effects of these substances on oral tissues. Male Sprague-Dawley rats were randomly divided into four groups as follows: corn oil given group; chard extract (500 mg/kg/day) given group; amiodarone (100 mg/kg/day) given group; amiodarone+chard given group (in same dose and time). All substances were given for seven days. Chard extract (500 mg/kg) was given 1 h prior to the application of amiodarone. Amiodarone and chard extract were fed by gavage to rats. All animals were fasted overnight and on the 8th day they were sacrificed under anesthesia. Gingiva and salivary gland samples were taken from animals and homogenized in saline. Results were evaluated statistically and discussed.

PM-118 Poster
Thermal trauma may cause damage to organs distant from the original burn wound and may lead to multiple organ dysfunction. Following burn injury all tissues are subject to injury and chemical reperfusion occurs during burn shock. Myrtus communis L., Myrrtaceae is well known medicinal plant and has been shown to have antioxidant properties. The aim of this study was to investigate the effects of oral Myrtus communis subsp. communis (MC) on burn-induced oxidative tissue injury. Wistar Albino rats were divided into three groups as follows: control group, burn group, MC extract (100 mg/kg/day, oral) given burn group. Burn group rats were exposed to 90 OC bath for 10 s to induce burn. Rats were then decapitated 48 h after injury. Small intestine samples were taken from animals and homogenized. Antioxidant biochemical parameters were determined in homogenized intestine samples. Results were evaluated statistically and discussed.

PM-119 Poster
Effects of chord (Beta vulgaris L. var. cicla) on cardiac damage in valproic acid induced toxicity.

Veil Ustundag U.1, Tunali S.1, Alev B.1, Ipeki H.1, Emekli-Altufan E.1, Tunali Akbay T.1, Sener G.1, Yarat A.1
1'Marmara University.'
2'School of Pharmacy.'
3'Department of Pharmacognosy.'

Valproic acid (VPA) is an antiepileptic drug used for the treatment of seizures in children and adults. Moreover in recent years VPA has been shown to be effective in various cancers and Alzheimer disease. The side effects of VPA were shown in many studies. Chard (Beta vulgaris L. var. cicla) is a herbaceous biennial leafy vegetable cultivated in many parts of the world, low cost plant and widespread use in many traditional dishes. It has been demonstrated that chard has antioxidant, antiacetycholinesterase, anti diabetic, antitumor and hepatoprotective effects. The aim of this study is to evaluate whether VPA might interfere with oxidative me-
Fermented milk products are well known for their health benefits. Multiple reports have described their health benefits on gastrointestinal infections, allergic disease activity, improvement in lactose metabolism, reduction in serum cholesterol, immune system stimulation, antimutagenic, anti-inflammatory, and anti-diarrheal properties, improvement in inflammatory bowel disease and suppression of Helicobacter pylori infection. Kefir is a fermented dairy product produced by incubating milk with the microflora of kefir grains. It differs from other fermented milk products in that it is produced with a mixture of bacteria and yeast confined to a matrix of discrete kefir grains recovered after fermentation. Traditionally kefir grains have been used for centuries in many countries, as the natural starter for the preparation of the unique self-carbonated dairy beverage. The antioxidant activity was obtained through the lactic acid fermentation. Lactic acid bacteria play the predominant role in the manufacturing of traditional dairy products. The purpose of this study is to determine the antioxidant properties of kefir and yoghurt which is traditional fermented product with positive effects on health.

Antioxidative features such as reducing power, β-carotene bleaching effect, ferrous ion chelating ability, total antioxidant activity, nitric oxide (NO) scavenging effect, 2,2’-azino-bis(3-ethylbenzothiazoline-6-sulfonic) acid (ABTS) and N,N-dimethyl-p-phenylenediamine dihydrochloride (MDP) radical scavenging activities of kefir and yoghurt samples were investigated and the results were compared to standard antioxidants (EHA, BHT, ascorbic acid, Trolox, β-tocopherol and epicatechin).

Results obtained from this study showed that kefir and yoghurt, especially in low concentrations, demonstrated higher total antioxidant and DMPD radical scavenging activities than many other standard antioxidants. Kefir and yoghurt have a powerful antioxidant properties at various antioxidant systems. The antioxidative activities of traditional fermented kefir and yoghurt may be attributed to their proton-donating ability, their reducing power, NO scavenging and lipid peroxidative inhibition results. Crustome of kefir and yoghurt may act as a nutritional supplement with antioxidative activity.

**PM-121**

**A prudent dietary pattern is associated with a lower risk of Gestational diabetes mellitus.**

Gunnarsdottir T, Tryggvadottir EA, Birgisdottir BÉ, Medek H, Geirsson RT.

1Unit for Nutrition Research, National University Hospital and Faculty of Food Science and Nutrition, University of Iceland.

2Department of Obstetrics and Gynecology, Women's Clinic, National University Hospital, Reykjavik, Iceland.

Objective: To investigate the association between maternal dietary pattern and GDM.

Material and methods: A prospective observational study including 168 pregnant Icelandic women aged 18-40 years. These were recruited at routine 20 week ultrasound at Landspitali National University Hospital in Iceland. All participants kept a four day weighed food record as soon as possible following recruitment (baseline week 19 - 24). Data on dietary intake was recorded into the ICEFOOD calculating program based on the Icelandic food database (ISGEM). Principal component analysis was used to extract dietary patterns from 29 food groups. All women underwent an oral glucose tolerance test in weeks 23 - 28. Results: One clear dietary pattern (evgenvalue 2.4) was extracted comprising of seafood, eggs, vegetables, fruits and berries; vegetable oils, nuts and seeds; pasta; breakfast cereal; coffee and tea with a negative correlation with intake of soft drinks and french fries. Variance explained was 82.2%. The prevalence of GDM was 2.3% among women of normal weight before pregnancy and 18.3% among overweight/obese women. The pattern was associated with lower risk of GDM (OR: 0.54 95% CI: 0.30; 0.98). When adjusting for age, parity, pre-pregnancy weight, energy intake, weight gain and physical activity the association remained (OR: 0.35 95% CI: 0.14; 0.94). Key findings: Adhering to a prudent dietary pattern in pregnancy may be beneficial in preventing GDM, especially among women already at higher risk due to pre-pregnancy overweight or obesity.

**PM-122**

**Antioxidants and mortality in the PREDiMEd study.**


Nutrition Research Group, Research Institute of Biomedical and Health Sciences, University of Las Palmas de Gran Canaria, Las Palmas de Gran Canaria, Spain.

Objective: A high intake of antioxidants has been associated with a protective effect on health. The aim of the present study was to assess the association between the total dietary antioxidant capacity, the dietary intake of different antioxidants vitamins and mortality in a Mediterranean population at high cardiovascular disease risk.

Material and Methods: This study was conducted within the frame of the PREDiMEd study (Prevención con Dieta Mediterránea; multicenter, parallel-group, randomized controlled clinical trial that aimed to assess the effects of a Mediterranean-type diet on clinical cardiovascular effects. A total of 7,447 subjects between 55 and 80 years were included in this study. Different antioxidants vitamins intake and total dietary antioxidant capacity were calculated from a validated 137 item food frequency questionnaire at baseline. Information on mortality was ascertained by an end-point adjudication committee unaware of the dietary habits of participants after they had reviewed medical records and linked up to the National Death Index. Cox regression model were used to assess the relationship between the dietary of antioxidants and the mortality.

Results: A total of 292 deaths took places along a median follow-up of 4.3 years. Subjects belonging to the upper quartile of antioxidant capacity were younger, with high educational level, more active and had less caloric intake and high alcohol intake. Multivariate-adjusted models revealed no statistically significant difference between mortality and total antioxidant capacity (Q4 HR=0.91; 95% CI 0.65-1.27 vs Q1 ref) and the intake of most of the vitamins studied. Subjects in the upper quartile of lutein intake (HR 0.62; 95% CI 0.43-0.90) and selenium intake (HR 0.70; 95% CI 0.48-1.02) showed a lower mortality. Key findings: No statistically significant association was found between antioxidant capacity and mortality in elderly subjects at high cardiovascular risk.

**PM-123**

**Association between cereal consumption and metabolic syndrome: the PREDiMEd study.**


Nutrition Research Group, Research Institute of Biomedical and Health Sciences, University of Las Palmas de Gran Canaria, Las Palmas de Gran Canaria, Spain.

Objective: The metabolic syndrome and its individual components are associated with increased cardiovascular disease risk. Among non pharmacological treatments, diet is the cornerstone of strategies for cardiovascular risk reduction. Our aim was to analyzed, the association between baseline cereal consumption and risk of metabolic syndrome after 1 year of follow-up in the PREDiMEd study.

Material and Methods: Cross-sectional analyses were carried out at baseline and after follow-up for 1 year and longitudinal analysis were conducted in a cohort of individuals at high risk of cardiovascular disease from the PREDiMEd study. A 137-item validated semi-quantitative food frequency questionnaire, anthropometric measurements, fasting plasma glucose and lipid profile were obtained at baseline and after 1-year follow-up. Odds ratio and 95% confidence intervals (95%CI) of metabolic syndrome were calculated across quartiles of total cereal consumption. The metabolic syndrome was defined in accordance with the updated Adult Treatment Panel III (ATP III) criteria.

Results: Subjects in the top quartile of total cereal consumption had an increase risk of metabolic syndrome at baseline (OR=1.23; 95% CI=1.03-1.47); p for trend= 0.010 compared with those in the lowest quartile after adjusting for potential confounders.

---

*International Journal of Community Nutrition 2014, 0 (suppl)*
Longitudinal analyses showed that individuals in the top quartile of total cereal consumption at baseline had an increased risk of incident metabolic syndrome at one year (OR=1.42; 95% CI=1.52-1.03; p for trend =0.027) compared to those in the bottom quartile. Participants in the third and top quartile of total cereal consumption had an increased risk of incident impaired glucose tolerance (OR: 1.79; 95% CI: 1.22-2.64; OR: 1.52; 95% CI: 1.02-2.28, respectively; p for trend<0.021) when compared to the bottom quartile.

Key findings: Higher cereal consumption is associated with a significantly higher prevalence and incident metabolic syndrome and impaired glucose tolerance in individuals at high risk of cardiovascular disease.

**PM-124**  
**Poster**  
**Eating away-from-home meals and quality of dietary carbohydrate and fat intake in the SUN Project.**

Villacic C., Santiago S., Zapie I., de la Fuente-Amillaga C., Bes-Rastrollo M., Martínez-González MA, 3  
1Department of Food Sciences, Physiology, University of Navarra, Pamplona, Spain.  
2Department of Preventive Medicine and Public Health, University of Navarra, Pamplona, Spain.  
3CIBER Fisiopatología de la Obesidad y Nutrición (CIBERObn), Instituto de Salud Carlos III, Spain.

Objective: To investigate the association of eating away-from-home with a) the quality of dietary carbohydrate intake and b) the quality of fat intake.

Material and methods: We assessed 19,371 participants in the SUN cohort who completed a validated 136-item semi-quantitative food frequency questionnaire at baseline. The Carbohydrate Quality Index (CQI) was defined as the sum of carbohydrates. The Fat Quality Index (FQI) was calculated using the ratio MUFA+SFA+ TFA. Thus, the ranges of the CQI and FQI were 4 to 20, and 0.5 to 5.9, respectively. Subjects were classified into four groups according to their frequency of eating out (never/almost never, 1-3 times/month, 1 time/week and 2 more times/week). Multiple linear regression models were fitted to determine the association of eating away-from-home meals and both indexes. A poor CQI or FQI was defined as a value lower than the 25th percentile for both scores. Logistic regression analyses were used to assess the association between the frequency of eating out and a poor index after controlling for potential confounders.

Results: Participants showed an average CQI and FQI of 11.3 (SD 3.2) and 1.7 (0.5), respectively. A higher frequency of eating away from home (≥2 more times/week) was associated with a lower CQI and a lower FQI in comparison with low frequency of eating out (never/almost never). For the CQI, adjusted mean difference was -0.29, 95% CI= -0.41, -0.17 (P for trend <0.001), and for FQI it was -0.02, 95% CI= -0.03, -0.00 (P for trend 0.023). Participants with a highest frequency (≥2 more times/week) of eating away from home compared to those with the lowest frequency had higher adjusted risk of a poorer CQI, (adjusted OR 1.31, 95% CI= 1.17, 1.46, P for trend <0.001), but unrelated to FQI (adjusted OR 0.92, 95% CI: 0.82, 1.02, P for trend 0.190).

Key findings: A higher frequency of eating-away-from-home meals was associated with a lower quality of dietary carbohydrate or dietary fat. These findings highlight the importance of nutritional education addressed to eating-out consumers.

Funding: The SUN Study has received funding from the Instituto de Salud Carlos III, Official Agency of the Spanish Government for biomedical research (Grants P10/02658, P11/02293, P11/00615, RD16/0045, G03/140 and B7/2010), the Navarra Regional Government (45/2011) and the University of Navarra.

**PM-126**  
**Poster**  
**Adherence to the Mediterranean diet and QT interval duration: The PREDIMED Study.**


Nutrition Research Group, Research Institute of Biomedical and Health Sciences, University of Las Palmas de Gran Canaria, Las Palmas de Gran Canaria, Spain, CIBER Obn Physiopathology of Obesity and Nutrition, Institute of Health “Carlos III”. Madrid, Spain.

Objectives: The heart rate corrected QTc interval has been proposed as a relevant proxy for arrhythmia risk. Studies conducted in the general population have revealed that a longer QTc interval correlates well with a greater mortality risk. Our aim was to examine the association between heart-rate corrected QT prolongation and the adherence to a Mediterranean dietary pattern in subjects at high cardiovascular risk from the PREDIMED study.

Material and methods: Participants were randomly assigned to 1 of 3 diets: Mediterranean diet supplemented with extra-virgin olive oil, Mediterranean diet supplemented with mixed nuts, or advice to follow a low-fat diet (control group). We analyzed 520 subjects from Reus and Castellon islands who had available ECG data for analyses. Generalized Linear Models were fitted to assess the adjusted differences (regression coefficients [b] and their 95% confidence intervals [95%CI]) in the average change in the magnitude of the QTc interval (Difference: QTc (2 year follow-up) – QTc baseline; and percentage QTc (2 year follow-up) -QTc baseline) across each of the 2 Mediterranean diet intervention groups and the control group.

Results: Multivariate adjusted models revealed a statistically significant association between the average change in the QTc interval and the intervention (b= 0.007, 95% CI =0.003 to 0.011) for the Mediterranean diet supplemented with mixed nuts versus the control group. For the Mediterranean diet with extra-virgin olive oil the association was not significant (b= 0.002, 95% CI= -0.003 to 0.006).

We did not find any significant difference in the analyses conducted according to categorical of actually observed adherence to the Mediterranean diet, with b=0.65 (95% CI=0.34 to -0.95) for the highest category of adherence, and b=0.24 (7.28 to -2.29) for the moderate versus the lowest adherence.

Key findings: Among persons at high cardiovascular risk we found a significant but not clinically relevant difference in the magnitude of the QTc interval after intervention of nutritional Mediterranean diet supplemented with mixed nuts. No significant differences were found between the three interventions in the average change expressed in percentage. Further studies are needed to clarify these associations.
Diabetes mellitus is a serious health problem affecting major populations worldwide. Treatment of diabetes mellitus and its complications in the recent context has focused on the usage of plant extracts and their constituents. Chard (Beta vulgaris L. var. cicla: Chenopodiaceae) is a herbaceous biennial leafy vegetable cultivated throughout the world. The leaves can be used in salads or cooked like spinach. In the present study, the protective effect of chard on glycoprotein components and advanced oxidation protein products (AOPP) levels which are altered in diabetes, was examined in the liver tissue of streptozotocin (STZ) – induced diabetic rats. Male, Sprague Dawley rats were used in the study. Rats were randomly divided into three groups. Group I, Control animals given citrate buffer, Group II, Diabetic animals treated with STZ, Group III: STZ-diabetic animals given chard extract. Hyperglycemia was induced by as a single dose STZ (60 mg/kg), intraperitoneally. The chard extract was administrated by gavage technique to rats at a dose of 2 g/kg/day for 45 days, 15 days after the last dose, were made diabetic. On day 60, livers were removed from rats and used for the analysis of glycoprotein components and AOPP levels. Glycoprotein components such as hexases, hexosamine, fucose and sialic acid, and AOPP levels were significantly increased in liver tissues of diabetic rats. Administration of chard significantly decreased glycoprotein components and AOPP levels in the diabetic group, indicating that chard possess a significant beneficial effect on these parameters. These results suggested that chard might have a significant role in alleviating liver damage in STZ diabetic rats.

PM-128
Poster
Changes in food consumption and nutrient intake after 10 years of follow-up in a Mediterranean cohort: the SUN project.

De la Fuente-Arrillaga C. 1, 2; Santiago S. 3; Zazpe I. 1, 2, 3; Benito-Corchón S. 1; Bes-Rastrollo M. 1, 2; Martínez-González MA. 1, 2
1Department of Preventive Medicine and Public Health, University of Navarra, Pamplona, Spain; 2CIBER Fisiopatología de la Obesidad y Nutrición (CIBERobn), Instituto de Salud Carlos III, Spain; 3Department of Nutrition and Food Sciences and Physiology, University of Navarra, Pamplona, Spain

Objectives: To evaluate within-subject longitudinal changes in food consumption and nutrient intake after 10 years of follow-up in a Mediterranean cohort. Material and methods: The SUN (Seguimiento Universidad de Navarra) project is a prospective Spanish cohort study with continually-open recruitment. We followed-up our first participants, 3,036 Spanish university graduates (58% women) during 10 years. Dietary intake at baseline and after 10 years was assessed using a semi-quantitative 136-item food-frequency questionnaire, previously validated in Spain. Results: After 10 years of follow-up participants showed a significant (p< 0.001) increase in the consumption of fruits (21 g/day), vegetables (40 g/day), low-fat dairy products (59 g/day), fish (3 g/day), lean meat (5 g/day), whole grains (5 g/day), and tree nuts (3 g/day). We also observed reductions in the consumption of legumes (-2 g/day), whole-fat dairy products (-10 g/day), red meat (-15 g/day), sugared drinks (-29 g/day), and wine (-4 g/day). With respect to nutrients, the most relevant changes were found in a higher proportion of energy from carbohydrates (2% E), increased fiber intake (0.4 g/day), and a decrease in total energy intake (-42 kcal/day), total fat intake (-5 g/day), and dietary cholesterol intake (-14 mg/day). Key findings: In this Mediterranean cohort study, beneficial changes in food consumption and macronutrient intake were observed after 10 years of follow-up, which may be partially attributed to the participation in a prospective cohort study with frequent repeated contact with participants to inquire about their dietary habits. Funding: The SUN Project has received funding from the Instituto de Salud Carlos III, Official Agency of the Spanish Government for biomedical research (Grants P10/02658, P110/02293, P113/00615, RD06/0045, G03/140 and B7/2010), the Navarra Regional Government (45/2011) and the University of Navarra.

PM-129
Poster
Creditys4Health: Girona Pilot Nudge innovation platform for promoting healthy eating and physical activity.

Ngo de la Cruz J., Román-Villan B. 3, Ribas-Barba L. 1, Llorente-Sarras J. 2, 3; Creditys4Health Consortium
1Fundación para la Investigación Nutricional-FIN, Barcelona Science Park, University of Barcelona, Spain; 2CIBER Fisiopatología de la Obesidad y Nutrición, Instituto de Salud Carlos III, Spain; 3Research Institute of Biomedical and Health Sciences of the University of Las Palmas of Gran Canaria, Spain; 4Escola Universitària de la Salut i l’Esport (EUSES), University of Girona, Spain

Creditys4Health (C4H) is an FP7-EC funded project (#602386) inspired in the “nudge” concept for health promotion. Using a web platform, it aims to stimulate users to increase their physical activity and adopt healthy Mediterranean-based eating habits via personalized paths derived from existing behaviours, enhancing motivation, and further reinforcing motivation through an incentive system. The preventive care prototype will be iteratively tested in Greece, Italy, and Spain. This presentation focuses on the first pilot study in Girona, Spain. Objectives Girona Pilot 1: To evaluate changes in participants’ physical activity and eating habits, and to assess the utilisation and effectiveness of the personalised paths delivered through the web platform. Material and Methods: 150 subjects aged 18-65 meeting inclusion criteria and providing informed consent will be recruited from healthy adults residing in Girona. Health and anthropometric data will be collected, an accelerometer will be provided, and three online baseline questionnaires on motivation, nutrition and physical activity will be completed. The user will select 2-3 goals from a list of identified nutritional issues, and set physical activity goals by planning weekly sessions, and will continue with stepwise selection of new goals once the initial set. More personalised interactive algorithms will be provided for 2 months of intervention with one month follow-up period. The final assessment consisting of motivation, nutrition and physical activity questionnaires and anthropometric measures will be conducted post-intervention.

PM-130
Poster
Brief theory web-based intervention targeting health professionals aiming to increase their intention on performing nutritional screening in the elderly.

Tourtousoupolou K.
Center for Health Services Research, Department of Hygiene, Epidemiology & Medical Statistics, Medical School, University of Athens.

Introduction: The World Health Organization defines malnutrition as one of the most serious threats to public health worldwide. The elderly are affected by this phenomenon due to a multitude of risk factors that favor the development of malnutrition and its non-eary detection can lead to serious health problems. Objective: This study aimed to develop and evaluate a concise educational intervention program, based on the Theory of Planned Behaviour for the detection of malnutrition in the elderly. The program involved health professionals (doctors, nurses, health visitors, psychologists, etc.) from various health service structures (e.g. Hospitals, Health Care Centres, etc.). The objectives of this study were to increase the participants’ intention and to improve the positive attitudes, the perceived social pressure (subjective norms) and the perception about their ability (perceived control) to use nutritional screening tools in the elderly. Material and Method: A pretest-posttest non-equivalent groups design was used. The intervention group consisted of 20 health professionals and the comparison group of 19 health professionals from various health care facilities. The intervention was web-based and applied online. The intervention education program was based in an educational manual, videos and a scientific paper to target the key concepts of the Theory of Planned Behaviour. The comparison group received no intervention. A Theory of Planned Behaviour questionnaire was constructed and validated for the evaluation of the program. Within and between groups differences on the Theory of Planned Behaviour variables were considered. Results: The evaluation of the program showed a statistically significant increase in the intervention group regarding the intention on using nutritional risk screening tools in the elderly as compared to the comparison group after the implementation of the intervention (p = 0.049), as well as statistically significant improvements in the subjective norms of the intervention group as compared to the comparison group (p = 0.012) Key findings: Achieving increase of intention and improvement of the perceived social pressure (subjective norms) on the use of nutritional screening tools for the detection of malnutrition in the elderly suggest that this educational intervention program could be a component of a broader, multi-faceted and multi-level educational program aiming to train health care professionals in detecting malnutrition in the elderly.

PM-131
Poster
Household socioeconomic status, maternal diet and infant young child feeding (YCF) practices in rural Chittagong, Bangladesh.

Afin S, Guldan GS
Asian University for Women, Chittagong, Bangladesh

Objectives: Household socioeconomic status (SES) is a major determinant

III World Congress of Public Health Nutrition - 121 -
of maternal and child undernourishment. This study aimed to evaluate associations between household SES with quality of maternal diet and maternal BMI, current IYCF practices and infant and young children's nutritional status in a rural area in Chittagong, Bangladesh.

Material and methods: Cross sectional interviews were conducted among 113 mother-infant pairs with infants and young children aged <24m in different contiguous villages. Principle component analysis (PCA) was used to categorize household SES levels, into four quartiles from low to high. Multivariate logistic regression was performed to check associations and identify confounders.

Results: Households with higher SES were more likely to have mothers taking calcium and vitamin tablets on a regular basis (p<0.05). In terms of maternal BMI status, the lowest SES quartile had the highest proportion (25%) of underweight (BMI<18.5) mothers, while the highest SES quartile had the highest proportion (32%) of overweight and obese (BMI≥25) mothers (p=0.002). However, maternal diets, which were often risky and poor, showed no associations with household SES level (p=0.19). Higher levels of maternal education (12-15y) were correlated with exclusive breastfeeding for the first 6 months (p=0.03) and achievement of minimum dietary diversity (p=0.05). The prevalence of wasting among the infants and young children was more common in lower than higher SES households (57% vs. 18%; p=0.012). The responsive feeding behaviors were poor for all infant and young child age groups, with more than 50% of mothers using negative verbal methods and actions to encourage their infants and young children to eat.

Key findings: The study found that the quality of maternal diets and IYCF practices were relatively poor in the studied Chittagong villages. To improve the situation, awareness programs and community-based interventions are needed targeting mothers irrespective of household SES level, especially those who live in rural setting with lower socioeconomic status.

PM-132 Poster

Effect of zinc intake on growth in infants: A meta-analysis.

Nissensohn M.1, 2; Sánchez-Villegas A.1; Fuentes Lugo D.1; Hernández Sánchez P1, 2; Doreste Alonso J.1; Peña Quintana L.1; Ruano C.1; Lowe N.L.1; Hall Moran V.5; Skinner A.1; Warthun-Medina M.1 and Serra-Majem L.1

1Nutrition Research Group, Research Institute of Biomedical and Health Sciences, University of Las Palmas de Gran Canaria, Spain. 2Ciber Obn Pathophysiology of Obesity and Nutrition. Institute of Health "Carlos III", Spain. 1Faculty of Health Sciences, Unacar, Ciudad del Carmen, México, 2Unit of Gastroenterology, Hepatology and Pediatric Nutrition. Complejo Hospitalario Universitario Insular Materno-Infantil de Las Palmas. Las Palmas de Gran Canaria, Spain. 3International Institute of Nutritional Sciences and Food Safety Studies, University of Central Lancashire, Preston, UK. 4Maternal & Infant Nutrition & Nurture Unit, University of Central Lancashire, Preston, UK.

Objectives: A systematic review and meta-analysis of available randomised controlled trials (RCTs) was conducted to evaluate the effect of zinc (Zn) intake on growth in infants.

Material and methods: Out of 5500 studies identified through electronic searches and reference lists, 19 RCTs were selected after applying the exclusion/inclusion criteria. The influence of Zn intake on growth was considered in the overall meta-analysis. Other variables were also taken into account as possible effect modifiers: doses of Zn intake, intervention duration, length of median age of infants and sex of infants.

Results: Zn intake was not associated to Weight, MUAC, Head circumference, or weight for age score (ZWA). Length for age score (LAZ) and Weight for length z-score (WLZ) were assessed. Pooled β and 95% confidence interval (CI) were calculated. Additionally we carried out a sensitivity analysis.

Results: Zn intake was not associated to Weight, Height, MUAC, Head circumference and LAZ in the pooled analyses. However, Zn intake had a positive and statistically effect on WAZ (B = 0.06; 95%CI 0.02 to 0.10) and WLZ (B = 0.05; 95%CI 0.01 to 0.08). The dose response relationship between Zn intake and these parameters indicated that a doubling of Zn intake increased WAZ and WLZ by approximately 4%. Substantial heterogeneity was present only in Length analyses. (I² = 45 % ; p = 0.03). Zn intake was positively associated with length values at short time (4 to 20 weeks) (B = 0.01; CI 95% 0 to 0.02) and at medium doses of Zn (4.1 to 8 mg/day) (B = 0.003; CI 95% 0 to 0.01). Nevertheless, the effect magnitude was small.

Key findings: Our results indicate that Zn intake increases growth parameters of infants. Nonetheless, interpretation of these results should be carefully considered.

PM-133 Poster

Contribution of foods to energy intake according to local of consumption among adolescents.

Souza, B.S.N.; Cunha, D.B.; Siclieri, R.
Institute of Social Medicine, State University of Rio de Janeiro, Brazil

Objectives: The objective of the present study was to describe food intake and their contribution to energy intake according to the local of consumption among adolescents of public schools in a low income city in Brazil. Methods: Data are from baseline of a randomized community trial conducted among 5th graders of 20 public schools in the city of Duque de Caxias, a low income city in Brazil, in 2010. The students completed one 24-h recall on baseline and all foods reported were grouped into 29 food groups, according to their nutritional content and the way they are commonly consumed. Food intake and contribution of food to energy intake (% were estimated according to the local of consumption (home, school or away from home).

Results: A total of 458 students were evaluated and 50.4% were male. The mean of age was 11.1 years old. The five food groups with higher percentage of contribution to energy intake away from home were not healthy, including 'sweets and candies' (10.7%), 'sweetened beverages' (10.2%), 'snacks' (9.9%), 'soft drinks' (8.4%) and 'cakes and cookies' (7.9%). At home, the contribution of 'sweets and candies' and 'sweetened beverages' are also high (10.7% and 10.2%, respectively). The consumption of 'bread' (14.3%), a healthy food maker, was higher in school than at the other places.

Key findings: These findings might indicate that away from home the consumption of food is unhealthy and in school, despite the provision of meals with healthy food maker, the consumption of unhealthy items remains high.

PM-134 Poster

Antioxidant effect of a low-fat diet supplemented with Le- mon verbena extracts on biochemical markers of multiple sclerosis long-term care residents.

Carranza-Fernández M.C., Turón M.J., Rodríguez-López J.M.1, Rodríguez-Pérez R.2, Muráiz E.1

1Institute of Food Science and Technology (ICTAL), University of León. Spain. 2Institute of Biomedicine (IBIOMED), University of León, Spain. 3Campofrío Food Group. Madrid. Spain. 4State Reference Centre (CRE) of Disability and Dependency. San Andrés del Rabanedo. León. Spain.

Introduction: Multiple sclerosis (MS) treatment options are primarily limited to immunomodulatory therapies in MS non-progressive forms. Nutritional interventions can be considered a very promising approach to complement conventional MS treatments. Studies on the role of diet and dietary supplements such as polysaturated fatty acids (PUFA), vitamins, micronutrients and antioxidants in MS process suggest that diet may be considered as a complementary treatment to control disease progression, improve wellness and ameliorate symptoms of MS patients.

Objectives: In this study we present a nutritional intervention on MS patients from a long term care facility consisting on reducing dietary fat content. The aim of the study was the investigation of the effectiveness of a low fat-diet on biochemical markers of patients with progressive forms of multiple sclerosis.

Methods: A randomized prospective placebo-controlled study involving 9 participants, 5 of them assigned to the intervention group (low-fat diet) and the other 4 to the placebo group. The effect of the dietary intervention, involving diet modification, was examined for 42 days by measuring anthropometric, biochemical parameters and oxidative stress markers in blood at baseline (day 0), intermediate (day 15) and end day (day 42) stages of the treatment.

Results: The assessment of oxidative and inflammatory markers in urine and serum samples show a significant decrease in 8-iso-PGF2α and IL-6 after dietary intervention. Catalase activity was also affected by an increasing serum levels after the reduction of fat content on the diet. C reactive protein values diminished significantly in the intervention group after antioxidant supplementation. No significant differences were observed in other oxidative stress markers.

Key findings: The results suggest that diet and dietary supplements are involved in cell metabolism modulation and MS-related inflammatory processes. Consequently, low fat diets and antioxidant supplements may be used as complementary therapies for treatment of multiple sclerosis. The influence of fat consumption and dietary supplements on the activity and progression of multiple sclerosis is still under discussion. Therefore, further studies are needed to confirm the effect of nutritional interventions in multiple sclerosis.

PM-135 Poster

Adequacy of muscular mass estimations provided by biometric parameters analysis for the assessment of body composition in subjects over 55 years.

Aparicio-Ugarriza R.1, 2; Marín-Puñalco P.2; Lázaro-Socorro R.1, 2; Maro-Soñanco B.1, 2; Tur JA3, Palacios C.1, 2, 3
1IFINE Research Group, 2Department of Health and Human Performance, Faculty of Physical Activity and Sport Sciences (INEF), Universidad Politécnica de Madrid; 3CIBE-Robin CB1203/30038.
4Research Group on Community Nutrition and Oxidative Stress (NUCOX), Universidad de las Illes Balears.
Objectives: Body composition assessment in the elderly is important due to age-related changes. Bioimpedance analysis (BIA) instruments perform assessments of the body composition based on a 2-compartment model (fat mass and fat-free mass) of the human body. They also provide an estimation of the muscular mass, thus including a third compartment, which could be more suitable for comparisons with other methods, like the dual-energy X-ray absorptiometry (DEXA), which is considered the gold standard on body composition measurement. The aim of this study was to evaluate the accuracy of the two estimation procedures that BIA offers, when compared with the DXA results.

Material and method: BIA (TANITA Corp, BC-418MA) and DXA (GEHealthcare, Wisconsin, USA) were applied to a sub-sample of the FIS PI11/01791 study (48 men and 57 women, 55-82 years old). The variables analysed were fat-free mass percentage and muscular mass percentage. Waist and hip circumferences were obtained by a trained ISAK anthropometrist using an anthropometric tape (Rossscript SRL Mercasur). Waist-to-hip ratio was calculated from these measures. Results: Outcomes of muscular mass measures with DXA, 2-compartment model of BIA and 3-compartment model of BIA were respectively 71.0% (CI 95%: 68.5-73.1), 74.9% (CI 95%: 73.4-76.4) and 71.6% (CI 95%: 70.2-73.0) for men and 57.6% (CI 95%: 56.0-59.3), 64.4% (CI 95%: 62.7-66.2) and 61.2% (CI 95%:59.6-62.9) for women. There were significant differences (p < 0.001) between all the measurements for both genders except for the values obtained by DXA and 3-compartment model in men. However, there were significant differences (p < 0.01) between these two methods for men with a waist-to-hip ratio over 0.90 or a waist circumference over 102 cm.

Key findings: The estimation of the muscular mass provided by BIA might be adequate when evaluating men over 55 years. While there are significant differences between the three fat-free mass measures for women, it can be seen that 3-compartment estimation provides a better approximation to DXA values. Better estimations were found for men with reduced waist circumference and waist-to-hip ratio.

Supported by Instituto Salud Carlos III (PI11/01791). lmFINE and NUCOXX are members of the EXERNET research network.

PM-136 Poster

Consumo de alcohol y factores asociados a consumo no-moderado de alcohol en población universitaria.

Scholz A,1 García de la Hera M,1,2 Navarrete Muñoz E,1,3 Gimenez-Monzó 1,3, Checa-Sevilla JF,1,4 Viquel J,1,4 1 Universidad Miguel Hernández. 7 CIBERSESP

Objetivos: El consumo de alcohol es un problema relevante en Salud Pública a nivel mundial, debido a su alta prevalencia y su estrecha relación con diferentes enfermedades. La población joven es un colectivo vulnerable al consumo elevado de alcohol. Por ello, el objetivo de este estudio es describir el consumo de alcohol y analizar los factores asociados a un consumo alto de alcohol (>10 g/día) frente a un consumo moderado de alcohol (0-10 g/día) para el total de bebidas alcohólicas y para el consumo de cerveza y vinos en población universitaria.

Material y Métodos: Se analizaron de forma transversal los datos basales del estudio UNEH incluyendo a 1141 participantes de 17-35 años de ambos sexos. La ingesta dietética y el consumo de alcohol se midieron mediante un cuestionario de frecuencia alimentaria validado. Se estimó los gramos de alcohol diarios y se clasificó en tres categorías (no bebedores, bebedores moderados (>0-10 g/día) y bebedores no-moderados (>10 g/día)). También se recogieron variables socio-demográficas, estilos de vida, de salud y antropométricas en el cuestionario basal. Para explorar los factores asociados al consumo no moderado comparado con el consumo moderado se excluyeron a los no bebedores y se utilizó regresión logística múltiple. Resultados: El 19.6%, 68.8 y el 1.6% de los participantes se clasificaron como no bebedores, bebedores moderados y bebedores no-moderados. La media del consumo de alcohol de los bebedores moderados fue 3.5 g/día (DE: 2.5) y la de los bebedores no-moderados 18.7 (DE: 14.2). El alcohol ingerido provino en su mayoría del consumo de cerveza, vinos y bebidas alcohólicas. Los factores asociados a un consumo no-moderado de alcohol en general fueron: ser hombre (OR: 2.60; (C95%: 1.65-4.10), la edad (OR para un año más: 1.10; IC95%: 1.03-1.16) y ser fumador (OR: 3.41; IC95%: 2.24-5.19). Los resultados fueron similares cuando exploramos los factores asociados a un consumo no-moderado de alcohol de cerveza y vinos.

Hallazgos Claves: El consumo de bebidas alcohólicas en población joven universitaria de nuestro estudio es mayoritariamente bajo-moderado. Los hombres, una edad mayor y el consumo de tabaco se asocian a un mayor consumo de alcohol en general y de cerveza y vino en particular. Estos resultados pueden ser utilizados para dirigir programas de prevención y educación para la salud al colectivo de universitarios.

PM-137 Poster

In vitro inhibitory effect of Aloe vera (L.) Burm. f. leaf on the activity of some enzymes.

Sacan O1, Aken H1, Yanardag R1 1 'Istanbul University, Faculty of Engineering, Department of Chemistry, 34320-Avcilar, Istanbul, Turkey. 2 'Istanbul University, Faculty of Pharmacy, Department of Biochemistry, 34116-Beyazit, Istanbul, Turkey.

Aloe vera L. Burm. f. (=Aloe barbadensis Miller; Aloeaceae) “The miraculous plant” possesses succulent leaves which gel or whole extracts are commercially used in cosmetics for its skin care properties and also as food supplement for its vitamins, enzymes, glycoproteins and multiple health benefits. The whole leaf or the separate inner gel are used topically for various skin problems. Numerous internal uses of A. vera leaf juice are reported in India, Africa, the Caribbean, Central and South America. Medical usage and applications of Aloe, deal with skin diseases, diabetes, gastrointestinal disorders, cancer and the effects are mainly attributed to immunomodulatory or antioxidant activities. Compounds responsible for these activities were sometimes isolated and identified but some authors prefer to declare that the synergistic effects of the compounds are responsible for the beneficial effect of the plant.

Research for medicines based on the inhibition mechanism of enzymes is a promising topic. In this study three different enzymes were chosen: Elastase, neuraminidase and α-amylase. Elastase inhibition is important for cosmetics and may be correlated with the burn healing effect of the gel. Neuraminidase plays an important role in viral proliferation is a drug target for the prevention of the spread of influenza infection and may be correlated with the wound healing effect of the gel. α-Amylase, operating in the breakdown of starch, may be correlated with the well documented hypoglycemic effect of the leaf. Aloe vera leaves were collected from the plant which is cultivated in the greenhouse of Istanbul University Alfred Heilbronn Botanical Garden. The leaves were washed and cut from the middle, the gel was separated by scratching with a spoon. The leaf gel was homogenized in phosphate buffer and gel (leaf skin) was cut in small pieces, homogenized with PBS and filtered through cloth. The filtrate was centrifuged and the supernatant was lyophilized. Appropriate dilutions were made before use.

The leaf skin and gel extracts were examined separately for their elastase, neuraminidase and α-amylase inhibitory activities. Among these enzymes, A. vera leaf gel and skin extracts showed the best inhibition for elastase and α-amylase and moderate inhibitory activity for neuraminidase. The enzyme inhibitory activities of the extracts were increasing in a dose-dependent manner. The results were in accordance with the wound healing and the anti-diabetic activities of A. vera leaves documented by scientific research.

PM-138 Poster

In vitro inhibitory potential of Amaranthus lividus L. on some enzymes.

Sacan O1, Can A1, Yilmaz Ozden Y1, Yanardag R1 1 'Istanbul University, Faculty of Engineering, Department of Chemistry, 34320-Avcilar, Istanbul, Turkey. 2 'Istanbul University, Faculty of Pharmacy, Department of Biochemistry, 34116-Beyazit, Istanbul, Turkey.

Amaranthus plants (Amaranthaceae) are widely distributed throughout the world and they are able to produce grains and leafy vegetables. Amaranthus lividus L. (= A. blitum) locally known as “dari mancan” is used as leafy vegetable in West Black Sea Region of Turkey. The leaves of Amaranth constitute an inexpensive and rich source of protein, carotene, vitamin C, and dietary fiber, minerals like calcium, iron, zinc, magnesium, oxalic acid, nitrates, and phosphorus. In vitro antioxidant potential and hepatoprotective effect of A. lividus has been investigated in our earlier studies. Enzyme inhibitory effects of some plants are very important for the treatment of some diseases such as diabetes and Alzheimer’s disease etc. In this study, in vitro enzyme inhibition potential of A. lividus for α-glucosidase, α-amylase, neuraminidase, elastase and acetylcholinesterase was investigated. The stems with leaves and flowers of A. lividus were collected in August from Bartın, Turkey. A voucher specimen was deposited in the herbarium of the Faculty of Pharmacy, Istanbul University (ISTE); herbarium code number: ISTE 83401. The stems with leaves and flowers were washed with distilled water and dried at room temperature. The extract was prepared by heating powdered A. lividus (10 g) with 100 ml distilled water for 30 min. The extract was filtered and evaporated in a rotary evaporator. The inhibition of α-glucosidase, α-amylase, neuraminidase, elastase and acetylcholinesterase activities were determined by spectrophotometric assays. A. lividus aqueous extract strongly inhibited α-glucosidase, α-amylase and elastase activities, but not acetylcholinesterase. In the other enzymes examined. The inhibition of all of enzymes were increased with increasing extract concentrations. Therefore, Amaranthus lividus may be considered as an important plant in food industry, cosmetic industry and medicine.

PM-139 Poster

Fluid intake, biomarkers and body composition differences between physically active and non-active elderly people.

Maroto-Sánchez B1,2, Luzardo-Socorro R1, Aparicio-Ugarriza R1, Palacios G1, Díaz AE1, González-Gross M1,2 1 Institute of Public Health Nutrition, Faculty of Medicine, University of Murcia, 30100-Murcia, Spain. 2 Madrid, Spain. 3 Istanbul University, Faculty of Engineering, Department of Chemistry, 34320-Avcilar, Istanbul, Turkey. 4 Istanbul University, Faculty of Pharmacy, Department of Biochemistry, 34116-Beyazit, Istanbul, Turkey.

OBJECTIVES: In the elderly, the accumulation of fat mass and the reduction of lean mass are associated with functional disability and increased mortality. In this study, body composition differences and biomarkers between physically active and non-active elderly people were assessed.
Objective: To evaluate the increase or decrease of inadequate intake of nutrients after 10 years of follow-up in a Mediterranean cohort: the SUN Project.

Material and methods: The SUN (Seguimiento Universidad de Navarra) project is a prospective Spanish cohort study. We followed up 3,036 Spanish university graduates (58 % women) during 10 years. Dietary habits at baseline and after 10 years were assessed using a semi-quantitative 136-item food-frequency questionnaire, previously validated in Spain.

The prevalence of inadequate intake of nutrients was studied according to national nutritional objectives or Estimated Average Requirement (vitamins or minerals) at baseline and after 10 years of follow-up. Odds Ratios (OR) (95% CI) were calculated for each nutrient's inadequate intake using the baseline data as the reference category.

Results: A higher risk of inadequate intake according to national nutritional objectives or Estimated Average Requirement after 10 years of follow-up was observed for iodine [OR=1.5 (1.2 to 1.9)], selenium [OR=1.4 (1.1 to 1.8)], calcium [OR=1.2 (1.1 to 1.2)], vitamin E [OR=4.5 (3.7 to 5.3)], n3 [OR=1.5 (1.3 to 1.7)], n6 [OR=2.6 (2.0 to 3.1)] and monounsaturated fatty acids [OR=1.4 (1.1 to 1.6)]. Whereas the risk of inadequate intake was lower for vitamin C [OR=0.6 (0.4 to 0.9)], total carbohydrates [OR=0.6 (0.5 to 0.7)], fiber [OR=0.7 (0.6-0.8)], total fat [OR=0.8 (0.7-0.9)], saturated fatty acids [OR=0.4 (0.3-0.5)] and polyunsaturated fatty acids [OR=0.4 (0.3-0.5)] and cholesterol [OR=0.5 (0.4-0.5)].

Key findings: Although participants in this Mediterranean cohort are more likely to follow healthy dietary practices, our results suggest that even among university graduates nutritional education is needed to adapt to Spanish nutritional requirements.

Funding: The SUN Project has received funding from the Instituto de Salud Carlos III. Official Agency of the Spanish Government for biomedicai research (Grants PI10002658, PI1002293, PI1300615, RD12/0045, G03/140 and 87/2010), the Navarra Regional Government (45/2011) and the University of Navarra.
consumed one product (mainly a single botanical), 11.9% two and 2.2% more than two. The total number of products consumed was 465. The main dose forms used were capsules and tablets/lozenges. The five most frequently reported botanicals were: Cynara scolymus (artichoke), Valeriana officinalis (valeriana), Equisetum arvense (horsetail), Foeniculum vulgare (fennel), and Passiflora incarnata (purple passionflower).

Key findings: This study presents the first data on actual consumption of PFS in Spain that can be compared with other European countries. Given the rise in PFS consumption, and the few existing studies, it is recommended that nutritional studies include assessment of these types of supplements to allow for gaining insight into the risks and benefits of their consumption.

**PM-143 Poster**

**Anthropometric indicators of obesity as predictors of cardiovascular risk in the elderly.**

Ribeiro, A.Q; Martins, M.V; Souza, J.D; Franco, F.S; Martinho, K.O; Tinóco, A.L.A

Universidade Federal de Viçosa, Brazil

Objective: Evaluate the predictive capacity of anthropometric measurements in identifying cardiovascular risk in elderly patients at the Family Health Strategy of Viçosa-MG.

Material and methods: This was a cross-sectional epidemiological study with 349 elderly persons. Cardiovascular risk was calculated using the ratio of triglyceride levels with HDL-cholesterol (TG/HDL-c) levels. The anthropometric variables measured were waist circumference, body mass index, waist-to-height ratio, and conicity index. A biochemical assessment of triglycerides and HDL-cholesterol was performed. The anthropometric measurements were also related to cardiovascular risk using Receiver Operating Characteristic (ROC) curves.

Results: The observed results suggest that all these anthropometric indexes can be used to predict cardiovascular risk in males. However, in females, only BMI showed predictive capacity. The cutoff points identified appeared very close to the cutoffs recommended and recognized in other studies, with the exception of waist circumference measured at the midpoint between the last rib and the iliac crest, which showed a considerable difference.

Key findings: All anthropometric indexes can be used to predict cardiovascular risk in males and females. Waist circumference at the midpoint between the last rib and the iliac crest was the best anthropometric measure to predict cardiovascular risk in males and smaller waist circumference and waist-height were the best anthropometric measures in females.

**PM-144 Poster**

**Hemoglobin levels during the first trimester of pregnancy and risk of abortion.**

Anja V1, Abajo S2, March G2, Aguilar P, Romano E1, Ribot B1,2

1Grupo de Investigación en Nutrición y Salud Mental (NUTRISAM). Universidad de la República, Montevideo, Uruguay. 2Institut d’Investigación Sanitaria y Sociosanitaria (ISSyS), Reus, Tarragona-Reus. Institut Català de la Salut, Spain.

Objective: Iron deficiency in early pregnancy has been associated with increased incidence of abortions, however there is no evidence on the effect of high levels of iron. Therefore, the objective was to evaluate the incidence of abortions in a population of Spanish pregnant women and its relationship with different hemoglobin levels during the first trimester of pregnancy, adjusting for other risk factors.

Material and methods: Longitudinal study conducted on 9488 pregnant women who followed up their pregnancy in primary care from 2007 to 2012 in a Mediterranean area. The age of pregnant women, body mass index (BMI), number of previous abortions, tobacco habit and first trimester hemoglobin levels (Hb), were collected from the computerized clinical records. Pregnant women were grouped into 6 groups according to their levels of hemoglobin: Hb <100 g/L, Hb: 100 to 109.9 g/L, Hb: 110 to 119.9 g/L, Hb: 120-129.9 g/L, Hb: 130 to 139.9 g/L, Hb >140 g/L. Statistical analysis were performed using SPSS version 20.0.

Results: Pregnant women were 30.0 ± 5.5 years old, 43.6% were primiparous and 18.4% reported being smokers during pregnancy. A 3.9% of pregnant women started pregnancy with anemia (Hb <110 g/L) and 13.2% with Hb above 140 g/L. The incidence of abortions was 5.9%, with a mean gestational age of 13.2 ± 5.9 weeks. This incidence was significantly higher in the group with anemia (9.4%) and in the one with high levels of Hb (10.2%). Abortion risk is increased by having >35 years (OR: 2.0, 95%CI: 1.7-2.5), presenting Hb levels below 110 g/L (OR Hb <100 g/L: 2.6 95%CI: 1.3-5.5, OR Hb 100-109.9 g/L: 2.2 95%CI: 1.3-3.7) or above 140 g/L (OR: 1.9, 95%CI: 1.3-2.9). The risk of abortion did not increase by the number of previous abortions, smoking or BMI of the mother.

Key findings: The incidence of abortions is higher not only in presence of anemia but also in presence of hemoglobin values above 140 g/L during the first trimester. Besides controlling low hemoglobin levels at the beginning of pregnancy, it is important to highlight the importance of early detection of high hemoglobin levels to prevent the risk of abortion by avoiding iron suplementation.

**PM-145 Poster**

**Comparison of functional autonomy and associated factors in elderly patients with or without metabolic syndrome.**

Ribeiro, A.O1; Martinho, K.O2; Franco, F.S3; Longo, G.Z3; Tinóco, A.L.A1

1Universidade Federal de Viçosa, Brazil. 2Universidade Federal do Estado do Rio de Janeiro, Brazil.

Objective: The aim of this study was to compare the autonomy and its associated factors in elderly patients with or without metabolic syndrome.

Material and methods: This study was a cross-sectional study comprising 402 subjects aged 60 years or older, of both sexes, attended at the Family Health Program, in Viçosa / MG. The metabolic syndrome was classified according to the criteria of the International Diabetes Federation. Autonomy was classified according to the protocol GLAM. The independent variables of the study were gender, age, marital status, education, physical activity, sedentary behavior, number of chronic diseases, depressive symptomatology and cognition level. A multiple linear regression model was used to estimate associations between the variables and autonomy in older adults with and without metabolic syndrome.

Results: In the elderly group without metabolic syndrome, autonomy was associated with increasing age, sedentary behavior, and depressive symptomatology. In the presence of metabolic syndrome, in addition to these factors, the lowest level of education, being insufficiently active in physical activities, and have at least one chronic disease is not transmissible, also correlated with worse autonomy.

Key findings: It was concluded that the presence of metabolic syndrome, negatively interfered with worse functional autonomy of the elderly.

**PM-146 Poster**

**Depressive symptoms in elderly patients with metabolic syndrome: a case-control study.**

Ribeiro, A.O; Franco, F.S; Martinho, K.O; Martins, M.V; Longo, G.Z; Tinóco, A.L.A

1Universidade Federal de Viçosa, Brazil. 2Faculdade Atenas-Paracatu, Brazil

Objective: The objective was to identify factors associated with depressive symptoms in elderly with metabolic syndrome.

Material and methods: It was a case-control study to check sociodemographic and lifestyle influencing depressive symptoms in elderly patients with metabolic syndrome. The cases were attended in Family Health Strategies, and the control group consisted of individuals with metabolic syndrome who didn’t have depressive symptoms. It was used as a measure of association, odds ratio (OR) with confidence interval of 95% and p-value, obtained by conditional logistic regression model.

Results: It was observed that of the 242 seniors who presented metabolic syndrome, 60 (24.79%) were cases presenting depressive symptoms and 182 (75.21%) were controls, with no significant depressive symptoms. Males were represented by 12 cases and 43 controls for females there were 121 cases and 139 controls. The mean age of cases was 74.03 (sd = 7.22) and of the controls was 71.74 (sd = 6.62). Most individuals belonging to the cases and controls were married, currently working, had 1-4 years of schooling and were white or Latino. Among the sociodemographic variables, only age was significantly associated with the presence of depressive symptoms. Among the cases, there were higher chances of developing stress (OR = 8.10), compromised mental cognition (OR = 1.83), worse health perception (OR = 5.76), dependent according to the ADL (OR = 2.05) and being in mourning (OR = 2.49) compared to the controls. The intake of nutrients vitamin B6, vitamin B9, vitamin B12, selenium and zinc and sedentary behavior were presented quantitatively. Nutrients were adjusted per calorie intake and sedentary behavior analyzed in hours sitting and/or lying. Consumption of vitamin B6, vitamin B9, vitamin B12, selenium and zinc, as well as sedentary behavior, showed no statistically significant difference between cases and controls.

Key findings: We concluded that elderly individuals considered stressed, grieving, older than 80, with poor self-perceived health and cognitive impairment were, respectively, 13.95, 3.68, 6.39, 8.02 and 3.00 times more likely to present depressive symptoms than individuals without these characteristics.
PM-147 Poster
Perceptions and attitudes on healthy nutrition of parents and children, participating in a school-based feeding program in disadvantaged areas in Greece: A qualitative study. 

Soritoul A1, Zota D1, Kastorini C1, Veloudaki A1, Petralias A1, Yannakoulia M1, Linou A1,2,2.
1 Institute of Preventive Medicine, Environmental & Occupational Health, Proaktotaxis, 7 Fagoktisias str., Maroussi, 15125, Greece. 2 Department of Statistics, Athens University of Economics and Business, 76 Patission str., Athens, 10434, Greece. 3 Department of Hygiene, Epidemiology and Medical Statistics, Medical School, National and Kapodistrian University of Athens, 75 Mikras Asias str., Athens, 11527, Greece. 4 Department of Nutrition and Dietetics, Harokopio University, E. Venizelou 70, 17671 Athens, Greece.

Objectives: With the aim of reducing the rates of food insecurity and promoting healthy eating, we designed and implemented the Program on Food Aid and Promotion of Healthy Nutrition, a school-based intervention program believing that a daily free provision of a healthy mid-day meal, in disadvantaged areas in Greece. We conducted focus groups, in order to explore parents’ attitudes towards healthy eating and the provision of a daily school meal and their children’s approach. 

Materials and Methods: Eligible participants included elementary and junior high school students and their parents, who participated in the intervention program. Twenty focus groups were conducted (January - February 2013), 6 with parents and 14 with students from participating schools in Athens (Greece) selected randomly. Sample consisted of 44 parents and 98 children. Data were processed respectively, in relation to among others, perceptions regarding healthy eating and barriers, parental practices for promoting children's healthy eating and attitudes towards the program.

Results: Analysis of the transcripts was done using the Krueger’s method. Parents and children, according to the Mediterranean diet as a healthy, traditional pattern. Mothers appear to the dominant nurturing role in the family. Nearly all parents understand their role-model effect and comment on the benefits of family meals. As part of their parenting role, they use various methods to promote a healthy diet. The most reported barriers include taste and preference for sweets. Working mothers referred, also, to the lack of time. Most of the children’s responses mirrored those given by their parents. Still, some younger children mentioned strict parental practices concerning the consumption of healthy family meals. Concerning the free provision of the mid - day meal in the school setting on a daily basis, most parents understood the importance of the program. Benefits of healthy eating. Others emphasized the social benefits of the program for the families in need. Also parents also perceived the program mainly as health promoting.

Key Findings: The results of the present study improved our understanding on the perceptions about healthy eating of parents and children living in socioeconomic disadvantaged areas, as well as their views towards a school food aid program that included the daily, free provision of a healthy mid-day meal. The findings of this research allowed us to design and implement tailored-made activities for the promotion of healthy eating targeting people living in these areas.

PM-148 Poster
Are infants in the Western Highlands of Guatemala meeting major and trace mineral requirements from breast milk during early and later lactation periods?

Perez HM1, Leblanc AS1,2, Li C1, Solomons NW1, Scott ME1, Koski KG1.
1 McGill University, Montreal, QC, Canada. 2CESUAM, Guatemala City, Guatemala.

Objectives: To compare adequacy of daily infant intake of major and trace minerals from early and later breast milk of rural Mam-Mayan mothers with international recommendations.

Materials and Methods: Using Inductively Coupled Plasma Mass Spectrometry, concentrations of 11 minerals (Na, Ca, Mg, Mn, Zn, Cu, Cr, Se, Fe, P) were measured in breast milk samples during both early (<45d, n=52) and later (4-6mo, n=37) lactation periods. To calculate daily infant intake of minerals, a three-step process was used. First, energy requirement was calculated by multiplying infant weight (kg) by age-adjusted FAO/WHO/UNU energy needs for breastfed infants. This value was then divided by the assumed 0.67 kcal/ml of breast milk to estimate the daily volume of milk consumed. Plasma concentrations of minerals were multiplied by volume of milk to obtain total within-day mineral intake. These were compared to the international recommendations. An in-depth questionnaire recorded infant feeding practices including feeding frequency (FF). Statistical significance was set at p<0.05.

Results: As expected, infants in early lactation consumed significantly less breast milk compared to later lactation (529 vs 800 ml/day, p<0.05). Median intakes of Na, Ca, Mg, Zn, P were below the international recommendations at both stages of lactation. Of these inadequately consumed minerals, Ca and Mg intakes in early lactation were the most deficient, with 98% of daily infant intakes falling below recommendations. In later lactation, Ca and Zn intakes were the most deficient, with 94% of daily infant intakes falling below recommendations. Median intakes exceeded the recommendations for Fe in early lactation only and for Mg in later lactation only. Cr, Mn, Cu and Se were adequate in both periods. In general, mothers met FF recommendations, although 10% in early and 14% in later lactation periods failed to breastfeed > 8 times/24 hours. Despite this, there were no differences in mineral intakes in either early or later lactation based on FF.

Key Findings: Low mineral concentrations exist in breast milk from Mam-Mayan mothers, resulting in inadequate daily intakes by full breastfed infants in early and later lactation periods. Our results show that most infants are consuming inadequate intakes of K, Mg, and Ca during early and Ca and Zn during later lactation periods. Moreover, volume of milk differs between early and later lactation periods, suggesting that the universal assumption of breast milk intake of 780 ml/day is not appropriate for our population.

PM-149 Poster
High prevalence of intestinal fructose malabsorption in patients with chronic abdominal pain.

Ortega Anta R1, Patta Aroca G1, Jiménez Ortega A1,2, Abdel Majid Abu Saj H1,2, Jimeno Pita P2,2,3, Diarra S1,2, Gómero P1,2,4, Jiménez Ortega M1,2, Sacko M1,2, Yrot Y1,2,3, Dicko Y1,2,5, Solomons NW1.
1 Departamento de Nutrición. Facultad de Farmacia. Universidad Complutense de Madrid. 2 Unidad de Gastroenterología Pediátrica. Servicio de Pediatría. Hospital San Rafael.

Objectives: Chronic abdominal pain is a disease with high prevalence in children. It is very significantly associated to anxiety in the patient and the family environment as well as to high demand for health resources, being an entity of difficult treatment. Increased consumption and utilization of fructose lead us to consider the role of malabsorption and fructose intolerance as a cause of chronic abdominal pain.

Materials and methods: A prospective study in which hydrogen / methane (H2/CH4) breath test is made after fructose overload in children and adolescents with abdominal pain of long duration (more than 6 month), etiological study with no abnormal results and lack of response to standard measures of treatment. The selected patients are given a dose of fructose 15gK (maximum 20g), H2/CH4 baseline measurement and determinations every 25 minutes during 175 minutes were performed. It is considered positive when the concentration of H2 is higher than 20ppm and / or the concentration of CH4 is higher than 12ppm. Patients with a positive test are given low fructose - sorbitol diet with subsequent clinical management in the query. Results: 23 patients (13 men/10 women) with a mean age of 8.64 years were included. All patients had chronic abdominal pain, associated other symptoms in varying degrees (diarrhea 43%, 35% bloating, abdominal pain 9%). The H2/CH4 breath test after fructose overload was positive in 86% of patients. In 18 of the 23 patients were also conducted throughout the study hydrogen breath test after lactose overload, but it was only positive in 17% of patients. The patients with positive fructose test which dietary treatment was prescribed improve in a large percentage, but there are awaiting clinical control.

Key Findings: Children and adolescents with chronic abdominal pain of long duration in our study have a high percentage of intestinal fructose malabsorption. Fructose - sorbitol restricted diet may be an effective treatment in these cases.

PM-150 Poster
Integrating malaria, nutrition and early child development in Mali: impact on child health, nutrition and development.

Diana S1, Dicko Y1, Roschon N2, Clarke S3, Bamado M1,2, Sacko M1,2, Griffis Y3.
1 Save the Children Mali. 2 Save the Children USA. 3 Institut National de Recherche en Santé Publique, Mali. 4 London School of Hygiene and Tropical Medicine.

Objectives: To reduce the prevalence of malaria, anemia and stunting and to improve cognitive function (ability to learn) and school readiness in children aged 0-5 years, by integrating seasonal malaria chemoprevention with home fortification with micronutrient powders delivered through community based preschools in Sikasso, Mali.

Materials and methods: A cluster randomized trial was conducted in 60 villages with community-run preschools supported by Save the Children between May 2013 to September 2014. All children under 5 years in the intervention communities received two rounds of malaria treatment during the peak malaria transmission season, followed by up to four months of daily home fortification with micronutrient powders and nutrition education. A cross sectional survey is currently being conducted in all intervention communities targeting 1,200 children aged three and five years, randomly sampled from each of the 60 communities to assess children's cognitive function, school readiness, height for age z score, hemoglobin levels and malaria parasitaemia. Parental interviews are also conducted for each child to identify other home and parenting factors related to child development.
Results: Preliminary results will be available in September 2014 and will compare the prevalence of malaria, anemia, stunting, cognitive function and school readiness for children aged 3 years and 5 years in the intervention and comparison communities to assess the impact of seasonal malaria chemoprophylaxis and home fortification with micronutrient supplementation and the feasibility of delivering these through community-based schools. Key findings: There have been no previous studies examining the combined impact of these two malaria and nutrition interventions in early childhood, nor their benefits for child development. This evidence is very timely for Mali and the sub-region as they begin scaling up seasonal malaria chemoprophylaxis (as recommended by WHO in June 2013 for Sahel countries), early childhood development and nutrition and are looking for models to integrate the different sectors to maximize impact.

**PM-151 Poster**

**Association between changes in weight status and sociodemographic data in three years follow-up of Brazilian adolescents from Rio de Janeiro, Brazil - ELANA Project.**

Vega GV, Moraes MM, Dias AS.
Institute of Nutrition Josué de Castro, Federal University of Rio de Janeiro

Objectives: Evaluate the changes in weight status between 2010 and 2012 and its relation with sociodemographic data in Brazilian adolescents. Materials and methods: Data are from the Longitudinal Study of Adolescent Nutritional Assessment – ELANA Project, which consists in a cohort of adolescents from four private and two public schools of the metropolitan area of Rio de Janeiro that were on sixth grade of middle school in 2010. Body mass index (weight/height^2) was obtained in baseline and after two years. Weight status was classified in three levels: “no change”, “overweight” and “overweight/obesity” according to Tanner stages. There were significant differences between gender, age and type of school. Energy and nutrients dietary intake during pregnancy was assessed by the chi-square test; p<0.05 was considered for statistical significance. Results: Five hundred twenty-seven adolescent (52.6% boys), with mean age of 11.6 years (SD = 0.84) were analyzed in 2010 and in 2012. After three years, 88% of adolescents did not change their weight status; 8.7% that were overweight changed to normal weight; 3.2% that were normal weight changed to overweight. All meals, only frequency of breakfast showed significant relationship with change in weight status, as 14.2% of adolescents who had breakfast twice a week or less that were overweight in 2010 changed to normal weight in 2012 (p=0.020), and 13.0% of adolescents who had breakfast 3 or 4 times a week that were overweight in baseline changed to overweight three years later (p=0.018). Analysis were adjusted for self-reported sexual maturation.

Key findings: Changes in weight status were related to omission of breakfast in two different ways: weight gain was related to having breakfast less than two times a week, while weight losses was related to having breakfast twice or less a week. Although known to be unhealthy, omitting breakfast seems to be a strategy used by adolescents to lose weight.

**PM-153 Poster**

**Healthy food as protective factor from depression postpartum.**


1. EUIRSTOS Excellence Centre for Paediatric Research, University of Granada, Spain. 2. Department of Obstetrics and Gynecology, University of Granada. Spain. 3. Department of Paediatrics, School of Medicine, University of Granada, Spain.

Objectives: The aim of this study was to assess the relationship between the prevalence of postpartum depression (DPP) in healthy normoweight, overweight, obese and diabetic pregnant women according to their eating and self-rated health habits.

Materials and methods: We included 84 participants in the PROBE Study (www.ClinicalTrials.gov NCT01634464) which were divided into two groups: DPP group according to the Edinburgh Scale criteria for postpartum depression diagnosis at 6 weeks postpartum and non DPP (NDPP) group. Energy and nutrients dietary intake were assessed analyzing the 3-day food record (10% of respondents), energy and nutrients dietary intake during pregnancy was assessed by the chi-square test; P<0.049. The daily intakes of B2 vitamin, iron and folic acid tended to be lower in the risk DPP group, although these differences did not result statistically significant (P = 0.06).

Key findings: Our data suggest that deficient dietary intake of various nutrients during pregnancy could be associated to a higher risk of postpartum depression. These results highlight the role of micronutrients supplementation which doesn’t disregard the importance of individualized dietary control throughout pregnancy. The results suggest also that healthy food intake and self-rated during pregnancy could be a protective factor for developing postpartum depression.

*Supported by the Andalusian Government, Economy, Science and Innovation Ministry (PREFOLCE Excellence Project Ref: P05-CTS-29341).

**PM-154 Poster**

**Nutrimetry: the scoring of Height and BMI.**

Solem-Sols, J.E.; Richard-Lara, M.; Lopez-Velazquez, L.; Lanumbe-Zabala, E.S.; Esteve-Lanao, J.A.; Alcocer-Gamboa, A.M.


Objectives: To present a simple method that could be used as an epidemiological instrument that can help survey the malnutrition. Material and methods: The calculi of Nutrimetry (Nutrimetry) are based on the Z-scores of Height-for-age (HAZ) and BMI-for-age (BAZ) after the World Health Organization references. Each child will sum 1 for HAZ-2, 5 for HAZ<-2, and 3 for the rest; Also will sum 0 for BAZ-1, 1 for BAZ<-1, 6 for the rest. After summing the points from both variables, all the possible scores are 1, 3, 4, 5, 6, 7, 8, 9, and 11. The prevalence values for each category will be arranged on a 3x3 square. From left to right, the upper row will contain: 5; 8, 11; the middle row: 3, 6, 9; the bottom row: 1, 4, 7. Even numbers reflect healthy weight, while odd numbers reflect thinness (small numbers) or overweight/obesity (large numbers).

We measured the weight and height of 4701 boys and 4509 girls aged 5
to 11 years from public schools of the State of Yucatan. We calculated the HAZ and BAZ and applied the Nutrimetry procedures.

Results: The prevalence values by code for the male sample were the following: upper row: code 5=0.0%, code 8=0.1%, and code _11=0.4%; middle row: code 3=5.3%, code 6=33.3%, and code 9=41.7%; bottom row: code 1=2.0%, code 4=12.1%, and code _7=5.3%. And for the female sample: upper row: code 5=0.1%, code 8=0.0%, and code _11=0.2%; middle row: code 3=5.9%, code 6=37.7%, and code 9=36.5%; bottom row: code 1=2.6%, code 4=12.4%, and code _7=4.4%.

Key Findings: These results are consistent with the official data from the National Health and Nutrition Survey, adding a new point of view to face the assessment of nutritional status. After our experience, there are some advantages in this instrument. First, in clinical attention it facilitates the communication with the patient, especially with children or adolescents. Second, the easy understanding and flexibility for adding colors or reinforce the score with appropriate attention, makes possible its use at school for preventive purposes. Third, using numbers we avoid the stigmatization that might be caused from words such as ‘obese’ or ‘thin’, and we convert even numbers in goals instead.

PM-155 Poster Analysis of food consumption as an element of vulnerability in an indigenous community in the state of San Luis Potosi, Mexico.
Rodríguez-Ramos F., Aradillas-Garcia C., Díaz-Barriga F.
Coordination for Innovation and Application of Science and Technology (CIACyT)

Objective: Analyze the nutritional status, caloric intake and frequency of food consumption on a site with an indigenous population with toxic exposure problems in the state of San Luis Potosi, Mexico.

Materials and Methods: A cross-sectional study with school children between 6 and 10 years. The community is located in the Huasteca region of the state, 6 hours far from the capital, where is constant exposure to toxic waste predispositions of pesticides used in agriculture, HAP's by wood smoke in homes and pollution by deforestation outdoors.

Weight measurements (P), size (T), age (E) to assess the nutritional status according to WHO standards were considered. Also, weight for age (P/E), BMI-for-age (BMI/E) and Height for age (H/E) was evaluated. Dietary assessment was performed by applying Consumption Frequency Questionnaire (SNUT) validated by the National Institute of Public Health, which consists on 112 reagents comprising the different food groups.

Results: The nutritional status of children in the community has a prevalence of chronic undernutrition of 20.5%, which is above average for the state in rural areas (14.3%) according to the ENSANUT 2012. Nevertheless, the prevalence of Overweight is minimal (3%) compared to the average for the same population (11.5%). Table 1.

The average caloric intake is appropriate for the age range, however there is an increased consumption of carbohydrates. The frequency analysis shows that the nutrient intake comes primarily from cereals and legumes. Besides, there is a significant consumption of energy dense products. The animal products consumption resulted from low to moderate, indicating a deficient intake of animal protein as well as iron and calcium. The results show that the population has a high prevalence of chronic undernutrition, coupled with poor intake of high importance minerals for both physical and intellectual development, a protective factor against environmental threats and as a way to strengthen the immune system. Interventions are needed in the community to reduce environmental threats and risk factors for vulnerable groups.

PM-156 Poster High capacity of clays for the mycotoxin detoxification in food and feed.
Department of Toxicology and Pharmacology, Faculty of Veterinary Medicine, Universidad Complutense de Madrid, 28040 Madrid (Spain).

Mycotoxins are secondary metabolites produced by fungi that can contaminate all stages of food chain. The contamination of food and feed with mycotoxins represents an important risk factor for human and animal health. In order to avoid mycotoxins, several strategies have been investigated which can be divided into pre- and post-harvest technologies and into biological, chemical and physical methods. The physical methods are focused on the removal of mycotoxins by different adsorbents added to mycotoxin-contaminated diets with the hope of being effective in the gastro-intestinal tract more in a prophylactic rather than in a therapeutic manner. At present, the utilization of mycotoxin-binding adsorbents is the most applied way of protecting against the harmful effects of contaminated food and feed. The aim of the present work is to evaluate the capacity of the Green and Montmorillonite clays as adsorbents against mycotoxins-induced cytotoxicity on Caco-2 cells. Cytotoxicity was investigated by using different mycotoxins, ochratoxin, fumonisin B1, and aflatoxin B1 at increasing concentrations (1-100 µM). MTT and LDH assays were used to test cell viability in presence or not of Green and Montmorillonite clays (0.1 mg/ml). Cell barrier integrity was also evaluated measuring the trans-epithelial electrical resistance (TEER) during 21 days with a Millicell-ERS Voltohmmeter. Our results demonstrated a statistically significant decrease of cell viability in a concentration dependent-manner following 24 h incubation with the mycotoxins tested. Both clays at the concentration range of 1-0.01 mg/ml did not produce any statistically significant decrease on cell viability. After a 24 h co-incubation period with mycotoxins and both clays, Green clay at 0.1 mg/ml was more effective than Montmorillonite clay reducing the toxicity induced by mycotoxins in Caco-2 cells. We also demonstrated that in epithelial epithelial cell lines from human (Caco-2 origin, aflatoxin B1, fumonisin B1 and ochratoxin significantly decreased TEER (40%). Co-incubation of both clays with mycotoxins significantly reverted barrier function of the intestinal epithelium to almost control levels. In conclusion, the present study allowed identifying the adsorption capacity of Green and Montmorillonite clays against mycotoxins commonly found in food and feed. The utilization of these adsorbents mixed with the food and feed can provide a versatile tool of preventing mycotoxicosis.

This work was supported in part by the Laboratorio ARGILETZ, S.A., 77440 Lízy sur Ourcq-FRANCE.
Objetivos: El estudio de los nutrientes aportados por el organismo heterófitico Schizochytrium sp., el cual se obtiene industrialmente por fermentación. Se pretendía analizar químicamente las fracciones liposolubles en orden a confirmar las estructuras descritas en la literatura e identificar nuevas sustancias biológicamente activas que puedan llegar a ser importantes nutrientes en alimentación. También se pretendía elucidar la aplicación de este microorganismo como fuente de grasa insaturada.

Materiales y métodos: Por maceración del polvo de Schizochytrium sp. con diclorometano y metanol seguido de filtración y concentración en rotavapor se obtuvo el extracto bruto del organismo. Por cromatografía en columna eluyendo con n-hexano/acetato de etilo con cantidades incrementales del último se obtuvieron sucesivas fracciones que se monitorizaron por cromatografía en capa fina (TLC), aislando varias fracciones que se analizaron por H-NMR, 13C-NMR y GC-MS.

Resultados: Se identificaron 49 compuestos que se clasificaron en 24 tipos de compuestos orgánicos pertenecientes a los n-alcanos, 1- alquenos, 1- alcanoles, ácidos grasos libres, ésteres metílicos y éteros de ácidos grasos saturados e insaturados, mono-, di-, y tri-glícéridos –saturados e insaturados–, ácidos grasos poliinsaturados, ésteres y monohidratos de glucosa. Se obtuvieron sucesivas fracciones que se monitorizaron por cromatografía en capa fina (TLC), aislándose varias fracciones que se analizaron por H-NMR, 13C-NMR y GC-MS.

Conclusión: Schizochytrium sp. produce gran cantidad de lípidos, incluyendo componentes con ácidos grasos insaturados, lo que lo habilita como un microorganismo aplicable en nutrición funcional.
Objective: To identify the nutritional content of the diet usually followed by these people, focused on identifying the excesses and deficiencies of nutrients which could be related to the high prevalence of malnutrition in this area (one of the highest in the country).

Material and methods: A prevalence study was carried out between June and November of 2012. A random stratified by age and gender sampling was conducted, getting 217 individuals sample size. We took anthropometric measures (height, weight, BMI, body, perimeters and folds) to assess nutritional status. Data on eating habits were also collected through interviews, observation of preparing meals and 80 of them completed three 24-hour recalls, 2 from weekdays and one more from weekend.

Results: 24-hours recalls show an imbalance in the supply of micronutrients with a high intake of protein and fat, but low in carbohydrate (except in the youngest group where is offset) resulting in a low caloric intake. As for inorganic elements we found low levels for iron (except in some age groups men), calcium and potassium. However the ingested sodium was very high, an increase of overweight (1.7%) and an increase in obesity (3.3% to 4.6%), although these differences are not significant, they do show a trend toward weight gain. Regarding habits, parents need nutritional advice and healthy habits because children know what is desirable to eat, but not implemented due to lack of supervision.

Key findings: Although monitoring the impact of ANSA on overweight and obesity in children should be evaluated in the long term, yet no positive changes are observed in children in the six months of the study it is recommended to monitor additional measures to help avoid eating sweets and foods that provide excess fat and simple carbohydrates, not only within the school but also in the family.

PT-006

Prevalence of overweight and obesity among adult population in a Mexican-USA border city.

Pérez-Morales ME,1 Hernández-Navarrete T,Y,1 Alcántara-Jurado LA,1 Hurtado-Ayala LA,1 Bacardi-Gascón M,1 Jiménez-Cruz A.2
1 Facultad de Ciencias Químicas e Ingeniería, Universidad Autónoma de Baja California. 2Facultad de Medicina y Psicología, Universidad Autónoma de Baja California.

Objective: Assess the prevalence of overweight (OW) and Obesity (O) among ≥18 year old Mexicans living in Tijuana, Mexico.

Material and methods: Total adult population greater than or equal to 18 years old is 1.247.746 subjects, from which a representative sample of 1072 subjects (≥18 years of age) was obtained (95% confidence level). We measured weight (kg), height (m), and waist circumference (cm) according to standard procedures. The body mass index (kg/m²) was calculated and the WHO (2000) cut-off points for BMI status (OW: 25.00 kg/m², Oe: 30.00 kg/m²) was used. To assess abdominal obesity (AO) the WHo cut-off points (WC >94 cm in males and >80 cm in females), and the Mexican Health Minister cut-off points (WC>90 cm in males and >80 cm in females) were used. Subjects with disabilities and pregnant women were excluded.

Results: The study population age ranged from 18-86 years (39.5±15.4 y). Females were 59.6% (n=639). Mean BMI was 28.6 ± 5.2 kg/m². The prevalence of overweight and obesity was 74.1% (39.9% and 34.2% respectively). The prevalence of overweight in females was 36.2% and of obese was 10.5% whereas the prevalence of overweight and obesity in males were 45.5% and 28.2% respectively. According to the Mexican cut-off points criteria in women greater prevalence of AO (89.5% vs 71.36%) was found. According to WHO cut off points, AO was 10.8 percentage points lower in males (60.28%).

Key findings: The prevalence of overweight and obesity in Tijuana was higher (74.1%) than the reported by the National Survey of Nutrition (2012). The prevalence of OW, O and AO are alarmingly high and make this problem in the City and in the nation the highest public health priority. For international comparison we recommend using the WHO cut-off points.

PT-007

Scoping the National Agreement for Health (ANSA) in children (9-11 years old) at Puebla, México.


Objectives: Today Mexico is in first place in the world of childhood obesity. Considering that our country has a large population of infants, the federal government has developed strategies to counter problems projecting the future, same that are aimed at reducing the obese population, focusing on the highest priority to children who are most affected at present. The

therefore, the objective of this study was to evaluate the scope of the National Agreement for Food Safety (ANSA) in children of 9-11 year old at a school of Zacatlán, Puebla through their anthropometric measures before and after the entry into force of the cited agreement.

PT-008

Z-Score Anthropometric Indicators Derived from NCHS-1977, CDC-2000 and WHO-2006 in 52 to 60 month-old Children in Central Area of Peru.

Castro J., Chirinos D. Universidad Nacional del Centro del Perú. Huancayo-Perú

Objectives: To Identify and analyze the distribution of Z-scores of anthropometric indices of children between 36-60 months of age in the province of Huancayo-Perú, calculated based on the NCHS-1977, CDC-2000 and WHO-2006 references. Weight-for-height, height-for-age, weight-for-age and body mass index are understood using the Z-score classification system with the three standards.

Material and methods: We analyzed a database of 2640 children (1268 males and 1372 females) collected between 1992-2007 in 25 of 28 districts of Huancayo province (3250-3500 MASI). The Z-scores were determined using the Anthro V.3.0 and the Epilinfo 6.04. Data were divided into four chronological periods: 1. 1992 with 532 data; 2. 1993-1997 with 370 data; 3. 1998-2002 with 494 data; 4. 2003-2007 with 1244 data. Benchmarking was considered for the Z-scores of weight-for-age, height-for-age, weight-for-height and body mass index (BMI), established in NCHS-1977, CDC-2000 and WHO-2006. Movements of population curves and Z-scores variation graphs for each benchmark used were analyzed using the software V15, Minirth V15 and Excel.

Results: The Z-scores were different with each assessment standard. The mean±SD of the weight-for-age, height-for-age, weight-for-height and BMI Z-scores with NCHS were -0.85±0.88, -1.29±1.07, -0.04±0.84, 0.05±1.05 respectively, with CDC, the values were -0.79±0.95, -1.08±1.05, -0.12±1.00 and 0.05±0.91 and with WHO the values were -0.75±0.84, -1.40±1.02, 0.15±0.91 and 0.21±0.91, correspondingly. Considering that the Z-scores average describes the nutritional status of the entire population, this study shows in the case of height/age, that the average Z-scores (1.40) of children in the central highlands moves further from the WHO median and is closer to the NCHS median (-1.29). These results support the assumptions of WHO, noting that the stunting evaluation in children under the age of 5 years with the NCHS standard was not the most appropriate.

Key findings: The distribution of the weight-for-age, height-for-age, weight-for-height and body mass index Z-scores were different when using NCHS-1977, CDC-2000 and WHO-2006 references, noting that all distributions are shifted either to the left or right, which allowed to describe the nutritional status of the entire population without resorting to predefined established cut-off points. With benchmarking, an increase of overweight (17.8% to 19.5%) and an increase in obesity (from 3.3% to 4.6%), although these differences are not significant, they do show a trend toward weight gain. Regarding habits, parents need nutritional advice and healthy habits because children know what is desirable to eat, but not implemented due to lack of supervision.

Key findings: Although monitoring the impact of ANSA on overweight and obesity in children should be evaluated in the long term, yet no positive changes are observed in children in the six months of the study it is recommended to monitor additional measures to help avoid eating sweets and foods that provide excess fat and simple carbohydrates, not only within the school but also in the family.
Objectives: To determine whether there are differences in sweetened, energy and alcoholic beverages intake, milk consumption and calorie intake among menopausal, obesity, age, sex, and waist circumference among Mexican college students.

Material and methods: Second and third year college students from five schools at the Autonomous University of Baja California, Mexico were assessed. Weight, height, and waist circumference (WC) were measured, and a dietary frequency questionnaire was administered. The questionnaire applied was a previously designed and validated among college student in Virginia Tech. The questionnaire was developed to estimate mean daily intake of 19 beverage categories. BMI was calculated and weight status was classified according to WHO. Abdominal obesity was considered when the WC was ≥ 94 cm in women and ≥ 91 cm in men. Rank differences of drinks and calorie consumption by sex, age, BMI and WC were calculated using the Mann-Whitney test. Differences in beverage consumption by discipline of study was conducted by 1-way ANOVA

Results: 1138, 17 to 30 year students were assessed (50% female). The prevalence of overweight, obesity and abdominal obesity in women was 25, 12 and 33% respectively, and in men 30, 14 and 17% respectively. Men consumed more milliliters and kilocalories per week of sugar sweetened, milk, alcoholic and energy beverages than women (p < 0.001). People over 21y consumed more milliliters and kilocalories per week of drinks than ≥ 21y (p = 0.02 and 0.03 respectively). Older than 21y consumed more alcoholic drinks in milliliters and kilocalories per week (p=0.012 and 0.044 respectively), than younger. People with BMI ≥25 kg/m², consumed less energy and total kilocalories per week (p=0.007) and total kilocalories per week (p=0.046) than those with a BMI ≥ 25 kg/m². People with abdominal obesity reported lower consumption of sugar sweetened beverages, alcoholic beverages and total calories than people with normal WC (p=0.046, 0.025 ± 0.02 respectively).

Key findings: Men consumed more sugar sweetened, milk, alcoholic and energy beverages than women. People older than 21y consumed more kilocalories of alcohol than younger. People who were overweight or obesity consumed more kilocalories per week than normal weight. People with abdominal obesity consumed less sugar sweetened beverages, alcoholic beverages and total calories than people with normal WC.

PT-010
Effect of menopause and perimenopause on lipid profile and inflammatory markers.
Taleb-Belkadi O', Chaib H', Fatah A', Chaﬁ B', Mekki K'.
1Laboratoire de Nutrition Clinique et Mètabolique, Département de Biologie, faculté des Sciences de la Nature et de la Vie, Université d'Oran, Algèrie. 2Polyclique de Toulouse. Oran, Algèrie. 3Service de Maternité. Établissement Hospitalier Universitaire (EHU) d'Oran, Oran, Algèrie

Objectives: Perimenopausal and postmenopausal women are more susceptible to cardiometabolic disease related to declining estrogen concentrations. It has been found that estrogen may be responsible for the protective effects seen amongst younger women. Inflammation has been proposed to be a fundamental promoter of cardiometabolic disease, interacting with many pathophysiologic pathways to lead to vascular damage. The aim of this study was to investigate the effect of menopause on lipid profile and inflammatory markers in Algerian women.

Patients and Methods: This cross-sectional study enrolled 114 women who were classified as perimenopause (n = 44), postmenopause (n = 40) or non-menopausal (n=30) women. In serum, we analysed total cholesterol (TC) and triglycerides (TG) by enzymatic colorimetric methods. HDL-C was analysed after precipitation (Kit Bioro, Germany). LDL-C was calculated using the formula of Friedewald. Albumin and total proteins were measured by enzymatic colorimetric method (kit Biobilo, France). Total cholesterol, triglyceride, high density lipoproteins (HDL-C) and C-reactive protein (CRP) analysis were performed by immunobead assay (Cyramz Chemical's ACETM ELISA kit).

Results: Total Cholesterol (TC) was significantly higher in perimenopausal (p <0.01) and postmenopausal women (p = 0.05), compared to non menopausal women (n=30) in both age and in all areas. LDL-C was increased in perimenopausal and postmenopausal women compared to non menopausal women (p = 0.01), while HDL-C concentrations were decreased in perimenopausal and postmenopausal women (p < 0.001) compared to non menopausal women. TCHLDL-C and C-LDL-C/HDL ratio were significantly increased in perimenopausal (6.09 ± 4.26, 6.41 ± 2.50) and postmenopausal (6.47 ± 3.66, 7.61 ± 4.40) compared to non menopausal women (3.58 ± 1.71, 3.48 ± 0.98) (p < 0.001). TNF-α and IL-1α levels were respectively more elevated in postmenopausal (8.9 ± 5.7 pg/mL, 9.06 ± 6.59 pg/mL) than non menopausal women (5.2 ± 2 pg/mL, 4.31 ± 2.36 pg/mL) (p < 0.05). Moreover, increase in C-reactive protein was noted in perimenopausal and postmenopausal women compared to non menopausal women (p < 0.05).

Values of albumin were similar in all groups. However, proteins concentrations were decreased in postmenopausal compared to perimenopausal women (p < 0.01).

Conclusion: This study demonstrates that dyslipidemia and high cytokines and CRP are prevalent in perimenopausal and postmenopausal women which leads to an increase in the spread of inflammation and risk of cardiometabolic disease.

PT-011
Overweight in childhood and adulthood, nutrition and cardiovascular risk: Kaunas cohort study.
Petkevičienė J, Kriščioniene V, Kumbiene J, Raskilienė A, Mareikytė A, Petkevičius, D'Ora, Oran, Algeria. 1Laboratoire de Nutrition Clinique et Mètabolique, Département de Biologie, faculté des Sciences de la Nature et de la Vie, Université d'Oran, Algeria. 2Polyclique de Toulouse. Oran, Algeria. 3Service de Maternité. Établissement Hospitalier Universitaire (EHU) d'Oran, Oran, Algèrie.

Objectives. To date, the contribution of childhood body mass index (BMI) to long-term cardiovascular risk has not been clearly established. Moreover, little is known about how well BMI in childhood predicts adult cardiovascular disease (CVD). The aim of the study was to establish the role of childhood BMI and gain of BMI in prediction of CVD risk factors in adults.

Material and methods. Kaunas cohort study started in 1977. A random sample of Kaunas schoolchildren born in 1964 (n=1082) was examined in the first cross-sectional survey. In 2012, a total of 507 subjects (63.9% of eligible sample) participated in the 35-year follow-up survey being 48-49 years old. Health examination included measurements of blood pressure, anthropometric and biochemical parameters. People older than 21y were excluded from the study. Physical activity, dietary habits and socioeconomic status were assessed. Weight, height, and waist circumference (WC) were measured and weight status was categorized into three groups: 1) normal BMI (<25 kg/m²); 2) overweight in childhood and normal BMI in adults; 2) overweight in childhood and adulthood, nutrition and cardiovascular risk factors compared to the first group. Dietary habits of the subjects with overweight in childhood and adulthood were the most unhealthy. The intake of sugar was the highest (18.4±7.6% of energy) and the intake of vegetables was the lowest (22.2±5.8% of energy) and the intake of dietary fiber was the lowest (17.7±8.1 g) compared to other two groups. People older than 21y consumed more kilocalories of alcohol than younger. People who were overweight or obesity consumed more kilocalories per week than normal weight. People with abdominal obesity consumed less sugar sweetened beverages, alcoholic beverages and total calories than people with normal WC.
mean serum levels of folate, vitamin B12 and ferritin were 17.1±7.4 (nmol/L), 405±166.4 (pg/ml) and 64.4±51.8 (ng/L), respectively. The mean corpuscular volume (MCV) in the study population was 82.85 fl (sd: 5.57) and the 65.3% of anaemia cases were microcytic.

After adjustment, anaemia was found to be more prevalent in urban setting and among those children who had splenomegaly (OR: 1.67 (CI 95%: 1.02-2.78) and OR: 4.59 (CI 95%: 1.02-4.57) at 405±166.4 pg/ml ferritin level, respectively). This was a result of protective factor against anaemia (OR: 0.58 (CI 95%: 0.35-0.95)). No significant associations were found for serum concentrations of vitamin B12 and folate, while higher serum ferritin level was positively associated with anaemia (p<0.001).

Key findings: The magnitude of anaemia determined in this study (30.9%) is considered as a moderate public health problem according to WHO standards. We found high prevalence of microcytic anaemia and adequate iron store, being higher serum ferritin level positively correlated to the presence of anaemia. Widespread infection or inflammation in the study area may be the another reason. Further studies are needed to explain the presence of infectious diseases in the study population and/or measuring modulators of acute inflammation such as normal C-reactive protein and/or α₁-acid-glycoprotein (AGP), are needed to reach conclusions.

**PT-013**

**Poster**

**Low-carbohydrate diet attenuates efficiently inflammatory response and oxidative stress in obese rat.**

Loulaa S.; Lamri-Senhadji M.Y.

Laboratory of Clinical and Metabolic Nutrition, Department of Biology, Nature and Life Sciences Faculty, University of Oran, Algeria.

Objectives. The inflammatory response triggered by obesity involves many components of the classical inflammatory response to pathogens and includes systemic increases in circulating inflammatory cytokines. Calorie restriction reduces the levels of multiple inflammation aspects, suggesting a link between nutritional status and inflammation. The aim of this study was to see if different hypocaloric diets can reduce lipid peroxidation and inflammation markers in obese rat.

Material and methods. Five weeks old male Wistar rats were kept in individual cages on a 12 hour daynight cycle at 24°C and fed with a high fat diet during 8 weeks. Obesity was randomly divided into three groups and consumed a low-carbohydrate diet (1.16Mj), a calorie restricted diet (40% of the standard diet energy, 0.96MJ) or a normal caloric diet (1.50MJ), for 4 weeks. At day 78, glycemic homeostasis (glucemia, insulinemia and glycosylated hemoglobin) was estimated. Serum lipid peroxidation markers (thioarbituric acid reactive substances, hydroperoxides and isoprostanes) and inflammatory adipokines concentrations (leptin, adiponectin and tumor necrosis factor alpha) were determined.

Results. In low-carbohydrate and calorie restricted diets versus normal caloric diet, glycemia (-38% and -32%, respectively), insulinemia (-35% and -67%, respectively) and glycosylated hemoglobin (55% and -23%, respectively) were decreased. Also, serum thioarbituric acid reactive substances (-34% and -37%), hydroperoxides (-38% and -35%), isoprostanes (-45% and -42%), leptin (-13% and -23%) and tumor necrosis factor alpha (-26% and -25%), adiponectin values were increased (+34% and +32%, respectively). Moreover, leptin and tumor necrosis factor alpha levels were lower with low-carbohydrate diet compared to calorie restricted diet (-22% and -26%, respectively).

Key findings. Low-carbohydrate diet compared with calorie restriction was more effective in reducing the cardiometabolic risk associated with obesity by attenuating lipid peroxidation and inflammation profiles.

**PT-014**

**Poster**

**Substitution of sardine oil by margarine increased adipose tissue enzymatic antioxidant defense in obese rats.**

Harmaz Reguiz S.; Boukhar N.; Lamri-Senhadji M.Y.

Laboratory of Clinical and Metabolic Nutrition, Department of Biology, Nature and Life Sciences Faculty, University of Oran, Algeria.

Objectives. The diet-heart hypothesis refers to the link between dietary fat consumption, blood cholesterol and risk of cardiovascular disease. Intake of trans fatty acids unfavorably affects blood lipids and lipoproteins. As margarine is a major source of trans, claims for the advantages of margarine over butter or other fats need to be scrutinized. The impact of replacing two fats of different origin (natural or industrial) was studied on dyslipidemia, lipid peroxidation and enzymatic antioxidant defense in high fat diet-induced obese rats.

Materials and methods. Fifty male Wistar rats were divided into two groups (n=24) and consumed during one month (d30) 20% margarine or sardine oil. At d30, 6 rats from each group were sacrificed and the remaining rats were then subjected to a change in diet for 1 month (d60) when replaced by sardine oil or margarine. At days 30 and 60, the cholesterolemia and triglyceridemia were estimated. In adipose tissue, the lipid peroxidation markers (thioarbituric acid reactive substances and hydroperoxides) and enzymatic antioxidant defense (superoxide dismutase, glutathione peroxidase and glutathione reductase) activities were measured. Results. Cholesterolemia and triglyceridemia did not significantly change significantly when sardine oil was replaced by margarine. In contrast, the substitution of margarine by sardine oil, reduced cholesterol and tryglycerol levels (-35% and -57%, respectively). In adipose tissue, thioarbituric acid reactive substances levels were reduced by 14% when sardine oil was replaced by margarine and by 18% when margarine was substituted by sardine oil. The replacement of sardine oil by margarine decreased hydroperoxides (-34% and -37%), hydroperoxydes (-38% and -35%), isoprostanes (-38% and -35%) and reductase activities were enhanced (+54% and +46%, respectively) when sardine oil was substituted by margarine. In contrast, glutathione peroxidase activity was reduced (-56%). Moreover, the replacement of margarine by sardine oil reduced superoxide dismutase (-11%) and glutathione peroxidase (-18%) activities, while it elevated glutathione reductase activity (+45%).

Key findings. In obese rats, the substitution of sardine oil by margarine does not modulate the dyslipidemia, but it decreases lipid peroxidation and inflammation. It is possible to propose tissue by enhancing antioxidant defense and seems efficient in adipose tissue against the cytotoxic action and the oxidative stress induced by a fat enriched diet.

**PT-015**

**Poster**

**Influence of dietary nitrate supplementation on the autonomic nervous system activity.**

Šťastnárová, L.; Stejskal, P.

Masaryk University Brno

Objective: The aim of the research was to investigate the effect of dietary nitrate supplementation (DNS) (beetroot juice containing 0.4 grams of dietary nitrate) on parameters of heart rate variability.

Material and Methods: 10 healthy men (21 - 41 y.) attended four-week double-blind experiment (nitrates/placebo) and they strictly followed the instructions of physical activity and diet. Each subject underwent a ramp incremental exercise test in vitro maxima conditions, 8 six-minutes tests on the standardized intervals (5 % below the anaerobic threshold), 8 measurements of spectral analysis of heart rate variability (SA HRV), 2 measurements of body composition, and 8 collections of venous blood samples.

Results: Analysis of plasma nitrates and nitrates significantly demonstrated a significant increase in heart rate in test at rest (53.63 ± 7.82 min-1 vs. 57.70 ± 3.99 min-1, p = 0.0000) and during standardized submaximal load (147.87 ± 11.06 min-1 vs. 152.33 ± 8.67 min-1, p = 0.0000). In our subjects also occurred an insignificant increase in blood pressure in the conditions of DNS (147.87 ± 10.94 mmHg vs. 121.70 ± 8.67, p = 0.1587). Significant increase in respiratory quotient during submaximal test (0.9476 ± 0.0417 vs. 0.9625 ± 0.0000) corresponds to a significant increase in ratio of maximal heart rate reserve (75.59 ± 5.46 % vs. 78.02 ± 4.76 %, p = 0.0000).

Key findings: These results point to the dominating negative effect of changes in autonomic nervous system activity which can inhibit the effect of nitrates on the formation of endothelial NO (with all circulatory and metabolic consequences).

**PT-016**

**Poster**

**Is Alcohol Drinking Associated with Renal Impairment in the General Population of South Korea?**

Lee Y.A., Kim H.N., Song S.W

Department of Family Medicine, St. Vincent's Hospital, College of Medicine, The Catholic University of Korea

Background: We examined relationships between the average amount of daily alcohol intake, drinking patterns, and renal dysfunction among South Korean adults aged ≥ 20 years.

Methods: The analysis used data from the Korean National Health and Nutrition Examination Survey (KNHANES), a cross-sectional survey of Korean civilians, conducted from January to December 2011. In this study, a sample of 5,251 participants was analysed.

Results: Compared with abstinence, the odds ratio for a decrease in estimated glomerular filtration rate (eGFR) was 0.14 (95% CI: 0.01-0.91) among heavy drinkers, and 0.42 (95% CI: 0.17-0.98) among binge drinkers and the association between the amount of mean daily alcohol intake, binge-drinking status and a likelihood of reduced eGFR value (p = 0.038) was significant. Moreover, the drinking pattern (p = 0.003) and adjusting for age, smoking status, amount of physical activity, morbidity hypertension, diabetes, dyslipidemia, anaemia and body mass index (value = 0.037) between alcohol consumption and the urine albumin to creatinine ratio in men, or between alcohol consumption and renal dysfunction in women.
Conclusions: Alcohol consumption was inversely associated with a reduction in eGFR in Korean men. However, these findings should be interpreted cautiously, given the other harmful effects related to alcohol consumption, especially heavy and binge drinking.

PT-017 Poster
Relationship between skinfold thickness and distance from the place of residence to the city among children and youth aged 7-13 years inhabiting rural areas: A repeated 30-year cross-sectional study.

Rozanowski J.1, Cyrek L.2, Rozanowska A.3
1 NZOZ Twoj Lekarz, Czelmo, Poland. 2Institute of Biology and Environmental Protection, Pomeranian University in Slupsk, Poland. 3Student at Medical University of Gdansk, Poland

Objectives: Increasing rates of childhood obesity all over the world are a cause for serious public health concern. Neighbourhood and community environments are thought to play a contributing role in the development of obesity among youth, but it is not well understood which types of physical environment characteristics have the most potential to influence obesity outcomes. Available literature analysing the impact of various environmental factors upon physical development of children and adolescents delivers only limited data addressing relations between the place of residence and distance or time necessary to commute to city (cultural centre).

Material and methods: Children (n 9201; 4544 boys and 4657 girls) aged 7-15 years inhabiting rural areas in Pomerania Region, Poland and attending to regional schools participated in a cross-sectional study. None urban transport between any place of abode and big city was available. Three-stage data collection was conducted in time-points: 1976-1984, 1988-1992 and 1998-2002. The driving distance between each child's residence and the city was determined with geographic information systems providing data both on the distance and the driving time. Statistical relevance of differences in mean standardised of the three skinfolds thickness: triceps skinfold (TSF), subscapular (SCSF) and abdominal (ASF), as well as skinfolds thickness in total (z-score) depending on the distance to the city, was assessed with t-test.

Results: Regardless the gender, all stages reported lower skinfold thickness average in participants living further off the city (over 30 km) when compared to those whose place of abode was within 15 km. The differences were statistically significant in girls in the years 1988 – 1992 (TSF P <0.001; SCSF P<0.001; ASF P=0.002), and in boys at all periods (P-value from 0.003 to 0.001). Our study uncovered that both groups showed no difference to the city characterised by similar socio-economic status (parents' educational status and occupation, population density, distance to school and household crowding). Simultaneously no statistically significant differences in children residing over 30 km from the city were observed when juxtaposing phases 1st vs. 2nd, 1st vs. 3rd and 2nd vs. 3rd, where distance from their place of abode was within 15 km distance only comparison of stages 1976-1984 vs. 1988-1992 revealed statistically significant differences in skinfold thickness.

Key findings: Within the population of rural children overweight was associated with proximity to the city and revealed that along with the increase in the distance the tendency to overweight measured by skinfold thickness decreased.

PT-018 Poster
Iodine deficiency prevention affected by salt reduction policies.
1Universidad Autónoma Metropolitana-Iztapalapa, Ciudad de México, México. 2Instituto Nacional de Ciencias Médicas y de Nutrición Salvador Zubirán, México.

Micronutrient malnutrition disorders should be examined within the whole context of the national socio-economic milieu. Iodine, is an essential component required for the production of thyroid hormones that humans need for many metabolic functions of the human body, its insufficiency intake impair mental and physical development that cannot be reversed by nutrition interventions. The importance go beyond the goiter as the only manifestation of deficiency, but also include awareness of the impact during pregnancy and infancy that can produce lethal clinical outcomes of the offspring and increase infant mortality. Deficiency during childhood reduces somatic growth, and cognitive and motor functions. Iodine sources in foodstuff, such as marine and dairy products, eggplant, radish and jumil forest bug are not available to all population. The only source and intake that people recognize is the iodized salt. The aim of this study is to investigate the population knowledge of the iodine disorders that might be produced by salt reduction, and to inform them the importance of the disorders produced by iodine deficiency. A survey to a total of 284 individuals, were provided, all identified iodine in salt, they did not know the problems produced by iodine deficiency, all include salt in meals, 23 of them agree to reduce salt but not void it from their diet. The Thyroid hormone, regulate many physiologic processes, including reproductive functions, growth and development. In the developing brain, influences cell growth and migration; promotes growth and maturation of peripheral tissues and skeleton, increases energy metabolism in most tissues and it raises the basal metabolic rate. Iodine deficiency produce goiter at all ages, but the most adverse effect is to the brain from the second trimester of pregnancy to the third year after birth that thyroid hormone are required for neuronal migration and myelination of the central nervous system termed as cretinism. Iodine deficiency cannot be reversed by nutrition interventions. Salt excess intake is associated with hypertension but it can be medical control. In conclusion salt consumption should be adequate but not void because sodium is an essential mineral in the balance of body fluids and iodine to prevent goiter and cretinism.

PT-019 Poster
Predictors of Change in Weight and Waist Circumference: 15-year Longitudinal Study in Australian Adults.
Abdshahab S.1,2, Lahmann H.P.3, Williams G.M.1,2, van der Pols J.C.3,4
1 In The Nutrition and Prevention of Cancer and Biology, Department of Medicine, Southern Clinical School, Monash University, Australia. 2QIMR Berghofer Medical Research Institute, Cancer and Population Studies, Locked Bag 2000, Royal Brisbane Hospital, Australia; 3The University of Queensland, School of Population Health, Australia.

Objectives: This study examines which socio-demographic and lifestyle characteristics are associated with weight and waist circumference (WC) change in a cohort of Australian adults over a 15-year period (1992 to 2007). Further, it tests the effect of period of birth (birth cohort) on mean change in weight and WC at two time points 15 years apart.

Material and methods: Up to three repeated measures of weight (n=1437) and WC (n=1317) were used. Self-reported data on socio-demographic and lifestyle characteristics were derived from repeated questionnaires. Applying generalised estimating equation (GEE), concurrent changes in predictors and outcomes were used for the analyses. Multivariable models, stratified by sex, were adjusted for potential confounders.

Results: Participants born more recently were heavier, on average, than those in the same age group 15 years earlier, but there was no such sex difference. Birth cohort effect was associated with change in weight and WC, but the pattern was different: participants gained weight up to age 55 years, while WC gain continued to 65 years. In women, higher level of recreational physical activity was associated with lower WC gain. Women categorised as sedentary had a 2.7 times higher WC gain than women with high recreational activity level (0.51 (0.34, 0.67) vs. 0.19 (-0.04, 0.43)) cm/year, P = 0.01. Parity was also associated with WC change in women, with an upward trend in average WC gain for women with up to 3 children but lower average increases for those with more than 3 children (all P<0.05).

Conclusions: This study confirms a birth cohort effect on body weight, with later-born cohorts being heavier. Our findings add longitudinal evidence to the knowledge that gain in anthropometric measures is a widespread problem affecting both sexes. In both men and women, age is the most important factor affecting change in weight and WC. However, engaging in recreational physical activity can prevent WC gain, even in women.

PT-020 Poster
What works (and why) in community nutrition education interventions directed at low-resource audiences.
Bell LL1, Cates SC2
1 Altarum Institute. 2 Survey Research Manager, RTI International.

Objective: Nutrition education designed to prevent or reduce obesity in limited-resource populations in the US is funded through various programs administered by the U.S. Department of Agriculture The purpose of this study was to assess the effectiveness of seven model nutrition education programs in promoting behavior change related to increased fruit and vegetable consumption and consuming low-fat dairy products. These model programs were conducted in seven different states.

Materials and Methods: Two of the interventions were conducted in child care settings and three were conducted in schools, and included a classroom component with take-home materials for parents. One intervention evaluated the impact of a web-based curriculum for women, and the final intervention was conducted with older adults (65-80). All projects used similar evidence-based curricula. Process evaluation data were collected to examine if the programs were implemented as intended, and examine factors that both facilitated or challenged their ability to achieve results. The process evaluation included key informant interviews with project
staff and partners, focus groups with clients, observations of client delivery and examination of administrative data. An impact evaluation was used to assess the impact of each intervention on participants' nutrition behaviors, including consumption of fruit and vegetables (FV) and use of fat-free/low-fat milk (instead of regular or reduced-fat milk). The impact evaluations used an experimental or quasi-experimental design with self-reported data collected on participants' nutrition behaviors using a food frequency questionnaire at pre- and post-intervention.

Results: The more highly-refined interventions showed statistically significant impacts on primary outcomes. One of the two childcare interventions showed a significant impact on at-home consumption of vegetables and use of fat-free/low-fat milk. One of the three adolescent-based interventions had significant impacts on FV consumption and use of fat-free/low-fat milk. The intervention targeted to older adolescents showed a significant impact on FV consumption. None of the other four showed significant behavioral impact, mostly due to the ability of the agency to implement the intervention or the need to manage logistical challenges. Lack of parental involvement also affected the school and childcare sites' ability to promote behavior change.

Key findings: The study findings suggest that well-planned and effectively implemented community nutrition interventions can improve nutrition behaviors of both young and the old in populations with limited financial resources. For interventions targeted to children, more work is needed to strengthen parent engagement to positively affect children's dietary behaviors. 

PT-021 The use of the pile sort method to understand food beliefs and classification systems in adolescents in peri-urban Lima, Peru. Banna J.C., 1 Buchthal O.V., 1 Delormier T., 1 Perry M.E. 2, 3 Creced-Kanashiro H.M. 2
1 University of Hawaii at Manoa, Honolulu, HI; 2 Instituto de Investigación Nutricional, Lima, Peru.

Objective: The aim of this study was to understand food classification systems in adolescents in peri-urban Lima, Peru. Methods: Unconstrained pile sorts with 30 cards with food images were conducted with 10 males and females ages 15–17 years. Respondents were asked to pile each card one pile and explain their groupings. In addition they were asked to order the foods pictured from healthy to unhealthy foods. A team-based analysis approach was used to analyze descriptions of the card piles and healthy/unhealthy foods using a coding schema. Results: The multidimensional scaling and hierarchical clustering analysis revealed six main food item clusters. The following labels and descriptors were most often to describe the main groupings identified: 1) junk food (non-nutritive, tasty, expensive, chemical); 2) fruits and legumes (healthy, tasty, lunch foods); 3) vegetables (prevent disease, natural); 4) meat (favorite, fatty, contain hormones); 5) dairy (breakfast foods (contain protein)); 6) fruit (prevent disease, contain vitamins). The more the more healthy the foods were considered, the more the consumption of nutrient-dense foods was encouraged. The study findings suggest that well-planned and effectively implemented community nutrition interventions can improve nutrition behaviors of both young and the old in populations with limited financial resources.
A comparative study of nutritional problems in preschool aged children in Nepal. Acharya, J., van Teijlingen E., Murphy, J., Hind, M. Bournemouth University

Introduction and Objectives: This paper explores diversity of cultural beliefs, knowledge and habits about food and nutrition that have affected health in positive and negative ways. The main objective is to measure the level of knowledge, attitudes and beliefs about ‘nutritious’ food for children amongst poor mothers in Nepal. Materials and methods: A mixed-methods study was conducted in an urban and rural area of Nepal. Sampling: A qualitative study was conducted with 524 mothers of 3-5 year old children as well as and seven Focus Group Discussions (FGD), consisting of Pharmacists, Auxiliary Nurse Midwives, Health workers, Social workers, Mothers, Spiritual healers and policy makers. Data collection: Data collection took place in three successive phases: coordination, field management, pilotting and survey from 25 June to 27 September 2012. Analysis: Quantitative data was analyzed using SPSS (v20.0) reporting mothers’ knowledge, attitudes and beliefs in respect of their children’s nutrition. Results: A total daily protein intake of 14.9 g was reported by 40% of the mothers with a 27% reduction of the serum anion Gap (p=0.0006). Significantly also decreased: leukocytes, 18% (p=0.0000); triglycerides, 53% (p=0.0000); urea, 45% (p=0.0000); homocysteine, 17% (p=0.0000); microalbuminuria, 81% (p=0.0000); systolic blood pressure, 8.3% (p=0.0000); and diastolic blood pressure, 7.5% (p=0.0000). Conclusions: The macronutrient Ma-Pi diet improved, at short term, insulin resistance and decreased the cardiovascular risk in type 2 diabetic patients. The reduced acid load was evidenced.

PT-025 Poster

PT-028 Poster


Background/Aims: The diet acid load has been associated to inflammation, insulin resistance, and cardiovascular risk. Main purpose of this study was to evaluate the impact of the lower acid load of the macrobiotic vegetarian Ma-Pi diet (70% carbohydrate as whole cereals, 12% vegetable protein, 18% fat) on this association. Methods: A prospective 21 days dietary intervention was carried out in 24 adults with type 2 diabetes (15 men, 9 women; 60.3 ± 6.4 y of age). Cases were selected from diabetic patients attending to the Preventive Medicine Centre of the University La Sapienza, Rome. Subjects were submitted to anthropometric, body composition, biochemical, and blood pressure records. Data was at onset and termination were compared. Results: The lower acid load diet was evidenced by the 7% increase in uric acid (p=0.0027) and 10% in blood bicarbonate (p=0.0014), together with a 27% reduction of the serum anion Gap (p=0.0006). Significantly also decreased: leukocytes, 18% (p=0.0000); triglycerides, 53% (p=0.0000); urea, 45% (p=0.0000); homocysteine, 17% (p=0.0000); microalbuminuria, 81% (p=0.0000); systolic blood pressure, 8.3% (p=0.0000); and diastolic blood pressure, 7.5% (p=0.0000). Conclusions: The macronutrient Ma-Pi diet improved, at short term, insulin resistance and decreased the cardiovascular risk in type 2 diabetic patients. The reduced acid load was evidenced.

PT-027 Poster


Background: The anthropometric status of the under-five children in orphanages in Abuja, Nigeria. Anthropometric indices of the children were assessed using length/height, weight and upper arm circumference. Material and Methods: The study was conducted using 200 orphans (96 males and 104 females) aged 0-59 months living in two orphanages in Abuja, Nigeria. Anthropometric indices of the children were assessed using length/height, weight and upper arm circumference. The weight of each child was measured using a Seca 880 (UNIS) scale. The length measurement of children 0-2 years was taken lying down (recumbent length) with portable (cranios-speed) length measuring board. Heightometer was used to measure the height of children 25-59 months. The upper arm circumference was determined using a Shakir’s strip (arm circumference non-stretch tape) marked in appropriate colours (green, yellow and red) to the nearest 0.1cm. The anthropometric data was analysed using anthropometric: 2011 and 2013 and categorized using WHO Anthro software version 2.2.4; designed for application of the WHO child’s growth standard in individuals and population 0-60 months. Results: The result showed that 45.5% of the orphans were overweight, 63.5% were stunted while 47.5% were wasted. Further categorization showed that 9.5% of the orphans were severely underweight while 36.0% were moderately underweight; 26.0% were severely stunted while 37.5% were moderately stunted; 10.0% were severely wasted while 37.5% were moderately wasted. Using the mid-upper arm circumference, 29.5% of the children were moderately malnourished while 9.5% were severely malnourished. The high percentage of the orphans that were stunted, wasted and
underweight indicates that many children in the orphanages were malnutri-
tioned. Stunting shows long term growth faltering. This could have adverse
effect on intellectual, cognitive and physical development of a child.
The child will not be able to achieve his potentials to contribute positively to
the economic and social development of nations.
Key findings: The anthropometric indices showed that more than half of the
children were underweight and 37% of them were overweight. This calls for urgent need
for nutritional interventions in the orphanages like Severe Acute Malnutri-
tion (SAM) Management and nutrition education for caregivers.

**PT-029**

**Association of bullying with the nutritional condition in teen-
age obesity among girls 11 to 15 years in Mexico City, 2013.**


1Department of Agricultural and Animal Production, Division of Biological
Sciences and of the Health, Autonomous Metropolitan University, México.
2Department of Attention to the Health, Division of Biological Sciences
and of the Health, Autonomous Metropolitan University, México.
3Student of the Doctorate of Biological Sciences and of the Health, Autonomous
Metropolitan University, México. *Rectoría General, Autonomous Metro-
politan University, México.

One of the principal problems that is taking summit inside our society is the
topic of the bullying. This phenomenon is a product of the visualization of
the violence that penetrates all the areas, including the school.
The adolescence is a period in which the identity development is particularly
important and depends of the social environment. In agreement with the experts,
bullying has a negative impact in the teenager development. The research on student
violence and victimization indicates that the implied teenagers suffer, in many occasions, serious psychosocial con-
sequences. The bullying brings with it immediate consequences like the auto-
concept and self-esteem deterioration of both principally involved actors, the
victim and the aggressor.

The aim of the present study was to determine if bullying influences the
nutritional state of the teenagers in the secondary public schools in Mexico City.
There was obtained a sample of 135 teenagers of the first degree of
secondary of the morning and evening shifts, corresponding 67.4% to the
boys and 32.6% to the second one, of which 54.67% is women and
53.3% remaining men. By means of the application of CURMIC-S ques-
tionnaire and the use of Who Anthro Plus program, obtained the diagnosis of
bullying and the nutritional state respectively. There was a overweight
prevalence of 25.9% (23.8% for women and 27.8% for men), and the
obesity prevalence was 14.1% (12.7% for women and 15.3% for men). 36.3
% of the total of the teens recount to have presented some type of bullying
at least in one occasion, while the remaining one 63.7% refer never have
presented some situation of school harassment. Analyzing the presence of
bullying for school shift the teenagers on the morning shift have major
probability of suffering some type of bullying (41.8 %), in comparison with
teenagers in the evening shift (25.0 %) nevertheless the difference is not
statistically significant (p = 0.05).

On having related the existence of bullying to relation to the sex, one thought
that women present major probability of suffering some type of school
harassment (46.0 %), in comparison with men (27.8 %), being the statis-
tically significant difference (p=0.05). The teenagers who have thinness and
overweight present major probability of suffering bullying (50% and 45.7
% respectively), in comparison with teens with normal weight (32.5 %)
nowadays they do not find statistical significant difference (p = 0.05).
In conclusion we did not find a direct correlation among bullying with the
nutritional state of the teenagers.

**PT-030**

**Nutritional status and school environment of 1st grade schoolchildren in Bulgaria, 2013.**

Duleva V., Petrova S., Rangelova I.

National Center of Public Health and Analysis, Sofia, Bulgaria

Objectives: Obesity of children is an important health problem in Bulgaria.
The phenomenon belongs to the most alarming health problems in the country.
The present survey was carried out in 2013, in 2013 the second survey
on representative sample of 1st grade schoolchildren was conducted in the
same schools. The aims to measure the trends in overweight and obesity in
primary schoolchildren and to assess the school environment.

Material and methods: The survey followed the protocol of the WHO Euro-
pean Childhood Obesity Surveillance Initiative, which was jointly directed
by the WHO Regional Office for Europe and the participating Member Sta-
tes. The national representative sample included 185 school; a total 3353
of 7-years old schoolchildren were enrolled. The weight and height were
measured with standardized anthropometric equipment and methods.
Overweight and obesity were assessed by BMI. WHO growth reference for
school-age children and adolescent, 2007 are applied. The school masters
filled-in the school record form.

Results: The data from 2013 present the high prevalence of overweight and
obesity, the rate of overweight (including obesity) among boys is
32.4% and in girls – 28.6%, obesity levels are – 15.7% among boys and
12.2% for girls. The data shows negative trends in overweight and obesity
in schoolchildren, the prevalence of obesity is increasing between 2008 (in
2008 the rate among boys is 12.8% and 11.8% for girls) and 2013 years,
especially in studied boys. After entering into force of national regulation of
healthy nutrition of schoolchildren in 2009, there are some positive changes
in school environment: nutrition education is included in school curriculum
from 2010, 7% of studied schoolchildren does not have salty and sweet
food in their meals. The phenomenon of suffering some type of bullying in
the areas, takes the high rate of 40.7% for boys and 35.4% for girls among
secondary schoolchildren. The phenomenon is a product of the
violence that penetrates all the areas, including the school.

Key findings: The anthropometric indices showed that more than half of the
children were underweight and 37% of them were overweight. This calls for urgent need
for nutritional interventions in the orphanages like Severe Acute Malnutri-
tion (SAM) Management and nutrition education for caregivers.
PT-033
The iodine content in food products from Poland.

S. Kostkiewicz, Jarosz K., Kryger B., Glowiak A., Oltarzewski M.
National Food and Nutrition Institute, Warsaw, Poland.

Objective: The Polish territory has been classified as an iodine-deficient area. Since 1997 the national programme of obligatory iodisation of household salt was implemented. Household salt should contain potassium iodide (30 ± 10 mg KIO₃ per kg of salt) or potassium iodate (39 ± 13 mg KI0₃/kg of salt) which corresponds to 2.3 ± 0.77 mg of iodine/100g of salt. The aim of this study was to access the iodine content in daily diets of Polish pupils and the role of household salt as a source of iodine.

Material and methods: The study was carried out in 2006, 2008, 2009, 2010 and 2011 among 981 girls and boys aged 9-13 years with the use of one-day dietary recall. The data of iodine content in food products was based on the National Food Composition Tables. The results of iodine intake were compared to the Estimated Average Requirements (EAR). In daily diets the share of iodine (% from food products including iodised salt was performed.

Results: The mean total daily iodine intake in the group of pupils was 99 µg and ranged from 3 to 1012 µg (girls) to 102 µg (boys). The comparison of individual iodine intake to EAR values showed that 62.4% of diets were above EAR. Household salt was the most significant source of iodine (68%) in diets of studied pupils. The mean iodine intake from household iodised salt was 67 µg. The others important sources of iodine were milk and milk products (12%).

Key findings: Factors that impact the iodine deficiency prophylaxis based on obligatory iodisation of household salt is effective. Household salt is the main source of iodine in daily diets of Polish pupils. The results of this study show the need of household salt iodisation in Poland.

PT-034
A multi-stakeholder approach to explore commitment and capacity to address infant and young child feeding practices in the Breda Valley District, Western Cape, South Africa.

Du Plessis LM, McChailan MH, Drimie SE
Division of Human Nutrition, Department of Interdisciplinary Health Sciences, Faculty of Medicine and Health Sciences, Stellenbosch University, Cape Town, South Africa

Background and objective: The Community Nutrition Security Project (CNSP) baseline research investigated the food-security situation in vulnerable communities in the Breda Valley, Western Cape, South Africa; the site for an IYCF rural camp intervention. Nutritional assessments indicated, among other poor, infant and young child feeding (IYCF) practices and high levels of stunted growth in children. Phase 2 of CNSP, reported here, applies a systematic approach to identify and engage with many different stakeholders that can impact IYCF practices at the district level. The research explored the capacity of key stakeholders, the relationships among them and their relative power and influence with regard to the IYCF situation.

Materials and methods: A strategically selected group identified key stakeholders in IYCF followed by individual in-depth interviews with particular stakeholders. Hereafter, stakeholders were engaged in a workshop through a participatory research method (“NetMap”) that defines relationships among stakeholders as well as their priorities and powers.

Results: Interview-data showed that stakeholders displayed a good understanding of IYCF and development, but appropriate IYCF practices were not well known. Factors influencing IYCF practices in the district were identified as poor knowledge, poverty, unemployment, misuse of social-security grants, teenage pregnancies, child neglect, gangsterism, drug abuse and HIV. A discrepancy between the various government entities was highlighted as a contributing factor to sub-optimal service delivery and poor community response. The “NetMap” process revealed a significant flow of financial support from National Treasury towards services focused on young children. This allocation of funds is commensurate with rigid compulsory attendance and the opening of opportunity costs, resulted in changes in the curriculum. The strengthening of the higher education, considering the university autonomy, the creation of departmental and the implementation of post graduate, diversifies the grounds of the course, by the insertion of new content and the inclusion of interns. Pedagogical of health-care education, agricultural, sociology and anthropology appeared into the curriculum. In 1980s, the Food Education is present as a discipline of Public Nutrition. In order to assess the demands of teaching, due the new minimum curriculum, it broadens the number of subjects and consequent fragmentation of content. After that, it creates the discipline Nutrition Education, University's changes altered the responsibility for the course. The course has a large restructuring with the modification in the curriculum and period. Disciplines as Agricultural Education, Health Education and Pedagogy disappear, giving place to Health Promotion. The humanities, such as sociology, become "Applied Nutrition". In the early 21st Century, the approximation of the healthcare and education sectors for the establishment of the curriculum guidelines for changes in healthcare courses, reflected in changes.

Conclusions: The reformulation was a complex process that involves various stakeholders and the development of several writing and synthesis activities. There have been changes in the structure, resulting from health and education public policies. For that reason, this subject needs to be included in the curricula.
PT-037

**The association between obesity/overweight and lipid profile in a sample of 6-7 year olds.**

Omidvar N.M1,2, Narmocheh A.M1,2, Kalantari N.1, Salehi F.1, Amiri P.1, Eslamian G.1, Sobhani R.1, Yarpardan A.H.1

1. Department of community Nutrition, Faculty of Nutrition & Food Technology, National Research Institute of Nutrition and Food Technology, Shahid Beheshti University of Medical Sciences & Health Services, Tehran, Iran; 2. Nutrition & Dietetic School of Medicine, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran.

Objectives: Childhood obesity contributes to several complications, including increased risk of type 2 diabetes, hypertension, cancers and psychological disorders. The aim of this study was to evaluate the association of overweight and obesity among Iranian 6-7 year old children with lipid profiles, as an adverse cardiovascular risk factor.

Methods and results: This study was conducted as the baseline analysis of a Primary health care-base trial on 171 overweight/obese first-grade students aged 6-7 years in the city of Tehran. Body weight and height were measured and body mass index (BMI) was calculated. Z-scores of BMI for age were calculated by WHO AnthroPlus software. Blood samples were drawn and total cholesterol, high-density lipoprotein cholesterol (HDL-C), low-density lipoprotein cholesterol (LDL-C), and triglycerides were measured. Normal range of lipid profile was evaluated based on National Cholesterol Education Program (NCEP) Expert Panel on Cholesterol Levels in Children.

Results: The sample included 77 (45%) boys and 94 (55%) girls, with mean age of 80.7±5.1 months. Of the total sample, 20.5% were overweight (z-score BMI for age 1 to 2) and 79.5% obese (z-score BMI for age ≥ z2). Mean±SD BMI z-score of the sample was 2.7±0.94. Elevated levels of TG (≥ 250 mg/dL) and Cholesterol (≥ 170 mg/dL) were observed in 62.6% and 29.1% of subjects, respectively. Only 29.1% of children had normal HDL-C levels (≥45 mg/dL) and 74.3% of children had acceptable level of LDL-C. The Spearman correlation coefficient between z-score indicated a positive significant association with triglycerides (r=0.316), LDL-C to HDL-C ratio (r=0.23) and a significant negative association with HDL-C (r=-0.3), only in girls. No significant association was observed between BMI z-score and total cholesterol and LDL-C in both sexes.

Key findings: the results show that overweight and obese children are at increased risk of cardiovascular disease. This calls for proper interventions to prevent and control overweight and obesity in primary school children. The study sample is now under a pilot weight management program.

PT-038

**Traditional dietary patterns and obesity: a population-based study in Córdoba, Argentina.**

Ababey L.R.1, Pou S.A.2, De La Quintana A.G.3, Forte C.A.3; Diaz M.P.3


Obesity is a chronic, complex, multifactorial disease that has sharply increased in prevalence in both developed and developing countries. According to the second National Risk Factor Survey, 18% of adult population of Argentina was obese in 2009.

Factor analysis has an intuitive appeal in nutritional epidemiology as it offers a means of factoring intakes of a variety of foods reflecting underlying eating patterns.

Objectives: a) To identify traditional dietary patterns from adult populations in Córdoba city by sexes; b) To describe the dietary patterns emerging specifically from populations with obesity. Material and methods: This work included 4327 subjects (2495 women and 1832 men) from a population-based study performed in Córdoba city (Argentina) in 2009 to 2012. To assess dietary intake, a food frequency questionnaire was used. A posteriori dietary patterns were identified through principal component factor analysis (varimax rotation) carried out on a selected set of 15 major food groups.

Results: We identified four major dietary patterns in male population named “med-sugar and starch rich foods”, “western pattern” (meat, eggs, meat products, potato and meat products”, “fruit, nonstarchy vegetables, dairy and seafood foods”) and “high-sugar drinks pattern”. Among the male population with obesity (16.7%) emerged two specific patterns characterized by strong factor loadings on meat products and alcohol, and snacks and high-sugar drinks, respectively.

In women, the dietary patterns identified were labelled as “starch-rich foods” (cereals products and nonstarchy vegetables), “fruit and vegetables”, “meat products” and “high-sugar drinks”. The dietary patterns for female population with obesity (17.2%) were similar to the overall population, although a new pattern emerged with snacks, dairy foods and cheeses as dominant groups.

Key findings: Subjects with obesity have characteristic dietary patterns that differ from typical patterns in overall population, especially in men.

PT-039

**In Vitro digestion-assisted development of b- cryptoxanthin-rich functional foods.**

Granado-Lorencio, P.1; Banco-Navarro, P.2; Perea-Sacristán, J.; Herran­dez, Elena, B.3; Donoso-Navarro, E; Silvestre-Mardomingo, RA.3


Introduction: Consumer demand for natural products favours the development of foods containing bioactive ingredients with health benefits. B-Cryptoxanthin (B-Cx) is a major dietary provitamin A carotenoid mostly provided by citrus fruit that displays antiatherogenic and bone anabolic effects.

Bioavailability is a critical point on assessing the role of bioactive compounds in human health. In this context, in vitro models based on human physiology have been developed as simple, inexpensive and reproducible tools to study digestive stability, hydrolysis, micellarization and intestinal transport, and to predict the bioavailability of food components (i.e. B-Cx).

Objective: To assess the effect of lipid emulsions on the bioaccessibility of B-Cx.

Methods: Experimental beverages; Three identical B-Cx-enriched milk-based fruit beverages were developed except for the present of different lipid components; A) soy lecithin, B) milk fat plus emulsifier, C) olive oil plus soy lecithin.

In vitro bioaccessibility : Stability (recovery), the degree of b-cryptoxanthin esters hydrolysis and the incorporation into aqueous-micellar phase of total and free b-cryptoxanthin were assessed using a previously tested in vitro gastrointestinal model. Analysis of b-cryptoxanthin was performed in aliquots collected in duplicate at different time points during the in vitro digestion procedure. B-Cx in beverages (extracted with and withoutaponification) and analysed by HPLC.

Results: Initial total content of B-Cx in the beverages ranged between 148-178 μg/dl while free-B-Cx was similar in all of them, accounting for 21%. At duodenal phase, free-B-Cx was also very similar in all the beverages, ranging between 55-59 μg/dl and accounts for 31-46% at this stage. Thus, the degree of ester hydrolysis (duodenal/ initial) varied between 48% (beverage A) and 65% (beverage C). In the micellar phase, free-B-Cx ranged between 34 μg/dl (beverages B and C) and 53 μg/dl (beverage A) indicating that between 90% (beverage A) and 57-58% (beverage B and C) of the free-B-Cx present in the beverage at the start was available for absorption (micellar phase). However, the total B-Cx (spaprofined) recovered in the micellar phase ranged between 81% (beverage B) and 100% (beverage C) of that initially present in the food.

Conclusion: Our results support the suitability of in vitro models to provide relevant information to assess the effect of food matrix modifications on the bioaccessibility of bioactive components. Thus, in vitro digestion-assisted approach may be useful in the design and evaluation of functional foods.
PT-041

Compliance of the Dietary Reference Intakes (DRI) for Spanish Population-2010 among Menorcan elderly people.

Tur JA.; Montenegro C.; Bibiloni MM.; Ferra A.; Pons A.

1 Research Group on Community Nutrition and Oxidative Stress, University of Balearic Islands, and CRIBRoin (Physiopathology of Obesity and Nutrition), Palma de Mallorca, Spain; 2 Department of Nutrition, University of Granada, Spain.

Objectives. The aim was to study the compliance of the Dietary Reference Intakes for Spanish population and the percentage of the population below 2/3 and 1/3 of the DRI.

Methodology. The population of interest comprised 402 participants (187 men and 215 women) aged between 65 and 94 years from Menorca Island. The questionnaire included more than 35 questions related to socioeconomic and anthropometric data, food and lifestyle habits and physical activity. Energy and nutrients intake was derived from the average daily food consumption reporter in two non-consecutive 24-hour diet recalls. The proportion of individuals with intakes below 2/3 and 1/3 of the DRI was the criterion used to estimate the risk and high risk to inadequate intake. Descriptive analysis was used means and SD. The unpaired Student T test was used to test differences between gender means. Analyses were performed with SPSS version 21.0.

Results. Energy intake was significantly lower than DRI in men and women. Non significant differences were found between thiamine, riboflavin, niacin, pyridoxine, folic acid and zinc intake in men and women. However, men had significantly lower or higher intakes than DRI for all nutrients, except for niacin and folic acid (p<0.05). Energy, thiamine, riboflavin, pyridoxine and zinc intakes were more frequently below 2/3 DRI in men than in women (p<0.05); however, vitamin B12, C, A, iron and selenium intakes were more frequently below 2/3 DRI in women than in men (p<0.05). Less than 7% of the participants had high risk of deficient intake for all nutrients except to vitamin D, retinol and vitamin A in men and women. It did not exist gender differences in the proportion of participants below 1/3 DRI for all analysed nutrients. In conclusion, considering the DRI for Spanish population, consumption of vitamin E, vitamin A and vitamin D should be increased in the Menorcan elderly people.

Key findings: Compliance of the Dietary Reference Intakes (DRI) for Spanish Population-2010.

Percentage of the population above 2/3 and 1/3 of the DRI. Vitamin E, vitamin A and vitamin D should be increased in the Menorcan elderly people.

PT-042

Metabolic syndrome prevalence among Northern Mexican adult population.

Tur JA.; Salas R.; Bibiloni MM.; Ramos F.; Villareal L.; Pons A.; Sureda A.

1 Research Group on Community Nutrition and Oxidative Stress, University of Balearic Islands, and CRIBRoin (Physiopathology of Obesity and Nutrition), Palma de Mallorca, Spain; 2 Faculty of Public Health Nutrition, Autonomous University of Nuevo León, Monterrey, Mexico; 3 Department of Health of the State of Nuevo León, Mexico.

Objectives. The aim was to examine the prevalence of metabolic syndrome and associated risk factors in Northern Mexican adults aged ≥16 years.

Methodology. The study was a population-based cross-sectional nutritional survey carried out in the State of Nuevo León, Mexico. The study included a sub-sample of 1,200 subjects aged 16 and over who took part in the State Survey of Nutrition and Health Nuevo León 2011/2012. Results. Anthropometric measurements, physical activity, blood pressure and fasting blood tests for biochemical analysis were obtained from all subjects. The prevalence of metabolic syndrome in Mexican adults aged ≥16 years was 54.8%, reaching 73.8% in obese subjects. This prevalence was higher in women (60.4%) and increased with age in both genders. Multivariate analyses showed no evident relation between metabolic syndrome components and the level of physical activity. The increasing prevalence of metabolic syndrome highlights the need for developing strategies for its early detection and prevention. Key findings: Metabolic syndrome prevalence among Northern Mexican adult population.

Obese Mexican adults, mainly women, are particularly at risk of developing metabolic syndrome.

The metabolic syndrome prevalence was higher in Mexican women than in men and increased with age in both genders.

PT-043

Zinc intake and status in Portuguese women living in Lisbon area.

Tavares NR.; Abreu S.; Costa S.; Miranda A.; Rosado C.

CBIOS, Universidade Lusófona de Humanidades e Tecnologias, Campo Grande, Lisboa, Portugal; CIDAE Faculdade de Desporto, Universidade do Porto, Porto, Portugal; DSIPS, Instituto Nacional de Saúde Doutor Ricardo Jorge, Lisboa, Portugal.

Zinc is an essential microelement, especially in relation to its impact on immune function, bone mass, cognitive function and oxidative stress. Inadequate intakes of microelements negatively affect the nutritional status. Data are scarce on zinc intake and status in Portuguese women. In this study the intake and status of zinc in women living in Lisbon area were assessed. Dietary intakes were collected using the 4-day recall-record method. Status of zinc values were obtained from blood samples. Seventeen subjects completed the study. All were Caucasian women with a mean age 52.3±7.3 years and mean body mass index 24.29±2.19 kg/m². Estimated mean daily zinc intakes were 6.8±2.1 mg and 1.2±0.4 mg for Spanish and Portuguese women, respectively. Mean serum zinc concentration was 10.4±1.9 μmol/L and 47% participants showed values <10.7 μmol/L. The relationships between indices of zinc nutritive status were not significantly correlated. In relation to the zinc Dietary Reference Intakes, zinc intakes were inadequate. The results showed a zinc deficiency in this women group living in Lisbon area.

PT-044

Prevalence of Overweight Among HIV-infected Adults in Panama.

Escalada L.; Farías H.; Núñez A.; Ríos-Castillo L.; Palar K.; Derose K.

1 HIV and Nutrition Unit, World Food Programme, Regional Bureau for Latin America and the Caribbean, United Nations, Panama; 2 STDIHNADS National Program, Ministry of Health, Panama; 3 Nutrition Research and Comprehensive Development Foundation, Panama; 4 RAND Corporation, Santa Monica, CA, USA.

Background: Overweight is an important risk factor for cardiovascular disease and is of increasing concern among people with HIV on antiretroviral therapy. Objective: To estimate overweight prevalence among Panamanian HIV-infected adults. Methods: A cross-sectional study was conducted from November 2013 to March 2014 in 2 HIV care centers in La Chorrera and Colon, Panama. The sample included 80 adults (53% men) with mean age 42±9 years. Body mass index (BMI) was calculated from measured height and weight. Overweight was defined by BMI ≥24.9 kg/m²; percentage body fat (%BF) >25% for men and >33% for women; waist circumference (WC) >102 cm for men and >88 cm for women. Results: Mean ± SD for BMI was 23.6±4.1 kg/m² among men and 24.9±5.6 kg/m² among women (t-test, p<0.05). Prevalence of overweight by BMI was 38% among men and 50% among women (Chi², p<0.05). Mean ± SD of %BF was 20.6±7.1% among men and 31.3±8.6% among women (t-test, p<0.05). Prevalence of overweight by %BF was 21% among men and 53% among women, (Chi², p<0.05). Mean ± SD of WC was 83.7±10.8 cm among men and 83.1±14.4 cm among women (t-test, p<0.05). Prevalence of overweight by WC was 7% among men and 35% among women (Chi², p<0.05).

Conclusion: Overweight is a substantial problem among Panamanian HIV-infected adults, especially among women, and has important clinical and public health implications. Monitoring of nutritional status of HIV-infected adults is necessary to identify those who may benefit from interventions designed to address overweight among this population.

PT-045

Young athletes and their dietary habits.

Hrncirikova I.; Kapounkova K.; Kumst M.; Dovtsova L.

Czech Republic, Brno, Masaryk University, Faculty of sport studies.

III World Congress of Public Health Nutrition
Introduction: Sport gymnastics is a demanding power discipline. Good quality performance and trainings require supply of macronutrients and micronutrients. In a junior category, the demand for quality nutrients is even higher owing to growing organism in youths.

Currently, diet in inseparable part of training programs of sporting children. Composition of dietary regime becomes crucial, as it must contain balanced amount of basic nutrients, vitamins, and minerals, along with supplementary plans and individual forms of supplements. All must correspond with training seasons and present requirements. The demands in juniors for quality and quantity of nutrients are, of course, bigger than the ones of adults. Insufficient, even temporary absence of notion in this result in damage to health, in better scenario the outcome is merely inferior performance or training.

Methodology and results: We carried out a research into 33 members of gymnastic teams. There were 13 boys and 20 girls. The average age was 15.5 years. The average age of girls was 14.7 years. The average height/weight ratio of boys was 170 cm/62 kg. The average height/weight ratio of girls was 155 cm/48 kg.

We applied a method of dietary habits analysis through 24 hour recall, a standard questionnaire for dietary habits in sporting and non-sporting population, in a four days course, i.e. 3 working days and one weekend day. This weekend day was chosen due to presumed differences in the training program. The evaluation of dietary habits was carried out by 5W program, which is used in Czech hospitals and other health-care institutions. Furthermore, we analyzed the body posture through Inbody 230 machine, performing on a principle of bio-electric impedance. A consequent measurement was passed through Cortex machine based on indirect calorimetry.

The measurements were carried out in the morning on an empty stomach, without training, the probands having been instructed. The measurements took place twice a day in three consequent days. The results gave the consequent average figures.

The average height/weight intake of all probands in four days was 7000 kJ a day, consisting of 250 g of carbohydrates, 60 g of fat and 60 g of proteins a day. The energetic intake of probands was irregular, they suffer from vitamin and mineral insufficiency and the diet is rather monotonic. The recommended intake of nutrients for this age group and sports performance at least 350 g of saccharides 80-90 g of proteins and similarly, 80-90 g of fat a day. The absence of basic nutrients is apparent. Their long-term insufficiency will result in weariness, worse sports performance, injury, decrease in cognitive functions and development.

Conclusively, the analysis of dietary habits showed lack of information on the importance of nutrition in demanding training in sport gymnastics. It revealed the necessity of immediate intervention, education and intense cooperation with trainers, parents and probands. From the long-term point of view, this type of diet will result in injuries, weariness, insufficient development and growth in youths.

PT-047 Poster Comparison of nutritional status and associated factors of patients in a public hospital and other private.

Aziel C, Pignola A, Pusman M.

Clinical Nutrition Careers Specialization, School of Medicine, Buenos Aires University, Argentina.

Introduction: The malnutrition prevalence on admission to Latinoamerican Hospital affects over 50% of patients, increasing health costs, without discrimination between public and private institutions. Detzyk Subjective Global Assessment (SGA) is a nutritional screening tool that can identify individuals according to risk of malnutrition, providing valuable data on its causes.

Objectives: To compare the differences in nutritional status and associated factors in admission patients to Buenos Aires Autonomous City public and private hospital, Argentina.

Materials and Methods: A comparative cross-sectional study. During Period April 2013, 210 patients were assessed at admission within 72 hours in the Medical Clinic rooms by hospital nutritionist using Subjective Global Assessment (SGA) in Buenos Aires German Private Hospital (GH), and 120 belonging to Ramos Mejia Public Hospital (RMH). Data were analyzed with STAT and EPDAT VCC - 3.1 Results: Similar gender distribution; mean age 61.2 years (+15.6).

Nutritional Status: GH: 73.3% (95% CI 62.9-82.1) had no malnutrition (NM); RMH: 25.5% (95% CI 16.9-34.6) had moderate malnutrition (MMR) and 1.2% had severe malnutrition risk (SMR); for RMH: 25% (95% CI 16.8-34.6) had NMR; 35.9% (95% CI 25.7-45.2) had MMR and 39.1% (95% CI 29.4-49.3) had SMR being found statistically significant differences (p<0.00001) in NMR and SMR.

Deficiency signs: 23.3% (95% CI 55.8-65.2) had no WL in the GH and 33% (95% CI 23.9-43.1) in the RMH; 16.6% (95% CI 9.4-24.7) had severe WL in the GH and 30% (95% CI 21.2-40.4) in the RMH; both statistically significant (p<0.0001) and p=0.0387, respectively. This variations in the last month mainly associated with hypoxia: 35% (95% CI 25.7-45.2) in the GH and 65% (95% CI 54.8-74.3) in the RMH; statistically significant difference (p<0.00001).

Malnutrition prevalence (p=0.005) were found in the categories without loss and in severe and moderate loss of both compartments. Statistically significant differences (p=0.005) were found in the categories without loss and in severe and moderate loss of both compartments.

Deficiency signs: 30% (95% CI 21.2-40.4) had low GI and 60.8% (95% CI 49.7-69.7) of SMR, statistically significant differences (p<0.0001).

Fat loss and lean mass: GI: Lossless 72.2% and 70% similar percentage (21-28%) for each category: lossless mild loss, moderate loss, severe loss of both compartments. Statistically significant differences (p=0.005) were found in the categories without loss and in severe and moderate loss of both compartments.

Conclusions: Patients in public hospitals are more likely to enter malnourished than patients in private hospitals, a condition probably produced by reduced access to food and health care.
10 to 103 times higher in Gil compared to other groups at M1 and M2, respectively. Key findings: The best model to induce nephrolithiasis in rats was 0.5% Ethylene Glycol combined with vitamin D3 (Gil), which acted as a catalyst for this induction process by increasing the calcification and kidney damage.


Objective: To compare dietary variety and general characteristics of the diet of Guatemalan women of reproductive age from 4 selected socio-geographic settings.

Materials and methods: 171 women, aged 18-45 y and neither pregnant nor lactating, were recruited across 4 socio-geographic sectors in the departments of Quetzaltenango and Retalhuleu in western Guatemala. The samples were as follows: a rural, low-income group living in the department of Quetzaltenango (n=51, QLU), an urban, low-income group living Quetzaltenango City (n=40, QUL), an urban, middle-income group living Quetzaltenango City (n=40, QUM) and an urban, middle-income class living in Retalhuleu (n=50, RUM).

Previous-day dietary recalls were collected. Homemade mixed dishes were disaggregated to basic ingredients; portion sizes were not taken into account. Individual dietary variety was determined by counting the number of different food and beverage items consumed in a single 24-h period. Dietary variety was compared between groups using Chi-square.

Results: A total of 119 different food and beverage items were reported amongst 171 female participants. The dietary variety was the highest for the QUM sample (n=141), followed by the RUM sample (n=133), the QL sample (n=122), and the lowest for the QUL sample (n=85) (p<0.001). 56 items were reported in all 4 areas. 10 food items were only mentioned by QUL, 9 by QUL, 24 by QUM and 13 by RUM. The 10 most commonly consumed items were ordinary ingredients of recipes (sugar, oil, salt and water) and traditional foods (tortillas, black beans, bread, tomato, onion and coffee). Of these, only sugar, salt, water, tortillas, tomato and onion were reported across all 4 areas. Oil and bread were only mentioned in the urban areas, whereas typical corn products such as pinol (grounded corn), tamale (made of corn dough) and minced corn, were only mentioned in the rural setting.

Key findings: Dietary variety, which has been shown to be associated with dietary adequacy, varied between socio-demographic areas examined. Strategies associated with dietary and health improvement for Guatemalan settings, such as nutrition, hygiene, food culture and local foods. Funded by: Sight and Life of Basel, Switzerland.

PT-050 Poster Using intervention mapping to develop the nutrition education strategy component of a randomised trial promoting healthy food and beverage purchases in Australian remote Indigenous communities. Liberato SC, Ball K, Knight F, Brimblecombe J, Menzies School of Health Research, Charles Darwin University, John Mathews Building, Casuarina, NT, Australia

Background: Nutrition education can raise individual knowledge and self-efficacy to positively influence healthy food intake. There is limited evidence available on the development, implementation or effects of nutrition promotion activities in remote Aboriginal communities in Australia. There is also a lack of information on the elements of nutrition interventions that are most effectively influenced by the implementation of specific intervention development processes. An Intervention Mapping framework was applied to the development and proposed process evaluation of the in-store nutrition education component of a randomised controlled trial examining the impact of a price discount intervention and a combined price discount and in-store nutrition education intervention for promoting purchase of fruit, vegetables, water and diet soft-drinks among remote Indigenous communities.

Methodology: The intervention mapping comprised six steps: (1) Needs assessment, (2) Preparing matrices of change objectives, (3) Selecting theory-informed intervention methods and practical applications, (4) Producing the program components and materials, (5) Planning program adoption, implementation and sustainability, and (6) Planning for evaluation to assess the level of implementation achieved including five elements: i) fidelity; ii) dose delivered; iii) dose received; iii) reach; and iv) context. All determinants included in the matrices for each program objective were listed and matched with analyses derived from the Social Cognitive Theory. Thematic parameters and characteristics of the context were checked and the selected method was translated into a nutrition education strategy.

Results: A 6-month nutrition education strategy was developed comprising four interactive activities (taste-testing [2], cooking demonstration and sun-gain-drinks display) and three non-active activities (monthly posters and activity sheets and shelf-takers displayed during the entire intervention period). Six data collection instruments were developed for the process evaluation.

Conclusion: This paper contributes into the development of nutrition promoting interventions that consider theory together with multiple sources of evidence, expert opinion and context. Given this, the design of this intervention involved the development of a detailed process evaluation strategy to collect data on delivery, reach and fidelity of the planned activities. This information will serve to further inform the development and evaluation of nutrition promotion activities. The process evaluation will inform an assessment of the extent to which implementation of an intervention in a real-life setting impacts on food and beverage purchasing among Indigenous Australians.

PT-051 Poster Differences in selected dietary habits between lower and upper secondary school students. Överby NC, Haugen T, Haagardt R. University of Agder, Serviceboks 422, 4604 Kristiansand, Norway.

Objective: To explore differences in meal pattern and artificially sweetened beverages or sugary sweetened beverages purchased among lower and upper secondary school students.

Material and methods: First grade students from all upper secondary schools in the two Norwegian counties of Aust-Agder and Vest-Agder (mean age: 16 years) and 8th grade students in four selected lower secondary schools (mean age: 14 years) were invited to participate, in 2012 and 2010 respectively. In total 2132 adolescents, 1650 16-year olds and 482 14-year olds filled in the same food frequency questionnaire regarding beverage and meal frequency. Having artificially sweetened beverages or sugary sweetened beverages 3 times a week or more often was categorized as a high consumption of sugar-sweetened beverages. Meal patterns were categorized into having a meal often (6 times/week or daily) or seldom (5 times/week or less). Differences were tested with Pearson's chi-squared test.

Results: There was a significantly higher proportion of 14-year olds who had sugary beverages more often (47% vs. 42%, p=0.033) compared to 16-year olds. However there was a significantly lower proportion of 14-year olds having ASB often (16% vs. 27%) compared to 16-year olds. There were fewer 14-year olds having lunch often than 16-year olds (58% vs. 65%, p=0.008). Further, there were no significant differences in proportion of having breakfast (71% vs. 67%, p=0.055), dinner (87% vs. 85%) and supper (58% vs. 53%, p=0.056) often between 14-year olds and 16-year olds, respectively.

Key findings: With higher age fewer students consumed sugary sweetened beverages often, however there were more who consumed artificially sweetened beverages often than younger students. The transition from lower to upper secondary school is an important time for public health initiatives, and more descriptive data are important for such initiatives.

PT-052 Poster Perception of body image in urban adult female population of Valladolid. Cao Torija M.J., 1, 2 Castro Alija M.J., 1, 2 Jimenez Perez J.M.; Fernandez Escudero I.; Quinto Fernandez E. 2. 1Facultad Enfermería Ciencias de la Salud Universidad de Valladolid. 2 Centro de Investigación de Entobiotecnología y Nutrición (CENIVA) Facultad de Medicina Universidad de Valladolid. *Area de Nutrición y Bromatología. Facultad de Medicina. Universidad de Valladolid.

Introducción: Body image has been defined as a multidimensional structure that differ in two underlying dimensions, the first refers to the perceptual aspects of body size estimation and the second includes the emotions or feelings that the individual has associated with his physical appearance and cognitive assessments that makes of its own body. Having a negative body image can affect health. When this happens there is a greater predisposition to more disturbances such as anxiety, depression, low self-esteem, anorexia, bulimia, binge-eating, and many others, all of which can have serious consequences.

Objectives: Set the perception of body image in a representative healthy adult women of Valladolid (Spain) collect.
Results: From estimates of height and weight data we obtain a mean body mass index (BMI) of 24.43, within normal parameters. 87.5% of women are concerned about their body weight, between of them the 78% of the cases are concerned due to a combination of aesthetic and health reasons. The 57.14%, have tried to hide their silhouette with clothes and if we calculate the index body set (BMI), it gives a score of 108.11 listed as moderate fat accumulation of weight. In the perception of body image, esti-
mated by using models, we find that the 37.49% believe that the model that represent them has overweight or obesity.

Conclusion: The women in our study have a normal mean BMI stimate. They are concerned about their weight, which overestimate moderately. They try to hide their silhouette and consider that their image corresponds to overweight in a high percentage of cases.

PT-053 Water Balance Index: the development of a new instrument.
Karanapanas G1, Panagiotakos D2, Malisova O3, Kapsokafoulo M4. 
1Agricultural University of Athens, Athens, Greece. 2Harokopio University, Athens, Greece

Objectives: To develop a subjective instrument estimating water balance, the Water Balance Index (WBI), with applications both in research and in public health care to assess its behav­iour by quasi-field testing.

Materials & Methods: We developed the WBI following a formative mo-
del mirroring essen­tially EFSAS’s recommendations on Dietary Reference Values for water. We targeted the adult general population (ages 18-65y). We included items of varying difficulty, e.g. glasses of water, easy-as well as water-sufficient, aiming not only to an evaluative but also to a dis­cri­minative function for the instrument.

Following the development, we applied the WBI on epidemiological data, scoring the partici­pants (n=828) of the study of the Water Balance Questionnaire (a more meticulous instrument with similar goals). Field testing included statistical description of the WBI and its items on the above mentioned sample. Examination of the dimensionality of the construct using Factor Analysis. Evaluation of WBI’s internal consistency by calculating inter-item and item-total Spearman ρ correlations as well as the Cronbach’s α.

Results: The WBI consists of two parts, the preamble, logging weather conditions, age and gender, and the main part with 12 items recording consumption and loss of water. The main items are divided in three sec­tions: water intake from beverages, water intake from solid foods and water loss from expiration and perspiration. All 12 items are modeled as categorical variables with 5 response options, scored from 1 to 5 as water intake increases for the con­sumption items and from 5 to 1 as water loss increases for the urination/perspiration items. This results to a theoretical range of 12 to 60.

The item response distribution is centrosymmetric with a mean value of 26 and standard deviation of 3.2 units for both sexes indicating good discri­minative characteristics and absence of floor and ceiling effects. Factor Analysis reveals that multiple factors contribute to the WBI and the in­ter-item and item-total correlations as well as the Cronbach’s α confirms the normality of the items included, thanks to a truly minimal instrument. Key Findings: A short subjective instrument, the Water Balance Index, me­asuring water balance by assessing water consumption and water loss from the body.

PT-054 Association of feeding regimen with mucosal colonisation and prevalence of sepsis and necrotizing enterocolitis in preterm neonates admitted to neonatal intensive care unit (NICU).
Pamir Ü1, Metsvah T1, Iljoja ML1, Lutsar P1. 
1Department of Microbiology, University of Tartu, Estonia, 2University Cli­nics of Tartu, Estonia, 3Tallinn Children’s Hospital, Estonia, 4Tartu Health Care College, Estonia 

Background: Feeding regimen may influence gut colonisation and develop­ment of necrotising enterocolitis (NEC) and late onset sepsis (LOS). 

Material and methods: A prospective open label two centre randomised study. We recruited 159 neonates aged ≤72h with risk factors of early-onset sepsis and collected rectal swabs and then twice a week. Feeding regimen was recorded for the first 7 days and catego­rized into total parental nutrition (TPN) and oral feeding - breast milk containing regimen (BMCR), when breast milk constituted at least 11% of enteral feeds, or formula.

Results: Altogether 79 received formula, 48 BMCR and 41 TPN; 73 cases in 50 neonates of LOS and 15 cases of NEC were observed. On multiple logistic regression analysis, formula and BMCR as compared to TPN were associated with 4 to 5 times increased colonisation by Gram-positive (GN) (OR=4.52; 1.89-16.72 and OR=8.61; 2.52-29.36, respectively) by Gram-positive (GR) microorganisms. The only independent differ­ence between BMCR and other feeding groups was the lower colonisation with S. haemolyticus (formula – OR=6.24; 1.73-22.50; TPN – OR=2.75; 1.02-6.97). In comparison to BMCR, TPN was associated with increased odds of LOS (OR 3.04; 1.02-9.07) and to formula feeding with increased odds of NEC (OR 3.04; 1.02-9.07), the route or charac­ter of feeding did not affect the development of NEC.

Key findings: Formula and BMCR had similar effect on gut colonisation by aerobic opportunistic organisms. Although BMCR promoted colonisation by opportunistic organisms, overall enteral feeding regimens in compari­son to TPN prevented development of LOS.

PT-055 Role of dietary lipids on growth, sexual maturation and breast cancer risk.
Erschli R1, Moral R1, Solanas M1, Vela E1, Scopetta I1, Erschli E1. 
1Work center: Medicine School, Universitat Autònoma de Barcelona, Be­lletara, Spain.

Objectives: Based on the importance of early-life events, including nu­trition, in breast cancer risk, we have investigated the effects of high fat diets on mammary gland development and its susceptibility to transformation.

Material and methods: Female Sprague-Dawley rats were fed three diffe­rent experimental diets: a low fat diet (LF) from weaning (control group), a high corn oil diet from weaning (HCO group) or from induction (LF-HEVOO group), and a high extravirgin olive oil diet from weaning (HEVOO group) or from induction (LF-HEVOO group). Animals were gavaged with 7,12-dimethylbenz(a)anthracene (DMBA) and were euthanized at 24, 36, 51, 100 and 246 days.

Results: The results showed that the administration of the HCO diet, but not the HEVOO diet, increased the body weight variation and the mass index of the animals. Both high fat diets increased hepatic expression of lipid metabolism genes, but only the HEVOO diet increased UCP-2 expres­sion. Vaginal opening was advanced in both high-fat groups, especially in the HCO group. Such group had also increased body weight around 20%, higher number of corpora lutea at post-puberty, and tended to have higher mRNA levels of kispeptin in hypothalamus. We observed little changes in the mRNA expression of hormone receptors by the effect of dietary lipids. Both high-fat diets induced subtle changes in the mor­tality of the mammary gland at post-puberty. 8-casein mRNA increased over the time in the mammary glands of all groups and it correlated with glandular density at the end of the study. The HCO diet had a clear stimulating effect on mammary carcinogenesis, whereas the HEVOO diet seemed to have a weak enhancing effect, since the clinical parameters of the animals fed that diet were more similar to the control group.

Key findings: High corn oil and high olive oil exert a different influence on the initiation of puberty onset and breast development, what may be one of the mechanisms of their differential modulatory effects on mammary tumorigenesis. Our data highlight the transcendence that dietetic factors may have on health and the importance of establishing healthy dietetic habits from childhood.

PT-056 Advances in public health nutrition research in Central and Eastern Europe and Balkan countries using the Balkan food platform and dietary tools.
Gurinovic M1, 2, Milezovic L1, 2, Kadic A1, 3, Finglas P1, Glithec M2. 
1Centre of Research Excellence in Nutrition and Metabolism, Institute for Medical Research, University of Belgrade, Serbia. 2Capacity Development Network in Nutrition in Central and Eastern Europe- CAPNUTRA, Serbia. 3EuroFIR AISBL, Belgium.

Objectives: To support pioneering public health nutrition research in Central and Eastern European and Balkan Countries (CEEEBC) we aimed at development of harmonized/standardized food and nutrition Research Infrastructure (RI) such as food composition (FCDB) and consumption data­bases and dietary assessment tools.

Material and methods Forming and implementing the Balkan Food Platform (BFP): signing the Memorandum of Understanding (MOUs) with nu­trition stakeholders from CEEEBBC; Identification of the challenges: FCDB status, tools for FCDB management, dietary surveys and FCDBs used to collect data; Definition of needs; Design of the nutritional tools, web-based EuroFIR harmonized software Food Composition Data Manage­ment (FCDM) for FCDB creation and DIETASSSESS&PLAN; Development of the 1st online regional FCDB for BC; Capacity Development (CD) activities: workshops, trainings and compilation of the foods and recipes information from CEEEBBC. 

Results During EuroFIR Nexus project BFP was established by signing of the MOUs among EuroFIR AISBL, Institute for Medical Research Belgrade, Capacity Development Network in Nutrition in Central and Eastern Euro­pe-CAPNUTRA and research organisations from Federation of Bosnia &
PT-057 Poster
Lifestyle and epigenetic changes in healthy volunteers and breast cancer patients.

Moral A; Rodríguez-Miguel C; Modellol A; Sancho A; Ruiz de Villa M; Ercíh E.
1. Department of Cell Biology, Physiology and Immunology, Medical Phys­
o­logy Unit, Medicine School, Universitat Autònoma de Barcelona, Bella­
terra, Barcelona, Spain. 2. Medical Oncology, IDOC Centro Mèdic (Institut d'Oncologia Corachan), Barcelona, Spain. 3. Department of Statistics, Facul­ty of Biology, Universitat de Barcelona, Barcelona, Spain.

Objectives: Breast cancer is the most frequent malignant neoplasia among women worldwide. In addition to genetic, epigenetic and endocrine fac­ tors, the environment, and specifically nutritional factors, plays a key role in its development. In this study we aimed to determine if lifestyle and dietary habits in relation to fat intake have an influence on breast cancer through epigenetic modifications on DNA.

Material and Methods: The methylation pattern of genes with a role in the hallmarks and characteristics have been characterized by methylation-specific PCR (MSP) in blood of healthy volunteers and in samples of blood, mammary gland and tumor of locally advanced breast cancer patients. The studied genes were: BRCA1, p16, RARβ, ESR1, PRB, REHBP1, NES1, CDH1, TWIST, HLA-A, CCR1.12, and MAP2. Moreover, we quantitatively analyzed some of these genes by CCombCompetitive Bifidulite Restriction Assay (COBRA) and bisulfite pyrosequencing. Furthermore, dietetic markers of erythrocyte membrane phospholipid fatty acids in peripheral blood were analyzed by gas chromatography. Additionally, lifestyle has been characterized through questionnaires (Food Frequency, Adherence to Mediterranean Diet and Physical Activity).

Results: MSP analysis in mammmary gland of all analysed genes. Using quantitative techniques we observed changes in DNA methylation according, in the majority of cases, to the results obtained previously by MSP. The analysis of dietetic markers showed a significantly increased in Omega-6 and Omega-3 fatty acids, and a significantly decreased in monounsaturated fatty acids, in erythrocyte membrane phospholipid of breast cancer patients compared to healthy volunteers. First results for Food Frequency, Adherence to Mediterranean Diet and Physical Activity questionnaires indicated some differences between healthy volunteers and breast cancer patients, such as higher values in patients for body mass index, alcohol and meet intake, adherence to Mediterranean diet, and lower rates of physical activity. However, those results may be influenced by the different mean age of the populations. Key findings: This work shows the influence of epigenetic alterations, especially in the obese, in the etiology of human breast cancer. We found some differences in gene methylation in peripheral blood between healthy volunteers and breast cancer patients. The methylation profile of some genes is compatible with that of a molecular cancer marker. Moreover, results showed changes in lifestyle and dietetic habits between healthy volunteers and breast cancer patients.

PT-055 Poster
Wild edible plants traditionally used in the contryide of El Jadida, coastal area in the center of Morocco.

Tabou T, Belahyan A, Belahsen R.
Chouaib Doukkali University, Faculty of Sciences, Lab. of Biotechnology, Biochemistry and Nutrition, El Jadida, Morocco.

Objectives: This project aims to investigate the diversity of wild edible plants in the rural area of El Jadida as well as the knowledge and tradition­al food practices related to their use, and to study the importance of these plants for the local population.

Material and methods: Fifty native people aged around 54 were surveyed using a semi-structured questionnaire. The sample size was determined by a non-probability sampling method. No special criteria have been used for the sample selection. The data collected for each plant focused on the local name, the consumed part, consumption frequency, preparation method, preservation method and season of harvest. The conversation was photographed or recorded by video when allowed. A reference Herbarium was also established during the investigation. Scientific identification is carried out on the samples with the help of a botanist.

Results: Sixty-two species have been recorded from 18 different families. Most represented families are: Astraeeae, Lamiaceae and the Apiaceae. Among the plants inventoried, wild carrot is consumed by 98% of the sample population. It is consumed mainly cooked as the main ingredient of a dish very much appreciated by the local population called “bouqila”. The second plant is Ajuga iva used in the traditional recipe of bread. This plant is also known for its hypoglycaemic medicinal properties. In the edible plants, 41% are locally cultivated. The leaves of the upper part are the most consumed (41% followed by the roots (27%) that are used in traditional dishes raw or dried as spices.

Key findings: the investigation data show that wild edible plants continue to be part of food habits among local populations especially in rural areas. They are eaten added or as complements to cultivated foods. However, there is a decline in transmitting the knowledge and the practices held by parents to younger generations. The data suggest an urgent need to enlarge the study to include other parts of the country, in the aim to safeguard this heritage before its disappearance. Also, it would be interesting to investigate the nutritional potential of these plants and to promote and encourage the sustainable consumption of the underutilized traditional products.
The objectives of this study were to (1) generate the parameters for folate intake from foods. The method for estimating relative folate intake took into account the food consumed as well as the fact that that intake will vary by person. The parameters were then applied to estimate the folate intakes based on food frequency questionnaire data from the Canadian Health Measures Survey (N=5600).

Results Using the parameters generated from adjusted regression models (based on 24 hour food recall data), we estimated that folate intakes based on food frequency questionnaire data is much lower than the estimates based on 24 hour food recall data, 147 micrograms for females and 224 micrograms for males > 20 year versus 405 and 520 micrograms, respectively. Further analysis is currently being conducted by adjusting the food groups to generate more detailed parameters and assess the correlations between estimated folate intake and blood folate level.

Key Findings Parameters generated from 24 hour food recall data can be used to estimate folate intakes based on the food frequency questionnaire by adjusting detailed food groups and food culture practice. Folate intake perceptions are necessary to clarify the relationship between folate intake and folate status.

PT-063 Lipid peroxidation and antioxidant defense in menopausal and postmenopausal Algerian women.

Introduction: Menopausal transition is a period in women's life characterized by decreasing ovarian function; it is often accompanied by increase of cardiovascular risk factors such as dyslipidemia and oxidative stress. In this study we evaluated the effect of menopause and perimenopause on the lipid profile, lipid peroxidation and antioxidant defense in Algerian women.

Subjects and Methods: This cross-sectional study enrolled 114 women who were classified as perimenopausal (n = 44), postmenopausal (n = 40) or non menopausal (n=30) women. In serum, we analysed total cholesterol (TC) and triglyceric level (TG).

Results: Total cholesterol was significantly higher in perimenopausal (p <0.01) and postmenopausal women (p < 0.05), compared to non menopausal women, while serum TG levels were similar in all women. LDL-C was analysed after precipitation (Kt Biocon, Germany). LDL-C was calculated using the formula of Friedewald. Lipid peroxidation was estimated using thiobarbituric acid reactive substances (TBARS) according to the method of (Quintanilha et al., 1982) using tetramethoxypropane (Prolabo) as precursor of malonaldehyde (MDA). Antioxidant defense was performed by analysis of superoxide dismutase (SOD) and catalase (CAT) activities on serum. The SOD activity was determined with Sigma Chemical kits (cat. no. 1916D) by measuring the diminution of superoxide radicals generated by xanthine oxidase and hypoxanthine.

Conclusions: Catalase activity was measured by the method of Bergmeyer (1974). CAT is involved in the detoxification of hydrogen peroxide (H2O2).

Results: Total Cholesterol (TC) was significantly higher in perimenopausal (p <0.01) and postmenopausal women (p < 0.05), compared to non menopausal women. Levels of lipid oxidative product (TBARS) were significantly increased in perimenopausal women and post-menopausal women compared to non menopausal women (p < 0.05). SOD activity was decreased significantly in postmenopausal women (52.2±22.4 U/ml) compared to non menopausal women (67.1±12.3) (p < 0.05). Similar values of CAT activity were noted in all groups. Superoxide dismutase and catalase activities were respectively more elevated in perimenopausal (81.9±25.7 U/ml, 104.5± 62.0 U/ml) compared to non menopausal women (67.1±12.3 U/ml, 68.1±27.0 U/ml).

Conclusion: This study demonstrates that dyslipidemia, lipid peroxidation allow antioxidant defense activity were prevalent in perimenopausal and post-menopausal women which leads to an increase in the oxidative stress leading for cardiometabolic disease.
Objectives: To gain an understanding from parents on (1) how they identify if their children are at risk of excess weight and (2) to evaluate the campaign concepts to ascertain whether they helped parents in recognising if their own children are ‘at risk’.

Materials and methods: 9 focus groups (n= 72) with parents of 1-12 year olds across the island of Ireland were conducted in both urban and rural locations in Republic of Ireland and Northern Ireland in July 2014. Groups were male, female or mixed and participants were aged from 20-30 or 31-45 years. Parents had identified their children as at risk of excess weight after completing a questionnaire. Seven focus groups consisted of parents from lower socio-economic backgrounds. All focus groups were conducted by the market research agency on behalf of safefood, were recorded, transcribed and major themes identified.

Results: Two major themes emerged on awareness and excuses. Although existing literature indicated that ‘lack of awareness’ among parents that childhood obesity could affect them was an issue it emerged that parents were aware that public health campaigns had an absence of solutions which in turn lead to a lack of engagement on the issue. Parents reported many excuses to addressing family lifestyle behaviours but as the focus groups progressed the facilitator began to confront the excuses directly and parents began to dismiss the excuses also.

Key Findings: Parents were unlikely to engage with a campaign that focused on raising awareness of the extent and consequences of childhood obesity. Instead they indicated that they wanted solutions that are credible, practical and relevant.

The campaign developed and continued on six practical solutions - give child size portions, not adult size; give more water and less sugary drinks; less ‘treat’ foods; be more physically active; have less screen time and adequate sleep. The three year campaign was launched in Oct 2014.

PT-065  
Poster  
Trends in prevalence of overweight in adolescents from a low socioeconomic neighborhood in the metropolitan area of Rio de Janeiro, Brazil.

Vega, GV, Santana, DD; Barros, EG; Salles da Costa, R  
Federal University of Rio de Janeiro (UFRJ) Department of Nutrition Jose de Castro (UNIC)

Objective: To investigate changes in the prevalence of overweight and association with demographic and socioeconomic factors among adolescents from a low-income area in the metropolitan region of Rio de Janeiro, Brazil.

Material and methods: Were analyzed data from two population-based cross-sectional surveys conducted through household interviews with 511 adolescents in 2005 and 314 adolescents in 2010, aged 12–18years old, selected by a three-stage cluster sample. Overweight were classified by the sex-and age-specific body mass index cut-offs (weight/height 2) based on World Health Organization criteria (>1.05 <cutoff). The chi-square test was used to compare the prevalence of overweight between the two studies and to examine the changes according to socioeconomic and demographic variables (gender; range age: 12-14 and 15-18 years; skin color: white; brown black/ brown per capita household income: lower and higher than 1/2 minimum wage). A p-value <0.05 was adopted for statistical significance.

Results: Overweight increased from 23.4% to 31% (p = 0.03) in period between the two surveys. The increase was higher in boys (22.3% to 34.7%, p = 0.02) than in girls (24.6% to 27.1% p>0.05) and in those aged 12-14 years (24.1% to 40.2%, p = 0.02). In 2010, the prevalence of overweight in adolescents aged 12-14 years old was higher than in those who were between 15-18 years (40.2% vs 22%, p = 0.01). Overweight was not associated with skin color and per capita household income in the two studies.

Key findings: Overweight in Brazilian adolescents from a low-income area increased significantly at 5 years between the two studies and the boys, especially the younger ones, are the most vulnerable group for whom intervention should be addressed urgently seeking prevention and control of obesity.

PT-066  
Poster  
Mechanism of action of the peptide of soybean on skeletal muscle atrophy suppressed.

S. Yamada, H. Fujita, H. Matsumoto and A. Ozeki  
Graduate School of Human Life Science, Osaka City University Women’s University

Objectives: We reported that skeletal muscle atrophy is suppressed by ingesting soy peptide (AM) in mouse. In particular, the intake of the soy peptide was effective in reducing slow muscle atrophy. We observed the effect of soy peptide on inhibition of muscle cell atrophy and the intake of the soy peptide also suppressed a decrease of the muscle protein. Therefore, in this study, we investigated the gene expression of IGF-1 in order to elucidate the mechanism of action of the peptide of soybean on skeletal muscle atrophy suppressed.

Material and Methods: Mice were purchased from SLC Japan. They were individually housed in stainless steel cages in a temperature, humidity and light controlled room (24°C, 60%, 12h light/12h dark cycle). All mice were fed the MF (Oriental Yeast Co., Ltd.) for 7 days. The mice were divided into groups consisting of given a control (water) group (W), suspension (water + tail suspension) group (WTS), an AM drink (175 mg/ml in water) group (AM) and an AM drink (175 mg/ml in water + tail suspension) group (AMTS).

RT-PCR Analysis

Animals were anesthetized with pentobarbital and sacrificed. Soleus and plantaris muscles were flash frozen in liquid nitrogen. Total RNA was extracted with miRNA easy Mini Kit (QUIAGEN). One µg RNA was retro-transcribed using the cDNA Archive kit (Applied Biosystems) following manufacturer’s instructions. Gene expression was measured by quantitative real-time PCR using ABI 7000 Sequence Detector System (Applied Biosystems). Specific assays on demand for IGF-1 and IGF-1 receptor were from Applied Biosystems. The level of each transcript was measured with the threshold cycle (Ct) method using as endogenous controls B-actin mRNA form mouse tissues.

ELISA

IGF-1 concentration in skeletal muscle was determined by immunoreassay.

Results: Results of this experiment, the soy peptide intake inhibited the atrophy of skeletal muscles, IGF-1 and IGF-1 gene expression were significantly increased by the soy peptide intake. Also IGF-1 receptor increased in skeletal muscle. The results of this experiment, the soybean peptide AM intake increases the gene expression of IGF-1, thereby suppressing the skeletal muscle atrophy have been suggested.

Key findings: soybean intake, skeletal muscle atrophy, IGF-1 gene, IGF-1 receptor.

PT-067  
Poster  
Experience and description of the process of human milk extraction of lactating mothers from the public health center in Quetzaltenango and its relation with the volume of the samples.

Díaz Ruíz, E., Fuentes, D., Alvey, J. Vossenaar, M., andSolomons, N.W.  
Center for Studies of Sensory Impairment Aging and Metabolism (CeSIA), Guatemala City, Guatemala

Objective: To describe the methodology and experiences during the human milk extraction process. To compare the population’s characteristics with the methods and the milk volume of the samples.

Material and methods: 44 lactating mothers of infants aged 5 to 7 mo were recruited at the Public Health Center in Quetzaltenango. A trained, female researcher extracted a single sample of human milk from a single breast using a standard technique of “whole breast extraction”. A manual extracting pump was used. The mother was asked not to feed the baby from the breast used for extraction for at least 1. Hour. The infant was allowed to feed from other breast ad libitum. All the samples were obtained during the morning, between 8:00 and 12:00.

Results: The median volume of breastmilk extracted was 25 ml. The distribution of extracted morning milk volumes across the 44 volunteers was: <25 ml (n=17, 38.6%); 25-49.9 ml (n=18, 40.9%); 50-74.9 ml (n=6, 13.6%); and >75 ml (n=3, 6.8%). A single mother had a volume <10 ml and a further 3 <20ml; this mothers reported feeling anxious at the time of collection. The age of the mothers ranged between 16 and 41 y; 14% were Mayan indigenous and the 86% were Ladinas and 82% were housewives. The median breastmilk volume by age of the infants was: 25 ml at 5 mo (n=13); 30 ml at 6 mo (n=16); and 25 ml at 7 mo (n=11). The median volume by level of schooling was: “none” 57.5 ml (n=2), “primary” 30.0 ml (n=13), “secondary” 27.0 ml (n=26) and higher 20 ml (n=3). Only 18 mothers restrained from breastfeeding form the breast used for extraction for at least 1 hour. The volume extracted, according to the time was: <15 min 22.5 ml (n=10); 15-29 min 27.0 ml (n=8); 30-60 min 35.0 ml (n=8); and >60 min 27.5 ml (n=18). The median volume of breastmilk was 30 ml for the 7 mothers that latched the infant to the other breastmilk during collection; and 25 ml for the remaining 37 mothers.

Key findings: When following the “whole breast extraction” procedures it is possible to collect at least 20 ml of breastmilk for most mothers, which is usually the minimum volume required for analysis. The time waited between extraction and the last breastfeeding episode is essential for adequate collections. Latching the baby to the other breast seems to be helpful in relaxing the mother, getting the milk flowing and providing sufficient volumes of milk.

Funded by: Sight and Life of Basel, Switzerland

PT-068  
Poster  
Study on the knowledge of infant and young child feeding practices in Labé, Guinea Conakry.

G. Gonzalez, M  
Acción Contra el Hambre

Objectives: In 2012, according to a health and nutritional survey in Guinea, it was found that the region of Labé had the most alarming rates of child
Antwerp, Antwerp, Belgium

tric

tanding the

feeding practices and its

frequent

workers report the same impediments and add the

Objective: The purpose of this study was to examine Latino mothers'

Harvard School of

Exercise and Health Sciences Department, College of Nursing and Health.

feeding practices and address these in their education approaches to prevent

child’s

childhood

grandmother’s traditions which

of

groups were asked to report their common

and

obstacles that prevent optimal growth of the child. The prevalent obstacles for optimal child feeding practices mentio-
ned were their occupation and the role of culture. In the same vein, health

workers report the same impediments and add the role of grandmothers

on nourishing and breast-feeding the child as a crucial factor that leads to

maldimunition. However, only 50% of those health

workers know about the advantages of breast-feeding practices following the

delivery.

Key findings: The core finding for the current study suggest that the lack of

knowledge and information provided by health workers and grandmo-
thers about breast-feeding practice and its exclusiveness might be associa-
ted with child malnutrition. In fact, women who give birth at home follow

grandmother’s traditions which lead them to acquire mediocre feeding

practices. On the other hand, women who give birth on health centers

report being instructed related to breast-feeding practices however they barely remember it. This might mean that the information provided at

health centers is not clearly transmitted nor is given at the appropriate

moment. Therefore, these findings suggest that adequate knowledge about

child’s breast-feeding and nutrition has to be reinforced in two levels, on

household and health centers.

PT-069

Poster

Latinas’ child feeding practices and styles related to weight status and the development of childhood obesity.

Lindsay AC, Groaney ML, Hetu A, Padua J. Exercise and Health Sciences Department, College of Nursing and Health. Sciences University of Massachusetts, Boston. Department of Nutrition, Harvard School of Public Health. University of Rhode Island.

Background: A growing literature points out to the importance of mater-

nal feeding practices and children’s eating behavior in the development of

childhood obesity.

Objective: The purpose of this study was to examine Latinas’ child

feeding practices and its influence in the development of childhood obesity.

Methods: One hundred forty-two low-income Latinas and their mothers

with preschool children (2-5 years of age) participated in this cross-sectional

study. Mothers completed questionnaires assessing maternal feeding prac-

tices, knowledge, and attitudes. Linear regressions for each anthropometric

measures were calculated using the equation: BMI = 0.506xLBM + 0xCFPQ + 0.0232xBMI_d + 0.0232xBMI_d + 0.05, where BMI_d is the estimated

BMI and CFPQ is the child’s weight status. The objective of each pair of

results correlated positively with age in both the males and females.

Results and Key Findings: Preliminary data analysis revealed a number of

child feeding practices used by Latinas mothers to be correlated with their

preschool children’s weight status. The main aim of the current study is to

reveal the association of weight status with feeding practices and address these in their education approaches to prevent childhood overweight and obesity with this population group.

PT-070

Poster

Relationship between resting metabolic rate, anthropome-

tric and oxidative stress parameters in newly diagnosed type

2 diabetes mellitus patients.

Livandra D.1, Mihai A.2,3, Petcu L.2, Picu A.2, Rosca A.2, Ionescu-Tirgoviste C.2,1, Manuelu-Keenoy B.1

1University of Medicine and Pharmacy "Carol Davila", Bucharest, Romania. 2National Institute of Diabetes, Nutrition and Metabolic Disease "Prof. N. Paulescu", Bucharest, Romania 3Department of Pharmacy, University of Antwerp, Antwerp, Belgium.

Background and Aim. Resting metabolic rate (RMR) is an important para-

meter to assess the nutritional status of both healthy subjects and type 2 diabetes mellitus patients. Moreover, information on resting energy con-

sumption is necessary to establish an individualized diet for a person newly

diagnosed with type 2 diabetes mellitus (T2D). The aim of our study was to

measure RMR (determined by indirect calorimetry) and to analyze the

relationship with anthropometric, biochemical, hormonal and oxidative stress parameters.

Subjects and methods. The study included 118 ND-T2D and 48 healthy age-

matched nondiabetic subjects. The diabetic group was divided into 2

subgroups according to their body mass index (BMI): group 1-overwei-

ght patients (BMI: 25.29 kg/m2) and group 2-obese patients (BMI: 30-

40 kg/m2). All participants were evaluated for anthropometric parameters

and was measured by indirect calorimetry (continuous VO2, VC02). Little medical biochemical tests, EUSA measurement of serum insulin, proinsu-

line, C-peptide, leptin and adiponectin levels and oxidative stress parameters (respiratory burst of isolated peripheral blood mononuclear cells (PBMC), serum total antioxidant capacity (TEAC) and fructosamine levels) were also monitored.

Results: Determined RMR was significantly higher in ND-T2D (1657±57

Kcal/day vs 1494±50 Kcal/day in controls, p<0.05) and in men (p<0.001)

in all groups. The differences between RMRd and RMRf were significantly

higher in women (p<0.05) and in the obese group (p<0.001). RMRd decrea-

sed slightly with age in both men and women. In the diabetisc group, RMRd correlated positively with obesity anthropometric markers (weight, BMI, WC, r = 0.47, p<0.01) with respiratory burst (r 0.35, p<0.05), serum proinsu-

line levels (r 0.39, p<0.05) and negatively with the values for HDL (r -0.29; p<0.05). Moreover, the obese group had significantly higher levels for respi-

ratory burst (0.0506±0.01 vs 0.0323±0.02DLU, p<0.05), insulin, proinsu-

line, C-peptide and leptin (p<0.05) while adiponectin levels were lower (p<0.05).

Conclusion. Measured RMR is associated to the obesity degree and oxida-

tive stress status and could be an important tool in the initial dietary treat-

ment of the metabolic disorders associated with atherosclerosis in obe-

se diabetes.

Acknowledgements. This work was supported by a grant of the Romanian National Authority for Scientific Research, CNCS-UEFISCDI, project number PN-II-ID-PCE-2011-3-0429.

PT-071

Poster

Relation of maternal feeding attitudes and children’s body


Alcocer-Garnuha, A.1,2, Selam-Solls, J.E.2, Ayala-Román, A.2,4, Cardona, C.3,5, Camero, E.4,6, Laranum-Zabala, E.3,1

1Programa PIAOY, Secretaria de Educacion del Gobierno del Estado de Yuca-

tan, Mexico. 2Grupo de investigación en ejercicio para la salud,ぺpa, Yucatan, México. 3Centro de salud de Tenabo, Campeche. Secretaría de Salud del Estado de Campeche, México. 4Secretaría de Salud del Gobierno del Estado de Yucatán, México. 5Departamento de Fundamentos de la Mo-

tricidad y Entrenamiento Deporte, Universidad Europea de Madrid, C/Tojo nº 28070, V.Otxón, Spain. 6Biodiánmic and Body Composition Laboratory, Universidad de Málaga, Campus de Teatinos S/N, 29071, Málaga, Spain.

Objectives: The Body Mass Index (BMI), percent of fat mass, and percent of

lean mass have been linked to cardiometabolic risk. The aim of this study

is to determine how these indicators might be influenced by parental

attitudes and feeding practices.

Material and methods: 91 students, aged 4 to 17 years, and their mothers

(who were in charge of their feeding) participated in a survey. The sample

was randomly selected, stratified by residence area, age and sex. We asse-

sured skinfolds (biceps, calf, and abdomen), circumference (waist, hips, and chest), and we calculated BMI, lean body mass (LBM), and body fat (BF).

The mothers answered the Comprehensive Feeding Practices Questionnaire

(CFPQ), which is composed of five scales: healthy eating guidance, moni-

toring, parent pressure, restriction, and child control. We calculated partial

correlation for each pair of variables, controlling the age. We estimated multiple linear regressions for each anthropometric variable.

Results: The majority of anthropometric variables (with exception of LBM)

showed significant correlations. LBM did not correlate with muscle circum-

ferences, nor BMI did. BF correlated negatively with healthy eating guidance

and pressure; whereas it correlated positively with restriction and child con-

trol. Healthy eating guidance was negatively correlated with %BF, %LBM,

BMI and FMI. We found two significant equations: IMC=25.12+CFPQ-

Guidance), R²=0.10, p<0.005; and IMC=24.41-2.1CFPQ(Guidance)=1.24CFP-

Q(Guidance); R²=0.15, p=0.048.

Key findings: Assuming that obesity is the result of a complex interaction of

multiple variables, our results suggest that healthy eating guidance attitudes

of parents should be potentiated as a public health policy in Yucatan. We

suggest to increase the sample size in future studies in order to improve the

statistical power.

PT-072

Poster

Prevalence of nutritional inadequacy in children 1-3 years

of age: EPACI Portugal 2012.

Lopes C.1,2, Moreira T.1,2, Severo M.1,2, Pinto E.3,1, Nazareth M.3,1, Rêgo C.4,1

1Instituto de Saúde Pública da Universidade do Porto. 2Departamento de Epidemiologia Clínica, Medica Predittiva e Saúde Pública, Faculdade de

III World Congress of Public Health Nutrition - 146 -
Objectives: To assess differences in adolescents’ diet quality, considering the gradient of consumption of SoFAs foods (high in total fat and added sugar) and to suggest a simplified indicator for the assessment of diet quality. Material and methods: A nationwide representative sample (n=7,425) of adolescents (10-19 years old) completed one day of food record in the first National Dietary Survey conducted in 2008-2009. The ROC curve method was used to find the cut-off points defining high SoFAs foods consumption, consequently diets with low nutritional quality. The analysis explored the association between sociodemographic and dietary characteristics with the categories of SoFAs foods consumption: moderate and high. Sample weights and the study design effect were considered in the analysis. Results: The cut-off limit that defined diets high in SoFAs foods were 40% of total daily energy intake. In average, SoFAs foods provided 53% of total daily energy intake. Moreover, 72% of adolescents reported excessive SoFAs foods consumption (>40% of daily energy intake). The consumption of SoFAs foods varied according to the quartile of monthly family income for both moderate (23% in the first quartile and 29% in the highest quartile) and high (60% in the first quartile and 69% in the highest quartile) SoFAs foods consumption. Adolescents with high intake of SoFAs had greater consumption of candies and sweetened drinks, pizza, breakfast cereals, sandwiches and baked goods, salad dressings, cheeses, yogurt, cookies & cakes, milk, juices, sugar sweetened beverages, snacks & chips, and processed meats when compared to adolescents with moderate consumption of SoFAs foods (<40% of daily energy intake). On the other hand, adolescents with extreme consumption of SoFAs presented higher consumption of rice, beans, coffee or tea, bread, fish, poultry, roots, and corn than those with high consumption of SoFAs.

Key findings: Significant proportion of Brazilian adolescents reported having low quality diets with high consumption of SoFAs foods and low consumption of fruits, vegetables, rice, beans, coffee or tea, bread, fish, poultry, roots, and corn which are considered a good indicator of the diet quality.
Objective: There are several food treatment processes such as refrigeration, freezing and heat treatment. Irradiation is one more, often referred as cold pasteurization because the whole process takes place at room temperature. During this treatment, the food is controllably exposed to gamma rays over a certain time, depending on the dose to be applied. This technique allows safety food with high levels of quality, decreasing the microorganisms responsible for food spoilage as well as the risk of foodborne diseases by destroying pathogenic microorganisms and it is considered a control measure in the production in several types of raw and minimally processed foods.

The aim of this study is to highlight the importance and challenges of ensuring food safety and quality of foodstuffs treated by irradiation through the implementation of management systems, IDACCPr-based systems according to international normative references.

Material and methods: It were applied an NP EN ISO 9001:2008 quality management system and an EN ISO 14470:2011 food safety HACCP-based system for food irradiation in our Radiation Technologies Unit. The requirements of these standards impose the implementation of control systems, monitoring and traceability process. For that, it is necessary to develop procedures, documentation and measure all the steps of the process, including the information provided to the consumer on food treated with ionizing radiation.

Results: From our experience, implementing an NP EN ISO 9001 quality management system and an EN ISO 14470 food safety HACCP-based system improves quality and efficiency and ensures food safety. Food treated with irradiation shows that the nutritional value and digestibility undergo minimal changes and the microbiological reduction obtained with this technology is difficult to match with other types of treatment.

The macronutrients were well studied and even for doses above 10kGy there were no significant changes. The same happens with minerals and vitamins, despite vitamins have different levels of sensitivity to gamma radiation.

Key findings: Each food has its own characteristics, so it is essential to validate the applied technology before the irradiation. This way it is possible to reach the target and set the dose to be applied.

The application of this treatment is advantageous in different aspects such as: disinfection, inhibition of germination, sterilization, increasing the shelf time of fresh fruit and minimally processed vegetables, as well as meals for immunodepressed people.

The implementation of the quality management system is essential to identify, control and monitoring all the important parameters, ensuring their traceability.

PT-077 Poster
Association of hypertension and nutritional status in a Brazilian adult population in 2012.
Dias Belloso, F. 1; Rodriguez Mora, C. A. 1; Cabral-Miranda, W. 2; Slater Villar, B. 2
School of Public Health, University of São Paulo 1; Department of geography, University of São Paulo 2

Objectives: To determine the occurrence of hypertension nutritional status of adults, according to its distribution per Unit of Federation. Material and methods: This is an ecological study using national data from the year of 2012 pertaining to the “Sistema de Vigilância Alimentar Nutricional” for the nutritional status of adults, using Body Mass Index, and “Vigilância de fatores de risco e proteção para doenças crônicas por inquérito domiciliar” for hypertension data. First, a descriptive analysis was performed for the variables of interest and we noticed the adhesion of these variables to the normality curve. An analysis of regression was performed to test the linear association of hypertension as the dependent variable, and malnutrition, normal weight, overweight, obesity and excess weight (obesity and obesity), as explanatory variables. Subsequently the Global Moran’s test was applied to test spatial dependence between variables.

Results: An association was found between hypertension and obesity (p <0.03), and was also identified spatial dependence between these two variables (p<0.001). These results show that the states with higher prevalence of hypertension are those with the highest concentration of obese adults. The relationship of these data show that it is necessary to formulate strategies and guidelines that provide prevention and control for the appearance of these comorbidities, and thus ensure a healthier life style.

PT-078 Poster
Prevalence of the metabolic syndrome in trained professionals and in formation in health sciences in Asunción Paraguay.
Faculty of Medicine, National University of Asuncion, Paraguay. Universidad Rivarola Irigüi, Reus, Spain.

This research is part of the Multicenter Study LATINMETs.

Objective: To determine prevalence of metabolic syndrome (MS), in health professionals (doctors, nurses, nutritionists) and final year students of these careers, in the National University of Asuncion.

Material and Methods: A descriptive cross-sectional, observational study. Data on weight, height, body mass index (BMI), waist circumference, blood pressure, biochemical tests:  Glycemia, triglycerides and HDL cholesterol, were collected.

Results: We included 132 volunteers, ages 18 to 65. Data were collected from July to November 2012 - 2013. The prevalence of metabolic syndrome was determined by the presence of three or more of the five criteria recently harmonized by the International Diabetes Federation IDF, American Heart Association, National Heart, Lung and Blood Institute. 60.6% (80) were female. The mean age was 30.8 + 11.2, ranging between 19-65 years. 19.7% (20) physicians, 9.1% (12) nurses, 10.6% (14) Nutritionists, 57.6% (70) medical students, 1.52% (2) nutritionists and 1.52% (2) nutrition.

The average weight was 70.5 + 19.9 (42-180), 46.2% had normal weight (61), 30.3% overweight (40), 22% obesity (29), 1.5% underweight (2). 28.9% (38) had waist circumference > 90 cm in men and 26.5% (35) > 80 cm in women. The average blood glucose level was 89.3 + 7.7, HDL cholesterol 102.8 ± 7.9, triglycerides 109.7 ± 28.7. Those diagnosed was 19.7% (26), of which 73.1% (19) were male, 26.9% (7) women. 73.1% (19) were under 40 years. 19.3% (10) of the 52 professionals and 20% (16) of the 80 students were diagnosed with metabolic syndrome. Those diagnosed with metabolic syndrome had abdominal obesity (AO) 96.2% (25), low HDL cholesterol, 92.3% (24), triglycerides >150 84.6% (22), hypertension 46.1% (12), blood glucose >100 mg/dl 19.2% (5).

Conclusions: Metabolic syndrome was diagnosed more frequently in men under 40 years and students. The most frequent components of the metabolic syndrome were OA, followed by low HDL cholesterol and increased triglycerides.
To increase soy consumption in the diets of the BUWEA members, thereby decreasing protein calorie malnutrition and improving overall health status; 2) To provide adequate technical assistance and training to the BUWEA members on the cultivation, expansion and commercialization (micro-enterprise) of the soybean in order to improve malnutrition, health and economic sustainability; 4) To increase the soybean crop yield for further expansion of the cultivation project for economic sustainability; and finally 5) To implement soy-processing machines to increase consumption of soy and creating long-term sustainable economic activity for the BUWEA members and their families.

Material and Methods – Initially, focus group of 42 women representing 220 members (1400 indirect beneficiaries) of the Bukoba Women’s Empowerment Association (BUWEA) was conducted to share the Tanzania Mainland Nutrition Survey findings to assess local diet and nutritional knowledge of commonly consumed foods. The focus group’s outcome led to a bottom-up solution: creating an infrastructure to cultivate soybean to improve the existing diet and create economic sustainability among the members of the cooperative.

Results – Bi-yearly workshops were provided to BUWEA members on the topics of health, processing soybean, packaging soybean, marketing, accounting, and grant writing, technical assistance from local horticultural/extension specialist, and working with different local organizations for expansion of the micro-enterprise. The ongoing workshops on soybean cultivation and educating the BUWEA women’s group regarding the benefits of the crop offer a real chance of improving the nutritional status and economic sustainability.

Key Findings – Approaching the problem of undernutrition should address underlying causes to create sustainable solutions with replicability and contiguity, as in the case of Bukoba Rural, Republic of Tanzania.

PT-081

Problems diagrams as a community’s empowerment instrument in improving health conditions.

Olivera, I. G.; Barbosa, J.; Camozzi, A.B.D.Q.; Guimarães, M. M.

Faculdade de Nutrição - Universidade Federal de Goiás; Faculdade de Educação Física - Universidade Federal de Goiás; Prefeitura de Goiânia - Secretaria Municipal de Saúde - Distrito Sanitário Leste

Objectives: Present results of actions stimulating social control and participation performed with the eastern region health unit council of Goiânia’s municipality, Goiás, Brazil.

Methods: After the Data-Mining analysis collected through quick participative estimative (EBP) provided for a workshop in which local health council members defined by vote an important, solvable problem of the region. For identifying the causes, consequences, coping and solving proposals, the problem diagram methodology was used.

Results: 18 persons participated. The main identified problem was lack of basic sanitation structure and stormwater drainage in the Family Health Center’s coverage area. Intervention actions were sketched using the problem diagram method, sanitation lack figuring as core problem in the tree’s “trunk”. The causes, or roots, were lack of public interest, community’s inertia, lack of bureaucracy, and as consequent intake, its improper prescription and intake. Based on the above, this study aimed to analyze the profile of prescriptions and infusions hospitalized patients in a public hospital in southern Brazil with the intention of promoting interventions in clinical team.

Material and method: Descriptive cross-sectional study with consecutive included between March and May of 2013 through a prescription of patients in exclusive enteral therapy, involving quality indicators (infusion prescription and energy needs) and personal data. Data were analyzed in software SPSS13.

Results: The final sample consisted of 64 patients, mostly men (51.6%), elderly (70.3%) and underweight (45.3%). Caloric goal (468 cal), prescription (890 cal) and infusion (621 cal) have shown significant differences (p < 0.05) on the first day, with 48.4% of infusions did not follow the prescription. Considering the results, a training course was proposed, with the participation of 25% of the clinical team of the hospital. This course was showed the results as a form of sensitization, also were discussed the reasons for non-infusion (failure to record, death, transfer) and terminated with corrective actions involving the registration of the infusion and improved communication.

Key findings: The absence of registration in the medical records of the infusion may be the cause of differences between the indicators, impairing patient monitoring. The formation and performance of a Multidisciplinary Team Nutrition Therapy is essential to show improvement in clinical status of hospitalized patients.

PT-084

The new time eating: perceptions and changes in eating behavior.

Auler, F.; Ribeiro, CSS; Rosellini, CF; Santos, JG

Nutrition Undergraduate Program. School of Health and Biosciences. Pontifical Catholic University of Paraná. Curitiba, Paraná, Brazil

Objectives: Economic growth and the acceleration of production overlapped with time, at a rate that significantly change the speed by day. Thus, various rituals that were previously established, have been modified over the decades. Therefore, to understand the reasons that lead individuals to the actions buying, preparing and eating food was the main objective of this research.

Material and methods: Qualitative research done by semi-structured interviews were applied to men and women, about the rituals and importance to eat, what you eat, time of consumption. Data were organized by category of information. For this study were surveyed individuals between 18 and 85 years old, residents of large and small cities in Brazil, resulting in 30 individuals.

Results: In the age group 18-50 years, women prepare their daily meals alone and family, spending little time in this preparation. The food in the home during the week is much more focused on practicality and “do not spend time” and focuses on dinner. During the weekends dedication to preparation intensifies within the home environment. Lunch always done away from home, with work colleagues or solitary individuals with higher age group 50 years and who were present and experienced the economic, social and political transitions that took place in Brazil tend to keep food traditions and look for healthier food. The Brazilians who were born during or after the 70s, realize eat away as great option for their lives, because the facilities of consumption. These generations work out and eat away from home almost daily. And the Brazilians who were born after the
PT-085  

Poster  

Eating out and "pleasure" reinvented: A temporal focus between 1970 and 2007 in the restaurants of autonomous consumption in Curitiba/Brazil.  

Auler, F; Ribeiro, CSG  
Nutrition Undergraduate Feeding Difficulties Center, lnstitute Fisberg, Sao Paulo, Brazil.  

Objective: Eating out has shown a continuous process in the new society, generating economic, social, cultural and nutritional consequences. Recognize historical and sociological reasons for eating out is fundamental, besides being a health guarantee for nutritional science. Based on the above, this study aimed to demonstrate how changes in eating habits have been observed in recent decades, revealing the complexity of the models of consumption and its determinants in Curitiba, Brazil.  

Methods: For this research applied a multidisciplinary and comparative approach between the various aspects of eating: economic, social, political, cultural and nutritional. The contributions of different areas of knowledge were analyzed, the food situation was studied and discussed the evolution of the issue at the national and municipal levels context, through semi-structured interviews with 10 entrepreneurs the area of food and 30 customers of these establishments.  

Results: The eating out, really is permeated with symbolism that change and alternate according to the different regions of Brazil, reiterating that the eating out is directly related to the cultural and social code in which subjects are involved. It could be observed that the market supply and income of the population, given the economic and political processes, caused great difficulties in household access to food, making eating out an easy and affordable alternative financially. The presence of different restaurants in Brazil occurred also stimulated by self-employment. With different economic programs occurred over decades, the opening of borders and import and export systems in Brazil, there was a mass of unemployed and the need for new job opportunities and income with this significant increase in developments in the area of feeding. The need of the industries offering food work also enabled greater access to eating out, causing many businesses open their doors and consolidate.  

Key finding: In Curitiba, the restaurants were raided by the elderly (in pursuit for practicality and company), the children and their parents (in pursuit of health, family-sociability and empowerment), by adolescents (in pursuit of social interaction and adventure). The eating out was a space that need to eat as well as possible during their working hours, demonstrating that eating migrated from home environment for business and health actions should be carried out so that there is consumer protection.  

PT-086  

Poster  

Multidisciplinary protocol for clinical assistance and research in feeding difficulties.  

Fiszberg M, Maximino P, Junqueira P, Machado RHV  
Feeding Difficulties Center, Institute PENSi/ Sabará Children’s hospital (São Paulo, Brazil)  

Objectives: To develop and implement a multidisciplinary protocol for clinical assistance and research in feeding difficulties in childhood and adolescence.  

Methods: Protocol is designed for outpatient assistance directed to children and adolescents with feeding difficulties not psychiatrically diagnosed with eating disorders. The protocol is structured in a triple care process that the patient is evaluated by a pediatrician, feeding therapist and registered dietitian in the same appointment, which will be recorded and observed by the team in a mirrored room. Parents will be instructed to bring one meal and utensils commonly used, so feeding is observed and evaluated. A feedback process is scheduled for diagnosis and multidisciplinary treatment plan explanation. Further appointments are scheduled for the implementation of suggested therapies and follow up.  

Results: The first appointment consists in obtaining personal and socioeconomic data, school records and personal/family history, followed by medical, nutritional and feeding therapist’s evaluations. Medical evaluation assessed a detailed anamnesis, physical examination (with pubertal assessment, according to Tanner), height and weight (World Health Organization indexes, 2007), head circumference, biochemical analysis and bone age, presence of associated diseases and specific diagnostic tests, if necessary. Nutritional assessment consists in full evaluation of nutritional history and dietary intake (obtained from three-day-food-records) of calories, macro and micronutrients, dietary fiber and water intake, compared to Dietary Reference Intakes. Body composition is assessed by body mass index, circumferences (arm, neck and waist) and triceps skinfold. The feeding therapist evaluation investigates aspects related to breastfeeding, oral habits, speech and language development, feeding behaviors, sensorial and motor aspects, tonus and mobility of oral structures, and interaction between child and caregiver. Patients are categorized according to type of feeding difficulty and parental styles to define specific therapies (nutritional education activities, medications, re-establishment of oral functions or referrals to other professionals).  

Conclusion: The proposed assistance model enables a global assessment of patients with feeding difficulties, thus enhancing chances of treatment success. Its implementation should also allow validation as a theoretical and practical model of assistance, enabling expertise of other professionals and stimulating investigation of possible lines of research on the subject.  

Keywords: picky eater, feeding behavior, children, inter-disciplinary research, nutritional support.  

PT-087  

Poster  

Dairy product intake and risk of type 2 diabetes in an elderly Spanish Mediterranean population at high cardiovascular risk.  

Díaz-Águeda A, Bulló M, 1 Martínez-González MA, 2 Corella D, 2 Estruch R, 2 Fito M, 2; Salas-Salvadó J 1,2  
1 Universitat Rovira i Virgili; 2 CIBERObee, University of Navarra;  * University of Valencia; 1 Hospital Clinic; 4 IMH; 5 University of Las Palmas de Gran Canaria; 5 IMIBAPS; 6 University of Balearic Islands and Son Espases Hospital.  

Background and objective: The possible effects of dairy product consumption on diabetes risk remain controversial. The aim of this study was to longitudinally investigate the association between total dairy product consumption and their subtypes, and the risk of new-onset type 2 diabetes (T2D) in an elderly Mediterranean population at high cardiovascular risk.  

Material and methods: We prospectively followed 3,454 individuals from the PREDIMED study who were free of diabetes at baseline. Dietary intake was assessed yearly using a 137-item validated food-frequency questionnaire. Dairy product consumption was categorised into total, low-fat, non-reduced-fat, and subgroups: milk, yogurt, cheeses, and fermented dairy products. Hazard ratios (HRs) were calculated using multivariable-adjusted Cox regression.  

Results: During a median of 4.1 years of follow-up, we documented 270 newly diagnosed cases of T2D. After adjustment for age, sex, BMI, lifestyle, and the consumption of food other groups, the HR of diabetes between the highest and the lowest tertile of daily dairy product consumption was 1.36 (95% CI, 0.96-1.91) for total, 0.90 (0.65-1.24) for low-fat, 0.79 (0.59-1.08) for non-reduced-fat, 1.27 (0.85-2.03) for milk, 1.50 (0.89-2.56) for yogurt, 0.82 (0.42-1.59) for cheese, and 0.79 (0.38-1.63) for fermented dairy products.  

Conclusion: Intake of dairy products can improve the risk of diabetes, with the highest and the lowest tertile of consumption being associated with a lower risk of diabetes.  

PT-088  

Poster  

Candidate items for fortification within a novel, alternative strategy of "total fortifiable energy": A model from Guatemala.  

González, M.; Solomons, N.W.J.; Smith, G.  
1 Center for Studies of Sensory Impairment, Aging and Metabolism (CoS-SIAM), Guatemala City, Guatemala; 2 The Global Essential Nutrient Foundation, Singapore  

Objectives: To generate a profile of potentially fortifiable foods from a specific sub-population of Guatemalan women in order to visualize and project the feasibility of an alternative approach to public health fortification as proposed by Omer Dary. This is called the “total fortifiable energy” approach. This alternative looks to avoid the fortification of a single staple item, such as salt or sugar, but rather distributes lower levels of the deficient nutrients across as many of the commonly-eaten products as practicable.  

Materials and Methods: Previous-day dietary recall interviews, enumerating items eaten, disaggregating the ingredients in recipes and interrogating the fortification levels consumed in grams, in 234 women provided the data. They were recruited and interviewed in an urban context from the clinic population of a government health post (n=121) or in a series of 8 rural villages of Mam-speaking Maya-indigenous residents (n=113) in the Quetzaltenango Province in the Western Highlands of Guatemala. They varied in their reproductive phase (pregnant or lactating) and were classified by size and...
status as either pregnant (n = 116) or lactating (n = 118). A total of 189 different beverage or food items, including ingredients, were catalogued. We further classified these items into three exclusive categories: not-fortifiable (NF), i.e. non-processed natural foods; already fortified (AF) i.e. retailed with the specified addition of one or more micronutrients; and potentially fortifiable (PF) i.e. centrally-processed commercial foods not yet containing a micronutrient fortification.

Results: Of the 189 foods, 122 (65%) were classified as NF, 18 (9%) as AF, and 49 (26%) as PF. The categories in the potentially-fortifiable class include pastas and whole-cereal-grain products, packaged desserts, snacks, processed meats, and dry cheeses among others. Although condiments and sauces do not contain much intrinsic energy, they are added in somewhat fixed amounts to recipes and side dishes, both of which suggest an estimable quantity of usual energy intake.

Key findings: Over half of the items consumed in this population would never lend themselves to industrial fortification, although biofortification could conceivably enrich some of them with additional micronutrients. Of the 49 items that undergo some commercial processing, less than half have been exploited for fortifying and representing leverage for improving access to dietary micronutrients.

**PT-089**

**Poster**

**Independents associations of moderate, vigorous and recreational physical activity with premorbid metabolic syndrome.**


**University Hospital Dr. Negrín, Las Palmas, Spain; *Research Institute of Biomedical and Health Sciences, IUBS, University of Las Palmas de Gran Canaria, Spain; **Research Unit, Primary Care, University Hospital "La Candelaria", Tenerife, Spain; *Canary Health Service, Las Palmas de Gran Canaria, Spain; **Department of Preventive Medicine and Public Health, University of Las Laguna, Spain.

Objectives. Metabolic syndrome (MS) increases the risk of all-cause mortality. Lifestyle interventions are key to prevent metabolic disorder associates to MS. The aim of this study was to examine associations between physical activities (PA) and MS in adults.

Method and materials. The study was cross-sectional, probabilistic and multistage random sample of 6729 adults (18-75 years old) from the Canary Islands (Spain, 2004). Anthropometric and clinical tests were performed. For each participant, the 3 most important PAs were assessed by validated questionnaire. Data of 18,479 PAs was registered and classified according to duration, intensity, and total time expenditure. Each component of MS was measured with standardized clinical protocols. Participants were classified into three levels of MS: No MS, premorbid MS and morbid MS. Participants with diabetes or with antecedents of cardiovascular events in 3 components of MS were classified as "morbid MS". Multinomial logistic regression was used to analyze associations between five PA dimensions and MS. The influence of 1) socio-demographic factors (age, gender, education, social class, occupation, smoking habit, ancestry, marital status), 2) family antecedents (paternal and maternal antecedents of diabetes, hypertension and cardiovascular events) and 3) number of obesity criteria (IMC, waist-height ratio and abdominal circumference) on potential associations of PA with MS was examined by step-wise analysis.

Results. No significant associations were found between PA and MS, though some significant associations remained for light, moderate vigorous and recreational PA, as well as for recommended PA level with premorbid MS. For morbid MS, only vigorous and recommended PA levels remained associated. When family antecedents were included, morbid MS was not associated with PA, whilst premorbid MS showed associations for PA and MS though the significant associations remained for light, moderate vigorous and recreational PA, as well as for recommended PA level with premorbid MS. For morbid MS, only vigorous and recommended PA levels remained associated. When family antecedents were included, morbid MS was not associated with PA, whilst premorbid MS showed associations for PA and MS though the significant associations remained for light, moderate vigorous and recreational PA, as well as for recommended PA level with premorbid MS. For morbid MS, only vigorous and recommended PA levels remained associated.

**PT-091**

**Poster**

**Antioxidants consumption in the diet of Krakow inhabitants, assessed on the basis of Dietary Antioxidant Index.**


1 Department of Hygiene and Dietetics, Jagiellonian University, Medical College, Krakow, Poland. 2 Department of Pharmacobiology, Jagiellonian University, Medical College, Krakow, Poland

Objectives: Total antioxidant capacity (TAC), which is the cumulative capacity of food components to scavenge free radicals is reported to be inversely related to the risk for oxidative stress-induced diseases. FFQ-based TAC values are used in nutritional epidemiology to assess antioxidant intake from food, what is usually treated as Dietary Antioxidant Index (DAI).

The aim of the study was to estimate the daily intake of antioxidants among the inhabitants of the city and area of Krakow, on the basis of DAI.

Material and methods: Dietary antioxidant index was investigated on the basis of food frequency questionnaire (FFQ). In the FFQ 145 food items were classified into groups such as fruits and dried fruits, vegetables and vegetable products, dairy products, starch, and grains-based products, prepared dishes, fresh herbs and spices and beverages. Participants reported how often they ate each food in the past month. Medium serving size was chosen as a reference. In order to calculate DAI for each participant, previously published databases from United States and Italy, containing the most commonly consumed foods were used. The ferric-reducing antioxidant power (FRAP) measuring the ferric-reducing ability of plasma was chosen as a method of estimation of total antioxidant capacity of food supplied in the daily diet. Three hundred and fifty healthy volunteer subjects (180 women and 170 men) were included in the study. They were 21-60 years old (mean age was 42.3 ± 14.1 years). They were not smokers. The DAI values were compared in female and male groups using Tukey's test.

Results: The mean value of DAI of all examined persons was 52.84±26.1 mMol. The values of DAI were significantly higher in women (63.91±25.58 mMol) than in men (49.36±22.75 mMol), p<0.05. Fruits: had the biggest contribution in total DAI values, next beverages (especially coffee) and nuts. All examined persons used to eat too rarely the food with high
antioxidant activities such as spinach and Brussels sprouts, berries, almond, kiwi, hazelnut, and soybeans oil. The menu did not use fresh herbs and spices, especially marjoram and rosemary.

Key findings: The recommendation for Polish people (on the basis of our study) is to increase the consumption of food rich in antioxidants and it should have favourable outcome for prophylaxis of chronic diseases, especially cancer and heart diseases.

The dietary modification towards higher consumption of antioxidants should be implemented as one of the public health strategies.

PT-092

Poster

Fat intake and types of dietary fats among elderly people with cardiovascular disease. 
Skop-Lezenadzowa A.1, Kolarczyk E.1, Zejcz J.1
Department of Hygiene and Dietetics Krakow, Jagiellonian University, Medical College, Poland

Objective: In Poland, like in other European countries, together with population ageing number of people suffering from nutritional disorders and related diseases as e.g. cardiovascular illnesses is growing. Proper diet can be treated as an effective complement for pharmacotherapy. In case of cardiovascular diseases fats, both quality and quantity, seem to play a crucial role in diabetes’ etiology. In the presented study analysis of fats’ type and amount, and cholesterol content in food rations of elderly people with cardiovascular disease.

Material and methods: 128 individuals (66 women and 62 men), hospitalized in 1 Clinic of Cardiology and Hypertension JUMC in Krakow, took part in the study, aged 73.2±6.9y. Daily intake of energy, fat content, fatty acid composition and cholesterol were estimated using a 24-hour dietary recall method, repeated three times for each individual (2 week-days and 1 feast-day). Results for each patient were compared with norms published by National Food and Nutrition Institute in Warsaw and guidelines elaborated by Polish Forum for Prevention of Cardiovascular Diseases. “Statistica for Windows” ver. 7.1pl was used for statistical analysis. Mann-Whitney test was used for evaluation of differences between men and women groups.

Results: Men's diet and women's diet were significantly different in terms of higher intake of fat: 50.2g among men and 18.1g among women (p=0.04). Percentage of energy from saturated fatty acids in diets was higher than dietary recommendations (10.6% of Daily Nutritional Ratio (DNR) vs. <7% in recommendations), while intake of monounsaturated fatty acids was in accordance with dietary guidelines. Percentage share of polyunsaturated fatty acids was low: 4.6% of DNR for long men and 4.1% among women (p=0.04). Proper percentage share of omega-6 linoleic acid according to norms should reach 4% while in examined population was 3.37% of DNR for men and 3.04% for women. Guidelines, for people with lipid disorders, indicate 200 mg of cholesterol per day as a safe three coronary heart disease risk. These values were determined: 235.7mg/day for men and 229.04mg/day for women.

Key findings: Despite all patients being under the care of a clinic dietitian, the majority of them were making nutrition mistakes, mainly in terms of fat quantity. Repeating nutrition mistakes can accelerate development of already existing cardiovascular disorders. In order to improve nutrition a 10-day balanced menu, adjusted to their health condition and individual preferences, were constructed for each patient.

PT-093

Poster

Variables predictive of adherence to a Mediterranean hypocaloric diet in the treatment of obesity and overweight, in a group subjects living in Lanzarote.
Casasñas-Quintana L.1,2, Bautista-Castaño L.1,2, Serra Majem L.1,3
1Department of Clinical Sciences, University of Las Palmas of Gran Canaria, Las Palmas de Gran Canaria, Spain. 2Nutrition Research Group, Research Institute of Biomedical and Health Sciences, University of Las Palmas of Gran Canaria, Las Palmas de Gran Canaria, Spain. 3Ciber de Bioquimica, Farmacia y Alimentación (CIBERBF), Instituto de Salud Carlos III, Madrid, Spain

Objective: To assess the factors that could predict a successful completion of a weight loss program.

Material and methods: A single-centered, cross-sectional, prospective study conducted over 4 years. Data were obtained on 500 overweight subjects (428 women, 72 men) aged 18-81 years (mean 41.7) and body mass index (BMI) of 31.44 (range 25.09-51.33) seeking help to lose weight at a specialist obesity clinic. A program involving a hypocaloric, Mediterranean diet was designed in order to provide the necessary balance, with training and follow-up support. Changes were evaluated at 3 months (the first step) and at the end of the program (the second step). The same consumers were evaluated for both steps. The differences were calculated for the two steps. The method based on the application of a Kendall’s crown of the head to the hip joint; the ULS was the distance from the hip joint to the knee joint; and the LLS was estimated by measuring the length from the knee joint to the sole of the foot. The estimated total composite length was calculated by adding up the ULS, LLS and ULS in mm, and correcting the final dimension in cm, applying the correction-factor from the 5 cm or 10 cm reference length in the image.

Results: For all individuals measured, the Pearson correlation of observers A vs B was r=0.77 and the Spearman rank-order correlation was r=0.76; for A vs C, the respective values were r=0.89 and n=0.90, and for B vs C, r=0.84 and n=0.80. For all doll measurements from photographs (n=32), the respective correlations of A vs B were r=0.37 and n=0.66; for A vs C, r=0.54 and n=0.76; and for B vs C, r=0.84 and n=0.81. All r values were significant from p<0.001 to p<0.004.

Key findings: When using this new approach of photographic images to assess newborn length in inanimate models, we find a generally highly-significant inter-rater correspondence.

PT-094

Poster

Newborn anthropometric assessment using photographic images: Preliminary testing with inanimate (cut-out and doll) models: Inter-rater correspondence of estimates. 
Orozco MV.1,2, Solomana KN1, Kimura H3 and Lukacs T1
1Center for the Studies of Sensory Impairment, Aging and Metabolism (CESSIAM), Guatemala. 2Center for Atlitlan Studies, Universidad del Valle de Guatemala, Guatemala. 3Japan International Cooperation Agency (JICA)

Objectives: Insofar as the gold-standard measurement of newborn length has questionable accuracy, it is uncomfortable for the infant and may be unsuitable in its forced extension of the skeleton and nerve-network; we aim to develop a photographic image approach to newborn length assessment using simulations with inanimate models and evaluate inter-rater correspondence.

Materials and Methods: Three observers (A, B, and C) each evaluated in the prepared images using a photographic image approach to newborn length assessment by using simulations with inanimate models and evaluate inter-rater correspondence.

PT-095

Poster

Optimally accepted salt reduction across cultures - By using naturally brewed soy sauce as a salt replacer and maximising its potential with "Overall Taste Intensity-based approach" 
Shimojo R.1,2, Sato T.3, Inamura M.3,4, Leong L.5
1Kikkoman Europe R&D Laboratory B.V., The Netherlands. 2Research & Development Division Kikkoman Co., Japan. 3National University of Singapore, Singapore.

Objectives: High salt intake could increase a risk of hypertension and is directly related to the development of cardiovascular disease. Since World Health Organization published recommendations for salt intake (N=12) in 1990, lots of researches were carried out in this field. However, most of them were demonstrated in one country. A cross-cultural study is still quite rare. This could be one of the reasons that the previous outcomes have not been applied into practice.

The aim of this study is to propose an optimal salt reduction approach based on "Overall Taste Intensity" with using naturally brewed soy sauce, and demonstrate it in three countries (Netherlands, Singapore and Japan) to understand whether it can be used global or not.

Material and methods: In each country (Netherlands, Singapore and Japan), approximately 60 local observers were recruited. In all three countries the age range was 18-60 years and male and female participation was nearly equal. Three types of foods (salad dressing, soup, and stir-fried pork) were investigated whether it would be possible to reduce the NaCl content with naturally brewed soy sauce. In the first step, an exchange rate (ER) by which NaCl could be replaced with soy sauce without a significant change in the overall taste intensity was established per product type, by means of alternative forced choice tests. In the second step, the same consumers evaluated five samples per product type with varying NaCl and/or soy sauce content on pleasantness and several sensory attributes.

Ill World Congress of Public Health Nutrition - 152 -
Results: The acceptable percentages of salt reduction in the Netherlands, Japan, and Singapore were respectively 32%, 34%, and 35%, averaged over three products. Although cultural difference can be seen in each food, the overall average of salt reduction percentage was similar. The correlation between pleasantness and overall taste intensity was always higher than the correlation between pleasantness and salinity in all three countries and in all three recipes. It indicates that overall taste intensity was the main driver for acceptance.

Key findings: Regardless of a familiarity toward naturally brewed soy sauce, it globally works as a salt replacer. Soy sauce does not only compensate salinity, but enhances overall taste with Umami substance. It can be said that a flavor-based “saltiness-based approach” might miss and/or underestimate its feasibility as a salt replacer. Thus, we propose that “Overall Taste Intensity-based approach” is more suitable for non-salinity compensating salt replacers.

PT-096
Comparison of dietary diversity according to the stature-ponderal status and gender among the rural middle school children in the northwest of Morocco
Sbaibi R., Aboussaleh L., Seebockgasse 4, Graz, Austria

Objectives: This study compares the dietary diversity scores according to the stature-ponderal status and gender among the rural middle school children in the northwest of Morocco.
Material and methods: A sample of 300 was observed in a rural school in the northwest of Morocco. The dietary diversity scores are calculated by counting the number of the 11 food groups consumed by the middle school children interviewed during a period of 7 days. The stature-ponderal status was determined by height for age and Body Mass Index (BMI) for age.
Results: The sample consists of 102 girls (34%) and 198 boys (66%). The average age is 15.45 ± 1.64 years, ranging from 12.3 to 19.74 years. Stunting and thinness are respectively 9.7% and 10%. The comparison by Mann-Whitney test with a risk a = 5% shows that there was no significant difference in dietary diversity scores between the normal group (N = 271) and the group with stunting (N = 29) (u = 3056, p = 0.051), same thing between normal group (N = 270) and the group with thinness (N = 30) (u = 3566; p = 0.260). Also between girls and boys (u = 9588.5, p = 0.460).

Key findings: It seems that dietary diversity is not affected by the stature-ponderal status or gender, but instead the socio-economic conditions of the environment.

PT-097
Body composition and dietary protein intake of geriatric patients
Sturtzel, B.; Ohrenberger, G; Elmadfa, I
1University of Vienna, Department of Nutritional Sciences, Althanstraße 14, 1090 Vienna, Austria. 2Haus der Barmherzigkeit, Geriatric Hospital, Seeböckgasse 30, 1160 Vienna, Austria

Background: Old, frail people, especially institutionalized geriatric patients, are at a very high risk for ingesting not enough protein. Insufficient protein intake could lead to an accelerating loss of lean body mass despite a constant Body Mass Index (BMI).

Objective: Therefore we examined whether the current uptake of protein-energy intake (g/kgBW/d) and mean energy intake was greater in the group of geriatric patients (N = 47) than in the group with stunting (N = 29) (u = 0.063, p = 0.950).

Results: The mean body mass index (BMI) of the geriatric patients was 23.1 ± 3.7 kg/m². The group with stunting had a BMI of 18.0 ± 1.4 kg/m². Mean protein intake was 0.65 (±0.20) g/kgBW/d which was significantly below the reference intake of 0.8 g/kgBW/d.

Conclusion: In the line with published data we could show that BMI-stability in older individuals does not imply body composition stability. As the protein intake of the geriatric patients was significantly below the recommended daily intake of 0.8 g/kgBW/d and correlated significantly with lean body mass (LBM) we concluded that there must be a causal relationship between the protein intake and the loss of lean body mass of the geriatric patients.

PT-098
The School Fruit Scheme’s impact on children’s barriers to eating vegetable and fruits.
Woinska K, Jarosz M, Jazewska-Schuetz J, Taraszewska A
National Food and Nutrition Institute, Department of School Nutrition Division, Poland

Objectives: Surveys indicate that a large percentage of the school-aged children population does not consume the recommended intake of fruits and vegetables. The aim of the study was to analyze the School Fruit Scheme’s impact on children’s barriers to fruit and vegetable consumption.
Material and methods: The study was conducted in the school year 2010/2011 in 38 primary schools in Poland among students aged 9 years on the basis of anonymous questionnaires in two types of schools: participating in the School Fruit Scheme and control group. The study was carried out in two stages: before launching the distribution of free fruit and vegetables (October 2010) and at the end of the fruit and vegetables distribution period (May-June 2011).
Results: 33% of the children participating in the program reported that there was at least one barrier to eating fruit. In the first stage 27.5% responded that the barrier is too short breaks, 30.5% prefer to eat something sweet, 18.8% do not eat fruit because their friends do not eat and for 15.3% it takes too much time. In the second stage of the study showed significantly less response “I do not eat because colleagues do not eat” and “I prefer to eat something sweet” (p = 0.0001) in the intervention group than in the control (10.5% vs 17.4% and 19% and 27.6%, respectively). 28% of the children reported that there is at least one barrier to eating vegetables.

Conclusion: The results of the study showed that children’s barriers to eating vegetables were less prevalent than barriers to eating fruits.

PT-099
The ‘40-Something’ program improved fruit intake and nutrient density of the diet in premenopausal mid-age women at 12-months.
Hollis J. L. 1,2; Williams L. T. 1,2; Collins C. E. 1; Morgan P. J. 1,4
1Priority Research Centre in Physical Activity and Nutrition, The University of Newcastle, Australia. 2Nutrition and Dietetics, School of Health Sciences, Faculty of Health and Medicine, The University of Newcastle, Callaghan, NSW, 2308, Australia. 3Nutrition and Dietetics, School of Allied Health Sciences, Griffith University, Southport, QLD, 4215, Australia. 4School of Education, Faculty of Education and Arts, The University of Newcastle, Callaghan, NSW, 2308, Australia

Objectives: Mid-age women commonly experience an increase in weight and visceral fat and a reduction in lean muscle mass during the menopause transition. Their nutritional requirements also change post-menopause with a need for better diet quality as energy requirements reduce and micronutrient requirements increase. Mid-age is a key time to prevent obesity-related adverse health problems and nutritional deficiencies later in life. The 40-Something Randomised Controlled Trial (RCT) (ACTRN12611000649009) aimed to determine if a 12-month health professional-led intervention, based on motivational interviewing principles, could improve dietary intake, increase physical activity and prevent weight gain in mid-age, healthy weight and overweight premenopausal women.

Material and methods: Women (mean (SD) age = 47.3 ± 1.8 years, weight = 68.7 (7.9) kg) were randomly allocated to the motivational interviewing (MI) group (n=28) (4 x 60 minute dietitian consultations and 1 x 60 minute exercise physiologist consultation delivered over 12 months), or a self-directed (SD) control group (n=26) which received no intervention. Participants completed 4-day weighed food records and physical activity diaries at baseline (n=53), three months (n=49) and 12 months (n=35). Nutrient intakes were compared to Australian nutrient reference values and converted to nutrient densities. The Multiple Model analyses were performed to see whether the score covariates (age, socioeconomic status, baseline body mass index) and interactions were used to test for between-group differences by group and between participants who did and did not meet weight control goals.
Results: MI women had diets significantly more nutrient dense for iron (0.93 g/MJ, p=0.01) and potassium (89.87 mg/MJ, p=0.04), and consumed more
Adebayo F.A., Erkkila A., Sohaib K., Erkkola S., Sugiharto

Years of fruit (0.71 serves/d, p=0.02) than were nutrition status of -6.27, p=0.38), or for minutes of physical activity (46.04 min/d, p=0.13), pedometer-measured steps (504.49 steps/d, p=0.81) and sitting time (32.51 min/d, p=0.77). Women who achieved weight control goals consumed the highest amount of fruit (0.76 serves/d, p=0.02) and less meat/meat alternatives (-0.34 serves/day, p<0.01) servings than women who did not.

Key findings: The findings demonstrate the effectiveness of the 40-Something RCT in improving nutrient density and fruit intake in premenopausal women. The lack of physical activity and sedentary behaviour change indicate that future interventions with this group may need to more strongly emphasise physical activity, which may be achieved by allowing women to tailor health professional support by choosing follow-up consultations with a dietitian or exercise physiologist.

PT-100 Poster

Relationship between Environmental Factors and Nutrition Status of Children Under Five Years Old in Mindi Village, Porong-Indonesia on October-November 2012.

Sugiharto C., Isdana F.Z., Mufarrihah I., I Adha Agus P.U., DwI F.B.N.2
Department of Public Health, Faculty of Medicine Wijaya Kusuma University, Surabaya-Indonesia. 2Graduate Program of Faculty of Medicine Wijaya Kusuma University, Surabaya-Indonesia

Objectives: Nutrition status is one of the important parameter for measuring social and health. The prevalence of malnutrition in children is one of the indicator in Millennium Development Goals (MDGs). Nutrition status is related to some factors, including environmental factor of the children. This study aimed to analyze the relationship between environmental factors and the nutrition status of children under five years old in Mindi Village, Porong-Indonesia on October-November 2012.

Materials and Methods: This was an observational cross-sectional analytic study conducted in Mindi Village, Porong-Indonesia on October to November 2012. Sample 19 respondents of 257 in population. Observed variables were nutrition status of children under five years old for five days as dependent variable and environmental factors as independent variable, which were smoking habit in the family, house ventilation, residential density, and family type. Fisher's exact test was performed for analyzing the relationship between the environmental factors and the nutrition status of children under five years old.

Results: The characteristic of the respondent was: having female children under five years old (63.16%), bad nutrition status (73.68%), smoking habit in the family (73.68%), inadequate house ventilation (57.89%), adequate residential density (94.74%), good floor type (89.47%). The result showed that environmental factors related to the nutrition status of children under five years old were: smoking habit in the family with p = 0.001 < a (0.05) and house ventilation p = 0.04 < a (0.05). Efforts should be focused in changing the environmental factors, especially the smoking habit in the family and house ventilation to reduce the amount of bad nutrition of children under five years old.

Key findings: Nutrition status, smoking habit, house ventilation, residential density, floor type.

PT-101 Poster

Breastfeeding perceptions and practices among African immigrant mothers in Helsinki metropolitan area.

Adebayo F.A., Erkkila A., Schab K., Erkkola M.

Work center: University of Eastern Finland, Kuopio Campus, University of Helsinki, Finland

Background: Breastfeeding, especially when done exclusively for the first six months, is the recommended infant feeding method. Through breastfeeding, infants need feeding by young infants and development, are made available to them. Despite various benefits of breastfeeding, there are low rates of it globally. Exclusive breastfeeding in particular has been very low, even in Africa where breastfeeding is believed to be nearly universal. Based on the fact that breastfeeding as a practice is important cultural setting and breastfeeding among a particular group of people can be understood by studying their perceptions about its practices.

Objectives: The aim of the study was to examine perceptions about breastfeeding and the factors that are associated with breastfeeding practices among African immigrant mothers in Finland.

Material and methods: The study used qualitative method involving thematic semi-structured in-depth interviews. The interviews were conducted from March to June 2011 among 10 African immigrant mothers. The women were recruited using Snowball sampling technique. Inclusion criteria include: living in Helsinki Metropolitan Area, having given birth to a child whose age was between 1-3 years, and being able to speak and understand English language. All interviews were audio-recorded, transcribed verbatim and analysed using content analysis.

Results: Seven major themes emerged from this study, (1) general perception of breastfeeding; (2) perceived advantages and disadvantages of breastfeeding; (3) breastfeeding practices and levels of commitment; (4) breastfeeding decision and social influences; (5) attitude towards breastfeeding; (6) sources of awareness and information; (7) perceptions about formula feeding.

Mothers' perceptions about breastfeeding included it being beneficial for both mother and infant, maternal-infant bonding, and for reducing the risk of breast cancer, among others. Positive perceptions and attitudes about breastfeeding were found in association with high rate of breastfeeding practices both in terms of initiation and duration. Breastfeeding decision and practices were generally influenced by indigenous culture, encouragement from social network, and information about the importance of breastfeeding. Despite the high level of commitment towards breastfeeding, the prevalence of exclusive breastfeeding was lower than globally recommended.

Conclusion: African immigrant mothers in Finland had strong and positive perceptions about breastfeeding. This study recommends that breastfeeding promoting educational programmes are very important especially for improvement in exclusive breastfeeding.

PT-102 Poster

Effect of micronutrient intake on the immune system of people living with HIV/AIDS.

Oly-Alawuba N.M., Abugwor C.A.

Imo State University Owerrri, Nigeria

Background and objectives: HIV/AIDS is one of the most raging global epidemics with its resultant death effect. The number of people infected with this disease increases every year. The increased energy expenditure and tissue breakdown associated with HIV infection are thought to increase the requirements of micronutrients. There is urgent need for nutritional intervention to halt its continued spread and to improve the quality of those already infected and living with it. This study aims at assessing the effect of micronutrient intake on the immune system of people with HIV/AIDS by their consumption of some known fruits and vegetables.

Methods: Five (5) HIV Volunteers comprising of 4 females and 1 male in the age range 26-40 years were recruited in the heart to heart unit of the Catholic Mission Hospital Emekuku Owerrri, Imo State of Nigeria. Five known fruits in season (Orange, carrot, Tomato, Pineapple and watermelon) were bought, peeled and cut in pieces for blending. The undiluted fruit juices were separately collected in clean sterilized containers and kept in a cool place for further use. Two doses (50c) of the undiluted fruit juices were served to them in the mornings and in the evenings for a period of seven days. The CD4 (Cluster of Differentiation) counts of the individual respondents were determined using the CD4 reagents and the patec flow machine. The micronutrient content of the fruits were chemically analyzed using modern methods of AOAC.

Results: Result showed that four out of the five respondents used in this study had higher CD4 count after the intervention period of seven days and there had not been a reduced CD4 count at the interim period. There were higher increase of Vit A, Vit B1, Vit B2, & Carotene in carrot, Niacin and Vit E was highest in tomatoes, while orange had highest level of Vit C compared to other fruits.

Conclusion: Fruits have been found to contain remarkable quantities of micronutrients (vitamins and minerals) especially the antioxidants. This finding is very important in boosting the immune system of HIV positive people. Micronutrient intake over a week range had considerable effect on the CD4 count and could do more if given for a longer period.

There is need therefore to incorporate fruit based micronutrients in the diets of HIV/AIDS patients.

PT-103 Poster

Abscess infections and malnutrition – a cross-sectional study of polydrug addicts in Oslo, Norway.

Slaeland M., Wandel M., Bø H., Himer P., Haugen M.

1Oslo and Akershus University College, Oslo; Department of Nutrition, Institute of Basic Medical Sciences, University of Oslo; 2Nutritional Laboratory, Department of Medical Biochemistry, Oslo University Hospital, Aker; 3Division of Environmental Medicine, Norwegian Institute of Public Health, Oslo, Norway

Background: Injection drug use and malnutrition are widespread among polydrug addicts in Oslo, Norway, but little is known about the frequency of abscess infections and possible relations to malnutrition. Objectives. To assess the prevalence of abscess infections, and differences in nutritional status between drug addicts with and without abscess infections. Design. A cross-sectional study of 195 polydrug addicts encompassing interview of demographics, dietary recall, anthropometric measurements and biochemical analyses. All respondents were under the influence of illicit drugs and were not participating in any drug treatment or rehabilitation program at the time of investigation. Results. Abscess infections were reported by

III World Congress of Public Health Nutrition - 154 - International Journal of Community Nutrition 2014, 0 (suppl)
25% of the respondents, 19% of the men and 33% of the women (p 0.025). Underweight (BMI 1.85 kg/m²) was significantly more prevalent in the abscess infected than in the non-abscess-infected group (p 0.001). The abscess-infected addicts reported fewer meals, lower intakes of fruits and vegetables, lower energy percentage (E%) from protein and higher E% from sugar. They also had lower total intakes of vitamins D, B 1, B 6, B 12, folic acid and the non-abscess-infected group. The two groups differed significantly with respect to S-C-peptide (p 0.042) and B-HBAlC (p 0.012), and the prevalence of hyperhomocysteminaemia (P-HCY 1.5 µ mol/L) was 73% in the abscess-infected group and 41% in the non-abscess-infected group (p 0.001). The concentrations of 5-25-S-hydroxyvitamin D 3 was very low. Conclusion. The prevalence of abscess infections was 25% among the examined polydrug addicts. Dietary, anthropometric and biochemical assessment indicated a relation between abscess infections and malnutrition.

PT-104
Poster
Correlations between body mass index and elevated parameters of lipid metabolism in Austrian adults.
Hasenegger V.
Department of Nutritional Sciences, University of Vienna

Objectives: The aim of the presented study was to illustrate the correlations between an increased body mass index (BMI) and elevated plasma total cholesterol, LDL-cholesterol and triglycerides as well as lowered HDL-cholesterol in Austrian adults, which were identified in numerous studies.

Materials and methods: The presented data were collected within the framework of the "Austrian study on nutrition 2010/12". Altogether 313 Austrian adults (18-64 years) were examined. Body height and body weight were measured according to standardized procedures. Blood lipid profile was analysed photometrically using a Vitros 250 autoanalyser. To classify the individuals as underweight, normal weight, overweight or obese BMI was calculated as body weight in kilograms divided by body height in meters squared. According to the World Health Organization overweight was defined as BMI≥25 kg/m² and obesity as BMI≥30 kg/m².

Results: Plasma total cholesterol, LDL-cholesterol and triglycerides were increased whereas HDL-cholesterol was deceased significantly with increasing BMI. Thus, the mean ratio of total- to HDL-cholesterol was increased with increasing BMI, too. Overweight and obese individuals had significantly higher mean total cholesterol (5.4 vs. 5.7 mmol/L, p<0.05), LDL-cholesterol (3.2 vs. 3.7 mmol/L, p<0.001) and triglyceride levels (1.1 vs. 1.5 mmol/L, p<0.001) compared to overweight individuals whereas HDL-cholesterol was significantly lower (1.7 vs. 1.8 mmol/L, p<0.001). 74.3% of overweight and obese adults and only 61.5% of normal weight persons revealed total cholesterol above the threshold of 5mmol/L (p<0.05). Moreover, the percentage of overweight and obese adults with triglycerides, LDL-cholesterol and ratio of total- to HDL-cholesterol above the corresponding reference values (1.7 vs. 3.0 mmol/L, 5) was significantly higher than the percentage of normal weight individuals with altered blood lipid profile. Recommended HDL-cholesterol (>1.2 mmol/L) were reached in 88.7% of normal weight and only 53.4% of overweight and obese adults (p<0.001).

Key words: Adult, BMI, HDL, LDL, triglycerides, overweight, obesity

PT-105
Poster
Association between supplementation of vitamin C and E for one year and serum α-tocopherol concentration in elderly Iranian patients with MCI.
Sorous M, Alavi A; Elmadadi I.
Department of Nutritional Sciences, University of Vienna, Austria

Background and objectives: Elderly patients with MCI (Mild Cognitive Impairment) show different levels of vitamin E status, serum α-tocopherol content also in the elderly may be influenced by different factors. Only insufficient data are available about the influence of supplementation with antioxidants on the vitamin E status. In this study the impact of one year intervention with vitamin E and C on the serum α-tocopherol was assessed.

Methods: A 12-month, double-blinded, placebo-controlled trial was conducted in 180 elderly Iranian individuals with MCI aged between 60-75 years (90 women and 90 men). Divided into two main groups, the intervention group and the control group. The intervention group received 300 mg vitamin E (Alpha-tocopheryl acetate) and 400 mg vitamin C (Ascorbic acid), and the other 90 persons (Control group) received specially designed placebo. All patients were not taking any drugs that might interfere with the supplements. Serum α-tocopherol contents were assessed in all patients at baseline, 6 and 12 months of intervention using HPLC.

Results: Results show there was a significant difference between females in the control and supplemented group at six months and at the end of intervention (Females, control/supplemented 29.7±6.107, 35±10.67 µmol/L, p<0.043) and (Females, control/supplemented 27.6±11.07, 36.5±11.07 µmol/L, p<0.0008) respectively. At the end of the intervention there was a significant difference between males in control and supplemented group (Males, control/supplemented 26.1±37.55, 32.3±14.55 µmol/L, p<0.012), but there was no significant difference between males at six months in control and supplemented group (Males, control/supplemented 27.7±6.4, 30.1±14.56 µmol/L, p<0.34).

Conclusions: One year of antioxidant supplementation with vitamin E and C in elderly subjects with MCI lead to significant increase in the serum α-tocopherol levels.

PT-106
Poster
Snacking between main meals is associated with a higher risk of metabolic syndrome in a Mediterranean cohort: the SUN (Seguimiento Universidad de Navarra) Project.
De la Fuente-Arrillaga C.1; Pimenta A.1; Bas-Rastrollo M.1; Gea A.1; López-Iachetta R.1; Martínez-González MA.1,2 1 Dept. of Preventive Medicine and Public Health, University of Navarra, Pamplona, Spain; 2 CIBER Fisiopatología de la Obesidad y Nutrición (CIBER-OB); Instituto de Salud Carlos III, Spain; 1 Dept. of Material and Child Nursing and Public Health, Federal University of Minas Gerais, Belo Horizonte, MG, Brazil.

Objectives: To evaluate the association of snacking between main meals with the risk of developing Metabolic Syndrome (MetS).

Material and methods: Data from a dynamic prospective cohort study, the SUN Project (Seguimiento Universidad de Navarra) was used. Snack consumption was evaluated, using the following question: "Do you have the habit of eating between main meals?" MetS was defined according to the updated harmonizing criteria. We estimated multivariable-adjusted Relative Risks (RR) of MetS and their 95% Confidence Intervals (95% CI), using Poisson regression models. An exploratory factor analysis was also used to identify patterns of snacking.

The study included 6,851 university graduates, initially free of MetS, and followed-up for a median of 8.3 years.

Results: Among our participants, 34.6% reported usual snacking between main meals. The cumulative incidence of MetS was 5.1% (9.5% among men and 2.8% among women). Snacking between main meals was significantly associated with a higher risk of developing MetS after multivariable adjustment (RR 1.30; 95% CI 1.06-1.60). A higher adherence to an "unhealthy snacking pattern" was also independently associated with increased incidence of MetS (RR for the 4th quartile of adherence compared to non-snacking: RR 1.55; 95% CI 1.05 - 2.04; for trend: p<0.012).

Key words: Findings: Our findings suggest that avoidance of snacking between main meals can be included among the preventive approaches to reduce the risk of MetS development, especially when snacks contain foods of poor nutritional quality. Further longitudinal studies in general population should be conducted to corroborate this relationship.

Funding: The SUN Study has received funding from the Instituto de Salud Carlos III, Official Agency of the Spanish Government for biomedical research (Grants P1002658, P1002293, P1000615, RD060045, G03/140 and B73/2010), the Navarra Regional Government (45/2011) and the University of Navarra.

PT-107
Poster
Standardization of Nutritional Equivalency of Food Composition Database in Latin American Survey of Nutrition and Health (ELANS).
Fisberg M.1;2; Kovalsky J; Fisberg R.M.; de França N.A.G.; Amigo M.P.; Cortés L.Y.S.; on behalf of the ELANS Study Group.
1 Faculdade de Medicina e Ciências da Saúde, Universidade de São Paulo, São Paulo, Brazil. 2 Instituto de Nutrición y Bioquímica - Pontificia Universidad Javeriana – Bogotá, Colombia

Objectives: To describe the methodological concepts and procedures involved in the standardization of nutritional equivalency of food composition database across the 8 Latin American countries participating in the Latin American Survey of Nutrition and Health study (Estudio Latinoamericano de Nutrición y Salud (ELANS)).

Material and methods: The data for this study will be originated from an ongoing multinational cross-sectional study in a representative urban sample of 10,000 adults of both genders and from 3 socioeconomic strata of 8 Latin American countries (Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Peru and Venezuela). A standard study protocol was design to investigate nutritional intake pattern in all countries enrolled. Two 24-hour recalls using Multiple Pass Method will be applied among the individuals of all countries. Quality of the acquired information will be checked, and the quantification of food and beverages intake will be conducted using national published data concerning the quantities of household measures and recipes. The data from the 24-hour dietary recall will be entered into the Nutrition Data System for Research program (NDS-R, version 2013, Nutrition International Journal of Community Nutrition 2014, 0 (suppl) III World Congress of Public Health Nutrition - 155 -
Coordinating Center, University of Minnesota). A food matching standardized procedure will be strictly conducted by the countries. This procedure involves a nutritional equivalency of local food items (food, beverages, and recipes) reported by the study subjects of each country to foods available in NDS-R database. A concordance rate between 80 and 120% for energy and macronutrient content will be considered to establish food selection from this database. Regional food preparations will be provided by national publications and will be entered into the software as standard recipes.

Results: Using this method of standardization and documentation at the food and nutrient levels will likely minimize systematic and random errors in nutrient intake estimations and allow comparisons between these Latin American countries. This is an important initiative for harmonization of dietary assessment that could be applied in a standardized manner in different populations and could therefore generate comparable dietary data in multicentre epidemiological studies.

PT-108  Poster
The Amed Certification enables to follow a healthy eating diet outside the house for more than 51,000 people per day in Catalonia.
Salvador G; Miranda G; Castell C; Cabezás C; Mateu A
Public Health Agency of Catalonia, Barcelona.

Background. Cardiovascular disease, caused mainly by physical inactivity and poor food habits, are among Catalonia’s population main cause of death. The Mediterranean diet is well known for being one of the healthiest diets, with cardiovascular protective effects. Since 31% of the Catalan people eats out at least once a week (Monday to Friday), the Catalan Public Health Agency designed in 2007 the Amed Certification in order to identify and certify Mediterranean diet promoting establishments, whilst improving their food offer. This pioneer project in Spain is addressed to restaurants, food chains and dinners, especially schools. Nowadays, there have been 322 certified establishments, in 87 municipalities, reaching more than 51,000 people per day.

Objective. To evaluate the improvements in the use of selected typical Mediterranean foods, observed within the applicants, before and after the certification since 2012.

Material and methods. Food offer is collected with an online questionnaire through Amed’s website. Later, the data is confirmed by telephone or by a personal visit of a certified Dietitian-Nutritionist. Following the Amed criteria, a descriptive analysis has been applied to obtain the improvement percentage of the food offer within the applicants (olive oil, vegetables and pulses, whole grain products, fresh fruit and low fat dairy desserts).

Results. From 2012 to May 2014, a total of 159 establishments have been certified for offering Mediterranean meals to 25,725 people/day.

The improvements are an increase of 69% in the use of high-oleic-acid sunflower oil for frying, 33% in the incorporation of whole grain products (bread, pasta and rice), 24% in the use of olive oil or high-oleic-acid sunflower oil for cooking, 23% of low fat dairy products for dessert, 10% in the offer of more vegetables and pulses in the first course, 33% in the offer of fresh fruit for dessert and 3% in the offer of lean meats and fish in the second courses. Olive oil was already used as the main salad dressing by all applicants.

Key findings: The Amed certification guarantees food improvements within the certified establishments, mainly concerning the change of common vegetable oil for high-oleic-acid sunflower oil for cooking and/or frying. It also increased the use of whole grain products, mainly bread, and fresh fruit and low fat dairy products for dessert.

PT-110  Poster
Physical activity between Brazilian adult consumers and non-consumers of yogurt.
Posso G; Fisberg RM; Corrente JE; Fisberg M

Objective: The aim of this cross-section population-based study was to evaluate the association between yogurt consumption and physical activity in a sample of adults living in Sao Paulo, Brazil.

Material and Methods: The data come from a cross-sectional population-based survey entitled ‘Lifestyle of adults consumers and non consumers of yogurt living in Sao Paulo, Brazil’, in which a total of 2,610 adults were allocated in 10 equal number of yogurt consumers or non-consumers group according to their yogurt consumption frequency (more than or equal to 4 times a week in the last year or less than 1 time a week, respectively) and matched according to sex, age and socioeconomic status. Additionally, inclusion criteria were: individuals between 18 and 59 years old and belonging to A, B, and C socioeconomic classes. In the present study, data were available from 2,581 individuals. Trained interviewers collected data between February and March 2014 through face-to-face household interviews. The interview consisted of two phases, selecting and recruiting and final interview, both on the same day. In the first phase, a questionnaire was applied to obtain data about yogurt intake frequency, demographic characteristics, lifestyle variables (smoking, pregnancy) and socioeconomic classification. Individuals who met the inclusion criteria went on to the second phase of interview, in which data about lifestyle characteristics, including physical activity, were obtained.

The International Physical Activity Questionnaire (IPAQ) long version was used to assess levels of physical activity. Individuals were categorized into two groups according to the physical activity score: very active (moderate-intensity activity and/or walking for a minimum of 30 min on five days each week or vigorous-intensity activity for a minimum of 20 min on three days each week) or not very active. Moreover, individuals were categorized into active or not active according to their leisure-time physical activity.

Results: The overall prevalence of very physically active individuals was 37.0%. Compared with non-consumers, yogurt consumers presented higher prevalence of individuals categorized as very active (39.17% vs. 34.89%; p = 0.028) and higher proportion of individuals physically active reaching leisure-time (17.70% vs. 14.40%; p = 0.0230).

Key findings: It was concluded that yogurt consumption is associated with higher level of physical activity and lower prevalence of inactivity during leisure-time.
PT-113 Poster
Changes in body composition according to anthropometry in Brazilian elderly.
Ribeiro AQ, Rezende FAC, Priore SE, Franceschinii SCC
Department of Nutrition and Health, Federal University of Viçosa, Brazil

Objective: To assess changes in body composition due to aging by anthropometric-institutionalization elderly in Brazil.

Material and methods: A population, household and cross-study among seniors aged greater than or equal to 60 years, of both genders, living in Viçosa, Minas Gerais, Brazil, from June to December 2009. Weight, height, circumferences of waist, hip, calf and arm, body mass index (BMI), body adiposity index (BAI), waist-hip ratio (WHR) and waist-height ratio (WHtR) were evaluated according to gender and age groups (60-69 years; 70-79 years; 80 years and over). Data were analyzed using Stata version 9.0 and the Student t test to compare genders; ANOVA was used for comparison between age groups, and α = 0.05 was adopted as the significance level.

Results: were evaluated, with a slight predominance of women (53.3%), who had a higher age mean when compared to men (71.5±4.8 vs 69.9±5.7 years, p<0.01), and a higher prevalence of overweight (BMI ≥ 27 kg/m²) assessed by BMI (59.9% vs. 43.3%, p<0.001). Women had higher mean values for BMI, WHR, BAI and arm circumference (p<0.001), whereas men had higher means of weight, height, and WHR (p<0.001). Means of waist and calf circumferences did not differ between the genders (p>0.05).

Key findings: a significant reduction of total body mass occurs with advancing age, especially in men, mainly due to the loss of peripheral body reserves. The central body adiposity basically did not change with advancing age, and it may result in an increased cardiovascular risk and disability in the elderly.

PT-114 Poster
Vitamin D in adult smoking and ex-smoking females: intake, serum concentration and body composition.
Paulo Sotelo Júnior, Fabio Benevenuto Meloni P, Maimo Carvalho F, Paiva Sôrgio AR, Botucatu School of Medicine, UNESP - São Paulo, Brazil.

Introduction: Smoking is associated negatively with serum concentrations of vitamin D in women and cause changes in the body composition. Obesity may too influence the serum concentration of vitamin D, probably to be stored in adipocytes. In this way, the profile of adult women smokers and ex-smokers were evaluated and compared to serum concentration of vitamin D, dietary intake and corporeal composition.

Methodology: 55 women were evaluated in the period from March 2012 to June 2012. Among these, 18 were active smokers (S), 18 ex-smokers (ex-S) and 19 nonsmokers (NS)was performed. The evaluation was performed by means of Identification Questionnaire, Frequency Questionnaire of Solar Exposure, 24-hour recall in triplicate (intake of calcium and vitamin D), Body Composition (weight and height, body mass index) and Biochemical (vitamin D and serum calcium, phosphorus and magnesium). In smokers, ex-smokers and nonsmokers groups was performed the t-test or Mann-Whitney test and multivariate linear regression using the program SigmaPlot for Windows version 12.0 (Systat Software), employing p<0.05 as statistical significance.

Results: The average age of women smokers and ex-smokers was greater than 50 years (S=52.8±7 years, Ex-S=51.7±8 years and a NS=

PT-115 Poster
Prevalence of eating disorders in students of educational centers from Gran Canaria.
Álvarez-Malé ML1,2, Bautista-Castaño F1,2,3, Serra-Majem L1,2,4
1Department of Preventive Medicine and Public Health, University of Las Palmas de Gran Canaria, Las Palmas de Gran Canaria, Spain. 2Asociación Gull-Lasquete para el Estudio y Tratamiento de la Anorexia y la Bulimia en Canarias, Las Palmas de Gran Canaria, Spain. 3Nutrition Research Group, Research Institute of Biomedical and Health Sciences, University of Las Palmas de Gran Canaria, Las Palmas de Gran Canaria, Spain 4Ciber de Fisiopatología de la Obesidad y Nutrición (CIBER OBN), Instituto de Salud Carlos III, Madrid, Spain

Objective: To assess the prevalence of eating disorders in Spanish students between 11 and 33 years old using standardized methods.

Material and Methods: 1342 students were randomly selected from educational centers on Gran Canaria, Spain. We used a two phase cross sectional design which involved the screening (EAT-40 questionnaire at a cutoff score of 20) and a semi-structured interview (EDE). Sociodemographic variables and weight status were also evaluated.

Results: In 2013 we studied participants of 15 educational centers on Gran Canaria. In the first phase we found a prevalence of risk of 27.42% (18.11% of females, 9.31% of males). In the second phase, 538 participants agreed to proceed with clinical evaluation (285 at risk, high scores; 253 selected sample not at risk). The overall prevalence of eating disorders was 4.11% (2.54% of females, 1.57% of males). Diagnostic comparison of the prevalence of anorexia nervosa was 0.19%, of bulimia nervosa 0.57% and of eating disorder not otherwise specified 3.34%.

Key findings: The prevalence of eating disorders diagnosis in Gran Canaria is similar than in the rest of Spain. However, the prevalence of risk of eating disorders in Gran Canaria is especially high considering data of other studies made in Spain and other countries.

PT-116 Poster
Serum 25(OH)D and its association with adiposity in brazilian adolescents.
Novel J1; Oliveira R.M.S.2; Candido A.P.C.3; Leite I.C.G.3
1Federal University of Viçosa 2Federal University of Juiz de Fora

Objectives: Evaluate the prevalence of insufficiency/deficiency of vitamin D and its relationship with overweight and body fat in adolescents.

Material and Methods: This is a cross-sectional study with 160 adolescents (euthrophic and overweight), aged between 15 and 17 years of high schools of the city of Juiz de Fora, Minas Gerais, Brazil. Nutritional status was assessed by body mass index according to World Health Organization. Dietary intake was assessed using a food record by 3 days. Biochemical evaluation included analysis of calcitrol [25(OH)D]. Adolescents with waist circumference above the 90th percentile were classified at risk. Body composition was assessed by tetrapolar bioimpedance.

Results: The mean age was 16 years, 55.6% was male, 48.1% was eutrophic and 51.9% was overweight. Deficiency of vitamin D [% 25nmol/L (10ng/ml)] was observed in 1.25% of adolescents. Insufficiency of vitamin D (25-75 nmol/L(11-30 ng/ml) was observed in 70.6% of the sample. Serum 25(OH)D were lower in adolescents with excess body fat and with waist circumference at risk (P<0.05).

Key findings: This study concluded a high prevalence of vitamin D insufficiency in adolescents (70.6%), even in sunny country like Brazil. This is one of the few studies conducted in developing countries evaluating the association of vitamin D with abdominal and total adiposity in adolescents.

More studies are needed to understand the effect of vitamin D in metabolic changes.

PT-117 Poster
Influence of a Mediterranean dietary pattern on body fat distribution: Results of the PREDIMED-Carinas Intervention Randomized Trial.
Research Institute of Biomedical and Health Sciences, University of Las Palmas de Gran Canaria, Luis Pasteur sn, 35016, Las Palmas de Gran Canaria, Spain. Ciber de Fisiopatología de la Obesidad y Nutrición (CIBER OBN), Instituto de Salud Carlos III, Madrid, Spain

Objective: To assess the influence of a Mediterranean dietary pattern (MeDiet) on anthropometric (weight, Body Mass Index (BMI) and waist circumference (WC)) and body composition parameters (percentage of total body fat (% TBF); total fat mass (% TMF); proportion of trunkal fat mass (TMF) in a randomized dietary trial (PREDIMED Study) among high cardiovascular risk subjects.

Design: randomized primary prevention trial.
Participants/Settings: 351 Canarian subjects aged 55 to 80 years old, with diabetes or other cardiovascular risk factors.

Intervention: Participants were randomly assigned to one of three different diets: MeDiet + extra-virgin olive oil (EVOO) [n = 117], MeDiet + Nuts, [n = 117] or a control group with low fat diet (n=117). All participants received quarterly individual and group educational sessions and, depending on
group assignment, free provision of extra-virgin olive oil, mixed nuts, or small nondiet gifts.

Outcome measures: Changes in anthropometric measures and body fat distribution after 1 year. Body composition was estimated by octopolar electrical impedance analysis.

Statistical analyses: Paired t-tests were conducted to assess yearly changes in anthropometric and body composition variables in each intervention group. ANOVA tests were used to assess the effect of dietary interventions on these changes. All those comparisons that were statistically significant in the ANOVA analysis were subsequently analyzed by two by two through the Benjamin-Hochberg test, which penalizes for multiple comparisons. Results: Dietary intervention with Mediterranean diet, with a high proportion of total fat (around 40%) predominantly monounsaturated fats can be an alternative to low-fat diets, in the loss or weight maintenance regimes in obese or overweight.

Key Words: Mediterranean diet, obesity, body composition, body fat, octopolar impedance analysis, PREMED Study

PT-118
Poster
Observer accuracy in the preliminary testing of a newborn anthropometric assessment method using photographic images.

Orozco MW, Solomons NW1, Lukacs T1 and Kimura H2
1Center for the Studies of Sensory Impairment, Aging and Metabolism (CESSIAM), Guatemala. 2Center for Atitlán Studies, Universidad del Valle de Guatemala, Guatemala. 3Japan International Cooperation Agency (JICA)

Objective: The recent recognition of stunting at birth in Guatemalan rural populations highlights the importance of early diagnosis at a public health level. The objective of this study was to determine the observers’ accuracy when using a photographic image method to determine newborn length against the gold-standard infantometer.

Materials and Methods: Three observers (A, B, and C) used each different digital cameras to take pictures of 3 two-dimensional cardboard figures and 2 soft-body baby dolls, both of the approximate overall length of a human newborn. In sagittal exposure photography, we produced an image in the “fetal position.” We sustained the head-to-trunk posture to maintain a“Frankfort plane” gaze, while the sole of the foot was positioned to form a 90° angle at the ankle. A reference-length of either 5 or 10 cm was affixed to the model. Pictures were printed out and each observer used a metric ruler, placed to the nearest mm to measure each of three linear components of the body: the trunk segment (TS); upper-leg segment (ULS); and lower-leg segment (LLS). The TS corresponded to the distance from the crown of the head to the hip joint; the US was the distance from the hip joint to the knee joint; and the LLS was estimated by measuring the length from the knee joint to the sole of the foot. The estimated total composite length was calculated by adding up the TS, US, LLS in mm, and correcting the final dimension in cm, applying the correction-factor from the 5 or 10 cm reference length in the image.

Results: The CVs for 24 cardboard images across observers was: A: 6.2%; B: 5.8%; and C: 5.6%, and for the 32 doll images: A: 6.5%; B: 4.0%; and C: 4.3%. For all common mean cut-out measurements (n=24), the Pearson correlation of observers A vs B was r=0.77; for A vs C, r=0.89 and for B vs C, r=0.84. For all common mean doll measurements (n=32), the Pearson correlation of observers A vs B was r=0.86 (p=0.04); for A vs C, r=0.54 (p=0.001) and for B vs C, r=0.839 (p<0.0001).

Key findings: There is a significant inter-rater correspondence and low variability within observers, when using this new approach of photographic images to assess newborn length in mannequin models.

PT-119
Poster
Trends in food supply during the last 50 years in Greece.

Benetou V1, Spyridis I1, Kastorini C2, Belogianni K3, Zota K4 and Linos A1
1School of Medicine, National and Kapodistrian University of Athens. 2Institute of Preventive Medicine Environmental and Occupational Health (Polepasis)

Objectives: Knowledge on food consumption data and their changes over time is considered essential in order to set and monitor food-based dietary guidelines (RDeGs). Although national food supply data do not reflect actual intakes, they provide insight into food availability and its changes over time, especially in the absence of regularly conducted national food consumption surveys. The temporal trends in the supply of major food groups in Greece were investigated during the last 50 years.

Materials and methods: Food supply data collected from food balance sheets compiled by Food and Agricultural Organization (FAO) of the United Nations were reviewed from 1961-2009.

Results: During the last 30 years, per capita supply of vegetables, and less fruit, increased: from 114.6 to 244.3 kg/capita/year, fruits from 133.5 to 141.3 kg/capita/year, cereal supply decreased (from 166.8 to 148.9 kg/capita/year), while growing trends were observed for potatoes (from 32.0 to 71.6 kg/capita/year). The supply of pulses has been reduced by half in 2009 (8.9 kg/capita/year) compared to 1961 (7.2 kg/capita/year). Dairy products supply has increased, especially milk (from 34.7 to 96.7 kg/capita/year) compared to cheese (from 13.3 to 26.7 kg/capita/year). Meat supply, including poultry, has exhibited considerable increase (from 21.1 to 74.8 kg/capita/year), whereas fish and seafood supply has increased only slightly (from 16.2 to 20.4 kg/capita/year). Animal fat and vegetable oils supply have both increased (animal fats: from 1.9 to 4.3 kg/capita/year, vegetable oils: from 17.5 to 25.9 kg/capita/year), whereas, the increase in vegetable oils referred mostly to sunflower oil (from 0.2 to 5.6 kg/capita/year). Olive oil supply reached a maximum value (21.8 kg/capita/year) during the ‘70s and showed a decreasing trend thereafter. Mean per capita sugar supply has increased dramatically (from 15.3 to 34.4 kg/capita/year). Alcoholic beverages supply increased also significantly (from 40.3 to 67.7 kg/capita/year) while wine supply is progressively declining compared to other types of alcoholic beverages. During 2001-2009 a subtle decline was observed in vegetable and fruit supply but also for meat supply.

Key findings: Unfavorable changes in food supply have been observed for the majority of the food groups during the last 50 years, reflecting a gradual shift away from the traditional Greek dietary pattern. Food and nutrition policies should focus more in preserving and promoting traditional Greek diet across the life span. BFDBs for the Greek population, used as a policy tool, can contribute towards this direction.

PT-120
Poster
Relationship of screen time with body weight and eating habits in teens.


Objectives: “Screen time” is a term used for activities performed in front of a screen, like watching TV, working on a computer or playing video games. Screen time is a sedentary activity, which means being physically inactive while sitting, and during the time of screen consumption very little energy, so it is necessary to evaluate if there is any relationship between screen time and eating habits or body weight.

Material and Methods: This was a descriptive, longitudinal study. Male and female adolescents aged between 16 and 22 years were surveyed about the time they spend in front of screens and additionally inquiring about their habits questionnaires were applied. The information was separated by anthropometric, socioeconomic, dietary habits and lifestyles, the data were analyzed based on body mass index, having 4 main parameters: underweight, normal weight, overweight and obesity and the statistical analysis was performed for the conclusions.

Results: Normal weight adolescents watch television three to four days a week, however TV hours are one to three and they don’t eat while watching TV. They use the computer between one and two hours, listening music but do not eat, neither do when using a game but rarely play. They have three meals a day, drink three to four glasses of water, most have scheduled times of food and perform some physical activity. They consume lots of fruits and vegetables, cereals and snacks and rarely instant food, fast food or soft drinks. In obese adolescents we found that daily television are between one and three hours, more than two hours using the computer; they perform not specific school and eating random meals: one or two glasses of water a day, most do not perform any physical activity, consume many simple carbohydrates, instant food and soft drinks, sometimes fruits, vegetables and much of the food they eat is the result of TV ads.

Key findings: Although no relationship between hours in front of screen and overweight and obesity was found, we observed that the influence of television could be a cause of overweight and obesity. According to the findings of this survey is a priority not only promote the development of good eating habits and increasing moderate and vigorous physical activity, including sports activities, but also decreasing sedentary activities such as idle transport, screen time and time sitting.

PT-121
Poster
Betaine and choline intakes are related to total plasma homocysteine: health survey of São Paulo, Brazil.

Lopes, RVC; Castro, MA; Baltar, V; Marchioni, DLM; Fisberg, RM
1Department of Nutrition, School of Public Health, University of São Paulo. Dr. Arnaldo Avenue, 715, São Paulo-Brazil. 2Department of Epidemiology

III World Congress of Public Health Nutrition - 158 -
and Biostatistics, Institute of Community Health, Fluminense Federal University, Brazil.

Background: Elevated concentrations of plasma homocysteine (Hcy) have been associated with an increase in the risk for cardiovascular diseases. Hcy can be reduced through remethylation to methionine that use folate or betaine as methyl radical donors. Betaine can be obtained directly from diet or choline oxidation. The objective of this study was to evaluate betaine and choline intakes and investigate their relation to Hcy in residents of the city of São Paulo.

Methods: Data were obtained from 584 adults and elderly of both genders in a population-based cross-sectional study called Health Survey - São Paulo (SA-SP 2008). Plasma homocysteine geometric means were analyzed according to tertiles of choline and betaine intakes and a linear trend was also performed.

Results: The prevalence of hyperhomocysteinemia was higher in men (28%), elderly (21%), individuals with lower family income (21%). About 31% of individuals with hyperhomocysteinemia showed folate deficiency (<7.5 mmol/L) and 26% of them showed vitamin B12 deficiency (<200 pmol/L). There was a decrease in Hcy medians as tertiles of betaine intake increased for all studied variables, except for elderly, individuals with higher family income than minimum wage, individuals who were not normal-weight, non-smokers and non-consumers of alcoholic beverages. Choline was noted to have a relation to plasma homocysteine levels in both genders, in individuals with higher family income, non-smokers and in consumers of alcoholic beverages.

Conclusion: The present study suggests the importance of betaine intake and its inverse association with plasma homocysteine levels in adults and elderly residents of the city of São Paulo.


Rural Development Administration, Korea

This study aimed to investigate the factors influencing on the intention of vegetable consumption among children and adolescents in Korea. To determine students' intention toward vegetable intake, a survey with structured questionnaires based on the theory of planned behavior was implemented to elementary, middle and high school students in Seoul and Gyeonggi province. CTV-5 was used to analyze data. To examine the differences of attitude, subjective norm, and perceived behavioral control toward vegetable intake among elementary (n=241), middle (n=212) and high school (n=305) students, one-way analysis of variance and Tukey's multiple comparison test were conducted. Intention was not different among groups. Attitude was not different, however, elementary school students had the highest subjective norm (p<0.001) and perceived behavioral control (p<0.001). The regression model for elementary school students (R²=0.69%, p<0.001) showed that attitude (B=-0.47, p<0.001) and perceived behavioral control (B=0.28, p<0.001) were significantly related to intention on vegetable intake, objective norm was not. In case of middle school students (R²=0.53%, p<0.001), attitude (B=0.50, p<0.001) and perceived behavioral control (B=0.28, p<0.001) were also significantly related to intention on vegetable intake and subjective norm was not. The result of high school students' model (R²=0.46%, p<0.001) was similar. So, intervention for children and adolescents to increase vegetable consumption should be targeted to improve attitude and perceived behavioral control toward vegetable intake.

PT-123 A daily snack containing green leafy vegetables, fruit and milk for increases in women's erythrocyte docosahexaenoic acid - a randomised controlled trial in slums of Mumbai, India. Chopde A1; Kohree S.H.; Saharia S.A.; Patidar R.; Fall C.H.D.; Joshi S.1

1Centre for Study of Social Change, Mumbai, India, *MTRC Life course Epidemiology Unit, Southampton, UK; Department of Nutritional Medicine, Interactive Research School for Health Affairs, Bharati Vidyapeeth Deemed University, Pune

Objectives: DHA is important for brain development and cognition. DHA supplementation during pregnancy influences gestation period and infant size. Snacks containing GLV, fruit and milk, consumed by women before and during pregnancy in the Mumbai Maternal Nutrition Project (MMNP) increased DHA content compared with a control. Our objective was to investigate whether consuming these snacks for 12 weeks increases erythrocyte DHA among women of reproductive age.

Methods: Non-pregnant women aged 14-35 y. Living in Mumbai slums were randomized to receive a daily fried snack made from GLV, fruit and milk or a control snack made from low micronutrient vegetable. Snacks were consumed under observation. Blood was collected at 0 and 12 weeks. Erythrocyte concentrations of 15 fatty acids including DHA were estimated by Gas Chromatography and expressed as g/100g fatty acid.

Results: At least 85% of women consumed ≥3 snacks per week. The median (IQR) erythrocyte DHA in the experimental group, increased significantly from 1.50 (1.11, 2.03) g/100g at 0 wks to 1.86 (1.50, 2.43) g/100g at 12 wks, while it reduced from 1.78 (1.37, 2.32) g/100g at 0 wks and 1.60 (1.32, 2.04) g/100g at 12 wks in the control group. The median difference in erythrocyte DHA between 0 & 12 wks was -0.21 (-0.42, -0.11) in the experimental and 0.02 (-0.05, 0.30) g/100g in the control group. Group allocation was a significant predictor of change in the erythrocyte DHA in multivariate analysis (p=0.001).

Key Findings: Consumption of a food based snack increases women's erythrocyte DHA as a proportion of total fatty acids. This increase may have contributed to the positive effect on birthweight observed in the MMNP. We plan to study the effect of the snack on cognitive function of the MMNP offspring.

PT-124 Vitamin D status of Icelandic children – associations with intake and season. Guðnarsdóttir T, Thorisdóttir B, Steingrimsdóttir L, Palsson GP, Thorisdóttir H

1Unit of Nutrition Research, Faculty of Food Science and Nutrition, School of Health Sciences, University of Iceland & Landspitali University Hospital. 2Children’s Hospital, Landspitali University Hospital

Material and methods: Blood samples from participants in a prospective cohort study on diet and growth of Icelandic children, born year 2005, were analysed for serum levels of 25-hydroxyvitamin D (25-(OH)D) (n=76 and n=139 at 12 months and 6 years, respectively). Vitamin D sufficiency (25-(OH)D>30 nmol/L) was defined. Dietary intake was estimated with 3-d weighed food records at 12 months and 6 years. Results: At 12 months vs. 6 years of age, the mean levels of 25-(OH)D were 98.1±32.2nmol/L vs. 36.5±17.9 nmol/L. 92% vs. 63% of children were considered vitamin D sufficient, 3% vs. 31% vitamin D insufficient and 5% vs. 6% vitamin D deficient. The median vitamin D intake was lower than recommended (7.7µg/d vs. 4.9µg/d at 12 months and 6 years, respectively). At 12 months, five out of six infants at risk of deficiency had no intake of supplements (vitamin D drops and fish liver oil) or fortified products (e.g. milk, porridge, cereals). At 6 years, intake of fish liver oil was associated with vitamin D status during autumn and winter but not during summer. During summer, physical activity was associated with vitamin D status. Key findings: The majority of Icelandic children following recommendations on vitamin D intake are vitamin D sufficient.

PT-125 Plant Food Supplements for gastrointestinal use. Evidence based efficacy. Román-Viñas B1; Vargas-Murga L1; Ngo de la Cruz J1; Ribas-Barba L2; García-Alvarez A1; Williamson G3; Restani P; Serra-Majem L1

1Fundación para la Investigación Nutricional-FIN, Barcelona Science Park, University of Barcelona, Spain, 2OBER Fisiopatología de la Obesidad y Nutrición, Instituto de Salud Carlos III, Spain, 3School of Food Science and Nutrition, University of Leeds, United Kingdom. 4Dipartimento di Scienze Farmacologiche e Biomolecolari, Università degli Studi di Milano, Italy.

The efficacy of Plant Food Supplements (PFS) is not fully evidence based and the recommendations of use are mostly based on tradition and observational studies. Objective: To conduct a systematic review to evaluate the efficacy of the ten most used PFS for gastrointestinal uses (according to a research strategy and expert consultation).

Materials and methods: This study has been carried out within the PlantLIBRA project (PT7-EC funded project n°245199). A search strategy was conducted in EMBASE, MEDLINE, Scopus, Scholar and Cochrane library, from January 1970 to July 2013. The search identified 547 abstracts. After applying the inclusion/exclusion criteria, 54 studies were selected for analysis. Twenty-nine studies evaluated the effects of Cassia senna, 12 studies evaluated those of Plantago ovata, 10 studies those of Silybum marianum, 3 studies those of Cynara scolymus and one study those of Foeniculum vulgare.

Results: The results of the analysis showed that for most of the Cassia senna studies did not provide additional benefits over PEG, NaP, castor oil, cascaralax, or enema or placebo for bowel preparation for colonoscopy, proctoscopy, barium enema or colon surgery and produced more secondary effects. Cassia senna was equal to or less effective than other laxatives in improving the symptoms in patients suffering from constipation. Plantago ovata was effective in improving symptoms in patients with irritable bowel syndrome (combined with a tranquilizer and a muscle relaxant). In patients with haemorrhoids, PFS containing Plantago ovata ameliorated the symptoms and bowel habit and reduced pain in patients undergoing haemorrhoidectomy. Silybum marianum PFS did not show any benefits on hepatic biochemical markers in patients with acute or chronic hepatitis. Cynara scolymus contained in PFS showed an improvement in cholesterol blood levels. Foeniculum vulgare relieved colic symptoms in new-born children.
Key findings: Plantago ovata and Cynara scolymus produced benefits on the gastrointestinal area investigated. The F5S for prebiotic uses included in this review need to be further investigated with adequate randomized controlled trials to draw a conclusion about their effectiveness.

PT-126
Poster

Sensory assessment in a sample of schools food offered in Cornellà de Llobregat.


Background: From 2006, the Public Health Agency of Catalonia assesses the quality of regional schools’ food offer. The School Menus Revision Program (PRMD), in the framework of the Integral Plan of Health Promotion through Physical Activity and Healthy Eating, consists of an initial report and a follow-up of the suggested improvements. Sensory aspects were also assessed in order to complete this information.

Objective: To assess the sensory quality of school menus and food services.

Methodology and Materials: The pilot experience has been carried out in the town of Cornellà de Llobregat in 9 schools (7 public and 2 private). Three of the kitchens were self-managed, four were outsourced and two lunch services were caterings. Eight food services were from hot chain production and one from local production. The children tasted the food in order to assess sensory aspects. Afterwards, a questionnaire was applied and completed in order to assess health concerns about the nutrients in fruit. However, the costs of fruits were not considered important attribute in this case, which is important for Chinese consumers.

Results: 70% of the students considered that the meal was satisfactory, from which 20% consider it good or very good. A total score of 5.3 over 10 was obtained. According to the health care professionals (n=18), the texture and consistency was appropriate in 40% of the first courses and 55% of the second courses, while 61% of the first courses and 55% of the second courses had the appropriate temperature. According to the students (n=113), 50% considered that the texture and consistency were appropriate, only 37% eat a second fruit portion per day and 90% consume food at school that they never eat at home. Overall, 63% considered taste to be the main aspect to be improved.

Conclusions: Both health care professionals and students granted a pass score to the sensory assessment of the school lunch service. The school food service increases the variety of children's food consumption. The pilot test has been welcomed by schools. Reports are made by the school, the local government and the Department of Education.

PT-127
Poster

Attributes influencing Chinese consumer’s choice between local and imported fruits.

Xue XL, He C; Perez-Cueto FJA.

1Integrated Food Studies, Aalborg University-Copenhagen. 2Department of Development and Planning, Aalborg University-Copenhagen

Objective: To identify the quality attributes influencing Chinese consumers choice between imported and locally produced fruits.

Methodology: Cross-sectional web-based survey through different Chinese Social Medias in Spring 2014, including socio-demographics, attitudes and knowledge towards fruit consumption and attributes of fruits. Attributes of origin (local/imported), taste (sweet/sour), price (expensive/cheap), texture (hard/juicy/glossy/soft-pulpy), and color (green/red) were presented in combinations issued from an orthogonal design. A conjoint procedure was applied to obtain the utility estimates. All data were analysed by STATA v 22, and a p-value < 0.05 was considered significant

Results: In total 398 people participated in the study, but only 305 provided complete questionnaires. Majority of participants (67%) were aged between 20-29 years, 48.9% had Bacher or higher education, 96.4% believed that eating fruit more than 200g/day was a positive effect on one's health; however, only 43.2% reached that consumption level. Knowledge about recommended daily intake and actual daily fruit intake were not associated or correlated (P=0.48 and 0.09). Besides, among quality related attributes, the attribute “taste” is the most important factor (39.4%), while “texte” values secondly (19.7%) in these 5 attributes. “Color” is the least important attribute in this case, which is only 12.4%. Attributes “origin” and “price” value are almost equal, respectively 14.4% and 14.4%. The utilities for apple show that Chinese consumers prefer to purchase the apple with glossy texture, sweet taste, red, cheap and locally produced. Key findings: Texture and taste are the most important attributes for Chinese consumer’s fruit choices in this study. Besides this, Chinese consumer concerns about the nutrients in fruit. However, the influence of other attributes such as package, size of fruit, do not seem big correlations with fruit quality.

PT-129
Poster

Nutrient intake in pre-pregnant and pregnant women at high risk of gestational diabetes.


1The Hospital District of Helsinki and Uusimaa, Helsinki, Finland. 2Unit of General Practice, University of Helsinki, Finland. 3Department of Obstetrics and Gynecology, Helsinki University Central Hospital, Finland. 4Folkhälsan Research Centre, Helsinki, Finland. 5Department of Food and Environment Sciences, University of Helsinki, Finland. 6Unit of Primary Health Care, Helsinki University Central Hospital, Finland. 7Unit of Primary Health Care, Kuopio University Hospital, Finland. 8Department of Obstetrics and Gynecology, University of Helsinki, Finland. 9National Institute for Health and Welfare, Department of Chronic Disease Prevention, Helsinki, Finland.

Objectives: The objective was to study the nutrient intake and its adequacy among women at elevated risk of gestational diabetes (GDM).

Material and methods: Subjects were 394 Finnish women either planning pregnancy or at ≤ 20 weeks of pregnancy at baseline and either having had a history of GDM. Nutrient intake was assessed from 3-day food records. Statistical significance for the hypotheses was evaluated by using generalized linear models with appropriate distribution and link function, median regression models (least-absolute-value), and chi-square test.

Results: The pre-pregnant and the pregnant women had a mean fat intake of 33% (SD 7 and 6), and 56% (SD 6). The pre-pregnant women had a carbohydrate intake of 44% (SD 6) and the pregnant of 46% (SD 6). Sucrose intake among pregnant women with a history of GDM was 23% (SD 3) which was different from the other pregnant women (27% (SD 4) (p<0.001). The pre-pregnant women does frequently used dietary supplements than the pregnant (53% vs. 77%, (p<0.001), and had medidolic acid intake below the national recommendation. Both, the pre-pregnant and the pregnant women had intake of vitamin A below the recommendation.

Key findings: The observed non-consumption of dietary supplements and calcium among women at high risk of GDM may further increase their risk of GDM. A history of GDM, however, seems to reduce sucrose intake in a future pregnancy. Women planning pregnancy and pregnant women seem to have insufficient amounts of vitamin D and folate from food and thus need supplementation. Adequacy of intake of vitamin A in Finnish pregnant women needs further studying.

PT-130
Poster

Iron and haemoglobin status in school children and women in West Java, Indonesia - before and after start of cooking oil fortification with vitamin A.

Abas B. Jahan, Men Kyaw Htet, Korenomp El, fried, Budi Utomo, Soekmarn

Objectives: Malnutrition is one of the most nutritional problems among children under 5 years in IRAN. Because of multi-disciplinary character of malnutrition, an interventional action, named “multidisciplinary interventional program for improvement of nutritional status of children in Iran”, were designed and implemented since 1959. In this program a range of interventions were implemented through the primary health care system, including nutrition, health and literacy education for mothers, practical instruction on feeding methods, environmental sanitation, the promotion of home-grown vegetables, reinforcement of the growth monitoring programme, and food distribution among malnourished children in poor families. This study aimed to develop qualitative methods to explore the existing challenges and barriers of implementation of this program from the perspective of policy makers, executive manager, and practitioner at national and province level.

Materials and methods: We conducted a qualitative study involving 21 semi-structured interviews, plus 8 telephone interviews with policy makers, executive managers, and health care practitioners at national and province level from March to May 2014. Interviews were recorded, transcribed, and coded. Data were analyzed using directed content analysis.

Results: Lack of inter-sectoral coordination and mobilization, political change and subsequent change in assistant directors in health sectors and the other organization every four years in Iran, confusing eligibility criteria and application process, old version of executive instruction of program, heavy workload of practitioners, limited source of funds and credits, limited human resource in health facilities, practitioner’s perceptions of enforcement, lack of monitoring and incentives for health practitioners, and delays in distribution of food rations among children were identified as barriers that influence implementation of this program.

Key Findings: Policymakers must address existing barriers as well as consider new strategies to improve nutrition policies in this national multi-disciplinary program so that the program can continue to address nutritional needs as well as provide good health care for its beneficiaries.
Objective: Vitamin A has a role in mobilization of iron stores; hence increased vitamin A intake may contribute to improving iron status in vitamin A-deficient populations. We assessed iron status among 5-9-year-old children and 15-29-year-old women, just before and a year after introduction of vitamin A-fortified cooking oil in a pilot program in Indonesia.

Materials and Methods: Twenty-four villages from 2 provinces on West Java were randomly selected, and poor families recruited. Hemoglobin, serum retinol, ferritin and soluble transferrin receptor (sTfR), CRP and AGR were measured in two surveys (July 2011 and July 2012), in 159 children and 168 women. Serum retinol and ferritin were adjusted for sub-clinical inflammation using standard adjustment factors based on CRP and AGR. Body iron was calculated using Cook's method.

Results: Mean serum retinol increased from 34.3±12.6 to 39.4±12.4 μg/dl among children (p<0.001) and from 42.7±19.2 to 50.9±16.6 μg/dl among women (p<0.001). Serum ferritin levels increased from 47.3±25.8 to 53.9±32.4 μg/L in children (p=0.004) and from 49.7±35.1 to 58.1±41.4 μg/L in women (p=0.011).

In children, sTfR concentrations were 5.6±1.2 and 5.7±1.5 mg/L at baseline and median sTfR, with no significant change in prevalence (11.1% at baseline, 3.8% at endline) of cellular iron deficiency (sTfR>8.5 mg/L). In women, sTfR decreased from 16.5±35.6 to 5.7±3.7 mg/L (p=0.001), and cellular level iron deficiency fell from 28.2% to 6.5% (p=0.037). Body iron stores increased from 5.8±2.5 mg/kg to 6.3±2.7 mg/kg in children (p=0.036) and from 6.0±3.0 to 6.6±3.6 mg/kg in women (p=0.036).

In children, mean haemoglobin levels improved from 12.6±1.1 to 12.9±1.1 (p=0.01), but anemia prevalence did not fall significantly (14.5% and 9.7%, p=0.17). In women, neither haemoglobin levels nor anemia prevalence (10% at both baseline and endline) changed.

In univariate analysis, there were no consistent correlations between serum retinol and iron indicators or haemoglobin in children. Among women, basal-line to endline change in serum ferritin correlated positively with serum retinol at endline (r=0.17, p=0.03) and with the baseline-to-endline increase in retinol (r=0.19, p<0.01). sTfR at endline correlated negatively with sTfR at baseline (r=-0.23, p=0.01).

Key findings: Findings suggest that consumption of vitamin A-fortified cooking oil, in addition to improving vitamin A status in women and school-age children, also mobilizes iron stores and reduces iron deficiency at cellular level among women (but not school-age children) in Indonesia.
PF-134 Results of the screenings of the nutritional status of under-five children in Upper River Region, the Gambia. 
Martinez G1, Caballero M2, Homs C3, Mila R1, Vital M4, Serra Majem L4,5 NG0 Nutrition without Borders. 2Center for Health and social studies, University of Vic (Barcelona). 3Institute of Biomedical and Health Research of Las Palmas, University of Las Palmas de Gran Canaria, Las Palmas de Gran Canaria, Spain. 

Introduction: Malnutrition is a leading cause of death among children under 5 years in sub-Saharan Africa. Anthropometry has been identified as one of the best tools for assessing the nutritional status of children at risk of suffering from malnutrition in developing countries. In Gambia, the prevalence of under 5 years (2003-2009) suffering from underweight, moderate and severe is 20%. About 7% of under-fives are suffering from wasting, moderate and severe.

Objective: In 2010 the NGO Nutrition Without Borders (Barcelona, Spain) opened the Centre for Nutritional Rehabilitation and Education (CREN) in the city of Basse, Upper River Region (URR), The Gambia aiming at improving the health status of the children and women of this region of The Gambia by means of improving their nutritional status, decreasing the prevalence of malnutrition among children and protecting the household food security.

Methodology: Every Month between January 2011 and January 2012, the 12 CHNs were expected to carry out a nutritional screening in 12 villages selected by the NAfNA Focal Person in URR. After sensitizing the population and convening them to the selected venue, the children under five years old had their nutritional status assessed. Using a WHO grading scale and following the WHO guidelines, the status was determined by obtaining the indicator of weight-for-height (WHF) or weight-for-length (WFL) from the weight-for-height Z score charts. Between January 2011 and January 2012 a total of 142 screenings were carried out in different villages of URR.

Results: During 2011, 142 community screenings for malnutrition were carried out in 142 villages of URR, The Gambia. 11744 under-5 years children inhabi-tants of URR had their nutritional status assessed during this period. The results offer a percentage of 6.84% of under-5 years suffering from severe (5.68%) and moderate (1.16%) wasting according to the definition of the WHO guidelines. The indicator used to achieve those data was the weight-for-height or weight-for-length, following the recommendations of the WHO.

Conclusions: According to UNICEF, more than 7% of children in The Gambia are affected by malnutrition in the period 2003-9. In 2011-12, in a sample of 10258 children in Upper River Region, the eastern most region of The Gambia, the percentage of children with severe and moderate wasting is 6.8%. This means that more resources and effort are still to be put into this region in order to help to decrease this high prevalence of children with malnutrition.

PF-135 Poster The role of nutrition education in the promotion of improved complementary feeding in rural Malawi. Muelhoff E,1 Westaway E,2 Chakhola L3 Nordin S3, Kalumbwa W2 1Food and Agricultural Organisation in Rome; 2Food and Agricultural Organisation in Malawi; 3University of Malawi, Chancellor College, Blantyre, Malawi.

Malawi, a developing country with a growing population of 14.5 million, suffers from high levels of chronic undernutrition (UNICEF 2008). Chronic malnutrition, and particularly stunting, continues to be a public health burden for Malawi that results in multiple detrimental outcomes for individuals, households, communities and the nation. In Malawi, 47.1% of children under 5 years old are stunted, which is the highest prevalence within the Southern Africa region. During 2011-12, FAO Malawi in collaboration with the Ministries of Health, and Agriculture and Food Security extension staff carried out Trials of Improved Practices in Kasungu and Mzimba districts to test the feasibility of implementing improved complementary feeding practices targeted at children aged 6-23 months. Recipes were developed using locally available and affordable foods, which were tested with families and caregivers to assess cultural acceptability and feasibility. Results were used to design the community-based nutrition education strategy "Kupitsa Patsogolo Kadetsedwe Kayenela ka Ana" – KPKKKA (Let us Improve Child Feeding), which is being implemented in the 4-year FAO integrated agriculture-nutrition programme “Improving Food Security and Nutrition Policies and Programme Outreach in Selected Malawi, Kasungu and Mzimba Districts” (FAO). The KPKKKA nutrition education programme is aligned to the Scaling Up Nutrition movement in Malawi which aims to fight malnu-trition among children aged 6-23 months. The key messages focus on the benefits of a diversified diet using local foods, in combination with good hygiene practices, to improve the nutritional status of children aged 6-23 months. KPKKKA involves a cascade of training from government nutritionists in the Ministries of Health, and Agriculture and Food Security, Master Trainers, Extensions Workers and Community Nutrition Facilitators to the mothers/caregivers. In each village, a pair of volunteer Community Nutrition Facilitators organises a group of approximately 15 mothers/caregivers with children aged 6-18 months and undertakes 10 nutrition education sessions (and four cooking demonstrations) for approximately 2 hours each fortnight. Every 6 months, a new group is expected to be formed to ensure sustainability of the programme. To-date, KPKKKA monitoring activities in-dicate positive nutrition outcomes for children aged 6-23 months as well as for other participants. However, the integration of nutrition education with agricultural input support has raised important programmatic issues such as the need for appropriate targeting to ensure synchronisation of interventions. Also, efforts to scale up using available delivery systems (i.e. health and agricultural extension services) without paying top-up allowances or providing incentives is not straightforward.

PF-136 Poster The school lunch program review (PRuME) in Catalonia improves the quality of menu plannings, 2008-2014. de Catalunya. de Catalunya. de Catalunya.
Background: The School Lunch Program Review (PRuME), included in the Integral Plan for Health Promotion through Physical Activity and Healthy Eating (PAAS) of the Public Health Agency of Catalonia (ASPCat) is one of the activities of the Project 2.2 of the Health Plan 2011-2015. The program began in 2006, in collaboration with the Department of Education, and it has been offering to review the menu planning of the schools in Catalonia. In the evaluation of the 2500 menu plannings that we have started monitoring the implementation and acceptance of the suggested measures of improvement.

Objective: To assess the compliance of the suggested recommendations for improvement.

Methods: After submitting the initial assessment report, a questionnaire for processing and monitoring the evolution of the suggestions for improvement is sent to the school. The answers to the questionnaire and the new menu plannings are evaluated.

Results: (n = 896) 88% consider it a useful tool. 83% believe that the report will lead to the improvement of the menu plannings. The report was sent to different stakeholders. Regarding to the new menu plannings, the following changes are observed in achieving the recommendations: (n = 465): specification of ingredients and preparations of starters (25%-62%), specification of ingredients and preparations of main courses (65%-72%), presence of non-refried food (75%-98%), presence of vegetables (51%-79%), presence of fresh fruit (75%-91%), daily presence of vegetables (65%-91%) and recommended frequencies of foods (45%-60%).

Conclusions: The assessments have improved key aspects of menu planning. The report with suggestions for improvement is known by different stakeholders and is highly regarded. The mainstreaming of PRuME with the involvement of different professionals and local public health teams is essential and bring an added value. 

Objective: Insulin resistance and acetonemia depend on calcium homeostasis. Cross-sectional studies have associated elevated serum calcium levels with markers of impaired glucose metabolism. However, only one prospective cohort study has demonstrated an increased risk of diabetes in individuals with increased serum calcium concentrations. The aim of the present study was to prospectively investigate the association between albumin-adjusted serum calcium concentrations and type-2 diabetes in subjects at high cardiovascular risk.

Material and methods: Prospective assessment of participants from two Spanish prediabetes centers where serum calcium levels were measured at baseline and yearly during follow-up. Multivariate-adjusted Cox regression was fit to assess association between baseline and changes in serum calcium levels and relative risk of diabetes incidence. Results: After a median follow-up of 4.78 years, 77 new cases of type-2 diabetes occurred. An increase in serum calcium levels during follow-up was related to an increased risk of diabetes. In comparison with individuals in the lowest tertile (0.78±0.29 mg/dl), the hazard ratio (HR) and 95% CI for diabetes incidence in individuals in the higher tertile of change (0.52±0.03 mg/dl) during follow-up was 3.48; 95%CI: 1.48-8.17; p-trend=0.01. When albumin-adjusted serum calcium was analyzed as a continuous variable, per 1 mg/dl increase, the HR of diabetes incidence was 2.87; 95%CI: 1.18-6.96; p-value=0.02. These associations remained significant after individuals taking calcium supplements or having calcium levels out of normal range had been excluded. Key findings: An increase in serum calcium concentrations is associated with an increased risk of type-2 diabetes in individuals at high cardiovascular risk.

PT-138 Poster

García-Alvarez A1,2, Millá-Villarroya R1,3, Ribas-Barba L1,2,3, Egan B1, de Klein S1, Badea M1, Maggi FM1, Salmenninha M1, Restani P1, Serra-Majem L1,2,3, on behalf of the PlantLIBRA PFS Consumer Survey Group.

Fundación para la Investigación Nutricional-FIN, Barcelona Science Park, University of Barcelona, Spain; 1CIBER Fisiopatología de la Obesidad y la Nutrición, Instituto de Salud Carlos III, Spain; 2PlantiLIBRA PFS Consumer Survey Group.

Objectives: To provide an overview of the PFS botanical ingredients consumed for body weight reasons in six European countries and to explore the relationship between their consumption and BMI.

Material and methods: This study has been carried out within the PlantLIBRA project (FP7-EC funded project nº249169). Data on PFS usage were collected in Finland, Germany, Italy, Romania, Spain and The United Kingdom, in a cross-sectional, retrospective survey of 2359 PFS consumers using a bespoke frequency-of-PFS-use questionnaire. Analyses were performed in a subsample of respondents taking the products for reasons of “Body weight”. Subsample characteristics are described, consumed PFS botanical ingredients according to the reason “Body weight” and “Dieting for overweight/obesity” are identified, and the relationship between the 3 most consumed botanicals and BMI is explored (proportions compared using χ² test, p<0.005 for significance). Results: “Body weight” was reported as one of the reasons of use in 252 of 2874 total products consumed. In Spain, 21 5% PFS were used for “body weight” (top reason for taking PFS), in Germany 8.7%, in Italy 8.2%, in Finland 6.0%, in Romania 5.8% and in the United Kingdom 2.9%. Overall, 113 consumers were “dieting for overweight/obesity”: Spain 17.4% (n=19); Germany 23.1% (n=36); Romania 0.8% (n=3); and no dieters in the United Kingdom. Cynara scolymus (ar-tichoke), Camelia sinensis (green tea) and Foeniculum vulgare (fennel) are the 3 most consumed botanicals by respondents taking PFS for reasons of “body weight”. Artichoke and green tea PFS consumers’ BMI significantly falls <25 kg/m² compared to “non-consumers” (p=0.038). BMI is not significantly different between fennel and pineapple-containing PFS consumers and non-consumers. Among PFS consumers responding to be “dieting for overweight/obesity”, the 3 most consumed botanicals are Cy­nara scolymus (artichoke), Foeniculum vulgare (fennel) and Ananas comosus (pineapple). Artichoke-containing PFS respondents’ BMI is significantly lower <25 kg/m² compared to “non-consumers” (p=0.038). BMI is not significantly different between fennel and pineapple-containing PFS consumers and non-consumers.

Key findings: “Body weight” is the top reason for PFS use in Spain. Artichoke and green tea are the most consumed botanicals from PFS taken for reasons of body weight, with their consumers’ BMI significantly <25 compared to non-consumers’. Among dieters for overweight/obesity, only artichoke-containing PFS consumers have a significantly <25 BMI as compared to non-consumers.

PT-139 Poster
Nutritional status of schoolchildren in the Andean region of Peru.

Aníta V1,2, Ballonga C1, Toledo S1, Ribot B1, Canals J1
1Unidad de Nutrición / Salud Pública, Grupo de Investigación en Nutrición y Salud Mental (NUTRISAM), Instituto de Investigación Sanitaria Pere Virgili (ISPV), Universitat Rovira i Virgili, Reus, Spain; 2Unidad de Soporte a la Re­search (USR) Rovira-Tarragona, Institut d'Investigació en Alimentació Polèm•tica Jordi Gol i Gorrina. 3Departament de Patologia, Grupo de Investigación en Nutrición y Salud Mental (NUTRISAM). Research Centre for Behavioural Assessment (CRAMC), Universitat Rovira i Virgili, Tarragona, Spain

Objectives: The regional government of Cusco (Peru), based on anthropo­metric data, reported 60% of malnutrition among children from Ccocha district, located in the Andes at about 3625 meters above sea level and that encompasses rural population and low socioeconomic status. In order to perform a nutritional intervention tailored to the territory, the aim of the project was to assess, together with the NGO Amantani Ccocha, the degree of malnutrition among school children.

Material and methods: Descriptive study conducted on 171 children between 6 and 12 years old from the Ccocha district. Weight and height, hemoglobin and serum albumin were determined. Dietary intake was assessed using a food frequency questionnaire validated. International Classification of Z-score for weight-for-age and Z-score for height-for-age of the World Health Organization were used to determine acute and chronic malnutrition respectively.

Results: 13.8% of children showed acute malnutrition and 48.6% chronic malnutrition. 0.6% had altered levels of albumin and 0.7% had anemia. The frequency of consumption of dairy products, fruits and vegetables is low (0.8. 0.6 and 0.6 servings per day, respectively). The one of protein foods (meat, fish and eggs) is slightly lower (1.6 servings/day), however, the frequency of consumption of starchy and fat (3.7 and 2.3 servings per day, respectively) is adequate, to the rations recommended for this group of age. Regarding the frequency of simple sugars, it is excessive (3.1 servings/day). Key findings: Chronic child malnutrition in the district of Ccocha is high although the acute is low. This corresponds with the good nutritional status in proteins and iron from the biochemical point of view. The deficient quality of the diet can hide an insufficient supply of micronutrients that can affect specific nutritional status and/or the cognitive status of infants. Therefore, in the project it is planned to assess neuropyschological functions of children and make a nutrition education intervention to improve diet quality.

Acknowledgments: Funded by the University Rovira I Virgili, the nonprofit association Recolectores de Sueños and supported by the NGO Nutrición sin fronteras.

PT-140 Poster
Prevalence of metabolic syndrome and associated factors in elderly of Viçosa, Minas Gerais, Brazil.

Ribeiro, A.O; Gonçalves, M.R; Martinho, K.O; Franco, F.S; Longo, G.Z, Tindó, A.L.A.

Objective: The aim of this study was to determine the prevalence of meta­bolic syndrome and associated factors in elderly enrolled in the Program of Family Health Strategy, Viçosa/MG, Brazil.

Material and methods: The study was cross-sectional probability sample of elderly aged over 60 years, both sexes (n = 402). The dependent vari­able was the metabolic syndrome. Independent variables: gender, age, education, professional education, social class, skin color, smoking habits, weight, hip ratio, waist circumference, physical activity, selbst-perceived health status, self-reported diabetes mellitus, hypertension self-reported and biochemical variables (glucose, triglycerides, HDL-C, LDL-C and VLDL). To verify the associations was used chi-square for linear trend. To evaluate the difference between the means used were the t test and Mann Whitney. The response rate was 100%.

Results: The prevalence of metabolic syndrome was was of 60.95% (95% CI:79.60-71.14) in the elderly, ranging from 43.13 % to 72.73% in men and women. After adjusting for possible confounding variables were asso­ciated with MS in both sexes: the presence of diabetes and hypertension, self negative perception of health, overweight, changed WHR, waist circumference changes, elevated triglycerides, HDL, VLDL and glucose. High levels of LDL was associated only with males.

Key findings: It was concluded that more than half of the sample had me­tabolic syndrome, similar to that found in the population. Factors amenable to intervention as hypertension, overweight and diabetes were associated with MS.

PT-141 Poster
Sedentary behavior as an obesity factor in a representative sample of Spanish children from the ALADINO study.

Villalobos TK1, Pereira JM, López-Sobañer AM1, Pérez Farínd N1, Ortega RM1
1Department of Nutrition. Faculty of Pharmacy. Complutense University of Madrid. UCM Research Group VALORNut(97/0030). 2Faculty of Health Sciences. Alfonso X El Sabio University. 3Spanish Agency of Consumers. Affairs, Food Safety and Nutrition (AECCOSAN).

Objectives: Recent evidence suggests that the time that children and young people spend in sedentary activities (defined as those that involve sitting or reclining) may be associated with increased risk of cardio metabolic disa­
Intake of fruits in healthy, overweight, obese and diabetic mothers during pregnancy with the intake of sugar, sweets and pastries of their offspring at 3 years of age.

Methods: 61 pregnant women mother-child pairs participating in the PREO-project (www.ClinicalTrials.gov NCT01634646) were studied in the preanalysis. 25 were healthy normoglycaemic (18BMMc25), 13 were overweight (25BMI≤30), 12 obese (BMI≥30) and 11 developed gestational diabetes. The dietary assessment was performed using a food frequency questionnaire at 24 weeks gestation and was analyzed according to the dietary recommendations for pregnant women from the United States Department of Agriculture (USDA). In the same way, dietary assessment in children at 3 years of age was performed with 3-day food diaries and the percentage of total energy value from sugar, sweets and pastries was analysed using the DIAL software for assessing diets and food compositions (Version 2.16 2010). ANOVA test and multiple linear regression model were performed for data analysis using IBM SPSS Statistics 21.0. Dependent variable was the percentage of total energy value obtained from sugar, sweets and pastries present in the children diet, and independent variables were the mother's fruits intake according to USDA recommendations and the study group.

It was seen that the offspring born to those mothers who did not achieve the dietary recommendations for fruits (at least 2 cups per day) during the second trimester of pregnancy, showed a higher percentage of total energy intake from sugar, sweets and pastries (5.6±3.6) versus those children born to mothers that achieved the recommendations (2.8±2.6; b=3.277; p<0.02); however, this association was not related to the study group.

Conclusion: The inadequate intake of fruits in mothers during the second...
trimester of pregnancy is related to a higher intake of sugary foods in their children at 3 years of age regardless of maternal nutritional status before pregnancy. These results support the hypothesis that the intrauterine nutrition causes permanent changes in the foetus which seems to have an influence promoting non beneficial and more obesogenic feeding practices in their children.

**PT-145**

Poster

**Daily eating frequency, blood lipids and dietary aspects of adults and elderly of São Paulo, Brazil: cross-sectional analyses.** Fisberg RM, Pereira JL, Mendes A, Marchioni DML. Departamento de Nutrição, Faculdade de Saúde Pública, Universidade de São Paulo, São Paulo, SP, Brasil.

Objective: evaluate blood lipids and the characteristics of the diet to eating frequency in adults and elderly of the city of são paulo, brazil. Methods: the sample comprises 485 adults and elderly from the cross-sectional health survey of são paulo (SaPSal), conducted in 2008. Dietary intake was assessed using one 24-hour dietary recall using the Automated-Multi-Pattern-Food. Fasting blood draw, anthropometric measures and information on health and life condition were collected in the households. Individuals were classified in four categories according to the number of eating occasions (EO): a) less than three; b) three c) more than three and less than six; d) six or more. Medians and interquartile ranges were used to describe continuous non-parametric variables and Kruskal-Wallis and trend tests were used to compare the values between EO categories. Categorical variables frequencies were described and compared by Pearson ch-squared tests. Results: adults are more likely to have higher eating frequency: 10% of men and 5% of women have less than three eating occasions a day while 2% of men and 7% of women have six or more (p=0.015). There were no differences in age, body mass index, waist circumference, smoking status, physical activity level, family income, and blood lipid measures (serum cholesterol, triglycerides) in men according to EO categories. Energy intake increases in parallel with EO categories in men (p<0.001) and women (p<0.001), while energy density becomes lower when increasing EO categories (pmen=0.002; pwomen=0.008). Almost all the nutrients analyzed increases according to EO (except cholesterol, saturated fat acids and glyceric index for men and cholesterol and glyceric index for women). When analyzing nutrients per 1000 kcal, for men, fiber consumption increases in parallel with EO (p=0.009), those with three EO had the lowest total fat (p=0.026) and saturated fat (p=0.024) consumption, while those with more than three EO had the highest polyunsaturated/saturated fat acids consumption (p=0.019) and the highest polyunsaturated/saturated fat acids ratio (p=0.0064). For women, those with three EO had the lowest fiber consumption while those with six or more EO had the highest fiber consumption (p=0.001). Those with less than three EO had the lowest polyunsaturated/saturated fat acids ratio (p=0.0138).

Key findings: there were no differences in blood lipids measures according to eating occasion categories while energy intake increases and energy density decreases when increasing EO categories in man and women.

**PT-146**

Poster

**Consejos de alimentación y actividad física para personas mayores: de la evidencia a las recomendaciones.** Roset MA1, Serra-Farró P, Caranza-Gil-Dolz del Castellar M, Diez-David P, Puigde-Cuesta L, Salvador-Castell G, Bach-Faig A1,2


Se calcula que hacia el año 2050 el 30% de la población mundial tendrá más de 65 años. Para apostar por la calidad de vida de las personas mayores, el Ayuntamiento de Barcelona con el apoyo de muchas otras instituciones genera una guía: “¿Qué debemos comer, cómo y por qué?” De consejos de alimentación y actividad física para la adopción y seguimiento de unos hábitos de vida más saludables para las personas mayores. Tal y como aconsejan las líneas europeas de salud, de promover una mayor responsabilidad en las personas, puede ser especialmente útil para las personas mayores, con la ayuda de profesionales expertos en estas áreas. El consejo de alimentación y actividad física en las personas mayores es clave para la mejora de la calidad de vida y la salud. La guía quiere llegar a un 12% de la población, casi 340.000 personas de más de 65 años de la ciudad de Barcelona a través de la distribución de folletos y otros materiales en las entidades que las atienden.

**PT-147**

Poster

**Adhesion to nutritional intervention program in shift workers: preliminary study.** Zimberg, I.Z; Santos, M.V.L; Silva, F.R; Tufo, S.F; De Mello, M.I4; 1Departamento de Psicobiologia, Universidade Federal de São Paulo (UNIFESP/FMUSP) - São Paulo, Brazil. 2Escuela de Educación Física, Universidad Federal de Minas Gerais (UFMG) - Belo Horizonte, Brazil.

Objectives: Verify adhesion to a qualitative nutritional intervention program and changes in food intake and body composition in shift workers. Material and methods: Nineteen shift workers (18 to 55 years), 14 females, 5 males, 10 in morning shift workers, and 9 in night shift workers were included in the study. The intervention comprised a nutritional program conducted in different forms of media (electronic, newspapers, radio and magazines). Shift workers were submitted to a qualitative nutritional interventional program of 1 month. Before and after intervention subjects were submitted to anthropometric and nutritional evaluations. Anthropometric evaluation included measurements of body weight, height, waist and hip circumferences as well as body composition measurements by plethysmography. Changes in dietary pattern were evaluated by a questionnaire developed by Ministry of Health of Brazil, based on food Guide for the Brazilian Population.

Results: No baseline differences were observed in anthropometric and demographic characteristics of day and night workers. Day and night workers had good adherence to nutritional intervention, which was observed by the improved of diet quality score. Body weight changed significantly (p = 0.05) from the beginning to the end of the intervention only in night shift workers with a mean loss of 1.26 ± 1.5 kg. Both groups body fat percentage changed significantly (p = 0.05) from the beginning to the end of the intervention with a mean loss of 1.35 ± 2.2% for day workers and 2.12 ± 1.1% for night workers.

Key findings: The results proved that the objective of the study was successful, since the group manifested an improvement in eating habits and consequent weight loss. The conclusion is that nutritional intervention with emphasis on eating habits and nutrition is effective. Emphasis should be given to positive results in night workers, since there is a higher propensity for the development of metabolic disorders and obesity in this group of workers.

Falls and osteoporotic fractures are a frequent cause of disability, dependancy and mortality in elderly women.

Aims To assess the risk and occurrence of falls and fractures by age, body mass index, and bone mineral density in a group of older woman from Cordoba city, and to analyze their causes and consequences.

Method Correlational descriptive study. Population: 86 older woman ≥60 years old, attending senior centers in Cordoba in 2013, with prior risk assessment. Variables: risk of falling, fracture risk, occurrence of falls, occurrence of high fracture risk; with a significant association with age (p=0.0007), low BMI (p=0.0001) and a family history of hip fracture (p=0.0382). The average BMI was 28.7±4.2 kg/m2, and the prevalence of obesity in the older woman was 40.7%.

According to the BMD, 36% was normal, 44.2% had osteopenia and 19.8% of the older woman had osteoporosis. In this last group 35.3% had also submitted a prior fracture, with higher frequencies among those ≥80 years.

Half of those with osteoporosis had normal weight and the rest had BMI ≥25 kg/m2. 50% of the older woman had suffered ≥1 fall since the initial assessment, mainly in public/urban places, accidentally, caused by extrinsic factors. 12.2% had serious consequences, of which 9.3% were osteoporotic fractures. 83% of those who fell had overweight/obesity (p=0.0283). All the older woman with fractures were ≥70 years (p=0.0396), half of them with a previous fall risk (p=0.0242) and high fracture risk; with a significant association with age (p=0.0007), low BMI (p=0.0001) and a family history of hip fracture (p=0.0382).

Conclusions: Even though the risk of falling was low, its occurrence was high, especially in the older woman with high BMI. The falls were due to extrinsic factors and were not associated with the previous risk of falling. The occurrence of fractures was as expected for this group and was significantly associated with age, BMI and prior fracture risk.

PT-149 Right to adequate food protection in pregnant women and children, Cordoba, Argentina.

Poster

Perovic N.R., Ruffino C., Popelka R.M., Lamfri N.Z.; Coseano M.; Carrillo J.; Escuela de Nutricion, Facultad de Ciencias Medicas, Universidad Nacional de Cordoba 1 y Facultad de Filosofia y Humanidades, Universidad Nacional de Cordoba 2.

Objective: The aims of this project were: -strengthen food and nutrition security from the perspective of human rights and gender in public health policy and nutrition, in the community of Juan Pablo II, Cordoba, Argentina; and -reduce the premature abandonment of the exclusive breastfeeding practice on children under six months, and continue up to age two years.

Material and methods: Subjects of law were pregnant women, lactating women, their children and families, from Juan Pablo II community. Strategies, methodologies, techniques and tools were constructed from the right to health and food, in a context of primary health care focused on families and community, from an equality and social solidarity perspective.

Results: The research included a total of 153 pregnant women and infants. Accessibility the healthcare system measured by gestational week identifying indicator, show that 80% of the total number of pregnant women were identified before week 20. As an indicator of access and right to natural food, the prevalence of exclusive breastfeeding for children under six months was 38%. Also, the continued breastfeeding with complementary food on children aged 6-12 twelve months old was 41%.

The internal, neonatal and infant mortality, as indicators of health equity, was 0%.

Main findings: The results are related to the access to right to food, for children as human right holders. Data obtained, also show that preventable risks and life protection are collective achievements, as a result from cooperation between state policies and the community involvement.

PT-150 Screen time is associated with insulin resistance in schoolchildren of Madrid, Spain.

González-Rodríguez LG1, Rodríguez-Rodríguez E2, López-Sobaler AM2, Ortega Anta MJ2.

1. Department of Human Nutrition and Dietetics. Faculty of Health Sciences. Alfonso X El Sabio University. 2. UCM Research Group VALORNUT (2003020). Department of Nutrition. Faculty of Pharmacy. Complutense University of Madrid. Spain. 3. Analytical Chemistry Departmental Section, Faculty of Pharmacy. Complutense University of Madrid. 4. Department of Nutrition, Faculty of Pharmacy, Complutense University of Madrid.

Objective: Sodetary behaviors have been associated with obesity and type 2 diabetes, particularly screen time. Therefore, the aim of the present study was to analyze the relationship between screen time and the presence of insulin resistance in schoolchildren of the Community of Madrid, Spain. Methods: A group of 564 schoolchildren (258 boys and 306 girls) aged 9-12 years were studied. A physical activity questionnaire that included the hours spent on watching TV, PC use and playing video games was applied. Screen time was obtained by the sum of hours spent in the previous three activities. Fasting glucose and insulin were determined and the HOMA-IR was calculated to establish the presence of insulin resistance in children. HOMA-IR cut-off value of ≥3.16 was used as indicative of insulin resistance. Waist circumference was measured. All calculations were made using SPSS (version 19.0).

The statistical significance was set at p<0.05.

Results: Mean screen time was 1.66±1.04 hours per day, boys had more screen time than girls (1.76±0.88 vs. 1.58±0.99, p<0.05). The 44% of the studied children had two or more than two hours of screen time per day, was related with higher BMI, glucose and HOMA-IR were 81.7±10.1 mg/dl, 6.3±4.8 μU/ml and 1.26±0.88, respectively. Glucose were higher in boys than in girls (83.3±10.2 vs. 80.4±9.8 mg/dl, p<0.01), while insulin and HOMA-IR were lower in boys compared with girls (5.76±4.22 vs. 6.82±5.68, p<0.01 and 1.19±0.91 vs. 1.31±0.86, p<0.05), respectively. The 4.47% of the studied children had HOMA-IR values indicative of insulin resistance. Children who spent less than two screen hours had lower HOMA-IR values than those children who spent two or more hours (1.10±0.79 vs. 1.42±0.96, p<0.001). Longer screen time was significantly associated with higher HOMA-IR (r=0.143, p<0.01) after the adjustment for sex, age and waist circumference of children.

Conclusions: Almost half of the studied children had more than two hours of screen time per day. The 4.47% of the studied children had HOMA-IR values indicative of insulin resistance. Screen time was associated with increased insulin resistance in schoolchildren, so it should be advisable the reduction of prolonged screen time for preventing obesity and type 2 diabetes and other related health conditions in schoolchildren.

Acknowledgements: Study supported by a Health Research Project from the Carlos III Health Institute (ISCiii-FIS). (Project: PI060318).

PT-151 PERSSEO Project: Internal consistency for constructs related to fruit and vegetable intake of the children questionnaire.

Pérez Rodrigo C1, Araneta Bartrina J2, Campos Amado P1, Carbonell Pascual V1, en nombre del grupo colaborativo PERSSEO.

1. Sociedad Española de Nutrición Comunitaria (SENC).
2. Agencia Española de Seguridad Alimentaria y Nutrición (AESA).

Background: This paper describes the internal consistency of constructs related to fruit and vegetable intake in the children questionnaire in PERSSEO project, a Project aimed at the promotion of healthier eating and physical activity habits in schools and community with the final aim of obesity prevention.

Methods: A community intervention trial was conducted with a quasi-experimental design, involving 67 Primary schools (1st-4th grades) from 6 Autonomous Spanish Regions. A control (n=34 schools) and intervention (n=33 schools). The evaluation study protocol included anthropometrical measures, food and beverage consumption, usual physical activity, sedentary lifestyle, as well as selected determinants for this behaviours. Using a cross-sectional research design, internal consistency reliability for subscales of behaviour theory-based constructs measuring personal, social and environmental correlates of fruit and vegetable intake in 9-12-year-old children was assessed using Cronbach alpha. The constructs included self-rated intake, self-rated intake compared to other children, knowledge about recommended daily intake levels, preferences, bring fruits/vegetables to school, modelling, active parent encouragement and facilitation, availability at home and at school. All constructs, except knowledge, were assessed with a five-point scale from: ‘never/fully disagree/dislike very much’ (–2) to ‘yes/fully agree/agree very much’ (+2). Pre-tests were assessed for 14 different fruits and vegetables to assess the knowledge about the recommended intake, children were asked on an eight point scale, with response options ranging from ‘no fruit or vegetables’ to ‘5 pieces or portions per day or more’. Results: Some 5555 children (9-12 yr) provided valid answers for this part of the children questionnaire in the study. Fewout of the eight subscales, the most consistent were added more than one item. Cronbach’s alpha values computed were moderate to high (range 0.51 to 0.93) with the exception of parental facilitation, which had a value below 0.50 for food (α=0.49).

Conclusions: PERSSEO child questionnaire assessing personal, family, and social-environmental determinants related to fruit and vegetable behaviours has good internal consistency of constructs for the large majority of items.

PT-152 A qualitative analysis of the eating habits of primary school children in urban areas of Cork and Almeria.


1. Nutrition and Dietetics Department, Faculty of Health Sciences. University of Cork, Ireland. 2. Nutrition and Dietetics Department, Faculty of Health Sciences. University of Almeria, Spain. 3. Nutrition and Dietetics Department, Faculty of Health Sciences. University of Cordoba, Spain. 4. Nutrition and Dietetics Department, Faculty of Health Sciences. University of Granada, Spain. 5. University of Almeria, Spain.

A qualitative analysis of the eating habits of primary school children in urban areas of Cork and Almeria.
Background and objectives: A number of child health problems are widely perceived to be related to changes in diet and eating habits. This study investigates this perception in two different European urban areas in the following ways: by obtaining and comparing the perception of health professionals, teachers, parents and carers about the eating habits of primary school children, by proposing solutions and strategies for these problems and needs.

Material and Methods: In-depth interviews using semi-structured guides were conducted with expert informants matched by background knowledge and experience in each of two cities: Almería (Spain) (n=15) and Cork (Ireland) (n=15). Data from the in-depth interviews was transcribed and analyzed using the grounded theory qualitative research methodology.

Results: The informants were generally negative about child eating habits, which they held were influenced above all by the family, but also by television, marketing, peers and school. The solution they proposed were integrated ones, involving both the family and external factors.

Key findings: While informants in both cities were in general agreement, they cast the problem differently: in Almería as the abandonment of the traditional Mediterranean diet, and in Cork as the result of economic developments. However, there were no major differences in the actual problems and needs they identified. This suggests that both locations could cooperate to find a solution.

PT-153
Poster Alpha-tocopherol concentrations and weight status as predictors of HOMA-IR in schoolchildren of Madrid, Spain.
P. Palomero-Escoce C1, Rodríguez-Rodríguez C1, González-Rodríguez LG2, Aparicio Vázquez AT2, López-Solábe AM3. 1Center of Studies and Health Services, Veracruzana University, Mexico. 2Analytical Chemistry Department Section, Faculty of Pharmacy, Complutense University of Madrid. 3UMC Research Group VALORUN (020030), Department of Nutrition, Faculty of Pharmacy, Complutense University of Madrid, Spain. 4Department of Human Nutrition and Dietetics, Faculty of Health Sciences, Alfonso X El Sabio University. 5Department of Nutrition, Faculty of Pharmacy, Complutense University of Madrid, Spain.

Objective: Alpha-tocopherol concentration is an important biomarker of the antioxidant status, in turn, the insulin resistance is associated with an increased oxidative state. The condition of overweight/obesity is associated both with the oxidative stress and the presence of insulin resistance. Therefore, the aim of the present study was to determine the concentration of alpha-tocopherol and the weight status as predictors of insulin resistance in schoolchildren of Madrid.

Methods: A cross-sectional study with an initial sample of 564 schoolchildren (258 boys and 306 girls) aged 9-13 years was performed. Schoolchildren of the same age and sex who were overweight (BMI >P85 and <P97) (n=93), obese (BMI >P97) (n=90) and schoolchildren randomly selected (using a table of random numbers) from the remaining 381 who were of normal weight (BMI <P85) (n=90) were selected from the total sample to participate in the study. The final sample consisted of 283 schoolchildren. Plasma glucose and insulin were determined and HOMA-IR (homeostasis model assessment) was calculated by using the equation: insulin (µIU/mL) x glucose (mMol/L) / 22.5. Insulin resistance (IR) was defined as the HOMA value corresponding to the mean plus two standard deviations (SD) of the normal weight group for both sex (boys=r.166 and girls=r.2.752). Alpha-tocopherol concentrations were quantified by reverse-phase HPLC with UV detection, and it was adjusted for total serum lipids (cholesterol + triglycerides). All calculations were made using SPSS 19.0.

Results: The HOMA-IR was 1.98, and the statistical significance was set at p<0.05. The concentrations of alpha-tocopherol were not significantly different between boys and girls (r=0.98; p<0.001). The HOMA-IR values were significantly higher in obese than in the overweight schoolchildren (2.07±1.19 vs. 1.52±0.81; p<0.01), respectively, as well as in those schoolchildren who had overweight/obesity (2.07±1.19 vs. 1.08±0.64; p<0.01), respectively. The concentrations of alpha-tocopherol/tot lipids in the schoolchildren without IR were higher in comparison with those who had IR (47.4±9.66 mg/g vs. 39.7±7.85 mg/g), respectively. The HOMA-IR values were significantly associated with the concentrations of alpha-tocopherol/tot lipids (β=0.018±0.006, p=0.006) and were significantly positively associated with BMI (β=0.129±0.018, p=0.001), gender (β=0.459±0.124, p=0.001) but not with age (β=0.136±0.075, p=0.072) (R=0.344, p<0.001 for complete model).

Conclusion: These results show that the presence of lower alpha-tocopherol concentrations and a less favourable weight status, are associated with a higher HOMA-IR values and this situation was less favourable in boys than in girls.

PT-154
Poster Study habits and alcohol consumption risk assessment according to WHO criteria in college students.
Carlos Brito R1, Ruano Rodríguez C2, Brito Ojeda E1, Ruiz Caballero JA1, González-Hernández JL2, Serra-Majem L2. 1Department of Physical Education. Department of Mathematics. University of Las Palmas de Gran Canaria. 2Nutrition Research Group, Research Institute of Biomedical and Health Sciences, University of Las Palmas de Gran Canaria, Spain. 3Obirn Physiophatology of Obesity and Nutrition. Institute of Health "Carlos III". Madrid, Spain.

Objectives: 1. The harmful use of alcohol ranks third among the main factors of premature death and disability worldwide. It is estimated that each year causes about 2.5 million deaths, and a considerable proportion of them corresponds to young people between 15 and 29 years. 2. The objective of this study is to analyze the alcohol habit in young student population. We wish to determine the risk class of alcohol by the limits defined by the WHO through which we define the low, moderate and the high-risk drinking.

Material and methods: Cross-sectional analysis of drinking habits in 2169 young students from the University Juan Carlos I in Madrid by validated test beverage consumption (Heirch, 2010) in which data are collected weekly and quantity of different beverages. The amount of ethanol consumed alcohol expressed in UBE / week and the percentage of subjects in the sample belonging to each of the risk categories, whereas the WHO criteria by which a high-risk drinking is defined to those calculated men presenting consumption >28 UBE / week and 17 UBE / week or more for women, the moderate risk included.

Results: In total 2169 of 5 students, 9% have a moderate risk of alcohol and 2.12% high risk according to the criteria of the WHO. Men have a tendency to use more high-risk 3, 43% and 1.4% in women, a pattern that is repeated in moderate consumption values of 7% and 5% respectively. Analysis of drinking: The analysis shows a percentage of lower risk than expected on drinking habits in students. Further investigations are needed to minimize shortcomings to various factors, including the possibility that data collection is performed during exam periods where alcohol is severely diminished.

PT-155
Zapata I*1, Mari-Baust M*, Bes-Rastrollo M*, de la Fuente C1, Mix-Sanchis A*, Morales-Salvérez-Velaa MM*. 1Department of Preventive Medicine and Public Health, University of Navarra, Pamplona, Spain. 2CIBER Fisiopatología de la Obesidad y Nutrición (CIBERobn), Instituto de Salud Carlos III, Madrid, Spain. 3Instituto de Salud Carlos III, Madrid, Spain. 4Institute of Physical Education, Department of Mathematics. University of Las Palmas de Gran Canaria, Spain. 5Institute of Health Carlos III, Madrid, Spain. 6Centre of Studies and Health Services, University of Las Palmas de Gran Canaria, Spain.

Objective: To evaluate nutrient intakes and Healthy Eating Index (HEI) scores comparing children with autism spectrum disorder (ASD) with typically developing (TD) children and the intakes of both groups with dietary reference intakes, given that previous research has suggested that the diet of children with ASD may not meet recommendations.

Material and methods: A matched case-control study was conducted using 3-day food diaries completed by 105 ASD (93 boys and 12 girls) and 495 TD (266 boys and 229 girls) children between 6 and 9 years old in Valencia, Spain. The Children were recruited from the same area and the socioeconomic backgrounds. The probability of intake adequacy was assessed using the estimated average requirement cut-point method and a probabilistic approach. Student’s t-tests and χ2 tests were used to assess the statistical significance of the difference between means and proportions, respectively. Linear regression was applied to compare the two groups and logistic regression to assess the results with respect to Spanish dietary recommendations. Multivariable-adjusted models were fitted to control for potential confounders. All statistical tests were two-tailed and alpha was set at 0.05.

Results: We observed no significant differences between the two groups in age (93.7±96.4 months, p=0.22), HEI score (65.32±66.17, p=0.43), total dietary intake (1955 vs. 1961, p=0.86) or food variety score (3.72±3.53, p=0.45). Linear regression showed that ASD children had a lower intake of cereals and dairy products and higher intake of legumes and vegetables (β=-20.1, 95% CI: -30.45 to -9.58; β=-40.8, 95% CI: -78.46 to -3.22; β=21.2, 95% CI: 4.98, 37.36; β=22.5, 95% CI: 4.77, 40.28 respectively). This is consistent with higher intakes of fibre, folate, vitamins B6, E, and K, magnesium and zinc, but lower intakes of calcium and sodium in these children. Logistic regression analysis showed that adherence to recommendations was greater for fibre (OR=0.28, 95% CI: 0.09, 0.82) and vitamin E.
Analysis of Legal Norms which established the Fund for Food and Nutrition Actions in Brazil 2006-2011.

Cardoso A.C.C.; Pereira M.H.Q.; Pereira M.L.A.S.; Reis C. 4; Santos S.M.C.; Santos M.P. 4
Departamento de Saúde Coletiva, Universidade de Brasília; Escola de Nutrição, Universidade Federal da Bahia 2; Universidade do Estado da Bahia 3; Secretaria de Saúde do GDO 4.

A specific funding mechanism to implement the Brazilian National Food and Nutrition Policy actions started in 2006. Since then the Ministry of Health publishes annual Ordinances intended to establish a line of funding to implement the policy guidelines. The funds are passed directly by decree, from the National Health Fund to specific accounts of State or Municipal Health Funds.

Objective: To identify, classify and analyze the Ministry of Health Ordinances published in the period 2006 to 2011, verifying the correspondence of their contents with the political and institutional government context.

Methods: To perform the analysis of administrative normative acts, the Ordinances were organized from its physical structure; Title (nature, number and date); Menu (brief description of its contents); Preamble (justification); Body of the decree (related to the text); Closure (requirements to implement measures, transitional provisions, clause validity and revocation clause); Signatures and Attachments. Finally, successive readings were done to identify core content, classify and compare, where relevant quantification and interpretation were performed. The interpretation of information aimed to understand the meanings often not expressed in the body of the decrees, in light of the historical and institutional context.

Results: Although the ordinances should be published every 12 months, intervals of seven to 17 months were noted, in 2007 and 2010 respectively. As for the Menu, the object suffered nominal change: Ordinance number 1,357/2006 refers to "use the remaining balance of financial resources related to the implementation of Nutrition Ordinance number 3,181/2007," "financial resources of the Healthy Eating Program"; but Ordinance number 1,424/2008 and the following ones, as "annual payment from fund to fund" corresponding to the Fund itself. All Ordinances have as reference the National Food and Nutrition Policy and allude to the nutrition system for the health conditionsality of Bolsa Família, the Brazilian conditional cash transfer program, as well the micronutrient deficiencies programs. Concerning the body of the norm, the 2006 ordinance included 26 cities (the state capitals), but from 2009 on, cities with more than 150,000 people were benefited, leading to a total of 177 cities. With the transition of the mode of cash transfer from the 2007 Ordinance on the payment was made in a single annual installment on the specific fund. Key Findings: The analysis of ordinances contributed to overcome different interpretations and questions regarding the use of these specific resources.

Optimisation of a juice with two varieties of prickly pear (Opuntia ficus-indica) treated by thermolaurasond using surface response method.

Cruz Canino N.1; Montiel Columbus N.1; Bautista Vilteau P. G.; Pérez Tinoco M. R.1; Calderón Ramos Z.2 and Omaña Covarrubias A.1
1Centro de Investigación Multidisciplinaria, Área Académica de Nutrición, Instituto de Ciencias de la Salud de la Universidad Autónoma del Estado de Hidalgo, México. 2Facultad de Nutrición, Zona-Veracruz, Universidad Veracruzana, México.

Objectives. The prickly pear (Opuntia ficus-indica) is abundant in Mexico, is a good source of bioactive compounds such as polysaccharides, this compound has generated great interest because of its antioxidant properties associated with health, such as prevention of noncommunicable disease (cardiovascular, cancer, diabetes). Ultrasound is considered an emerging technology, in order to obtain a juice thermolaurasonicated secure with high bioactive compounds; an experimental design response surface would find optimal process conditions. This research work aims to obtain the optimal condition of ultrasound treatment process of a juice mixture juice with two varieties of prickly pear (Opuntia ficus-indica) with low microbial load, high content of phenolic compounds and antioxidant activity using experimental design of response surface.

Material and methods. A mix juice was made with purple and green prickly pear (6:4 volume/volume) and the thermoultrasound treatment was applied using central composite rotary design with two process variables which were temperature (40-50 °C) and time (15-25 min) with a fixed amplitude of 80%, obtaining 10 treatments. The response variables were total (aerobic mesophilic) and yeast by the method of standard plate count, the content of phenolic compounds by the Folin-Ciocalteu method and antioxidant activity by DPPH using spectrophotometry at 765 and 520 nm respectively. Results. The R2 obtained was 0.90 in all response variables, this means that the mean values are adjusted to the mathematical model of the experimental design. A decrease in total count of 2 log CFU mL-1 was not detected was observed. Microbiology results were found within the NOM-130-SSA1-1995 (2 log CFU mL-1), the reduction obtained is attributed to the ultrasound damage the lipid membrane of the microorganisms. The maximum content of total phenolic compounds obtained was of 880 mg of Acid Galid Equivalent, and the antioxidant activity was of 2280 μl of Trolox Equivalent/L. The increase of phenolic compounds is due ultrasound breaks the cell walls of the pulp releasing compounds, this increase correlates with the antioxidant activity by DPPH.

Key findings. With the response surface design, the optimum process conditions by ultrasound were obtained in temperature and time in order to reach an innocuous juice with high antioxidant capacity that maintains the potential to eliminate free radicals which cause damage to the body.

Sugar-sweetened beverage consumption and obesity in children: quality of the studies doesn’t influence conclusions.

Naisarroh M.4, Fuentes Lugo D.5, Serra-Majem L.4
4Nutrition Research Group, Research Institute of Biomedical and Health Sciences, University of Las Palmas de Gran Canaria, Spain. 5Ciber Obn, Biopathology of Obesity and Nutrition, Faculty of Health “Carlos III”, Madrid. Spain. 4Facultad de Salud, UNED, Ciudad de Guatemala, Mexico.

Introduction: A number of recent reports assert that sugar containing drinks may play a key role in the aetiology of overweight and obesity in children and adults. However, the critical reviews of the current available evidence show contradictory findings, highlighting the weaknesses of many studies. The main controversy remains whether the association is directly cause-effect or if the quality of the studies may influence the outcome.

Objective: The aim of the current study is to describe the most recent scientific evidence they are in sugar-sweetened beverages and child obesity, and to further analyze the quality of the studies in terms of their results.

Methodology: We conducted a computer search of PubMed database looking for published meta-analyses of epidemiologic studies which primary aim is to estimate the relation between SSB intake and obesity in children. Only randomized control trials studies were selected. PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) adherence was assessed in all included studies.

Results: After applying the inclusion and exclusion criteria; only six meta-analyses were included in our study. Only two systematic reviews specifically reported their data using PRISMA guidelines (Te Morenga et al. 2013, Malik et al. 2013). Remaining studies (Mattes et al. 2011, Kaiser et al. 2013, Forshew et al. 2008 and Vartanian et al. 2007) achieved 83%, 74%, 72% and 50% respectively of adherence to PRISMA guidelines. Two of the included studies found a positive relationship between SSB and obesity (Vartanian et al. 2007 and Malik et al. 2013). On the other hand four articles found no relationship between SSB and obesity (Kaiser et al. 2013, Forshew et al. 2008, Mattes et al. 2011 and Te Morenga et al. 2012).

Key findings: The increasing consumption of sugar sweetened beverages in children and adolescents as one of the main causes of the current obesity pandemic is a very trendy research area which is not exempt of controversy. There is no relation between the quality/adequacy of the studies (using PRISMA criteria) and the results they reached. Interestingly, the studies with the highest and lowest adherence to PRISMA (Malik et al 2013 and Vartanian et al 2007) both found a positive association between SSB and obesity. Better designed and longer term studies are needed in order to reach science-based conclusions to establish this relationship properly.

Dietary Inflammatory Index (DII) and mortality in NHANES III Cohort Study.

Nitin Shivappa 1, Susan E. St Eck 2, James R. Hussey 2, Yuncheng Ma2, James R. Hibbert 2
1Cancer Prevention and Control Program, University of South Carolina, Columbia, SC 29208, USA. 2Division of Epidemiology and Biostatistics, Arnold School of Public Health, University of South Carolina, Columbia, SC 29208, USA. 2Division of Preventive and Behavioral Medicine, Department of Medicine, University of Massachusetts Medical School, Worcester, MA, USA.

Background: Various dietary components are known to have an effect on overall mortality but very little is known about the relation between overall diet and mortality through the effect of inflammation. Materials and Methods: We examined the ability of a newly developed dietary inflammatory index (DII) to predict mortality in the National Health and Nutrition Examination Survey (NHANES) III cohort study. The DII was
computed based on baseline dietary intake assessed 24-h dietary recalls (1988-94). Mortality was determined from the National Death Index records through 2006. Cox proportional hazards regression was used to estimate hazard ratios. During the follow-up period through the end of 2006, 2795 deaths were identified, including 615 cancer, 158 digestive cancer and 1233 cardiovascular (CVD) deaths.

Results: Multivariable analysis, adjusting for age, race, diabetes status, hypertension, physical activity, BMI, poverty index and smoking, revealed positive associations between higher DII and overall mortality (HR for DII Tertile3 vs 1 = 1.34; 95% CI 1.19-1.51, p-trend<0.0001), cancer related mortality (HR for DII Tertile3 vs 1 = 1.46; 95% CI 1.10-1.96, p-trend<0.01), digestive cancer mortality (HR for DII Tertile3 vs 1 = 2.10; 95% CI 1.15-3.94, p-trend<0.03) and CVD mortality (HR for DII Tertile3 vs 1 = 1.46; 95% CI 1.18-1.81, p-trend<0.0006).

Conclusion: These results indicate that a pro-inflammatory diet, as indicated by higher DII scores, was associated with overall, cancer and CVD mortality.

PT-160
Prospective studies of South Asia on Double Fortified Salt as a cost effective approach to combat micronutrient deficiencies.

Nair,S, Joshi,K, Rana,R
Department of Foods and Nutrition, Faculty of Family and Community Sciences, The M.S. University of Baroda, Vadodara, Gujarat, India.

Today's time focuses on progressing economy worldwide. National damage assessment report by MI for 80 countries reported mean GDP loss to be 1%, of which 0.2 to 2.7% belonged to developing countries and India.

With respect to iron deficiency and iodine deficiency 4 million and 0.2 million DALYs are lost respectively. In 2008 burden of Iron Deficiency Anemia increased and it is estimated that 4 million DALYs will be lost every year. While calculating cost benefits of Double Fortified Salt (DFS) vs Fortified Foods, it was observed from various studies on wheat flour (9:1), home fortification (37:1), were much ahead than DFS (2-5:1), but the cost effectiveness, ease of technology and its daily usage as a daily commodity puts DFS ahead than any other fortification.

Fortification of salt with 20–40 mg iodine/kg using potassium iodate and 10mg Ferrous sulfate to avail 40ppm Iodine and 1000ppm iron per day has proven that anemia can be brought under control. Our studies in Gujarat using the formula from National Institute of Nutrition, on pregnant women(n=247) proved circulating iron levels were maintained throughout during the entire pregnancy. Over and above the iron status improved by 1.5%(p<0.001). In school aged population a concomitant increase was observed with 0.56gm/dl in girls(n=431) and 0.6gm/dl in boys(n=516). It showed overall 6.3% decrease in anemic levels of the population (p<0.001). Therefore based on an intake of DFS as 10mg/day the cost when calculated for 1 billion population of India revealed 47.7million$ for iron and 4.56million$ for iodine, which amounts to total cost of 52.26million$. Therefore we can conclude that if DFS is incorporated into daily diet consumption, it can avert the reported values of 4.2million DALYs lost every year for India.
Edible insects as a gourmet dish in high class restaurants in México.

Milo Ruiz V1, Calvo Carrillo C2, Quirino Barreto T1, Sahijeral Oaxaca J1, Murata Ch1
1Universidad Autónoma Metropolitana Unidad Xochimilco; 2Instituto Nacional de Nutrición "Salvador Zubirán"

Mexican food is much more than tamales, tacos and mole (chicken with hot sauce), insect cuisine is emerging from the past and some up-market restaurants are featuring an array of insect food. Grubs, ant eggs, grasshoppers, ants and water bugs, rounded off with ingredients of different kind, are prepared to produce either local traditional food or gourmet dishes in high class restaurants. As a demand for insects food increase and outstrips supplies that can be gathered from the country, the necessity for growing insects have become, and involve farmers and rural people as a producers and consumers to provide information about edible insects, since some species may require special techniques of gathered and preparation to render them nice. Insects captured by farmers help them to improve their nutrition and health. The aim of this study is to investigate the offering of edible insects to the public at gourmet restaurants, and the customers acceptance. Ten gourmet restaurants were visited to investigate the availability of edible insects at the menu, as well as the acceptance by the people. All restaurants have escamoles (ants eggs) three have ma-guey white grubs, one maguey red grubs and two grasshoppers. Escamoles were the most demanded, follow by maguey grubs, and grasshoppers were the least consumed. Most of the dishes served at these up market restaurants are traditional based, although also present actual recipes, the association between actual recipes and the more classical ones, produces an unique character of the Mexican cuisine. A fusion of cultural traditional techniques and contemporary cooking methods implies its uniquely Mexican dishes culinary identity.

The influence of nutrition education with controlling blood sugar levels for outpatient type 2 diabetes mellitus.

Hamid K1
1Department of Nutrition, Faculty of Public Health, Hassanabad University

Background and objectives: Lifestyle changes, especially in big cities, led to the increasing prevalence of degenerative diseases such as diabetes mellitus type 2. And lack of knowledge in running a diet therapy in patients with diabetes that can lead to increased blood sugar levels. This study aimed to determine the effect of nutrition education on increased knowledge, dietary adherence and controlled blood sugar levels of Type 2 Diabetes Mellitus Outpatients in New Jimmending Maternal and Newborn Health Center. Methods: was an experimental study of Pre- experimental research design with one group pre and posttest design. Sampling was done using purposive sampling with a sample of 27 people. Data analysis was performed with the McNemar test.

Results: this study showed no change in the increase in patient knowledge significantly (p=0.125) but increased knowledge before education from 85.2 % to 100 % better after the education category. There was an increased change in patient diet adherence (p= 0.035) before education was from 25.9 % to 59.3 % were categorized as adherent after education. And there was an increased change in patient blood sugar control patients (p=0.000), before education was from 3.7 % to 48.1 % were categorized as controlled after education. Dietary compliance after nutrition education based on energy intake; protein intake; fat intake and carbohydrate intake were more docile as many as 59.3%; 59.3%; 85.2% and 63.0%. And the average blood glucose levels contribute controlled on energy intake; protein intake; fat intake and carbohydrate intake were 62.5%; 56.2%; 52.2% and 52.9%. Conclusion: there was no influence of nutrition education with increased knowledge there was influence of nutrition education on dietary adherence and controlled in blood sugar levels. We suggested to be set onwards diet to control blood sugar assisted with physical activity (Sport) and medication compliance.

Production, Acceptability and Storage of cocoyam Snack, a perfect way of combating malnutrition.

Ovwela, A.J
University of Ibadan, Ibadan, Oyo state, Nigeria.

Background: good nutrition is essential foundation for health and development, inadequate food intake leads to poor growth in children worldwide, weight loss and wasting in adult. Despite the intervention of the United Nations to reduce hunger by 50% in the Millennium Development Goals, Yet malnutrition continues to be the world's most serious problem and the single-biggest contributor to child mortality. Local production and utilization of traditional foods will encourage dietary diversity for adequate nutrients intake. Cocoyam is at present undeniably in Africa, the possibility of increasing its utilization lies in developing suitable processing technology, securing consumer acceptance and marketable products and achieving economic feasibility.

Methodology: peeled cocoyam was processed into a delicious snack in three different samples and compared with a control. This snack contain adequate amount of protein, vitamin and minerals. The following analysis were carried out (Proximate Analysis, Sensory evaluation of the different samples, Functional Properties (Mineral Determination, free fatty acid and Anti nutritional Compounds) and stored for 5months.

Result: the proximate composition shows there is no significant difference between the commercial sample, sample a (cocoyam + ginger) and sample c (cocoyam +onions) at (p<0.05) level. Also there is significant difference in the fat content of all the samples with sample A(cocoyam+Ginger) having the highest fat content of 18.39g/100g), The low fat content of sample B(cocoyam +pepper) and sample C(cocoyam+onions), coupled with its research content, makes it an ideal food for geriatric patients. The overall acceptability of the sensory evaluation carried out using 15 men panelists indicates that sampleA(cocoyam+ginger) is as accepted as the commercial sample. The result of free fatty acid determination after a period of storage which lasted for five(5) months, it very obvious that even after five months(5 months) of storage, only sample C(cocoyam +onions) was tending towards Rancidity.

Conclusion: in order to attain a considerable level of food security, low and middle income countries should be encouraged and assisted to invest in the production and utilization of traditional foods. Utilization of local foods will increase food supplies and broaden the food base at household and national level, Will also increase household income and stimulate increased consumption.

Monounsaturated fatty acids, olive oil and health status: a systematic review and meta-analysis of cohort studies.

Schwingshackl L, Hoffmann G
Department of Nutritional Sciences, Faculty of Life Sciences, University of Vienna

Objectives: No dietary recommendations for monounsaturated fatty acids (MUFA) are given by the National Institute of Medicine, the United States Department of Agriculture or the European Food and Safety Authority. In contrast, the Academy of Nutrition and Dietetics as well as the Canadian Dietetic Association both promote <20% of daily total energy consumption in the form of MUFA. Previous meta-analyses of cohort studies reported inconsistent results with respect to the effects of MUFA on risk of coronary heart disease. The aim of this meta-analysis of cohort studies was to focus on monounsaturated fat and cardiovascular disease, all-cause mortality while differentiating between the different dietary sources of the fatty acids (i.e. oleic acid, olive oil).

Materials/Methods: Literature search was performed using the electronic databases MEDLINE, SCOPUS and EMBASE until March 28, 2014. Study specific risk ratios and hazard ratios were pooled using a random effect model by the Cochrane software package Review Manager 5.2. To enable a consistent approach to meta-analysis and interpretation of findings in this review, relative risk estimates for association of fatty acids and outcomes that were often differently reported by each study were transformed. Results: Thirty-one cohort studies (42 reports) including 833,995 subjects with 311,586 events and 731,409 events for the objectives and were included in the meta-analysis. The comparison of the top versus bottom third of fatty acid (combined subgroups: monounsaturated fat, monounsaturated fat: saturated fat ratio, and olive oil) distribution in each study resulted in a significant risk reduction for all-cause mortality (RR: 0.90, 95% CI 0.84-0.96, p = 0.003; I2= 65%), cardiovascular mortality (RR: 0.89, 95% CI 0.82-0.97, p = 0.007; I2 = 48%), cardiovascular events (RR: 0.91, 95% CI 0.85-0.97, p = 0.003; I2 = 59%), and stroke (RR: 0.83, 95% CI 0.71-0.97, p =0.02; I2=70%). No significant changes could be observed for coronary heart disease. Subgroup analyses showed only a significant association between higher intakes of olive oil and reduced risk of all-cause mortality, cardiovascular events, and stroke. Therefore, olive oil is crucial for the results of the primary analysis. Key findings: The results of the present meta-analysis demonstrated an overall risk reduction of all-cause mortality (10%), cardiovascular mortality (11%), cardiovascular events (9%), and stroke (17%). Monounsaturated fat (mixed animal and vegetable sources) per se did not yield any significant effects on these outcome parameters, indicating that only olive oil (the predominant source of monounsaturated fat in south European countries) is responsible for the protective health effects. In a western diet often associated with a higher risk of these events, monounsaturated fat is mostly supplied by foods of animal origin, further substantiating the results of the present meta-analyses.

“Fat? Who is fat?” Self-image acceptance and weight control behaviours among overweight and obese adolescents.

Tur JA, Bibiloni MM, Pons A, Rich J
Introduction: Unbalanced dietary habits in adolescents are a growing problem in the developed world. Nutritional education is central in intervention strategies. A good understanding of eating behaviour and the reasons behind eating healthy or unhealthy food is of particular importance as it can influence on health in adolescence.

Objective: Analyze the nutritional knowledge in young people, and to describe their perception regarding food information.

Material and methods: 384 adolescents and young adults (13 to 22 years old) took part in the study. The task was self-administered, following the instructions given by the interviewers. Participants were asked to perform a nutritional knowledge questionnaire related with 3 aspects: 1/ number of servings that should be consumed daily from different food groups. 2/ nutritional characteristics of foods. 3/ food effects on health.

Complementary 6 discussion groups with 38 participants were conducted.

Results: Participants have poor nutritional knowledge being the main ignorance related with daily food servings and food effect on health.

Differences in nutritional knowledge with gender, age and quality of the diet were explored. Although nutritional knowledge was not strongly affected by gender, age and quality of the diet, some differences were spotted. Considering gender, differences were found with knowledge about nutritional characteristics of foods. Boys have better knowledge than girls. Considering age, older participants have better knowledge than youngest, concretely about nutritional characteristics of food, and food effects on health.

Quality of the diet was not related significantly with nutritional knowledge. Information generated in discussion groups showed that most part of them said that they had enough information about food and dietary habits. The principal settings where they learned about this topic were at school and with family. Participants know the balance diet and they are conscious about their unhealthy dietary habits. For them health is not the main reason for choosing foods.

Key findings: Results from the present study show that participants have an important confusion in different nutritional aspects although they believe they have a lot of information about this topic. These findings deserve an improvement reflection about the type and amount of contents we use to improve dietary habits. Healthy food habits have to be promoted working together with different settings and working in an extended and evaluated program in order to ensure that interventions allow participants to assimilate the contents properly. In addition, interventions in food habits promotion should take into consideration others perspectives beyond health.
**PW-009**

**Poster**

**Community elders in Taiwan who spend more on vegetables and fruit but not animal-derived food use less emergency and in-patient services.**

Lo YC1, Wallqvist ML2,3,4, and Lee MS1,4

1School of Public Health, National Defense Medical Center, Taiwan, ROC
2Institute of Population Health Sciences, National Health Research Institutes, Taiwan, ROC
3Monash Asia Institute, Monash University, Australia

Background: Greater vegetable and fruit (VAF) intakes are associated with reduced risks of all-cause, cancer and CVD mortalities in the general population. However, the consumption of various foods for vulnerable groups is threatened by increasing food prices. Much of the economic burden of health care for older persons whose diet may change due to these costs.

Purpose: To investigate prospectively the effects of food group (VAF, animal-derived, grain, and others) expenditures on emergency department (ED) visits, length of hospital stay (LOS), and their costs.

Methods: In the 1990-2000 Elderly Nutrition and Health Survey in Taiwan, 24-food frequency questionnaires were completed during a follow-up by contrast, animal-derived food intake was associated with the highest of these expenditures.

Adjustment for covariates, that higher VAF expenditure predicted lower health care utilization and costs for ED and LOS, and that higher animal-derived food expenditure predicted increases was confirmed.

Conclusions: Significant for ED and LOS utilizations and costs for 1,650 eligible elders were obtained by linkage to National Health Insurance claims. Generalized linear models were used to appraise the associations between energy-adjusted food group expenditures and annual health care utilization and costs.

Results: Among the four food groups, the highest expenditure tertile for VAF had the lowest annual mean usage (i.e., visit, day, and costs) for ED and LOS. For the lowest expenditure tertile, animal-derived food intake was associated with the highest of these expenditures.

Adjustment for covariates, that higher VAF expenditure predicted lower health care utilization and costs for ED and LOS, and that higher animal-derived food expenditure predicted increases was confirmed.

Conclusions: Significant for ED and LOS utilizations and costs for 1,650 eligible elders were obtained by linkage to National Health Insurance claims. Generalized linear models were used to appraise the associations between energy-adjusted food group expenditures and annual health care utilization and costs.

**PW-010**

**Poster**

**FoodSwitch: a smartphone application to help consumers make healthier food choices.**

Dunford E1, Trevena H1, Goodsell C2, Webster J1, Neal B1

1The George Institute for Global Health, University of Sydney, Australia
2Xyris Software, Brisbane, Australia

Background and objectives: Existing front-of-pack labelling schemes can be difficult for consumers to understand. With >50% of Australians owning a smartphone, and consumers increasingly using smartphones to shop for food, the FoodSwitch application was developed to show consumers the nutritional characteristics of foods in an easy-to-understand format and to suggest similar healthier products.

Methods: A database containing nutritional information and barcodes for 40,000 Australian packaged foods was created. All foods were categorised into >850 categories, with each item assigned traffic light colours indicating levels of fat, saturated fat, sugar and salt based on the UK Food Standards Agency guidelines. Food Standards Australia New Zealand’s nutrient profiling criteria was applied to each product to calculate which items appeared as healthier choices. A crowd-sourcing function was built into the application to engage consumers in the attainment of healthier choices.

Results: When the barcodes of a food product is scanned, FoodSwitch displays the level and traffic light colour for total fat, saturated fat, sugar and salt. A listing of healthier products is shown on the screen. FoodSwitch was downloaded by >250,000 users in its first year, had >27,000,000 media impressions globally, and was recently launched in the UK and New Zealand, with plans underway for launch in the USA, India and China by the end of 2015.

Crowd-sourcing resulted in 6,000 additional products added to the database in the first week. Nutritional information for >300 products is still sent in by users each week. Over 2,000 consumer feedback emails have been received which have led to a version of the application for hyperthermals, SaltSwitch, being released and a version for people with Coeliac Disease, GlutenSwitch. Key findings: FoodSwitch has empowered Australian consumers seeking to make better food choices. In parallel, the huge volume of crowd-sourced data has provided a novel means for low-cost, real-time tracking of the nutritional composition of Australian foods. There appears to be significant opportunity for this approach in many other countries.

**PW-011**

**Poster**

**Dietary habits and associated factors in school-aged children living in Libo Kemkem and Fogeraga districts, Amhara Regional State, Ethiopia.**

Pérez-Formigó J1,2, Herrador Z1, Sordo L1, Gadisa E3, Custódio E4
1Centro Nacional de Epidemiología, Instituto de Salud Carlos III, Spain
2Centro Nacional de Medicina Tropical, Instituto de Salud Carlos III, Spain
3Armauer Hansen Research Institute, Ethiopia

Objectives: The aim of this study was to assess the dietary habits of school aged children in Libo Kemkem and Fogera districts, Amhara Regional State, Ethiopia and identify the socioeconomic, educational and community factors associated with it.

Material and Methods: A cross-sectional survey was conducted in May 2009 using multistage cluster sampling. The study population was children 4 to 15 years old of two districts in Amhara Regional State, Ethiopia.

Socio-demographic and clinical data were obtained by questionnaire, and diet information by a 24 hour recall. Food items were classified in 9 food groups following Food and Agriculture Organization (FAO) methodology. The diversity of the diet was considered appropriate when 4 or more different food groups had been consumed the day before. The prevalence of proper diet was calculated according to rural/urban area, sex, and age. The chi-square test was used to assess differences between groups.

A socio-economic (SES), socio-educative (SED) and community endowment (CEI) index were created using principal component analysis.

Finally, a multivariate model was created for the outcome “Adequate Diet”, including age group, sex and the different indexes created.

Results: A total of 889 children were surveyed. The mean age was 8.8 years and 48% (425) were girls. Grains and tubers were consumed by 98% of the children followed by fats and oils (91.2%), Vitamin A non-rich fruits (84.3%) and the group meat, poultry and fish (20.5%). Around 21% of the children had an adequate diverse for the total population, that turned in to 16.4% and 39.9% in the rural and urban settings respectively (p<0.01).

In relation to age, 22.3% of the boys had a proper diet compared to 19.8% of the girls although no significant. There were not significant differences between age groups either. In the multivariate analysis proper diet was associated with the setting, being the children in the urban settings nine times more likely to have a proper diet (OR=9.35% 9.2 (6.2-13.8)) and living in a house that owned livestock (OR=9.35%) 2.4 (1.3-4.3). Diet diversity score was higher in the first tertiles of the SES and the SED but differences were not significant.

Key findings: Diet diversity is significantly better in urban settings compared with rural areas and in some countries in our area of study. It is a rural area of relatively food security and therefore we consider that an intervention in nutrition education will be appropriate.

**PW-012**

**Poster**

**Low dairy consumption associated with stunting in Equatorial Guinea.**

Custodio E1, Ncogo P2, Aparicio P3, Benito A1
1Centro Nacional de Medicina Tropical, Instituto de Salud Carlos III, Spain
2World Health Organization, Geneva, Switzerland
3World Health Organization, Regional Office for Africa, Brazzaville, Congo

Objectives: Equatorial Guinea is a Sub-Saharan country experiencing a nutrition transition and with a 32% prevalence of stunting. However, there is no published data on the dietary practices of its population. The aim of this study was to assess diet practices among children below 5 years of age and determine its association with stunting.

Material and Methods: A cross-sectional survey on Nutrition & Health was conducted in Equatorial Guinea at national level in February-March 2004. Anthropometry was measured following WHO procedures and stunting was defined as height for age < -2 standard deviations (SD) based on WHO Growth Standards. Dietary information was collected through a 24 hour recall. Dietary diversity score (DDS) and Minimum Dietary Diversity (MDD) were calculated using the 7 food groups suggested by the WHO guidelines.

Results: Of the 552 children surveyed, 91% consumed grains and tubers the day before, 47% legumes and nuts, 89% dairy products, 89% fish (meat, poultry and/or fish), 4% eggs, 44% fruits and/or vegetables rich in vitamin A and 75% fruits and/or vegetables not rich in vitamin A. The consumption of legumes and nuts was associated positively with stunting only in the bivariate analysis, and the consumption of dairy products showed an inverse association with it that remained after adjusting by age, sex and socioeconomic status, OR(95% CI): 0.23 (0.06, 0.81). The mean DDS was 3.2 (SD=1.4), and only 61% of the children reached the MDD, although these two indicators were not statistically associated with stunting.

Key findings: Dietary diversity is low among children aged 2-5 years in Equatorial Guinea, although the consumption of animal source foods is high. The consumption of milk and dairy products seems to protect from stunting in this population.
**Poster PW-013**

**Low consumption of fruits, vegetables and dairy products among HIV-infected children in El Salvador.**

Martin-Cañavate R., Sandoz MP, Sagredo MP, Escobar G*, Rivas E*, Custodio E.

*Centro Nacional de Medicina Tropical, Instituto de Salud Carlos III, Spain*.

School in Sciences of Reproduction and Development, Trieste University. 
Concluding National of Epilepsy foods by children Carlos III in Spain. 
*Centro Nacional de Excelencia para Niños con Inmunodeficiencias, Veneto* (CEI) index were created using principal component analysis. 

Finally, a multivariate model was created for the outcome " Adequate Diet," including age group, sex and the different indexes created.

**Objective:** To assess the dietary practices of HIV-infected Salvadoran children.

**Materials and methods:** In September and November 2010, a cross-sectional survey including food frequency questionnaires was conducted to all HIV-infected children attended at Centro de Excelencia para Niños con Inmunodeficiencias (CEI) Hospital de Niños Benjamin Bloom, the reference hospital for all HIV diagnosed children in El Salvador.

**Results:** A total of 889 children were surveyed. The mean age was 8.8 years and 48% (425) were girls. Grains and tubers were consumed by 98% of the children followed by fats and oils (91.2%), Vitamin A non-rich fruits (84.3%) and the group meat, poultry and fish (20.5%). Around 21% of the children had an adequately diverse for the total population, that turned in to 16.4% and 39.9% in the rural and urban settings respectively (p<0.001).

In relation to age, 22.3% of the boys had a proper diet compared to 19.8% of the girls although no significant. There were not significant differences between age groups either. In the multi-analysis proper diet was associated with the setting, being the children in the urban settings nine times more likely to have a proper diet [OR(95%CI) 9.2 (3.6-23.8)] and with living in a house that owned livestock [OR(95%CI) 2.4 (1.3-4.3). Diet diversity score was higher in the first tertiles of the the SES and the set but differences not more significant.

**Key findings:** Diet diversity is significantly better in urban settings compared to rural settings in our area of study. It is a rural area of relatively food security and therefore we consider that an intervention in nutrition education will be appropriate.

**Poster PW-014**

**Low dairy consumption associated with stunting in Ecudorian Guamaní.**

Castro J, Chinos D', Tejada de Riveras D'.

*Universidad Nacional del Centro del Perú. Huanuco-Pe. Universidad Nacional Federico Villareal. Lima, Perú.*

**Interamerican Association for Environmental Defense-Peruvian Society of Environmental Law for Oroya reported lead contents in the air that easily exceed 800% the maximum limits set by General Direction of Environmental Healthy-Peru (1.5 μg/m3) and the highest percentage of WHO (0.5μg/m3). In Huanuco, the lead level in air was 44 tony per year being the main sources of pollution the vehicle fleet. The highest concentration of lead for 24 hours was 15 μg/m3 standard as being the monthly average of 1.5 μg/m3.

**Objectives:** To assess the lead concentration in umbilical blood cord of 64 babies born to pregnant women living in the cities of Huanuco (commercial urban area) and La Oroya (mining area) and its impact on the level of hemoglobin, length, weight and APGAR score at birth.

**Methods:** Blood samples were collected in Hospitals II El EsSalud La Oroya and Huanuco Regional Hospital when the La Oroya smelter was operating normally. The quantification of lead concentration was performed by atomic absorption with graphite furnace in the Peruvian Institute of Nuclear Energy. Biological sampling protocols responded to Iyengar and Rapp (2001).

**Results:** The mean concentration of lead in the umbilical cord blood in infants of La Oroya and Huanuco city were 18.03 μg/dl and 22.96 μg/dl (p=0.016) respectively, these values being 3.6 and 4.6 times higher than the critical level (0.3 μg/dl) suggested by the CDC (2004). Hemoglobin levels were significantly lower in infants of La Oroya and Huanuco city were 18.3 and 16.9 g/dl (p=0.000). Only registered anemia in infants of La Oroya (9.38%). By regression analysis, the inverse association was evident between the content of lead in umbilical cord blood and the hemoglobin content, weight, length and APGAR score at birth.

**Key findings:** The average concentrations of umbilical cord blood lead in infants of La Oroya were significantly higher than in Huanuco (p=0.016). Huanuco neonates had a higher hemoglobin content than those born in La Oroya (p=0.000), which is due to the inverse relationship between hemoglobin and umbilical cord blood lead because of environmental pollution this element. In La Oroya neonates was observed 9.38% of anemia. Statistical relationships between levels of umbilical cord blood lead with weight (r=0.03; p=0.99), height (p=0.049; r=0.24) and APGAR scores (p=0.000; r=0.35) at birth were found, showing that the higher the level of lead in the blood of the umbilical cord, weight, height and APGAR birth were significantly lower. Hemoglobin was also affected, but not significantly (p=0.089).

**Poster PW-015**

**Preferences of healthy and less healthy foods in school children in Mexico: longitudinal study.**

1. De Lira-García C., Jiménez-Cruz A. and Barcasc-Gascón M. 
2. Universidad Autónoma de Baja California, Mexico. 
3. Facultad de Medicina y Psicología, Graduate Nutrition Program. 

**Objective:** To assess healthy and less healthy food preferences (FP) in elementary school children (ESC) and to determine whether there is an association with their body mass index after a period of 12 months.

**Methodology:** Children from 2nd and 5th grades in 28 elementary schools were assessed. Weight and height were measured according to standardized procedures. Overweight (OW) and obesity (OB) was calculated according to WHO criteria. Children FP were assessed using 54 cards of foods usually consumed by Mexican children at baseline and one year later. Distribution of children’s food preferences was calculated. To assess the associations of healthy and less healthy foods preference in OW/OB and normal weight children Chi square test were conducted. To assess the risk of becoming OW/OB according to their FP multinominal analysis of logistic regression was performed.

**Results:** 1531 ESC participated in the study. The average age of children was 11±1.6y (6-13y), 52% were girls and 49% were OW/OB. Baseline: Ice cream, cookies, orange juice, pizza and chocolate milk were the most preferred foods by children while quince paste, tomato, fruit in syrup, avocado and vegetable soup were the least preferred. Forty eight per cent and 33% of ESC preferred more healthy food at baseline and at the end of the study respectively (p=0.001). ESC who prefer healthy food at baseline after adjusting for mother education, were less likely to become OW/OB at the end of study, OR=0.56 (IC 0.95, 0.37-0.84, p=0.005), and after adjusting for BMI z-score at baseline, OR=0.59 (IC 0.95, 0.38-0.90, p=0.014).

**Conclusions:** The most preferred foods were high in sugar content and energy dense foods. Children liking more healthy food, after adjusting for mother education at the beginning of the study were less likely to become OW or OB. After adjusting for BMI z-score at baseline, children who prefer more healthy food were less likely to be OW or OB. These results indicate that the preference of healthy food in second and fifth grade children is a protective factor to become OW or OB.

**Key findings:** Second and Sixth grade Mexican Children who prefer healthy food are less likely to become OW/OB a year later.

**Poster PW-016**

**Measurements of adiposity associated with cardiometabolic risk factors in Mexican school children.**

Ramos-Íñáez N, González Álvarez C, Ortiz-Hernández E. 

**Objectives:** Obesity is factor to develop cardiovascular diseases and diabetes mellitus type II. In children, is known that excess of adiposity also causes metabolic problems. The aim of this study was to establish the measurement of adiposity that allows identifying cardiometabolic problems in school children.

**Materials and Methods:** Participants were 119 children aged 6 to 12 years old (61 boys and 58 girls). Measurements of adiposity were: body mass index, percentage of body fat, circumference of waist, visceral fat and abdominal subcutaneous fat. Percentage of body fat was estimated with dual energy X-ray absorptiometry. Waits circumference was measured around the iliac crests. Visceral and abdominal subcutaneous fat was assessed with magnetic resonance in 4 sites (L1-L2, L2-L3, L3-L4 and L4-L5). The cardiometabolic factors assessed were: high levels in plasma of glucose, triglycerides, total cholesterol, and low-density lipoprotein cholesterol; and low concentration of high-density lipoprotein cholesterol. Homeostatic model assessment to quantify insulin resistance and elevated blood pressure were also evaluated.

**Statistical analyses:** Descriptive statistics was estimated. Pearson correlations were calculated to establish the association between measurements of adiposity and cardiometabolic factors. Linear regression models were estimated to determine if measurements of adiposity explained the variance of cardiometabolic factors adjusted by sex and age. Statistical significance was used at p<0.05

**Results:** Boys had significantly higher body mass index, waist circumference and visceral fat than girls. There was no difference in cardiometabolic parameters between sexes. Almost 71 % of scholar children presented one or more cardiometabolic risk factors. Measurements of adiposity did not correlate with total cholesterol, low-density lipoprotein cholesterol and glucose. Diastolic blood pressure was only associated with percentage of body fat. The linear model regression showed that measurements of adiposity explained significantly the variance of homeostatic model assessment (40-50%) and triglycerides (12-17%). The percentage of body fat, waist circumference and visceral and abdominal subcutaneous fat explained the lowest variance of high-density lipoprotein cholesterol (1-12%).

**Key findings:** There is a high prevalence of cardiometabolic risk factors in
Mexican scholar children, insulin resistance was the best cardiometabolic risk factor parameter explained by the measurements of adiposity. High-density lipoprotein cholesterol was not adequately predicted by measurements of adiposity in this sample of Mexican scholar children.

**PW-017**

**Poster**

**Functional capacity and nutrition status of community-dwelling elderly.**

Souza L.B.1; Papini S.P.; Corrente J.E.2

1Universidade Federal de Mato Grosso do Sul, Brazil; 2Universidade Estadual Paulista, Brazil.

The aim of this study was to evaluate the relationship between functional capacity and nutritional status for community-dwelling elderly. To evaluate this association, an epidemiological cross-sectional study was conducted with 361 seniors aged 60 or older in a city, Brazil. The assessment of functional capacity was obtained by applying the Scale of Activities of Daily Living through the Katz index (ADL) and Instrumental Activities of Daily Living through the Lawton index (IADL). To evaluate nutritional status, anthropometric variables were measured: weight, height, body mass index (BMI), waist circumference (WC), circumference arm (CA), arm muscle circumference (AMC), corrected arm muscle area (CAMA) and triceps skinfold thickness (TST). As result, related to functional capacity, it was observed that 89.9% and 67.6% of the older were fully independent for ADL and IADL, respectively. Regarding anthropometry, it was observed that the values of the variables weight, height, BMI, CAMA and WC are higher in men compared to women (p<0.05). The average values of TST behaved in the opposite way, being higher in women (p<0.0001). The average values of AC and BMI show no statistical difference. When evaluated according to BMI, it was observed that 18.28% of the older were overweight, 36.01% were classified as normal weight and 45.71% were overweight. No significant associations were found between any of the variables from the nutritional status and the classification of ADL. Related to IADL, it was found significant associations between IADL and BMI (p = 0.0293), WC (p = 0.0316) and AC (p = 0.0241). Considering the functional capacity obtained by ADL and IADL as dichotomous response variables, a logistic regression model was fitted considering the anthropometric variables and nutritional status as explanatory variables corrected by age and it was observed that there was a relationship between nutritional status and functional capacity (IADL) for older people showing a relationship between BMI (OR=2.34) and WC (OR=1.97). The data show that overweight people have a higher risk of being dependent in IADL than those classified as normal weight as well as those with values of WC above those considered ideal. It is possible to conclude that the maintenance of a healthy and appropriate weight is associated with a good functional capacity in community-dwelling elderly.

**PW-018**

**Poster**

**Students’ attitudes to sustainability and sustainable consumption – a qualitative analysis.**

Metz M, Freytag-Leyer B, Klotzer C

University of Applied Sciences Fulda

Objectives: Attitudes are a key driver of consumption behavior. Sustainable consumption behavior might only be implemented when adequate attitudes to sustainability are present. But, attitudes to sustainability seem to be often coined by negative aspects such as resistance, renunciation, and denial of anthropogenic responsibility for global problems. This project aims to examine students’ attitudes to sustainability and sustainable development.

The underlying research question is: Which attitudes do students have to sustainability and sustainable development?

Material and methods: Data were collected from a group of 26 students enrolled in a course on sustainable consumption and behavior change at the University of Applied Sciences Fulda (Germany) in spring 2013. The students were asked to prepare and present a private poster presentation on their lifetyles. The presentations were audio-taped and transcribed. The transcripts were analyzed by means of “qualitative evaluative content analysis”.

Results: The dimension of attitudes on sustainability and sustainable development was approached by the participants in terms of motives, barriers, and supportive aspects. From 26 students 15 refer to barriers to sustainability. Two main barriers are mentioned: first rural living which e.g. requires driving by car and often goes along with bad public transport; second the family which e.g. provides non-sustainable products and serve as role models in the living environment. Statements on negative support-catalysts are only made by three students. They refer to the same aspects, but in a positive way. Family and environment could also be supportive by sustainable food supply and furthering life skills. Almost all participants (25/26) present motives to sustainability and sustainable consumption. They express e.g. that (last) but one technique is very important to them, but that they also care for saving electricity.

Key findings: The methodical approach seems very useful because all students were motivated to comment on their attitudes to sustainability and sustainable consumption by their photo documentations. It is an innovative approach which links teaching and research. Photo-based research also sends more adequate than e.g. a questionnaire because it can be assured that stating attitudes consciously is difficult without having triggers such as photos.

Data analysis shows that attitudes are presented in very individual sets mostly differing between individuals. Concerning factors influencing their behavior most participants refer to external factors, also called external attribution.

In a further research step the students’ attitudes should be compared to their consumption behavior to discuss strength of influence.

**PW-019**

**Poster**

**Components of an obesogenic environment in Kuwait.**

Garduño-Díaz SD1 and Garduño Díaz PY2

1American University of the Middle East; 2independent consultant in sustainable development

Objective: The physical, economic, political and sociocultural components of the environment in Kuwait were analyzed to determine if the country classified as an obesogenic environment.

Materials and method: Following the ANGELO framework, the physical, economic, political and sociocultural components of Kuwait were analyzed to determine if the country classified as an obesogenic environment. Availability and accessibility to an almost unlimited amount of food, energy, trans fats and sugars are likely to be significant contributors to obesity and diet-related diseases.

Key findings: In tandem to the diet, harsh climate conditions, sociocultural practices and a lifestyle designed for decreased energy expenditure contribute to the creation of an obesogenic environment in Kuwait.

**PW-020**

**Poster**

**Menu labeling in traditional restaurants: the most appreciated and effective way.**


HAS University of Applied Sciences, ’s-Hertogenbosch, The Netherlands

Our aim is to support restaurant guests/customers by making the healthy choice the easy choice. Since the introduction of labeling in the “out-of-home” sector, an increasing amount of research has focused on the effectiveness of different types of menu labeling. Various labeling possibilities were tested, but mainly in fast-food restaurants and in the United States. Only a limited amount of studies has focused on the implementation of menu labeling in full service restaurants. Though, in the Netherlands about 30% of the energy intake is consumed “out-of-home”, there is only a limited amount of information available on the healthiness of restaurant dishes. In previous studies it was investigated what the chances and barriers are for restaurants to implement menu labeling. Competitiveness and creative challenges were identified as two potential opportunities, where complexity was identified as the main barrier. The objective of this study was to determine which type of label would be mostly appreciated by Dutch restaurant customers and by restaurant owners. Three different types of label were used in this study: simple logo, ranking and nutritional information (calories). Potential customers were recruited online and asked to fill out a questionnaire, based on Rogers’ diffusion of innovations theory. Restaurant owners were approached in person. In this study we included the following attributes: knowledge (does the potential customer know what labeling is), relative advantage (the degree to which the implementer sees menu labeling as an advantage) and compatibility (the degree to which the innovation is consistent with the ideas and opinions of the implementer). Health consciousness of the respondents is investigated using the theory of Dutta-Bergman. A total of 384 respondents will be included, to determine the appreciation for a certain label among the customers. A smaller group of restaurant owners (n = 30), responsible for the menu, will be questioned on their opinion. Based on these results, the most appreciated label will be identified and used in future studies. In these future studies it will be investigated whether the use of a label on the menu affects the choice of consumers and if there is an increase in choice of healthy dishes.

**PW-021**

**Poster**

**Impact of probabilistic food replacement: substitution of meat with oily fish in the UK diet.**

Pigat S

Creme Global

Objectives: This analysis looks at the impact of substituting red and processed meat with oily fish in the UK diet. Creme Nutrition® enables analysis of
PWD-022
Poster
Development of Anthocyanin Intake Model using Creme Nutrition®.
Pigat S
Creme Global

Objectives: This analysis is part of the EU FP7 BACCHUS project which investigates the beneficial effects of dietary bioactive peptides and polyphenols on cardiovascular health in humans. By combining consumption data from the UK NDNS Rolling Survey with data on the bioactive constituents anthocyanins found in berries (obtained from eBasis), a dietary intake model was created to assess actual intakes of anthocyanins from berries in the UK.

Methods and materials: Data on anthocyanin levels in berries was extracted from eBasis, a database containing published data on the content and biological effects of bioactive constituents in plant based foods. This data was then matched to all berries consumed by participants of the NDNS survey. A model that predicted anthocyanin intake was created to consider multiple data points of concentrations derived from eBasis. Assessments are performed by combining the UK food consumption diaries and eBasis data with probabilistic Creme Nutrition® intake models.

Results: Mean and P97.5 of total anthocyanin intake from fresh and frozen berries in the UK population were 4.9mg/d (±0.9) and 70.5mg/d (±32.3) for the total population. The mean daily consumption of total phenolics was 4.4mg/d (±0.9) and the P97.5 was 72.2 (±32.3). For consumers only the daily total anthocyanin intake had a mean of 28.4mg/d (±4.8) and a P97.5 of 246mg/d (±35.2) and a total phenolics intake with a mean of 24.1mg/d (±4.8) and a P97.5 of 196.3mg/d (±34.4).

Key findings: A model linking anthocyanin data (based on eBasis data) and berry intake in the UK was established. This research included fresh and whole shaped berries only; further comprehensive intake analysis is currently being carried out for 4 European countries for multiple foods and compounds.

PWD-023
Poster
Components of an obese scens in Kuwait.
Kriaucianiene V', Petkeviciene J', Webber L L
Lithuanian University of Health Sciences, Medical Academy, Kaunas, Lithuania; *UK Health Forum, London, UK

Objective: Lithuania participates in the EConDA project which is funded by the EU Health Program and aims to develop the methodology for measuring cost-effectiveness of interventions for chronic diseases prevention, detection and treatment. Obesity is one of the main risk factors of chronic diseases. Primary health care has a unique opportunity for prevention and management of obesity.

Using data from the Lithuanian health behaviour monitoring survey, this study assessed changes in the prevalence of obesity over eighteen years and the level of giving advice on diet and physical activity by health professionals.

Material and methods: The data were obtained from ten biennial cross-sectional nationally representative postal surveys from 1994 to 2012. In total, 7969 women and 10695 women aged 25-64 participated in these surveys. Self-reported body weight and height were used to calculate BMI. Information on whether health professionals advised patients to change dietary habits or to increase physical activity was obtained. The odds of receiving advice on diet and physical activity were calculated using multiple logistic regression models.

Results: Since 1994 the proportion of overweight men increased from 47.0% to 58.9% and the proportion of obese men - from 10.6% to 18.8% (p for trends <0.05). In women, the prevalence of obesity has not changed significantly and was 20.3% in 2012. The most remarkable increase in the prevalence of obesity was found in the oldest age group (55-64 years) of men and women. The proportion of obese women decreased in the youngest age group. During the observational period, the odds of obese people being advised by health professionals to control their weight increased (OR per each two-year study period was 1.16 (CI 1.1-1.3) in men and 1.14 (CI 1.1-1.2) in women). In 2012, 37.4% of obese respondents reported that they had once been advised to change their diet and 19.8% reported advice to increase physical activity. The odds of receiving advice increased with age. An association between receiving advice and self-reported attempts to lose weight was found: the obese respondents being advised were 3.4 times more likely to make attempts to reduce their weight than those who were not being advised.

Key findings: Over eighteen years, the prevalence of obesity increased among Lithuanian men. Health care professionals became more active in giving advice for controlling weight of obese. Future work will use these findings in the EConDA models to test the impact of weight management interventions upon future burden on NCDs.

PWD-024
Poster
Changes in beverage consumption habits from pre-pregnancy through pregnancy.
Skreden M', Bore E', Sage1a l1, Vistad P, Offer N, Crame Nutrition®
1University of Agder, Kristiansund, Norway; 2Solandet Hospital, Kristiansand, Norway

Objectives: The present study explores the changes in beverage drinking pattern from pre-pregnancy through pregnancy.

Material and methods: From April 2010 to January 2013 nulliparous women aged <18 years with a singleton pregnancy and a BMI ≥19, were consecutively recruited to the randomized controlled “Fit for Delivery” study from primary health clinics in Southern Norway. At inclusion, gestational 15 (median, 9-20), the women reported how often they consumed various beverages at present, and in retrospect how often they drank the different beverages before they got pregnant. Of 256 eligible women from the control group 245 answered the same questionnaire in gestational week 36. The answers were dichotomized into drinking ≥1 times per day and drinking <1 times per day for all the beverages except alcohol which was dichotomized into drinking ≥1 times per week and drinking <1 times per week. Changes in consumption of different beverages were analysed with repeated measure ANOVAs.

Results: The percentage of women reporting drinking milk (40% vs. 47%), fruit juice (16% vs. 26%) and water (87% vs. 93%) daily or more frequently all increased from pre-pregnancy to early pregnancy (p<0.01 for all items), while the percentage of women who reported at least daily consumption of artificial sweetened beverage (14% vs. 10%, p=0.021) and coffee (52% vs. 16%, p=0.001) both decreased. Pre-pregnancy, 9% reported drinking alcohol at least once weekly, whereas no one reported drinking alcohol weekly or more frequently in pregnancy (p<0.001). From early pregnancy to gestational week 36 the percentage of women drinking milk (47% vs. 65%, p=0.003) and coffee (16% vs. 22%, p=0.028) daily or more frequently both increased.

Key findings: There is a significant change in beverage consumption from pre-pregnancy to early pregnancy and to some extent also into late pregnancy among Norwegian women.

PWD-025
Poster
Vitamin D status in adult women hypothyroid controlled by the nutritional status.
Torresani ME, Biasatti C, Câceres LM, Minniti VP, Vattuone MM.
School of Nutrition School of Medicine UBA. UBACYT Project 2012-2015

Introduction: Vitamin D deficiency is a situation that prevails in the world and can affect people of any age. Many authors have linked vitamin D deficiency with diseases such as type 2 diabetes mellitus, insulin resistance, metabolic syndrome, cardiovascular disease, various types of tumors, cancer, immune disorders obesity, muscle disorders and falls.

Objective: To associate vitamin D status by radioimmunoassay in healthy women with a mean age of 57.38 ± 10.87 years with a mean BMI of 25.67 ± 3.51 kg/m2 and a mean waist circumference of 84.70 ± 10.17 cm.
stronger between vitamin D levels and age (r = 0.027, p = 0.015). Conclusion: The majority of the sample had decreased plasma levels of vitamin D, finding significant inverse association between nutritional status and age with the status of vitamin D.

**PW-026**

Poster

**Rhythm of body weight loss in overweight adult women controlled by TSH level and nutritional treatment adherence.** Ubcayt Project 2012-2015.

Tomancova ME, S QUALICE, Alonza B, Belén L, Maffi L, Oliva L, Rodol ML

School of Nutrition. School of Medicine. UBA. UBACYT Project 2012-2015.

Introduction: The increased serum level of thyrotropin (TSH) within the reference range may be a predictor factor for difficult weight loss in adult women.

Aim. To study the rate of decline in weight loss in overweight or obese adult women, according to the level of TSH and the degree of adherence to nutritional therapy.

Methodology: Prospective, longitudinal, observational design. Nonrandom sample of overweight or obese > 30 yrs women, who attended the Foundation for Research on Endocrine Metabolic Diseases (City of Buenos Aires). Dependent variable: change in body weight (< 1% and ≥1% per week). Independent variables: TSH levels (mIU/L) and categorized in Group A > 2.5 mIU/L and Group B ≤ 2.5 mIU/L, perceived adherence expressed in % compliance (nutritional treatment and activity planned scheduled physical) categorized into ≤50%, > 50% to 70% and > 70%, level of excess weight (BMI (kg/m²): 25-29.9, 30-34.9 and ≥35); age (< 40, 40-65 and > 65 years) and period of time between initial appointment (2,3 or 4 yrs).

Results: Group A: 33%, Group B: 67%. Most of the sample lost less than 1% of weight per week (Group A: 54%, Group B: 57.3%), with an adherence perception between 50% and 70% (Group A: 56.7%; Group B: 50.7%); with no significant differences between groups. Weekly weight loss showed a direct correlation with adherence level (r = 0.465, p = 0.000), and an inverse correlation with time among initial and control appointment (r = -0.30, p = 0.001) and BMI categories (r = -0.242, p = 0.01), regardless age, thyroid function or TSH level.

Conclusions: The weekly weight loss showed direct relationship with treatment adherence, regardless of age, thyroid function or level of TSH.

**PW-027**

Poster

**Pesticide Residues in Fruits and Vegetables Samples from Jordan: levels, dietary intake and risk assessment during 2010/2011.**

Aloubah M1; Jeghri M2; Battah A1

Jordan University Medical college

The presence of pesticide residues was investigated in 2467 samples of fruits and vegetables during 2years 2010-2011 in Jordan. These samples were collected and analyzed by the residue analysis center in the Ministry of Agriculture in Jordan. The aim of this study is to estimate the dietary intake of pesticides residues consumed at 2010 and 2011, depending on the population consumption for these fruits and vegetables based on the results of the Jordanian National expenditure and income household survey carried by the Department of Statistics. Multi-analysis methods to analyze 114 different pesticide types were used. Among the agricultural products studied, pesticides residues were detected in 399 of samples, of which 66 exceeded the EU maximum residue limits (MRLs). Among the 22 detected pesticides, chlorpyrifos has the highest frequency 45% and 61% for 2010 and 2011 respectively, followed by cipermethrin with 28.74% (in 2010) and 27.58% (in 2011). The chronic dietary risk assessment was undertaken by determining the national and theoretical maximum daily intake (NTMDI) and national estimated daily intake (NEDI). Neither NTMDIs nor NEDIs for each pesticides residues have exceeded the acceptable daily intake (ADI) for both 2010 and 2011 either in adults or teenagers or children. A cumulative risk assessment was performed using the hazard index (HI). None of the HI (for NEDI) exceeded the 100% for all categories. The HI% are always less than 5% for adults, less than 7% for teenagers and less than 13% for children for 2010, whereas less than 8% for adults, less than 12% for teenagers and less than 23% for children at 2011 with corresponding to EU ADIs. The determined HI values were found to represent a small portion of the respective ADIs. This results indicate that the detected pesticides could not be considered a serious public health problem for the Jordanian population through fruits and vegetables consumption. Nevertheless, a continuous monitoring and dietary intake for pesticides residues are recommended.

**PW-028**

Poster

**Nutritional status of Polish women serving in the army, police and fire brigades.**

Bertrandt J.J. Koss A1, Szymarska W2

Military Institute of Hygiene and Epidemiology, Poznań, Poland; Department of Health, the Ministry of Internal Affairs, Warsaw, Poland

Work of women in uniformed services has become more and more common phenomenon in Poland. Number of women in the uniformed units steadily increases. Women in the Border Guards represent nearly one-quarter of the officers, in Police they make approx. 15% per cent, and the least change of women is in the army. The aim of the work was to assess nutritional status of women officers serving in the uniformed services. Total of 157 women underwent examination, 28.1% of them was serving in Polish Army, 61.1% in Police and 10.8% in the State Fire Service. Body height and body mass were determined for all women, what made a base for the BMI calculation. Based on the BMI values examined women were classified into following groups: underweight (BMI 17.0 - 18.4 kg/m²), standard body weight (BMI 18.4 - 24.9 kg/m²), overweight (BMI 25.4 - 29.9 kg/m²) and obesity (BMI ≥ 30 kg/m²).

Results: Average age of examined women was 30.2 ± 6.4 years. Average body height and body weight were 166.6 ± 6.2 cm and 62.3 ± 9.4 kg respectively. Average BMI value amounted to 22.3 ± 2.3 kg/m². Underweight was found among 3.6% of women, standard weight among 83.5% of subjects, while overweight was found in 5.8%, and obesity in 3.1% of women serving in uniform. The highest percentage of subjects indicated overweight (20.3%) was found in the group of women serving in the army and the highest percentage of obese women was found among the ones serving in the State Fire Service.

From the metabolic civilization diseases prophylaxis point of view occurrence of nutritional disturbances of various degrees of severity among 16.5% of examined women raise anxiety. Underweight, overweight, and certainly obesity can lead to not only creation and development of diet-dependent civilization diseases, but also to decrease in physical fitness required in uniformed services.

Conclusion: Carrying out trainings on health education regarding principles of rational nutrition and nutritional prophylaxis of civilization diseases seems appropriate.

**PW-029**

Poster

**Evaluating the success of reducing body weight.**

Strybecka H, Hubuk P

Military Institute of Hygiene and Epidemiology, Poznań, Poland; Department of Health, the Ministry of Internal Affairs, Warsaw, Poland

Background: A normal balance of body fat is associated with good health and life longevity. The issue of excess fat in relation to lean body mass, a condition known as altered body composition, can greatly increase risk of cardiovascular disease and more. To indicate the degree of obesity in individuals, independent of sex, BMI is calculated parameter that uses patient’s height and weight. Therefore two persons having the same height and weight can have the same BMI although their body composition can be diagnostically different. Methods: For the purpose of the study we have recruited 57 healthy female (with the average age of 39.0±8.0 and BMI 29.1±3.1 kg/m²) from the residents of Hradec Králové district, Czech Republic. The subjects meeting the inclusion criteria were randomly divided into two groups. The first group (n=28) was assigned targeting a reducing diet. The second group (n=29) went through the controlled aerobic exercise in addition to the same diet. The basic anthropometrical parameters and measurement of body composition were used to evaluate the success of the programs.

Results: At 1st group was higher weight loss than the 2nd, but this weight loss included decrease of the fat tissue and the loss of the muscle mass (decrease of weight was significant; the decrease of the fat tissue was not). The loss of the fat tissue as well as the increase of the muscle mass at group 2 was significant. Conclusion: The commonly used anthropometrical parameters such as BMI and WC are sufficient for a basic assessment of weight change and alert to the risk of increased fat in the abdominal area. However, the evaluation of reduction programs should concentrate on the changes in body composition that cannot be captured by the BMI and WC. Therefore, it is necessary to apply more sophisticated methods, such as the BIA. Further research relating to this subject was funded by “Long-term plan of development of organization 1011”
PW-030

Poster

Sugar intake in Cuban children and adolescents.

Hernández-Tetra M; Puentes-Márquez L; Cabrera-Martínez A; Miranda-Díaz M; Ruiz-Álvarez V

Institute of Nutrition, Havana, Cuba

Background and objectives: High sugar consumption is associated with obesity, glucose intolerance, serum lipids modifications and predisposition to diabetes mellitus. Nutritional recommendations set the sugar upper level intake around 10% of the total energy intake. Objective of this study was to assess its dimension in the Cuban young population.

Methods: 873 children and adolescents (56 preschoolers, 768 school children and 49 adolescents, 4-16 y of age) included in studies of body composition, physical activity and daily energy expenditure by isotopic methodology, submitted to semi-quantitative report diet recalled, 24 hours diet recalled or 3 day weighed dietary records for the assessment of the sugar contribution to the total energy intake. Data were evaluated with the FAO CERES Software.

Results: High energy intake, fast foods and soft drinks; low consumption of fruits, vegetables, and micronutrients. Sugar intake doubled the nutrition. In some studied group, one of each three children consumed more than three times the recommended daily portion.

Conclusions: The observed high sugar intake in all children and adolescents favours fat accretion and the high prevalence of NCDs in adulthood. Those results shall be urgently considered in the nutrition policy.

PW-031

Poster

Comparison of results in cheese factories surfaces by ATP bioluminescence and traditional methods. Quickness versus Safety.

Carrascosa, C.; Raposo, A. S.; Sanjuán, E.; Saavedra, P.; Pérez, E.; and Millán, R.

1Department of Animal Pathology, Animal Production, Bromatology and Food Technology, Faculty of Veterinary, Universidad de Las Palmas de Gran Canaria, 35413 Arucas, Las Palmas, Spain.

2Centro de Investigación Interdisciplinar Egas Moniz, CIiEM, Instituto Superior de Ciencias de la Saúde Egas Moniz, ISCEM, Quinta da Granja, Monte de Caparica, 2829-511 Caparica, Portugal.

3Department of Mathematics, Mathematics Building, Campus Universitario de Tafira, 35018 Las Palmas de Gran Canaria, Spain.

Objectives: The microbiological control of surfaces is an important tool for verifying proper cleaning and disinfection program within the framework of a Hazard Analysis and Critical Control Points quality system that requires rapid monitoring systems to provide information once the production process has finished and before the product is released on the market in order to apply the appropriate corrective measures. Microbiological hygiene in food production and processing aims to protect consumers against pathogenic agents and guarantee food quality by identifying microbial risks in food production surfaces areas that can be avoided through microbiological control of such surfaces.

Most research in this field has focused on microbiological contamination in different food industries, but only a few studies have analysed the contamination of cheese factories comparing different methods. Therefore, the aim of this study was to determine the coherence between the different control techniques used to evaluate the microbial load of different surfaces in cheese factories located in the Canary Islands (Spain) using two traditional microbiological techniques and bioluminescence. The results were analysed and compared statistically to check the effectiveness of cleaning and disinfection.

Material and methods: In the present study, the levels of aerobic contamination at different points in the production chain (curd vat, filler, mould, table and ambient) of five cheese factories were analysed using contact plates, dipslides and bioluminescence methods. Almost all the cheese factories showed similar levels of contamination.

Results: ATP bioluminescence detected the largest number of unacceptable surfaces (47.7%), followed by the contact plates (41%) and dipslides (22%). The dipslide and contact plate methods showed moderate concordance and significant differences (p < 0.001) between the various surfaces sampled. The points in the production chain were classified according to contamination rates, being minimal in the curd vats-fillers and maximal in tables-surfaces. The same surfaces were also sampled to determine the Enterobacteriaceae, mould and yeast growth using contact plates and dipslides and no concordance between these two methods was detected.

Key findings: These results were analysed and discussed taking into account the importance of cleanliness and disinfection in cheese factories, as a part of the Hazard Analysis and Critical Control Points quality assurance system, concluding that industrial cheese factories require ATP bioluminescence as a complementary technique to control cleaning and sanitizing procedures, combined with traditional microbiological methods to identify microbiological hazards that may contaminate final products.

PW-032

Poster

Relation between overweight and obesity with food consumption inside the school in teenagers aged 11 to 13 in Mexico City.

Radilla C; Vega S&; Gutiérrez R; González G; Radilla MF; and Coronado M.

1Department of Agricultural and Animal Production, Division of Biological Sciences and of the Health, Autonomous Metropolitan University, Campus Xochimilco. Calzada del Hueso 1100, Colonia. Villa Quieta Delegación Miguel Hidalgo, C.P. 04960 Mexico, District Federal. Phone: (55) 54837000 ext. 3054.

2Biological Sciences and Health, Autonomous Metropolitan University, Campus Xochimilco.

Objectives: The present study was to know the food consumption inside the school and evaluate the relation with the nutrition condition. The study sample was constituted by 190 teenagers (96 girls and 94 boys) aged from 11 to 13 years, of eight second primary schools in Mexico City.

Results: The teenagers population takes nutritious specific needs due to its development potential and a scanty knowledge of the concept of healthy food, which pushes them to consume hypercaloric food that can increase the presence of overweight and obesity.

Conclusions: The present study set to know the food consumption inside the school and evaluate the relation with the nutrition condition. The study sample was constituted by 190 teenagers (96 girls and 94 boys) aged from 11 to 13 years, of eight secondary public schools in Mexico City.

The teenagers population takes nutritious specific needs due to its development potential and a scanty knowledge of the concept of healthy food, which pushes them to consume hypercaloric food that can increase the presence of overweight and obesity.

PW-033

Poster

Food appearances in children's television programmes in Sweden.

Olausdotter, S. & Berg, C.

University of Gothenburg, Department of food and nutrition, and sport science.

Objectives: Exposure to TV commercials partly explains the association previously found between TV viewing and dietary habits. Studying other television content in addition to advertisements is necessary. The aim of this study was to examine the nature and extent of verbal and visual appearance of food and beverage in children's programmes in Swedish public service television, by analysing frequency and type of foods, determining in what context more or less healthy foods appear, and identifying messages on health and taste.

Material and methods: The study object was the most popular children's TV programme in Sweden, watched almost daily by 45% of children under the age of 10 years. The analysed material consisted of approximately 25 hours, broadcast over a four-month period of the most popular TV viewing season. All appearances of food and beverages were coded as well as the context in which the foods were discussed or appeared. Two food groups were analysed further: fruits and vegetables and high-calorie and low-nutrient (HCLN) foods.

Results: Of the 287 programme sections, food or beverage appeared in 78%. Foods were often presented with people, in particular adults and males. Of the foods appearing, HCLN foods constituted 19% of the food shown, and fruits and vegetables 39%. HCLN foods were presented significantly more frequently together than alone, while the opposite was true for fruits and vegetables. HCLN foods were more in the foreground, consumed and actively handled than fruits and vegetables.

III World Congress of Public Health Nutrition

- 177 -
Fruits and vegetables were, on the other hand, promoted with health messages. Key findings: Food and beverages appear frequently in children's programmes in Swedish public service television. Cookies, confectionaries and other HCIN foods accounted for one food appearance out of five in the analysed material. The HCIN foods seem to be presented as more desirable for children than fruits and vegetables by appearing with children and being actively handled.

PW-034 PosterEuropean food and health research infrastructure: inventory and identified gaps and needs.

Brooke F. Slimani C, Lalvrie M, Ocké M, Tetens F, Zimmermann K*
1Food, Consumer Behaviour and Health Research Centre, University of Surrey, United Kingdom of Great Britain and Northern Ireland
2University of Paris 13 (UP13), France
3Université Claude Bernard Lyon 1, France
4Higher Education and Vocational Training (Milieu) (RVM), the Netherlands
5Danmarks Tekniske Universitet, Denmark
6UUL, Wageningen UR, the Netherlands

Objectives: High-quality food and health research is required to help combat the diet-related public health challenges seen across Europe. This research can only be achieved if supported by the necessary research infrastructures (facilities, resources or services). This study reports on the first phase of the EuroDISH project: mapping the status quo of food and health research infrastructures and identifying gaps and needs.

Methods: Research infrastructure was mapped in four areas of food and health, represented by the DSM model: Determinants of dietary behaviour; Intake of foods and nutrients; Status and functional markers of nutritional health; and Health and disease risk of foods and nutrients. The study design consisted of desk research, quantitative semi-structured interviews (n=30) and a stakeholder workshop (n=49). A common protocol was used throughout to co-ordinate research objectives, data collection and recording of results.

Results: Few research infrastructures were mapped relevant to determinants of dietary behaviour. In contrast, a number of infrastructures, predominantly knowledge containing resources (collections, archives and data banks), were mapped in the intake, status and health research areas. Several research infrastructure gaps and needs were identified. In general, a need for greater accessibility to data, methods and equipment across countries and disciplines was highlighted. In addition, a requirement to create sustainable infrastructures (not only project based) which pool resources and address multiple/broader research questions was emphasised.

Key findings: Research infrastructure is not evenly distributed across food and health research areas. There remains enormous potential to create, advance and link infrastructures to stimulate high-quality food and health research.

Acknowledgements: The EuroDISH co-ordination and support action is supported by the European Commission under the Food, agriculture and fisheries, and biotechnology theme of the 7th Framework Programme for Research and Technological Development (Contract No. 311788). We would like to acknowledge Johannes L. Arendt, Julia Bardes, Astrid Böhm, Rosalie AM Dohnuske-Rutten, Léopold Feuze, Paul Finglas, Marjolein Geurts, Camilla Hoppe, Jeppe Iversen, Martine Lalvie, Marga Ocké, Krijn Poppe, Nadia Slimani, Harriette M Snoek, Inge Tetens, Lada Timotijević, Pieter van ’t Veer, Cécile Vors and K Zimmermann for all their contributions to this body of work.

PW-035 PosterDimensiones teórica y práctica de la de educación en nutrición en dos contextos de América Latina: Bogotá Y San Pablo.

Cervato-Mancuso AM
University of San Pablo

Introducción: En América Latina, es evidente el proceso de fortalecimiento para estructurar sistemas de salud, basados en la Atención Primaria de Salud, mediante las acciones de promoción de la salud. Entre estas acciones, se incluyen las prácticas educativas grupales como uno de los procesos de trabajo.

Objetivo: El objetivo de este estudio fue comparar los grupos de Educación Nutricional (EN) en la dimensión teórica y práctica de la Atención Primaria en Salud (APS), entre dos capitales de países latinoamericanos: San Pablo (Brasil) y Bogotá (Colombia).

Métodos: Fue identificada la percepción de la EN y las características de los grupos a partir de lo reflejado por nutricionistas en ambas ciudades a través de la determinación del perfil de los actores, aplicación del cuestionario y realización de la entrevista. Para el análisis de los datos, fue utilizada la técnica del Discriminante del Juego Colectivo.

Resultados: Fueran entrevistadas 27 nutricionistas en cada ciudad. El perfil de los actores fue similar, sin embargo hubo diferencia en la formación académica y autonomía de trabajo. Se obtuvieron 17 Ideas Centrales sobre la EN, clasificadas en seis ejes temáticos (transmitir mis conocimientos, tos, patrones de alimentación saludables; espacio de negociación de los hábitos alimentarios; proceso de intercambio de experiencias e autonomía a la hora de elegir). Estos se relacionaron con las características grupales, que al mismo tiempo tuvieron diferencias de acuerdo con los programas de APS.

Conclusiones: Los resultados corroboran que la teoría y la práctica de la EN están en tránsito en ambos los países, desde un enfoque tradicional para uno más humanista, incorporando el empoderamiento e intercambio de saberes. Sin embargo, a una velocidad lenta comparada con las políticas y necesidades de salud.

PW-036 PosterConsumers of organic bread are at risk of inadequate iodine intake in the Netherlands: a scenario study.

Geursts M, Raaij v, Verkam-Koosterman J.
Centre for Nutrition, Prevention and Health services, National Institute of Public Health and the Environment, the Netherlands.

Introduction and objective: Iodine is an essential nutrient for normal physical and cognitive growth and development, especially during pregnancy and infancy. In the Netherlands, iodine intake is generally adequate and two major sources are bread containing iodized salt and dairy products. The consumption of more sustainably produced foods is an emerging trend. Due to a Court decision, most organic breads produced without iodized salt, in contrast to regular bread for which use of iodized salt is regulated with a covenant. Therefore, consumers of organic bread might be at risk for a low iodine intake. The objective was to qualify the risk of inadequate iodine intake if organic bread would be consumed by the Dutch population.

Material and methods: Data from the Dutch Food Consumption Survey (2007-10) and the food composition database (2011) were used to estimate the habitual iodine intake. This intake was compared with the EAR to estimate the proportion with inadequate intakes. In the food consumption data no details on use of organic foods were available. It was assumed that consumers of organic bread had the same dietary habits as the general Dutch population. In the scenario, all bread was assumed to be organic and as such produced without iodized salt.

Results: This scenario study showed a habitual median iodine intake varying between 80 and 132 μg/day for men, depending on age. For women this intake varied between 77 and 119 μg/day. The percentage of men and women with an iodine intake below the EAR was respectively 16-26% and 22-52%, depending on age. During pregnancy the iodine recommendation is higher. Assuming the iodine intake of women of childbearing age is similar to pregnant women, about 90% would have an inadequate intake.

Key findings: In a population that is mostly iodine sufficient, people consuming organic (no-iodized salt) bread were identified as a risk group for a low iodine intake. It is recommended to be able to identify consumers of organic bread in food consumption surveys, especially with the emerging trend for more sustainable food production. In addition, research is needed to identify feasible differences in dietary habits between consumers of organic bread compared to and the regular population. It is especially important to get insight in the iodine status and intake of pregnant women and young infants, because of the irreversible effects on cognitive development.

PW-037 PosterThe association of food insecurity and socioeconomic status with general and central obesity in two Iranian ethnic groups.

Rezaadeh A,1,2 Omidvar N,1 Eini-Zinab K,1 Ghad-Tabatabaei M,2 Magdazadeh A,1 Ghavamadeh S,2,3 Nour-Saadat S,2,3

1Department of Community Nutrition, National Nutrition and Food Technology Research Institute, Faculty of Nutrition and Food Technology, Shahid Beheshti University of Medical Sciences and Health Services, Tehran, Iran
2Students’ Research Committee, Shahid Beheshti University of Medical Sciences and Health Services, Tehran, Iran
3Department of Demography, Faculty of Social Science, Tehran University, Tehran, Iran

Knowledge Utilization Research Center, Tehran University of Medical Sciences, Tehran, Iran

Nutrition Department, Faculty of medicine, Urmia University of Medical Sciences, Urmia, Iran

Food and Beverages Safety Research Center, Urmia University of Medical, Urmia, Iran

Objectives: to assess the relationship between General and central obesity with food insecurity (FI) and socioeconomic status (SES) in Azeri and Kurd ethnic groups living in Urmia city, North Western Iran.

Methods: in this cross-sectional study, 723 participants (427 women and 296 men) aged 20-64 year old, from two ethnic groups (445 Azeri and 278 Kurd) were selected through a combination of cluster, random and systematic sampling methods. Demographic and socioeconomic characteristics were assessed by a questionnaire and household food security status was measured using adapted household food insecurity
access scale through face-to-face interviews at homes. Anatomic proportions (weight, height, waist and hip circumstances) were measured and evaluated using standard methods. BMI was. Overall weight and general obesity were defined as 25-30 kg/m² and BMI<30 kg/m², respectively. Abdominal obesity was defined by national cutoffs of waist circumference (WC) (95 cm in both genders) and waist to hip ratio (WHR) (0.95 and 0.90 in men and women, respectively). Multivariate logistic regression was used to estimate odds ratios (OR) of obesity for the studied risk factors.

Results: Of the all subjects, 33.2% were overweight (31.7% of Azeris and 35.6% of Kurds), while 30.7% were generally obese (33.7% of Azeris and 23.9% of Kurds) and 40.8% had central obesity (44.5% of Azeris and 39.6% of Kurds). Prevalence of General and central Obesity were significantly higher in Azeris (p<0.05). Moderate-to-sever Fl was more prevalent in Kurds (28.5%), compared to Azeris (17.3%) [P<0.01]. After adjusting for confounders, in Azeris, being female (OR=0.43, CI95%:0.23-0.79) and moderate and severe Fl (OR=0.70, CI95%:0.41-1.17) and in Kurds, being female (OR=0.39, CI95%:0.22-1.23) and higher total cost/ head (OR=1.005, CI95%:1.002-1.009) were related with higher chance of general obesity. On the other hand, the chance of central obesity was lower in Azeris with high educational levels (OR=0.64, CI95%:0.21-0.94), females (OR=0.83, CI95%:0.11-0.89), as well as home owners (OR=0.62, CI95%:0.39-0.60). However, in Kurds, being female (OR=0.79, CI95%:0.38-0.98) and moderate-to-sever Fl (OR=0.34, CI95%:0.16-0.74) and higher total income/head (OR=0.44, CI95%:0.61-0.84) decreased the chance to be centrally obese. In contrast, in Kurds the chance increased with increase in age (OR=1.06, age 18-24 (195%:1.02-1.1) and total cost/head (OR=1.004, CI95%:1.001-1.008).

Key findings: Better SES decreased the chance of general/central obesity in both ethnic groups. Despite this fact, the association between moderate-to-sever Fl and the risk of general/central obesity is different in Azeris compared to Kurds.

NW-038 Poster Guadix: healthy city: local strategy to reduce obesity.

Lorente Fernández JR, González Acalá JA, Acalá González MC, Sánchez López, M, Serrano Cruz I, Rivas García F* * Guadix Council. Plaza de la Constitución 1. 18500 Guadix (Granada)

Objective: To prevent childhood obesity through optimization and unification of all available local resources and put the politics of health promotion in the local public agenda Guadix. As part of the legislative powers of local government, the city of Guadix (Granada) initiated a municipal strategy designed to prevent obesity.

Material and methods: It has managed to develop an intersectoral common and continuing between all municipal departments that may be involved directly and indirectly in preventing obesity.

Results: Among the most highlights the participation of students, estimated at 2180, ages 6 and 17, from different educational levels, 62% of the activities have focused on the school while the rest (32%) were distributed in the community and familial, yet 6% of the proceedings had as objectives the healthy eating, including the incorporation of the city in a research study on childhood obesity and restoration. 32 Information campaigns were developed and 965 people participated in outdoor activities. Current date have built a healthy lifestyle based on promoting physical activity and healthy eating also have generated new lines of work under the municipal health plan.

NW-039 Poster Serum lipid levels and dyslipidemia prevalence in Balearic Islands adolescents, a Mediterranean region.

Tur JA, Bibiloni MM, Salas R, Pons A 1Research Group on Community Nutrition and Oxidative Stress, University of Balearic Islands, and CBERobn (Physiopathology of Obesity and Nutrition) 2Faculty of Public Health Nutrition, Autonomous University of Nuevo León

Objectives: To provide data on serum lipid levels, dyslipidemia prevalence and associated risk factors among adolescents.

Material and Methods: A random sample (n=362, 143 boys and 219 girls) of the Balearic Islands’ adolescent population (aged 12-17 years) was interviewed, anthropometrically measured, and provided a fasting blood sample. Serum lipid levels were categorized according to the 2011 Expert Panel on Integrated Guidelines for Cardiovascular Health and Risk Reduction in Children and Adolescents. Dyslipidemia was defined as the presence of one or more of the following conditions: TChol ≥200 mg/dl, LDL-c ≥130 mg/dl, non-HDL-c ≥145 mg/dl, HDL-c <40 mg/dl, TGlyc ≥130 mg/dl. Results: One in ten adolescents has at least one abnormal lipid concentration. The overall prevalence of borderline-high + high TChol, LDL-c, non-HDL-c, and TGlyc were 24.3%, 10.4%, 13.3%, and 14.9%, respectively. This TChol prevalence was higher among girls (27.4%) than boys (19.1%). The overall prevalence of borderline-low + low HDL-c was 12.2%, higher among boys (20.7%) than girls (6.3%). The overall prevalence of dyslipidemia was 13.7% (boys: 14.9%, girls: 12.9%). Low HDL-c and high TChol levels were the most prevalent dyslipidemias in boys (6.4%) and girls (9.1%), respectively. Overweight/obese subjects were significantly more likely to have at least one abnormal lipid concentration (OR: 2.10; 95% CI: 1.06-4.15) and subjects with abdominal obesity were more likely to have at least one abnormal lipid concentration (OR: 3.17; 95% CI: 1.04-9.66) than their leaner counterparts. Early intervention to encourage appropriate nutrition and physical activity at early ages could be relevant strategies to prevent and/or reduce the high risk for atherosclerosis in our population.

Funding. Project ISCIII 11/01791, CIBERobn CB12/035/20038. Grant of support to research groups no. 35/2011 (Balearic Islands Gov. and EU FEDER funds).

Key findings: Serum lipid levels and dyslipidemia prevalence in Balearic Islands adolescents.

One in ten adolescents has at least one abnormal lipid concentration. A high TChol level was the most prevalent dyslipidemia among adolescents.

NW-040 Poster Positive evolution of women in the pseudo-maintenance stage in an intervention for fat consumption.

Menezes MC, Mongoli AS, Lopes ACS

University of Minas Gerais, Brazil

Objectives: To identify the prevalence of “pseudo-responders,” i.e., individuals in the pseudo-maintenance and non-reflective action stages of change and their evolution throughout intervention. The hypotheses were as follows: (1) the prevalence of pseudo-maintenance is high, and (2) individuals in pseudo-maintenance are less sensitive to intervention for fat consumption.

Material and methods: In a randomized controlled trial, the intervention group participated in 10 workshops based on the Transtheoretical Model to reduce fat consumption during six months. Subjects in the intervention group were classified as true or pseudo-respondents. The participants included a sample of Public Health Service users aged 220 years who were regular users of the service and had not participated in any previous intervention for fat consumption. A total of 71 women completed all the study phases from 2009-2010 (20.6% attrition). Individuals were classified as “true responders”, pseudo-maintenance (i.e., mistakenly perceived their lipid intake as adequate - Soprole et al, 1996), or non-reflective action (i.e., did not recognize the inadequacy of their lipid intake - Ma et al, 2003). The main outcomes were anthropometric measurements; dietary habits and food consumption including three 24-h dietary recalls, and readiness to change.

The statistical analyses performed were χ², Fisher’s exact, Student’s t-test for independent samples, Mann–Whitney, McNemar, paired Student’s t-test, and Wilcoxon signed rank test.

Results: About half of participants were in pseudo-maintenance (control group: 14 of 31; intervention group: 19 of 40). Only two were in non-reflective action and therefore they were not analyzed. Post-intervention, individuals in the intervention group in pseudo-maintenance evolved distinctly from true responders, with greater progression to later stages of change (p = 0.031) and reduced calorie intake (p = 0.001), weight (p = 0.048), and body mass index (p = 0.028).

Conclusion: The results show the importance of pseudo-maintenance stage when Transtheoretical Model is used because of the high prevalence and distinguished performance of people in this stage. However, the development of specific interventions appears unnecessary if perception and food consumption are considered together.

Funding Sources: Fundação de Amparo à Pesquisa do Estado de Minas Gerais - FAPEMIG.
CIRAD; May

School of Biological Sciences, Dublin Institute of Technology, Dublin

School for

With norms becoming

were

(p<0.0001),

Nestor S

Holdsworth M.

different

desirable

Body satisfaction was

Malian

n=300 adults.

marked for Moroccans in Africa, i.e. 45.9% of Moroccans

living

in

France wanted to

see it as

larger

height and weight were measured to

calculate BMI. To estimate ideals for body size, participants associated their views with one of nine silhouettes ranging from underweight to obese. Results: 24.9% of Malians and Moroccans (26.6) living in France was similar to that in urban Mali (24.9) and Morocco (26.5), but higher than for rural Malians (24.1) and Moroccans (25.1) (p<0.001). Objectives: Perceptions of body size can influence whether obesity is seen as desirable and therefore whether a population is motivated to change. Few African studies have investigated the effect of migration and living in different environments on preferences for body size. The present study examined body size preferences and satisfaction of adults living in urban and rural Morocco as well as migrants from France from these contexts to investigate if their weight status and body size preferences vary in these different geographical contexts.

Material and methods: Cross-sectional studies were conducted in Mali and Morocco (rural and urban zones) and in France of Moroccon and Malian migrants using matched quota sampling of a target sample of n=300 adults. A structured interviewee-administered questionnaire was used. Height and weight were measured to calculate BMI. To estimate ideals for body size, participants associated their views with one of nine silhouettes ranging from underweight to obese. Results: 24.9% of Malians and Moroccans (26.6) living in France was similar to that in urban Mali (24.9) and Morocco (26.5), but higher than for rural Malians (24.1) and Moroccans (25.1) (p<0.001). Objective: The trend was more marked for Moroccans in Africa, i.e. 45.9% of Moroccans living in France wanted to lose weight compared with only 19.2% and 20.4% living in rural and urban Mali respectively. Malians and Moroccans living in France were less likely to see large body sizes as healthy, i.e. only 5.2% of Malian migrants and 3.7% of Moroccan migrants living in France believed that large body sizes are healthy, compared with rural Mali (43.3%) and Morocco (11.9%) (p<0.0001). Malian and Moroccan migrants in France were less likely to associate being ‘large’ with success and more likely to see it as shameful, compared with those living in Africa (p<0.0001).

Key findings: There is some evidence of a transition of attitudes within Mali and Morocco, from rural to urban areas, but even stronger evidence of a shift in body size norms for Malian and Moroccan migrants to France, with norms becoming similar to that of French citizens, suggesting evidence of acculturation.

Objective: A cross sectional study was carried out to assess anthropometrical status, dietary behaviours, knowledge and use of a fortified complementary food product within the household of Panamanian children enrolled in a food distribution programme and hence, examine which of these variables influenced the nutritional status. Collection of this information identified opportunities for growth in delivery of the programme to its beneficiaries.

Materials and Methods: The study was conducted in a local urban health center in the province of Panama, amongst sixty child beneficiaries aged 9-59 months and their caregiver returning to collect the fortified complementary food. A pre-tested questionnaire and measurements of weight and height were completed. The prevalence of stunting, underweight, and wasting were calculated using WHO cut offs. Statistical tests used included chi-square tests for independence, independent sample t tests and multivariate analysis tests.

Results: Fifty three percent of children were enrolled in the programme longer than the recommended duration of six to nine months. Twenty percent of children were stunted, 10.3% were underweight, and 8.3% were wasted. Weight for height z scores were calculated. The product was prepared with milk (P=0.005), the mother was employed (P=0.017). Fifteen percent of mothers were currently employed. A lower household income was associated with other people consuming the product (P=0.002) with 42% of caregivers reporting other household members consuming the product. Children older than 24 months of age were five times more likely to be at risk of/under weight (P= 0.01 OR=5.07, 95% CI= 1.45-17.72). Employment of the mother was associated with the child consuming the product (P=0.042) and carbohydrates more frequently (P=0.039). Reported daily consumption of carbohydrates, protein, dietary and fruit were lower than food based dietary guidelines for pre-schoolers.

In 89% of households, the product was prepared according to recommended methods. ‘Sufficient’ knowledge of the product was identified in 68% of the caregivers; having received initial product education and correctly answered a statement on the nutritional purpose of the product.

Key Findings: Children had higher weight height z scores if their caregivers reported preparation of the product with milk versus current recommendations with water. Employment status of the mother significantly influenced the child’s dietary behaviours, product consumption and nutritional status. Provision of nutrition education has cause to be effective in improving practices of use of the product and dietary habits within the household and act as a complementary method to improving the nutritional status of the child beneficiary.
PW-045 Poster
Social marketing program impact: "Nutri Yapa" for the Buenos Aires Autonomous City Health Center concurrent community.
Clinical Nutrition Career Specialization, School of Medicine, Buenos Aires University, Argentina.

Introduction: Considering the social marketing as useful and applicable tool in primary health care, is designed and implemented the "NutriYapa" program with the intention of bringing children to the green grocers and to promote family vegetables and fruits consumption.

Objectives: To estimate the impact in changing eating habits to consumption of vegetables and fruits, of the "NutriYapa" Social Marketing Program (SMP) recipients.

Methodology: A prospective intervention design carried out in the May-June 2013 on the concurrent community to the Health Center and Community Action (CESAC) dependent on a Buenos Aires Autonomous City Public Hospital (Argentina) Where the "NutriYapa" SMP was implemented. 41 adults participated in meetings with educational tasting vegetables and fruits. 22 people gave the "Give to child the yapa" voucher changed in three greengrocery area that agree to join the SMP. Changing eating habits in relation to consumption of vegetables and fruits educational encounter last month by telephone survey to the adult participants was estimated. According to the responses were classified as accepting Prochaska and Di Clemente change process stages. He also interacted with the participants in the NutriYapa Facebook profile.

Results: The vouchers exchange was greater than 80%. The survey revealed that 71% of the action stage, having incorporated new vegetables and fruits daily, while 22% were in contemplation as they said they would try in the future and 7% were in precontemplation showing absolute disinterest.

Due to the immediate multiplication of Facebook friends it was not possible to differentiate those attending the program of the general users who are actively involved. Work continues on the active site, with 163 followers.

Conclusions: To maintain behavior change as well as to cover a larger number of beneficiaries to the program, it is suggested to repeat the activities carried out in these and others CESAC and sites concurrency families (clubs, schools, parks, fairs, etc.). The social networks power as a resource is emphasized to encourage the maintenance of changes in eating behavior.

PW-046 Poster
Food fortification.
Jorge R.; Graça P.; and Oliveira C.
Egas Moniz Interdisciplinary Research Center

Hunger, as a permanent state of undernutrition, indicates that a certain population is failing to obtain the essential nutrients for a balanced and healthy life, throw diet.

Poverty limits the access to food, health care and education systems, leading to a highest incidence of illness and lower life expectancy.

Investing in nutrition contributes to productivity, economic development and poverty diminishing by increasing work capacity, a cognitive development, better academic performance and lower illness and mortality risks.

A poor nutrition perpetuates the poverty and undernutrition cycle directly due to a low productivity as a consequence of a bad physical condition and greater predisposal to illness and indirectly by the diminished cognitive evolution, wasting academic and health care resources.

To that extent, the present communication will approach food fortification as a strategy to fight undernutrition, showing a research focused on a recent literature review about these topics, accessing specific examples that may be adapted to various contexts. The current revision was done to contribute for the creation of the new Strategic Plan for Cooperation in Health of the Community of Portuguese Language Countries.

Micronutrient supplementation and food fortification with micronutrients are increasingly seen as a gold standard of the direct nutrition interventions, with many publications supporting these ideas, such as some reviewed Lancaster publications and some expert Copenhagen Consensus publications.

Food fortification seems to be a promising strategy to control micronutrient deficits, iron, iodine, vitamin A and zinc, although there are some important variables to be considered like technical viability, total costs and cost-effectiveness ratios, safety and bioavailability.

Being vital, to evaluate the impact on the populations covered with these fortification programs.

PW-047 Poster
Unhealthy fats in ready-to-eat foods in low socioeconomic settings in India: A case study of the food environments of rural villages and an urban slum.
Downs SM, Gupta V, Ghosh-Jerath S, Lock R and Singh A.
1 Menzies Centre for Health Policy, University of Sydney
2 Indian Institute of Public Health (Delhi), Public Health Foundation of India
3 London School of Hygiene and Tropical Medicine
4 All India Institute of Medical Sciences

Objectives: Identifying which policies might be the most effective in specific settings requires a thorough understanding of the existing food environment. The objectives of this study were to: 1) describe the food environment with reference to commercially available ready-to-eat foods sold by vendors in rural village and urban slum settings in India and 2) analyse the type and quantity of the fat in these foods.

Material and methods: The food environments of two villages in Haryana (n=260 households) and a slum setting in Delhi (n=261 households) were examined. Snack consumption and purchasing patterns were identified through household surveys using a questionnaire and 24-hour dietary recall. As part of the household survey, participants were asked about their snack consumption and purchasing patterns. Structured interviews with vendors in the rural villages (n=27) and urban slum (n=17) examined the variety of foods available, the factors affecting the choice of oils for snack preparation, cooking practices and trans fat awareness. In addition, snack samples from the villages (n=17) and slum (n=32) were analysed using gas chromatography (AOAC 996.06 protocol).

Results: Over half of households in the villages and a third of those in the slum consumed freshly prepared snacks; however, consumption of packaged snacks (labelled and unlabelled) (86% rural, 66% urban) was higher. Although oils and fats manufactured by multinational companies were being purchased, the most commonly used oils and fats were unbranded products produced by small and medium sized manufacturers. Refined oil and vanaspati were commonly used for the preparation of fresh snacks and were not discarded at the end of day. The mean fat content in snacks was 27.7±100g serving (SD 18.3) in the villages and 30.5±100g serving (SD 12.5) in the urban slum. Of the vendor samples taken, 65% of rural and 75% of urban snacks contained trans fats. The fat content of sampled oils contained high levels of saturated fat (ranging from 24.7-69.3% of total fat) and trans fat (ranging from 0.1-29.9% of total fat). Only 7% of the participating vendors were aware of trans fats and their health implications.

Key Findings: Improving the quality and transparency of the contents of ready-to-eat food in low socioeconomic settings in India is essential. Interventions should be targeted at the manufacturers of oils, fats and pre-packaged snack foods. Identifying ways of producing affordable healthier oils that have the properties required by vendors will be crucial in improving the quality of ready-to-eat commercially available foods.

PW-048 Poster
Sardine and bogue protein hydrolysates improve high density lipoprotein composition and their antioxidant potential in rat fed high-cholesterol diet.
Boualga A, Benomar S, Yahia S, Guillén N, Rodriguez-Yoldí MG, Osada J.
1 Laboratoire de Nutrition Clinique et Métabolique, Faculté des Sciences de la Nature et de la Vie, Université d'Oran, Algérie
2 Department of Biochemistry and Molecular Cellular Biology
3 Department of Pharmacology and Physiology, Veterinary School (Zaragoza University), Health Research Institute of Aragon, CIBEROBN, Zaragoza, Spain

High density lipoproteins (HDL) play a key role against cardiovascular heart disease by acting on cholesterol efflux and lipid peroxidation.

The aim of this work was determined to designate in rat fed high cholesterol diet whether HDL composition and their antioxidant potential were improved by sardine (Sardina pilchardus) and bogue (Bopsis boops) protein hydrolysates. 18 male Wistar rats (220±10 g) fed 20% casein, 1% cholesterol and 0.5% cholic acid were divided into three groups and received a daily gavage of 1g kg BW of sardine (SPH) or bogue (BPH) protein hydrolysates for 30 days. The third group, named control group (CG) received in the same conditions water. Compared with CG, SPH and BPH reduced markedly cholesterolemia (-66%), serum triacylglycerols, free cholesterol and phospholipids concentrations. Serum hydroperoxide contents were respectively 2.2- and 3-fold lower in SPH and BPH and malondialdehyde was also reduced. HDL-cholesterol contents remained unchanged with SPH and BPH. Compared with CG, esterified cholesterol-HDL contents were increased by BPH while those of SPH were reduced. Moreover, BPH increased significantly apoA4- and sphingomyelin-HDL contents but lowered phosphatidylcholine. In the latter group, serum lecithin cholesterol-acyl transferase (LCAT) activity was 1.3-fold higher but with SPH this activity was 1.4-fold reduced compared with CG. ApoA1 contents were similar in serum and in HDL fraction of the treated groups compared with CG. Compared with CG, serum paraoxonase activity was 1.3-fold higher in BPH rats but this activity remained unchanged in SPH group. Hydroperoxide- and malondialdehyde-HDL contents were reduced by these two fish protein hydrolysates. Glutathione peroxidase activity was respectively 1.2- and 2.2-fold higher and superoxide dismutase activity was increased by 1.3- and 1.4-fold with SPH and BPH compared with CG.

Despite a low iCAT activity, SPH exerted a hypcholesteremic effect. Furthermore, the higher sphingomyelin levels noted in BPH group did not seem to have
an inhibitory effect on LCAT activity, this was probably due to the high APOA4-AHI contents, in addition, the lower hydroperoxides obtained particularly with BH4 could be explained by the higher glutathione peroxidase activity. It was also probably due to the high shingomyelin levels which represent the resistant phospholipids pool against oxidation. Thus, sardine and especially bogue protein hydrolysates that appear operate by different mechanisms may have great potential for use as a nutraceutical to control hypercholesterolemia and oxidative stress by improving cholesterol efflux and antioxidant potential.

**PM-049**  
**Food intake in institutionalised older people according to the dietary assessment from the Mini Nutritional Assessment (MNA).**

Serrano Urra R., Iglesias Llopist R., Arenas Tebar LIP, Vico Garcia C', Delkado Soria A', Garcia-Meseguer MT\(^1\)

\(^1\)Department of Mathematics. Faculty of Computer Science Engineering. University of Castilla-La Mancha. Albacete, Spain


The dietary intake of the last 3 months, significant differences were used to compare proportions. Stepwise regression analysis was used to analyze the items that best predicted the MNA total score.

**Results:** According to the selected six items from the MNA 97.1% of the residents ate three full meals daily, 95% consumed more than two servings of fruit and vegetables, all the population consumed protein products daily, 5% drank less than three servings of fluid and only 51.1% had more than five servings of fluid daily. Regarding to the decline of food intake over the past three months, significant differences (p<0.05) were found between both genders, being higher in women (26.8% of women). The six questions in the MNA about dietary assessment explained 43.7% of the variability of the MNA total score.

**Key findings:** According to the dietary assessment from the MNA, the diet of elderly people living in nursing homes in Albacete follows an appropriate protein intake and most elders have an adequate fruit and vegetable intake. It was found a poor fluid intake in an important proportion of residents. The declined food intake due to loss of appetite was the item with higher predictive value in the MNA total score.

**PM-050**  
**Nutrition of children aged 1 to 3 years from nurseries in Bulgaria.**

Rangelova L., Duleva V, Petrova S., Tatyaerox T., Zyuymbayuleva Z.

National Centre of Public Health and Analyses, Sofia, Bulgaria

**Objectives:** Providing adequate nutrition is one of the main factors, affecting on the growth, optimal physical and mental development and good health status of children aged 1 to 3 years. The aim of the current study is to investigate the nutrition and nutritional status of children, bringing-up in nurseries in Sofia city, before Implementation of a legislative ordinance of the Ministry of Health, regulates requirements to ensure that all children aged 0 to 3 years from child care institutions and child’s kitchens have healthy nutrition.

**Material and methods:** In 2013, a survey on 41 nurseries in Sofia city, random selected from places of residence with total 10519 children aged 1 to 3 years old, was conducted. The subject of the current survey was to study 1636 children aged 1 to 3 years from 77 nurseries’ groups. From the medical questionnaire collected from the nurseries, the data for age, sex and height and weight measurements of the studied children, nursery nutrition and organization of nutrition were obtained. The weekly menu and corresponding food balance sheet from 4 seasons were analyzed. The results were compared with reference values for energy and nutrients intake for healthy children with moderate physical activity.

**Results:** Portion sizes of the offered food of children aged 1 to 3 years in 88% of studied nurseries were larger from recommended and were equal to those recommended for children aged 3 to 6 years. The average daily intake of food from offered food for energy, proteins, carbohydrates, main vitamins and minerals in these nurseries were upper than the recommended, except folate, vitamin D and iron that were under the recommended levels for the children from 1 to 3 years of age. The average daily fat intake was 32.7% (28.4%) from the average daily energy intake of the food (normal range 30%-40%). In the weekly menu the milk and milk products, vegetables, meat, fish and vegetable oils were insufficiently presented and did not give the correct balance. There are increased risk for deficiency of main nutrients and impaired nutritional status of children due to excessive energy and under-adequate average dietary intake.

**Key Findings:** The results are basis for methodical guidelines material, recommendations and follow-up assessments regarding implementation of the new ordinance for improving nutrition of children from Bulgaria.

**PM-051**  
**Use of dessert lizard as a natural product to treat diabetes in a mouse model of the disease.**

Brito-Casas Y', L., López-Ríos L', I., Wiebe J.C., Núñez-Mogollón F.J.,' Ojeda A.1, Wägner AM,1

1Sección de Endocrinología y Nutrición. Complejo Hospitalario Universitario de Castilla-La Mancha-Inmuno- Gerencia de GC, 2Instituto Universitario de Investigaciones Biomédicas y Sanitarias de la Universidad de Las Palmas de GC

**Objectives:** Traditional African testimonials describe glucose-lowering effects of orally administered dessert lizard (DL). We aimed to evaluate acute and chronic effects of DL in diabetic C57BL/6 mice.

**Material and methods:** To assess its short-term effect, several doses of DL or saline were orally administered with 2 g glucose/Kg during a glucose tolerance test (OGTT), in different days, in a randomised, cross-over design. C57BL/6 mice fed a 60%-fat diet. The most effective dose was fed in the diet for 90 days and compared with high-fat diet only (n=10 group, 50% males). Body weight (BW), food and water consumption, welfare state and external appearance were assessed weekly. HBAlc (glucose) and insulin (both intraperitoneal and oral) were performed before and after treatment. Cold allodynia response was assessed by the acetone test, higher scores indicating more neuropathy. For comparisons between groups, Wilcoxon’s or Student’s test were used. A two-tailed p<0.05 was considered significant (SPSS v18).

**Results:** Short-term experiments showed hyperglycaemic effects of DL when compared to saline at 15’ (AIC\_(glic)15= 61.23 (61.69 mg/dl; p=0.004) and a trend in the AUC (AUA\_(glic)15= -19.63 (36.03; p=0.073).

During chronic treatment, skin lesions (alguea and ulcers) and a certain level of stress (observed, not quantified), were seen in both groups, but only in the DL group did they lead to the sacrifice of two females after 9 wks of treatment. In the post-treatment evaluation (Control=10 vs DL=8), of cold allodynia, it was improved in the treated group, with less frequent and intense responses [Control 1.22 (0.33) vs DL 0.81 (0.34) pain intensity, p=0.022; 1.0875-1.000 vs 0.75 (0.375-1.00), % of response, p=0.034].

**Key finding:** Orally administered DL acutely reduces blood glucose in diabetic mice. Its long-term administration increases food consumption, body weight and insulin-resistance. Improvement in cold allodynia suggests a direct effect of DL on pain or on neuropathy itself. More studies are needed to assess the potential uses of this traditional nutraceutical product.

**PM-052**  
**Who do adolescents trust, when it comes to food messages?**

Rendahl, J., Korpi P, Pipping Ekström, M. and Berg, C.

Department of Food and Nutrition, and Sport Science, University of Gothenburg, Sweden

**Objectives:** Adolescents are exposed to different messages about food, and have the pressure of making choices where they take responsibility for their own health and live up to social expectations. A variety of agents mediate food messages, which adolescents have to evaluate and handle. From a health promoting perspective it is interesting to explore how adolescents evaluate the credibility of food messages from different
The purpose of the National Cancer Institute (NCI) Method to estimate the Prevalence of inadequacy intake for older people.

Corrente JE 1; Bronzi de Souza I 2; Justina Papini S 2
1Federal University of Marro Grande do Sul

Objectives: the aim of this study is to calculate the prevalence of inadequacy intake of micro and macro nutrients for older people using National Cancer Institute (NCI) method.

Methods: a representative sample of 365 older people were chosen at random and interviewed at home collecting data using 3-24 hour recalls. This sample was chosen from a data set of older people from the city of Botucatu, São Paulo, Brazil, set up to investigate quality of life. Socioeconomic and lifestyle data were also collected. The data from the 24-hour recall were transformed in consumption of macro and micronutrients using Nutrition Data System (NDS) software. The prevalence of inadequacy of micro nutrients were calculated using NCI method through the routines MIXTRAN and DISTRIB for SAS software and the everyday life cut-off. For macro nutrients, the inadequacy were calculated using Acceptable Macronutrient Distribution (AMD) categorization. Results: 62.6% of the older people from the sample were female, 58% were married, 66.7% had primary school, 44.7% were hypertensive. It was found that the consumption of macronutrients for the older people was adequate. For micronutrients, it was found that vitamin D and Z, calcium and copper presented the most inadequate intake. Conclusions: the NCI method was efficient to estimate the prevalence of inadequate intake and it is very important to establish policies in order to clarify the importance consumption of these nutrients for this age group.

PM-054  
Trends of household insecurity during the economic crisis in Portugal – Results from the INFOAMILIA Survey (2011-2013).

Gregório ML 1; Graca P 1,2; Gomes S 2; Santos C 2; Nogueira PI 2
1Faculty of Nutrition and Food Sciences of University of Porto, Portugal
2Directorate-General of Health, Portugal

Introduction: Food insecurity (FI) has received much attention in recent years in high-income countries due to the increasing of poverty and social inequalities indicators, as a result of the global economic crisis. The guarantee of food security, defined as a situation that exists “when all people at all times have access to sufficient, safe and nutritious food to maintain a healthy and active life”, becomes a priority action for food and nutrition policies. This study aims to evaluate the FI trends during the economic crisis in Portugal.

Methods: Data were derived from the national FI survey in Portugal – INFOAMILIA Survey – conducted by the Directorate-General of Health. Data analysed for this paper includes data from three surveys, during the period 2011-2013. FI was evaluated using a psychometric scale adapted from the Brazilian Food Insecurity Scale and data were collected by face-to-face interviews. Descriptive analyses were undertaken to determine the prevalence of FI and Chi-square tests were used to assess bivariate associations.

Results: From 2011 to 2013 the prevalence of FI was essentially unchanged and in 2013 the prevalence of FI fixed on 50.7%. From those Food Insecure households (FIH), 33.4% are in low FI, 10.1% in moderate and 7.2% in severe FI. Comparing data from these three years, statistical differences were found in prevalence of moderate and severe FI between 2011 and 2012. For the national average, it was found a decrease in moderate FI prevalence (2.9 percentage points) and an increase in severe FI prevalence (2.4 percentage points), between 2011 and 2012.

Key findings: The prevalence of FI was relatively unchanged between 2011 and 2013. The changes observed were not statistically significant, meaning that the difference may be due to sampling variation. The majority of FH are in the low FI level, which represents that the household at least had enough about accessing adequate food or had reduce the quality of their food intake, without substantially reduce food of quantity. Moreover, moderate and severe FI household were 17.3% of the three course sample analyzed, indicating situations where the quantity of food intake was reduced because the household could not afford enough food. To our knowledge this is the first study regarding to household FI in Portugal during the economic crisis. The monitoring of FI is helpful to evaluate the extent of this problem and the associated factors in Portugal in order to support the implementation of public health actions, targeting decisions to minimize the health impacts of economic crisis.
Objectives: To assess the potential intake of iodine among different socioeconomic groups through the use of iodized salt in the production of three widely consumed processed foods in Indonesia.

Materials and methods: Interviews were conducted with nine major producers of three selected food products: instant noodles, stock (including complete food seasoning), and soy sauce; to determine each product's average iodized and non-iodized salt content, annual production, and market share by region and socioeconomic status. Recent food industry-related reports were analysed to verify and supplement interviews.

Results: Based on average per capita consumption and estimated amount of salt per unit of each product, if all salt was iodized to the national minimum of 18 parts per million, these three products alone could contribute to at least 10% of the recommended adequate daily iodine intake for an adult (150µg). This is a minimum estimate since iodized salt in Indonesia often contains considerably higher levels of iodine.

Instant noodles and stock have the highest potential contribution to iodine intake due to the relatively high per capita consumption of the product (instant noodles) and salt content (stock). The instant noodle producer with over 65% market share, distributed fairly evenly across the population, reported that it already includes iodized salt in its products.

Based on market data and assuming a minimum salt iodine level of 18 parts per million, total potential iodine intake from the three products combined was estimated, for the respective socioeconomic classes as: A (richest) 17%, B 10%, C1 4%, C2 3%, D 4%, E (poorest) 3%.

Key Findings: The World Health Organization recommends universal salt iodization – the fortification with iodine of all salt used for human and animal consumption – as the main strategy for eliminating iodine deficiency. In practice, many countries, including Indonesia, currently only regulate and monitor for iodization of table salt.

Legislation and supporting regulations for iodization of salt for the food industry could provide enhanced protection against iodine deficiency, in particular for groups consuming a large proportion of salt from processed foods. To account for expected future decreases in total salt intake following implementation of salt reduction policies, the level of iodine in salt could be adjusted at production based on population iodine status.

The full presentation will report expected impact by product type, examining which products already include iodized salt together with their approximate market share by socioeconomic class and region.

PM-057 Use of salt shaker by the university population.

Objectives: To assess the use of salt shaker in different meals.
- To know the use of salt shaker in different meals.
- To know the use of salt addition when cooking.
- To study the preference of healthy product buying.

Material and methods: An electronic questionnaire was sent to the students and staff of different Spanish universities using the virtual campus. The Universitat de Vic, Universitat Rovira i Virgili and the Universitat de Alacant took part in this study.

We asked about the addition of salt at cooking time, and in what kind of product is added, and the addition of salt in the finished dishes with the salt shaker.

Also wanted to know was the interest for the low-salt products respect to low-fat and low-sugar and the interest in view the quantity of salt products.

Results: A total of 1056 individuals of both genders (73% female and 27% male) from 18 to 65 years completed the questionnaire.

The habit for purchasing foods low in salt was very low (76,4%) so that 87,9% of respondents never watch the salt content of foods and they didn’t understand the differences between salt and sodium (58,3%).

In addition, 25% of respondents did not understand the difference between salt and sodium in the nutrition information on food products.

Half of the respondents always or almost always add salt when cooking compared to only 8% who do not ever add salt. The salt addition at the cooking time is in vegetables, paste, meat, sauces, omelets or soups dishes where salt is always added. However, in most cases the salt was added little by the salt shaker except in salads.

Key findings: The university study population does not receive salt intake in the same way that the intake of fat or sugar and this causes their use during the cooking of food is widespread. Training in culinary techniques and the use of other seasonings like herbs or spices to replace the use of salt intake would decrease.
Methods: Study 1) 110 SMEs filled out an online questionnaire which was developed to obtain an overview of attitudes and activities of SMEs with respect to innovation; their interest in trends, among which health and wellbeing; and their view on logos as a possible way of health communication.

Study 2) Dutch food companies (n=75) were asked, which themes they would prefer to work on with the technical universities.

Results: In Study 1 it was shown that innovation is important for SMEs. This is illustrated by their innovation activities: >80% are innovating in products and >50% in processes. Challenges are: limited time, money and knowledge on innovation in general and lack of specific knowledge on innovation and health. Health was among the most appealing trends, as was sustainability. However it was also noted that taste is equally or more important than health. Of the responding companies, 43% used a health logo. However the functionality of logos was unclear: whether they increase sales or are informative enough.

Results of study 2 are summarized as three major themes where technical universities and companies could work on together: 1) Healthy product composition, 2) Perception of food by the consumer & 3) Sustainable food production.

Key findings: There is a large willingness in the food sector to collaborate with the technical universities to ensure high quality future food professionals. Opportunities are a large willingness to innovate and an increasing interest in the already appealing trend of nutrition and health in addition to sustainability.

PM-061 Poster

Learning about food allergies in school children

Martos López A1, Rivas García P2, Lorente Fernández JR3.
1 Colegio Oficial de Veterinarios de Murcia.
2 Ayuntamiento de Guadix (Granada). Unidad de Salud y Consumo.

Objective: Promote awareness and education through various workshops theoretical practical, on allergic reactions and food security. Disseminate among children schoolbased aspects involving allergic reactions to foods, Matherals and methodology: 6 educational workshops were held for two weeks in October 2013, in each of the existing schools in the city of Guadix (Granada). Titled “Food Allergies What do we know?” these workshops they went to the school population in the 4th and 5th of education primary. Informational material, coupled with theoretical exposure was distributed practice, group work. Tools were used so that students are able to identify which foods are involved and information must provide the same on their labeling regarding the substances can be considered as allergic. The 90-minute sessions per center they entailed conducting 3 groups with 10 students and a pooling of actions worked.

Results: With respect to the initial state of knowledge of reactions allergic noted that all participants, 1.5% had some type allergy, 85% were unaware of having any knowledge on the subject on food allergies. Only 5% of schools on held admitted ever worked the theme of allergies food, compared to other steps taken in the field of food and nutrition. Attending the workshops involved a total of 210 students of average age 10 years. 200 information leaflets were distributed. After exposure and Workshop final evaluation 65% of schoolchildren know which showed basic knowledge between foods and allergies.

PM-062 Poster

Cardioprotective effect of a Punicalagin-Hydroxytyrosol mixture supplement on α-LDL and endothelial function in healthy middle-aged adults.


Objective: To design and research nutritional products that may promote a healthy aging is a current topic of great interest in food and nutrition science. The aim of the present study was to evaluate the cardioprotective effects of consumption of an antioxidant nutriceutical supplement (punicalagin, hydroxytyrosol) in healthy middle-aged adults.

Material and Methods: In a randomized, cross-over, double-blind, placebo-controlled study, 85 healthy middle-aged adults ranged from 40 to 70 years and BMI from 18.5 to 29.9 kg/m2 (68 w, 17 m), received 3 capsules/day of an antioxidant nutriceutical mixture supplement (Asx) (65% punicalagin extract; 3.7% Hydroxytyrosol; 331 ng maloxtadon) or Placebo (400 mg maloxtadon). Each volunteer received the 2 product in random order (AsxPlacebo or PlaceboAsx) during 8-weeks intervention periods with 4-weeks washout period. Subjects maintain their usual diet and an Antioxidants foods list were forbidden to consume during the study. At baseline and at the end of each intervention period, cardiovascular disease risk indicators were measured: endothelial function through the flow-mediated dilation (FMD) in the brachial artery, assessed with Doppler ultrasonography; α-LDL (atherogenic factor) in blood samples; and blood pressure. Anthropometric (Weight and BMI) and Dieteric (energy profile) variables were also evaluated.

Results: 72 subjects (14 males) completed the study (53±4.4 years, BMI =24.6±3.0 Kg/m2). Subjects compliance with the capsules and dietetic recomendations over the both interventional periods. Voluntaries consuming only Asx during 8 weeks decreased significantly FMD, α-LDL and Diastolic Blood Pressure (FMD: 7.7±8.0 to 9.3±7.4, %, p<0.05; α-LDL: 115±90 to 104±75, 12±10, 72, %, p<0.05). Anthropometric and Dietetic variables were not modified during the intervention.

Key findings: The consumption of an antioxidant supplement with Punicalagin and Hydroxytyrosol, may contribute to promote a healthy aging through a cardioprotective effect on the endothelial function and reducing the atherogenic risk.

PM-063 Poster

Regular consumption of Lactobacillus plantarum 3547 probiotic leads the differentiation of Lymphocytes into effector cells in healthy people.

López-Plaza B, Barmajo LM, Weber TK, Morato M1, Roldán E, Gómez-Candela C. Nutrition Department. Health Research Institute (IDiPAC), La Paz University Hospital (Spain).

Objective: To evaluate the effect of regular consumption of Lactobacillus plantarum 3547 (LP3547) probiotic on Lymphocyte Subpopulations of healthy people.

Methods: A randomized, double-blind, placebo-controlled clinical trial was carried out during 12 weeks in 78 healthy volunteers of both genders with an BMI ≥18 - <40 kg/m^2 and between 40 and 50 years old, without chronic diseases and without pharmacologic treatment. Before 2 weeks of diet stabilization and fermented foods suppression participants were randomized into 2 groups: Probiotic Group (LPg, n=39) received daily capsule of LP3547 (10x109 cfu) and Placebo Group (PG, n=39) with a capsule containing maltodextrin. Both groups maintained the habitual pattern of physical activity and diet. At the beginning and end of the intervention, blood samples were collected to determine lymphocyte subpopulations by Flow Cytometry. Anthropometric data and diet were evaluated.

Results: At the beginning of the intervention both groups had similar values of lymphocyte subpopulations in plasma. After the intervention the participants who belonged to PG showed a significantly decreased of B lymphocytes while those belonging to GP remained stable (- 1.2±0.7 vs. 0.19±0.67 %; p<0.05). Even though Total T lymphocytes did not show differences at the end of the study, Helper T lymphocytes (CD4+) had a significant increase between the beginning and the end of the intervention in LGp (from 46.5±6.7 % to 49.5±6.2 %; p<0.001) while those participants belonging to PG remained stable (from 47.7 ± 48.9±11.2%). CitoToxic T lymphocytes (CD8+) showed a significant decrease between the beginning and end of the intervention in LGp (from 71.7±10.7 % to 71.7±10.7 %; p<0.01) while those participants belonging to PG remained stable. Others Lymphocyte Subpopulations as the Natural Killers had no significant changes.

Key findings: Regular consumption of LP3547 probiotic for 12 weeks leads the differentiation of lymphocytes into effector cells in healthy people. Its intake promotes an increase in helper T lymphocytes and a decrease in the CitoToxic T lymphocytes percentage while B lymphocytes remained stable which could improve the immune response.

Study supported by CARI NSA group through HENUFOOD project (CEN-20101016) from CENIT program of Economy and Competitiveness Ministry in Spain.

PM-064 Poster

WaSH in Nutrition strategy in the Sahel: Highlighting the importance of water, sanitation and hygiene practices in the nutritional responses.

Rivero E, Guardiola Ma, Sanchez Ma. Accion Contra el Hambre.

Objective: In 2012, several humanitarian water, sanitation and hygiene nutrition actors, put together a strategy to guarantee minimum wash conditions at the nutritional center and up to the household of the couple malnourished child-caregiver through out the Sahel. The said Water Sanitation in Nut strategy was diffused and started being implemented in Burkina, Cameroun, Mali, Mauritania, Niger, Senegal and Chad around mid 2012. This study compiles and analyzes the understanding of the strategy, and the extent of its implementation. One of the main objectives of the study is to understand the impact that the implementation of the strategy has in the nutritional status of children.

Material and methods: 50 Surveys were held among wash and nutrition actors of the strategy (National and International NGOs, Funding agen­ cies, Governments) throughout the Sahel. The questions inquired: the overall understanding of the strategy, the coordination among actors, and the monitoring and evaluation of impact of the strategy. Two field visits to

III World Congress of Public Health Nutrition - 185 -
Mauritania and Niger help contextualize the responses. In both countries, were carried out personal interview and visit to the health structures.

Results: Results about the strategy show that the status of implementation and also understanding varies widely between countries. The strategy has been frequently interpreted as the set standards of infrastructure at health centers with distribution of kits for mother and child and there is no evidence about the impact of the strategy.

In the 17 nutritional centers visited, there is common lack of hygiene and poor sanitation facilities, and a systematic absence of treated water available. Post monitoring distribution studies, combined with morbidity data from the supported nutritional centers do not show evidences of improving children’s health when a water treatment kit are distributed and promoted to use during the nutritional treatment. There are not even clear trends showing the incentive that the kit does on the completion of treatment.

Key findings: The core of the strategy is poorly understood among the involved actors, and thus, its implementation is often limited to health centers, to certain targeted or individual actions, overlooking the importance of behavioral change. The strategy has often been understood as synonymous of the distribution of kits in the health center. There are poor field evidences showing the link between access to wash facilities during nutritional treatment as a means for a faster recovery. Thus, pointing to the need to conduct rigorous studies that combine wash and nutrition indicators.

PM-065 Poster  
Intake and biochemical status of minerals in pregnant women living in Austria.

Rust P, Elmadfi I. Department of Nutritional Sciences, University of Vienna, Austria.

Objectives: Adequate maternal diet is important in the outcome of pregnancy and the health of the mothers and children. Micronutrient deficiency during pregnancy is associated with several complications. Therefore, this study was designed to determine the intake and biochemical indicators of pregnant women living in Austria.

Material and methods: Blood samples of 113 Austrian pregnant women (3rd trimester, 18-43 y) were analyzed. Plasma zinc concentrations were examined by atom absorptions spectroscopy (AAS). Vitros D160 IDTSCS I Chemistry System was used to assess iron, magnesium and calcium in plasma.

Results: Mean serum iron concentrations (12.25 [10.79; 13.72] mmol/l) were within reference values (7.5-31.7 mmol/l). But, corresponding to the poor average intake of 14.95 [12.30; 16.88] mg/dL, every fourth women was clearly iron deficient. 60% of estimated women took iron supplements, while 21.3% of these showed too low iron levels. 30.8% of women that didn’t substitute iron were undersupplied. Hemoglobin and hematocrit levels reached 15.95 [15.11; 16.79] g/dL and 46.36 [43.94; 48.77] %, respectively. Only three women showed poor levels of iron.

Average plasma magnesium plasma concentrations (0.74 [0.73; 0.76] mmol/L) reached the reference range (0.7-1.0 mmol/L). Even so, childbearing women had a good supply with magnesium (356.72 [323.63; 389.92] mg/dL) via food one third didn’t reach plasma reference data. Magnesium status was not affected by supplementation. On average zinc intake (10.97 [9.91; 12.03] mg/dL) reached D-A-CH recommendations of 10 mg/d and plasma levels (8.79 [8.57; 9.02] mmol/L) were above the reference of 8.1 mmol/L.

Nevertheless, more than one third had an unsatisfying supply with zinc and 27.4% a bad biochemical status.

Mean calcium concentrations (2.37 [2.3; 2.39] mmol/L) were within references (2.2-2.4 mmol/L) confirming adequate calcium intake. Key findings: Taken as a whole calcium status can be assessed as hugely satisfying, iron status as adequate, while magnesium and zinc levels should be improved. Ensuring adequate intake and monitoring mineral levels in pregnant women is an important health care goal because an unbalanced diet prior and during pregnancy, regarding the intake of micronutrients, can have long-lasting effects on the health of offspring later in life.

PM-066 Poster  
Nutrient Intakes of Manitoba Children and Youth: A population-based analysis by pulse and soy consuming status.

Adriana M, Mukena' Paul Fieldhouse1 2 B. Nancy Yu 3,4

1Human Nutritional Sciences
2Community Health Sciences, University of Manitoba, Winnipeg, MB, Canada, R3T 2N2 3Manitoba Healthy Living, Seniors and Consumer Affairs

Objectives: In the past 25 years, the rate of childhood obesity in Canadians has tripled. The rate of childhood overweight and obesity in Manitoba alone is 31 percent, a significantly higher proportion than Canada’s national average. Children’s eating habits play a pivotal role in their current as well as future health, with poor diets being linked to a multitude of negative health outcomes. As previous work suggests that pulse and soy consumption may favourably influence nutrient intakes, the objective of this study was to use pulse/soy consumption as an indicator to explore and evaluate the eating profile of Manitobans 18 years.

Materials and Methods: Data from the Canadian Community Health Survey Cycle 2.2 conducted by Statistics Canada was used for this analysis. The study was restricted to respondents 2 to 18 years of age residing in the province of Manitoba. Respondents were divided into groups based on pulse or soy consumption based on results from their 24 hour dietary recall. Pulse or soy consumers were identified as individuals who had reported eating at least one soy or pulse product during their recall period.

Results: Overall, 8.2% of Manitoba children age 2-18 y reported consumption of soy or pulse products on any given day. In terms of demographics, there were no significant differences found between consumers and non-consumers in terms of gender, age group, body mass index, or location. On the other hand, the nutrient intake profiles of non-consumers and consumers did not differ significantly, except when nutrients were expressed relative to energy intake. Observing the dietary intakes and patterns of Manitobans 2-18 (regardless of consumption status or weight category), it is clear that the majority of Manitoba’s youth are not consuming healthful diets. Intakes of calcium, fibre and fruit and vegetable consumption was low among all groups. More alarmingly, the average intake of sodium in both groups exceed the tolerable upper intake level of sodium.

Key Findings Although pulse or soy consumption does not appear to affect the nutrient intake profile of young Manitobans, results from this study shed light on the poor eating habits of Manitoba’s children and youth overall. Results gathered from this project present a variety of dietary intake issues affecting Manitoba children and suggest the need to focus more on this growing concern. In particular the disturbingly high intakes of sodium need to be addressed and require further studies to obtain more detailed information on this trend.

PM-067 Poster  
Study of the long term impact of micronutrient supplementation during infancy on growth, anaemia and zinc status in pre-school children.

Warthon-Medina M1, Quilter P, Zavaleta N, Dillon S, Lazarte P and Love N

1International Institute of Nutritional Sciences and Food Safety Studies, University of Central Lancashire, Preston PR1 2HE, United Kingdom, Instituto de Investigacion Nutricional, Lima, Peru.

Objectives: The key objective of this study was to examine the long term effect of multiple micronutrient supplementation compared with iron supplementation alone on measures of growth, anaemia and zinc status.

Materials and methods: This study was built on an initial randomized, double-blind controlled trial in 2010, supported by UNICEF, in which 902 infants, aged 6-17 months, from Villa El Salvador in Lima, Peru, were given supplements of either iron (Fe) or multiple micronutrients (including iron and zinc) (MMN) daily for 6 months. In 2012, a subsample of 184 infants from the original control group was randomly selected to participate in a follow-up trial. The outcome measures of this follow-up trial were growth, plasma zinc and iron (haemoglobin concentration) for both the Fe (n=97) and the MMN (n=87) groups. Anaemia was defined as haemoglobin concentration below 11 g/dL. Plasma zinc concentration below 70ug/dL - 10.7umol/L was used to define zinc deficiency. The WHO child growth standards, height-for-age, below -2 Z-Score was used to define stunting. The CDC BMI percentiles were used to define overweight (less than 5 percentile). The age range of the children at follow-up was from 36-48 months old and the mean age of the children was 41.55 (SD=3.16) months for the Fe group and 41.40 (SD=3.23) months for the MMN group.

Results: No significant differences were observed for haemoglobin concentrations (t(179)=0.97, p=0.334) between Fe or MMN groups. However, anaemia was identified in both the Fe (11.5%) and MMN group (14.1%). In both groups, with no significant group differences: X2 (1, N=183)=0.29, p=0.59. No significant differences were observed for plasma zinc status (t(178)=0.265, p=0.792). Identified 2n deficiency was 1% in the Fe group and 1.2% in the MMN group, with no significant difference between groups: X2 (1, N=179)=0.08, p=0.93. With reference to stunting, 2% of children were stunted in the Fe group and 2.3% in the MMN group; and identified underweight children were 5.2% in the Fe group compared to 3.5% in the MMN group. Analyses of these data suggested that children in both groups were no more likely to have stunted growth or be underweight than expected by chance (stunted growth: X2(1, N=183)=0.10, p=0.75; underweight: X2 (1, N=183)=0.30, p=0.73).

Key findings: Analyses showed that multiple micronutrient supplementation had no additional long term effect on growth and zinc status compared with iron supplementation alone. However, a relatively high prevalence of anaemia was still noted in the pre-school children who received either treatment for 6 months, suggesting that either a longer period of supplementation was required and/or efforts to improve infants’ diet.
PM-068

Maternal risk factors for low birthweight.

Petrov I.1; Rangelova L.1; Duleva V.1
National Center of Public Health and Analyses, Sofia, Bulgaria

Objective: Low birthweight (LBW, <2500 g) can be related to preterm delivery or to intrauterine fetal growth retardation (assessed using small for gestational age, SGA), or to birth defects associated with the immediate consequences increasing the risk of neonatal morbidity and mortality. SGA infants mainly are at lifelong increased risk for chronic diseases (hypertension, diabetes type 2, coronary heart disease). Preventive actions are more likely to be successful if we know better the risk factors for different LBW categories. Objective of the study is to investigate for which factors in women were LBW arranged through one or both mechanisms related to maternal nutritional status, health and adverse influences.

Material and methods: Survey on a nationally representative sample of 2468 children aged under 5 years and their mothers was conducted. The height and weight were measured. Nutritional status of children was assessed using WHO growth standards, 2006. Data about birth weight of children, term of delivery, maternal age, pre-pregnancy weight, gestational weight gain (GWG), smoking, alcohol consumption, harmful working conditions, gestational diabetes of mothers and their ethnicity were obtained by active interview and medical records.

Results: The rate of infants with LBW was 5.5%. In average LBW was associated mainly with preterm delivery (58.6%) but there was a significant difference depending on the ethnicity of mothers. 65% of LBW in Bulgarian mothers were preterm, in Roma mothers the incidence of preterm LBW was 41.1%. The high rate of LBW among Roma infants among Roma mothers was associated with their lower economic status and multiple gestations. The prevalence of mothers with low pre-pregnancy weight (BMI<18.5 kg/m2) was 18.9%, those with overweight – 12.3% and obesity – 3.4%. The incidence of LBW among pre-pregnant underweight mothers was significantly higher (30.2%) vs 17.4% in normal pre-pregnant weight (5.1%). Pre-pregnancy underweight and obesity were high risk factors for LBW related to preterm delivery. Low GWG was determined in 30.4% of mothers, more often among women with low pre-pregnancy weight (39.1%). The incidence of LBW was highest when both risk factors in women were available (17.3%). LBW was twice higher in smoking mothers (p<0.05). The other investigated maternal factors were not significantly associated with LBW.

Key findings: Low pre-pregnancy weight of women is high risk factor for delivery of low birth weight children. The risk for LBW is increased significantly when both risk factors in women were accompanied with low gestational weight gain and smoking during pregnancy.

PM-069

The relation of fast food pattern with body mass index and physical activity in Iranian women.

Rezaeezadeh A1; Omidi V2; Rashidi B1
1Department of Community Nutrition, National Nutrition and Food Technology Research Institute, Faculty of Nutrition and Food Technology, Shahid Beheshti University of Medical Sciences and Health Services, Tehran, Iran
2Students’ Research Committee, Shahid Beheshti University of Medical Sciences and Health Services, Tehran, Iran

Objectives: to determine the association between fast food dietary pattern with body mass index and physical activity in Iranian women.

Materials and Methods: In this cross-sectional study, 516 women aged 20-50 years who were selected by random sampling. Among 516 selected women who were invited to participate, 460 women agreed to involve in the study (the participation rate 89%). Dietary information was collected by a valid and reliable semi-quantitative food frequency questionnaire by trained dietitians. Weight was measured to the nearest 100 g, without shoes while wearing minimal clothes. Height was measured to the nearest 1 mm without shoes with shoulders in a normal position.

Body mass index (BMI) was calculated as weight in kg divided by height in meters squared. Physical activity was measured using a validated questionnaire and was expressed as metabolic equivalents (MET=1MET (3.5ml/kg/min/kg)), in which nine different MET levels were ranged on a scale from sleep/rest (0.9 METs) to high-intensity physical activities (>6 METs). The MET-time was calculated by multiplying time spent on each activity level by the MET value of each level. Data were analyzed in SPSS software. Fast food dietary pattern was defined through frequency and amount of four items (hamburger, french fries, sausages, fried chicken and pizza) that were loaded in order to reduce the four items to one representative factor as manifestations of composite factors. Multiple linear regressions were used to estimate the relation between fast food pattern and BMI. Also the relation between fast food pattern and physical activity was assessed by Pearson correlation.

Results: The mean ± SD of participants BMI and physical activity was 26.7±5.3 kg/m2 and 25.7±7.2 MET/hour/day, respectively. The mean ± SD of fast foods consumption were 89.0±3.14 hours/month for sausages, 6.7±145.5 g/month for sausages, 46.3±167 g/month for hamburger, 120.2±177.2 g/month for pizza and 359.3±1683 g/month for fried potato. There was a negative weak correlation between fast food pattern and physical activity (r=-0.30, p<0.05). After adjusting for confounders (age, smoking, physical activity and energy intake), fast food pattern was positively associated with BMI (B=0.62, 95%CI: 0.27-0.96).

Key findings: Our findings suggest that fast food pattern was positively related with BMI and negatively correlated with physical activity in the studied women. This calls for the need to design programs as well as proper regulations to promote healthy eating patterns and active life style in the community.

PM-070

Heterocyclic amines from meat intake is associated with oxidative stress in Sao Paulo - Brazil.

Marchion DM1; Carvalho AM2; Santos FA Gatts G3; Loureiro AP4; Fisberg R5
1School of Public Health University of Sao Paulo, Sao Paulo, SP, Brazil
2Instituto de Medicina Social, Universidade do Rio de Janeiro, Rio de Janeiro, Brazil
3Instituto de Saúde Social, Universidade do Estado do Rio de Janeiro, Rio de Janeiro, Brazil
4Instituto de Medicina dos Trabalhadores, Universidade Federal Fluminense, Niteroi, Brazil

Background. Heterocyclic amines (HA) from meat intake have been linked to cancer due to generate reactive substances that can damage the DNA. Malondialdehyde (MDA) is a widely used marker of oxidative stress, as well as a tumor promoter. The action of these reactive substances can be mediated by genetic and environmental factors. The aim of the current study is to investigate the relationship between intake of heterocyclic amines and malondialdehyde concentration in plasma, considering polymorphism of detoxification enzymes and lifestyle factors.

Methods. Data came from a cross-sectional survey of adults and elderly people living in Sao Paulo, Southeastern Brazil, conducted in 2010 (n=479). The HA intake was assessed according to the 24-hour dietary recall method and a structured questionnaire with cooking methods and of Cronh. The amount of heterocyclic amines was calculated by the Computerized Heterocyclic Amines Resource (http://research.memory.cancer.gov/). It was used PCR-based assays to detection of GSTM1 and GSTT1 deletion. Malondialdehyde was measured in plasma after derivatization by thio­barbituric acid and separation on HPLC. Lifestyle information was obtained by the structured questionnaire. The association between MDA and GST were done by a linear regression adjusted by smoking, deletion of GSTM1 and GSTT1, sex, age, body mass index (BMI), race, kcal of diet, and C-reactive protein.

Results. The sample comprised 37% of men, 63% of women, 53% of adults and 47% of elderly. The frequency of deletion of both variants GSTM1 and GSTT1 was 7%. The mean of heterocyclic amines intake was 369ng/dl (95%CI: 307; 430ng/dl) and the mean of MDA concentration was 0.73umol/l (95%CI: 0.70; 0.76umol/l). The MDA concentration was associated to HA intake (B=0.0005; p<0.001) but HA was not associated with MDA concentration after adjustment for genetic and lifestyle factors. A finding of our study is the high intake of HA can increase the oxidative stress independently genetic and lifestyle factors, and potentially increasing the risk of chronic diseases, such as cancer.

PM-071

Fluctuations in household food consumption related to the presence of adolescents at home.

Rodrigues Pm1; Monteiro Ls1; Cunha DB2; Araujo MC2; Sichieri R2; Pereira Ra1
1Instituto de Nutrição Joséul de Castro, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil
2Instituto de Saúde Social, Universidade do Estado do Rio de Janeiro, Rio de Janeiro, Brazil
3Instituto de Educação em Saúde, Universidade Federal Fluminense, Niterói, Brazil

Objective: To assess differences in prevalence food group consumption between households with and without adolescents.

Material and methods: The study evaluated data from one day of food record of a representative sample of the Brazilian population (n=34,003) of 2010 years-old obtained in the first National Dietary Survey conducted in 2008-2009. Foods were grouped into 58 food groups. Individuals were classified as belonging to households formed only by ≥20 years old individuals or to households with at least one adolescent (10-19 years old). The analysis considered sample weights and the effect of study design.

Results: In the sample analyzed, 8% of the subjects lived alone and were ≥20 years old, 27% were from households with two ≥20 years old individuals, 15% lived in households with three or more ≥20 years old individuals, 9% were from households with one ≥20 years old individual and one adolescent, and 1% were adolescents living alone. Compared to individuals belonging to households constituted only by ≥20 years old individuals, those belonging to households with at least one adolescent, showed higher prevalence (p<0.01) of consumption of eggs (8 vs 15%), corn (12 vs. 10%), cookies and cakes (33 vs 29%), sugar and sweets (16 vs 13%) and sugar sweetened beverages (32 vs. 29%). On the other hand, individuals of households formed by ≥20 years old individuals showed higher prevalence (p<0.01) in the consumption of cheeses (18 vs 10%), soups (12 vs 9%), fruits (39 vs 31%), vegetables (48 vs 36%), coffee or tea (85 vs 78%), and alcoholic beverages (6 vs 3%).
Key findings: The presence of adolescents seems to be associated with the profile of food consumption in the household as there were differences in food consumption among individuals belonging to households with at least one adolescent and those from households with adults only. The presence of adolescents was associated with greater prevalence in the consumption of foods high in sugars. On the other hand, individuals belonging to households composed solely by adults had greater prevalence in the consumption of recommended foods, like fruits and vegetables.

PM-072  Poster  Interdependence in the consumption of non-alcoholic beverages in adolescents.

Fernandeis de Noe, Rodrigo Prm; Matins Vrm; Vega Gv; Pereira Ra.
Instituto de Nutrição José de Castro, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil

Objective: To evaluate whether there is interdependence in the consumption of non-alcoholic beverages in adolescents.

Material and methods: In the baseline of the Longitudinal Study of Nutritional Assessment of Adolescents (ELANA) were examined 1,851 10-19 years old students attending two public and four private schools (1039 high school and 812 elementary school). The consumption of another financial questionnaire. The daily frequency of consumption of processed fruit drinks, fruit juices, tea or mate, guarana soft drink, low calorie soda, regular soda, milk, and coffee was estimated. The interdependence in the consumption of these beverages was assessed with the correlation coefficient (p<0.05).

Results: Milk and coffee consumption were positively correlated among both high school (r=0.21) and elementary school students (r=0.12). In both groups, the consumption of tea or mate was positively correlated with the consumption of fruit juices (elementary school: r=0.19; high school: r=0.12) and processed fruit drinks (elementary school: r=0.15; high school: r=0.08) but showing a slight inverse correlation with the consumption of soft drinks, among both elementary school (r=-0.08) and high school students (r=-0.07). Similarly, the consumption of guarana soft drink was correlated with the consumption of fruit juices (elementary school: r=0.17; high school: r=0.19) and processed fruit drinks (elementary school: r=0.24; high school: r=0.22). Among elementary school students, guarana soft drink was also associated with the consumption of sodas (r=0.20). The consumption of fruit juices and processed fruit drinks was correlated (elementary school: r=0.42; high school: r=0.32). Among elementary school students, the consumption of low calorie soda was positively associated with the consumption of tea or mate (r=0.14). Guarana soft drink (r=0.18), fruit juices (r=0.11), processed fruit drink (r=0.13), and regular soda (r=0.14). Among high school students, low calorie soda was only positively correlated with regular soda (r=0.16). Among high school students, there was an inverse correlation between soft drinks and fruit juices (r=-0.08) and processed fruit drinks (r=-0.09). Finally, among high school students, there was an inverse correlation between the consumption of milk and guarana soft drink (r=-0.08), fruit juices (r=-0.07) and regular soda (r=-0.06).

Key findings: The findings showed that the consumption of beverages can be correlated; remarkably, milk consumption was inversely correlated with sugar added beverages consumption among high school students. Furthermore, the consumption of different types of sugar sweetened beverages was correlated.

PM-073  Poster  Effect of Weight Loss on Inflammatory Markers and Iron Parameters in Overweight and Obese Women.

Kaner GQ, Pekcan QP (1) Nuh Naci Yorganci University/Faculty of Health Sciences, Department of Nutrition and Dietetics
2Hacettepe University, Faculty of Health Sciences, Department of Nutrition and Dietetics

Obesity and its associated comorbidities are an ongoing health-care problem in the worldwide. Excess adiposity is associated with low-grade inflammation and decreased iron status. Iron depletion in obesity is thought to be mediated by an inflammation-induced increase in the body’s main regulator of iron homeostasis. Weight loss is recommended for inflammatory syndromes such as obesity and metabolic syndrome. This study has been performed to evaluate the association between weight loss and conservative treatment have been described. The aim of this study was to determine the effect of dietary intervention on iron parameters. A total of 147 women, aged 20-49 years, admitted to internal medicine, endocrinology and dietician clinics of the department were included to the intervention study. Subjects were divided into two groups and dietary treatment for weight loss was applied. First group was consisted of women with normal hemoglobin levels (n=101). In the study, a general questionnaire was applied, biochemical parameters [who blood count (WBC), anemia parameters, C-reactive protein (CRP), soluble transferrin receptor (sTfR)], 24-hour dietary intake record for 3 consecutive days and physical activity levels were determined, anthropometric measurements were taken and bioelectrical impedance analysis was done. After three-months of follow-up intervention, women with anemia had 10.1% weight loss, women without anemia had 10.7%. Statistically significant correlation between body weight loss and CRP levels was determined (p<0.05).

PM-074  Poster  Changing the food environment to reduce childhood obesity risk: four case studies in community organizing.

Jones SF, Pepe H, Draper CQ; Wilson MZ, Craig P, Childers CE
1Center for Research on Information and Communication Technologies, Arnold School of Public Health, University of South Carolina
2Department of Health Promotion, Education, and Behavior, Arnold School of Public Health, University of South Carolina

Objective: Several major organizations have called for action to address the social determinants of health through policy, systems, and environmental change. Unfortunately, many policy, systems, and environmental change initiatives targeting food have shown weak or opposite of expected results. Community capacity building and engagement seem to be at a critical and effective community organizing approach to food systems change. We hypothesized that the use of a community organizing approach to food systems change would better engage food insecure community members, resulting in lowered risks of childhood obesity.

Methods: Four community coalitions that were engaging or had a desire to engage in food systems change were selected through an application process. Using participatory action research methods (e.g., photo voice, q studies), capacity building workshops, and direct action community organizing, each community advanced or initiated an issue campaign to move some aspect of the local food system (e.g., city funding of a community kitchen, development of a community garden for youth, etc.). Using participatory observation with detailed ethnographic notes, key informant interviews, surveys, and participatory action research data, we developed case studies of phase one of the issue campaigns (e.g., engaging people affected by hunger insecurity or at risk of child obesity) in identification of food systems issues and their solutions.

Results: We found that direct action community organizing approaches, such as door knocking in residential neighborhoods, house meetings, and engaging community leaders, were difficult approaches for coalitions to sustain. In particular, the development of relationships between coalition staff, members, and affected community residents was challenging even when coalitions expressed a commitment to engaging communities. Community organizers often expressed unwillingness to participate when asked to knock on doors or host house meetings. These community engagement barriers were addressed through mobilizing capacity building workshops to re-frame food systems issues, and in 3 communities replacing community organizers unwilling to engage in direct action.

Key Findings: Building capacity for community engagement is a needed priority for organizations to effectively promote policy, systems, and environmental change.

However, implementing community organizing strategies has proven to be difficult at times and time consuming. Through deep community engagement using community organizing strategies between community organization trainers, community organizers, and coalition members, a shift in cultural norms, on an individual and organizational level, is possible and necessary to address systems level changes. As a result, strong connections within communities have been built and mobilized in effort to improve food systems in each of the four communities.

PM-075  Poster  Evaluation of the appetite ratings by visual analogue scores (VAS) after consumption of a breakfast soft bread.

Gonzalez-Anton R, Rico MC, Sanchez-Rodriguez E, Ruiz-Lopez MD, Gil A, Mesa MD
1Department of Biochemistry and Molecular Biology II, Institute of Nutrition and Food Technology "Jose Mataix", Biomedical Research Centre, University of Granada, Granada, Spain
2Department of Nutrition and Food Science, Institute of Nutrition and Food Technology "Jose Mataix", Biomedical Research Centre, University of Granada, Granada, Spain
Objective: To evaluate the appetite ratings of a breakfast soft bread with a high content of fiber and protein.

2. Subjects and methods: Thirty healthy volunteers consumed an experimental soft bread enriched in fiber and protein (Paravita Breakfast®), as a breakfast, or a control breakfast consisted of sliced white bread (85 g), jam (10 g) and margarine (2 g) to adjust for energy density, fat and sugar density. Each breakfast was assessed in two different times. Appetite ratings were evaluated with a visual analogue scale (VAS). Subjects were instructed to consume the tested breakfasts within 10 min. The subjects immediately completed two VAS, one on breakfast palatability and another on appetite feelings. Appetite feeling VAS was repeated every 30 min until a total of 4 h had passed. Four hours later, an ad libitum lunch consisting of a standardized meal and water were provided. The subjects were instructed to eat until comfortably satisfied. Immediately, after the ad libitum lunch, volunteers completed the palatability and the appetite feeling VAS. Hunger and fullness-effective model (LMM) was used to compare areas under curve (AUC) calculated for both breakfasts. The Pearson’s coefficient was used to check the lineal associations between variables. P < 0.05 was considered significant.

Results: AUC hunger decrease tended to be greater after the intake of the breakfast soft bread (P = 0.055) whereas prospective consumption decrease was higher (P = 0.022). In addition, the postprandial time-course of the composite appetite score, as a global magnitude of satiety, was higher after intake of the experimental breakfast (P = 0.040). Although there was no difference between groups for the ad libitum lunch energy intake after the two breakfasts, there were significant relationships between energy intake and all appetite scores immediately before the lunch meal (at 240 min) (hunger: r = 0.452, satiety: r = -0.444, fullness: r = -0.394, prospective consumption: r = 0.528 and composite appetite score: r = -0.483, all P <0.001).

Key findings: The consumption of this experimental soft bread enriched in fiber and protein contributes to appetite control by reducing hunger, enhancing satiety feelings. These effects may be beneficial for the prevention of obesity and treatment of metabolic diseases as diabetes mellitus.

The present work was supported by PURATOS NV (contract no. 3725 signed with Flanders Enterprise General University Grant (IHC) and this trial is registered at clinicaltrials.gov asNCT02090049.
ple. We found a high variance in the beta-carotene intake values. Due to this is a pilot study, the mean values could be affected by the impact of extreme values. Studies with larger sample sizes should be conducted in order to perform further analysis of beta-carotene.

PM-079 Poster
Food consumption patterns in the Community of Madrid. Nutrition Survey of Madrid, Spain (LUCAM)

Objective: to analyze the consumption patterns of certain food groups according to age.

Methods: to evaluate the food consumption of the citizens of the Community of Madrid we used a food frequency questionnaire of over 161 foods. This survey was conducted in a representative sample selected by random sampling (N=1553).

Results: Cereals: consumed by 99.8%, the major percentages of consumption among the 18-34 years group (p<0.05). Highest consumption of pasta, white bread, and energy bars among the youngest, while whole wheat bread among those over 65 years. Dairy: consumed by 99.4%, the major percentages of consumption were in the group of over 65 years (p<0.05). Highest percentages of consumption of cream cheese, whole milk, natural yogurt and custard among the youngest; blue cheese, fermented milk with lactobacillus and cured cheese in the group of 35-64 years, skim milk, nonfat yogurt and fresh cheese among those over 65 years. Vegetables: consumed by 99.3%. The highest consumption percentages were in the group of 35-64 years (p<0.05). Legumes: consumed by 98.8% and group of 35-64 years showed the highest percentages (p<0.05). Fruits: consumed by 100%. The highest percentages were in those over 65 years (p<0.05). Meats and derivatives: consumed by 99.2%. The highest percentages of consumption of pork, pigeon, chicken, pork, chicken, p<0.05; hamburgers, p<0.01 and sausages, p<0.05, were among the youngest. Fish: whitefish, consumed by 95.3%, the major percentages of consumption were in those over 65 years, p<0.01. Fatty fish, no association was found. Canned foods consumed by 94.9%. The major percentages of consumption were in the group of over 65, p<0.01. Nonalcoholic beverages: consumed by 100%. Coffee, tea, soda and nonalcoholic beer were mainly consumed by the group of 35-64 years, while cola refreshments, low-calorie drinks and juices among the youngest.

Water: consumed by 99%, the major percentages of consumption were in the group of over 65. Alcoholic beverages: consumed by 74.6%. Whiskey and beer were mainly consumed among the youngest; cider and spirituous drinks in the group of 35-64 year, while wine among those over 65 years, p<0.01. Pre-cooked foods and ready-to-eat foods: consumed by 97.4%, high percentages among the youngest (p<0.01).

Conclusions: association between the consumption of certain types of food and age was found, emphasizing the consumption of low-fat foods and fruits those over 65 years; cereals, lean meats, precooked meals, refreshments, beer and whiskey among the youngest and fish, legumes and cheese in the group of 35-64 years.

PM-080 Poster
Salt and Trans fatty acid content of school meals served in public schools from the Autonomous Region of Madrid (Spain) 2009-2013: “School Meals Programme”

Objectives: to analyze the salt and trans fatty acids content of school meals served at public schools from the Autonomous Region of Madrid (Spain).

Material and methods: A total of 291 public schools attending children aged 6-9 years old were visited in these four years: 74 in 2009; 92 in 2010; 55 in 2011; 34 in 2012 and 36 in 2013. Blinded visits to schools conducted by dietitians/nutrition experts were carried out. A duplicate of the meals is served, and the same portion sizes served to the 6-9 year-old children was collected from the school canteens. The duplicate portion was chemically analyzed in an accredited laboratory (Axima Laboratorios) in order to determine protein content, lipids and polyunsaturated fatty acids (gas chromatography), carbohydrates (calculated) and sodium. Nutritional reports have been sent to the Education Council including: energy content, caloric profile, lipids profile, trans fatty acids, sodium and salt content.

Results: the average salt content per meal was 3.53±1.56g. This represents the 70.6% of the daily maximum recommended by World Health Organization (5 g per day) for the adult population in just one meal that should correspond randomly 30% of the total energy. If we compare between years, the values are the following: 3.72±1.22g in 2009; 3.16±1.16g in 2010; 3.46±1.16g in 2011; 3.12±1.03g in 2012 and 4.52±2.86g in 2013. Only 29 of the 291 meals analyzed showed sodium contents less than 45% of the recommendation whereas 28 showed sodium values higher than 90%. The average trans fatty acids content was 0.17±0.17g If we compare between years, the values are the following: 0.25±0.21g in 2009; 0.16±0.14g in 2010; 0.12±0.07g in 2011; 0.09±0.06g in 2012 and 0.15±0.22g in 2013. Recommended dietary intakes for trans fatty acids for children should reach less than 1% of the recommended energy intakes of this population (2.000 kcal). Only 2 meals covered the 0.5% of the recommended energy intake.

Key findings: Salt content school meals are still very high, that is why collective catering services should urgently work to lower the content. As for trans fatty acids content, it has to be considered to be very low, which represents a positive result for the menu evaluation in the observed period. In addition, positive changes have been observed for different nutritional markers (caloric profile, variety, food servings, etc) related to the school meals service from year 2000 when FEN started the School Meals Programme.

PM-081 Poster
Zinc supplementation in young children: a review of the literature focusing on contextual factors
Liberato SC, Singh G, Muhrland K

Background and aims: it is estimated that zinc deficiency is responsible for over 400,000 child deaths in Africa, Asia, and Latin America. This review examines the impact of zinc supplementation, administered prophylactically or therapeutically, on diarrhoea.

Methods: Relevant published articles were identified through systematic searches of electronic databases. Bibliographies of retrieved articles were examined for additional papers. Studies were only included if there was a control group not receiving zinc supplementation; included children from birth to 5 years old; participants received zinc supplementation either for treatment of diarrhoea or for prevention of diarrhoea; Outcomes of interest included diarrhoea outcomes (prevalence, incidence, stool output), respiratory infections, otitis media, anthropometric measurements and mortality were reported.

Results: A total of 38 studies met the inclusion criteria and were included in this review. The effect of prophylactic zinc was examined in 29 studies; 14, 7, and 18 examined diarrhoea outcomes, respiratory diseases and otitis media outcomes, anthropometric measurements, respectively. Prophylactic zinc has been shown to be effective in decreasing both prevalence and incidence of diarrhoea, reducing respiratory infections and improving growth in children with impaired nutritional status. There is less conclusive evidence of reduction in diarrhoea duration for diarrhoea severity. While prophylactic zinc decreases mortality due to diarrhoea and pneumonia, it has not been shown to affect overall mortality. Nine studies examined the effects of therapeutic use of zinc for treatment of diarrhoea: 9, 3 and 1 examined diarrhoea outcomes, respiratory infections outcomes and mortality. Therapeutic use of zinc for the treatment of diarrhoea in children has been shown to reduce diarrhoea incidence, stool frequency and diarrhoea duration as well as respiratory infections in zinc deficient children. However, stool output is only reduced in children with cholera. Less conclusive evidence exists for therapeutic zinc reducing mortality due to diarrhoea and respiratory infections.

Key findings: Although zinc has been included in diarrhoea management policies in many countries, there are no guidelines for intervention strategies to reduce zinc deficiency at the population level. It is hoped that this review will serve as a foundation for health workers in the field seeking to scale up nutrition interventions for reducing zinc deficiency in the field.

PM-082 Poster
Factors associated with adiposity in Brazilian elderly according to Body Mass Index and Body Adiposity Index
Ribero, Andréia Q; Fogal, Aline S; Longo, Gianna Z; Pessoa, Milene C; Franceschini, Sylvia C C; Novais, Juliana F.
Departamento de Nutrição e Saúde – Universidade Federal de Viçosa – Viçosa (MG), Brazil.

Objectives: to determine the factors associated with adiposity in elderly according to two anthropometric indices, Body Mass Index (BMI) and Body Adiposity Index (BAI). Material and Methods: Locally representative cross-sectional study carried out in 2009 was used as a set data. The sample size comprised 532 elderly residents in Viçosa, Minas Gerais, Brazil. Domiciliary interviews were conducted using a questionnaire containing sociodemographic and health variables. Weight, height, waist and hip measurements were obtained at the time of interview and subsequently the BMI and the BAI indexes were calculated. Sociodemographic, lifestyle characteristics, health status and functional ability were analyzed. Data analysis was stratified by sex and included simple frequency distribution, Student t test and analysis of variance (Bonferroni correction), in addition to multiple linear regression. The significance level was 0.05.
Poster PM-083

Food consumption assessment of students in a municipal public school in Goiânia, Goiás, Brazil.

Oliveira, I. G.1; Camará, A.b.g.2; Guimarães, M. M.1; Fábulade Nutrição - Universidade Federal de Goiás; 1 Prefeitura de Goiânia - Secretaria Municipal de Saúde - Distrito Sanitário Leste

Objectives: Assess activities results regarding nutritional education carried out with students from a municipal school located in the eastern region of Goiânia, Goiás, Brazil, partaking the Health in School Program.

Materials and Methods: The study was done between 2012 and 2013, in a municipal public school participating in the Health in School program. At first, in 2012, a nutritional and food intake assessment was done with 116 children between 6 - 12 years old, considering overweight and obesity prevalence (15% and 4.4%, respectively). Daily consumption of protective foods was found to be low, vegetables (7.76%), fresh fruits (34.49%), raw salad (35.18%) milk and derivatives (49.15%), with exception of beans, consumed daily by 88% of students. Foods considered of risk were frequently consumed, particularly soft drinks (20.6%), wafers, sweets and candies (18.96%), crackers and snacks (15.51%). Following, nutritional education activities were carried out through a ludic methodology, by use of plays for approaching the ten steps for a healthy eating. Finally, in 2013, a new nutritional and food intake assessment was carried out.

Anthropometric assessment comprised of individuals' weights and heights collection, and the body mass index for the age group was used as nutritional health parameter, with the cutoff points as established by the World Health Organization for those older than 5 years. Food intake was assessed through the Nutritional Vigilance System's food intake frequency questionnaire, which identifies the food intake frequency for both protective and risk foods in the last 7 days. The daily intake of protective foods was considered adequate, whereas risk food intake frequency should have been limited to a maximum of two days, as professor by the Brazilian Population Food Guide.

Results: 108 students aged between 6 - 12 years partook the activities. A decrease in the daily intake of protective foods such as beans (84.5%), milk and derivatives (44%), fresh fruits (33%), raw salad (24.2%), vegetables (66.6%), and an increase in risk food intake, particularly sweet cookies, filled waffles, sweets, candies (27.75%) and soft drinks (21.6%) was verified.

Key findings: Activities did not achieve the expected results in promoting the consumption of protective foods, possibly due to being specific, isolated activities. Finding suggests that a framework of actions to be carried out longitudinally, pervading disciplines, as means to a collective construction, might be more effective in reaching the students.

Poster PM-084

Children malnutrition inequality between two Brazilian poor regions

Regnemile Lima, Condo, Vil. University of Sao Paulo

Objectives: Estimate children malnutrition inequality between two Brazilian poor regions.

Material and Methods: The data are from the demographic and health surveys during the periods 1995-2005 in North and Northeast of Brazil. Malnutrition of children younger than 5 years of age was measured by height-for-age <2 Z-excores, with the World Health Organization (2006) data providing the reference. We assessed malnutrition inequality during periods through concentration curve and concentration index. The rank variable was building for principal component analysis, using 17 socioeconomic variables.

Results: The prevalence of malnutrition was 50.2% and 49.8% for 1996 e 2006 respectively. The concentration curve for under-five malnutrition variable takes higher values among poorer people in both years, the concentration curve stood above the line of equality. The farther the curve is above the line of equality concentrated the health variable among the poor. The concentration index was 0.011 and -0.057 in the two years respectively. The negative concentration index in 2006 reflects the higher concentration of stunting among poorer children than 1996.
people are more likely to adopt in their behavior from the environmental changes, including regulations on food labeling and interventions to promote healthy eating currently taking place in Mexico.

**PM-087**

**Evaluation of wasted hot foods distributed in the restaurant in the metropolitan region of Curitiba - Brazil: sustainability ensured?**

Auler, F.; Puchetti, J.M.; Ribeiro, CSG; Trellean, AN
Nutrition Undergraduate Program, School of Health and Biosciences. Pontificial Catholic University of Paraná. 11551 Imaculada Conceição Street, 1155, Prado Velho, Zip Code 80215-901, Curitiba, Paraná, Brazil.

Objective: According to national survey (POF 2008-2009), increased frequency of food outside the home was 35% in recent years, evidencing the interest for establishments offering variety, low cost, speed, autonomy in choosing what and how much is consumed. Waste exists in restaurants free consumption. Because to this, the aim of this study was to quantify the nutrition undergraduate professionals in food waste in the restaurant in the metropolitan region of Curitiba - Brazil.

Material and method: To conduct the survey in question were weighed 100% of hot preparations produced on the local for 30 days of study. After the production process of each preparation, all preparations were potted and their actual weights were identified. The clean and dirty scraps were quantified, in addition to food scraps on the plates of customers. Data analysis was also necessary to quantify the number of customers per day, plus the mean amount of food sales to customers. Through these data we obtained the average consumer and rest-intake, the analysis of the meal and weight of food consumption and waste and quantity losses by overproduction. To facilitate the analysis, were grouped foods that had prepreparation ingredients and ways of cooking in similar types of groups. Through these data we obtained the average consumer and rest-intake, and we could also estimate the percentage of food waste in the restaurant in the metropolitan region of Curitiba - Brazil.

Results: The average kilograms of food produced was 240 kg (SD 43 kg), average food waste produced and distributed in buffet 1.48% (SD 1.89%), and average food waste in tanks distribution was 37.5 kg (SD 14.4 kg). The average food waste was thrown into 40.8 kg and 16.8 kg rest-intake per day. Considering the total clients served on the local (n = 6510) and the amount consumed, it was possible to estimate that the per capita was 422 grams per customer.

Key finding: We conclude that, to be successful in an enterprise there is need for improvement in planning, reducing waste of raw materials, which apart from being a factor of financial sustainability for producers of dining establishments, also represents significant environmental impacts.

**PM-088**

**Right to Adequate Food and Health of children and adolescents in public schools: a local experience in Buenos Aires (Argentina).**

Graciano BA; Ventua AM*
CeSAC (Health and Community Action Center) Nº 41
decentralized Office of the Tertiary Public Ministry of Buenos Aires City

Objectives: This work focuses on the Right to Adequate Food and Health of children and adolescents in public schools in the City of Buenos Aires (especially in La Boca, a high per capita income neighborhood), and the violation of these rights. Its aim is to describe the joint work process between Health, Education and Justice on maltreatment in excess (overnutrition) at public schools and the responses that the Local State provides to this problem.

Material and methods: Anthropometry in children and adolescents in public schools; observations in schools during lunch time and recess; interviews with school directors and assistant directors; interviews with health professionals; and analysis of legal, political and social framework and its responses to the incorporation of children’s and adolescents’ rights to Adequate Food and Health (using as theoretical framework the International Human Rights Law).

Results: In the City of Buenos Aires (and specially in La Boca), anthropometry showed that more than one third of the students were overweight. However, this problem is “naturalized” by the school community (teachers, school directors and assistant directors, families) and different areas of government do not contemplate this health problem in their programs and actions, and do not implement the differential treatment that these cases deserve. The only signs found in lunch school programs, which provide special menus with a medical prescription. However, the public health sector lacks the operational capacity to complete comprehensive actions needed in all the schools. There are specific laws (Nº 2598/2007 and Nº 3704/2010) on school health and healthy eating in schools; this last one has only a partial implementation.

Key findings: The rights-based approach to Social Protection holistically face the problems of children and adolescents. Despite the co-responsibilities that families, society and State have; the State have an obligation to immediately meet the needs of food and health.

This work found that the State is not taking the actions that children and adolescents with overweight need in order to achieve their rights to adequate food and health. Intersectoral work is needed in order to jointly build a community that demand for their rights and fully access them.

**PM-089**

**Prevalence of abdominal obesity in Brazilian studies.**

Auler, F.; Rosa, CS; Nakashima, AT
Nutrition Undergraduate Program, School of Health and Biosciences. Pontificial Catholic University of Paraná. 11551 Imaculada Conceição Street, 1155, Prado Velho, Zip Code 80215-901, Curitiba, Paraná, Brazil.

Objective: Abdominal obesity is characterized by the accumulation of fat in the central or abdominal region of the body and is usually associated with metabolic abnormalities and greater occurrence of chronic diseases. To diagnose abdominal obesity anthropometric indicators are used. Based on the above, this study aimed to know the anthropometric indicators of abdominal obesity used in Brazilian studies.

Material and methods: The study was based on literature search of articles published between 2002-2012 and indexed by SCIELO. The keywords used were: “abdominal obesity”, “central obesity”, “android obesity”, “central obesity”, “waist circumference”, “waist circumferential”, “sagittal abdominal diameter”, “SAAD”, “waist / hip index”, “CRI”, “waist – hip ratio”, “WHR”, “waist-hip ratio”, “WTR”, “waist-height”, “WHt”. After the screening of articles, reading the summaries was taken considering the inclusion criteria (original article, population-based study conducted in schools, health centers or outpatient clinics, considering all age groups, with individuals of both sexes in any city in the country and in Portuguese language of Brazil) and exclusion (studies with pregnant women, postpartum women, renal disease, liver disease, mental patients with hereditary syndromes, HIV patients and review articles). Finally, the results were summarized and described, considering the prevalence of abdominal obesity, anatomical points to measure and cut points.

Results: In this study 54 articles were analyzed, and most studies have been conducted with adults (56%) and women (75%). The prevalence of abdominal obesity was determined in 43% of articles, and in the group of children and adolescents the prevalence ranged from 7.5% to 88.1% and among adults and elderly the prevalence ranged from 35% to 67%. The most widely used indicator was waist circumference (n = 48), with different cutoff points (range between 80 and 88 cm for women and 88 and 102 cm for men), despite having a national standard.

Key finding: We can observe the lack of standardization among Brazilian studies in the anatomical point and cutoff, which proved to wide variations in the prevalence of abdominal obesity.

**PM-090**

**Problem of allergic diseases in Polish children population. Is it connected with blood type?**

Maciejewska G.1; Rotkiewicz M.2; Schlegel-Zawadzka M.3
Institute of Physiotherapy, Faculty of Health Sciences, Jagiellonian University Medical College Kraków; 1
The Regional Outpatient Department of Pediatric Infection Diseases Hepatology Center of John Paul II Hospital in Kraków; 2
Institute of Public Health, Faculty of Health Sciences, Jagiellonian University Medical College Kraków; 3

Background and objectives: According to ISAAC, ECRHS and ECAP, Poland belongs to group of countries with very high incidence of allergic disease. Symptoms of allergy are present in 10-15% of children. The most common symptoms are atopic eczema, rhinoconjunctivitis and asthma. There are different studies indicating different prevalence of allergy in children compared to adults. There are no research done at the consulting rooms of physicians cooperating with the Polish help societies for children with asthma and allergic disease in the whole Poland.

Results: The most allergies present in the group of subjects with blood type A (44%) and blood type 0 (27%). Percentage of children with disease among males and females with the main criterion of blood type was significantly higher (chi² = 6.96; p = 0.03). Percentage of males with blood type AB and 0 and females with blood type 0 were different when compared to averages among Polish population. There were no relationship between the length and course of mother labour (chi² = 0.48; p = 0.49), medication taken through pregnancy (chi² = 1.77; p = 0.18) or during breast feeding period (chi² = 2.03; p = 0.87), and signs of allergy. However, there were significant statistical relationship between unevenfult pregnancy course and food allergy in infant, maternal allergy (allergies to pollen and food allergies) and signs of allergy in affected children. There is another significant relationship between the kind of feeding (bottle vs. breast), infants had received and symptoms of food allergy (chi² = 22.96; p = 0.0001) and Aero-allergy (chi² = 13.82; p = 0.0002) in children. Another statistically significant link exists between...
sensitivity/intolerance to breast milk when breastfed and development of allergy symptoms in children (chi2=16.72; p<0.01). In infants with blood types AB and B there was no relationship between blood type and sensitivity to breast milk. However, this relationship was statistically significant in children with blood types A and O (A type chi2=11.99; p<0.01; type O chi2=13.87, p<0.01).

Conclusion: Timing and type of food allergy symptoms is connected with the way the infants were being fed during first months of life and the blood type of affected individuals.

**PM-091**  
**Poster**  
**Prevalence of overweight and obesity and status of chronic non-communicable diseases in Egyptian adolescents.**  
Nebal A. Aboul Ell, PhD, Dina I. Shebab, MD, Mervat A. Ismael, MD  
Clinical nutrition department, National nutrition institute, Cairo, Egypt.

Objectives: are to study the current prevalence of overweight and obesity among Egyptians from 2000 to 2008, to estimate the prevalence of glucose disorders, hypertension, lipid profile, and metabolic syndrome, and to investigate some related risk factors among 10 to 18 years old school adolescents.

Materials and methods: For assessing prevalence rates of overweight and obesity among adolescents, data from reports of other cross-sectional studies carried out by NNI (2000-2005) and EDHS, 2008 were compared. To estimate the prevalence of glucose disorders, hypertension, lipid profile, and metabolic syndrome, a randomized stratified cluster-sample of preparatory and high school students was used. BMI was calculated and referred to corresponding international reference values for age and sex. A fasting blood sample was drawn to assess lipid profile and fasting plasma insulin.

Results: Overweight and obesity are prevalent among Egyptian adolescents of both sexes, and at least for girls the prevalence has increased in the last few years. Pre-diabetic state was present among 16.4% of adolescents. The crude prevalence of hypertension is 1.4%. The overall proportion of adolescents with high total cholesterol is 6.0%; the proportion with high LDL-cholesterol is 7.5%, with high triglycerides 8.2%, and with low HDL cholesterol 9.4%. The nationwide prevalence of metabolic syndrome among Egyptian adolescents is 7.4%. Regarding pattern of physical inactivity among adolescents by sex, about half of female and third of male adolescents did not practice any form of physical activity. With respect to tobacco use among adolescents, about two third of the adolescents were exposed to smoking by families and friends and about 7% were regular smokers. Also, among the results of this study, breakfast was skipped by almost 50% of adolescents. One third of students did not include basic food groups in their diet. Pickles and salt intake are high in nearly 25% of participants. More than 50% of adolescents reported fying as the usual way of cooking preferred by their families.

Conclusion: The problem of overweight and obesity appears to be emerging rapidly among this age group. Type 2 DM, hypertension and cardiovascular risk factors in young are serious in terms of morbidity and mortality suggesting that they are an appropriate target for screening. School-based programs promoting healthy eating, increasing physical activity and cessation of smoking are recommended for prevention of obesity and related diseases.

**PM-092**  
**Poster**  
**Evaluation of nutrition education program for prevention of type II diabetes among Egyptian children & adolescents.**  
Nebal A. A., Wafaa A. S., Dina I. S., Mervat A. I.  
National Nutrition Institute – Cairo – Egypt

Objectives: To raise the awareness of the students to the importance of protective role of healthy nutrition and lifestyle for prevention of T2DM and its complications and to evaluate their nutrition knowledge, anthropometric and laboratory results pre and post to Nutrition Education Program (NEP).

Material & Methods: 324 students (118 males and 206 females) were selected and representative of twenty eight (preparatory and secondary) schools in urban (143 adolescents) and rural (181 adolescent) areas. They were subjected to nutrition education process that was deliver nutrition education through a series of lessons and activities to the students. The process was continued for three months and conducted in three stages: Pre-program evaluation, NEP implementation and Post-program evaluation. The studied adolescents were subjected to clinical, anthropometric and laboratory assessments in the pre and post program period. The program consists of two modules that covered topics related to basics of nutrition and diabetes mellitus.

Results: This study revealed an impressive gain in knowledge among participants following the NEP implementation. The program has not successfully changed obesity and overweight percentages, however. A dramatic improvement in fasting blood glucose (FBG) level was elicited after the NEP as 16 out of 21 (76.0%) of the diabetics and 61 out of 104 (58.7%) of the pre-diabetics had normal FBG in the post evaluation phase. Lipid profile didn’t change significantly but 17.0% of participants had an increase in their high density lipoproteins (HDL-c) level in the post evaluation phase to be re-categorized in the acceptable range.

Conclusion: The results of this study suggest that patients who are at risk for T2DM should be screened early and treated aggressively to prevent the onset of the T2DM whenever possible. The short-term changes observed in the present study are markedly encouraging and indicate great potential for progressive improvement.

**PM-093**  
**Poster**  
**Cardiovascular risk profile of Brazilian vegetarians.**  
Pimentel, c. 1 · 2; Philippi, s. 1 · 7; Simionetta, v. 1; Ro, f. 2; Tedorovic, e. 3; Siewrc, e. 4  
1. University of São Paulo  
2. Paulista University  
3. University Federal of ABC  
4. University Federal of São Paulo

A total of 96 healthy subjects (56 vegetarians and 40 omnivores) were recruited. Fasting blood samples were analyzed for glucose, insulin, cholesterol, triglyceride, high-density lipoprotein cholesterol (HDL-C) and low-density lipoprotein cholesterol (LDL-C). Health-conscious was determined by smoking habits, taken of dietary supplements and physical activity. In order to assess cardiovascular risk, Total/high-density lipoprotein (HDL-C) cholesterol and LDL/HDL cholesterol ratios were calculated. Insulin Resistance (IR) was assessed by HOMA-IR. We undertook that study to examine the total cardiovascular risk profile of Brazilian vegetarians.

Results: There was no significant difference in age, sex, smoking habits, triglyceride, cholesterol and LDL-C between the two groups, whereas the Total/high-density lipoprotein (HDL-C) cholesterol (3,23 ± 0,84 vs 3,90 ± 0,99, p<0,001) and LDL/HDL cholesterol (1,91 ± 0,69 vs 2,42 ± 0,79, p<0,001) ratios were significantly lower in vegetarians than omnivores. The vegetarian group had significantly lower body weight (63,9 ± 10,4 vs 69,4 ± 14,8 kg, p=0,032); BMI (22,5 ± 2,6 vs 25,0 ± 3,9 kg/m2, p=0,011); waist circumference (81,8 ± 8,2 vs 88,7 ± 10,9 cm, p=0,003) and higher HDL-C (54,88 ± 14,44 vs 47,30 ± 12,27 mg/dl, p=0,008). The vegetarians also had lower risk for IR by HOMA (1,17 ± 0,70 vs 1,48 ± 0,8, p=0,021) compared to omnivores. In relation to health-conscious, vegetarians have a tendency to practice more physical activity (64,3% vs 42,5%, p=0,056) and take more dietary supplements (48,1% vs 20,5%, p=0,012), although the number of smokers were similar in both group.

Conclusions: Brazilian vegetarians have lower body weight, BMI and waist circumference and high level of HDL-C than omnivores. Total/high-density lipoprotein (HDL-C) cholesterol and LDL/HDL cholesterol ratios are risk indicators with greater predictive value than isolated parameters used independently. Particularly, LDL-C, so owing to different predictive value of each risk factor, the Brazilian vegetarians had a better cardiovascular risk profile than omnivores. Vegetarians are health-conscious, deliver nutritional education and may potentially provide metabolic and cardiovascular protective effects.

**PM-094**  
**Poster**  
**Post-launch monitoring of novel foods/ingredients: Methodology applied to additive Stevia.**  
Bevers MCC, Hendriksen MAH, Nikerk EM, Tomme EHM, van Raaij JMA  
International Institute of Public Health and the Environment (RIVM), Bilthoven, the Netherlands

Objectives: In Europe novel foods and novel food ingredients (NF) need to be approved before entering the European market. Companies must provide a safety dossier including an estimation of the expected use and intake. In the Decision of the European Commission to the company, it is indicated in what products and to what levels the NFs are admitted. Subsequently, other companies may ask permission to introduce similar NFs. As a consequence, the actual use of a NF might become substantially larger than initially thought, meaning that safety of a NF might no longer be guaranteed. How may novel foods or ingredients be monitored after launching?

Materials and methods: We developed an approach to monitor in what foods and to what levels a NF has been introduced to the Dutch market (post-launch monitoring). We developed a flow-chart which consists of 7 steps: the first 4 steps have to do with the identification in what foods a NF is currently on the Dutch market; the last 3 steps deal with the quantification of the level of NF used. We applied the newly developed method to the additive Stevia Rebautiana. This natural sweetener is added among others to tabletop sweeteners, flavoured drinks, and milk drinks. In the European Union Stevia is an approved additive (and not officially approved as novel food). The method has appeared to be feasible and per May 2013 the pre-extract steviol glycosides was identified in 37 brands on the Dutch market.

Results: With two scenarios we estimated the intake of Stevia in the Dutch population: the worst-case scenario and the ‘25%-market share’ scenario. The worst-case scenario assumes that all food products in those food categories to which the novel food ingredient is actually added, contain the novel food ingredient and to the maximal reported or measured level.
In this scenario, the Acceptable Daily Intake (ADI) for Stevia was exceeded in less than 5% of the children and in less than 9% of the adults. The 25%-market share scenario gives a more realistic estimation of daily intake. In this scenario, the ADI was exceeded in less than 3% of the children and adults. Main contributor to daily steviol glycosides intake for children is water-based flavoured drinks, on a large distance followed by milk drinks and tabletop sweeteners, and for adults tabletop sweeteners followed by water-based flavoured drinks.

Key findings: We conclude that the developed approach seems to be feasible to estimate actual intake of approved NFs (or approved additives). It is unclear whether exceeding the ADI to the observed levels can involve health effects. Regular monitoring is warranted, especially because it is expected that Stevia will be added to more foods and in higher concentration levels (up to the permitted levels).

PW-095  
**Poster**  
**Body fat, inflammation and cardiometabolic risk in Cuban adolescents**  
Ruiz-Alvarez V; Hernandez-Triana M; Díaz-Sánchez ME; Lanyau-Domínguez Y; Hernández-Hernández H; Martínez-Turts et al.  
Department of Biochemistry and Physiology, Instituto of Nutrition, Havana, Cuba

Background. Overweight (OW) is highly prevalent in Cuba but there is a lack of data in adolescents.

Main Objective: To identify possible associated factors with increased body fat.

Material and methods. A case control study was carried out in 50 OW vs. 50 normal adolescents matched by age and sex and submitted to records of body composition by deuterium dilution, epidemiological recall, blood pressure, biochemical indicators, physical activity by PAQ-A questionnaires, 24 h dietary recall, and cardiometabolic risk. Groups were compared using non-parametric tests and the associations with X' independence analysis and non parametric correlations. The Cohen's effect size (g) was used to evaluate means differences.

Key findings. OW adolescents showed 20 kg more Wt, a 40% higher BMI, and 48% more fat than controls of similar age (13y), height (162 cm) and sexual maturity. Fat accretion was accompanied by higher serum lipids, insulin, HOMA IR, C Reactive Protein, IL-6, TNF-α, blood pressure, and cardiometabolic risk. They had more than 4 portions of fast foods/week. OW adolescents ingested more energy (26%), proteins (27%), and fat (36%) mainly as animal products, only 25% of the dietary fiber DRIs, and 7.2 times more sugar (21% of energy) and sodium (3-4g) as recommended. Their total plasma antioxidant capacity (TAC) was also higher. Variables associated to their higher cardiometabolic risk (+1.8 vs. -1.8) were serum lipids, glycaemia, insulin, HOMA index, body fat, PCR, IL-6, TNF-α, and the dietary intake of energy, macronutrients and micronutrients. HB and serum HDLC were inversely associated to OW.

The logistic regression showed OW not associated with birth weight, mother BMI at conception or physical activity, but with a higher energy intake (p=0.000; OR:1.03; CI: 1.00-1.04), their fathers overweight (p=0.021; OR:1.02-1.17), and the dietary intake of energy, macronutrients and micronutrients. The lifestyle characterised by sedentary behaviour and obese/obsgesic food habits seems to affect more the susceptible adolescents with a familiar predisposition to body fat accretion. Their increased TAC, generated by the increased nutrient intake was not able to avoid the enhanced cardiometabolic risk.

PW-096  
**Poster**  
**Mate consumption: a popular tradition in Uruguay present in the new generations.**  
Fajardo G1, Sena G1, Ruffo C1, Marino Donangelo C1, Delta Sandra A P1  
1Escuela de Nutrición- Universidad de la República. 2Instituto Polo Tecnológico de Pando, Facultad de Química, Universidad de la República

Objective: To determine the pattern of mate consumption in teenagers students in the Department of San José, Uruguay.

Material and Methods: Descriptive, cross-sectional study of a non-random sample of 49 students between 14 and 19 years of age attending a Technical School in San José, Uruguay. The information was collected through an online self-administered survey. Consent of a responsible adult and the student's assent were required. Registration and submission of the questionnaire was done via internet through a blog designed for the purpose.

Results: Mate is a traditional beverage in Uruguay made by infusion in hot water of dried and ground leaves of ilex paraguariensis and drank with a metal straw (“bombilla”). The receptacle used is usually a gourd made from the fruit of Legneria vulgaris. Mate was consumed by more than half of the respondent students (67.3%), particularly by females. Among those drinking mate, 54.5% started this habit at 9-13 years of age, and 15.2% at 4-8 years of age. 25% acquired this habit at home. The main reason for consuming mate was flavor, followed by the feeling of well being. Nine out of ten consumed mate daily, 57.6% drank between half a liter and 1 liter of the infusion per day. 10% used very hot water, 43.1% preferred the bitter natural flavor, which is due to the tannins of the mate leaves, while 15.2% used sweeteners. Most of the students (60.4%), consumed plain mate leaves while the rest used a combination of mate leaves and other medicinal herbs. The afternoon was the preferred time of day for consumption. More than half consumed mate in the company of friends and family, and 50% ate cookies and/or pastries at the time of mate consumption.

Conclusion: The amount and patterns of mate consumption in this population age group in Uruguay indicate the need of further studies of the potential nutritional and health effects. Mate consumption has a social and emotional role which is transmitted throughout generations.

PW-097  
**Poster**  
**Fruit and meat intake are associated with oxidative damage in DNA.**  
Marchioni, DML; Carvalho, AM; Carioca, AAP; Fisberg, RM  
University of São Paulo, School of Public Health, Department of Nutrition

Objectives: To verify the association among fruit, meat and heterocyclic amines from meat intake and oxidative damage in DNA.

Material and methods: Data were sample from 72 adults and elderly from the Health Survey of Sao Paulo, Brazil (SA-2008). Fruit and meat intake was estimated by a 24-hour dietary recall (24HR) and a detailed food frequency questionnaire with preferences of cooking methods and level of doneness of meats. The heterocyclic amines intake was estimated linking the meats from 24HR to a database of heterocyclic amines. The oxidative damage was estimated by concentration of 8-Oxo-dG (80HdG) in plasma. The relationship among the variables was done by Pearson's correlation test. Multivariate linear regressions models were used to verify associations among the dependent variable (80HdG concentration) and the following independent variables: meat intake; fruit intake; heterocyclic amines intake; ratio of fruit and meat intake; ratio of fruit and heterocyclic amines intake; adjusted by sex, age, energy intake, smoking and body mass index.

Results: The mean intake (=0.03; p=0.780) and heterocyclic amines (r=0.11; p=0.339) were not correlated with 80HdG. However, fruit intake (r=-0.31; p=0.007), ratio of fruit and heterocyclic amines intake (r=-0.37; p=0.022) and ratio of fruit and meat intake (r=-0.38; p=0.001) were correlated with oxidative damage in DNA. After models adjustment, fruit intake (β=-0.0005; p=0.047), ratio of fruit and heterocyclic amines intake (Β=-1.970; p=0.015) and ratio of fruit and meat intake (β=-0.123; p=0.011) were associated with concentration of 80HdG in plasma.

Conclusion: Fruit intake, ratio of fruit and meat intake, and ratio of fruit and heterocyclic amines intake were associated with 8HodG, showing that high fruit intake and low meat and heterocyclic amines intake can be efficient in prevention of oxidative damage, and cancer.

Key-words: fruit; meat; heterocyclic amines; oxidative damage; prevention. Researches relating to this abstract were funded by Municipal Health Secretariat of Sao Paulo, National Council of Technological and Scientific Development and Sao Paulo Research Foundation (no2012/10965-0).

PW-098  
**Poster**  
**Food and nutrition research in the Family Health Strategy, Brazil.**  
Vasconcelos, I.A.L.; Santos, L.M.P.  
1Nutrition Department, University of Brazilia, Brazil. 2Collective Health Department, University of Brazilia, Brazil

The Family Health Strategy was implemented in Brazil in 1994 as a political initiative to transform the public health care system. It focuses on prevention and health promotion. It includes the need to propose and implement actions on food and nutrition field.

Objective: to trace the profile of the research groups and publications focusing on nationwide food and nutrition-related interventions, diagnosis, or assessment in the context of the Family Health Strategy since 1994.

Material and Methods: Two methods were used: structured review and research group search. A Structured Review was conducted according to the systematic review principles of the Cochrane Collaboration and the
searched databases were Web of Science, Medline, Lilacs, SoCLEO and Embase. The following variables were collected: author, journal, and publication year, location; population; classified according to the municipality size by the Brazilian Institute of Geography and Statistics; Family Health Strategy coverage; the Municipal Human Development Indices; study design, methods, sample size, and target population; study objective/theme; education of the first author; and the degree of nutritional intervention or management. The research groups were searched in the Research Group Directory of the National Council for Scientific and Technological Development.

Results: Fifty-four original articles on some type of Family Health Strategy action related to food and nutrition were analyzed. They were published between 2002 and 2012 in 20 different journals. Focusing mostly on children from the Southeast region, these studies were coordinated by dieticians, nurses, and physicians. Thirty-one municipalities had Family Health Strategy coverage higher than 50%; and of these, 20 had Family Health Strategy coverage higher than 70%. Disease Melitheat, high blood pressure, and breastfeeding were the most common topics (n=23).

The quantitative methodology was employed by 42 articles, most about diagnoses. The groups who explicitly cited primary care as a study field of food and nutrition numbered two in 2000, eight in 2002, eleven in 2004, 18 in 2006, 22 in 2008, 24 in 2010, and 26 when the database was consulted. Some groups focused at least one research line in food and nutrition within the Family Health Strategy: one in 2002, two in 2004, three in 2006, four in 2008, seven in 2010, and four in the database.

Key findings of this structured review indicate that few studies focused on food and nutrition in the Family Health Strategy, probably because of the existence of few research groups in the country.

Objective: Chronic kidney disease causes a progressive and irreversible loss of renal function. We investigated the therapeutic effect of sesame oil, a natural nutrient-rich and potent antioxidant, on deoxycorticosterone acetate (DOCA) and 1% sodium chloride solution (DOCA/salt) induced chronic kidney disease in rats.

Material and methods: Chronic kidney disease was induced by subcutaneously injecting uni-nephrectomized rats with DOCA and 1% sodium chloride in drinking water. Four weeks later, the rats were gavaged with sesame oil (0.5 or 1 ml/kg/day) for 7 days. Renal injury, histopathological changes, hydroxy radical, peroxynitrite, lipid peroxidation, Nrf2, osteopontin, and nuclear collagen deposition were assessed 24 h after the last dose of sesame oil. Results: Blood urea nitrogen, creatinine, urine volume, and albuminuria were significantly higher in the DOCA/salt treated rats than in control rats. Sesame oil significantly decreased these four tested parameters in DOCA/salt treated rats. In addition, the creatinine clearance rate was decreased in nuclei Nrf2 expression, were significantly decreased in the DOCA/salt treated rats compared to control rats. Therapeutic sesame oil significantly decreased hydroxy radical, peroxynitrite level, lipid peroxidation, osteopontin, and renal collagen deposition, but increased creatinine clearance rate and nuclear Nrf2 expression in DOCA/salt treated rats.

Key findings: Sesame oil therapeutically mitigates DOCA/salt induced chronic kidney disease in rats by activating Nrf2 and attenuating osteopontin expression and inhibiting fibrosis in rats.

In the last decades, tourism has become one of the most prominent sectors of the national economy, contributing to the increase in GDP. Although Lanzarote is not considered as a "culinary tourism" destination, the island has a good, varied and qualified offer in restaurants. The objective of this study is to analyze the nutritional assessment of restaurants and establishments frequented by tourists by observing the type of food offered, for further analysis, and to propose changes if necessary. We understand that food, as a tourist attraction and as a tourism product, can produce and transform territories as well as promote regional development based on sustainable tourism.

This project's justification is based on the need of food-related tourism analysis. As a different elements part of host communities, it can be used by tourism from planning to management. We part from the hypothesis that the tourist menus offered, do not match healthy diet parameters. The methodology focuses on a previous literature review, observation, interviews and a signing technique in restaurants and other facilities frequented by tourists in areas of Puerto del Carmen, Playa Blanca, Costa teguise, Arrecife and other resorts in Lanzarote island. We have based on analysis-synthesis, induction - deduction and statistical method. Type of study: Cross-sectional, horizontal and descriptive, trying to estimate different nutrients proportions and to identify correlations and, if possible, some kind of causality. A comparison will be made with a healthy balanced diet. Once the nutritional assessment is made, results will be compared with reference diets such as the Mediterranean, noting differences and similarities.

Introduction: Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food for a healthy and active life. In Ethiopia over 12,000,000 people are chronically or sporadically food insecure. This study can help to inform policy makers the level and predictors of household food security status in urban and rural areas.

Objective: to assess levels and predictors of food insecurity among urban and rural households in Kombolcha woreda, Eastern Harerge zone, Eastern Ethiopia 2014.

Methodology: Cross sectional study was conducted from January 7 to 16; 2014. One urban and five rural wards known for their Khat and vegetable.
maize-soy and soy-sorghum production (Livelihood zones) were included in the study. Using stratified sampling 144 urban and 570 rural, a total of 714 households were selected. Two tools, Household Food insecurity access scale and Household dietary diversity score were used for data collection. Descriptive summary and Cross tabulations using Analysis of Variance, independent sample t-test, were performed. Finally hierarchi- cal linear regression was run after the assumptions were satisfied.

Findings: The Proportion of households that fall in food insecurity category was accounted for 74.6 percent (81.5 percent rural and 47.9 percent urban residents). Using household dietary diversity score, 61.7% rural households and 26.4% urban households had poor dietary diversity hence, food insecurity. There was significant difference in mean household food insecurity access scale and household dietary diversity with respect to gender of household heads among urban household. There was also significant difference in mean household dietary diversity of urban and rural households with respect to vegetable garden ownership, but not for household food insecurity access scale. The most important predictor of food insecurity for rural residents measured by both tools was wealth index and livelihood zones. Using household dietary diversity and household food insecurity access scale the most important predictor of food insecurity among urban household was vegetable garden ownership and women occupation respectively. In general food insecurity magnitude was greater among rural households than urban and there was also difference in magnitude of food insecurity among livelihood zones. Even though this place is known for its cash cropping, the state of food insecurity is not different from major food crop producing areas of the country.

PW-103
Poster
The Effect of Carob Flour on Blood Lipid Profile in Adults.
Fincanmetoglu ES,1 Peskan G,1 Aksoy M.1
1Ministry of Transport Maritime Affairs and Communications, State Airports Administration, Ankara, TURKEY; 2Hacettepe University Faculty of Health Sciences, Nutrition and Dietetics Department, Ankara, TURKEY. 3Bahtiyar University Faculty of Health Sciences, Nutrition and Dietetics Department, Istanbul, TURKEY.

The aim of the survey is to find the effect of consuming 10 g/day of carob flour on the blood lipid profiles of 20 adults (35-60 years old, 10 male and 10 female), with high triglycerides (2360 mg/dL) and/or total cholesterol (220 mg/dL) and whose body mass index (BMI) levels were above 25 kg/m². At the beginning of the study, dietary intake recaps were determined for two days (one day for weekend and during the week) and biochemical measures were assessed three times (at the beginning, first month and second month). Out of total, 80.0% of females and 70.0% of males were classified as overweight according to BMI classification and 40.0% of males and 80.0% of females were physically inactive (p>0.05). Total fat, monounsaturated fatty acids (MUFA) and total cholesterol intakes of males were higher than females during the weekends (p<0.05). Dietary fibre intakes were higher during the week, both in males and females (p<0.05). Daily carob flour consumption reduced total cholesterol level by 7.89±13.03% in the first month and 13.72±13.36% in the second month (p<0.01). Also statistically significant decrease was determined in total serum lipids by 14.89±16.09% (p<0.01). Significant decrease in serum triglycerides level was determined in males but not in females (p>0.05). Low density lipoprotein (LDL) cholesterol levels were decreased (both gender: 1st month: 8.90±23.25 and 2nd month 13.09±14.77 mg/dL; males: 13.27±17.34% and females: 12.90±12.63% (p<0.05). No significant differences were found in high density lipoprotein (HDL) cholesterol, LDL/HDL cholesterol ratio, Apo A-I levels increased only in females (p>0.05). No significant changes were determined in Apo B-100 and total serum bilirubin levels (p>0.05).

PW-104
Poster
Combined effect of cardiorespiratory fitness and sedentary behavior on overweight among adolescents.
Franceschin, MI; Moraes, MM; Veiga, GV.
Universidade Federal do Rio de Janeiro.

Objective: To investigate the combined effect of cardiorespiratory fitness and sedentary behavior on overweight in adolescents.

Materials and Methods: Data from 1015 adolescents aged between 13 and 19 years old, from two public and four private schools of the metropolitan region of the city of Rio de Janeiro, Brazil, participants of the baseline of Longitudinal Study of Adolescent Nutritional Assessment (ELANA project) were analyzed. Cardiorespiratory fitness (‘risk’ and ‘adequate’) was assessed based on the 9 minutes running and walking test; sedentary behavior was defined as 2 or more hours of television viewing time. Overweight was defined by the sex-age-specific body mass index cut-off (weight/height²) based on World Health Organization criteria (>1 Z-score).

The categories of cardiorespiratory fitness and sedentary behavior were combined into a new variable with 4 categories: a) risk and sedentary, b) adequate and sedentary, c) risk and no sedentary; d) adequate and no sedentary. Binary logistic regressions were carried out and associations were expressed in terms of odds ratio and its 95% confidence interval. Results are stratified by sex, age and type of school. Results: The prevalence of overweight was 27.2% and 53.6% presented cardiopulmonary fitness risk and sedentary behavior. Compared to this category, considered the worst case scenario for association of overweight and having same cardiorespiratory status but no sedentary behavior was 0.55 (CI95% 0.35-0.88) for girls, 0.64 (CI95% 0.45-0.92) for adolescents aged from 15 to 19 years old and 0.91 (CI95% 0.39-0.97) for students from private schools.

Findings: The prevalence of overweight was high and most teens at cardiopulmonary fitness risk and sedentary behavior suggests inactive lifestyle. Regardless the cardiorespiratory fitness status, not having sedentary behavior protects adolescents from being overweight, i.e. sedentary behavior is an important issue on strategies to prevent overweight among teenagers.

Nutri Ventures is the first children’s entertainment brand in the world developed exclusively to promote healthy eating. Nutri Ventures works by creating a positive environment so that children, from 4 to 10 years old, will associate good feelings with healthy food.

The objective of this project is to transform the Nutri Ventures adventures, a major cartoon success on TV, into a free of charge educational tool to promote healthy lifestyles, called the “Nutri-Guardians Project”. It’s an educational project targeted to all education and health professionals dealing daily with children from 4 to 10 years old, such as teachers, nutritionists, dietitians, nurses and medical doctors. All the materials are grouped into kingdoms of nutrition (similar to the divisions of the Portuguese Food Wheel) plus evil kingdoms (sugars, fats, fried foods and salt) so that it’s easy to professionals to present these issues to children. Health professionals can have access to a specific area where they can find support materials such as diplomas, food diaries, nutrition messages, posters and videos which can be used in clinical settings.

Parents can have access to all the information about the Nutri Ventures project, as well as professional advices about nutrition, tips and recipes at home with the kids. They can also learn about the story of Nutri Ventures and change the way they talk about food with their children, with the “Nutri-Translator”. With this tool they can check the meaning of the Nutri-Words that their children are using and apply them to daily conversations about food.

At the moment, the “Nutri-Guardians Project” is being implemented in Portugal with the support of the Ministries of Health and Education. Educational materials are offered through a free website and promoted by direct actions in schools. It is now available for more than 750,000 children in the country. Also in the USA, Nutri Ventures has signed an agreement with Partnership for a Healthier America (PHA), a nonprofit organization chaired by the First Lady Michelle Obama under which all 29 episodes of the series, along with educational materials, music videos and other digital features, will be made available for free to nearly 60,000 public elementary schools. “Nutri-Guardians” is to be implemented also in Brazil and Hungary, always through partnerships with Ministries and Education Associations.

This project is proving that entertainment can be associated with education without losing a sense of commitment to quality information and scientific based evidence.

PW-105
Poster
The nutri-guardians project – joining nutrition education and entertainment at global level.
Graça, P; Sousa, S.M; 3, Gomez, A.C.C.; 4, Monteiro, S.B; 5, Carvalho, R; 6, Lima, R.M. 4
1Directorate-General of Health, DGS; 5, Faculty of Nutrition and Food Sciences, Porto University; 6, Nutri Ventures Corporation; 3, Directorate-General of Education, DGE.

This project is proving that entertainment can be associated with education without losing a sense of commitment to quality information and scientific based evidence.
Methods: Using data from the Korea National Health and Nutrition Examination Survey I (1998) to V (2010-2012), we selected the adults aged ≥ 30 yr who participated in both a health examination and health interview survey. Results: From 1998 to 2012, significant decrease in the prevalence of hypertension was observed in both men (32.5 to 31.5%) and women (26.9 to 24.3%). Similarly, the prevalence of hypercholesterolemia significantly increased from 7.2% to 12.6% for men and from 8.4% to 14.9% for women, whereas the rates of awareness and treatment for hypercholesterolemia were relatively lower than that of hypertension and diabetes. During the period, prevalence of obesity significantly increased from 26.8% to 38.1% only in men. Conclusions: The increased prevalence of hypercholesterolemia and obesity may have contributed to the increasing trend in the mortality from coronary heart disease in Korea. Further population-based surveillance of blood cholesterol levels and obesity needs to be performed to inform strategies for improvement of these factors should be established in Korea.

Trends in energy intake among Korean adults: Results from the Korea National Health and Nutrition Examination Survey (KNHANS) from 1998 to 2012.

Yun S, Kim HI, Won Oh K
Division of Health and Nutrition Survey, Korea Centers for Disease Control and Prevention, Cheongwon, Korea

The objective of this study was to examine trends in energy intake among Korean adults from 1998 to 2012. This study included subjects who were 19 years and over and who completed the nutritional survey in the Korea National Health and Nutrition Examination Survey I (1998, 2001, 2005, 2007, 2009 and 2010-2012). Nutritional information was obtained from 1-day 24-hour recall administered by a trained dietary interviewer. In men, mean daily intakes of total energy significantly increased from 2196 kcal for 1998 to 2457 kcal for 2010-2012 (p for trend<.0001). In contrast, mean daily intakes of total energy of women decreased from 1748 kcal for 1998 to 1721 kcal for 2010-2012 (p for trend=0.0001). The percentage of energy from fat increased (from 17.3% for 1998 to 20.0% for 2010-2012 in men, p-for trend<0.001; from 16.0% for 1998 to 18.5% for 2010-2012 in women, p for trend<0.001), whereas the carbohydrate intake (from 66.9% for 1998 to 64.8% for 2010-2012 in men, p-for trend<0.001; from 69.2% for 1998 to 67.1% for 2010-2012 in women, p for trend<0.001) decreased. Energy intake and expenditure. Thus, it may have contributed to the increasing trend in the prevalence of obesity.

Latin American Survey of Nutrition and Health Study (ELANS): Study design.

Fisberg M.1,2, Koiväry L.3, Gómez Salas G.3, Rigotti A.4, on behalf of the ELANS Study Group
1Instituto Pasten – Fundación José Luis Eguioy Setubal – Hospital Infantil Sabar - São Paulo, Brazil. 2International Life Science Institute (ILSI) – Buenos Aires, Argentina. 3Instituto Pasten- Fundação José Luiz Egydio Setubal - Hospital Infantil Sabar - São Paulo, Brazil. 4Departamento de Nutrición, Diabetes y Metabolismo, Centro de Nutrición Molecular y Enfermedades Crónicas - Pontificia Universidad Católica - Santiago, Chile

Objectives: To present the design rationale of Latin American Survey of Nutrition and Health Study / Estudio Latinoamericano de Nutrición y Salud (ELANS), with particular emphasis to its quality control procedures and recruitment processes.

Material and methods: ELANS is a multicenter cross-sectional study of a representative sample of urban population from 8 Latin American countries (Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Peru and Venezuela). A standard study protocol was designed to investigate anthropometric profile, nutritional intake, and physical activity of 8,000 subjects enrolled. The study was based on complex, multistage sample design, stratifying by regions and using all regions of each country represented, and random selection of main cities within each region according to probability proportional to size method. Sample will be stratified by gender, age (15 to 65 years old), and socioeconomic level. Socioeconomic levels will be balanced and divided in three strata (high, medium and low) based on national indexes used in each country. All the study sites are university-based and will adhere to a common study protocol for training, implementation of fieldwork, data collection and management, and quality control procedures to be performed simultaneously. All participants will be required to provide a written informed consent. A pilot study at small scale will be performed in each country in order to test procedures and tools involved in ELANS. Anthropometric variables, including body weight, height, waist, hip and neck circumferences will be measured according to a standardized protocol. Nutritional intake evaluation will be performed using the two 24-hour dietary recalls, with "multiple pass" procedure and a food frequency questionnaire. Nutritional data will be entered in Nutrition Data System for Research (NDS-R, Minnesota University) after a harmonization process between local foods and NDSR database. Physical activity and energy expenditure will be assessed by IPAQ-long version questionnaire and 7-day accelerometry.

Physical Activity and Energy Expenditure in an Urban Latin American representative sample: The ELANS Study Methodology.

Koiväry L.3; Fisberg M.2,3; Herrera M.4; Yépez M.C.G.1; Pareja R.G.4; on behalf of the ELANS Study Group
1Escuela de Nutrición, Universidad de la República. 2Maestría en Nutrición, Universidad Católica del Uruguay. 3Instituto Pasten- Fundación José Luiz Egydio Setubal - Hospital Infantil Sabar - São Paulo, Brazil. 4Departamento de Nutrición, Diabetes y Metabolismo, Centro de Nutrición Molecular y Enfermedades Crónicas - Pontificia Universidad Católica - Santiago, Chile

Objectives: To characterize the methodology of data collection for determination of objective- and objectively-measured physical activity, sedentary time and energy expenditure in a representative sample of adolescents and adults from eight Latin American countries.

Material and methods: The study evaluates 8,000 subjects (15 to 65 years, both genders and from 3 socioeconomic strata) participating in the Latin American Survey of Nutrition and Health Study / Estudio Latinoamericano de Nutrición y Salud (ELANS), a cross-sectional study that will be performed in 8 Latin American countries (Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Peru and Venezuela). Objective and subjective measurements will be taken according to standardized procedures.Self-reporting of physical activity will be assessed by the International physical activity Questionnaire (IPAQ-long version) in four domains (at work, transportation, housework and leisure-time). The time total engaged in walking, moderate physical activity and vigorous physical activity will also be scored. Information not included as part of the summary score of physical activity such as sitting activities will be also estimated. According to the International physical activity Questionnaire (IPAQ-long version) in four domains (at work, transportation, housework and leisure-time).

Good practice in nutrition education programs, the Uruguayan case.

Saravia L., De León C
1Escuela de Nutrición, Universidad de la República. 2Maestría en Nutrición, Universidad Católica del Uruguay

The increase of nutritional diseases in latin america is a major preoccupation for governments, professionals and scientists that cannot find a solution for this problem. Nutrition education seems to be one of the resources that professionals have, to revert this situation. The VI Workshop of the iniciativa América Latina y Caribe sin Hambre (IALCH), from the Food and Agricultural Organization (FAO), established the need of creating a data bank of information, communica-
tion and nutrition education (ICEAN) programs to analyze them and to define good practices in nutrition education.

In order to meet these goals, a study was developed in 18 countries; Uruguay was one of the countries included studied.

Objectives: 1. Identify the ICEAN programs developed in Uruguay. 2. Identify the good practices in ICEAN programs and the success actions in each of them. 3. Identify human resources that work in those programs and the training that they have.

Material and methods: 1. A list of public and private institutions that have ICEAN programs was made and each one of them respond an intervention. To be included in the study, the ICEAN programs must fulfilled five requirements: they must be community and/or education programs, they should have a nutrition and alimentation approach, they must be in the implementation phase or be implemented in the last 5 years, they should have at least 100 beneficiaries and they must include evaluation.

2. With the results of the interviews, the programs were cataloged as having good practices or not, using a 12 item list provided by the IALCH. 3. The deans of the nutrition careers were interviewee and they respond about the teaching of nutrition education to future professionals.

Results: 18 ICEAN programs of Uruguay were interviewed and 12 met the inclusion criteria to the study. Just 7 of them qualify as good practices in nutrition education; one of these programs involved 45.000 children from 0 to 3 years and the other one, 138 scholar children.

In reference of the teaching of nutrition education in sanitary careers, only the 2 out of the 3 careers included it. In order to revert these results, an intervention program is going to be develop to increase the number of programs that qualify as good practices in ICEAN.

PW-111 Poster

Photo voice - a powerful tool for mapping the obesity facilitators in the Arab Israeli women population.

Adler D., Saliva S., Abed El Razic M., Harari R., 4

The Nutrition and Diabetic Department Hadassah Medical Center, Jerusalem, Israel

Photo voice is a process by which people can identify, represent, and enhance their community through a specific photographic technique. In Israel, obesity rates are found among Arab Israeli women. Arab women are at 3.5 time's higher risk for obesity than the Jewish women at the same age group. The study is a pilot.

Objectives: a. to recruit Arab women in their towns that will record and reflect their community's food environment through photos. b. to record thru the photo voice the major causes of obesity in their villages. c. to assess the impact of the tool on the awareness of the participating women to their obesogenic environment.

Material and methods: Arab nutrition students at their practicum chose to learn the photo voice technique and to run a pilot study practicing it in their 2 home towns. They recruited 8 women willing to participate in a pilot with cameras with which they photographed any scenario relating to obesogenic environment, inside their homes and in the town streets.

Results: the impact of the method on the students was overwhelming. Even though they were nutrition students who lived in their towns all their lives; the awareness to the obesogenic environment was striking. Mapping the obesogenic promoters from the photos included: sugary drinks, high fat dairy products, high fat meats, white flour bakery products, cakes, cookies, extensive use of sauce (make high fat milk product) in cooking, and high use of sugar liquid on top of bakery products.

Key findings: The photos voicing loud: the portion sizes are huge everywhere; at restaurants, at home, and even of traditional foods. Fraying and sugary drinks are everywhere; the tables on which the food is served are totally covered with foods and sugary drinks. The environment is loaded with high fat bakery products. There is lack of even basic walking trails. The photos included the very low salaries, taken by the women themselves, voicing the correlation of inequality to obesity. The tool had a striking impact on the awareness of the Arab women to the impact of the environment on their food habits. The lecture will include the photos as the powerful essence of the study, and its public health nutrition potential.

PW-112 Poster


Añez, E., Orellana, I., Zonis, I., Indart, P., Ferradas, N., Kovalsky, I.

ILSA Argentina

Objectives: SALTEN (Healthy, Active and Free from NTCD, for its initials in Spanish), is an ongoing two year school-based multi-component intervention aimed at improving healthy eating and physical activity habits in low SES Argentinean schoolchildren. Specific healthy eating objectives are to improve children's attitudes towards fruits and vegetables and to adopt healthier eating habits.

Materials and Methods: Seven hundred and eleven 9-11 yrs children attending schools (4 intervention and 4 control), matched for socio-demographic characteristics in a middle-to-low-income area of Bs As, Argentina take part in this programme. Within the healthy eating arm of the intervention, there is a multi-educational component focused on healthy eating habits, with a bottom-up, hands-on and motivational approach. Children are encouraged to challenge norms or habits around eating (e.g., eating fruit during school break) and to take this message home through specific activities such as games, or research activities. Another component of the intervention is that of facilitating accessibility to healthy eating opportunities. Specifically, the programme ensures daily access to fresh seasonal fruits during break-time as well as tasting days of less well-known fruits. Children in the control group follow the usual academic curriculum. Children's attitudes and frequency consumption of fruits, vegetables, core and non-core foods are assessed with a researcher administered diary and culturally adapted version of the Child Nutrition Questionnaire. Anthropometric measurements (weight and height) are assessed according to a standardized protocol. Outcome assessments are conducted at baseline and repeated at 6, 12 and 24 months later. Ethics approval was obtained from the Argentinean Medical Association.

Results: Preliminary results comparing baseline and 6 months follow-up outcomes show improvements in the intervention group for attitudes toward fruits and vegetables (p = 0.006), and statistically significant increases in weekly fruit consumption (p=0.009). Furthermore, children in the intervention group report decreased frequency of consumption of non-core beverages and foods during school breaks (both p < 0.001). At 6 month follow-up, there are no statistically significant changes in BMI z-scores in any group.

Key findings: Over a short 6-month period, ensuring daily access to fruits and promoting knowledge with a motivational approach is a successful strategy to change children's attitudes and behaviours towards a healthier diet.

PW-113 Poster

SALTEN! Healthy, active and free from NTCD: study protocol.

Kovalsky, I., Añez, E., Orellana, I., Zonis, I., Indart, P., Rausch Herscovici, C.

ILSA Argentina

Objectives: To present the study protocol of SALTEN (Healthy, Active and Free from NTCD, for its initials in Spanish), a school based intervention carried out in low SES areas of Bs As, Argentina.

Materials and Methods: SALTEN is a two-year multi-component intervention to improve physical activity and healthy eating habits in 9-11 years old children. The intervention is set in primary public schools (4 intervention; 4 control) matched for socio-demographic characteristics in a middle-to-low-income area of Bs As. It is framed within the ANGEO ecological model which emphasises the role of supporting environmental modifications (e.g., physical, economic, political or socio-cultural). Another core aspect of SALTEN, is on that of changing attitudes and frequency. The intervention includes an emphasis on fun and pleasure, the company of others and an absence of competitive aspects. The intervention consists of an educational component focused on healthy eating habits and physical activity, with a bottom-up, hands-on and motivational approach. Another component of the intervention is that of facilitating accessibility to healthy eating opportunities. Specifically, the programme ensures daily access to fresh seasonal fruits and easy access to drinking water; it promotes active school breaks (e.g., teachers coordinate traditional and no-traditional activities such as hip-hop dancing); and introduce simple changes in school playgrounds (e.g., provide balls, ropes). Children in the control group follow the usual academic curriculum and also participate in a healthy eating and a physical activity workshop. Anthropometrical measurements of body weight, height, sitting height and waist circumference are held according to a standardized protocol. Children's diet, eating willingness and attitudes towards healthy eating and physical activity opportunities are assessed with a shorter version of the Child Nutrition Questionnaire. Children's sedentary behaviours, engagement in, attitudes and barriers towards physical activities are assessed with a shorter version of the Child and Adolescent Physical Activity and Nutrition Survey. Outcome assessments are conducted at baseline and repeated at 6, 12 and 24 months later.

Results: The programme is currently underway and reaches a total of 1700 children in the intervention schools, directly affecting 711 children within the study target age-group. The results of this study will provide unique information on the feasibility of these types of multi-component interventions in hard-to-reach communities and with the difficulties of implementing prevention programs in developing countries. Preliminary results will be presented at the conference.

PW-114 Poster

Self perception of weight and body image in full time professors in a mexican university.


III World Congress of Public Health Nutrition

- 198 -
Objective: There are currently new factors that influence overweight and obesity beyond positive energetic balance and sedentarism, such as the erroneous perception of body weight and body image. The objective was to determine the association between self-perception of body weight and image and BMI in professors at the Mecaxili campus of UABC.

Material and methods: Observational, transversal and relationship study in 225 professors. A validated questionnaire was implemented, conformed in three sections, to evaluate sociodemographic and anthropometric data and images of anatomical models (Montero) were used to evaluate self-perception of body image. Information was processed with SPSS-18.0 statistical package, obtaining descriptive and parametric statistics (p<0.05).

Results: The average BMI was 29.2 mg/m². Overweight and obesity prevalence was 81.3% (90.3% in males and 74.3% in females). A tendency to underestimation was present, concerning erroneous perception of their body image related to their BMI (p<0.05).

Conclusions: Professors that carry overweight and obesity have a deficient perception of their body weight and image.

Key findings: Self-perception, obesity, body image.

PW-115  Poster  Prevalence of physical activity combined with sedentary behavior among adolescents. Franceschin, MJ; Moraes, MM; Veiga, GV. Universidad Federal do Rio de Janeiro.

Objective: Assess the prevalence of physical activity levels combined with sedentary behavior among adolescents according to sex, age and type of school.

Materials and methods: Data from 917 adolescents aged between 13 and 19 years old, from two public and four private schools of the metropolitan area of Rio de Janeiro, Brazil, participants of the baseline of Longitudinal Study of Adolescent Nutritional Assessment (ELANA) project were analyzed. The levels of physical activity were assessed by self-filled short form of The International Physical Activity Questionnaire. The adolescents were classified as ‘active’ or ‘inactive’ based on World Health Organization recommendation on physical activity for children and adolescents (>60 or ≥60 minutes of moderate to vigorous physical activity daily, respectively); sedentary behavior was defined as ≥2 or more hours of television viewing time. The categories of physical activity and sedentary behavior were combined into a new variable with 4 categories: a) inactive and sedentary, b) inactive and no sedentary, c) active and sedentary, and d) active and no sedentary.

The chi square test was applied for comparison between sex, age (13 to 14 and 15 to 19 years old) and type of school (public or private) with p<0.05 for statistical significance.

Results: The overall prevalence of physically active teenagers was 77.4% and sedentary behavior was 56.3%. The prevalence of active adolescents who watch television more than 2 hours per day was 32.9%. On the other hand, 12.9% of the teenagers were inactive and sedentary (the unhealthiest case scenario). Considering this category, the prevalence was higher among girls compared to boys (16.4% vs 9.0%, p=0.001) and also higher among students from private schools and those from public schools, those from public schools were 47.5% vs 10.9%, p<0.01. The prevalence of physically active adolescents who watch television more than 2 hours per day was 44.5% and higher among boys compared to girls (50.8% vs 38.8%, p<0.001). No statistical significance was found on analysis stratified by age.

Key findings: High prevalence of physically active adolescents who watch television more than 2 hours per day suggests coexistence of both physical activity and sedentary behavior. Girls and students from private schools seem to be less active and sedentary than their peers, so at higher risk of morbidities associated with physical inactivity, which demands special attention on strategies to promote physical activity and reduce sedentary behavior.

PW-116  Poster  Nutrition transition and the organisation of Food and Nutrition care in the Brazilian Primary Health Care system. Pacheco Santos LM, Constante Jaime D. Health Department, University of Brasilia; 1st Food and Nutrition Department of Basic Health Care Ministry of Health and Nutrition Department, University of Sao Paulo.

Food and nutrition, as basic requirements for health promotion and protection, are centered by the Brazilian Constitution. Thus, food and nutrition actions are the responsibility of the National Public Health System. Objective: This study presents and discusses the food and nutrition actions in primary care, taking as reference the current stage of the nutrition transition in the Brazilian population.

Method: The debate was structured in three sections: the first describes the food and nutrition situation of the Brazilian population; the second presents the Ministry of Health activities and the third, the remaining challenges of this agenda.

Results: The foods consumed by Brazilians, with higher average energy consumption (as cookies, processed snacks, pizza and soft drinks) are also related to diets with a high intake of saturated fats, sugar and salt, as well as insufficient dietary fiber. The Brazilian population is undergoing a nutritional transition process, characterized by the reduction of malnutrition and increased overweight and obesity in all life cycle. Weight for age deficits in children under five years old decreased from 5.4 to 1.8 %, while the reduction of height for age deficit was from 19.6% to 6.7% between 1989 and 2006. On the other hand 50% Brazilians are overweight and 15.4% of adult men and 16.9% of adult women are obese. The second section presents the actions taken to organizing food and nutrition care that involves promotion of adequate and healthy food practices, food and nutrition surveillance, the comprehensive care of nutritional disorders, intersectoral actions addressed to the determinants and constraints of food and nutrition and quality of care. Finally, a three sections agenda is to guarantee the human rights to health and nutrition. One of the concerns is the low insertion of Nutrition professionals in the management of food image and nutrition actions in the municipalities and their implementation at the local level. The flegdging monitoring and evaluation of food and nutrition actions, that should rely on tripartite: federal, state and municipal funding, can be seen as another limitation

Key findings: The current policy developments and food and nutrition programs in Brazil, as well as strengthening of the specific actions of care in primary care, are promising. On the other hand it is necessary to recognize that there is a long way to reach the consolidation of food and nutrition actions in the National Public Health System.

PW-117  Poster  Body image perception and eating habits with Body Mass Index in university students. Ponce-y Ponce de León G.¹, Arozarena-Arnadar M.B.¹, Esparrce-Betancourt M.A.¹, Mayagoya-Bata A.¹, Pataon-Camantes J.¹, Pastor-Cervantes K.¹. Facultad de Enfermería, Mexicali, Universidad Autónoma de Baja California, México; ¹Facultad de Medicina, Mexicali, Universidad Autónoma de Baja California, México.

Introduction: Obesity increases the risk of chronic non transmissible diseases, affects quality of life and decreases life expectancy by 5 to 10 years. The relative risk of high blood pressure and diabetes is 3 times higher in obese adults. On the other hand new factors exist that influence in overweight and obesity beyond positive energetic balance and sedentarism such as the erroneous perception of body image and food intake. Objective: Determine the relationship between self perception of body image and eating habits with BMI in nursing school students at UABC, Mexicali campus.

Material and methods: observational, transversal and relationship study in 384 students. A validated questionnaire was applied, conformed of three sections to evaluate socio-demographic and anthropometric data and anatomical model images (Montero) to evaluate self perception of body image and nine items of Likert’s scale to evaluate self perception of eating habits. Information was processed with the statistical SPSS-18.0 software obtaining descriptive and to those nutrition action in their BMI (p<0.05). Regarding eating habits 57.2% of males and 74.3% of females with overweight and obesity do not have healthy eating habits (p<0.05), but nonetheless 48.5% of students with overweight plus obesity (61% males and 41.9% females) answered they had healthy eating habits.

Conclusions: students who are overweight and obese have a deficient perception of their body image and eating habits.

PW-118  Poster  Life after retirement - a qualitative analysis of nutrition related attitudes. Haas K.², Beer-Borst S.¹, Kalbormann L.¹, Schueermann A.¹, Bürkli S.¹. ¹Bern University of Applied Sciences - Division Health. ²University of Bern, Institute of Social and Preventive Medicine. ³Bern University of Applied Sciences - Institute on Aging. ⁴Bern University of Applied Sciences – Bern University of the Arts. ⁵Bern University of Applied Sciences – School of Agricultural, Forest and Food Sciences.

Objectives: Life transitions like retirement are associated with changes in social relations, health lifestyle patterns and related behaviors, such as diet behavior, which may influence people’s ageing process and quality of life. The aim of this study was to investigate how eating habits change after retirement, and which motives/norms, attitudes, and experiences are related to such changes.
Materials and methods: Guided qualitative interviews were conducted between March and May 2010 with 15 men and 17 women aged 62 to 70 years, retired for 1-5 years and living in private households in canton Bern/Switzerland. Topics addressed were health and health awareness, nutrition knowledge, information seeking behavior, cooking and eating habits, food purchase, mobility, and social network during transition from employment to retirement. The interviews were transcribed and a computer-aided systematic contents analysis conducted.

Results: Retired people are generally interested in diet and health; they consider themselves as having a basic knowledge of food, nutrition and health. There was agreement among participants that maintaining good health is given high priority after retirement. However at the same time the interview, changes in eating habits were thought to be unnecessary. Most described their diets as well-balanced or pragmatic. Especially women indicated that they must be more careful about what they eat since retiring. More men than women described weight problems and generally showed more interest in fitness. A certain helplessness and a desire for clear directives was expressed, particularly with regard to information seeking behavior. The participants described it as challenging to be constantly confronted with changing and inconsistent nutrition/health information. Sharing domestic work still follows traditional gender roles.

Preparing meals for example is mostly done by women. Additionally, male participants find that it is not worth cooking for them alone.

Key findings: Most of the participants in the present study experienced the transition into retirement without major health problems. The importance of health was consistently stressed during the interviews. Since prevalence of chronic diseases rises with increasing age which is often associated with functional impairments combined with a loss of autonomy and a reduction in quality of life, health lifestyle patterns should be further raised within this population group. Especially men should be given special consideration with regard to nutrition and physical activity. Women in general had more men-specific health promotion activities should be established/implemented to maintain quality of life of retired single men.

Prevalence and correlates of obesity in Chile: findings from the National Health Survey 2009-10 Celis-Morales C.; Salas C.; Martinez MA; Diaz X.; Leiva AM; Willis ND.

1Human Nutrition Research Centre, Institute for Ageing and Health, Newcastle University, United Kingdom. 2Department of Physical Education, University of Concepcion, Concepcion, Chile. 3Institute of Pharmacy, Faculty of Education and Humanity, Austral University of Chile, Valdivia, Chile. 4Institute of Physical Education, Faculty of Education and Humanity, University of Bio-Bio, Chillan, Chile. 5Institute of Anatomy, Faculty of Medicine, University Austral of Chile, Valdivia, Chile.

Objectives: The numbers of overweight people continues to rise globally and more than one billion adults have a body mass index (BMI) greater than 25 kg.m-2. However, the factors contributing to the increase in obesity prevalence may differ by country. Therefore, the aim of this study is to estimate the prevalence of obesity and identify correlates that could contribute to the obesity level in Chile.

Materials and methods: A representative sample of 5,434 Chilean adults aged ≥15 years (59% women) who participated in the National Health Survey (2009-2010) were included. Socio-demographic data (age, sex, environment, education, income and smoking status), anthropometric (weight, height, waist circumference and BMI), diet and physical activity data were collected. Prevalence of obesity was estimated using the WHO guidelines for BMI (Normal <25.0, overweight ≥25.0 to 29.9 and obese ≥30.0). Linear and logistic regressions were used to determine the association between lifestyle and socio-demographic factors and obesity-related traits. Results: Overall 64.5% (95% CI: 62.0, 67.0) of the cohort were overweight or obese. Univariate regression analysis shows that BMI was significantly associated with age (B: 0.06, SE: 0.04, p<0.0001), number of days cycling per week (B: -0.16, SE: 0.02, p<0.001), vigorous exercise (B: 0.03, p<0.0001), intake of dairy products (B: 0.35, p<0.0001), whole grain consumption (B: 0.29, SE: 0.05, p<0.0001), salt intake (B: 0.59, SE: 0.04, p<0.0001), fruit and vegetable intake (B: 0.11, SE: 0.05, p=0.002), sleeping time (B: -0.17, SE: 0.05, p<0.0001) and smoking (B: 0.17, SE: 0.06, p=0.003). In addition, logistic regression analysis reveals that individuals living in urban areas compared to rural environment (OR: 0.78; 95% CI: 0.65, 0.94) and people with a middle or high level of education compared to a low level of education (OR: 0.66; 95% CI: 0.56, 0.77) were less likely to be overweight or obese. Conversely, people spending more than 4 hours per day sitting (OR: 1.14, 95% CI: 1.01, 1.29) and smokers (OR: 1.57; 95% CI: 1.33, 1.85) were more likely to be overweight or obese.

Key findings: The Chilean National Health Survey reveals that overweight and obesity is highly prevalent in the Chilean population. In addition, our analysis shows that modifiable socio-demographic, dietary and physical activity related factors are associated with the level of obesity in Chile. These findings provide evidence of factors that should be tackled through the implementation of public health interventions to reduce obesity levels in the Chilean population.

The modern Mediterranean diet pyramid for Italian population Del Balzo V; Germani A; Vitello V; Pinto A; Donini LM.

Sapienza University of Rome - Italy; Research Unit of Food Science and Human Nutrition - Opt of Experimental Medicine.

Objectives: To develop a new pyramid based on the Italian Mediterranean diet that takes into account the evolution of consumer and cultural heritage based on age-old knowledge, tastes, processing, food and crops linked to the territory. This need arises from a shift of lifestyle moving away from MD to an energy-dense food rich in protein, saturated fats and simple sugars.

Materials and methods: In the III Conference CICSMAN (International University Centre for Studies on Mediterranean Food Cultures) held in Parma (2009), a consensus position has been defined for the development of the Mediterranean Diet Pyramid. Starting from the theory of an original Mediterranean Diet “Platonic”, investigators have proposed a representation common to all Mediterranean basin, but adapted to any specific reality of the different countries (Italy, Spain, Greece and others). The statements defined are: distribution of food on several levels taking into account the contribution nutrient, frequencies and portions of consumption at each meal, every day and every week, the characteristics of MD such as tradition, seasonality, sustainability, frugality, conviviality. Each country, according to typical of own tradition, geographic location, socio-cultural aspects and changes in food consumption, proposes its own pyramid.

Results: In the first level of the pyramid importance is given to the marine foods such as cereals (pasta, bread, rice), fruit, vegetables, legumes, herbs, souces of fibers, nutrient and antioxidants. In the second level there is food to be consumed daily: milk, yogurt and breakfast cereals. Importance should also be given to the use of EVO, main food of the Mediterranean tradition and source of mono: The utmost foods. The olive oil can be used to reduce the consumption of salt and to preserve palatability and flavor. In the last level there are foods to be eaten in moderate weekly such as meat, fish, eggs, cured meat and cheeses. Legumes, when consumed with cereals represent a single dish typical of the tradition and with great nutritional value for the complementarity of nutrients. Dry fruit can be eaten weekly. While the wine, taken preferably at meals, can be consumed daily in moderation.

Key findings: In the Italian model, outside of the pyramid are the concepts that characterize the MD: tradition, conviviality, frugality, sustainability, healthiness, nutritionlhealth, palatability, territonnality, different culture. Furthermore, the graphical representation can be easily acknowledged and this may allow a greater adherence to the Mediterranean diet.
4 hours sitting per day (OR: 0.84 [0.74 to 0.94]), but participants living in a rural environment (OR: 1.83 [1.52 to 2.21]), having a higher education (OR: 2.08 [1.75 to 2.47]) or income level (OR: 2.17 [1.73 to 2.72]) were more likely to spend more than 4 hours sitting per day.

Key findings: Our findings suggest sedentary behaviours are highly prevalent in the Chilean population. Physical inactivity and sitting time correlate strongly with socio-demographic factors, which can inform future public health interventions to increase PA in the Chilean population.

PW-122 Poster
Socio-demographic patterning of physical activity levels and sedentary behaviour in Chile: results from the National Health Survey.

Cella Morales C C, Salas C C, Martínez MA; Diaz X; Leiva AMF; Willis ND; 1Human Nutrition Research Centre, Institute for Ageing and Health, Newcastle University, United Kingdom. 2Department of Physical Education, University of Concepcion, Concepcion, Chile. 3Institute of Pharmacy, Faculty of Science, University Austral of Chile, Valdivia, Chile. 4School of Physical Education, Faculty of Education and Humanity, University of Bio-Bio, Chillan, Chile. 5Institute of Anatomy, Faculty of Medicine, University Austral of Chile, Valdivia, Chile.

Objectives: Given the rapid socio-demographic and nutritional transition and the high prevalence of non-communicable diseases (NCDs) in Chile, risk factor surveillance, including physical activity and sedentary behaviours, is especially important. The aim of the present study was to examine the prevalence of, and trends in, physical activity and sedentary behaviour with respect to socio-demographic factors in Chile.

Materials and methods: A representative sample of 5,434 Chilean adults aged ≥15 years (55% women) who participated in the National Health Survey (2009-2010) were included. Socio-demographic data (age, sex, environment, education, income and smoking status) were collected. Physical activity levels were assessed using the Global Physical Activity Questionnaire (GPAQ v.2). Total activity, sitting time and sub-domains of physical activity, including time spent at work, transport and leisure were estimated.

Results: A quarter of the study population (24.1%; 95% CI: 21.9 to 26.7) did not meet the international physical activity recommendations (spending ≤600 MET-min/week). The odds of being physically inactive were higher in participants aged ≥65 years compared to the youngest (≥25y) age group (OR: 2.89 [2.27 to 3.68]) and higher in women than men (OR: 1.49 [1.29 to 1.70]). Participants with lower education and income levels were less likely to meet the guidelines compared to those with higher education and income levels (OR: 0.62 [0.51 to 0.75]) and OR: 0.72 [0.57 to 0.93]) respectively. The overall age-adjusted prevalence of sedentary risk behaviour (spending ≥4hr per day sitting) was 38.4% [35.6 to 41.2] in the study population. Women were less likely to spend more than 4 hours sitting per day (OR: 0.84 [0.74 to 0.94]), but participants living in a rural environment (OR: 1.83 [1.52 to 2.21]), having a higher education (OR: 2.08 [1.75 to 2.47]) or income level (OR: 2.17 [1.73 to 2.72]) were more likely to spend more than 4 hours sitting per day.

Key findings: Our findings suggest sedentary behaviours are highly prevalent in the Chilean population. Physical inactivity and sitting time correlate strongly with socio-demographic factors, which can inform future public health interventions to increase PA in the Chilean population.

PW-123 Poster
Food Consumption and Nutritional Labeling Among Immigrants to Israel from the Former Soviet Union.


Objectives: Nutritional labeling helps consumers make healthier choices regarding food product purchases. In this study, we examined the difference between immigrants from the former Soviet Union who immigrated to Israel beginning in 1990 (IFSU) and the general population of Israel regarding food consumption broadly and the use of nutritional labeling specifically.

Materials and methods: A representative sample of each population (n = 592) was composed and interviewed about food purchasing and use of food labeling.

Results: According to the findings, compared to the general population, the immigrants (21%) spent more on food products and information about the ingredients contained in food products; they tend not to follow nutritional labels; and report less on the need for nutritional integrative labeling. Following from this, in the second part of the study, we investigated which of the socio-economic variables is most important in shaping attitudes toward food nutritional labeling. Only immigration and age were found in correlation with attitudes related to healthy food consumption. In contrast, gender, education and religious observance did not affect food selection.

Key findings: Immigration was recognized as the main factor with more clout than the other variables. In conclusion, it is crucial to clarify immigrants’ perceptions of the concept of “health” and “proper nutrition” in formulating health promotion programs.

PW-124 Poster
Association between bread consumption and overweight/obesity: the Sun project.

De la Fuente-Arrillaga C 3,1, Bes-Rastrollo M 3,2; Zaque I 3,2, Vázquez-Ruiz Z 3; Benito-Corchón S, Martinez-González MA; 1Instituto de Preventive Medicine and Public Health, University of Navarra, Pamplona, Spain. 2CIBER Fisiopatología de la Obesidad y Nutrición (CIBERObn), Instituto de Salud Carlos III, Spain. 3Dept. of Food Sciences, Physiology, University of Navarra, Pamplona, Spain.

Objectives: White bread is the main staple consumed in Spain. To evaluate prospectively the relationship between bread consumption and the incidence of overweight/obesity in the SUN (Seguimiento Universidad de Navarra) project, a Mediterranean cohort of former university students was followed from many Spanish universities.

Materials and methods: We followed-up 6,496 Spanish university graduates with an initial body mass index < 25 kg/m2 (67 percent women, mean age: 36 years) during an average of 5 years. We assessed dietary exposures using a validated semi-quantitative 136-item food-frequency questionnaire (FFQ). Serving size was 60g.

We assessed the association between baseline consumption of white bread (five categories) or whole-grain bread and the incidence of overweight/obesity using multivariate models to adjust for age, sex, physical activity, time spent in TV watching, total time of sedentary activities, smoking status, baseline BMI, fiber intake, total Energy intake, and olive oil consumption.

Results: Among 6,496 participants initially free of overweight-obesity we found 943 incident cases of overweight/obesity. A higher consumption of refined bread was associated with incident overweight-obesity (multivariate adjusted odds ratio [OR]: 2.17 [95% CI: 1.73 to 2.72] per 2 consumption occasions per week: 1.40; CI 95%: 1.08-1.81) (linear trend, P = 0.008). No significant association was observed for the same comparison regarding whole-grain bread consumption (multivariate adjusted OR: 0.66, 95% CI: 0.35-1.23).

Key findings: A higher consumption of white bread (but not of whole-grain bread) was associated with an increased risk of developing overweight/obesity in a highly-educated Mediterranean cohort with a low baseline body mass index.

Funding: The SUN Study has received funding from the Instituto de Salud Carlos III, Oficial Agency of the Spanish Government for biomedical research (Grants P110/02658, P110/02293, P113/00615, RD06/0045, G03/140 and 87/2010), the Navarra Regional Government (45/2011) and the University of Navarra.

PW-125 Proposal
Proposal of a new index of adherence to the Mediterranean Diet.

Del Balzo V; Negro F; Pinto A; Vitelli V; Germani A; Donini LM; Sapienza University of Rome - Italy Research Unit of Food Science and Human Nutrition Dpt of Experimental Medicine

Materials and methods. Has been created a questionnaire for the study that consists of 23 multiple choice questions. The questions, based on the new Italian Mediterranean Diet Pyramid, investigating not only the eating habits, but also other aspects of the mediterranean model such as the conviviality, sustainability, tradition, frugality and physical activity. The validation of this test was performed with logistic regression analysis with BMI as outcome. The sample was recruited among municipal employees. The different options of each answer were sorted in order of increasing adherence and was built an ordered array of evaluation of the questionnaire answers with respect to the optimal answers. Has been identified 7 domains: consumption of cereals, animal foods, vegetables, pastries, alcohol as well as the eating habits and behaviors. It was a composite score calculated from the average deviations of 7 domains. Were compared the scores obtained by the sum of total deviation (all 23 questions) and that obtained by the average of the scores of 7 domains: the two scores of the subjects produce rank highly correlated. Has been attributed a score from 0 to 12 to the answers, according to the different relevance assigned to the items in terms of adherence to the Mediterranean Diet. In this way it was meant to highlight the more likely the differences between the various items.

Results. Were collected 3384 questionnaires for validation. Analysis of the single domains is that the adequate consumption of animal foods is negatively correlated with the adequate consumption of cereals, while the adequate consumption of animal foods is positively correlated with right behavior. In addition, the results indicate that increasing the consumption of cereals decreases the consumption of white bread nutritional labeling. Only immigration and age were found in correlation with attitudes related to healthy food consumption. In contrast, gender, education and religious observance did not affect food selection.

Key findings: Immigration was recognized as the main factor with more clout than the other variables. In conclusion, it is crucial to clarify immigrants’ perceptions of the concept of “health” and “proper nutrition” in formulating health promotion programs.
allow to make preventive interventions and nutrition education more appropriate.

**PW-126**  
**Poster**  
**Nutrition transition in indigenous children: analysis from the brazilian system of food and nutrition surveillance (SISVAN).**  
Santana Marchewicz TA; Magalhães AM  
Universidade Federal da Grande Dourados - Brasil

Introduction: Currently living in Brazil, 817,000 Indians, about 0.4% of the population, distributed 688 indigenous lands and some urban areas, located in almost every state (except Pauli and Rio Grande do Norte), occupying about 15% of the territory national. An analysis of epidemiological and nutritional profile of indigenous peoples reveals that worrying scene, in which children appear to be particularly affected, but that adolescents and adults are not free from the nutritional problems. The phenomenon known as the Nutrition Transition, which was historically associated with high mortality and also been observed in low-income populations and traditional populations, as Indigenous, for example.

Objective: This study aimed to verify the nutrition transition in under 10 years ago indigenous children from the Brazilian System for Food and Nutrition Surveillance (SISVAN).

Methods: The present study is the verification of the prevalence of nutritional risks in indigenous populations from data provided on the basis of records of the National Food and Nutrition Surveillance (SISVAN) for a long time of five years 2008-2012. Database of BMI (Body Mass Index)/Age (BMI/ ) of both sexes were collected. Results: It was observed that both the prevalence of deficit as overweight was higher than expected for healthy populations, on the other hand, there is a tendency to increase in the prevalence of overweight and downward trend in the prevalence of deficit.

Conclusion: It was concluded that prevails the phenomenon of nutritional transition in the studied population.

**PW-127**  
**Poster**  
**Places, occasions and company influence Chinese consumers’ choice between local and imported foods.**  
Xue XL; He C; Perez-Cueto FAJ  
1 International Food Studies, Aalborg University-Copenhagen. 2 Department of Development and Planning, Aalborg University-Copenhagen

Objective: To identify the places, occasions and the company that would influence the choice between locally produced vs. imported apples. Methodology: Cross-sectional web-based survey through different Chinese Social Medias in Spring 2014, including socio-demographics, attitudes and knowledge towards fruit consumption and attributes of fruits. Participants were asked to indicate whether they would choose locally produced apples vs imported ones on given occasions (week day, weekend, festivities, other special occasions), places (home, work, school, street) and company (family, friends, classmates, colleagues). All data were analysed with SPSS v 22, and a p-value < 0.05 was considered significant.

Subjects and setting: In total 398 Chinese people participated, but only 305 provided completed questionnaires (67.6% females; 67.5% aged 20-29; 49% had higher education; and 39% were married).

Results: Chinese participants consume both local and imported fruit at home and more often with their family, friends, classmates and colleagues. All data were analysed with SPSS v 22, and a p-value < 0.05 was considered significant.

Participants were asked to indicate whether they would choose locally produced apples vs imported ones on given occasions (week day, weekend, festivities, other special occasions), places (home, work, school, street) and company (family, friends, classmates, colleagues). All data were analysed with SPSS v 22, and a p-value < 0.05 was considered significant.

Objective findings: Chinese consumers choose to eat more often local fruit than imported fruit at weekends and weekdays. However, for festival and other special occasions, they choose more imported fruit than local ones (P<0.001), and they will prefer imported fruit at school or eating out (P<0.001).

Key findings: Chinese consumers choose imported apples mainly for special occasions while locally produced ones in more ordinary situations. The different consumption behaviours between local and imported fruit reflect the different values and intended use that Chinese consumers have regarding local and imported fruit.

**PW-128**  
**Poster**  
**Foods consumed at lunch and their contribution to energy and nutrient intakes in U.S. children and adolescents: analysis from the National Health and Nutrition Examination Survey 2007-2010.**  
Patel V; Y. Van der Horst K, Edridge A  
Public Health Nutrition, Nestlé Research Center, Lausanne, Switzerland

Objectives: Lunch meals provide an opportunity to offer a wide variety of food groups to children. However data on this eating occasion are scarce. This study aims therefore to examine lunch meals of U.S. children.

Material and methods: Data collected from a single 24-hour recall in children 4-8y (n=1895), 9-13y (n=1717), and 14-18y (n=1535) in the 2007-2010 National Health and Nutrition Examination Survey were analysed. Results: Lunch skipping was common, especially among older children. A total of 10.3%, 19.9%, 19.0% of the children 4-8y, 9-13y and 14-18y respectively did not report any lunch meal on the day of the recall. On average, lunch contributed to 25.5%, 23.9% and 27.1% of total energy intake in children 4-8y, 9-13y and 14-18y. The ten food groups most commonly consumed for lunch by children 4-8 years old were: bread, rolls, tortillas (36.3%), fruits (25.3%), condiments and sauces (19.1%), cereals etc./poultry (18.1%), vegetables excluding potatoes (18.0%), cheese (17.2%), black beans (12.7%), meat products (12.3%), fats and oils (12.1%) and dairy (11.9%). Although consumption of most food groups was comparable with older children, fruit and vegetable consumption tended to decrease with age. Fruit consumption decreased to 18% among 9-13 year olds and to 10.5% among 14-18 year olds. Intake of vegetables (excluding potatoes) dropped to 15.6% and 14.0% of consumers among children 9-13y and 14-18y respectively. However, the frequency of consumption of mixed dishes as sandwiches and pizza increased with age and most likely contributed to vegetable intake. With regard to beverages, children 4-8y consumed mostly sweetened beverages (21.2%), flavoured milk (19.0%), plain water (15.5%), plain milk (15.2%) and 100% fruit juice (12.8%) with lunch meals. Consumption of milk based beverages and 100% fruit juice decreased with age. Relative to energy contribution, lunch provided higher percentages of the day's total intake for protein and sodium and lower intakes for added sugar, iron and vitamins A and D among all age groups.

Key findings: Variety of food groups at lunch tended to decrease with age in U.S. children. Nutrition education programmes specifically targeted to adolescents are required, with emphasis on increased fruit, vegetable, milk and water consumption.

**PW-129**  
**Poster**  
**Yoghurt consumption in UK children and adults and associated food and nutrient intake.**  
Collin J1, Johns D2, Steer T2  
1CREDOC (Centre de Recherche pour l’Etude et l’Observations des Conditions de Vie), Paris, France, 2MRC Human Nutrition Research, Cambridge, UK

Objectives: Yoghurt is a source of dietary minerals, B-vitamins and essential amino acids. The consumption of yoghurt as well as other dairy products of observational studies is associated with a reduced risk for cardiovascular disease, gain, cardiovascular disease and diabetes. The objective of this analysis was to estimate intakes of yoghurt in the UK using nationally representative survey data and to explore the associated dietary pattern and diet quality.

Materials & methods: The analysis was conducted on data from years 1, 2 and 3 (2008-09/2010/11) of the National Diet and Nutrition Survey Rolling Programme (NDNS), in UK children (4 to 18 years old) and adults (19 to 64 years old). Participants completed a four-day estimated food diary. ‘Yogurts’ included all fresh dairy and excluded dairy desserts, yoghurts and quark. Participants were classified as ‘Yoghurt consumers’ (YC) if they reported ‘Yoghurt’ intake at least once in the four-day food diary. ‘Yoghurt’ consumption (g/d) was split into tertiles in children (0 < T1 < 31 < T2 < 62 < T3) and adults (0 < T1 < 37.5 < T2 < 75 < T3). Consumption of macro- and micronutrients were categorised against UK dietary reference values. Results: 45% of children and 37% of adults were YC (median intake of 40gd and 50g/d respectively). The diet of YC contained a higher mean intake of fish, high-fibre cereal and fruit and a lower intake of meat, manufactured products (including ready meals) and sugar sweetened beverages compared with non-consumers. The proportion of non-consumers who exceeded the recommended 35% of daily energy intake from fat was greater than in YC, children (46% vs 39%; p=0.02) and adults (41% vs 34%; p=0.02). In both children and adults, a higher proportion of non-consumers than YC had intakes of vitamin A, riboflavin, folate, calcium, magnesium, iron, zinc, iodine, potassium and selenium which fell below the lower reference nutrient intake (all p<0.01). Amongst YC, greater consumption of yoghurt was associated with a higher mean intake of riboflavin, folate, calcium, magnesium, iodine and potassium.

Key findings: A diet containing yoghurt is associated with greater intakes of micronutrients and fruit and lower intakes of fat and sugar sweetened beverages in this cross-sectional analysis, suggesting a higher diet quality. However, current intake of yoghurt in the UK is relatively low.

**PW-130**  
**Poster**  
**Costs of a Mediterranean diet in the PRIDIMED Study.**  
Bes-Rastrollo M1,2, Sayon-Orea C, Salas-Salonedo J2,3, Corella D1, Estruch R2,3, Martinez-Gonzalez MA1,2  
1Dept. of Preventive Medicine and Public Health, University of Navarra, Pamplona (Spain). 2CIBERObn, Instituto de Salud Carlos III, Madrid (Spain). 3Human Nutrition Unit, ISFIM, Rosvita Virgili University, Reus, (Spain). 4Departament of Preventive Medicine, University of Valencia, Valencia (Spain).

Objectives: The Mediterranean diet is a protective factor for several chronic diseases. However, the cost of following a Mediterranean diet has not yet been evaluated. The PRIDIMED Study (2003-2016) is a longitudinal study of 70,000 participants aged 35-70 years, from 13 areas of Spain. The objective of this work is to evaluate the costs of following the Mediterranean diet compared with other dietary patterns in the PRIDIMED Study.
Objective: There is a scarcity of studies evaluating the relationship between costs associated to a Mediterranean diet. Therefore, our objective was to evaluate the costs of adhering to a Mediterranean dietary pattern (MEDIT) in the PREMIDE study.

Material and Methods: Cross-sectional and longitudinal analyses of 6,731 participants of the PREMIDE clinical diet. Diet was assessed through a previously validated 137-item food frequency questionnaire (FFQ). There were nine options for the average frequency of intake of food items in the previous year, based on typical portion sizes, ranging from never/almost never, to at least six times per day. Costs of foods were derived from the Ministry of Industry, Tourism and Commerce of Spain. Monthly reported average costs for each food item were averaged to obtain the annual costs. The appropriate costs were used for the year that participants completed the FFQ. The total daily costs of foods for each participant were calculated by multiplying the cost of each food item per gram by the quantity of grams that the participant indicated she/ he consumed in an average day. Linear regression models and ANCOVA analyses were used to analyze daily food costs according to categories of adherence to the MDP (evaluated by 9-point Trichopoulos's score) to adjust for age, sex, educational level, marital status, and occupation.

Results: After one year of intervention the average daily costs (95% CI) in euros for each group of the PREMIDE study was: 6.33 (6.16-6.50) for those participants in the Mediterranean diet supplemented with nuts, 6.16 (5.99-6.33) for those in the Mediterranean diet supplemented with virgin olive oil, and 5.85 (5.67-6.03) for those in the control low-fat group. The baseline adjusted daily food costs (Euros/1000 kcal) according to categories of Mediterranean dietary pattern were: 2.25 (2.17-2.33) for low adherence, 2.47 (2.42-2.53) for medium adherence, and 2.51 (2.42-2.60) for high adherence (P for trend<0.001). Those participants who increased their adherence to the MDP after 1 year of follow-up increased their daily foods costs 1.63% more (95% CI: 0.30% to 2.97%) than those who did not change their adherence. In contrast, the daily food costs for those who decreased their adherence were 0.60% less (95% CI: -1.94% to 0.73%) compared to those who did not change.

Key Findings: On average, a higher adherence to a Mediterranean diet was associated with higher daily food costs. The SUN Study has received funding from the Instituto de Salud Carlos III, Official Agency of the Spanish Government for biomedical research (Grants P10102658, P10102293, P113/00615, RD06/0045, G03/140 and 87/2010), the Navarra Regional Government (45/2011) and the University of Navarra.

Objective: To evaluate the influence of the sarcopenia stage proposed by the European Working Group on Sarcopenia in Older People (EWGSOP), on the deterioration of physical fitness (PF) in elderly people.

Material and Methods. A total of 564 elderly people (166 men and 398 women) aged 71.9±5.1 were evaluated for body composition and PF within the framework of the elderly EXERNET multi-centre study. Body composition was measured by bioelectrical impedance (Tanita BC 418-MA, Tokyo, Japan). Muscle strength and physical performance were evaluated by handgrip strength (kg) and the 8-foot-up-and-go test (s), respectively. PF was evaluated using 7 validated tests for the elderly (balance, lower and upper body strength, lower and upper body flexibility, walking speed and aerobic capacity). According to EWGSOP, three sarcopenic stages were established: 1) Presarcopenia (low muscle mass without impact on muscle strength or physical performance), 2) Sarcopenia (low muscle mass, plus low muscle strength or low physical performance) and 3) Severe sarcopenia (low muscle mass, low muscle strength and low physical performance). Statistical significance was set at p<0.05.

Results. Fifty nine percent of the total sample presented normal values of muscle mass, considering normal as the three highest quintiles of muscle mass (≥8.61 kg m-2 in men and ≥6.59 kg m-2 in women) according to the Spanish reference values. The lowest quintiles of muscle strength (%1 kg in men and %7 kg in women) and physical performance (≥5.9 s in men and ≥6.7 s in women) were considered as low values. Twenty-eight, nine and four percent of the sample were included in the presarcopenia, sarcopenia and severe sarcopenia category, respectively. Deterioration of PF was associated with sarcopenic stage, with elderly people with severe sarcopenia obtaining lower levels of physical fitness compared with the sarcopenia and presarcopenia stages, in both sexes. Inside the presarcopenic stage, men obtained better results than women in all PF tests except for flexibility tests (all, p<0.05). In the sarcopenia stage, differences between sexes were only significant for handgrip strength, lower body flexibility, agility, walking speed and aerobic capacity (all, p<0.05). Inside the sarcopenia severe stage, significant differences were only found for handgrip strength and sarcopenia category, respectively. Deterioration of PF was associated with sarcopenic stage, with elderly people with severe sarcopenia obtaining lower levels of physical fitness compared with the sarcopenia and presarcopenia stages, in both sexes. Inside the presarcopenic stage, men obtained better results than women in all PF tests except for flexibility tests (all, p<0.05). In the sarcopenia stage, differences between sexes were only significant for handgrip strength, lower body flexibility, agility, walking speed and aerobic capacity (all, p<0.05). Inside the sarcopenia severe stage, significant differences were only found for handgrip strength and sarcopenia category, respectively.

Key Findings. Taking into consideration the classification proposed by the EWGSOP, the elderly with severe sarcopenia have a significantly lower level of PF, which may have a negative influence on quality of life and carrying out activities of daily living. Sex differences disappear with increasing levels of sarcopenia.


Objective: Mothers possess a pivotal role in the development of healthy dietary and meal habits from children as the feeding practices she uses affect children's emerging food preferences, intake patterns, developing food intake self-regulation and body weight. However, some of these practices, such as over-control, may emerge risks for children's eating behaviours. Perceived responsibility for children's feeding tasks is a significant factor that might elicit parental use of control in child feeding. Objective of the present study was to evaluate the association of mother's perceived responsibility for children's feeding tasks on children's dietary and meal habits.

Materials and Methods. This cross-sectional online survey, the dietary and meal habits of 132 mothers (age: 41.3±5.8 years) and 132 children (56% boys, age: 9.3±1.7 years). Data were collected through self-administered questionnaires (one for mothers, one for children) based on already existing validated tools. Mother's perceived responsibility for children's feeding tasks was assessed through the Child Feeding Questionnaire. For analytical purposes, mothers were divided in two groups: those achieving a score of at least 3.5 in the perceived responsibility component and those who did not. Normality was tested with Kolmogorov-Smirnov test. Independent samples t-tests were used to investigate the differences between mothers' meal and dietary habits.
when the perceived responsibility of mother was high compared to when it was low.

Results: When the perceived responsibility of mother was high, children consumed higher quantities of full fat yogurt (p-value=0.029), red meat (p-value=0.001), and fish (p-value=0.021) compared to children whose mother had low perceived responsibility. Furthermore, children whose mothers had high perceived responsibility consumed fewer out-of-home meals during the weekend (p-value=0.015) and more family breakfast meals (p-value=0.006) compared to those with low mother’s perceived responsibility.

No differences were found among other dietary or meal habits of children in relation to the high or low perceived responsibility of mother.

Key findings: The children whose mothers had high perceived responsibility for their feeding tasks presented better meal habits but, mostly, worse dietary habits. These findings emerge questions regarding the way mothers’ perception is related to children’s adherence to a prudent diet. More research is needed to confirm these findings and to further investigate the effect of father’s perception as well. The development of efficient strategies targeting on parents’ behaviours and beliefs regarding children’s optimal nutrition is crucial.

**PW-134**

**Culinary practices in urban households in Montevideo.**

Gana, G., Daffemins, M., Martinez, J., Simoncelli, M., Della Santa, A. Escuela de Nutrición, Universidad de la República, Uruguay.

Objective: To determine the culinary preparations commonly consumed at lunch and dinner in urban homes in Montevideo, Uruguay in April-May 2014.

Material and Methods: Descriptive, cross-sectional study of a non-random sample of 817 urban households in Montevideo, Uruguay. The survey method was employed using a structured form. The information was collected by interviewing the person(s) responsible for preparing the meals at home.

Results: More than half of the households surveyed (54.7%) were composed by 2 or 3 members. 20.7% of households were in poverty and 6.8% in extreme poverty. The type of preparation consumed usually differed at lunch and dinner, except for breaded beef patties present at both meal times, reflecting a tradition deeply rooted in this population. At lunch, garnished breaded beef represented 22.6%, while pasta with tomato sauce 8.4% and pot meals (casseroles, stews) 8%. At dinner, preparations mostly consumed were cokes, pies and pizzas (12.7%); soups and broth (10.2%); and garnished breaded beef (8.6%). Milk, tea, or fruit were sometimes consumed at dinner like a collation. During the weekend, there was the highest consumption of simple and stuffed pasta with sausage or tomato sauce (24%), grilled meat (22.2%) and pizzas (17%). These preparations reflect the influence of Spanish and Italian immigrants in the country. Bolling and baking represented the main cooking methods used.

The reasons for choosing a preparation were: taste (31%), convenience (36.5%), and baking represented the main cooking methods used. The development of efficient strategies targeting on parents’ behaviours and beliefs regarding children’s optimal nutrition is crucial.

Key findings: By aggregating those three risks to households with IAM+G we found 697.586 households in which adults and children starved at least once during the three months period preceding the survey.

**PW-136**

**The effect of parental gender on role modeling of eating habits.**

Esparmanich M.M.; Gavrieli A.; Chatzilexiou M.; Mestana S.; Panou I.; Pateli E.

Department of Dietetics, IST College, Athens, Greece – University of Hertfordshire, UK.

Objectives: The development of children’s food preferences is the result of interaction between genetic, familial, and environmental factors. Regarding familial factors, parents influence their children’s eating habits through various ways, one of which is modeling eating behavior. Several studies have investigated the effect of role modeling on children’s food intake by presenting mixed results. Additionally, it has been shown that a child’s body weight seems to be influenced mostly by same gender parents depicting probably similar eating habits. Thus, aim of the present study was to explore the effect of same gender parental role modeling on child’s food intake.

Methods and Methods: This was a cross-sectional study including 132 families having at least one child (mean age: 9.6±1.5 years). The study population was reached through schools. Self-completed food frequency questionnaires, developed from already existing validated tools were administered to the children during class (one questionnaire for every member of each family). Informed consents were obtained from parents both for participation of them and their children in the study. For analytical purposes 61 dyads of mother-daughter and 62 dyads of father-son were made. Normality of variables was tested using Kolmogorov-Smirnov test. Pearson correlations were used to examine associations between parents and child food intakes.

Results: From 42 food items and food groups tested, ten associations were found regarding food intake of fathers and sons and nineteen regarding food intake of mothers and daughters. In specific, in both cases, statistically significant positive associations were found for fish, vegetables eaten as side dish, fresh juices, full fat yogurt and whole wheat breakfast cereal consumptions. Regarding father-son dyads, positive correlations were also found for red meat (p=0.044), legumes (p=0.031), home-made pies (p=0.012), regular soft drinks (p=0.019) and refined bread/melba toast/nuts (p<0.009) consumption. For the mother-daughter dyad, positive associations were also found for low fat milk (p=0.032), chocolate milk (p<0.001), full fat cheese (p=0.019), white rice (p=0.023), refined pasta (p=0.001), potato (p<0.001), seafood (p<0.001), fresh fruits (p=0.025), margarine/butter (p<0.001), light soft drinks (p=0.001), salty snacks (i.e. potato chips) (p=0.001), honey/marmalade (p<0.013) and pizza or hamburger (p=0.006) consumption.

Key findings: More associations were found between food intake of mothers and daughters than fathers and sons. Secondly, associations were found for both the same and different kinds of foods/food groups for the two dyads. These findings could be attributed to several factors that need further investigation.

**PW-137**

**The situation in selenium as a modulator of blood pressure in schoolchildren.**

Jiménez Ortega Al*, Cuadrado E*, López-Sobaler AM1, Navia B1, Ortega RM1

1Pediatric Gastroenterology, Hospital San Rafael, Madrid, Spain. 2Department of Nutrition, Faculty of Pharmacy, Complutense University of Madrid, Spain. 3UCM Research Group VALORNUT (920030). Department of Nutrition. Faculty of Pharmacy. Complutense University of Madrid. Spain.

Objectives: Some studies have shown that individuals with hypertension produces more reactive oxygen species and have an impaired antioxidant defense system. Selenium is a micronutrient with antioxidant properties, so we hypothesized that it has a protective effective against hypertension. The aim of this study is to analyze the influence of status of selenium in blood pressure (BP) in a group of school children from Madrid. Methods: 573 children (264 boys and 309 girls) of 8-13 years were studied. Dietary intake data was obtained using 3-day food records. Serum selenium concentration was estimated by inductively coupled plasma mass spectrometry. Anthropometric and BP data were also collected, which allowed the identification of normotensive, prehypertensive (PHTA) and hypertensive (HTA) children, considering systolic and diastolic BP ≥95th percentile as PHTA and ≥97th percentile as HTA. It was established that children had excess of weight when their BMI was greater than 85th percentile for the reference population. Results: Among the children studied, 94.2% had normal BP (96±4±12.8 mmHg for systolic and 57.1±8.1 mmHg for diastolic), 4.6% PHTA (111.2±14.5 mmHg for systolic and 69.6±4.7 mmHg for diastolic) and 5.8% HTA (116.5±15.7 mmHg for systolic and 77.9±6.6 mmHg for diastolic).
does not observe differences among males. Our results do not show differences significant in BMI values or physical activity. Logistic regression model adjusted by socio-demographic, physical activity and anthropometric dates confirmed that high scores of depressive symptoms (OR: 1.081 IC 95% (1.03-1.13, p=0.001) score and low socioeconomic level was associated with low diet quality (OR: 2.91 IC 95% (1.29 - 6.38), p=0.010). In contrast, high socioeconomic level was associated with low diet quality, but low socioeconomic level was associated with low diet quality (OR: 5.28 IC 95% (1.74 - 15.96), p=0.010).

Key findings: Depressive symptoms influence on low diet quality in female adolescents from a school-based sample, but not in males. As well, low diet quality was influenced by low socioeconomic level. These results highlight the importance to include nutritional programs in prevent depression strategies especially in critical periods of development as adolescence.

Future research should seek to confirm these findings.

Acknowledgements: Spanish Ministry of Health and Consumption (PI070839)

PW-140 Alcohol consumption and risk of Non-Hodgkin Lymphoma: a meta-analysis of prospective studies.

Sergentanes TIN.1; Nanasios-Stathopoulou I. 1; Tzaninis I. G.1; Terpos E.2; Kandirnis A.1; Psaltopoulou T.1
1Department of Hygiene, Epidemiology and Medical Statistics, Medical School, University of Athens, Greece. 2Department of Clinical Therapeutics, "Alexandra" Hospital, Medical School, University of Athens, Greece
2Faculty of Medicine, Imperial College London, UK

Objective: The aim of this meta-analysis is to quantitatively synthesize the published prospective studies examining the association between the consumption of alcohol and risk of Non-Hodgkin Lymphoma (NHL). Material and Methods: Potentially eligible articles were sought in PubMed with a predefined search algorithm and no language restrictions were applied (end of search date: January 31, 2014). Reference articles and relevant reviews were systematically searched for additional articles in a "snowball" procedure. Two authors working independently performed the selection of studies and data extraction. Random effects models (Chalmers-Liard) were implemented for calculation of the pooled relative risk (RR) estimates. Separate analyses were performed by gender, type of alcoholic beverage (beer; wine; liquor) and subtypes of NHL (Diffuse Large B-Cell Lymphoma, DLBCL; Follicular Cell Lymphoma, FCL; Small Lymphocytic Lymphoma/Chronic Lymphocytic Leukemia SL/CLL). Analyses were performed with STATA 13.1 statistical software; this study was funded by Wenuid Kanker Onderzoek Fonds (WCRF NL) and administered by WCRF international as part of the WCRF International Programme.

Results: 11 cohort studies were deemed eligible, corresponding to a total sample size of 2,638,026 subjects among whom 11,316 incident NHL cases were noted. Ever or current alcohol consumption was associated with lower risk for NHL (pooled RR=0.89, 95%CI: 0.83-0.96). The protective association of ever/current consumption was particularly evident in males (pooled RR=0.85, 95%CI: 0.77-0.93) on the other hand, significance was evident at both genders (pooled RR=0.93, 95%CI: 0.81-1.07). Protective effects of ever/current alcohol consumption were noted in DLBCL (pooled RR=0.84, 95%CI: 0.78-0.90) and FCL (pooled RR=0.86, 95%CI: 0.79-0.94). On the other hand, no protective actions were detected with respect to SL/CLL (pooled RR=1.10, 95%CI: 0.90-1.36) or T-cell lymphomas (pooled RR=0.91, 95%CI: 0.78-1.04 for liquor).

Key findings: The synthesis of cohort studies points to the protective effects of alcohol consumption in NHL risk, especially among males. Future studies should focus on the mechanistic evidence underlying the beneficial effects, with emphasis on design-type associations and differential effects along with gender.

PW-141 Poster

Sodium intake in Spanish schoolchildren assessed by 24h urine levels.

López-Soláker AMP1, Andrés-P1, Cuadrado E’, González-Rodríguez LG2, Hernández Sánchez C1, Ortega RF2
1Department of Nutrition, Faculty of Pharmacy, Complutense University of Madrid. Spain. 2UCM Research Group VALGRUTN (920030). Department of Nutrition. Faculty of Pharmacy. Complutense University of Madrid, Spain.

Objective: The aim of this study was to assess the association between symptoms of depression and diet quality in adolescents of both genders. Material and methods: Study conducted on 229 adolescents (87 boys and 142 girls) aged 12-15 years. Symptoms of depression were assessed using the Youth’s Inventory. Diet quality was assessed using Krecce plus food questionnaire and we classified the subjects according to the cut-off defined by the authors. Then, we divided as low diet quality and medium diet quality which were named “low diet quality” and “high diet quality”. We also recorded body mass index (BMI), physical activity by Krecce Plus Physical activity questionnaire, and socio-demographic level using Hollinghead index.

Results: Females with low diet quality show significantly higher score of depressive symptoms (17.85±9.8 (mean ± SD)) than females with high diet quality symptoms (12.04±6.95 (mean ± SD, p<0.001), whereas we...
PW-142  Poster
Support to the effectiveness of a dietary intervention for the treatment of obese patients through non-invasive endoscopic techniques by endosuturing and Intragastric Dual Balloon.

1Bariatric Endoscopic Unit, San Chinarro University Hospital, Madrid, Spain.
2Department of Preventing Medicine and Public Health University of Las Palmas of Gran Canaria, Las Palmas de Gran Canaria, Spain.
3Nutrition Research Group, Research Institute of Biomedical and Health Sciences, University of Las Palmas de Gran Canaria, Las Palmas de Gran Canaria, Spain.

Objectives: In the nonsurgical treatment of obesity there is a high rate of failure. New endoscopic techniques have been developed, that could help not only during the treatment stage but also during the subsequent weight maintenance stage. These methods minimally invasive, such as endosuturing techniques (endoscopic sleeve gastrectomy (APOL0) and Primary Obesity Surgery Endolumenal (POSE)) and Intragastric Dual Balloon, need to be evaluated because long time outcome data is not available. The objective of the study is to investigate the safety and weight loss outcomes by these methods in the Bariatric Endoscopic Unit of the San Chinarro University Hospital of Madrid during the past two years.

Material and Methods: 60 patients receiving a Reshape Duo Balloon, 14 patients undergoing the APOL0 procedure and 160 undergoing the POSE technique, were followed for 6 months. Follow-up was carried out by a multidisciplinary team (endocrinologist, psychologist and sport assessor). The continuous variables (TBW) having the APOL0 and POSE procedure all the patients received overnight inpatient observation. Outcomes included adverse events, change in total body weight (TBWL) and percentage of TBW (TBWL) (80% TBWL). Results: With the endosuturing methods, patients tolerated the procedure well. No serious short or long term complications arose. All but one patient was discharged within 24 hours of procedure. In relation with the dual intragastric Balloon, one partial (single) balloon deflation was noted with no migration. The intolerance rate was very low (<2%) and patient satisfaction level was high, with 84% of patients reporting being satisfied or very satisfied with the procedure. Baseline BMI for APOL0, POSE and Dual Balloon was: 38.6 ± 5.1, 38.0 ± 4.7 and 38.9 ± 5.3 kg/m2 and mean age was: 45.7 ± 8.6, 43.4 ± 11.0 and 39.2 ± 9.5 years. Initial body weight was significantly reduced at 6 months of follow up. Weight loss for APOL0, POSE and Dual Balloon was: 20.2 ± 5.6, 14.8 ± 8.1 and 14.4 ± 7.4 kg and 96TBWL was: 18.5 ± 3.2, 13.1 ± 6.4 and 10.9 ± 6.4.

Key findings: Bariatric endoscopic techniques, included within a multidisciplinary unit can be a support to the effectiveness of a dietary intervention for the treatment of obese patients and be considered an effective, safe and well tolerated treatment.

PW-143  Poster
Total body water, water intake and cognitive function in children aged 8-9 years.

Aparicio A.1,2,3, Lozaque M.4,5, Mascarque M.6, Cuadrado E.1, Rodrigo A.1, Ortega RM.1,2,3
1Department of Nutrition, Pharmacy of Pharmacy, Complutense University from Madrid, Madrid, Spain; 2Department of Basic Psychology II (Cognitive processes), Pharmacy of Psychology, Complutense University from Madrid, Madrid, Spain; 3Research Group UCM-920030 (VALORUT).

Objectives: Although several studies performed in children suggest that a state of mild dehydration is associated with worse cognitive performance, few studies have demonstrated the beneficial effects of drinking water during the school day. The aim of the present work is to analyze the relationship between water intake and total body water and cognitive function in a group of schoolchildren.

Material and methods: This study included 97 Spanish schoolchildren (8-9 years of age) whose diets were recorded using a 3 day food record (from Thursday to Sunday). Total water intake (food and beverage) was calculated using the nutritional analysis software DIAL. Total body water (TBW) was determined by multifrequency bioelectrical impedance analysis. Cognitive function was assessed using the d2-test of Attention as a primary measure. In addition, TBW and TBWL of the participants didn’t meet water requirements. A positive correlation between TBW (kg) and the processing speed (β=5.5±2.2, p<0.05) and total effectiveness of the test (β=6.4±2.6, p<0.05). Furthermore, those children with TBW above 18 kg (95%) had a higher processing speed (boys: 139.0 points; girls: 139.6 points) than those with TBW (boys: 108.6 points; girls: 110.8 points) (p<0.05). Although we didn’t found an association between total water intake and the different d2-tests scores we observed that those with a higher mid-morning water intake (TBW= 339 ml/day) had a better effectiveness of the test (boys: 113.7 points; girls: 133.7 points) than those with lower water intake at the same time of the day (boys: 99.3 points; girls: 88.2 points) (p<0.05). Even, we found that per 100 milliliters of water drunk at mid-morning decrease 4.5 the number of omissions (unmarked “d”s characters) and increase 18.9 points the effectiveness of the test.

Key findings: Low total body water and an inadequate mid-morning water intake might affect adversely some cognitive abilities which can affect to school performance. It would be necessary to conduct more studies in order to facilitate the development of effective strategies for promoting appropriate drinking patterns at school.

Acknowledgements: This work was supported by a Santander-Complutense University of Madrid project (Ref. P0813-18866).

PW-144  Poster
Maternal obesity in early pregnancy and risk of pre- eclampsia, gestational diabetes mellitus and gestational hypertension in the pregnant population of Gran Canaria.

Bautista-Castaño I.1,2, Aidasiani Abanibi B.3, Guerrero de Sousa T.1, Mon­tero Candelaria D.1, Trujillo Jaime I1, Serra-Majem L.1,2
1Department of Preventing Medicine and Public Health University of Las Palmas de Gran Canaria, Las Palmas de Gran Canaria, Spain.
2Nutrition Research Group, Research Institute of Biomedical and Health Sciences, University of Las Palmas de Gran Canaria, Las Palmas de Gran Canaria, Spain.
3Ciber de Fisicopatología de la Obesidad y Nutrición (CIBER OBN), Instituto de Salud Carlos III, Madrid, Spain.

Objectives: To assess the role of the health consequences of maternal overweight and obesity at the start of pregnancy and weight gain during pregnancy on preeclampsia, gestational diabetes and gestational hypertension.

Material and methods: We studied the cohort of pregnant women (N=2,610) at the Maternal and Infant Health Centre of the University Hospital of Gran Canaria (HUMG) from 1993 to 2013. Outcomes were compared using multivariate analyses controlling for confounding variables. Ordinal logistic regression analysis calculating odds ratios (OR) and their 95% confidence intervals (95%C) were fit to assess the association between body weight gain during pregnancy and maternal categories of BMI, Normoweight women were used as the reference group. Potential confounders included as covariates in the model were maternal age (years, continuous), smoking habit (yes/no), socio-economic level (low, middle and high) and parity (yes/no).

Results: Compared to normoweight, overweight and obese women have greater risks of preeclampsia (RR=2.43 (95% CI: 2.24-2.63) and (RR=2.68 (95% CI: 5.81-6.78), gestational diabetes (RR=1.91 (95% CI: 1.80-2.02) and (RR=3.36 (95% CI: 3.16-3.57) and gestational hypertension (RR=2.39 (95% CI: 1.87-3.03) and (RR=6.69 (95% CI: 5.33-8.40). Other findings: Obesity and overweight status at the beginning of pregnancy increase the risk of preeclampsia, gestational diabetes and gestational hypertension. It is important to promote the normalization of bodyweight in those women who intend to get pregnant and to provide appropriate advice to the obese women of the risks of obesity at the start of the pregnancy.

PW-145  Poster
Proposal Title: A tale of two reviews. Program and policy lessons from two systematic reviews of feeding programs for preschoolers and school-aged children in developing countries.

Bautista-Rodríguez E, Llereto S, Weckl V, Francis D, Greenhalgh T, Janzen L, Noonan E.
1University of Ottawa. 2Nutrition Research Unit, Darwin University. 3Elizabeth Bruyere Research Institute, Ottawa. 4Epidemiology Research Unit, University of West Indies. 5Centre for Primary Care and Public Health, University of West Indies.
Barts and the London School of Medicine. The Hospital for Sick Children, Wythenshawe. The Campell Collaboration

Introduction. The consequences of undernutrition in childhood are severe; more than 35% of deaths and another 35% of the disease burden in young children are due to undernutrition. Physical and intellectual development may be adversely affected. Furthermore, undernourished children are less likely to attend school and benefit from it when they do attend. Early intervention is important to reduce hunger and maximize potential.

Feeding programs are designed to do that. Millions of dollars are invested in these programs, it is essential to learn whether, how, and why they work. We conducted two rigorous Cochrane systematic reviews on: (1) food supplementation for young children 2) school feeding. We performed structured process evaluations.

Objectives. To compare and contrast key outcomes and process factors for feeding programs for children and present policy and program implications. Method. We followed rigorous procedures, developing a logic model, standardized searching and involving at least two authors in reviewing searches, inclusion/exclusion, conducting data extraction, analyses and bias assessment. Our team assessed RDIs for energy, leakage, and, and barriers and facilitators to effectiveness.

Results. Thirty six studies were in the preschool review, 26 from LMIC. Eighteen studies were originally in the school meals review with 8 more in the update; 17 from LMIC. Here, we focus on findings from LMIC. Both reviews showed small effects on weight (preschool: 12 to .25 kg/year, school: 25 to 75 kg/year) and height (preschool: 48 to 67 cm/year, school 25 to 1.47 cm/year). The preschool review showed significant, moderate effectiveness for psychomotor development in 4 out of 5 studies. Both reviews showed significant effects for mental development, but evidence was sparse. School meals had consistent benefits for attendance and math performance.

Factors that impacted on effectiveness included: nutritional need, broken supply chains, redistribution of the supphement within the family, amount of supplemental energy given, palatability, parental/school capacity to give food, and degree of supervision of the feeding.

Policy/program implications. There is stronger evidence for ensuring that: 1) community organizations/schools are well-organized and prepared to deliver food 2) food is palatable and accepted by children and the community 3) distribution and intake of the supplement are closely supervised, 4) the AIs are met, 5) supplementintation starts early and continues for several years and 6) the poorest/ most undernourished children are targeted. There is moderate evidence for giving foods with high energy density and providing families extra rations.

PW-146 Poster Mediterranean alcohol-drinking pattern, alcohol abstention and case-specific mortality: the SUN Project. Gao A1, Bes-Rastrollo M1, Toledo E1, García-López M1, Martínez-González MA1,2. 1Department of Preventive Medicine and Public Health, School of Medicine-University of Navarra, Pamplona, Spain. 2ICIBER Fisiopatología de la Obesidad y Nutrición (ICIBERObn), Instituto de Salud Carlos III, Spain. 3Department of Cardiology, Clinica University of Navarra, Pamplona, Spain.

Objectives: Moderate alcohol intake has been related to lower total mortality compared with abstention. Moreover, it is well known that alcohol use include other dimensions beyond the amount of alcohol consumed. However, the effect of the alcohol consumption pattern may differ with respect to different specific causes of mortality. Therefore, in different populations at different risks, the effect of the alcohol consumption pattern may differ. We aimed to evaluate the relationship between the overall alcohol-drinking pattern and abstention with mortality and the interaction between the alcohol-drinking pattern and death from cardiovascular, cancer, and non-cardiovascular causes in a healthy Mediterranean cohort (SUN Project).

Methods: We followed 18,394 participants up to 12 years. A validated 136-item FFQ was used to assess baseline alcohol intake. We developed a score assessing simultaneously seven aspects of alcohol consumption to capture the conformity to a traditional Mediterranean alcohol-drinking pattern. We also scored to assess alcohol intake, alcohol intake spread out over the week, low spirit consumption, wine preference, red wine consumption, wine consumed during meals and avoidance of binge drinking.

Results: During the follow-up, 206 deaths were identified. Compared with the conformity of higher conformity with the MADP, the low-observance group exhibited a three-fold (HR [95% CI]=3.09 [1.74-5.55]) increased risk of mortality, and abstainers had an 82% increased mortality [HR [95% CI]=1.82 [1.14-2.90]]. Among drinkers, the risk of cardiovascular, cancer and non-cardiovascular non-cancer mortality apparently decreased without increasing categories of adherence to the MADP. However, abstainers were apparently at higher risk of cardiovascular mortality and non-cardiovascular non-cancer mortality, but at lower risk of cancer mortality.

For each 2-point increment in a 0–9 score of adherence to the MADP we observed a 25% relative risk reduction in mortality (95% CI 11, 38%). Within each category of alcohol intake, a higher adherence to the MADP was associated with lower mortality. Abstainers (excluded from the calculations of the MADP) exhibited higher mortality (hazard ratio 1.82, 95% CI 1.14, 2.90) than participants highly adherent to the MADP.

Key findings: In conclusion, alcohol consumers should not initiate the consumption but even moderate drinkers can benefit from the advice to follow a traditional MADP.

PW-147 Poster Metals (Ca, Mg, K, Na, Cr, Fe, Mn and Zn) in Sabrín oficialis. Rivas Abellán DT, Rubio Armendáriz C, González-Weller D1, Luis-González G1, Guíñez-Fernández AJ2, Hardisson de la Torre, A1. 1Toxicology Department. University of La Laguna. 38071 La Laguna, Santa Cruz de Tenerife, Spain.

Objectives: to quantify and to evaluate the levels of ca, mg, k, na, cr, fe, mn and zn in saliva of officialis based on the type of production (organic versus non-organic) and the type of packaging (filter bags versus packets). Material and methods: 16 samples of saliva officialis commercialized in tenerife (canary islands, spain) were analyzed by inductively coupled plasma-optical emission spectrometry (ICP-OES) to provide information on the origin of the vast majority of samples, we have not been able to clarify a relationship.


Objectives: to quantify and to evaluate the levels of ca, mg, k, na, cr, fe, mn and zn in saliva of officialis based on the type of production (organic versus non-organic) and the type of packaging (filter bags versus packets). Material and methods: 16 samples of saliva officialis commercialized in tenerife (canary islands, spain) were analyzed by inductively coupled plasma-optical emission spectrometry (ICP-OES) to provide information on the origin of the vast majority of samples, we have not been able to clarify a relationship.
PW-149 Poster

Major dietary patterns are related to biomarkers of endothelial dysfunction.

Pereira R.N.1; Elomäiha N.1; Peggio R.1; Gutiérrez L.1; Izarza V.1; Rubinstein A.L.1; Defagó M.D.1.2
Centro de Excelencia en Salud Cardiovascular para el Cono Sur (CECASC/ SACCECH), Instituto de Efectividad Clínica y Sanitaria, Buenos Aires, Argentina.

Objective: To examine whether dietary patterns constructed using principal component analysis are associated with markers of endothelial dysfunction in an Argentine population.

Material and methods: A cross-sectional study was conducted among non-institutionalized mainly urban 187 Argentine men and women from the Cescas I Study and free of previous cardiovascular event at baseline. We measured diet (food-frequency questionnaire), blood pressure and plasma concentrations of C-reactive protein, soluble vascular cell adhesion molecule-1, soluble intercellular adhesion molecule-1, and soluble E selectin. Correlations and multiple linear regression models were used to assess the relation between dietary patterns and markers of endothelial dysfunction.

Results: We identified three dietary patterns: Traditional (TDP), Healthy (HD), and Convenience and processed (PDP) food patterns. TDP was characterized by a high intake of refined grains, red meat, whole fat dairy products, vegetable oils, and “mate”, a traditional South American infused drink; HD was characterized by a high intake of vegetables, fruit, low fat dairy products, and legumes; and PDP consisted mainly of processed meat, snacks, pizza, and “empanadas”, a stuffed bread baked or fried. Lower scores in the TDP were inversely associated to serum concentrations of E selectin (p=0.0001). In HD, higher scores were inversely associated to a protein, whereas that lower scores showed a positive relation with E selectin (p<0.05). Contrary, higher scores in PDP were directly associated with E selectin concentrations (p<0.05).

Main findings: The present study supports the hypothesis that major dietary patterns are related with markers of endothelial dysfunction in an Argentine population.

PW-150 Poster

Vitamin K intake in Spanish adults: possible role in control of blood pressure.

Ortega RM.1,2; Rodriguez-Rodriguez EJ.3; Perea JMP.4; González-Rodríguez LG.4; López-Sobaler AM.1,2
Department of Nutrition, Faculty of Pharmacy, Complutense University of Madrid, Spain. 2UCM Research Group VALORNUT (9200390). Department of Nutrition. Faculty of Pharmacy. Complutense University of Madrid, Spain. 4Analytical Chemistry Department Section, Faculty of Pharmacy, Complutense University of Madrid, Faculty of Health Sciences. Alfonso X El Sabio University. Villanueva de la Cañada, Madrid, Spain.

Objectives: Vitamin K is an essential element in the coagulation, which is also involved in gamma-carboxylation reactions of proteins as osteocalcin, which might have a protective effect against age-dependent bone dysfunction. There is also evidence that vitamin K can have a benefit in the regulation and activity of proteins in the endothelial dysfunction, associated with e-reactive protein, whereas that lower scores showed a positive relation with E selectin (p<0.05). Contrary, higher scores in PDP were directly associated with E selectin concentrations (p<0.05).

Methods: A cross-sectional study was conducted among a non- institutionalized mainly urban 187 Argentine men and women. The dietary study was conducted using a 24-hour recall questionnaire for two consecutive days. We measured diet (food-frequency questionnaire), blood pressure, and plasma concentrations of C-reactive protein, soluble vascular cell adhesion molecule-1, and soluble E selectin. Correlations and multiple linear regression models were used to assess the relation between dietary patterns and markers of endothelial dysfunction.

Results: We identified three dietary patterns: Traditional (TDP), Healthy (HD), and Convenience and processed (PDP) food patterns. TDP was characterized by a high intake of refined grains, red meat, whole fat dairy products, vegetable oils, and “mate”, a traditional South American infused drink; HD was characterized by a high intake of vegetables, fruit, low fat dairy products, and legumes; and PDP consisted mainly of processed meat, snacks, pizza, and “empanadas”, a stuffed bread baked or fried. Lower scores in the TDP were inversely associated to serum concentrations of E selectin (p=0.0001). In HD, higher scores were inversely associated to a protein, whereas that lower scores showed a positive relation with E selectin (p<0.05). Contrary, higher scores in PDP were directly associated with E selectin concentrations (p<0.05).

Main findings: The present study supports the hypothesis that major dietary patterns are related with markers of endothelial dysfunction in an Argentine population.

PW-151 Poster

Nutrition risk among home delivered care support users: Baseline evaluation of a continuing education program for care providers.


Background and objectives - A cross-sectional survey was conducted in the context of a continuing education intervention program for workers in home delivered support care service. In this paper we present results of this baseline evaluation regarding nutritional risk of users of the service.

Methods - A cross-sectional survey among users of home delivered support care was conducted in the context of a 20 hour multidisciplinary education program. The protocol for baseline assessment included determinant factors of nutrition risk, food habits and physical activity of clients and nutrition risk screening using the validated short version of the Mini Nutritional Assessment (MNA).

Results - In the first phase of the project 75 people providing care in two city districts were involved. About 500 clients receive care in these districts. Data were collected for 218 users. Mean age of clients was 76.85 yr for men and 81.19 yr for women. Key determinant factors of nutrition risk identified in the group were consuming more than 3 drugs daily, eating alone and limitations for buying, preparing or consuming food and beverages. Significantly more women than men had more than three drugs daily (X²=7,224; p=0,001); had difficulties for chewing or swallowing (X²=5,393; p=0,021) or minimal mobility (X²=7,481; p=0,024). Conversely, more men had difficulties for buying, cooking or eating alone (X²=5,294; p=0,031), usually drank less than 3 glasses of beverages daily (X²=12,084; p<0,001). According to MNA screening, 63% scored at risk of malnutrition; some 10,8% were classified in the malnutrition group.

Conclusion - Prevalence of risk of malnutrition is high among home delivered support care. Awareness and adequate training for care providers should be essential for a high quality service.

PW-152 Poster

Proyecto ALIBEFIS-GLANC: Hábitos alimentarios y actividad física en países iberoamericanos.


Introducción.- El proyecto ALIBEFIS-GLANC, partiendo de una definición consensuada de lo que se entiende por hábitos, usos y costumbres alimentarias y de la evidencia disponible sobre las influencias de estos hábitos sobre la salud, la calidad de vida y la enfermedad, pretende responder las siguientes preguntas de investigación: ¿Qué conocemos de los hábitos alimentarios de los países iberoamericanos, que similitudes y diferencias existen?¿Cuáles son los hábitos, usos y costumbres vinculadas a la regulación y actividad física en adultos jóvenes y sus correlaciones con los países iberoamericanos? ¿Cuál es el objetivo del proyecto de analizar los hábitos, usos y costumbres en relación a la adquisición, preparación y consumo de alimentos, así como en relación con la actividad física en población joven de distintos países de iberoamérica. Métodos - Se ha diseñado un estudio transversal mixto impulsado por el Grupo GLANC vinculado a la Sociedad Española de Nutrición Comunitaria (SENCC). El estudio se realizará en población adulta joven como unidad primaria. El protocolo de estudio combina métodos cuantitativos, cualitativos y recopilación de información contextual de fuentes formales e informales existentes. El protocolo se ha adaptado al lenguaje, usos y contextos del entorno en cada país y se encuentra en fase de evaluación en un estudio piloto.

Resultados - En el proyecto ALIBEFIS-GLANC participan nodos de 14 países iberoamericanos. En la primera fase piloto se han seleccionado muestras de 50 individuos en los centros participantes. Los resultados de esta primera fase permitirán adaptar y validar el protocolo de la investigación. Se han seleccionado muestras de 400 individuos por cada nodo. El proyecto tendrá una duración de cinco años. En el contexto del Congreso Mundial de Nutrición y Salud Pública en Las Palmas de Gran Canaria tendrá lugar
Objectives: Despite the myths, beer is a fermented drink with a low caloric content. Different studies show that there is no relationship between moderate beer consumption and an increased weight and body fat, meaning it is not considered as being responsible for the so-called "beer belly". Therefore, the aim of this research is to analyze how body mass index (BMI), waist circumference and body fat percentage (BF%) can be affected by the consumption of beer in a healthy adult population.

Material and methods: From a wider sample, 120 adults from Madrid (18-50 years) were selected considering their beer consumption frequency: 60 Regular-Beer Drinkers (RBD) (27 men, 33 women) and 60 Non-Regular Beer Drinkers (NBD) (30 men, 30 women). RBD were defined as those men who declared to drink more beers/week or women who drink 3 or more beers/week, NBD were those with lower consumption. The following anthropometric parameters were recorded: weight, height, waist circumference and skinfolds (biceps, triceps, subscapular and suprailiac). BMI and BF% were calculated. Also Biapimendence Analysis (BIA) was used to measure BF%

Results: In both BMI and BF%, significant differences were observed. In the case of BMI, the RBD had lower BMI (23.1±2.3 kg/m²) than NBD (24.6±4.7 kg/m²) even considering the influence of sex by a two way ANOVA (p=0.030). The same pattern appeared for waist circumference, meaning RBD are the ones who had significantly lower values (76±12,7 cm) than NBD (81.7±12.9 cm, p=0.011).

Regarding BF%, calculated values from skinfolds and BIA were similar in both RBD (24,9±7.3% and 22.8±8.4%, respectively; p=0.014) and NBD (26.1±7.3% and 24.2±8.9%, p=0.01)

Key findings: The results in this sample showed that regular beer drinkers had lower BMI and waist circumference than those who don't drink it habitually. In addition no relationship between moderate beer consumption and an increased BF% was observed.

Acknowledgements: This study was supported by the Brewer's Association of Spain (9/2011) and "Manuel de Oya scholarship" (2012).
PW-157
Prediction of metabolic syndrome by clinical indicators.
Covarrubias Onahma A, Calderón Ramos Z, Fernández Cortis LT, Cruz Cansino N, An Guzman Federle D.
Universidad Autónoma del Estado de Hidalgo, México.

Objectives: The main objective of the research is to generate evidence of the association between the presence of acanthosis nigricans and metabolic syndrome.

Materials and methods: It was an applied clinical research, analytical observational directed to effective diagnosis and preventive procedure. Anthropometric and clinical variables (weight, height, abdominal circumference, blood pressure and acanthosis nigricans) in 400 students between 18 and 25 years old, of the Universidad Autónoma del Estado de Hidalgo, of which 99 were classified as overweight or obese. We measured biochemical parameters (plasma glucose, HDL cholesterol and triglycerides), for the diagnosis of metabolic syndrome was made according to the criteria of the International Diabetes Federation.

For quantitative variables was calculated mean, median and standard deviation, for qualitative variables absolute and relative frequency. X² parametric test was used to establish the association of the variables and the statistical analysis was done using SPSS version 21.

Results: The mean body mass index was 27.7 kg/m² according to WHO criterions, the most overweight. Taking into account the components of MS, we observed that the average waist circumference in women was 91.6 cm and 89.4 cm in men, in the case of glucose and triglycerides was 128.8 mg/dl, respectively, lower than the range that the International Diabetes Federation takes as diagnosis of metabolic syndrome. Otherwise HDL cholesterol, we found that the average was 23mg/dl. For men and women 30 mg/dl, fulfilling the diagnostic criteria for metabolic syndrome. The association between acanthosis nigricans and metabolic syndrome was positive (p = 0.020 x²) also noted that in subjects with overweight or obesity, acanthosis nigricans and hypertension are at greater risk of developing metabolic syndrome (prevalence ratio 2.73), without a significant change in the levels of glucose.

Conclusion: The association between the presence of acanthosis nigricans and metabolic syndrome in students is positive and significant (p = 0.020 x²). Metabolic syndrome is fully controllable, reduce to 70% the clinical expression with the treatment of obesity, which is why we conclude that prevention should be the primary strategy for public health and clinical is essential to it; so you can use the presence of acanthosis nigricans as a useful tool in the diagnosis and treatment.

PW-158
Calcium Intake and The Risks of Overweight and Obesity Among Preschool Children in Jakarta.
Hustina Rachman P, Agustina R 1, Endyarni Medise 8 3
1 SEAMEO RECFON (South East Asian Ministers of Education Organization Regional Center for Food and Nutrition), 2Department of Nutrition, Faculty of Medicine, University of Indonesia, 3Department of Pediatric Health, Faculty of Medicine, University of Indonesia

The prevalence of overweight and obesity in both developed and developing countries has been escalating. Yet the role of nutrients, such as calcium, towards overweight and obesity remains unclear among children in urban settings of developing countries. This study investigated the association between dietary calcium intake with the risks of overweight and obesity among preschool children age 3 to 6 years. A case control study with 81 matching pairs by age, sex and school was conducted in 23 randomly selected preschools in East Jakarta, Indonesia. Cases (n=81) were overweight or obese children, whereas controls (n=81) were normal children. Milk was the main contributor of calcium intake for both groups. After adjusted for high energy and protein intake, introduction to formula milk < 6 months, high restriction, overweight and obese mothers, preference of snacks, duration of breastfeeding < 6 months, and high pressure to eat, the risks of calcium intake towards overweight and obesity were not significantly different between case and control (Adjusted OR, 95% CI = 1.537, 0.57-4.16). Calcium intake was not associated with the risk of overweight and obesity among indonesian preschool children.

PW-159
Gender perspectives on food security and nutrition in Nepal.
Jhambindra Gyawali
1 PhD Student, College of Public Health, Chulalongkorn University, Thailand, 2Nepal Coalition for Global Research, Nepal

Introduction: Nepal is one of the least developed countries in the world. Poverty, gender inequality, illiteracy, malnutrition, food insecurity and poor health care systems are some of the emerging development challenges. A vast majority of population have limited access to food, health and nutrition services. The malnutrition among women and children in particular is very high.

Objectives: The purpose of this study was to review the gender perspectives of food security and nutrition in Nepal and assess its socio-economic impacts on households, families and communities.

Materials and methods: It was a cross sectional study which adopted mainly qualitative research methodologies such as focus group discussions, in-depth interview, key informant interviews and participatory observations.

Results: Food security and nutrition are among the priorities of development in view of the impact on agricultural productivity of global economic crises, food price spikes, and climate change. The extent to which gender inequalities in general, and the gender gaps in agriculture in particular, thwart attainment of these twin priority goals is a key concern given the vital role of women smallholders in household and community food and nutrition security.

Key findings: Rural women assume critical roles in attaining each of the pillars of food security: availability, access, and utilization. Their role is thus crucial throughout the agricultural value chain, from production on the family plot, to food preparation, to distribution within the household. However, their roles are generally undervalued and constrained by limitations on their access to resources, services, and labor market opportunities. Most rural households and communities in the country manage their agricultural production system based on social norms and practices that determine the gender division of labor which have profound impacts on nutrition status of women and children in particular.

PW-160
Live experience and satisfaction of urban Iranian women regarding subsidy targeting program through cash transfer.
Mohammadi-Nasrabadi F 1, Vedadhir A. 1, Omidvar N., 1Khoshetrafar MR. 1, Zoghi T 1, Khalafi M 1
1 Faculty of Nutrition and Food Technology Research Institute, Faculty of Nutrition Sciences and Food Technology, Shahid Beheshti University of Medical Sciences, Tehran, Iran, 2Faculty of Sociology, Tehran University, Tehran, Iran

Objectives: The subsidy targeting program through cash transfer in Iran, introduced in 2010, influence the quality of social life as well as nutritional status of Iranian households. In this qualitative study, life experience and viewpoints of urban women in Tehran about the program was evaluated.

Methods: In this study, we used participant observation, which in turn analyzed through Strauss and Corbin analysis method. To collect data, seven semi-structured focus group discussions were conducted with 76 women who experience the effects of cash transfer program on their households as mother, wife or daughter. Based on open sampling, with the aim of maximal variation of the participants' experiences, three demographically diverse areas from the north, centre and south of Tehran were selected. All the focus group discussions were audio recorded and transcribed verbatim. Data collection and analysis were done simultaneously using the Strauss and Corbin analysis method.

Results: In spite of primary goals of lowering inequalities and poverty, subsidy targeting program through cash transfer has increased the relative deprivation and social gaps in residents of capital cities like Tehran. FGDS showed that social observability and participation of members of Iranian household in social events has decreased as major components of social capital. Moreover, most of the participants believed that dependency ratio has become reverse in the households and spouses in reproductive age has more dependent on older family members for their livelihood. Some women believed that this program has increased the domestic violence which increased their hope to the future of their children which in turn could led to lower childbearing and population growth. In contrast, some women evaluated it as a good program which was not implemented well.

Key findings: Cash transfer Program in Iran has raised negative and positive viewpoints in women based on its impacts on inflation and household expenditures.

PW-161
Association between eating in the absence of hunger with body mass index and abdominal obesity in Mexican university students.
Santillana-Marín E 1, Jiménez-Cruz AR 1, Pérez-Morales ME 2, Bacaár-Gascón M 1
1 Universidad Autónoma de Baja California:Centro de Ciencias de la Salud de las Palmas, 2Facultad de Medicina y Psicología, Facultad de Ciencias Químicas e Ingeniería

Objective: To assess the association between eating in the absence of hunger with body mass index and abdominal obesity in Mexican university students.

Methods: A cross-sectional study was conducted in October 2013 with first and second year university students from the medical, dentistry, psych-
There is increased awareness of the importance of nutrition understanding of how to carry concepts and policies.

Methods: The purpose of this study is to contribute to the ongoing dialogue of the gaps in our understanding of effective nutrition-sensitive agriculture and food policies and commitments, and the food-based solutions that help inform countries in their efforts to scale up nutrition. Eight country case studies as well as a synthesis report were commissioned by the United Nations and examined the nutrition sensitivity of agriculture and food policies studied include Brazil, Malawi, Mozambique, Nepal, Senegal, Sierra Leone, South Africa, and Thailand. Results: The analysis found that most of the country case studies demonstrated increased awareness of the multi-sectoral nature of nutrition and political will to address the problems of undernutrition and overweight and obesity. Many of the policies analyzed in the case studies incorporate nutrition objectives, and indicators to measure progress, targeted the vulnerable and women focused on a diversified food production. However, some policies did not emphasize interventions to improve processing, storage, marketing and utilization of foods. Very few have assessed impact of their policies on nutrition outcomes. Major policies include nutrition objectives, but there is a tendency to prioritize explicit sector priorities within ministries at the expense of nutrition.

Key Findings: The country case studies demonstrated that there is some level of improvement in achieving positive nutrition outcomes, as well as an understanding, to varying degrees, that the agricultural sector has a pivotal role in achieving nutrition objectives. As we move forward into the post-2015 era, good practices and transferable lessons can be drawn from each country case study. The studies collectively highlight the importance of agriculture in well-developed human resource effective systems for planning, implementation, and monitoring impact for creating successful, nutrition-sensitive agriculture policies and programmes.

PW-163 

Comparison of Food Intake Patterns of Adolescents with USDA My Plate Dietary Guidelines.

Haddad Tabrizi L, Loma Linda University, Loma Linda, CA 92350 USA

Evaluating food intake among children has a great importance in preventing the onset of adult health problems. Studies suggest that dietary recommendations are not met among adolescents. The aim of this study was to determine if adolescents from highly educated families meet the USDA recommendations based on “Choose MyPlate”. A cross-sectional study was conducted among 336 females and 252 males ages 12-18 years attending selected private and public schools in California and Michigan, who reported their food intake using a web-based food frequency questionnaire. Recommended daily totals of food groups of the Choose My Plate guidelines were used for assessment of intake and X² test was used for comparison. Intake were non-normally distributed, thus, median values were compared to the guidelines. Nineteen percent of study population is vegetarian. Mean (SD) self-reported exercise was 30.5±2.6 min for each country case study. The studies rated nutrition objectives, and indicators to measure progress, targeted food-based approaches that impact nutritional status of populations. Methods: The purpose of this study is to contribute to the on-going dialogue of the gaps in our understanding of effective nutrition-sensitive agriculture and food policies and commitments, and the food-based solutions that help inform countries in their efforts to scale up nutrition. Eight country case studies as well as a synthesis report were commissioned by the United Nations and examined the nutrition sensitivity of agriculture and food policies studied include Brazil, Malawi, Mozambique, Nepal, Senegal, Sierra Leone, South Africa, and Thailand. Results: The analysis found that most of the country case studies demonstrated increased awareness of the multi-sectoral nature of nutrition and political will to address the problems of undernutrition and overweight and obesity. Many of the policies analyzed in the case studies incorporate nutrition objectives, and indicators to measure progress, targeted the vulnerable and women focused on a diversified food production. However, some policies did not emphasize interventions to improve processing, storage, marketing and utilization of foods. Very few have assessed impact of their policies on nutrition outcomes. Major policies include nutrition objectives, but there is a tendency to prioritize explicit sector priorities within ministries at the expense of nutrition.

Key Findings: The country case studies demonstrated that there is some level of improvement in achieving positive nutrition outcomes, as well as an understanding, to varying degrees, that the agricultural sector has a pivotal role in achieving nutrition objectives. As we move forward into the post-2015 era, good practices and transferable lessons can be drawn from each country case study. The studies collectively highlight the importance of agriculture in well-developed human resource effective systems for planning, implementation, and monitoring impact for creating successful, nutrition-sensitive agriculture policies and programmes.

PW-164

Introduction of soft drinks and industrialised beverages in the diets of infants attending public day care centers.

Toloni, MHA 1 ; Longo-Silva, G 2 ; Meneses, RCE 3 ; Taddei, IAAC 3

1 Federal University of Lavras, Brazil. 2 Federal University of Alegroa, Brazil. 3 Federal University of Sao Paulo, Brazil.

Objective: To identify the age at introduction of soft drinks and industrialized juices in the diets of infants enrolled in public day care centers and compare their nutritional compositions with the natural fruit juice. Material and Methods: Cross-sectional study with 636 children (aged zero to 36 months) of nurseries day care centers, whose mothers were interviewed about the age of feeding introduction. We compared the relative and absolute composition of soft drinks and artificial juice, comparing them with those of natural fruit juice for energy, sugar, fiber, vitamin C and sodium value. The chemical composition of fruit juice was obtained by consulting the list of Food Composition and for industrialized drinks it was used the average of the nutritional information on the labels of the five most consumed product brands. Results: The artificial drinks were consumed before the first year of life for more than half of the children studied with approximately 10% consuming it before six months. When compared to the composition of natural fruit juice beverages provide these quantities from 9 to 13 times higher than sodium and 15 times less vitamin C.

Key-findings: The introduction of soft drinks and industrialized juices in the diet of infants was untimely and premature as well, when compared to natural fruit juice, have worst nutritional composition, suggesting the need for action, based on strategies for food and nutrition education in order to promote the formation and maintenance of healthy eating habits.

PW-165

Periodontal and nutritional assessment of children in a rural zone in Minas Gerais, MG.

Saltao GMB 1 ; Sabaté J 2 ; Toloni, MHA 1 ; Longo-Silva, G 2 ; Menezes, RCE 3 ; Ambrósio GMB 4 ; Pereira AC 5

1 Federal University of Lavras, Minas Gerais, Brazil. 2 University Center-Universidade Federal de Lavras, Minas Gerais, Brazil. 3 Faculty of Odontology of Piracicaba, Sao Paulo University of Campinas, Piracicaba, Sao Paulo, Brazil.

Objective: To evaluate the periodontal and nutritional assessment of children from a rural school in Minas Gerais state and to investigate possible associations between social variables, behavioral, nutritional profile and periodontal. Material and Methods: Cross-sectional study with 146 students aged 4-16 years old from a rural school in Lavras. Was sent to parents a socioeconomic questionnaire validated in the literature with questions related to social variables, economic and behavioral. Oral examinations were performed by two calibrated examiners following the criteria of the World Health Organization. Children were examined in the schoolyard sitting on chairs and under natural light. Before examining the supervised brushing teeth was performed (the children received brushing kit containing toothbrush, paste and floss). Mouth mirrors plans and ball point probes were used. For anthropometric examination subjects were placed on a digital scale with centralized, barefoot and with as little clothing as possible, considering the factors weight, gender, age and height. Association analyses by chi-square test or Fisher’s exact frequencies lower than when there were 5 tests were performed. Comparison of periodontal indices, depending on the groups classified according to BMI, was performed by descriptive statistics median, minimum and maximum value and by Kruskal-Wallis test.

Results: The average age of our sample was 10.4 years with a standard deviation of 3.12 years. Data were analyzed by means of frequency distribution tables for each measured variable. Revealing that most of the
individuals examined were normal (73.5%), followed by overweight 12 (8.2%), already malnourished were present in 75.5% of the sample. It is observed that most of the children examined were from families with a monthly income up to the minimum wage, lived with a number of families between 4 and 6 individuals and their parents had studied up to primary education, and 50% of mothers and 53% of fathers had studied up to 4th grade of elementary school. Regarding periodontal indices observed, it was found that most had examined dental plaque and bleeding sextants (level> 0), indicating gingival changes. In relation to dental calculus the same trend was not observed.

Key-findings: Despite the reviews rural individuals present low family income, up to the minimum wage, these are mostly in eutrophic and with a tendency to overweight, suggesting the nutritional transition process for this population. Through the findings were not observed relationship between nutrition and periodontal conditions, since most of the examined showed plaque and bleeding sextants.

PW-166 Media Strategies and Commercials Appeals for Promotion of Food Products.

Object: To investigate the contents of advertisements about the foods in relation to the commercial appeals divulgated by means of internet and television.

Material and Methods: An interpretative survey of advertisements conducted in internet and television-conducted media, seeing that for this purpose, takes into account the ones interlinked by the key words: alcool, processed foods, meats and meat derivatives and legumes, plants, candies, processed meats, starchy foods, milk and dairy products, oils and olive oil were sought. The data were stored for in the form of relative frequency for each category and to test the significance of the differences was performed a square chi test of expected equal proportions, at the levels of 5%.

Results: The 154 advertisements surveyed were divided into 16 categories, where it was found that the main commercial appeals utilized singly or simultaneously were stimulus of the eating object (21.1%), illusions\fantasy (12.9%), family\friendship (12.2%) and flavor (13.2%). On the other hand, the commercial appeals utilized for spreading of foodstuffs were nutritional\dietary appeal (2%), price (1.7%) and consciousness (1%).

Key-findings: The media involved with food industry makes use of artifices, mainly emotional and affective, to attract the attention of consumers and create a desire for the consumption of the product to a sensation of pleasure and social rewards and satisfaction of the ego. Normally, they do not possess informative character but rather persuasive, appealing to the consumer's appetite. Those results call the attention to greater investments in policy programs which aim at the nutrition education, making the subject more critical and more autonomous in the formation of his eating habits.

PW-167 Traffic Light Labeling: tool for understanding food labeling.

Object: To present an adaptation of Traffic Light Labeling adopted in the UK and other European countries, to the current norms in Brazil and classify processed products marketed here.

Material and Methods: This tool is based on the use of light colors to appraise concentrations of total fat, saturated and trans fat, corresponding to sodium and 100g or 100ml of the product fiber. The red light indicates that the nutrient is present in excessive quantities; yellow, green and average adequate. Fibers for low concentrations have red color and the recommended stain. The adaptation and application of these concepts to Brazilian consumers were based on the standards of the Brazilian Nutrition Surveillance System and the Food Standards Agency.

Results: one hundred industrial products, which were selected from the Brazilian hypermarkets, opting for the first product listed on the page for each category were ranked. The analysis showed that there are higher amounts of total and saturated sodium and low amounts of trans fat and fiber. These data show that contemporary society due to the lack of time to prepare your meals, it is attempted to purchase ready-made available by the food industry and acquires under the influence of advertising and unaware of the health risks associated with the continued use of these foods.

Key findings: The use of this methodology aims to facilitate choosing healthy foods, sensitizing consumers about the disadvantages regarding the nutritional quality of industrial and stimulating industry to improve the nutritional composition of its products, from the perspective of receiving higher amount green signals and lower amount of red, thus contributing to the prevention of food errors, obesity and chronic diseases, the leading causes of disability and premature death in Brazil.

PW-168 Development of Instructional Resources for Nutritional Education of Children aged 5 to 6 Years.

Object: This study is intended to report the experience of the development of three instructional resources turn to food and nutrition education of children of five to six years old by a team of the course of Nutrition of the Federal University of Lavras (Universidade Federal de Lavras –UFLA).

Materials and methods: The study was based on Freire's pedagogy, which proposes an awareness education, with a participatory methodology. For such a goal, three resources have been developed: puppet theater, memory game and primer. The puppet theater addresses the importance of wholesome feeding, of nutrients and of the affective relationship involved in the act of eating in a playful and simple way. Basing on the importance of the pedagogic nature of the games in education, a memory game was developed related with the content of dramatization to promote the fixation of the content transmitted by the puppet theater. To give continuity to the activity of food and nutrition education proposed, a primer containing clear and objective texts about wholesome feeding and personal hygiene and of foods and recreational activities for children.

Results: Experience has shown that the development and preparation of teaching materials and nature that interact with the same subject in different activities should consider the needs and constraints of the target audience, and develop and produce a material economically and quality content that conveys a clear and objective manner and involve the learner in the formation of knowledge and knowledge exchange process. During the development of this work it became clear that food and nutrition education interactive has a detachable result in infant feeding. When the process of education is not restricted to children and meets the parents, teachers and legal guardians, it becomes more effective and extending activities throughout life.

Key findings: The work concluded that a well planned nutrition education, considering both needs and limitations have outstanding results in the child feeding and when that education is not limited to children and meets the parents, teachers and legal guardians, it becomes more effective and its results last throughout all their lifetime.

PW-169 Understanding local narratives, attitudes, beliefs and care-seeking practices during diarrhea episodes to inform public health behaviour change strategies in San Marcos, Guatemala.

Object: The study aimed to understand current knowledge, attitudes, beliefs and care-seeking practices during diarrhea among caregivers of children ≤5 year old children in a region of Western Guatemala to inform the development of a Ministry of Health's behaviour change strategy.

Materials and methods: As part of a larger formative research study, we included 8 health centres from 4 rural municipalities in the Department of San Marcos in the Western Highlands of Guatemala. Participation was voluntary. A total of 24 individual in-depth interviews and 7 focus-group discussions with a total of 77 caregivers of children ≤5 year old children were held using reflective dialogues and open-ended question guides. Interviews and focus groups were digitally voice recorded, transcribed verbatim and translated from Mayan Mam, Spanish and English languages. Data were coded using the study domains and HyperResearch® software. Interviews and focus groups were digitally voice recorded, transcribed verbatim and translated from Mayan Mam, Spanish and English languages. Data were coded using the study domains and HyperResearch® software.

Results: Caregivers characterized 11 types of diarrhea; each was associated with a unique perceived cause. Most of the putative causes offered by the mothers were not based on allopathic biomedical principles, but rather included aspects such as "hot and cold" properties of foods and drinks, the "evil eye", and weather changes, among others. Regarding care-seeking practices, taking young children with an active diarrhea episode to health center was a second resort, only after first attempting home treatment with traditional household remedies such as herbal infusions, herb-based pastes and self-prescribed biomedical. Elements for any reluctance to seek care within the public health system included factors such as long distances, confidence in the medical care system and financial costs. Key Findings: The response to an episode of infantile diarrhea has a complex basis in San Marcos. The perceived typology and related cause of diarrhea as well as the attitudes towards the effectiveness of diarrhoea treatment influenced caregiver’s choices in care-seeking and treat-
ment. Considering local narratives surrounding concepts and behaviours of diarrheal and preferred treatment strategies is essential for designing public health behaviour change strategies to influence caregivers. Funded by: The Micronutrient Initiative Canada through a grant from Grand Challenges Canada.

**PW-170**

**Poster**

**Estimated daily consumption of fortified table sugar among women of distinct socio-demographic origins in western Guatemalan: a comparison of two methods.**

Maldonado C A, Escobar M, Díaz E., Fuentes D., and Vossenaar M

Center for Studies of Sensory Impairment, Aging and Metabolism (Ces-SIAM), Guatemala City, Guatemala

Objective: As the governmental mandate in Guatemala calls for the fortification of granulated table sugar with retinyl palmitate, we sought to provide quantitative estimation of table sugar and the contribution of preformed vitamin A from this sugar in women of reproductive age from 3 socio-geographic settings.

Methods: Two dietary methods: (i) a single 24-hr recall and (ii) a 7-day food frequency questionnaire (FFQ).

Materials and methods: 120 women, aged 18-45 y and neither pregnant nor lactating, were recruited across 3 socio-geographic sectors in the departments of Quetzaltenango and Retalhuleu in western Guatemala. A single 24-hr recall was collected and a 7-day FFQ, focusing on foods and beverages with added sugar, were collected on the same day. Portion sizes were estimated with local household measures. Total estimated daily intakes of table sugar were calculated. Total vitamin A contribution from sugar was calculated as 10 μg vitamin A per gram of granulated sugar. Differences in estimated sugar intakes and contribution of vitamin A between area and assessment method were compared using Kruskal-Wallis. The correspondence between the two methods to assess daily intakes and contribution of vitamin A per gram of sugar are in Table 1.

Results: The correspondence between the two methods to assess daily intakes and contribution of preformed vitamin A per gram of sugar with the FFQ was moderate (r=0.57). The difference between the two methods decreased with FFQ, r=0.76. The median daily intake of table sugar was in descending order: 53 g (QuIL), 38 g (QuUM), and 36 g (RUM) (p=0.001). These sugar intakes correspond to 528, 379, 351 and 188 RE units of vitamin A, respectively, and were correspondingly significantly different between areas (p<0.001). Table sugar, alone, covered 100% of the daily RNI for 55%, 43%, 30%, and 20% of women, respectively. In RUM, 9 women had an estimated daily intake of preformed vitamin A from table sugar above 1000 μg/day, but not a single woman approached the 3000 μg UL for the preformed vitamin from sugar alone.

Key findings: When the specifications for retinyl palmitate addition in sugar fortification were enacted, it was assumed that women would consume 40 g of sugar daily, the median overall (37 g) is actually lower than that for these four groups combined. Preformed vitamin A in other foods and sources of provitamin A will be needed to complement sugar to assure adequate intake by all.

Funded by: Sight and Life of Basel, Switzerland

**PW-172**

**Poster**

**Risk of Eating Disorders in university students, physical activity and quality of life.**

Novablas Ruiz, JP; Santi Cano, MP; Rodríguez Martin, A1; Fombella Fernandez, Sara2; Sánchez González, Sara1; García Melgar, Javier1; García Jiménez, Jesús1.

1Biomedicine, Biotechnology and Public Health Department. University of Cadiz. 2Nursing and Physiotherapy Department. University of Cadiz.

Objective: To estimate the prevalence of risk of eating disorders (ED) in university students and its correlation with overweight and obesity, physical activity and health-related quality of life. Methods. Cross-sectional study. We determined: BMI, waist circumference, physical activity time (minutes / day), motivation for physical exercise (BMI-2 adaptation AMPEF), adherence to the Mediterranean diet (14-items scale), and health-related quality of life SF-12. Risk of eating disorders were determined by TCA Eating Attitudes Test-26 (EAT26) with cut-off point greater than or equal to 21. We applied WHO cut-off points for BMI and waist circumference, and 75 percentile as cut-off of adherence to the Mediterranean diet scale. The correlation between variables was obtained by Pearson test, differences between proportions with Fisher's test or Chi and the difference between means with T-test and ANOVA.

Results. We studied 155 university students with a mean age of 21.6 years and 55% of women. We obtained mean values of BMI of 24.9 and 23.7 in men and women respectively; waist circumference were 85.2 cm and 75.8 cm in men and women, respectively. Women had higher weekly physical activity than women: 75.6 min/day versus 53.1 min/day (p<0.007). The score of adherence to the Mediterranean diet was 5.6 (95% CI 5.3 to 5.9), with no differences between sexes. The health-related quality of life measure (SF12) presented means values of physical health of 54.5 in men and 53.7 in women; in terms of mental health quality of life was similar (43.3 and 44.5 respectively).

Women had higher EAT26 scores, indicating greater risk of ED than men: 12.5 vs. 7.9 (p<0.002). Risk prevalence of eating disorders in women was 22.5% compared with 8.1% of males (p<0.02). The risk of ED was correlated with BMI, waist circumference and perceived mental health related to total quality of life (SF12), but not with physical activity. There were no differences in physical activity and adherence to the Mediterranean diet based on the presence of risk ED.

The motivation for perform physical activity in young people at risk of ED were aimed at weight control and body image, and not towards the compensation, social affiliation and challenge. Physical activity correlates with perceived mental health and adherence to the Mediterranean diet, but not with the risk of ED.

Key finding: The risk of eating disorders in university students has a higher prevalence in women and is directly related to anthropometry and inversely to health perceived mental health. Males spend more time performing physical activity than women. In young people at risk of ED, motivation for exercise was primarily associated with control of body image and not the competition.

**PW-173**

**Poster**

**Obesity amongst parents and children; Is it passed on?**

Martínez Nieto, JM1; Villagrá Pérez, SA1; Novablas Ruiz, JP1; Rodríguez Martin, A1; Lechuga Sancho, A1

1Salud Pública Universidad de Cádiz, *Hospital Universitario Puerta del Mar* Cádiz

Objective: To determine the prevalence of overweight (SOB) and obesity (OB) amongst a young population, made possible looking at the parents nutrition.

Material and Methods: A cross-sectional study. City of Cádiz. School attending population 2005-2006 (3-16 years old) 14.332 subjects. A two stage sample: 594 subjects: 504 men (50.7%) and 490 women (49.3%). A survey among family antecedents: weight and size of the parents (TMS SEEDO CRITERIA) Anthropometric measurements of the child: weight and size, BMI (en kid criterion); overweight (SSP): Overweight and Obesity. The prevalence are calculated: IC 95%, X2 and the prevalence reasons given.

Ill World Congress of Public Health Nutrition
Results: The prevalence of SSP in the ancestors was: fathers 68.5%, mothers 38.1%. Amongst children: SBO: 17.1%, OAS: 11.4% and SSP: 28.5%. Calculating the prevalences amongst children according to their excess weight, one of their parents, the father, the mother, or both; give reasons for prevalence with understandable values between 1.1-1.5 and are found within the following cases, with reasons for prevalence close to 2; father SSP (RP-085: 1.97), mother SSP (RP-085: 1.97), mother SSO (RP-SSP: 3.28, RP-SSP: 2.99, RP-SSP: 2.06) Only mother SSP (RP-085: 3.07, RP-SSP: 1.95).

Key findings: There is a significant relationship between the excess weight of the child and of their parents, in both sexes and within all three age groups (3-5, 6-12 and 13-16). The aforementioned is more obvious amongst obese children than amongst those with excess weight, except within the 3-5 age range, that is superior amongst those overweight.

Excess weight of children and those obese are strongly related to the Mother's excess weight.

A Mothers excess weight has a big influence on the child. It is necessary to educate the Mother, as it is of a high possibility that the excess weight and obesity of the child is due to poor dietary habits from the family, especially the Mother.

PW-174 Poster

Anthropometric and sociocultural characteristics of the parents and the prevalence of underweight, overweight and obesity in an infant or young Spaniard.

Rodríguez Martín, A; Novallas Ruid, JP; Villalgrán Pérez, SP; Martínez Nieto, M; Lechuga Sancho, A.1 Salud Pública Universidad de Cádiz, 2Hospital Universitario Puerta del Mar – Cádiz

Objectives: To determine the prevalence of underweight, overweight and obesity according to the anthropometric and sociocultural characteristics of the parents of children aged between 13 and 16, attending school in Cadiz.

To analyse the possible relationship between underweight, overweight and obesity with the obstetric antecedents, with the eating habits and the family physical activity.

Material and Methods: A transverse study based on a population of 1283 children, aged between 3 and 16 attending school in Cadiz. Amongst the sociocultural characteristics of the parents we collected; the level of education, personal qualifications, work activity and the socioeconomical status of the family. We weighed the children and measured them at school, and using surveys, we asked the parents about their eating habits, physical activity, sedentary lifestyle, family antecedents and obstetrics. The BMI of the children was worked out according to the International Obesity Task Force measurement (the World Obesity Federation, as it is now known).

Results: The underweight prevalence was 3.8%, 56.6% a normal weight, 26.2% overweight and 13.4% obese. A higher level of education amongst the parents showed a higher number of underweight children (3.6% vs 4.3%); differing from the figures for overweight and obese children, where they are more prevalent amongst children from less educated families - especially on the mums side; high levels associated - 28% overweight and 17.6% obese.

The prevalence of overweight and obesity is higher when parents have a lower educational level associated with the urban environment or with those obese among those overweight and those obese are amongst the parents showed a higher number of underweight antecedents at birth and 30% have a low weight gain. 47% of overweight or obese children have antecedents with a high weight gain during pregnancy.

We did not find any significant differences in the prevalence of underweight, overweight or obesity related to breastfeeding or the eating habits of children. The fulfilment of the recommended amount of physical activity was principally amongst boys of a normal weight and amongst girls of legal age.

Key findings: Underweight, overweight and obesity are influenced by the level of education and the professional status of the parents, especially in the case of overweight or obese children. The prevalence of underweight children does not seem to be related to the socioeconomical status of the family, nor is it associated to the significant differences within their eating habits nor physical activity. On the contrary the correlation is significant with variable anthropometrics of the parents; the weight gain during pregnancy and the weight at birth.

PW-175 Poster

Does free school fruit improve school performance?

Djupesot E1, Nersenath CB1, Bere E1.
1University of Agder, Serviceboks 422, 4604 Kristiansand, Norway

Objectives: In order to increase children's fruit intake, from fall 2007, an official free school fruit program was implemented in all secondary elementary schools (grades 8-10) and all combined schools (grades 1-10) in Norway, but not in pure elementary schools (grades 1-7). It has been reported that pupils at 1-10 schools increased fruit intake and decreased consumption of unhealthy snacks compared to 1-7 schools (not receiving free school fruit) due to the nationwide free fruit implementation. A political argument for free school fruit is that it improves the pupils' concentration, and their school performance. To our best knowledge, there is no scientific evidence backing this claim, other than a report stating that this is the teachers impression. There are, however, indications for linking nutrition to school performance in developed counties, but proper intervention studies are clearly lacking.

The objective of the present study is to evaluate the effect of free school fruit program on academic performance (comparing 1-10 schools vs. 1-7 schools), and also to investigate a potential relation between the number of years with free school fruit and academic performance.

Material and methods: We analysed the effect of the free school fruit program on school performance in 5th grade. In this grade, national tests in mathematics, Norwegian and English have been repeated yearly since 2008. We used school average data from 2008 (i.e. one year with free school fruit) to 2012 (i.e 5 years of free school fruit), including 1462 pure elementary schools (grades 1-7, 85% participation rate) and 499 combined schools (grades 1-10, participation rate 66%). School performance was measured on a level from 1 to 3. Data was analyzed using t-tests.

Results: All years combined, the difference between combined and pure elementary schools were respectively 1.87 vs. 1.99 (p=0.01) for mathematics, 1.91 vs. 2.01 (p<0.01) for English and 1.92 vs. 2.01 (p<0.01) for Norwegian. Analyses stratified on years showed all similar results, and there were no trend towards improved results for the combined schools, compared to pure elementary schools, with increasing years of exposure to free school fruit program.

Key findings: The results show that pure elementary schools did better in all three tests, in all years, indicating no effect of the free school fruit program on school performance.

PW-176 Poster

Abdominal but not overall obese women: prevalence, environmental and socio-economic patterning in Tunisia.

1RD (Institut de Recherche pour le Développement), NUTRIPASS Research Unit, IBRO-UM2-UM1, Montpellier, France. 2TITKKA (National Institute of Nutrition and Food Technology), Tunis, Tunisia. 3SURVEN (Nutrition Surveillance and Epidemiology in Tunisia) Research Laboratory, Tunis, Tunisia. 4INSP (National Institute of Public Health), Tunis, Tunisia

Objectives: Due to the epidemiological and nutrition transition, Middle East and North African countries feature, especially among women, dramatically high prevalences of obesity. Overall, abdominal fat accumulation seems specifically predictive of adverse health outcomes, and its prevalence varies independently among women in different countries. Nevertheless, most epidemiological assessments of the burden of obesity and its co-factors are based on Body Mass Index only and epidemiological data regarding within-subject agreement of abdominal and overall adiposity is scarce. We studied within-subject abdominal vs. overall adiposity association and related environmental and socio-demographic cofactors among Tunisian women.

Methods: The cross-sectional study was based on a national, stratified, three-level, clustered sample of 35-70 year old women (n=2964) in 2005. Overall obesity was Body Mass Index≥weight/height²>30 kg/m², abdominal obesity Waist Circumference≥88 cm. We assessed within-subject abdominal but not overall obesity (AnO) and overall but not abdominal obesity (OnA) statuses (vs. concordance of the two types of adiposity): their association with environment (urban vs. rural area of residence, the 7 administrative regions which divide Tunisia), individual (age, menopause, parity women and those with free school fruit) and environmental and socio-demographic factors (education, professional, household welfare) was estimated by multinomial logistic regression models.

Results: In the population, abdominal obesity was much more prevalent (60.4%[57.7-63.0]) than overall obesity (37.0%[34.5-39.6]) mostly due to the high proportion of AnO women (25.0%[22.8-27.1]), while prevalence of OnA was residual (1.6%[1.1-2.2]). There were no adjusted associations of AnO status (vs. concordance) with urban vs. rural area of residence (P=0.21), married status (P=0.79), education (P=0.97) or household welfare level (P=0.94). Pre-menopausal (P=0.093), lower parity women (P=0.038) or those with work manual jobs (P=0.038) were slightly less likely to be AnO. However, there was a large variability in the proportion of AnO between the 7 regions (from 16.6% to 30.0%, P<0.0001).

Key findings: In a nutrition transition context with a high prevalence of obesity, one women out of four featured abdominal obesity while not overall obesity, and those obese are associated to the significant differences within their eating habits nor physical activity, but not more prevalently in those obese among those with excess weight, except within the 3-5 age range, that is superior amongst those overweight. Excess weight of children and those obese are strongly related to the Mother's excess weight. A Mothers excess weight has a big influence on the child. It is necessary to educate the Mother, as it is of a high possibility that the excess weight and obesity of the child is due to poor dietary habits from the family, especially the Mother.

Results: We did not find any significant differences in the prevalence of underweight, overweight and obesity related to breastfeeding or the eating habits of children. The fulfilment of the recommended amount of physical activity was principally amongst boys of a normal weight and amongst girls of legal age.

Key findings: Underweight, overweight and obesity are influenced by the level of education and the professional status of the parents, especially in the case of overweight or obese children. The prevalence of underweight children does not seem to be related to the socioeconomical status of the family, nor is it associated to the significant differences within their eating habits nor physical activity. On the contrary the correlation is significant with variable anthropometrics of the parents; the weight gain during pregnancy and the weight at birth.
lent in the eastern more developed regions than in the more rural western ones, possibly linked to genetic, epigenetic or developmental origins differ- rentials. Abdominal obesity must be included in the assessment of the bur- den of obesity in such contexts and causes of the highly prevalent abdomi- nal but not overall obesity status among women must be sought further.

PW-177 Poster
Child obesity and healthy life style habits: differences between physical activity and a sedentary lifestyle in relation to the parents education.
Rodríguez Martín, A.¹; Villagrán Pérez, SA ¹; Novabos Ruiz, JP ²; Martínez Nieto, JM²; Lechuga Sancho, A.²
¹Salud Pública Universidad de Cádiz, ²Hospital Universitario Puerta del Mar - Cádiz

Objectives: To determine the prevalence of overweight and obese children with a healthy lifestyle and with the parents level of education.

Material and methods: Cross sectional study. Reference population: school children in Cádiz during 2005-2006 (aged 13-16): 14,332. Taking a random selection of students from 6 schools: 4 state and 2 public schools. Biometric sampling: 1,283 subjects: 677 men (52.8%) and 606 women (47.2%). Anthropometric measures: weight and size according to the recommended values (AF) of students according Ainsworth and Pate criteria (MET: Metabolic equivalent/min and physical activity ≥ 60 min/d of moderate or intense physical activity), Sedentary habits (hs=2hrs screen/ day or >2hrs). We classified the level of education of the father (Pa) and of the mother (Ma): without studies and ≤6th, elementary and ≤6th, secondary and ≤6th, and of education >6th. A survey of the compliance of physical activity (AF) of students according Ainsworth and Pate criteria (MET: Metabolic equivalent/min and physical activity ≥ 60 min/d of moderate or intense physical activity) (AF): Sedentary habits (hs=2hrs screen/ day or >2hrs). We classified the level of education of the father (Pa) and of the mother (Ma): without studies and ≤6th, elementary and ≤6th, secondary and ≤6th, and of education >6th.

Methods: The study group consisted of 59 women in average age of 41 years and mean body mass index (BMI) of 30.5 km2/1. The body mass, anthropometric indicators were measured and estrogen metabolites concentration in urine was determined. The aim of this study was to deter- mine connections between phytosterogen consumption, body mass and 2/16 OH levels and define their main food sources.
Material and methods: The study group consisted of 59 women in average age of 41 years and mean body mass index (BMI) of 30.5 km2/1. The body mass, anthropometric indicators were measured and estrogen metabolites concentration in urine was determined. The phytosterogen intake was estimated using validated food frequency questionnaire (FFQ) in face-to-face interview. Phytosterogen dietary intake was calcula- ted based on available international databases. Results: Study showed negative correlation between BMI, daily phytosterogen intake (p<0.05) and intake of food products rich in phytosterogens (p<0.05). The highest intake of phytosterogens was associated with low- medium- and high-phytosterogens food items consumption accordingly in 49%, 32% and 19%. Moreover it was due to higher consumption
of whole grain bread and groats, vegetables (mainly cruciferous, yellow-orange vegetables, leafy, tomatoes, cucumbers), legume seeds and seeds (p<0.05). Patients characterized by medium phytoestrogen intake had significantly higher consumption of low-phytoestrogen food items compared to those with low phytoestrogen intake (p<0.05) but there were no significant differences compared to those with highest phytoestrogen intake. 43% of study population with the highest phytoestrogen daily intake was characterized by the highest level of 2/16 OHE ratio.

Key findings: The results showed that the higher BMI the less phytoestrogen daily intake. Furthermore the highest phytoestrogen daily intake was associated with higher level of 2/16 OHE ratio which can indicate a reduced predisposition to breast cancer.

Research related to this abstract was funded by the project PO IG 01.01.02.00-061/10.1

**PW-181**  
**Poster**  
**Diet diversification influence on metabolic disorders development in obese patients - Bioactive Food Project.**

Kostrzewa – Tarnowska A., Czapka – Matysiak M., Mierkiewicz J., Fejfer M.  
Department of Human Nutrition and Hygiene, Poznan University of Life Sciences, Poland

Objectives: Overweight and obese patients have paradoxically high rates of micronutrient deficiencies which in addition to excess body mass, body fat percentage can play role in metabolic disorders development. Human health is strongly associated with diet and its greater diversification can prevent diet related diseases. The aim of this study was to determine the relation between obesity, diet variety and nutritional state.

Material and methods: The study group consisted of 67 patients in average age of 43 years with average body mass index (BMI) of 36.7 kg/m². The body mass, anthropometric indicators, body composition were measured and blood biochemical parameters were determined. The diet diversification was estimated using validated Food Intake Variety Questionnaire (FIVeQ) and expressed by the Food Intake Variety Index (FIVel) which was calculated on the basis of number of food groups consumed per week (max 63) in amounts greater than trace.

Results: Food Intake Variety Index analysis proved that consumption of products from most of food groups: grain products and potatoes, fats, fruits, vegetables, dairy, meat, fish and eggs, sweets and snacks, non-alcoholic beverages besides alcohol (p<0.05) result in higher diet diversification (>25 FIVel). The study showed that the more varied diet the higher iron, folic acid (p<0.05) and vitamin C (p=0.052) blood concentration. The negative correlation between BMI and blood albumin, creatinine (p<0.05), iron (p=0.07) and positive between BMI and glucose, insulin and leptin (p<0.05) was found.

Key findings: Diet diversification and greater consumption of food from different groups rich in key nutrients and antioxidants positively affect the nutritional status of obese patients. Further research on wider group are needed to obtain more detailed data considering intake of specific food products and the nutritional value of patients' diet.

Research related to this abstract was funded by the project PO IG 01.01.02.00-061/10.1
SENC
SOCIEDAD ESPAÑOLA NUTRICIÓN COMUNITARIA

25 ANIVERSARIO
1989 - 2014