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

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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:

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International Journal of Community Nutrition
November 2014

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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

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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 that includes all the abstracts of the conferences, oral communications and posters presented during the III World Congress of Public Health 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 ill 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, Zinc), 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 III 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 25% 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
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:
István Jafiel, 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
María Neira, Switzerland
M.O. Venkatnes 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 Fernández, Belgium
SPEAKERS:
Massimo Masii-Benedetti, Italy
Maria Neira, Switzerland
Lynnette Neufeld, Switzerland
Rhona Applebaum, USA
Walter Willett, USA

POLLVALENTE PLENARY SESSION
Cost Effectiveness of Market driven Fortification to address Hidden Hunger
CHAIRS:
Jörg Spildemmer, Switzerland
Noel Salomons, Guatemala
SPEAKERS:
Andrew Prentice, The Gambia
Patrick Dextel, Switzerland
Simon Wiesner, Switzerland
NESTLE RESEARCH CENTER

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

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

14:30-16:30 POLLVALENTE PARALLEL SYMPOSIUM
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 Lagrignola
INTRODUCTION:
Sandro Demini, Italy
Roberto Capone, Italy
MODERATOR:
Alexandre Meybeck, Italy
SPEAKERS:
Elliot Berry, Jerusalem
Antonia Trichopoulou, Athens
Felice Adinolfi
Xavier Medina, Spain
Reka Belahsen, Morocco

CÁMARA PARALLEL SYMPOSIUM
Public-Private Partnerships: public nutrition services and private sector engagement - a conflict or reality?
CHAIR:
Klaus Kraemer
SPEAKERS:
Eva Monterrosa
Stefan Germer
Saskia de Pee
Ines Reinhard
Shubha Jayaram

SATELLITE SYMPOSIUM
Hydration and public health
CHAIRS:
Ronald Maughan, UK
Jane Holdsworth, UK
SPEAKERS:
Ahmed El-Sharkawy, UK
Ronald Maughan, UK
Ibrahim Elmasif, Austria
Maria Kapsokefalou, Athens
EUROPEAN HYDRATION INSTITUTE (EHI)

16:30-17:00 COFFEE BREAK

17:00-19:00 POLLVALENTE PARALLEL SYMPOSIUM
The value of multi-stakeholder initiatives against NCDs
CHAIR:
Ricardo Usay, Chile
SPEAKERS:
Jaap Sijde, The Netherlands
Monique Raas, UK
Ronit Endevelt, Israel
Petra Dekker, The Netherlands
Elisabeth Dunford, Australia
Ricardo Usay, Chile
CHOICES INTERNATIONAL

GRAN CANARIA PARALLEL SYMPOSIUM
Cost Effectiveness of Market driven Fortification to address Hidden Hunger
CHAIRS:
Jörg Spildemmer, Switzerland
Noel Salomons, Guatemala
SPEAKERS:
Andrew Prentice, The Gambia
Patrick Dextel, Switzerland
Simon Wiesner, Switzerland
NESTLE RESEARCH CENTER

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

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

TENERIFE PARALLEL SYMPOSIUM
Risk factors for healthy aging: Insight from the CHANCES Project
SPEAKERS:
Antonia Trichopoulou, Athens
Ben Schütte, Germany
Martin Bobak, UK
Mark O’Doherty, UK
Christina Bamia, Greece
Eugène Jansen, The Netherlands
CHANCES (CONSORTIUM ON HEALTH AND AGING: NETWORK OF COHORTS IN EUROPE AND THE UNITED STATES)

16:30-17:00 COFFEE BREAK

17:00-19:00 POLIVALENTE PARALLEL SYMPOSIUM
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 Lagrignola
INTRODUCTION:
Sandro Demini, Italy
Roberto Capone, Italy
MODERATOR:
Alexandre Meybeck, Italy
SPEAKERS:
Elliot Berry, Jerusalem
Antonia Trichopoulou, Athens
Felice Adinolfi
Xavier Medina, Spain
Reka Belahsen, Morocco

SATELLITE SYMPOSIUM
Risk factors for healthy aging: Insight from the CHANCES Project
SPEAKERS:
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Ben Schütte, Germany
Martin Bobak, UK
Mark O’Doherty, UK
Christina Bamia, Greece
Eugène Jansen, The Netherlands
CHANCES (CONSORTIUM ON HEALTH AND AGING: NETWORK OF COHORTS IN EUROPE AND THE UNITED STATES)

16:30-17:00 COFFEE BREAK

17:00-19:00 POLIVALENTE PARALLEL SYMPOSIUM
The value of multi-stakeholder initiatives against NCDs
CHAIR:
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SPEAKERS:
Jaap Sijde, The Netherlands
Monique Raas, UK
Ronit Endevelt, Israel
Petra Dekker, The Netherlands
Elisabeth Dunford, Australia
Ricardo Usay, Chile
CHOICES INTERNATIONAL
CÁMARA

SESION IN SPANISH

SATELLITE SYMPOSIAS (SENC-SLAN)

Las encuestas alimentarias y su impacto en acciones de promoción de la salud

MODERADORES:
Javier Aranceta Bartrina, España
Gemma Salvador Castell, España

PONENTES:
Gregorio Varela Moreiras, Spain
Susana Socolovsky, Argentina
Maria Nieves García-Casal, Venezuela
Blanca Román Viñas, España
Javier Aranceta Bartrina, España

THE COCA-COLA COMPANY SATELLITE SYMPOSIAS

Yogurt: A daily partner for health

INTRODUCTION:
Andrew Prentice, The Gambia
Luis Moreno, Spain

SPEAKERS:
Frans Kok, The Netherlands
André Marette
Luis Moreno, Spain
Seppo Salminen, Finland

YOGURT IN NUTRITION - INITIATIVE FOR A BALANCED DIET

TENERIFE

PARALLEL SYMPOISA

Nuts in health and disease

CHAIR:
Jordi Salas-Salavador

SPEAKERS:
Jordi Salas-Salavador
Joan Sabaté, USA
Cyril Kendall, Canada
Ying Bao, USA

INTERNATIONAL NUT AND DRIED FRUIT COUNCIL

ATLÁNTICO

Developmental Origins of Health and Disease (DOHaD) and its overarching relationship with nutrition in developing countries

CHAIR:
Rebecca Kanter, UK

SPEAKERS:
Sarah Kehoe, UK
Sophie Moore, UK
Matt Silver, UK
Shane Norris, South Africa

CONCLUDING REMARKS:
Rebecca Kanter, UK
Shane Norris, South Africa
DOHaD

19:00-20:00

POLIVATENTE

TRIBUTE: RAINER GROSS

CHAIR:
Noel Solomon, Guatemala

Tuesday Nov 11th

08:00-10:00

POLIVATENTE

PARALLEL SYMPOISA

Sugar in health and disease: need for a new threshold?

KEYNOTE:
Angel Gil, Spain

SPEAKERS:
Carmen Gómez Candela, Spain
Dolores Corella, Spain
Jo Jewell, Switzerland
John Sievenpiper, Canada

CÁMARA

PARALLEL SYMPOISA

Food systems sustainability: food security and nutrition

CHAIR:
Luis Serra-Majem, Spain

KEYNOTE ADDRESS:
Per Pinstrup-Andersen

SPEAKERS:
Parvis Koohafkan
Isatou Jallow, Italy
Elliot Berry, Jerusalem
Alexandre Meybeck, Italy
FAO

GRAN CANARIA

SATELLITE SYMPOSIAS

How can Phytase improve Public Health Nutrition

CHAIR:
Richard F. Hurrell, Switzerland

SPEAKERS:
Saskia de Pee
Richard Hurrell, Switzerland
Damien Rondre
Crepitoval Adeola, USA
Parul Christian, USA
DSM

10:00-10:30

COFFEE BREAK

10:30-12:30

POLIVATENTE

PARALLEL SYMPOISA

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

CHAIR:
Benjamin Caballero, USA

SPEAKERS:
Christine Slater, Austria
Shane Norris, South Africa
Victor Owino, Kenya
Florence Vasta, USA
Christine Slater, Austria
GRAN CANARIA

**SESSION IN FRENCH**

**12:30-14:00**

**SATELLITE SYMPOSIA**
Effectiveness and safety of low and non-calorie sweeteners revisited

**CHAIRS:**
Pilar Riobó, 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)

**13:30-16:30**

**POLIVALENTE**

**ORAL COMMUNICATIONS**

**MODERATORS:**
Helmut Schröder, Spain
Monique Raats, UK

- Sodium intake is associated with higher blood pressure in children of 4-5 years old. Valero-Gran D., Navarrete-Murios EM., García de la Hera M., Rodríguez-Bernal CL., Ballester F., Vioque J.


- The effect of malnutrition on the sensory motor development among children from 8 to 24 months, in Mayahi District, Maradi Region, Niger. Rivero Ba, Aboubacar M b, Charles Pa

- 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, Sunita Taneja, Tivendra Kumar, Mari S Manger, Helga Refsum, Chittaranjan S Yajnik, and Nita Bhessari

- 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, Poblacion AP, Taddei JA

- Dietary patterns and overweight among obese children. Durdo C., Saverio 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. Sonego M., Pellegrin M.C., Seward N., Lazarini M.


TENERIFE

**PARALLEL SYMPOSIA**
Folate-preventable congenital anomalies: using the WHO research strategy to guide effective actions in public health

**SPEAKERS:**
Luz Maria De-Regil
Elizabeth Tejero
Juan Pablo Peña-Rosas
Lísa Rogers

WHO / CDC

**12:30-14:00**

**LUNCH**

ATLÁNTICO

**SESSION IN FRENCH**

**12:30-14:00**

**PARALLEL SYMPOSIA**
Repenser la formation universitaire en nutrition en Afrique

**INTRODUCTION:**
Hélène Delisle, Canada

**SPEAKERS:**
Roger Sodjinou
AG Ikhnane Akory
Gaelle Julien, France
Cheikh M.H. Dehah, Mauritania
Hélène Delisle, Canada
- ORAL COMMUNICATIONS -

**Moderators:**

- Inmaculada Bautista, Spain
- Maira Bes-Rastrollo, Spain

**Presentations:**

2. Intrapersonal, social-environmental, and physical-environmental factors which predict healthy eating practices in Dutch adults. Swan, E, Bouwman, L, Hindlink, GJ PhD, Aarts, N PhD, Koolen, M PhD
5. 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, Laxson-Guillain B, Emmett P, Charles MA
7. The burden of obesity in the population of Cape Verde using different anthropometric approaches. Semedo MRS, Barros H
11. Associations between FTO variants and energy intake in adults: a systematic review and meta-analysis. Livstone KMM, Celis-Morales C, Lara J, Ashor A, Mathers JCC, on behalf of Food4Me Study
12. 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
14. Vitamin A stability in Nigerian retailed flour and fortification compliance level. Uchenda F, Atnomo T

**COMMUNICATIONS**

**Moderators:**

- Jesús Vioque, Spain
- Itandehui Castro, Spain

**Presentations:**

1. Local vs. Global food chain performance in Denmark. Nymand-Grarup A, Perez-Cueto FJA
2. 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 B
3. Validation of a picture book used to estimate food portion to be used in dietary surveys. Vilila S, Severo M, Guomor S, Rodrigues T, Lopes C, Torres D
7. Greenhouse gas emissions from production of foods for the American diet. Rose D, Stock K
8. Thermic effect, substrate oxidation, and satiety sensation of fish and chicken protein-based diets in middle-aged women. Tani AFA, Son HR, Kim BK
9. EMBRACE-MS BOWL: An assessment of a new plate-ware designed to improve nutrition and commensality. Virgen Castro DJ, Souza BSN, Santos Q, Perez-Cueto FJA
10. Photo voice - a powerful tool for mapping the obesity facilitators in the Arab Israeli women population. Adler D, Saliva S, Ahed El Rasic M, Harari R
11. The precarious livelihood in waste dumps: a report on food insecurity and health risk environmental factors among Brazilian recyclable waste collectors. Wallace S, Santos LMP, Hoefel MGL, Gubert MB, Spencer, J, Perez-Cueto FJA, on behalf of Food4Me Study
Eficiencia de la implementación de la dieta TENERIFE

14:00-16:30

COMUNICACIONES ORALES (SENC-SLANGLANC)

MÓDERADORES:
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. Zeri 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.
- ¿Dignidad en la Educación Física Chilena? Diferencias en intensidad y actividad física total en escuelas de distinto nivel socioeconómico. Cerda Rioscoso 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. Arguello RL, Cáceres ME, Alzina S, Bueno ED, Noguer SD, Planas MB, Romero Aufeld MJ, Figuerola-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 María del Rocio, Rangel Arriaga Ana Maria, Navarro M, Major M.
- Influencia de la aderencia a la dieta Mediterránea en el estado de salud autopercebido en población joven. Barrios R, Navarrete Muñoz JM, García de la Hera M, González-Palacios S, Valero-Gran D, Vioque J

17:00-19:00

POLIVALENTE

SATELLITE SYMPOSIAS

MODERADORES:
J. Alfredo Martínez, Spain
Gregorio Varela Moreiras, Spain

- Diferencias en intensidad y actividad física total en escuelas de distinto nivel socioeconómico. Cerda Rioscoso 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. Arguello RL, Cáceres ME, Alzina S, Bueno ED, Noguer SD, Planas MB, Romero Aufeld MJ, Figuerola-Grijalba R
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14:00-16:30

ATLÁNTICO

PARALLEL SYMPOSIA

Nutrición fetal y desarrollo neuroconductual del niño

CHAIR:
Mabel Carrera, Argentina

SPEAKERS:
Cristina Campoy, España
Victoria Artijo, España
Jordi Jutze, España

SOCIEDAD ESPAÑOLA DE NUTRICIÓN COMUNITARIA

16:30-17:00

COFFEE BREAK

20:30

OFFICIAL DINNER,
Hotel Santa Catalina
Wednesday Nov 12th

08:00-10:00

POLIVALENTE

PARALLEL SYMPOSIA

Reaching the unreach:ed: determinants of access to health care and nutrition interventions
CHAIR: Luz María De-Regil
SPEAKERS: Gerardo Zamora, Juan Pablo Peña-Rosas, Jacqueline Kung’u, Daniel Albrecht, Theary Chan, Cambodia

WHO/MIL

Ahmed El-Sharkawy, UK

Armando Agata Bialecka, Poland

RONALD MAUGHAN, UK

Rasmus Friis, Denmark

Karl Raats, Luxembourg

Maria Kapsokefalou, Greece

Lluís Serra-Majem, Spain

Marianna Frangeskou, UK and Spain

Laurits Rohden, Denmark

Louise Houlby, UK

Laurits Rohden

Daniel Albrecht, Germany

Luz María De-Regil, Spain

Jane Badham, South Africa

Jacqueline Kung’u, Kenya

Pablo Peña-Rosas, Cambodia

Pérez-Cueto, Copenhagen

Pérez-Cueto, Copenhagen

Soto, Guatemala

Simone Frey, Switzerland

Pablo Peña-Rosas

Pérez-Cueto, Copenhagen

Pérez-Cueto, Copenhagen

Soto, Guatemala

Simone Frey, Switzerland

ONL

Biesbroek S., Bueno-de-Mesquita H.B., Peeters P.H.M., Verschuren W.M.M., van der Schouw Y.T., Bramer W.G.H., Tyteca M., Tenore E.H.M.

AdipoQ has a greater impact on hypertension in lean than non-lean populations: a systematic review and meta-analysis. Arnabshahi S., Basting D., Subasinghe A. X., Evans R. G., Ridell M., Thrift A. G.

Association of selenium status and selenoprotein gene variation with colorectal cancer risk. Hughes D.J., Redikir V., Mérán C., Schomburg L., Freidling-Stir H., Ribé E., Hesketh J., Jenab M. (on behalf of EPIC Group)


Mediterranean Diet and Invasive Breast Cancer Risk in the PREMED trial. Toledo E, Sales-Salvadó J., Corella D, Fitó 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-Gonzalez MA, Bes-Rastrollo M.

10:30-12:30

COFFEE BREAK

12:30-14:30

PARALLEL SYMPOSIA

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

GRAN CANARIA

PARALLEL SYMPOSIA

Choice architecture (nudging) and public health nutrition
CHAIR: Armando Pérez-Cueto, Copenhagen
SPEAKERS: Armando Pérez-Cueto, Copenhagen
Laurits Rohden, Copenhagen
Trine Nørnsberg, Copenhagen
Rasmus Friis, Copenhagen
Louise Houlby, Copenhagen
Laurits Rohden, Copenhagen

PARALLEL SYMPOSIA

Connecting the dots: a global leadership movement for a healthy world
CHAIRS: Marıela Nissensohn, Spain
Ronald Maughan, UK
Marıa José Soto, Guatemala
Agata Bialecka, Poland
Ahmed El-Sharkawy, UK
Marianna Frangeskou, UK and Spain

TENERIFE

PARALLEL SYMPOSIA

Reach the unreach:ed: determinants of access to health care and nutrition interventions
CHAIR: Luz María De-Regil
SPEAKERS: Gerardo Zamora, Juan Pablo Peña-Rosas, Jacqueline Kung’u, Daniel Albrecht, Theary Chan, Cambodia

WHO/MIL

Ahmed El-Sharkawy, UK

Armando Agata Bialecka, Poland

RONALD MAUGHAN, UK

Rasmus Friis, Denmark

Karl Raats, Luxembourg

Maria Kapsokefalou, Greece

Lluís Serra-Majem, Spain

Marianna Frangeskou, UK and Spain

Laurits Rohden, Denmark

Louise Houlby, UK

Laurits Rohden

Daniel Albrecht, Germany

Luz María De-Regil, Spain

Jane Badham, South Africa

Jacqueline Kung’u, Kenya

Pablo Peña-Rosas, Cambodia

Pérez-Cueto, Copenhagen

Pérez-Cueto, Copenhagen

Soto, Guatemala

Simone Frey, Switzerland

Pablo Peña-Rosas

Pérez-Cueto, Copenhagen

Pérez-Cueto, Copenhagen

Soto, Guatemala

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ONL

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**GRAN CANARIA**

**SATELLITE SYMPOSIA**

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

**CHAIRS:**
Rosa Verstraeten, Belgium
Laura Fernández, Belgium

**SPEAKERS:**
Jaap Seidell, The Netherlands
Patrick Kolsteren, Belgium
Karl Raats

**TENERIFE**

**PARALLEL SYMPOSIA**

**Nutrition, mental health and quality of life**

**CHAIR:**
Almudena Sánchez-Villegas, Spain

**SPEAKERS:**
Tasmin Akbaraly, UK
Alfredo Gea, Spain
Cristina Ruano, Spain
Ana Rausumen, Finland

**ATLÁNTICO**

**ORAL COMMUNICATIONS**

**MODERATORS:**
Susana 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. Grobelaar 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 Romatza D, Bedregal P, López de Romatza G, Chirinos D
- Maternal knowledge and practices of exclusive breast feeding and anthropometric indices of their infants in southeast Nigeria. Ibeano V N., Uchemba S. C.
- Community health workers prevent harmful infant feeding and caring practices among mothers of children under 2 in Palestine. Al-Rabadi H
- School Nutrition Pilot in rural and urban Bangladesh: evaluation of nutritional and cognitive effects. Rifat Afsar, Avanti Basak Tukun, Zahir Akanda, Julian Wolfson, Greg Garrett, Eline Rosenromp, Rebecca Spohrer
- School based malaria clearance in Mali: impact on anemia and cognition. Diarra S., Roschini N., Clarke S., Rouhani S., Bamadio M., Sacko M.

**CÁMARA**

**DEBATE**

**Experiments or observations?**

**MODERATOR:** Miguel Ángel Martínez, Spain

**SPEAKERS:**
Joan Sabaté, USA
Walter Willett, USA

**GRAN CANARIA**

**DEBATE**

**Wine versus beer**

**MODERATOR:** Adam Drewnowski, USA

**SPEAKERS:**
Henk F.J. Hendriks, Netherlands
Ramón Estruch, Spain

**TENERIFE**

**SATELLITE SYMPOSIA**

**Vitaminas, hueso y salud pública**

**CHAIRS:**
Rosa María Ortega Anta, España
Vanessa Díaz González, España

**SPEAKERS:**
Manuel Sosa Henríquez, España
Mónica Bulló, España

**SINFÓNICA**

**TRIBUTE: NEVIN SCRIMSHAW**

**LEADERSHIP:**
Ricardo Usary, Chile
Irwin Rosenberg, USA

**13:30-14:30**

**LUNCH**

**14:30-15:30**

**BEST FIVE ORAL COMMUNICATIONS**

**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. Owoibi
- 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 BT, Moskol A., Ferrari P, Byrnes G, Silmani N, on behalf of the EPIC-PANACEA collaborators
- Focused ethnographic Study on Infant and Young Child Feeding Behaviors, Beliefs, Contexts and Environments in three Arsd and Semi Arsd counties in Kenya. Faith M. Thitu, Gretel H. Pelto

**12:30-13:30**

**DEBATE**

**Taxing foods as public health measure**

**MODERATOR:** Beatriz González López-Valcárcel, Spain

**SPEAKERS:**
Guillem López Casasnovas, Spain
Nathan Tefft, USA
15:30-17:00
SINFÓNICA
PLENARY SESSION
Nutrition research in the new era
CHAIRS:
Ángel Gil, Spain
Lluis Serra-Majem, Spain
SPEAKERS:
Reynaldo Martorell, USA
Martin Binks, USA
Lorraine Brennan, Ireland
Ángel Gil, Spain
Andrew Prentice, The Gambia

17:00-18:00
SINFÓNICA
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
SINFÓNICA
CLOSING CEREMONY
CLOSING LECTURE:
The Role of Food and Nutrition in Space Exploration
CHAIRS:
Jose Ramón Calvo Fernández, Spain
Lluis 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 parsimony's strengths lie in its ability to identify 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 metabolism, who 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, behavioural scientists, computer programmers, mathematicians and more will all be welcomed to our field. Horizontal acquisition of intellectual input from these specialties 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 BIU's food security index. These proxies indicate a very 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 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 continues, merely relying 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 Kannan M.G.**

University of Toronto, Canada.

The knowledge and solutions needed to effectively alleviate micronutrient deficiencies and malnutrition are more readily available than ever before 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, 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 diarrhoea along with oral rehydration therapy is also emerging as a major intervention to treat diarrhoea 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

**Maybeck 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 made. 63 countries have achieved the Millennium Development Goal of halving the percentage of their population who are under-nourished. An estimated one billion 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 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 ICN 2, 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 death in children before the age of five. Hidden hunger describes chronic inadequate 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 these nutrients, with a negative impact on early development. Iodine 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 the second birthday 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 generations.

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.
However, grain (maize, rice, wheat) is a good source for energy and protein and creates satiety but a rather poor source for micronutrients. These staple food are globally available and, compared to higher quality food, less expensive. Poverty results in a poor food pattern with low diversity and consequently in a poor supply of essential micronutrients. The reasons for poverty are manifold but they all interact finally with food insecurity to promote hidden hunger. Even short price shocks independent from what reason will have deadly consequences. The nutrient density score clearly shows that low price food is correlated with high energy but poor micronutrient density in contrast to food with a higher price. The food insecurity report of the US from 2012 clearly documents that the number of households living in moderate and serious food-insecurness increased 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.

Children are the one side of the hidden hunger medal - elderly the other. In the "First World" the problem of hidden hunger, in particular vitamins D, B12, iron and iodine is overlooked. In Europe up to 60% of elderly living in nursing homes are suffering from malnutrition. Malnutrition is frequently associated with depression and increased risk for cognitive impairment and immobility.

A couple of national surveys clearly show that in different groups adequate intake of micronutrients is indeed a problem. Folate, vitamin D, Calcium, Iron, Iodine but also Vitamin E and A are more or less below the recommended levels. We do not know whether and how this might have an impact on human health but epidemiological and experimental data show that a diet poor in one or more micronutrients is associated with risks for different diseases such as coronary heart disease, cancer, neurodegenerative diseases etc. To further evaluate that we need an assessment tool which allows to follow the nutrition behavior of risk groups and to have an early detection system for micronutrient inadequacy.

**Funding nutrition research in the 21st Century:**

**Sharing benefits from public-private partnership in nutrition.**

Massi Benedetti M.  
*Hub for International Health Research, Italy.*

Effect of globalization on food and nutrition

Nutrition as a component of the Geopolitical scenario

Nutrition as a major determinant of health

Concept of sustainable development

Shared value economic doctrine

Public-private partnership as the only way forward

Terms for partnership: factors to be taken into consideration

Facilitating factors

Barriers

External interfering factors

**Funding nutrition research in the 21st Century:**

**Sharing benefits from public-private partnership in nutrition.**

Neufeld L.M.1, Arabi M.2

1Global Alliance for Improved Nutrition, Geneva, Switzerland.  
2The Sackler Institute for Nutrition Science.

The field of nutrition benefits from a strong evidence base and regular updates of evidence through systematic reviews and focused peer-reviewed papers series, among other methods to summarize and disseminate evidence. Despite this, many gaps remain from basic understanding of biology (for example the influence of gut health and the microbiome on nutrient absorption, child growth), to methods for delivery of and effectiveness of nutrition interventions at large scale, and optimal combinations of nutrition interventions to improve health outcomes and optimization of use of scarce resources. Such evidence gaps often limit the progress towards improved nutrition by limiting the quality of program design and delivery but may also limit private sector investment in nutritious products and services. As the processor and distributor of food to the majority of the world’s population, the private sector can play an important role in nutrition through the development and marketing of nutritious products and services but evidence gaps may limit their ability and willingness to do so. This presentation will provide an overview of models by which the nutrition community can engage the private sector in identifying and filling evidence gaps and channel additional resources to nutrition research through investment of corporate social responsibility funds but also by identifying and addressing gaps in evidence that might foster making nutrition more relevant to business, while ensuring neutrality and the highest scientific standards.

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

Appelbaum R.S.  
*Science and Health Office, The Coca-Cola Company.*

Public-private partnerships and collaborations (PPPs and PCCs) 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 PCCs 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 or PCC to succeed—regardless of its size or focus.

There are many examples of such PPPs and PCCs 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 PCCs designed to help people live better lives.

Industry shares in 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 to focus 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—across all ages and income levels.

However, 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 PCCs 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 improve the distribution of medicine alongside other partners including USAID and the Bill and Melinda Gates Foundation. The goal is simple—to do what we can to strengthen health-care systems globally. Examples of other Golden Triangle PPPs and PCCs 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 deficiencies during certain life stages, such as pregnancy, lactation, and infancy, are among the causes of hidden hunger, which may “invisible” 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 specific area; 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 knowledge 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 financial driving force for this approach. 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 fact that many fortified products only 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 impacts 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 (FPM) 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 analysis 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 FPM 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.

Demili 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 its 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.

There is a need 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 Medi­terranian 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 2013 FAO has been conducting a series of activities on the Medi­terranian 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” and “sustainable diets protect and respect biodiver­sity 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.

Caponi, R.
CIHEAM-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 Mediterran­nees). Its main objective is the qualification and enhancement of the typical food products of the Apulia region, through the creation of the quality scheme “Quality Products of Puglia (PoQP)” 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 compli­menting 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 PoQP, typical of the Mediterranean Diet.

The main objective of this pilot project is to ensure that the products which adhere to the quality scheme PoQP 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 “Sustained­ness of food systems in the Mediterranean Area”, held in Malta in September 2012, on the occasion of the Meeting of Ministers of Agriculture of Member 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 methodolo­gy 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 PoQP, 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

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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 variety, 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 environmen­
tal sustainability - and which to a great extent grounded its nutritional and health benefits? To what extent it can constitute a model for the preservation and improvement of the environmental sustainability of diets in other areas.

The progressive evolution of the Mediterranean diet towards sustainability.
 Berry E.M.
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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 within 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 show the influence of each of the four dimensions allowed 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.
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 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 broader sense meant. 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.
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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 latter a blind mistrust towards it. More and more often, people pursue going back to the origins that give them credibility and calmness when it comes to 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 approach 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.
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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 give 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 underdeveloped 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 exchanges in technical expertise along 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).
 Extraordinary 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 endstates 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 light of rapid increases of obesity, there is rising concern that some food and beverage companies promote ‘leanwashing’ where a firms 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 area of WRA and WHA 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 Programme

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 regulation and availability. With increasing urbanization 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 establishes a production facility 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 costs), b) determining distribution options, including ‘market size’ of the product, c) distribution, and subsidized and commercial sales, including their marketing; 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 aim to promote nutrition development goals while engaging 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 traders, and middlemen. This 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 possible 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 product and subject them to an acceptability test. The project will raise funds to conduct dietary intake and nutritional status assessment of 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 activities and how each organization has played a role 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 now has 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/MNP reformulations. In-country advocacy efforts are also being strengthened via both top-down and bottom-up approaches, and the partnership has recognized that regional forums 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 to share experiences for greater impact. Lastly, there is need for increased access to the DSM-WFP project 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 nutrition needs.

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

Kwame Nitro Adu 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
Hydration, functional capacity and the promotion of physical activity.

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Hyponatremia, 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 hypohydration. 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 hypohydrated state compared to when euhydrated. A meta-analysis of the data from 23 trials revealed overall mean RPE to be significantly higher when hyponatremic 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.

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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 EFSACarine 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, thus exposing them 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.

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Euhydration, 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 implications1. 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 2 and 2.5 L/day, respectively2. However when water needs are higher, eg at sickness or hot temperature conditions or during physical activity levels, water intake must be at a more adequate level3. 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 other sources such as solid and fluid foods4.

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

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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 systematically reviewed.

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

Setting: General population

Participants: 26,018 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) whereas no consistent trend with age was observed. During follow up, 6,695 study participants died, among whom 2,624 died of cardiovascular diseases, cancer and other causes. Main age-, sex-, season- or country- specific differences were detected.

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).

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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. 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 (25–29.9 kg/m2) or moderately obese (≥30) tended to be associated with a lower risk of mortality compared to normal (≤18.5–25.1): ESTHER, HR (95%CI) 0.69 (0.58-0.82) and 0.78 (0.63-0.97); Rotterdam, 0.86 (0.79-0.94) and 0.80 (0.72-0.89). A similar relationship was found, but only for overweight in Kielstrup, 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 independent 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 measurement, it may still prove important to account for changes in risk factors over time so as to fully unveil 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).

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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 are usually opted 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 studies with 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 moderate/poor". Statistically significant odds ratios (OR) were then combined through meta-analysis.

There was a consistent trend of increased mortality for those with SPH "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) as compared to those with SPH "good/very good/excellent", adjusting for age, sex, 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 the set 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 more than 2% ethanol within the 2nd/3rd cohort specific tertiles (as opposed to being and ethanol consumer of the 1st tertile), having a higher education level (as opposed to having at maximum primary education), and performing vigorous physical activity (as opposed to not performing such physical activity) are factors associated statistically significantly with the odds of self-perceiving one's health as "generally good" rather than "generally bad".

The above indicate results support a consistent finding of increased mortality associated with moderate or bad SPH (as compared to generally good) among the elderly which follows a monotonic pattern in all analyses and persists after adjustment of a number of established factors which affect mortality including morbidity at baseline. The pattern of characteristics of elders who rate their health as generally good highlights a profile of these people which is more or less common across cohorts participating in this analysis.

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.

Biomarkers of aging and disease.
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The project CHANCES (Consortium on Health and Ageing: Network of Cohorts in Europe and the United States) is a collaborative large-scale integrating project funded by the European Commission (FP7) which aims to produce evidence on ageing-related health characteristics and determinants in Europe. CHANCES focuses on four groups of chronic diseases, cancer, cardiovascular diseases and diabetes, osteoporosis and fractures, cognitive function and psychiatric disorders, that are major contributors to the burden of disease in the elderly.

In the work-package on Biomarkers (WP9) an inventory was made of the biomarkers that have been measured in the various cohorts. In addition, a set of biomarkers have been selected, related to aging and diseases to complete the existing data set of biomarkers. Emphasis was on cohorts from Central and East-European origin (HAPEE cohorts from Krakow, Prague and Kaunas) and the ESTHER cohort (Germany). In these cohorts biomarkers of oxidative stress, antioxidant and redox status have been measured, in addition to biomarkers of nutrition (folate, vitamin B12 and vitamin D) and disease (kidney and liver function and inflammation).

In this presentation biomarker data will be given from the measurements within CHANCES supplemented with data from other studies. The focus will be put on the distinction between biomarkers for aging, nutrition and disease.

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.

The number of people with overweight and obesity continue to grow worldwide. This coincides with an increase of cardiovascular diseases, type II diabetes, certain types of cancer and other noncommunicable diseases.

Seidell J.
Free University of Amsterdam, The Netherlands.

To tackle this growing problem of obesity and other diet-related health issues, the World Health Organisation (WHO) called upon the food industry to:
- limit levels of saturated fat, trans fat, added sugars and salt in existing products;
- use simple, clear and consistent food labels;
- help consumers to make informed and healthy food choices.

A successful approach to fight obesity, calls for a joint effort between scientists, governments and the food industry.

The Choices Programme is a good example of such a cooperation. This initiative was started as part of a front-of-pack labelling programme helps consumers to make healthy choices. At the same time, the programme stimulates the food industry to develop healthier food products.

This programme builds upon a cooperation between governments, scientists and food industry. Public authorities can support the initiative by endorsing or approval of the programme (international policies).

Scientists, independently from industry, develop the product criteria based on international dietary guidelines from the WHO. These criteria are periodically reviewed by the scientific committee. Adaptations of regional criteria can be set by a national scientific committee, taking into account local food habits, dietary guidelines and product composition.

The food industry uses the criteria to reformulate their products to healthier options. Studies demonstrate an important impact of the programme on the healthiness of products. Amounts of sugar, sodium and saturated fat have been greatly reduced, whereas fibre content increased.

Data from a modelling study by Roodenburg et al.2, in a Dutch young adult population, show potential beneficial effects of Choices on energy and nutrient intakes, but also unintended effects on fat soluble vitamins. Calculated intake distributions showed that median energy intake was reduced by 16% by replacing normally consumed foods with Choices compliant foods. Intakes of nutrients with a maximal intake limit were also reduced (ranging from -23% for sodium and -62% for TFA). Effects on intakes of beneficial nutrients varied from an increase of 28% for fibre and 17% calcium to an unintentional reduction in fat soluble vitamin intake (-15 to -28%).


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 food; 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.

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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. The Ministry 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 Eshcharibi, 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 ads during children’s TV; 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 arena. For example: The Health Ministry initiated a national program to reduce salt intake, including factory 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 salt reduction, tap water consumption/reduction of sweetened beverages and healthier birthday party habits in nursery schools.

Results: The Ministry of Health and Israel’s leading food companies have agreed on salt reduction targets in 11 food categories. In several food groups, such as packaged salads and breads, companies have already begun to reduce salt content. Eshcharibi’s “food label” for low sodium, low whole grain bread currently appears on breads from all of Israel’s leading bakeries.

In the Health System, all public hospitals now provide more healthful food to both patients and visitors. The four health funds tripled the number of diabetes and weight reduction groups for children and adults. In 2015, the Ministry of Health will launch a “healthy parenting” initiative, to be implemented in well-baby clinics. Since 2011-12, over 300 schools have achieved accreditation as “health-promoting schools”. The Ministries of Agriculture, Education and Health are developing school fruit and vegetable distribution programs, added health promotion as an educational objective, and made it a basic component of teachers’ training. It is now illegal to sell or serve unhealthy foods in schools.

Additional initiatives included a game-based website for children, health-related content for children’s TV, health promotion in the military and the police and the production of a tool kit for workplace health promotion. Municipalities and local NGOs have initiated hundreds of programs in community centers and public spaces, including community and nursery-school edible gardens, “walking school buses” and bicycling groups for at-risk youth.

The program is not without challenges: front-of-packaging food labeling has encountered strong opposition both in and beyond government, as has reducing junk food marketing to children. In 2015, the Ministry of Health will be launching roundtables with relevant parties on both fronts, in order to achieve realistic and sustainable solutions.

Conclusions: It is possible to make national public health and health promotion programs to reduce the incidence of NCDS, if sufficient resources are recruited and attention is focused. Challenges, though, remain, and must be addressed, in order to achieve the National Program’s goals and equitably foster healthy behaviors on a population level.

Experience from Friesland Campina with Multi-Stakeholder initiatives on healthy diets.

Dekker P. FrieslandCampina, The Netherlands.

FrieslandCampina is one of the world’s five largest dairy companies. Its products like dairy-based beverages, cheese, desserts, infant nutrition, ingredients and products for professional consumers find their way in more than 100 countries mainly in Asia, Africa, EU and Middle East. The company is fully owned by Zuivel Coöperatie FrieslandCampina U.A., with more than 19,000 member dairy farmers from the Netherlands, Germany and Belgium.

By 2050 the world’s population is expected to have risen to between 9 and 10 billion people. Feeding this increasingly global population is an enormous challenge. From a nutritional perspective we are confronted with malnutrition and overweight/obesity at the same time. FrieslandCampina wants to help combat malnutrition and help reduce the growing number of people with overweight. FrieslandCampina does this by improving the composition of its products, by disseminating information about healthy eating and lifestyle, and by making the healthier selection of food easier for the consumer.

Preventing and combatting overweight and obesity is a shared responsibility of consumers, NGO’s, governments as well as food producers and food suppliers. FrieslandCampina is committed in working together with other stakeholders addressing this challenge. As such FrieslandCampina is one of the founding fathers of the Choices Foundation in the Netherlands and the International Choices Foundation in Brussels. Why does FrieslandCampina participates in Multi-Stakeholder initiatives? What are our conditions to participate? What is the impact of participation in these initiatives such as the Choices system, on the company and its brands? Out of the results: every year 2 million kilos less sugar is nowadays added in dairy and fruit based drinks on the Dutch market.

During a short presentation eight years of experience with the Choices Foundation will be shared by Petra Dekker, one of the leading nutritionists of FrieslandCampina.

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 10 years could result in >500,000 fewer coronary heart disease and strokes annually. This will only be achieved if there is quality, definitive data describing the food supply and how it can be improved.

The Global Food Monitoring Group (FGM) 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 FGM 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 FGM, and most of these are from Central and South America and the Asia Pacific region. The FGM 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 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 often wide variation in sodium levels in school foods, the lack of consistency in sodium and other nutrient levels, the use of crossed food labels and menu labels both nationally and globally, and the variations in locally made vs. imported products in lower and middle-income countries as opposed to developed countries.

The Netherlands and the UK have been used to develop a smartphone application called FoodSwitch which was launched as a public-private partnership with leading health insurance company, Bupa. By scanning the barcode of a packaged food product using a smartphone’s camera, the FoodSwitch application presents a nutritional profile of the food with easy-to-interpret, colour-coded traffic light ratings for total fat, saturated fat, sugar and salt content. The application also suggests healthier alternative products (at the brand level) in the same category of the scanned food. FoodSwitch has been an important outcome if the work of the FGM to date and is a good example of how a multi-stakeholder project can be used to directly help consumers make healthier food choices. A particular innovation in the app was the incorporation of a crowdsourcing function whereby users are able to contribute information on missing products. If a barcode is scanned but the corresponding UPC is not identified in the database, then the user is asked to photograph of missing items and the information is then added to the database. More than 500,000 photos of missing items have been sent in International Journal of Community Nutrition 2014, 0 (suppl)
by FoodSwitch users since launch, and this huge volume of crowd-sourced data has proven 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, and it is hoped that this will provide a practical scalable and affordable 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.

**Labelling developments in Latin America.**

Uaoy R
Institute of Nutrition INTA, University of Chile.

Considering the rapid rise in the prevalence of obesity and related NCDs in virtually all Latin American countries and the direct association of these diseases with diet and patterns of food consumption, there is a strong need for countries to adopt systems to track food consumption and physical activity in support of good health and nutrition. These measures have to be simple, easy to understand and applicable on large scale.

From an information labelling systems (FOLS), based on “food groups” specific criteria for sugar, fat, saturated and trans fat and dietary fibre, have been developed to provide an answer to this demand. A positive logo as has been developed by INSIP in Mexico and by the University of La Plata in Argentina, in order to guide consumers in selecting the “healthiest” options within each food category. This approach not only provides the best choice from what is available but also serves to guide the food industry towards health-nutrition driven innovation. The implementation of the choices approach requires cooperation of science, industry and government in each country where it is implemented, as demonstrated in the Netherlands. Where the food system has had an important impact on the sugar, salt, fat and fibre content of processed foods as well as has influenced population intake. FOLP should also help food industry to generate changes in processing that will promote healthier food consumption, with less sugar, salt, saturated fats and energy and more fibre and micronutrient intake. Considering that presently processed foods in most markets are loaded with excess sugar, salt and saturated fat; this approach depending on the setting can generate a virtuous cycle where both health demands and business interest are compatible. Unprocessed foods too should preferably be cooked with minimal or no addition of salt, sugar and saturated fats during preparation. These actions should ultimately lead to a healthier food supply/consumption patterns and lower NCD diet related risks and thus lower health costs. Thus, pursuing per se should not be a criterion to define health consequences; the challenge for all is to promote a healthy diet in which healthy foods can be consumed in their natural form or processed in a manner that does not compromise human health. The goal today and in the future is to change processing in support of good health and nutrition.

**Estudios de Balance Energético; metodología y resultados en la población española.**

Varela Moreiras G.
Nutrición y metabolismo. Universidad CEU San Pablo (Madrid), España. Fundación Española de la Nutrición (FEN).

El balance energético (BE) o equilibrio energético se refiere “simplemente” a que debemos comer la misma cantidad de energía que gastamos. Conocer el concepto de BE y aplicarlo a nuestras vidas es quizá el factor más importante para mantener una buena salud y tratar de prevenir la obesidad. Sin embargo, la teoría no es sencilla aplicarla ya que, por un lado, en este ya avanzado siglo XXI desconocemos todavía en gran medida, nuestro estilo de vida, nuestro comportamiento alimentario. Y éste es un tema, de una vez más complejo, lo que dificulta sin duda controlar adecuadamente este equilibrio que se refiere a la energía, pero además, en el otro lado, el correspondiente al gasto energético, aún es peor conocido y hay muy escasa información en la cuantificación adecuada del mismo. Debe reconocerse, además, que no debemos estudiar aisladamente los componentes del BE, sino de manera integrada, y que no se pueden separar, ni aportar información de una manera clara, y totalmente precisa, de una manera integrada, y así interaccionar. Problemas como la infr_valoración de la ingesta de energía, y la sobrevaluación del gasto, son frecuentes en la mayoría de las encuestas alimentarias, impactando más en aquellos grupos de población en los que el control del balance energético resulta aún más necesario. El empleo de las nuevas tecnologías abre innovadoras posibilidades para las encuestas de balance energético. Precisamente, la innovadora metodología (empleo de “tablet” para cuantificación de la ingesta, y de acelerómetros para el nivel de actividad física) en el reciente estudio ANIBES (“Antropométrica, Ingesta, y Balance Energético en España”), representativo de la población española, y que hemos desarrollado, proporciona una herramienta útil y actualizada para un mejor conocimiento del balance energético de la población española, como se pondrá de manifiesto en la ponencia.

**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 NUTRICION y Bromatología. Universidad CEU San Pablo (Madrid), España.

Las encuestas que muestran el consumo de alimentos aportan información acerca de la contribución 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 polihidroxi, polidextrina, inulina, FOS, GOS, IMOs y otros. Asimismo se presentarán los avances en edulcorantes intensivos y se hará referencia a los sustitutos de grasa presentes en múltiples alimentos de nueva tecnología.

La innovación tecnológica actual induce la constante reformulación de alimentos para hacer efectiva la reducción calórica de los alimentos enviados y el tema es fundamental dentro del debate actual sobre balance energético.

**Herramientas para planificar y medir consumo en intervenciones nutricionales: fortificación de alimentos.**

García-Casal M.N.
Instituto Venezolano de Investigaciones Científicas, Caracas, 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 de la contribución de una determinada intervención (fortificación, implementación, universal o dirigido), si se requiere incluir uno o más nutrientes y cuál es el aporte más indicado. Para reunir esta información, que además será utilizada como línea de base para medir el impacto de la intervención, una vez implementada, es ideal obtener evidencias clínicas o subclínicas de deficiencias, estimaciones que indiquen niveles de ingesta de nutrientes o las probabilidades de desarrollo de algunas deficiencias debidas a cambios en hábitos de consumo, condiciones sociales y/o económicas que estén ocurriendo en un determinado momento. En este esquema ideal, esta información debe ser obtenida de encuestas nacionales de salud y nutrición que se planifiquen especialmente para un determinado programa. Si esta clase de estudios no está disponible, se pueden usar datos nacionales recientes de consumo de alimentos, encuestas de ingresos y gastos del hogar (HIES por sus siglas en inglés), encuestas de panel, la herramienta de valoración rápida de fortificación (FRAT por sus siglas en inglés), las hojas de balance de alimentos de FAQ, encuestas demográficas de salud y/o información proveniente de las industrias sobre producción, ventas y consumo. Otras fuentes de información, aunque indirectas, son los documentos de política nacional, reportes de industrias, etc., los reportes de acciones de proyectos o publicaciones de estudios de eficacia. Se presentarán detalles de la FRAT y de las HIES. FRAT combina un recuadro de consumo de 24 horas simplificado y un cuestionario de frecuencia de consumo de alimentos. El FRAT permite por sí solo la inclusión como parte de una encuesta existente. FRAT recoge datos cuantitativos representativos a nivel de hogares, indicando el consumo de vehículos potencialmente fortificables además de datos sobre uso y disponibilidad de alimentos. Las HIES han sido recientemente validadas como herramientas para la estimación del impacto de programas masivos de fortificación de alimentos.

**El cuestionario como instrumento de valoración de la actividad física.**

Román Viñas 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 actividad física es necesario disponer de instrumentos que midan la actividad física de una manera válida y fiable 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 para la estimación del consumo, el cuestionario 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).

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and yogurt-based beverages. Moreover, CVD risk score
física como
should also inversely be considered when investigating the impact of yogurt consumption
milk and milk- and yogurt-based beverages. Moreover, CVD risk score
tose digestion in subjects who consumed yoghurt with
Yogurt is rich in many nutrients, including protein, vitamins B-2, B-6, B-12, calcium, potassium, zinc, and magnesium and the acidity of yogurt increases the bioavailability of specific nutrients such as calcium.
Yogurt consumers are more likely to have a better overall diet quality compared to non-users. Yogurt also has more lactic acid and galactose but less lactose than milk. Moreover, probiotics in yogurt have possible health benefits.

Yogurt is fermented with symbiotic cultures of Streptococcus thermophilus and Lactobacillus delbrueckii subsp. bulgaricus. Yoghurt itself has beneficial microbiota by probiotic bacteria in yoghurt may influence weight gain. Further evidence for or against a benefit of yogurt consumption on weight management is needed, but this should not advise against recommendations for including yogurt as part of a healthy diet, because it is a nutrients-dense, lower-calorie food that can help to meet guidelines.

Yogurt consumption and impact on cardiometabolic risk factors.

Growing evidence indicates that consumption of dairy, and particularly fermented dairy products, is linked with better diet quality and is negatively associated with long-term weight gain. Recent meta-analyses and epidemiological studies further suggest that there is a significant inverse association between the intake of fermented dairy products and the risk of 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.

Nut consumption and metabolic syndrome.

Salas-Salvadó J.

It is well established that nut consumption is associated with several health benefits on cardiovascular risk factors and cardiovascular disease. These benefits are mainly attributed to its high contain in many bioactive compounds. Scientific evidence supports that nut consumption is inversely related with the prevalence and incidence of the metabolic syndrome (MetS) and some of its components. Nuts reduce the postprandial glycemic response and the risk of insulin resistance and dyslipidemic profile. In addition, nuts are a good source of several bioactive compounds that provide cardioprotective and anti-inflammatory effects,
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 epialleles (Me2). Me2s are genomic regions where 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.
Norris 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 Autónoma 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 major 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 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.

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 are 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 more than any other macronutrient. Changes in body weight occur with any change in macronutrient intake that is associated with a lack of energy deficit compared with requirement for weight gain. Nowadays diabetics can consume sucrose (sugar) and foods that contain sugar as any other macronutrient. Changes in body weight occur with any change in macronutrient intake that is associated with a lack of energy deficit compared with requirement for weight gain. Therefore, it is important to point out that the long-term effects of continuing to follow these diets are not known.

Sugar 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.

Sugar 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 positive excess intake 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 developed 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. Special attention and the fate of sugars in human nutrition and health. Obesity rev 2009; 10 (Suppl 1): 55–58


Do genes modify the response to sugar and CHO intake?

Corella D.
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There is currently much controversy over what is the best recommendation to make on carbohydrate or sugar intake for the prevention of type 2 diabetes and related complications. In particular, the role of sugar in the etiology of type 2 diabetes has generated a substantial amount of research. However, it is still unclear whether sugars consumed from foods or beverages are contributing to the development of type 2 diabetes, as it is being suggested. There has been a wealth of conflicting evidence regarding the role of sugar in the development of type 2 diabetes.

Rationale for cutting down.

I Świetlicki. 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.

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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 sugar in tobacco with the suggestion that fructose-containing sugars are to cardiometabolic disease as tobacco is to lung cancer.

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, GLUT2 (fructose receptor, type 1, member 2) and GLUT3 (fructose receptor, type 1, member 3) that are selectively expressed in the kidney and the oral cavity. GLUT2 is the key sugar transporter in the body and the GLUT2 gene is part of the fructose transporter family (GLUT1, GLUT2, GLUT3). GLUT2 is the GLUT2 gene and the Carbohydrate-responsive element-binding protein (CREB) also known as MLX-interacting protein-like (MLXIP) gene, for which our group has found relevant gene-diet interactions. We also provide variability data on sweet taste perception in the population depending on age, as well as the influence of sex and sweet taste and functional on the (140 g of glucose per day). The consumption of a food or drink containing sucrose is associated with an improvement in mental ability, 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.

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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.
Orebro University, 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. Inequities 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.
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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 to design, implement and evaluate a technology-based social marketing initiative that was different that typical programs in that community.

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

Mikkel sen 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 municipality. 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.

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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 porridges 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 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 optimal 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.

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Phytate 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.


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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 (and not phytase) and the chelated cation precipitate and are largely unavailable for absorption. In pigs and poultry, the use of exogenous phytase is common for hydrolysis of phytic acid in the gastric phase of digestion in order to liberate phosphate and reduce the various antinutritive effects of phytic acid in the intestine. In both 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 (76). Evidence for zinc is the strongest; in a study of 165 food supplemen
ted children, the improved zinc absorption, reduction in deficiencies, and one study concluded that 165
children, trivalent phytate:zinc ratios in the environment facilitate the nutritionally important 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 necessity of phytic acid in the gastric phase of digestion in order to reduce the various antinutritive effects of phytic acid more cleanly. Phytic acid is increasingly implicated in the dietary calcium-phosphate interaction, allowing for increased calcium absorption. At pH above 1.1, phytic acid is also implicated as a cation precipitate and is slowly dephosphorylated as pH rises above 5 (for example in the small intestine). In this process, inorganic phosphate (a finite global source) is released and is available for absorption.

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

Christian P. Fischer, 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 in improving linear growth also include appropriate infant and young child feeding practices and complementary food supplements (CFSS), increasingly with high-energy and micronutrient dense lipid-based formulas. Among micronutrients known to promote linear growth, iron (as ferrous iron) is of particular importance. In a pooled analysis of randomized trials, improvement in mean height by 0.37 cm is observed in children supplemented with zinc for 24 weeks. It is estimated that 17.6% of the world’s population has zinc deficiency, and children in LMICs under age 5 years bear the greatest risk. Proxy indicators of zinc deficiency in the population include not only prevalence of stunting, but overall zinc supply and phytate:zinc ratio in the national food supply or typical diet. Although routine zinc supplementation is not commonly done in programs, zinc is added with other micronutrients in ready-to-use CFSS, in fortified food blends (such as Com Soy Blend), and also in 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 exoge­ nous phytase to micronutrient powders and found improvements in iron and zinc absorption, reduction in deficiencies, and one study also recor­ ded statistically significant increase in weight-for-age Z-scores (WAZ) in children, though no effect was observed on height. There is potential for adding phytase either to lipid-based supplements which include zinc, or to micro­ nutrient 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 beyond 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, Rodríguez Mora C.1, Sicoli J.1, Wenzel D.2, Bicalho D.1, Fischer E.2

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 pro-

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

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En el 2009, el gobierno de Brasil aprobó la ley 11.974, la cual 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 del 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, además de diferentes actores territoriales, 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 Sao Paulo, Brasil, en el año de 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; 100% de los municipios compraron alimentos de la AF; 80% compraron de agricultores del mismo municipio; en 38% de los municipios se realizó el control de la cadena de suministro; en 92% de los municipios, la totalidad de las escuelas recibieron alimentos de la AF; 96% de los municipios compraron alimentos de la AF, y 90% de los municipios compraron alimentos de la AF por el sistema de la AF.

Conclusión: Los resultados de la investigación muestran que la implementación de las compras directas de la AF en los municipios del estado de Sao Paulo está avanzando. Sin embargo, hay un reto importante para fortalecer las acciones para que los municipios alcancen por lo menos la meta del 30% establecida en la legislación y puedan mejorar la infraestructura de las escuelas.
Programas de Alimentación Escolar (PAEs) representan una intervención importante para la protección social, la generación de seguridad alimentaria y nutricional (SAN) y el cumplimiento del derecho humano a la alimentación. Estos programas han sido recomendados como una de las principales estrategias de desarrollo sostenible a largo plazo. Asimismo, un buen PAE tiene el potencial de promover la educación, contribuir al desarrollo del país y apoyar al sector de la agricultura. Sin embargo, el impacto de los programas de alimentación escolar en el desarrollo socioeconómico, el acceso a alimentos de los agricultores familiares, al mismo tiempo en que suministan productos frescos, diversificados y que de acuerdo a los hábitos alimentarios locales a los estudiantes. Teniendo en cuenta estos beneficios, los gobiernos deben planificar la sostenibilidad de sus PAES. Serán presentados los elementos de sostenibilidad para los PAES, los cuales fueron establecidos en un Foro de Expertos sobre Programas de Alimentación Sostenibles en América Latina coordinado por la Organización de las Naciones Unidas para la Alimentación y la Agricultura (FAO), y que deberán ser considerados por los gobiernos en la planificación del fortalecimiento y sostenibilidad de sus PAES a corto, mediano y largo plazo: amplio compromiso de todos los actores involucrados en los PAE; capacidad financiera del gobierno; sostenibilidad económica, social y ambiental; marcos legales y normativos claros; articulación intersectorial e interinstitucional y con políticas públicas de educación, salud, desarrollo social y económico, agricultura; principios, directrices y objetivos claros y adecuados a la realidad y necesidad de cada país; cumplimiento de recomendaciones nutricionales y calidad alimentaria definidas, adecuada oferta de alimentos a la cultura local, a las necesidades especiales alimentarias, a los grupos etarios, necesidades nutricionales y sanitarias; amplio respeto por la cultura y la diversidad, fortalecimiento de la escuela como espacio saludable y educativo; promoción de la educación para la SAN y la formación de hábitos, injertar y mejorar el equipamiento adecuado, con un plan de acción con mercados locales, especialmente con la agricultura familiar; sistemas de diagnóstico, monitoreo, evaluación; desarrollo y fortalecimiento de las capacidades de los actores sociales involucrados en la alimentación escolar; participación y control social, que incluyan mecanismos de transparencia.

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

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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 infallible and there is a need to optimize redox machinery with diet. Plant foods have been accredited of an antioxidant action in vivo. However, the extent to which they are able to tune oxidative stress and the identification of the dietary molecules involved, as well as the association with the endogenous redox systems. The role of antioxidant might be somehow of limited impact due to the non-physiological concentrations utilized, to the low degree of absorption of flavonoids and to their extensive metabolism within the body. Moreover, the mechanism of homeostatic control of antioxidant defenses under stress condition is not clarified and a clear detrimental effect of galenic antioxidant overloading has been shown in humans. All these unclear and somehow contrasting evidences raise concerns about the role of antioxidant for human health. The first systematic review evaluating the impact of plant foods on biomarker of antioxidant status and oxidative stress 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?

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At the cellular and molecular levels, many micronutrients act as enzyme cofactors, components of the antioxidant 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 system 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.

Hydration, inflammation and the immune system.

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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 to drink water or other beverages to proper get 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. 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 good hydration reduces the risk of unihabits 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 transmit information to the hypothalamus, place where the vasopressor (VP) is synthesized. This hormone plays a key role on water homeostasis throughout their function in osmoregulation. In a dehydration and hyperosmolality 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, present antigens to naive immune cells and activate effector responses from T 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 hydration 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.

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Personalized nutrition, obesity and inflammation.
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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 environment interactions. More than 50 putatively implicated genes in obesity phenotypes and adiposity traits have been evaluated 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 cancer. 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 consider "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 take into account the genetic variants 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 tailorize 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 genotypic background.

International consortia such a Food4Me are describing genetic variants that contribute to obesity in order to characterize nutrient x gene interaction and the treatment of children 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 tailorize nutrition. Indeed, 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 on the genotypic background.

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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 thickness, body circumferences, bioelectrical impedance analysis (BIA), nuclear techniques, and dual-energy X-ray absorptiometry (DXA) have recently been produced mainly using high-income country reference 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.

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

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

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Background: The efficacy on lean mass gain in Kenyan infants receiving a locally produced formulation of vitamin A 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-Biend [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-infant).

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.

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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.

Nutrition at the IAEA.
Slater C.

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 health and social consequences of nutrition-related noncommunicable diseases. Stable isotope techniques can be effectively used in a range of applications, including assessment of breastfeeding practices, body composition, and changes in energy expenditure and physical activity. Through its Technical Cooperation Programme, the IAEA has helped to establish stable isotope laboratories 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.
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 linear 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 WC, LDL-C, TG, insulin, HOMA-IR, CRP, IL-6, HCT, LDL-HDL ratio, SBP and DBP, and inversely associated with HDL-C (r<0.05). BF by D2O correlated similarly well with the skinfold equations of Deurenberg (r=0.88) and Dezenberg (r=0.82), and less so with BMI (r=0.69). Stunted (S) children displayed lower adiposity by %BF-D2O measurement and lower waist circumference (WC) than NS children, yet higher LDL-C (r=0.05) and no difference in waist-to-height ratio (WHtR). Overweight (OW) and obese (OB) children displayed lower %BF-D2O (p<0.5) and higher WC and LDL-C compared with NS 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 America Research Group; Anabel Pallaro (Argentina), Valen Ramos da Silva (Brazil), Gabriela Salazar (Chile), Eugenia Quintana (Costa Rica), Manuela Hernandez Triana (Cuba), Eugenia Aquilar (Ecuador), Ana Beatriz Sanchez (El Salvador), Sharmaine Edwards (Jamaica), Martha Nydia Ballesteros (Mexico), Jose Luis Gonzales (Peru), Eleutero Umierrez (Uruguay) and Maria Adela Baron (Venezuela).

Differences in growth and body fatness in children and adolescents from seven low-to-middle income countries: results from a Coordinated Research Project (CRP) of the International Agency of Atomic Energy (IAEA).

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Introduction: Patterns of growth and the accumulation of body fat during childhood and adolescence can have profound effects on future health and wellbeing. However, little is known about the variation and diversity of children’s growth and body fatness in low-to-middle income countries.

Objectives: To describe body fat percentage (%BF) by age, sex, and nutritional status in 6-16 y old children from 7 countries from Latin America, Asia, and Africa using a harmonized reference field method of deuterium oxide dilution.

Methods: In 909 children aged 6-16 years (54.5% girls) from 7 countries (Brazil (n=32), mean age 13.0 y), Cuba (n=97, 14.2 y), Guatemala (n=191, 13.6 y), India (n=283, 10.9 y), Malaysia (n=102, 11.2 y), Mauritius (n=95, 13.9 y), Uruguay (n=109, 8.2 y) participants of an IAEA CRP, we collected information on age, gender, weight, height, and total body fat derived from assessments of total body water by deuterium dilution. We estimated body mass-index-for-age (BA) Z-scores based on WHO 2007 reference and body fat percentage (%BF) as total fat mass/total weight. Obesity was defined as BAZ >2 and overweight BAZ 1-2.

Results: %BF was significantly higher for girls than boys (43.6% vs 33.8%) and also directly related to BAZ category, reaching 34.3% in obese children (girls: normal 31.4±7.7%, overweight 37.0±7.5%, obese 43.1±6.5%; boys: normal 24.4±8.7%, overweight 30.4±6.5%, obese: 39.2±8.7%). Associations between BMI and %BF were similar in most countries except where the sample size was small. Within category 6-9 y old participants had significantly higher %BF than those from other countries (i.e. boys India: normal 24.5±6.8, overweight 26.3±6.0, obese 35.5±11.1 vs Uruguay: normal 17.9±6.8, overweight 26.4±8.9, obese 26.9±2.3; in girls Malaysia: normal 43.0±5.4, overweight 51.5±4.2, obese 51.4±2.2 vs. Guatemala: normal 17.9±6.8, overweight 26.4±8.9, obese 26.9±2.3).

Key Findings: Using a standardized and objective measurements importing variations in %BF for BMI in children and adolescents from low-to-middle income countries have been demonstrated. This diversity has to be taken into account when defining normal growth during this developmental period, especially considering potential short and long-term impact on health.

Acknowledgements: Some funding was provided by IAEA. *IAEA CRP Child Obesity Group: Monica Britz (Uruguay), Elaine Rush (New Zealand), Asma El Hamdouchi (Morocco), Rolando Giovanni Diaz (Mexico), Noorjahan Joons (Mauritius), Bee Koon Poh (Malaysia), Rebecca Kurian (India), Manuel Ramirez Zea (Guatemala), Vladimir Ruiz Alvarez (Cuba), Ailing Liu (China), Camila Corvalan (Chile), Karina Pfrimer (Brazil), Andrew Hills (Australia), Christine Slater (IAEA).

Sustainable global food security: achieving the potential.

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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 energy food inputs 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’s ability to obtain food security, particularly in the developing world, are likely to be relevant for many low-income countries: improved rural infrastructure, markets and institutions, and 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 that the High Level Panel of Experts on Food Security (HLPE) and the World Committee on Food Security (WFS) in providing and disseminating such evidence is critically important.

Feeding the megacities and urban-rural linkages.

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Urbanization is one of the key drivers of change in the world today and feeding of 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 urbanizingworld 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 and councilors, producers, people, food and agriculture agencies (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 price revolution hit. 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 multi-stakeholder-multistakeholder 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

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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 bases 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 that all the food produced is wasted or is not eaten. Hungry and poor are food producers. At the same time food production is growing, and the food system does not feed the street population—men, women, children, the elderly, the disabled, the poor, the hard working. The levels of food production are such a way 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 lifetime without any appreciable risk to health. ADI is expressed in the form of mg of substance per kg of body weight (mg/kg bw). 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 ADI values for these sweeteners are considered to be safe for the general population and consumer exposures to additives are below the ADI.

EFSA has already re-evaluated aspartame, advantame and steviosides. The experts examined all uncertainties related to the evaluation of aspartame. Aspartame does not cause DNA damage and cancer, brain 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 (e.g., methanol is found in fruit and vegetables); an ADI of 40 mg/kg bw is therefore protective for the general population. Advantame is a neohesperidosid derived by chemical synthesis from isovonillin 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 was established for advantame in 2005; 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 uses the upper exposure levels 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 (e.g., 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 (e.g., identification of potentially risk groups, duration of exposure relevant to hazard(s), description of uncertainties inherent in the hazard characterization and exposure assessment and risk characterization) on which 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 of 1 mg/kg bw/day 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 (e.g., 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 relative risk to 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 EFSA 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 EFSA 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.

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

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Low and non-calorie sweeteners (LNCS) are ingredients used in a number of foods and drinks which are extremely popular in the world over. The dietary options that such products provide may be 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 of LNCS are set such a way 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 lifetime without any appreciable risk to health. ADI is expressed in the form of mg of substance per kg of body weight (mg/kg bw). 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 ADI values for these sweeteners are considered to be safe for the general population and consumer exposures to additives are below the ADI.

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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 (e.g., clean sweet taste, no bitterness, odorless), safety, compatibility with other food ingredients, and stability in different food environments.

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Epidemiologic perspective: low and no-calorie sweeteners, cancer, and pregnancy outcome.

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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 not 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 selected 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, 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 non-caloric sweeteners were 0.81 for cancers of the oral cavity and pharynx, 1.09 for oesophagus, 0.96 for colon, 0.94 for rectum, 1.16 for larynx, 0.94 for breast, 0.87 for ovary, 1.03 for prostate, and 0.99 for kidney cancer. There was no material difference in risk for saccharin versus other low-calorie sweeteners. After allowance for various confounding factors, the ORs for ever users of sweeteners versus nonusers were 0.80 (95% CI, 0.45-1.43) for gastric cancer, 0.62 (95% CI, 0.37-1.04) for pancreatic cancer, and 0.96 (95% CI, 0.67-1.40) for endometrial cancer. Corresponding ORs for saccharin were 0.65, 0.19, and 0.71, and for other sweeteners were 0.86, 1.16, and 0.70, respectively. Other data on breast, brain and haematopoietic 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) relative RR=1.31 for 1 diet soda drink/day and multiple myeloma (RR 2.02) in men, in the absence of any association in women, nor relative ORs to unity and, most important, the absence of any association in women, nor in both sexes combined (Rw 1.42). Thus, there is now convincing epidemiologic evidence of the absence of relevant 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, which 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, 1.09-1.43) for 4 servings/day of low-calorie beverages. However, for lower levels of consumption RR estimates were to unity and, most important, 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.

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Sugar-sweetened beverages are a major source of added sugars in the typical US diet. Low and non-calorie sweeteners (LCS) can help reduce sugar content 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 LM.

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 implementation, 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.

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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 hyperhomocysteinemia, some types of cancer, and congenital anomalies 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 (MTHFR) C677T, A1298C and methionine synthase reductase (MTRR) A66G 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.

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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 reproducutive age 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.
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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 has been 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.
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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 in-country key informants, UNICEF offices or through internet searches. Data were collected through semi-structured interviews during 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, 38 M.Sc. 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 overnourishment (2%). Annual student intakes 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 Africa 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.
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Au Mali, la situation nutritionnelle se complexifie car la malnutrition protéino-calorique sous toutes ses formes coexiste désormais avec les maladies chroniques de surcharge (obésité, diabète et maladies cardio-vasculaires). Ces maladies chroniques de surcharge qui sont en nette progression. Entre 11,2% et 3,7% des femmes en âge de procréer sont respectivement en surpoids et obèses en 2001 contre 12,4% et 5,2% en 2006. Au plan institutionnel, des évolutions se sont produites au cours des 15 dernières années en créant au sein du Ministère de la santé, une division nutrition dotée aujourd'hui de plus de dix agents et des points focaux affectés dans les directions régionales de la santé, le Centres de Santé de Référence, les Hôpitaux régionaux et l'Hôpital Gabriel Touré. Les CSRE et les C5SCOM mettent en oeuvre les interventions de nutrition du secteur santé. Il existe cependant un véritable défi à relever en terme de mise en place de compte de la nutrition dans les différents secteurs concernés (santé, développement rural, Education, Industrie, Promotion de la Femme, 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.

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'OOAAS compris entre 240 et 1200 licences, 24 et 120 masters et entre 12 et 60 doctorats (Global Public Health, supplements nove 2013). Ces séances à la réalité doive 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 DER 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 futures 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 l'FMOS avec l’appui de certains partenaires comme l’UNICEF et l’Agence Française de Développement va permettre aux étudiants de connaître les différents secteurs sur lesquels le nutritionnaliste doit être préparé pour répondre aux défis tels que la famine, la malnutrition chroniques non transmissibles, la dénutrition et la malnutrition néonatale, qui auraient un impact majeur sur les populations du pays, en leur assurant une adéquation du niveau de nutrition dans les âges 0-39.

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 training programs in Mali in partnership with UNICEF, Food 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).
This integrated vocational training program aims at enhancing capacity and capability among local, national and international nutrition and WASH professionals in French-speaking Africa, therefore building the resilience of local communities. The competency-based training program is designed for professionals working both in the public and private sectors. It is also addressing both "emotional repertoire" and "sustainable access to services" and is adapted to the regional context. This new initiative also aims at breaking the common sectoral approach in encouraging links between the Nutrition and WASH sectors (through joint sessions, and Wash in Nut module).

New academic training programs in nutrition and health in Benin.

Delphine BEKOM
TRANSMIT - WHO Collaborating Centre on Nutrition. University of Montreal, Canada.

Background: Non-communicable diseases (NCD) are now a major health issue in lower- and middle-income countries. Diabetes and cardiovascular diseases are among the four NCDs now recognized as a priority. Nutrition is central to NCD management and prevention, as well as for adequate policy, program delivery and research. In sub-Saharan Africa and particularly in French-speaking countries, academic training in nutrition has tended to focus on undernutrition and other deficiency diseases, as well as on food. In order to also address nutrition-related NCDs and to promote good nutrition, a public health and a clinical nutrition focus are required.

Purpose: In the framework of a university partnership project on the double burden of malnutrition funded by Canada (2008-2014) and involving academic partners of Benin, Burkina Faso and Mali, two new training programs in nutrition were developed at the Abomey-Calavi University in Benin: a regional Master’s program and an undergraduate program in nutrition. The purpose was to strengthen the professional workforce in nutrition in order to address the whole spectrum of nutrition disorders from a public health perspective, thereby contributing to nutritional health of the population.

Methods: Following needs assessments, the Master’s and Bachelor’s programs were developed according to the IMD reform (licences, master, doctorate), based on competencies to develop and keep in mind the complementary nature of these professional levels. The new regional Master’s program in nutrition and population health offered at the Regional Public Health Institute (IRSP) of Benin is a two-year program open to university graduates preferably with a few years of relevant practical experience. Following a common training core of a few months with other public health disciplines, the nutrition program is primarily based on problem solving and the required knowledge and attitudes: community nutrition and dietetics, along with advocacy for policies and programs, and social marketing. The undergraduate professional program in nutrition and dietetics for college (or paramedical) graduates is the first of its kind in French-speaking Africa. The students are trained during three years as nutritionists in nutrition, in order for them to perform adequately in clinical and public health settings, whether in public or private institutions. Their competencies encompass the management of all forms of malnutrition, the nutrition management of clinical conditions, the promotion of healthy eating and lifestyle, and the administration of food and nutrition programs. Several months of internship in hospitals, communities and food catering facilities are integrated in the program. Intensive training of trainers took place on-site through mentoring and at University of Montreal.

Results and conclusion: The Master’s and the Bachelor’s programs are now in full operation. Two cohorts of Master’s students from 5 different countries (n=20) have now graduated and are involved in nutrition work. The bachelor’s program has produced a first cohort of 17 graduates and a second one of roughly the same size is soon to complete the program. Challenges are for Master’s students to obtain a scholarship and for the Bachelor’s program to meet the high demand from private practitioners whereas their number has to be limited to 25 per cohort in view of space and internship placement requirements. It is too soon to tell whether the graduates will find appropriate employment.

Early nutrition programming of cognition and behaviour.

Campyu C.
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There is evidence that early nutrition can influence later mental performance, cognitive development and behaviour, and 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.nutrimenthe.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 & learning; the effects of food and the effects of food on mental illness. Extensive data from human and animal studies indicate that early diet and specific nutrients (e.g. iron, zinc, B-vitamins, folate, LC-PUFA) have a long-term impact on the function and structure of the brain. NUTRIMENTHE’s Generation R study has also proved that poor maternal thyroid function during pregnancy is an important risk factor for children's brain development. The results have 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 and 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. The polymorphisms 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 iodine supply 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 1 fish meal a week, one of the main sources of all essential long-chain omega-3 fatty acids. The ALSPAC 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, Reading Age, Working Memory and Speed Processing in the offspring at 8 years. The CHOP- Study has demonstrated the safety of lower and lower 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. In 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 adjusting for potential confounders. The resulting economic benefit of breastfeeding (<6 months) would be £ 4,208 (~ 5,000 $) per child and even more than doubled with £ 8,799 (~ 10,500 $) for 6+ months of breastfeeding. So, successful promotion activities for better early nutrition will therefore be highly cost-effective. In conclusion, the understanding of the mechanisms associated with normal 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.

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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 period 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 the fact during pregnancy, the prevalence of ID can reach the 40% 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 IDA 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 with low-tech sociocultural and the relations between maternal iron status and 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 third year of life and we assessed mental and behavioural development. The main findings: Our results show that iron deficiency during pregnancy affects children's mental and Behavioural development. In particular, we found that iron deficiency during pregnancy is associated with lower scores in cognitive and motor development and higher scores in emotional difficulties and problem behaviour. We also found that the relationship between iron deficiency during pregnancy and child development is mediated by maternal education and breastfeeding. In conclusion, our results suggest that iron deficiency during pregnancy may have long-term effects on child development and highlight the importance of iron supplementation during pregnancy to optimize child development.

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 data. We combined scores of 3-5 years among 1,892 and 1,589 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 anthropometric data of the Spanish population (aged 9-75 yr), as well as 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 data of the Spanish population (aged 9-75 yr), as well as 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 intakes 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

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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 may observe whether weight gain or loss, 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 combining several of these genetic studies of energy intake, expenditure and weight gain. While 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 methylations and microRNAs.

The importance of energy balance in obesity management.

Hand G.A 
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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 stored energy, 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


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CEU San Pablo University, Madrid and Spanish Nutrition Foundation (FEN), Spain.
Determinantes de la obesidad en etapas tempranas de la vida: estudios en México.

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Antecedentes: La eficacia del tratamiento de la obesidad infantil y del adulto es moderada a baja y diversos estudios epidemiológicos y revisiones sistemáticas han demostrado que la pérdida de peso mayor del 5% puede aumentar la mortalidad. Por lo que diversos expertos sugieren que la prevención de la obesidad debe iniciar durante las etapas más tempranas de la vida. México es uno de los países con mayor obesidad infantil en el mundo, que la ha convertido en el problema número uno de salud pública. El objetivo de esta presentación es analizar a partir de las evidencias de revisiones sistemáticas y de estudios originales realizados en el norte, noroeste y suroeste 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 durante y después del embarazo, en la diabetes gestacional, sobre el aumento de peso durante el embarazo. Se analizarán los resultados con estudios realizados en México, enfocados a la edad reproductiva, 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 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 exceso de peso por parte de los padres, los maestros, los estudios de medicina y los médicos. Se analizarán las implicaciones de estos resultados para el establecimiento de una política de salud pública que integre la prevención de la obesidad con la prevención de la estigmatización hacia las personas con obesidad.

Resultados: En México, son determinantes de la obesidad, la obesidad pregestacional, el aumento excesivo de peso durante el embarazo, la desnutrición pre y postgestacional, la inadecuada atención prenatal, la falta de la aplicación de las normas para el diagnóstico y tratamiento de la diabetes gestacional, la ingesta de alimentos chatarra antes de los dos años y la pobreza. Además, los niños con sobrepeso sufren de estigmatización por parte de los padres, las maestras, los médicos y los estudiantes de medicina.

Conclusión: Un amplio número de determinantes de la obesidad infantil y del adulto se presentan durante etapas tempranas de la vida en México, lo que requiere de una política integral para la prevención de la obesidad, enfocada principalmente a reducir los determinantes de la obesidad en etapas tempranas de la vida, acompañada de medidas que prevengan la estigmatización de los niños y adultos con obesidad.

Vitamin E status: an assessment.

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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. Given 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-supplement 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.

The issue of low vitamin E intake and serum level has to be widely addressed because of its potential subclinical and clinical consequences.
tions and diseases at intakes which are likely not to be achieved by regu­lar diet and which may be applicable for selected individuals and groups rather than for the general population.

**Vitamin E in risk reduction for fatty liver disease.**
Péter, S.
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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 non­alco­holic fatty liver disease (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 sta­ tus 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, lipid­soluble 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 pre­ventatory 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/d 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/d 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 of measure­ment, lack of evidence on consequence and uncertainty about roles of vitamin E in South Asia. 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 cohort study of 1st trimester vitamin E levels using lower cost assays in the future. In the first study, among 1605 1st trimester gravidas enrolled in a larger place­bo-controlled, maternal vitamin A or ϒ-carotene supplementation trial Bangladesh (JIVITA-1), 72% were vitamin E deficient, with plasma α-tocopherol <12 μmol/L. The odds ratio (adjusted for cholesterol, γ-toco­topherol, maternal age, gravidity and gestational 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-tocopheromerome), 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, FOX04, 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.

*Presented on behalf of the JIVITA Alzhins Project, Gilbanka, Bangladesh (AA Shamim, K Schulze, RD Merrill, A Kabir, P Christian, S Shaikh, L Wu, H Ali, AB Labrique, S Mehra, R Klemm, M Rashid, P Sun­guppa, E and Udomkesmalee) and the Johns Hopkins Plasma Nutriproteomics Team (R Cole, K Schulze, P Christian, L Wu, SU Lee, S Mehra, J Groopman and J Yager). These studies were supported by the Bill and Melinda Gates Foundation (Grants GH614 and OPP5241, respectively), Seattle, WA.

**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 part of 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 disea­se. Dr. Alsharief 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 need for coordination among these interventions. Coordination is critical to ensure efficiency in use of scarce resources but also as a means to ensure that all risks are minimized, both insufficient and excess intake. In collaboration with the Bill and Melinda Gates Foundation, Dr. Engle-S tone and the team at UC Davis have been developing an evidence based model to optimize combinations of interventions of micronutrient deficiency control programs.

Formación en nutrición.

Martin 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 con el objetivo de proponerles diversas formas de 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 enfren- tado a la alimentación y nutrición.

¿Es suficiente con la formación de Grado para proporcionar cuidados nutricionales de calidad?

El Aprendizaje de la Nutrición en el Grado en Enfermería, junto con las demás materias de la disciplina, permite desarrollar competencias para la atención relacionada con el tema de la NUTRICIÓN Y LA ALIMENTACIÓN. 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 indivi- dualizados y correctamente planificados. Con la nueva titulación de Gra- do se abre la posibilidad de continuar la formación académica. Esto per- mitirá, además de una futura integración en un equipo multidisciplinar de Nutrición, desarrollar en profundidad las competencias específi- cas de esta área de conocimientos.

Peró, 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 la finalidad de favorecer una formación multidisciplinar de Nutrición, desarrollar en profundidad las competencias específicas de esta área de conocimientos.

¿En conclusión, las competencias adquiridas con la realización de un pos- grado permitirán a los profesionales de enfermería tener un conocimien- to 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.

Dominguez Maeso A.
Unidad de Gestión Clínica de Endocrinología y Nutrición. Hospital Com- plejo Universitario de Jaén.

Cuando Florence Nightingale realizó los valiosísimos trabajos de investiga- ción enfermera que les valieron a los ingleses ganar una guerra, tenía claramente qué buscaba demostrar. Pienso que el principal problema con el que nos topamos las enfermeras especialistas o generalistas (en nuestro caso en nutrición) es no tener esa claridad de ideas, ya que nos hemos involucrado 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 formación propias de los másteres. En este sentido, en general, son las que hacen referencia al eje temático mono o interdisciplinario en el que confluyen actividades de investigación realiza- das por uno o más grupos de investigación, que tengan resultados visi- bles en su producción académica y en la formación de recursos humanos mediante 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 (CE5) emiten un acuerdo en materia de cooperación internacional para el desarrollo y para el desarrollo de nuevos Grados de Enfermería, los que se crean grupos de trabajo, sirve de base para diseñar y planificar tratamientos y disposiciones. Para la formación específica, los que se marcan en estos Grados, los que se prevean 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) en 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 entre los 2190 registros (una vez eliminados los documentos de temática general 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 multidisciplina- rios liderados por profesionales, sobre todo médicos, con los que forman parte de la colaboración. Aún más difícil es, que las líneas de traba- jos trabajos que se circunscriben a investigar sobre cuidados enfermeros y no a temas relacionados con su actividad día a día de los conocimientos en que se basan para su ejercicio cotidiano.

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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.

En estos momentos la promoción de la alimentación equilibrada forma parte de la Atención Primaria, pero la ingestión de alimentos adecuados tiene una parte importante en la prevención de enfermedades como la obesidad, el cáncer, la diabetes, entre otras. La disfagia es un problema que afecta tanto a pacientes en edades avanzadas como a niños y bebés, siendo necesario que los profesionales de enfermería conozcan las diferentes técnicas de nutrición y protejan la salud del paciente.

Influencia de la disfagia en el desarrollo de la malnutrición.

De Torres Aurel 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 el trastorno que se da cuando una persona tiene dificultad para tragar alimentos, líquidos o cualquier otra sustancia. Cuando la disfagia no se trata de manera oportuna, puede ser causa de malnutrición y deshidratación, lo que puede afectar la salud general del paciente.

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

Zanura G.
World Health Organization, Geneva, Switzerland.

El balance entre salud y bienestar es un concepto que se ha venido trabajando en la última década. El balance entre la vida activa y la salud es un factor que se ha venido trabajando desde la perspectiva de la equidad. En este sentido, la equidad en el acceso a intervenciones que abordan el doble desafío de malnutrición y obesidad es un tema de gran importancia. Es importante que se aborden de manera oportuna y efectiva las complicaciones que la disfagia puede causar, para que se preste la atención adecuada a los pacientes afectados.
A health systems strengthening approach to improve nutrition of pregnant women and newborns in Ethiopia, Kenya and Senegal.

Kung'u J.1,2, Ndiaye B.1, Ngedda C.1,2, Bagale G.1,2, Gold L.1,2, Neufeld L.1,2, De-Regil L.M.3

1Micronutrient initiative, 2Global Alliance for Improved Nutrition

Coverage of nutrition interventions for pregnant women is poor, but potential for 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 0-11months were randomly selected for the interviews and the convenience selected 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.1

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 non-communicable 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. Ameliorated 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 agenda? These questions can serve 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 (NSCF) 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.1

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 (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.1 & Perez-Cueto F.J.A.1

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 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.

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

Nørnborg T1,2; Houby U1,2; Jørgensen L1,2; He C2; Perez-Cueto F.J.A.3

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 convenience 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., Fris R., Andersen P.M., Olsen A.P., Perez-Cuetos F.J.A.1,2
1Department of Health Science and Technology, Aalborg University-Copenhagen. 2Human Nutrition Studies, University of Copenhagen.

Objective: The objective of this study was to investigate the attitudes towards choice architectural nudges and their intended impact of increasing 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 serving.

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-packaged, single portion of salad as default to the main course, and Nudge 3: Presenting each component of the salad separately to increase choices 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 consumption 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 he 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 choices 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.
Houly L1, Nørnberg T.R1, Skov L.R.2,3, Perez-Cuetos F.J.A.1,2
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 nudge 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±1.3 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 reference 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., Skov L.R.2,3, Nielsen B.K., Wichmann M., Schaldemose H.S., Atkinson L., Ahlmann F.K., Perez-Cuelto F.J.A.1,2
1Integrate 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 food lab. A control group (N=32) and an intervention group (N=33) were recruited to attend an ad libitum self-serve buffet at two different timeloses. 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=0.32).

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 of this architecture 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-Méndez M.J.
Center for the Studies of Sensory Impairment, Aging, and Metabolism – CeSSIAM- 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 CeSSIAM from the Fundación Interamericana de Nutrición (FINUT) (Löser B15), as well as through access to a similar instrument at the University of Granada (Osmostat 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.

A using 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 t 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 Osmostat 030 equipment (stored from 43 to 52 weeks) and the median Uosm was 430 mOsm/kg, with t value of 0.828. With this same aliquot solvent analysis 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

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Isoprostanate (F2-is), an index of lipid oxidation and 8-Hydroxydeoxyguanosine (8OHdG), product of nucleic acid damage, were inversely associated with urine volume (Uvol) with r values of -0.603 and -0.433 (p<0.001), and directly 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 normal value reported for children across 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.

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Objectives: The objective of the study was to investigate the relation 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 for men and 2600 ml for women). 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 no 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).

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

Methods: This was a prospective cohort study on healthy nurses and doctors on call/working on medical and surgical wards at a large university 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 mosm/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.

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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 "hypernatremia" AND "hypernatremia" 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 hypernatremia.

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).

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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 Program) network and is organized by the South East Asian Ministry of Education Organization Regional Centre for Food and Nutrition (SEA­MEO RECFON) 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 came from universities and research institutes (57%), government and policy making institutions (40%) and NGOs/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.

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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 scaling-up nutrition, it is necessary to convert well-constructed and cos­ted plans into action, at the programme implementation level. To this
end, attention to building the necessary leadership capacity, required to successfully lead and manage implementation through effective multi-sectoral teams, has largely been neglected.

The African Nutrition Leadership Programme (ANLP) has been building individual leadership capacity since 2002 with over 300 individuals from some 33 countries now part of the continent wide network. More recently, ANLP has focused on a series of initiatives to build transnational leadership capacity in organisations. The aim is to enable a higher degree of team effectiveness and grow the necessary skills and orientations, to successfully lead and manage the implementation of nutrition-specific and nutrition-sensitive interventions, in countries, at all levels of government, and multi-sectoral teams. These programmes have already contributed to the successful implementation of mandatory food fortification in Kenya and is now being used to build the needed managerial leadership capacity in the Zambian National Food and Nutrition Commission.

Public health challenges related to nutrition: the physical activity perspective.

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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 life style. 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 exercise as may balance the body energy balance until 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. Exercising 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 hyperprotein 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 thermogenesis by, for example, stimulating heat production in brown adipose tissue. Some forms of exercise can induce these two effects.

What 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 many 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.

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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 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—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 or 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

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

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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 over 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 sequentially within the same individual: early undernutrition that 'imprints' certain metabolic pathways and favors fat accumulation, insulin resistance, and other disorders, at a later age. Given that early undernutrition (particularly delay in longitudinal growth) is still prevalent in developing countries, the potential impact of this DB is significant. In spite of the existence of the DB, in most countries there is no direct correlation between under- and overweight. On the contrary, chronic undernutrition is decreasing worldwide, while overweight and obesity are increasing. This indicates that the interrelationship between under- and overweight is complex, and modulated by a number of factors, including income, gender, level of education, and access to health care.

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


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, instruments and tools, b) evidence-based 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, Greece, 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 children 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.

**Dietary Impact: Results of FITS in US and MING in China.**

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Most literature on the topic of the double burden of under- and over nutrition focuses on under and overweight in low and middle income countries, and does not often examine, in detail, the dietary patterns which contribute to these issues and must be understood in order to be adequately addressed. The current study uses two unique data sets to derive a more complete picture of the different dietary patterns of young children in US and China. The Feeding Infants and Toddlers Study (FITS) was conducted in the US in 2008, and collected 24 hour recall data for a large sample of 3200 children ages 0-48 months, with a second day collected for 25% of the children in order to adjust for usual nutrient intakes. The Maternal and Infant Nutrition and Growth (MING) Study was conducted in China in 2012, and collected one 24 hour recall for a large sample of 2485 children 0-36 months from 8 major cities in China. While nutrient intakes are generally adequate and the prevalence of frank under nutrition is relatively low in the US, poor diet quality and over nutrition are a far more prevalent issues. Examination of dietary patterns and food sources of energy show dietary patterns leading to these issues include the inadequate consumption of fruits, vegetables and healthy oils and high consumption of sweetened beverages and sweet foods. In China, there are several nutrients under consumed as well as a few over consumed, including calories. Examination of dietary patterns and food sources of energy show that dietary variety is low and rice becomes a major source of energy in the first year and the number one source of energy by age 24 months. In both US and China, it seems that high consumption of nutrient dense foods is creating the dietary imbalances. In China, foods such as rice and noodles seem to be displacing higher nutrient dense foods such as milk, creating key nutrient gaps as well as overconsumption of calories by some. In US, the high consumption of sweets appears to be consumed in addition to nutrient dense foods such as milk, but displacing fruits and vegetables. Such specific dietary patterns must be understood in each country so that effective approaches to amelioration can be developed.

**Ensuring evidence based nutrition policies: The EVIDENT network.**

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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 fixes solutions whereas stakeholders would rather see solution to prevent malnutrition, address lifestyle and behaviour and studies that address nutritional issues in broader strategies. There is overall a great 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 for 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.**

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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.

Objective: 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, population-based, 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. AHEI is a dietary index built on intake of 9 components: fruit, vegetable, ratio of white meat (seafood and poultry), red meat, trans fat, ratio of polysaturated fat to saturated fat, total fiber, nuts and soy, alcohol consumption and long-term multivitamin use. AHEI score was computed in 1991-1993 and 2003-2004. Recurrent depressive symptoms were defined as having a Center for Epidemiologic Studies Depression Scale score of 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 and behaviors status factors, AHEI score was inversely associated with recurrent 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 impro-
Alcohol intake and depression: The PREDIMED trial and the SUN cohort.

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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 agree 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 (adjustes hazard ratio (AHR) 0.65 (0.49-0.86) in the PREDIMED trial, and 0.68 (0.47-0.98) in the SUN cohort).

Dietary patterns and health related quality of life.

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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 such as 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 2004 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 (KIHD) Study.

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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 (KIHD) 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 records and serum concentrations of nutrients were also determined at baseline. Depressive symptoms were assessed with the 18-item Human Population Laboratory 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 intake 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 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.

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With the support of a systematic literature review we will argue to shed more light on the potentials 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.

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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 diets has often made the results of major dietary trials uninformative or misleading. A diet changing one dietary factor at a time 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 placebos 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, and 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 usually involved endpoints that respond quickly to dietary change, such as diabetes and cardiovascular disease. Due 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!
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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 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 effects?
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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, deacelihohylized 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 has 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.
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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 humans 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.
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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 study and analysis of data, resulting in weak design 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 inappropriate 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 details.

An important aspect in science is to carefully review the literature when designing studies and when presenting and discussing the results. Lancet recently highlighted that a systematic review of trials has to be conducted and the trial specific details included in the article. “Research in Context” is 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 that 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 programs and take into account not only potential efficacy but also potential taste (whether the services are available, accessible and of appropriate quality), utilization and coverage. A landmark publication by Victoria, 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, all 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 value-neutral interventions that can be built around industry-academia-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 metabolomic 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 microorganisms 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, believing 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 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 minimization of 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 Evonik-Degussa Poultry Research Award, Poultry Science Association in 2010, and the National Broller 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 CHF/AM'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.

**Tasnine Akbaraly**

I am currently a permanent Researcher at INSERM, the French National Institute of Health and Medical Research localised 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 Núcleo 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 Programa de asistencia que ha sido replicado en Argentina, Latinoamérica y Africa, 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 convertiría en una lucha del hombre contra el hambre.

Lucha por proteger el tesoro más preciado de la sociedad, los niños y as contribuir a enriquecer a nuestro querido país, por ser ellos, su principal riqueza.

**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, governments, 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) - UN ECLAC 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 in Basic Pharmacology, Faculty of Medicine, University Complutense of Madrid (Spain). Visiting Scientist, Department of Animal Pathology, National Veterinary School, Toulouse, France. IRI Research Institute Fellowships, USA. Medical Research Council, London, U.K. Visiting Research Fellow. Departments of Applied Physiology and Surgical Science, and Pharmacology, Royal College of Surgeons. England, London, U.K. Fellow Regio Colegio Complutense at Harvard University (USA). Member of the Expert Advisory Panel on Food Safety at the World Health Organization, Geneva, Switzerland. Member of JECFA. Membership of the European Food Safety Authority Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids. Expert of 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 Corporate Leadership Board, the EPDOE 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 OnBoard. 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.
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 1993, 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 of 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-

Javier Aranceta Bartrina

Javier Aranceta holds a doctorate in Medicine (MD) and Nutrition (PhD). Specialist in Preventive Medicine and Public Health. Head of Community Nutrition Unit of the Área Municipal de Salud y Consumo de Bilbao, Spain (1985-2013). Associate professor of the Department of Preventive Medicine and Public Health of the University of Navarra. Full Professor (ANECa). President of the Scientific Committee of the Sociedad Española de Nutrición Comunitaria (SENC). Coordinator of the Proyecto Perseo (AESAN). President of the Department of Food Science of the Academia de Ciencias Médicas de Bilbao. Member of the Royal Academy of Medicine of the Basque Country (RAMPV) and its Board of Directors. Member of the Real Sociedad Bascongada de los Amigos del País. Scientific Director of “Dieta Sana” magazine. Director of the Spanish journal of community nutrition (RENC). Member of the Steering Committee of the Fundación Española de Nutrición (FEN). Author or 25 technical books and editor or co-editor of other 39 books about Nutrition and Public Health in some of the most highly regarded medical publishing houses of the world. He has published 150 scientific articles related to his specialty (56 in international publications). Cumulative grade H=21. “Granado Covian” 2007 award. Award of the Academia Española de Nutrición 2009, for his career. Dilektuz Bzi 2008 award. Fundación Dieta Mediterránea 2006 award. Catedra 2005 award and first accésit at Prínci 1989 National Award of the Ministry of Health care and Consumption.

Victoria Arija

Victoria Arija, Professor of Preventive Medicine and Public Health in the Rovira i Virgili University (URV) from 1983. Full Professor in the Faculty of Medicine and Health Sciences Faculty in the URV. Coordinator of the Research Group on Nutrition and Mental Health in the URV. Coordinator of the Research Group Nutrition and Community Health in the Institute for Research in Primary Care, IDIAP Jordi Gol, of the Catalan Institute of Health. Member of the board of directors of the Spanish Society of Community Nutrition (SENC). Member of the board of the NGO “Nutrición sin fronteras”. Member of the board of directors of the Spanish Federation of Nutrition, Food and Diets (FESNAD). Her research topics are the assessment of nutritional status in populations, the assessment of the relationship between nutritional status and mental health in infants, schoolchildren, pregnant women, adults and elders; and also the effect of iron status (deficiency / excess) and the presence of genetic alterations on the neurobehavioral development of children, and of the iron excess on the onset of chronic diseases.

Montserrat Bacardi Gascón

Profesora investigadora de la Facultad de Medicina y Psicología de la Universidad Autónoma de Baja California en Tijuana, es reconocida en el nivel máximo en el Sistema Nacional de Investigadores. Se ha dedicado a la docencia e investigación en el área de nutrición, nutrición clínica y nutrición y salud pública desde que realizó la Maestría en Ciencias (Nutrición) en el Kings College de la Universidad de Londres en 1980. Miembro de la Academia Mexicana de Ciencias, ha publicado más de 150 artículos indicados en el JCR, que han sido citados más de 800 veces por otros autores. Ha presentado en congresos internacionales (España, Francia, Malasia, Inglaterra, Canadá, Turquía, Australia, Suecia y EEUU). Ha publicado 28 libros y capítulos de libro. Ha sido revisora de diferentes publicaciones del JCR y de diferentes programas y fondos de salud del CONACYT.
ber of many national and international organizations and groups: Health and Environment Research Group, the Moroccan Society of Nutrition, FANUS, MENANA and IUNS. Participated to several organizations of meetings like the First Federation of African Nutrition Sciences (FANUS) meeting, in Ouarzazate (Morocco) in 2007, the first international meeting of Nutrition in Marrakech (Morocco) in 2011, The International Workshop on Nutrition Transition in El Jadida (Morocco). The main current research subjects concern: nutrition transition, community nutrition, Mediterranean diet, obesity, micronutrient deficiency and Food composition and food sustainability.

Elliot M. Berry
Dr Elliot Berry graduated from the University of Cambridge, UK with distinction in medicine. In 1980 he won a Fogarty Research fellowship at the Rockefeller University to work on fat 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 Brain 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. Ademáes de su docencia en licenciatura y posgrado en la UNAM, 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 want to determine the impact of dehyrdation 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 working at 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 nutrition researches in the 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”. In addition to exercising nowadays as Head of the Department of Biological Chemistry and Nutrition at the University of Hohenheim, he has collaborated with several scientific societies, highlighting his participation as member of the High level panel of expert group of the global forum of food security and nutrition.

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 Dickinson 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.

Steven N. Blair
Steven N. Blair is Professor in the Departments of Exercise Science and Epidemiology and Biostatistics at the Arkansas College of Public Health, University of Arkansas for Medical Sciences, in Little Rock, Arkansas. He is also the Honors Causa in Obesity Research at the University of Cauca, Colombia. Dr. Blair is a Fellow in the American College of Epidemiology, Society for Behavioral Medicine, American College of Sports Medicine, American Heart Association, and American Kinesiology Academy; and was elected to membership in the American Physiological 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 Sciences from the University of Medicine, 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 special emphasis on physical activity, obesity, and obesity-related diseases.
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 work of body. 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 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 Conjoint 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 (Instituto 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 (PhD) 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 niños del Hospital Safety y de la Universidad de Johns Hopkins como director fundador del Centro de Nutrición Humana.

Es miembro del Consejo Directivo de la Nevin Scrimshaw International Nutrition Foundation (Boston), de la Nestlé Foundation (Suiza), y del International Life Sciences Institute (Washington). Ha sido Presidente de la World 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 Medearis Lectureship of the University of Harvard. El Dr Caballero ha participado activamente en comités científico nacionales e internacionales, incluyendo el Food and Nutrition Board, el Dietary Reference Intakes (DRI) Committee, el Panel on Macronutrient Requirements and Task Force, todos del National Academy of Sciences of EEUU. Ha integrado el panel de expertos que definen 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 (USDA), y diversos comités del National Institutes of Health.

Es autor de más de 200 publicaciones científicas. Es editor-en-jefe de la Encyclopaedia 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 Encyclopaedia of Human Nutrition, que recibió el premio al mejor libro del año en la British Medical Association. Su Guide to 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 reconocido libro 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 EURISTIKOS Excellence Centre for Paediatric Research (UGR). Member of the ESPGHAN Committee on Nutrition.Coordinator of the Research Group of “Infant Nutrition and Metabolism” (PAICS187). 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-March 2009 he was a General Secretary at Italian Ministry of Agriculture, Food and Forestry Policies (MIPAAF) he was in charge of coordination and management of the National Liaison Committee between the Italian Government and the Organizations of the United Nations for food and agriculture (FAO, IFAD, WFP).

From March 2007 to April 2008 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 fortification and 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 the long-term outcomes of cognitive and metabolic 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.

Saskia de Pee

Saskia de Pee has worked in international nutrition for nearly 20 years. Her areas of expertise are, amongst others, micronutrient deficiencies, fortification, including home-fortification, anemia, and treatment of moderate acute malnutrition, health and nutrition in the context of crises, and nutrition in rela-
tion 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-
me and is adjunct assistant Professor at the Friedman School of Nutrition Science and Policy of Tufts University in Boston and at Wageningen Uni-
versity, the Netherlands.

Luz María De Regil

Dr Luz María 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 multidiscip-

nary teams with diverse stakeholders, she is currently 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 program outside. Through her work, she has been invited to sit on editorial/ advisory boards in Mexico, USA and Switzerland.

Luz María 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 of Nutrition. Formerly, she was a vice-president of the Mexican Society of Nutrition and a member of the WHO Guidelines Review Com-
mittee and the WHO Research and Ethics Committee.

Maria Lourdes de Torres Aured

Diplomada Universitaria en Enfermería por la Universi-
dad de Zaragoza. Responsable de U. Dietética y Nutri-
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 Puerculicria y Pediatría por la Escuela Nacional de Sanid-
dad (posteriormente Instituto de Salud Carlos III). 1979. Y en Medicina del Trabajo y Seguridad Social por el Instituto Nacional de Higiene y Mexi-
can 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 Aragonesas de Nutrición (Araunales). Y preside-
mente del CO 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 más de 40 cursos, seminarios y/o talleres para profesionales sanitarios de Nutrición Antropológica; y Dietética y Dietoterapia, en diversos foros.

Integrante del Proyecto NIPF del Consejo General de Enfermería-Ministerio de Sanidad, en cinco líneas de investigación y desarrollo. Autora de más de cuarenta artículos en revistas científicas, de participaciones en sesiones de trabajo y congresos, y/o entidades relacionadas con la nutri-

Cheikh M. H. Deah

Cheikh M. H. Deah, PhD, enseña la nutrición en el se-
fin de la Facultad de Ciencias y Tecnique de l’Unversite des Sciences de Technologie et de Medecine (USTM) de Nouakchott, Mauritania, donde dirige el Master de Nutri-
ion y Salud. Él es de même chargé du cours d’Nutrition au sein du Département de Santé Publique de la Faculté de Médecine de la même Université. Il a en-
seigné à l’Institut Régional de Santé Publique de Ouidah, Benin dans le cadre du Master de Santé Publique. Cheikh est membre du Comité de Rédaction de la revue « Universal Journal of Public Health ».

En 2005, 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-
et de Médecine), Mauritanie. 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’État, Sage Femme et infirmier Médecosocial), de plans de modules de nutrition pour les cycles PCEM et PPA 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.

trition Aigue de la Mauritanie en 2000. Il fut le Coordinateur ou faci-
tifiant de nombreux projets régionaux, nationaux et internationaux, tels que : l’initial « Repositioning children’s right to adequate nutri-

Il est actuellement membre de plusieurs comités techniques dans son pays, dont l’International Nutrition Plan Committee et le Comité Techni-
entifique International du Programme de Leadership Africain de Nutrition (PLAN) et du Comité Scientifique du Congrès Maghrébin de Sécurité Sa-
nitaire des Aliments (édition 2013).

Petra Dekker

Petra Dekker is one of the leading nutritionists of Fries-
lanCampina. She did a Bachelor in Nutrition & Diete-
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 1995. 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 CIDA-funded project in West Africa on the double burden of malnutrition, with the aim of strengthening training, research and advo-
cacy capacity to address the issue (2008-2014).
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, CIHEAM-Bari (2013-present); Coordinator of the CIISCAM-International Univerity Interuniversity Centre on Mediterranean Food Cultures, University Sapienza of Rome, University of Gran Canaria, 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 of the XXI Century, Rome (1995-2000); Coordinator of the Interdepartmental Well Being Centre of the University of Cagliari (1994-1999); Coordinator of Pexus 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 alliance’s portfolio. 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 market and the household economy in emerging markets.

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 of the world. Dr. Detzel is a Board of Advisor of the Global Food Monitoring Group and the Global Food Policy Division. His current research focuses on achieving sustainable dietary practices and the price of foods by their nutritional quality. He is the author of the Nutrient Rich Foods nutrient profiling models to identify foods that are affordable, accessible, sustainable, and nutrient-rich. Dr. Detzel has spent a number of years in working on 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 market and the household economy in emerging markets.

Elizabeth Dunford

Elizabeth Dunford (Lizzy) is the Global Database Manager and Research Fellow for The George Institute for Global Health. 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 foods. Lizzy is a Registered Dietitian with the Dietetic Association of New South Wales, Australia and in the past 5 years she has presented at 19 national and 17 international conferences, 22 times as an invited speaker. In her short research career she has published 25 academic papers, has authored 3 external documents for the World Health Organization and is an invited reviewer for more than 20 nutrition and public health journals.

Ana Domínguez Maeso

Diplomada universitaria de enfermería: Universidad de Granada, Licenciada en antropología, por la Universidad Católica de San Antonio (Murcia), Supervisora de dietética infantil desde febrero de 1984, compartiendo esa, con las supervisiones de nutrición clínica y dietética desde Diciembre de 1986 y la supervisión de farmacia desde 1990. En la actualidad Supervisora de la UGC de Endocrinología y Nutrición del Complejo Hospitalario de Jaén y profesor asociado de salud en la escuela universitaria de enfermería de la universidad de Jaén, desde el curso 2001-2002. Continuando en la actualidad como coordinador de los practicum del grado de enfermería. Miembro fundador de la comisión de nutrición del Hospital “Ciudad de Jaén”. Miembro de la Comisión de continuidad de cuidados al alta hospitalaria, en los procesos asistenciales del Complejo Hospitalario de Jaén. Miembro de la comisión de redacción de la Revista de Enfermería del Complejo Hospitalario de Jaén. Miembro de la Comisión de Planes de Cuidados del Complejo Hospitalario de Jaén. Secretaria de ADENYD. Aportaciones a congresos nacionales 105; Aportaciones a congresos internacionales 3; N° de artículos publicados en revistas nacionales 21; N° de artículos publicados en revistas internacionales 2; Premios recibidos en concurrencia competitiva 8; Proyectos de investigación obtenidos en convocatorias públicas y competencias y contratos con empresas o con la administración.

Adam Drewnowski

Dr. Adam Drewnowski is the Director of the Center for Public Health Nutrition and Professor of Epidemiology at the School of Public Health, University of Washington. He is Adjunct Professor of Medicine and the Director of the UW Center for Obesity Research. Dr. Drewnowski received MA degree in biochemistry from Balliol College, Oxford and PhD in psychology from The Rockefeller University. He has been on the faculty at the Rockefeller University and at the University of Michigan before joining the University of Washington.

His studies deal with the socio-economic disparities in obesity and diabetes, and the price of healthy foods. Dr. Drewnowski has developed GIS/GPS methods to map the geography of obesity and food options at the neighborhood scale. His current research focuses on developing value metrics to identify foods that are affordable, accessible, sustainable, and nutrient-rich. He is the author of the Nutrient Rich Foods nutrient profiling models to rank foods based on their nutritional quality. Dr. Drewnowski has served on the Institute of Medicine Standing Committee to Prevent Childhood Obesity and is currently working on nutrient density of the diet in relation to greenhouse gas emissions (GHGES); ranking foods by their nutritional value and estimated carbon cost.

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 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 Neuroscience 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. He has been the Chair of a five-year, 14 site clinical trial in Alzheimer’s disease (CSP #546) 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

Senior Vice President at DSM Nutritional Products and Head for Nutrition & Science Advocacy. Professor for Healthy Aging at the Graz University of Technology. 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 completed his studies with a habilitation on the isolation and characterization of sterols from marine origin.

Further Manfred Eggersdorfer is active as honorary professor at the Faculty of Medical Sciences at the University of Groningen. He is member of the Advisory Board of the Johns Hopkins Bloomberg School of Public Health, of the Rauchfuss-Gesellschaft for Innovation and is 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 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-in-Chief 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 dietetic foods, Nutritional impact of processed meats, 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 & fat-technology requirements; NUGAC) and 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 nutrition in critically ill patients. 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 Associate Professor in the School of Medicine at the Barcelona University 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 Investigación Agroalimentaria (INIA) del Ministerio de Educación and Ciencia, Fondo de Investigación Sanitaria (FIS) and Instituto de Salud Carlos III del Ministerio de Sanidad, Política Social y Deporte. Currently is the leader of the Thematic Network “Mediterranean Diet and Cardiovascular Disease” from the ISCIII (Spain).


Umi Fahmida

Umi Fahmida, PhD is academic staff at Southeast Asian Ministers of Education Organization Regional Center for Food and Nutrition (SEAMEO RECFON) and has collaborated with a number of Universities Indonesia since 1997 and is currently Deputy Director of Program Division at SEAMEO RECFON under which the South East Asian Nutrition Leadership Program (SEA-NLP) is coordinated. She earned her Postgraduate degree in Nutrition (2003) and MSc in Community Nutrition (2006) 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 (LP) to develop/evaluate food-based recommendations. She received Post-doctorate Research Award from SPIN KNOW Netherlands for nutrigenomics/nutriestetics study on the role of LC-PUFA and iron on young child cognition. She has been working with studies and community-based trial on complimentary feeding recommendations developed using LP and is currently expanding its implementation into...
The aim of my simulation was to enhance the impact of nutrition in Europe. EUIRC 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 EUIRC’s communication materials can be found at www.eufic.org.

Laura Fernández Celemín
Director Nutrition and Food Safety, Deputy Director General – European Food Information Council (EUIRC). 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 EUIRC 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 publications 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. EUIRC 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.}

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 on 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 career: science in nutrition and health; supervision and development workshops (ENLP seminar) for young professionals in nutrition and health; and 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 Bioanalyst, 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 SHOPUS project which was conducted on adult and on children where they validated a web-based dietary assessment software. Latest 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.

Maria 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 leadership 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 Programme 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 as research investigator. Despite his young age, Dr. Gea has published more than 25 research articles in peer-reviewed international journals, and his investigation is mainly focus on alcohol consumption and chronic diseases.

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 (SNE). President of the Iberomerician Nutrition Foundation (FINUT). Manager Director R&D Poleва 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 the PhD Thesis as research investigation. 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 BSc in Biology and shorter courses in Public Health, e.g. Problem Solving in Public Health at the John Hopkins School of Public Health in Barcelona. Current work: Health promotion and primary prevention in various settings with the aim to promote health 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 con-

**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.

**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 (SENASA) 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 (fminFNE). For more than 20 years she has been analyzing the nutrition and physical status and its impact on both physical and cognitive function 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 Science 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 physiological, 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.

His work has been funded by multiple federal agencies, private foundations and corporate entities. He has been honored by election to American Physiological Society; The Obesity Society, Delta Omega Public Health Honor Society and The American Association for Advancement of Science. He is a Fellow of the American College of Sports Medicine.

**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 programmes. 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 Houby**

Louise Houby has obtained a M.Sc. in Integrated Food Studies from Aalborg University in Copenhagen, Denmark, where her studies primarily has been focused on choice in food consumption and nutritional values. She has worked for DSM within the effect of food processing on nutritional quality of food proteins. She joined Nestlé Research Centre in Switzerland in 1978 and became head of the micronutrient group focusing on iron bioavailability and fortification in reference to staple food fortification. Her research mostly has been focused on absorption studies with stable isotopes as a way to optimize iron and zinc absorption from infant foods. She 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 with iron and zinc status so as to demonstrate efficacy of fortified foods. She 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. She 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 advancing 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-year 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.

**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.

**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.

**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 Nutrition 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 45 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 worked on the applications of functional ingredients and enzymes in a variety of foods. And since 2012, I’ve been 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 (inter)national 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 (inter)national 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 focuses 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 Ghent University in international nutrition.

**Parviz Koohafkan**

Dr. Parviz Koohafkan, 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. Koohafkan, started his career in Iran as assistant profes­sor 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 Director 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 articles 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. Sight and Life’s three strategic areas are to advance malnutrition 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 expertise 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, inte­ects 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 boards. In 2012, Dr. Vecchia serves as an editor 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), a Graduate Diploma in Management from the Henley Management College (UK) and an Executive Masters in Business Administration from GIMPA (Ghana). Samuel began his career with Unilever Ghana Limited in 1994. He resigned in 2002 to start 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 processing company. The established company, Yedent, has attracted the attention and support of some of the world’s lead­ing nutrition organizations. Among them are Global Assessment and Advo­ced 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 registered jurist 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 contraceptive 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 1995 he co-founded, along with Vicente Ortín, the Centre for Research in Health and Economics (CRESE-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-UBA - 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 (June 2006) and the Department of Health of Catalonia 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


André Marette

Dr. André Marette graduated from Laval University in 1990 with a PhD in Physiology and Endocrinology. He 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 inflammation, type 2 diabetes and 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 pharmaceutical 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. Diplomado Universitario en Enfermería. Universidad Nacional de Educación a Distancia. Actividad docente.

Desde enero de 2011, en que se produjo la integración de la Escuela de Enfermería La Paz en la Universidad Autónoma de Madrid, ejercio como profesora en el Grado en Enfermería, en las asignaturas Farmacología y Nutrición I (2° curso) y Estudio y Manejo del dolor (4° curso).

Anteriormente había ejercido como profesora de Nutrición y Dietética y de Enfermería Medicoquirúrgica y nº en la Diplomatura de Enfermería de la ELIE La Paz desde 1998 hasta 2010. En relación con la actividad docente e investigadora, he participado en proyectos de innovación docente (propios y como colaborador), he atendido trabajos de fin de Grado y dispuesto de publicaciones científicas, tanto capítulos de libro como artículos en revistas nacionales, con índice de impacto, sin índice. Asimismo, he presentado más de 30 trabajos en congresos nacionales e internacionales con ponencias orientadas a la formación docente, y he participado en proyectos de I+D+i financiados en convocatorias competitivas de Administraciones o entidades públicas y privadas. Y estoy pendiente de la resolución de un nuevo proyecto. También he sido coordinadora del volumen “Nutrición y Dietética” de la colección Enfermería S21 (1º y 2º edición) editorial DAE (Grupo PARADIGMA).


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, Academico Correspondiente Real Academia de Farmacia(Royal Pharmaceutical Academy of Spain) and member of the Scientific Committee of the Federation of European Nutrition Societies (FENS 2003-2007), Spanish Federation of Nutrition, Food and Dietetics (FENSNA president 2005-2010).Member of the IUNS Council (2005-), President-elect of International Union of Nutritional Sciences (2013-), 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 surveys, Long-distance learning.
Ron Maughan

Ron Maughan is currently Emeritus Professor of Sport and Exercise nutrition at Loughborough University, England. He obtained his BSc (Physiology) and PhD at 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 Position: Academic 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. 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 ProMeal, 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 GENUD (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 has 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 Frontières (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 of the Micronutrient Forum and is a core member 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 Rønborg

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 she studied 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 Anthropoistics 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 UKCRC Centre of Excellence for Public Health, Queen’s University Belfast. My postdoctoral training to date has been in the field of cardiovascular medicine, and healthy ageing. 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 International Longitudinal Study of Ageing (NICOLA). 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 developing and testing interventions for tackling undernutrition in 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 2008 at CNIC, José has been coordinating the area of lifestyle epidemiology. Currently holding a Joint appointment at CNIC, José is co-investigator in two large cohorts aimed at identifying determinants
of early subclinical atherosclerosis: The PESA (Early Detection and Progression 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 in his own country, starting from basic biomedical research to currently working at applying epidemiological methods and advanced biostatistics 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 Euronet, 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 childhood obesity and European advisor 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 Activity (ISBNA) (2007-2013) and board member for Public Health Nutrition at Sociedad Española de Nutrición Básica y Aplicada (SEBNBA) (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, DAIRNO (Data Food Networks), 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 ELEGENBI (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 Nutrition 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 Pinstrup-Andersen

Per Pinstrup-Andersen is Professor Emeritus and Graduate School Professor at Cornell University and Adjunct Professor at Copenhagen University. He is past Chair 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 and 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 on Saturday 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 travelled 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 McCol­lum International Lecturer Award from the American Society of Nutri­tion 2010/11, and the 9th 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.

Dr. Prentice has published over 300 scientific articles, in high-impact journals (Nature Medicine, PNAS, J Biol Chem., FASEB J, Cell Metabolism, Diabetes, etc...) and 15 reviews or book chapters.

Dr. Prentice holds several national and international research grants and awards and a researchChair in the pathogenesis of insulin resistance and cardiovascular diseases. He is also leading international research collabora­tions with Norway, Finland, Brazil and France. Dr. Prentice has won 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. Prentice 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.

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 Inter­national 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 has
focused on 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 po­
litions, including long-term assignments in Ethiopia,
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 Grea­
ter Lakes Region, as well as South and Southeast Asia. Her responsibili­
ties 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 Ribió Serván
Pilar Ribió Serván, born in San Antonio, Texas USA.
MD, Universidad Complutense de Madrid, 1983. (A with
honors). PhD Universidad Complutense de Ma­
Specialist in Endocrinology and Nutrition, in Hospital
Ramón y Cajal Madrid, where worked until 1990. Fe­
lowship in Jackson Memorial Hospital, University of
demic and Professional Appointment: Associate Head of Nutrition and
Endocrinology Department, Fundación Jiménez Díaz-idc Hospital, Univer­
sidad Autónoma, Madrid.

Claudia Andrea Rodríguez Mora
Graduada en nutrición y dietética en la Universidad In­
dustrial de Santander, Colombia. Actualmente cursa la
maestría de Nutrición en Salud Pública en la Universi­
dad de São Paulo, Brasil y realiza intercambio académi­
coco en el Observatorio de la Alimentación de la Univer­
sidad de Barcelona, España. Becaria de la “Fundación de
Amargo à Pesquisa do Estado de São Paulo FAPESP”
y del programa de mobiliidad internacional Santander. Trabaja en Colom­
bia como nutricionista en la Secretaría Departamental de Salud de San­
tander y en el programa de alimentación escolar de Narino. Tiene expe­
riencia en el área de salud pública, actuando principalmente en la
asesoría de programas y políticas de alimentación y nutrición, alimenta­
ción escolar y seguridad alimentaria y nutricional.

Graduated in nutrition and dietetics at the Industrial University of San­
tander, Colombia. Currently pursuing a Master's degree in Public Health
Nutrition at the University of São Paulo, Brazil and takes academic ex­
change at “Observatorio de la Alimentación” at the University of Barce­
loña, Spain. Fellow of the “Fundación de Amargo à Pesquisa do Estado de São Paulo FAPESP” and the program of international mobility Santander. Works in Colombia as a nutritionist in the Health Government Depart­
ment of Santander and for the school feeding program of Narino. 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.

Blanca Román Viñas
Doctora en Medicina, médico especialista en Medicina
del Deporte y Master en Nutrición. Trabaja como inves­
tigadora en la Fundación para la Investigación Nutricio­
nal 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 Har­
nising nutrient recommendations across Europe with special focus on
vulnerable groups and consumer understanding) o el desarrollo de plata­
formas basadas en las TIC para promover la actividad física y la alimenta­
tión saludables (CALH-Credits for Health, PIPS - Personalised Information Platform for Life and Health Services). Es miembro del Comité de Asesores del CIBER de Fisiopatología de la Obesidad y Nutrición y del Instituto de Salud Carlos III. Sus áreas de investigación se centran en el estudio de los métodos de
medición de la actividad física, la evaluación de la misma en la población,
la evaluación de los hábitos alimentarios y de ingestas inadecuadas de
nutrientes en la población.

Cristina Ruano Rodríguez
Cristina Ruano holds a degree in Pharmacy from the
Complutense University of Madrid specialising in Bio­
chemistry and a Ph.D. in Public Health (Epidemiology,
Planning and Nutrition) from the University of Las Pal­
mas de Gran Canaria. She is a University Expert in
Community Nutrition and holds a post-graduate dip­
ploma in Mediterranean diet from the University of
Barcelona. 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 internatio­
nal projects. She is a member of the Biomedical Research Centre in Physio­
pathology of Obesity and Nutrition (CIBERobn). She has taken part
in several research lines in the field of Nutritional Epidemiology and she is
author and co-author of many articles on the relationship between nutri­
tion and diseases.

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

Joan Sabaté
Dr. Joan Sabaté is Professor of Nutrition and Epidemio­
logy in the School of Public Health, at Loma Linda Uni­
versity in the USA. In 1992, he was investigator and
co-author of the landmark population study first relat­
ing frequency of nut consumption to
heart disease risk factors among California Adventists. He subse­
quently served as principal investigator in a nutrition
research study that directly linked the consumption of walnuts to signifi­
cant reductions in serum cholesterol. His findings were published in the
New England Journal of Medicine in 1993 and received the attention of
more than 400 international media sources. Dr Sabaté continues to re­
search the relationship of tree nuts to heart disease risk factors.

Jordi Sala-Salvador
Prof. Sala-Salvador has occupied teaching and research posts at the Faculty of Medicine in Reus (UB) since 1984. At present, he is professor of Nutrition and direc­
tor of the Human Nutrition Unit of the Faculty of Medi­
cine and Health Sciences of the Rovira i Virgili Universi­
ty (URV), and President of the Federation of Spanish
Scientific Societies on Nutrition and Dietetics (FES­
NAD). 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 finan­
ced by public bodies and 28 projects in conjunction with the pharmaceu­
tical or food industries. He is one of the leaders of the PREDIMED study and has published more than 250 original articles.
Seppo Salminen
Professor, Degree Program on Health Biosciences 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 BOKU University, Vienna, Austria; Visiting Professor, Nutritional Toxicology, RMIT University, Melbourne, Australia; Registered toxicologist (Finland and Eurotox), Fellow of the ANZFA, Professor of the Joint Program of the Life Sciences Faculty and Medical Faculty of University Turku.
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 ANZFA.
Receiver of several international prizes such as Grand Prix du Yoplait, International Award of the Latin American Nutrition, Meckin托福 Prize. Over 250 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 Biostatistics (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 (FIS PI042421 and FIS PI080819) to assess the role of diet and physical activity on mental disorders and quality of life, she also participates in several Spanish or European projects related to nutritional epidemiology such as the PREDIMED 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 (FP6-0361196-2). Now part of CIBERObn (Spanish Biomedical Research Centre in Obesity Physiopathology and Nutrition network) collaborating within the PREDIMED-PLUS trial.

Ben Schöttler
Ben Schöttler 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 Schwartman
Nutritionist, Master in Nutrition and currently pursuing a Ph.D. in Public Health and Nutrition 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 Food Steering Committee (CEIÁ) 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 Bilthoven, The Netherlands.
His main research interest is in the role of life-style 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 Scholar: 99). He has served as president-elect and as president (1992-2000) of the International Ad Obesity 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 Epode 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 of the University in Siena. He worked as researcher 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 HRNC at Tufts University working on the role of vitamin E in immune function during ageing. He was Tenure of a grant of the Japan Society for Promotion 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 behavior 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. specializing 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 the Mediterranean Prevention 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 EHNR II: European Nutrition Health Report II. He is also co-signed 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.

Ill World Congress of Public Health Nutrition
In 1999 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 a 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 has been appointed Scientific Director of the CITS-CAM at Sanza University in Peru. He has received numerous awards and recognitions and serves as visiting professor in several European and Latin-American Universities.

He was the Promotor and the President of the I World Congress of Public Health Nutrition held in Barcelona in 2006.

**John L. 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 3D 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 nutrition 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/H/WW/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 Slater**


**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 topics in more than 80 international conferences and has taught numerous food regulatory and innovation courses in universities in the USA, Canada, UK, Mexico, 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 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 and a PhD in Human 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 University of Chicago and Massachusetts Institute of Technology in the USA, Universidad “Francisco Marroquín” in Guatemala, Universidad Federal de Río 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 Nutritional Sciences. He is Director for Central America of the New Shirnshaw 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 body composition and 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 Universidad Rafael Landivar, Guatemala, Maria José Soto started her career at CesSiam, Guatemala, as a research assistant in 2007. Because of her scientific performance the Hildegard Grunow Foundation (HFG) accepted to promote her future education. In 2009 she participated successfully in the V Taller Latinoamericano de Liderazgo en Nutrición, a one-week leadership workshop 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 Information 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 Spieldenner
Jörg Spieldenner 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 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 in 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 on 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 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 Tefft
Dr. Tefft’s research focuses on the economics of risky health behaviors and health policy. Using applied microeconomics and econometrics research methods, Dr. Tefft is primarily interested in how individuals make decisions regarding health-related behaviors in economic and policy contexts.

Dr. Tefft 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. Tefft 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 Iberamericana, 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.

Chan Theary
Theory 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 European Nutrition Societies (FENS) and as chairperson or key member of numerous Greek, European Commission and World Health Organization Committees. She has received nu-
merous 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 Troesch
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 micronutrient 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 INIATA (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 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 (SENC). He is also member of the Scientific Committee Board of ILSI Europe and EPG-DE 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-León, 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 MSH in, with a concentration in Neuroscience in the department of International Health at Johns Hopkins Bloomberg School of Public Health (JHSPH). Her thesis focused on adolescence 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 IRSHP.

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 (IIT 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 civic honours, for his leadership in the global movement against malnutrition and for MI’s role in that effort. 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 the Indian Pacific. Following her post-doctoral stay in Ecuador, 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 study stays 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 MI and is currently working on the development of a 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 and in 2004 he joined Hoffmann-La Roche in New York, 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 Research 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 Molli Katzen, The Fertility Diet, co-authored with Jorge Chavarro and Pat Skerrett and most recently Thinfluence, 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 Ingera, 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 Autonoma de Madrid, and a Master of Science in Health Research from the Universidad Publica 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 overweight (OW) (mean age 107 months) and 51 normal children, paired by age, sex, and socioeconomic status, and submitted to measurements of body fat by deuterium dilution, inflammatory cytokines, insulin, ferritin, transferrin receptors, glucose, serum lipids, haemoglobin, energy expenditure, blood pressure, and dietary intake. Comparisons were carried out means Odd ratios, Mann Whitney tests, main component and multivariate analysis and logistic binary regression. Results: OW children with 1,7 times more body fat showed higher levels of C-Reactive Protein (CRP), insulin, triglycerides, blood pressure, physical activity, and higher intake of refined cereals, canned fruits, soft drinks, fast foods, dietary energy, carbohydrate, polysaccharides, animal fat, methionine, and sodium; the essential fatty acids intake was lower and the sugar intake double as recommended and not different between groups. Most OW children had both parents OW (OR=7,955, P<0,046) and mothers with higher BMI at pregnancy. Children born by caesarean showed a 2.4 higher risk to be OW at school age (p=0,0031;IC:1.04-5.56). Four factors explained 72% of the sample variance: the association between adiposity, higher fast foods and fat intake and higher levels of CRP and insulin. Key findings: Fat accretion in school children was strongly associated to inflammation, hyperinsulinaemia, and high intake of fast foods, refined cereals, total energy, carbohydrates, sodium, and animal fat. Overweight was more related with wrong nutrition, BMI at pregnancy and parents’ overweight, than with a sedentary life style.

Key findings: 1. Bodyfat and inflammation in schoolchildren are associated.
2. Overweight is more prevalent in children from 8 to 24 months.
3. Physical activity and dietary intake are associated with overweight.

Objectives: To determine which factors were associated with infant postnatal growth, in a resource poor setting in Vietnam. Background and Methods: A cross-sectional study was carried out in the Therapeutic Feeding Center in Mayahi district, in 2013. 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 Raget 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 results show that the 58,33% of children maintain a good bodily posture despite their nutritional status. In addition, infants' crawling, walking in four legs, remained stable and strong. However, 64,52% of malnourished children with severe acute malnutrition (SAM) were unable to remain fully upright in a standing position and 75% lost sight of walking and without 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 capable to mentally represent and look for the object, and for group 2, 16,67% performed better than their contemporaries.

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 results may be influenced by the nutritional status for children with SAM must be ensured to prevent detrimental actions on their development from happening.
The Effect of Daily Vitamin B12 and Folic acid Supplementation on Growth in 6-30 Month Old Children in India: A Randomised Controlled Trial.

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Background: Folate 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, 210.9 and 3.5 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 children's and ponderal growth in children not receiving vitamin B12 supplements but not in those who did (P for interaction <0.001).

Conclusions: We provide evidence that low vitamin B12 status contributes to poor growth. We recommend local studies to identify the optimal approach for intervention and for confirming our findings.

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Sodium intake is associated with higher blood pressure in children of 4-5 years old.

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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 intake 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 M411 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/m\(^2\)), energy intake (KCal) and usual potassium intake. Multiple linear regression was used to estimate the association between intake of Na 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 (2.0%), 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) by every 10 g/dl of processed meats (B=0.86), bread (B=0.54), breakfast cereals (B=0.64) and per every gram of added salt (B=0.45). The DBP only increased significantly with the increase of consumption of bread (B=0.39). These significant associations found with transformed 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 table 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.

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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 stimulates 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=1938). 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-hip ratio (WHR), waist-to-thigh ratio (WTR), waist-to-weight ratio (WWR=waist circumference/Weight) and fat mass index (FMI=fat mass from tetra-polar bioelectric impedance/height\(^2\)) were obtained at 7 years old by trained personnel and then were used to identify body fat patterns by principal component analysis. Regression coefficients (\(\beta\) 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, FMI and WHR and a pattern 2 by WHR, WTR and WMR that allows 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 1/10 in n-6/n-3 ratio was not significantly associated with pattern 1 (B=0.025; 95% CI; 0.012–0.061), but was significantly and positively associated with pattern 2 (B=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 inadequate 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 examine 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 study the 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 31.0% of 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 the risk for diastolic hypertension 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.
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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 (CIDRO/07).
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 (<0.140.025; -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; -0.02), maternal food timeline 0:00-02:01; 02:01-04:00; 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 investigation. This knowledge may test the planning and evaluation of health and nutrition programs and policies.

OT-010 Oral communication
Dietary patterns and overweight among 4-6 years children.
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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 through a Food Frequency Questionnaire, administered to their primary caregiver. For each item, consumption was converted into daily frequencies, further categorized into lower (first quintile), intermediate (second-fourth quintiles, aggregated) and higher (fifth quintile). Dietary patterns 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 z-transformed into normal vs. overweight (≥2SD vs.>2SD), according to the World Health Organization’s cut-offs. Bimodal 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. “LHP” – lower in healthy foods (vegetables, fruit, fish); 3. “Healthier” – higher in healthy foods and lower in unhealthier ones (energy-densefoods, red meat) (pattern 3 used as reference). In the univariate analysis, both unhealthier dietary patterns were associated with higher odds of overweight prevalence (EDF OR=1.29; 95%CI:1.02-1.63; LHP OR=1.23; 95%CI:1.01-1.54). After adjustment for children’s sex, age, daily screen time, structured physical activity (maternal education and body mass index) and characteristics, these associations did not remain statistically significant.
Conclusion: Malawian children were more to have DM and overweight than the general population. Pre-diabetes were more prevalent among adolescents. Obese adolescents have 1.5 times the risk for obesity, and 1.2 the risk for diastolic hypertension more than the physically active adolescents.
OT-012    Oral communication

Sonogo ME, Sagrado MP, Rivas E, Escobar G, Martin-Cañavate R, Custodio E.
WHO Collaborating Centre for Maternal and Child Health, Institute for Maternal and Child Health (IRCCS) Burlo Garofolo, Trieste, Italy.

Background: 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.

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 17/176 (9.7%) children. Abnormal lipid concentrations were defined as triglycerides ≥130 mg/dl in children aged 10-19 years and a ≥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.

Conclusions: Target group children are highly at risk of unhealthy diet and physical activity. Further studies are needed to identify the causes of unhealthy lifestyles among children in anti-retroviral therapy.

OT-014    Oral communication

Greenhouse gas emission of diets in the Netherlands and associations with food, energy and macronutrient intakes.
Van den Bergh FJ, Brouwer MP, Kok FJ, Brouwer W.

Background: GHGE of diets 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).

OT-015    Oral communication

Intrapersonal, social-environmental, and physical-environmental factors which predict healthy eating practices in Dutch adults.
Swaan EJ, Bouwman IJ, Hiddink GP, Aarts MP, Koeten ME.

Method: Diet intake of 150 school children aged 7-9 years in Kibwezi district in Eastern Kenya was assessed using a qualitative multi-pass 24-hour recall. Model parameters we...
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. Previously identified predictors of food insecurity: educational 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 JMA1, Böchler FL2, van Duijnhooven FJB3, Hoogenveen RT1, TooroppeS J1, Hoekstra J1
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 extent 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 unfavourable intakes.

Material and methods: Health outcomes such as Quality-Adjusted-Life-Years (QALY) and mortality 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 - GREGÔRIO M1, NOÇEIRA P1, GRAÇA P1
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 (LIF). Most food and nutrition researches are lacking understanding of 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 LIF in Portugal.

This 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 determinants. This study is in line with 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 (families/friends) were main coping strategies. Our findings also suggests 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 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.

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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 healthful 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 ALSPAC 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%C)) 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 more evident when eating behaviours were reported after 12-15 months of age.
OT-019
Oral communication
Race is associated with obesity independent of socioeconomic status among Brazilian adults: 2008-2009 Household Budget Survey
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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 specific white, black and mulatto SES factor analysis with principal component extraction to derive SES index. SES was formed by income, education, and food access variables. The association between race and obesity independent of SES (estimated by individual factor scores), age, Brazil's regions was estimated using multivariate survey logistic regression. Interaction between race and gender was tested. All estimates were 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<0.01). 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.
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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 multistage random cluster sample of 1762 adults aged 25 to 65 years in Cape Verde, using the WHO STEPSwise 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 6.5% (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 37.6% (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%CI: 1.96-2.07 and urban women: 2.47; 95%CI: 1.43-4.52 for general obesity; and age adjusted odds ratio, urban men 2.7; 2.83-5.6; urban women: 2.45; 1.33-4.51 for abdominal obesity). Among men, abdominal obesity increased with age (OR: 6.54; 95%CI: 2.77-15.5 for WC; and OR: 7.04; 95%CI: 2.50-19.8) and education years (OR: 18.8; 95%CI: 1.55-220.4 for WC, and OR: 3.02; 95%CI: 1.19-7.64). Among women, general obesity and abdominal obesity increases with age (OR: 2.47; 95%CI: 1.35-4.52 for general obesity; OR: 3.25; 95%CI: 1.50-7.03 for WC; and OR: 4.39; 95%CI: 2.13-9.06 for WHR) and income category (OR: 1.65; 95%CI: 1.06-2.57 for general obesity; OR: 1.56; 95%CI: 1.04-2.33 for abdominal obesity).

Key findings: Overweight/obesity and abdominal obesity are a public health problem in Cape Verdeans 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
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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 was 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.
Jeron Lavelleker,1,2 Hilde P van der Ploeg,3 Willemien Kroegel,3 Wolffang Ahrens,1 Oliver Allass,4 Lene Frost Andersen,5 Laura Caprini,6,7 Sebastien Chastin,8 Alan Donnelly,9 Uli Ekeld,4 Paul Fingas,8 Marlon Rechert-Mors,8 J Anje Hebestreit,9 Ingdri Hendriksen,5,10 Thomas Kubiak,11 Manuela Lanza,12 Anne Loven,11 Carmen Macdoncha,13 Pablo Mazzocca,14 Pablo Monsivais,15 Marie Murphy,16 Ute Ntilhings,17 Donal J. O’Gorman,18 Britta Renner,19 Gun Roas,20 A. Jantine Schulte,21 Matthias Schubbe,22 Jürgen Steinacker,23 Karlen Stroh,22 Dorothee Volker,22 Peter van’t Vee,24 Nan-nan Lien,25 Ines Bourdeauhaus,26 Johannes Brugg,27 on behalf of the DEDIPAC consortium
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Amsterdam, the Netherlands.

Trans fatty acids in Europe: where do we stand?

TFA content in foods and on dietary TFA intakes in the European region.

TO-024 Oral communication
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
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 nutrient intakes and standard deviations, using published descriptions, 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.

Results: 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 kgm⁻² 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 106.2 KJ/kg·day (95% CI: -191.0 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 alleles.

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.

TO-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.

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Objectives: This study aimed to evaluate adherence to the traditional Mediterranean Diet (MD) and association with BMI, waist circumference (WC), total-saternal and proportion of total energy intake from foods, and financial status 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 (Peloponnesus) 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, potatoes, 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 intake levels 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 (r=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,

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with the greatest deviation displayed by Cret. Simultaneously, study results suggest that new food products and habits are increasingly challenging dietar­

t raditions, even among the elderly population. The processes how grea­
ter financial status can facilitate MD adherence, and how health outcomes are im­
act ed 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.*

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Objectives: The aim of this Study is to analyse the environmental re­
levance of human nutrition and to investigate if the nutrition recom­
mandations 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 pyra­


mid 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 the nutrients food pyramid was based on virtual water data. Using publicly available data on the water footprint of foods, a food pyra­


mid was developed within this study.

Results and Discussion: The three-dimensional pyramid of the Ger­
man Nutrition Society focuses on nutritional aspects and an adequate supply of nutrients based on food standard groups. The GHG emis­


ions-based pyramid, developed in Denmark, refers to the amount of GHG emissions in kg CO2-equivalents per kilogram food, the alloca­


tion 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 pyra­


mid. 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 gen­


eral, crop products have a lower environmental impact than animal food, which is consistent with the arrangement in the nutritional pyra­


mid. Looking at crop products, it is particularly preferable to choose regional and seasonal products from open land cultivation instead of products 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., Atinmos A.*

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Background: Wheat flour has been mandatorily fortified with vitamin A in Nigeria. Vitamin A fortification 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 twel­

ve 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. Fortifi­


cation compliance was calculated based on three assumptions: All sam­


ples were assumed to have been fortified with current Nigerian Interna­


tional 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 consi­


deration additional factors such as premix quality and stability, in-process addit­


ion challenges. Number of samples that met the required ranges bas­


ed on the assumptions was calculated in percentages. Data was analyzed using descriptive and inferential statistics at p<0.05.

Results: Pre and post-storage vitamin A content of flour was 18.2±10.7 IU/g and 6.4±5.2 IU/g respectively. Vitamin A stability in flour at 1, 2 and 3 months were 60.7%, 30.6%, and 21.4%. Only 11.8% samples met the standard (≥30IU/g). Initial vitamin A was 29.3±4% based on WHO guidelines (Feasible Fortification Level/Range (FRL) of approximately 30% loss (22.5–30 IU/g) and non-compliance was 76.5% After stability studies, compliance decreased to 5.9% while non-compliance level increased to 94.12%. Out of 17 flour samples, only 29.4% were compliant at 50% acceptable compliance range and 17.7% were compliant with vitamin A for vitamin A (15-30 IU/g) at pre and post-storage levels respectively. A significant difference existed between vitamin A content of flour and Nige­


rarian NIS.

Conclusion: Low stability and compliance were observed. High premix quality and monitoring should be ensured.

**OT-028**

**Oral communication**

*Local vs. Global food chain performance in Denmark.*

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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 societ­


ties, 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 repre­


sentations of food chain performance in 4 selected spheres: Market, Sci­


cific, 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 integra­


ted 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 sys­


mets, in a Danish context, was difficult 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 Denmark, interlinking the local and global food systems. It was 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: 311778.

**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.*

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Objectives: The Australian Government established the Food and Health Dia­


gle (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 were 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 decla­


red 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% reduc­


ion.
There were 125 the target.

Ition of food portions consumed/reported.

The agreement between the

tool 24h-recall EPIC-SOFT.

Standardisation of food selection for portion sizes (39mg/100g, P<0.001). By 2013, 67% of the products were of Porto Medica/School.

Correct picture portion. Between

Measurement was the different portion sizes on the plates (67.8%), and

results,

pilot double-blind placebo controlled

samples.

Blood pressure (SBP) 121-140 mm Hg and/or

pressure and the secondary outcome measures were

Pulse Wave Velocity, PWV, Pulse Wave Analysis

SPPB-800/200/2009 were used to identify the most consumed foods in the 5 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 n-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 Globodiet photos will be added. The Brazilian photo album 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 work will lead to the development of an IARC-WHO standard operating procedure, which will serve new joining countries and ensure high standardisation of food portion size estimates worldwide.

**OT-032 Oral communication**

**Olive leaf extract favourably modulates cardiovascular risk markers**

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Consumption of dietary polyphenols has been demonstrated to modulate a variety of cardiovascular risk markers. The leaves of the olive plant (Olea europaea) are rich in polyphenols, of which hydroxytyrosol (HT) and the secoirdiol oleuropol are most characteristic. This project aimed to assess the impact of olive leaf extract (OLE) in humans in both an acute and a chronic setting. In an acute, postprandial, cross-over study, 18 healthy subjects (9 male, 9 female, mean age 25.4 years, BMI 23.0 kg/m2) consumed either olive leaf extract (OLE), delivering 58 mg oleuropol and 4 mg HT, or placebo, separated by a 4 week washout. Vascular function was assessed at baseline, 0.5, 1, 1.5, 2, 3, 4, 6 and 8 hours via Digital Volume Pulse (DVP), blood clotting assessed for 6 hours in the presence of lipopolysaccharide. Interleukin (IL)-8, IL-6, IL-18, tumor necrosis factor-a and IL-10 concentrations were measured in supernatants. DVP-stiffness index (p<0.009) and ex vivo IL-8 production (p=0.0326) were both significantly lower across the intervention period compared to the control. Absorption of OLE was confirmed by the presence of specific olive phenolic metabolites in urine samples. To investigate the effect of chronic OLE supplementation, we conducted a randomised double-blind placebo controlled cross-over trial using a group of 60 prehypertensive (systolic blood pressure (SBP) 121-140 mm Hg and/or diastolic blood pressure (DBP) 81-90 mm Hg) males (mean age 45 years, BMI 27.0 kg/m2). The primary outcome measure was ambulatory blood pressure and the secondary outcome measures were plasma lipids, vascular function assessed by Pulse Wave Velocity (PWV), Pulse Wave Analysis (PWA) and DVP cytokines, cell adhesion molecules, CRP markers of glucose control and adiponectin. Subjects consumed 20 ml of liquid OLE providing 136 mg oleuropin and 6 mg HT, or a placebo liquid, daily for 6 weeks separated by a 4 week washout. Significantly lower values (p<0.05) were seen after OLE consumption vs control for SBP (daytime -3.95±11.48 mmHg, p<0.05) and PWV (24 hour -3.3±10.81 mmHg, p<0.05). DAP (3.00±8.54 mmHg; 2.42±7.61 mmHg), total cholesterol (-0.32±0.70 mmol/L), LDL cholesterol (-0.19±0.56 mmol/L), triglycerides (-0.18±0.48 mmol/L) and circulating interleukin-8 (-0.63±1.13 pg/mL) were decreased. All values are means±SD. We present compelling evidence that OLE could represent a useful dietary supplement to reduce risk of CVD.
The purpose of this study was to measure and investigate the effects of high protein diets using fish and chicken sources on thermic effect of food (TEF), substrate oxidation, and satiety. Six middle-aged women (mean age 44.5±3.08 y) participated in two isocaloric diet ingestions: fish meal and chicken meal. Each meal provided 25% of daily basal energy need (32/28/40% as protein/fat/carbohydrates) of the subjects. Preprandial and 5-hours postprandial energy expenditures (measured at each 30 minutes), and substrate oxidation were measured by indirect calorimetry, while satiety profiles were estimated by visual analogue scales (VAS). The 5-hours TEF was not significantly different between fish meal (8.21% of energy intake) and chicken meal (8.51% of energy intake). Although both of the meals directly reached the TEF peak at 30 minutes, the significant increment of postprandial energy expenditure in fish meal lasted longer (up to 270 minutes) than that of chicken meal (up to 60 minutes). In both of meals, all of macronutrient oxidation rates were increased after ingestion. Satiety profiles seemed similar in both of meals, but recovery of hunger and desire to eat sensation to the preprandial state was faster in chicken meal than in fish meal. Furthermore, even though high protein with fish and chicken diets did not differ in energy expenditure, fish diet had longer effect on thermic effect and satiety sensation rather than chicken-based diet. A low TEF (8.21% - 8.51% of energy intake) suggested that the age might influence the thermogenic process after meal ingestions, which may be the other factor to predict energy need in this middle-aged group.

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 Scape 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 plate bowl. The two dependent variables were food intake – total consumption of soup (grams), vegetable (grams) and energy intake (Kcal) – and social interaction – rate by the participants’ meal experiences through questionnaires (‘Visual Analogue Scale’ questions; scale 1-10). 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 log, log-log, or log-log-log function, with exception of the social interaction variable (during 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=0.351).

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 commensality. 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.
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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.
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 method 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 promotors from the photos included: sugary drinks, high fat meats, white flour bread and pastries, soda, sugar products, and high use of sugar liquid on top of bakery products.
Key findings: The photos voicing the major causes of obesity in their villages and the percentage of the obesogenic promoters from the photos are 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 salaris, 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.
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Objective: This study aimed to estimate the percentage of iron-fortified complementary food and intermittent preventive treatment for anaemia, on haemoglobin concentration, anaemia and iron status in a nine-month intervention study in young irish children. 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 heme Fe and 3.8 mg as ferrous fumarate 6 days/week; b) intermittent preventive treatment of malaria at 3 month intervals using sulfadoxine-pyrimethamine in combination with amodiaquine; c) both iron-fortified complementary food and intermittent preventive treatment; or d) neither. The primary outcome was haemoglobin and anaemia prevalence. Secondary outcomes were: plasma ferritin, iron deficiency prevalence and P. falciparum 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 93%. 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 P. falciparum prevalence and anaemia, while iron-fortified 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 children in iron deficient settings are more likely 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.
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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 unexplored. 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 the UK.
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.
Results.- “Eat-wise” balanced options were increased in the price discount phase by 35.4% (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 (+1.5%, p=0.635). 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 behaviour 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.

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Objectives. The numbers of overweight people continue rising globally, and more than one billion adults have a body mass index (BMI) greater than 25 kg.m-2. Face-to-face intervention programs for treatment of obesity are known to result in significant weight loss but can be expensive and limited in reach. Personalised (or tailored) eHealth lifestyle-based interventions offer potential to supportive and scalable approaches for obesity management and prevention, but their effectiveness remains unclear. The objective of the present study was to conduct a systematic review and meta-analysis of randomised controlled trials (RCTs) that tested the effect of personalised, eHealth lifestyle-based interventions on weight loss and in reduction of central obesity in adults.

Material and methods: Seven databases (ASSIA, CAB Abstracts, IBSS, Medline, Psych Info, Scopus and Embase) were searched using the following criteria: 1) RCTs; 2) web-based interventions; 3) dietary-related outcomes; 4) dietary-related outcomes. These studies were conducted in the United States, The Netherlands, Australia and Japan. Pooled analysis of the studies showed that web-based personalised interventions were more effective in reducing body weight (WMD: -1.97 Kg [95% CI: -2.47 to -1.47]) and waist circumference (WMD: -1.39 cm [95% CI: -2.8 to -1.1]); p<0.0001 than non-personalised web-based interventions in the short- to medium-term (12 to 48 weeks).

Key findings: These results provide strong evidence that personalised interventions delivered digitally are more effective in inducing weight loss and reducing central obesity, than non-personalised interventions at least in the short- to medium-term.

OT-042 Oral communication

Nutrientes de Aloe vera. Eliminación de la aloina.

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1. Objetivos: Abordar el estudio químico de los nutrientes aportados por la planta Aloe vera, la cual se aplica cada vez más en nutrición funcional. Se pretende analizar el zumo de la planta en orden a identificar y cuantificar los productos químicos descritos en la literatura. Al mismo tiempo se desea encontrar un camino para la reducción y posible eliminación de la aloina (suma de las antraquínonas emodina y barbaloina).

2. Material y métodos. Se puso a punto un método analítico capaz de identificar y cuantificar en una sola técnica a todos los metabolitos como las antraquinonas basado en espectrofotometría y UHPLC. Para ello se instaló una columna shodex OHPak SB-806 HQ en un aparato para UHPLC WVR-Hitachi, modelo Elite La Chrom dotado con dos bombas, un inyector automático, un detector de Índice de refracción y un detector UV-VIS. 

3. Resultados: 3.1. Intento de eliminación de las antraquinonas por oxida­ción con la lactasa de Rhus vernicifera. Después de varios días de trata­miento, la aloina permaneció en sus valores iniciales, los que se mideron tanto por espectrofotometría como por UHPLC.

3.2.- Intento de eliminación de las antraquinonas por oxidación con ozono.- La aplicación de una corriente de oxígeno ozonizado (-40 mg x L-1) durante 15 minutos a temperatura ambiente (55 °C) y 1.1 x minuto-1) elimina totalmente tanto emodina como barbaloina en un intervalo de dos horas. En 45 minutos se ha reducido la aloina total (emodina + barbaloina) de 336 ppm a 8.7 ppm. Sin embargo, el mucopolysacárido AMWP resultó afectado negativamente, pues las fracciones de mayor tamaño se transformaron en las de menor tamaño, lo que hace que el método discarbeeza en prácticas de este tipo por pérdida de la calidad.

3.3.- Intento de eliminación de las antraquinonas por filtración a través de gel.- La primera fracción que se eluye de la columna posee 1198.10 ppm de AMWP y 90.98 ppm de aloina, lo que supone un ligero aumento de la rela­ción aloina/AMWP. Rediseño del aparato en orden a mejorar esta relación supuso la subida de la presión y ruptura de la columna, lo que atribuimos a la alta viscosidad del zumo fresco del Aloe vera.

3.4.- Intento de eliminación de las antraquinonas por lavado con agua.- Lavados sucesivos (x3) de cubos de pulpa de Aloe vera (10 a 15 mm de lado) redujo la aloina a 57.00 ppm a 19.92 ppm, si bien el mucopolysacárido también resultó disminuido (3423.50 ppm a 1531.54 ppm).

4. Conclusiones: Aloe vera (Aloe barbadensis) produce un zumo incoloro compuesto por tres fracciones de mucopolisacáridos de diferente tamaño molecular y dos de aloina compuestos por las antraquinonas emodina y barbaloina. Si bien las tres primeras son beneficiosas para la salud humana –estimulan el sistema inmunológico–, las dos últimas producen cua­dros diarreicos y problemas nefríticos. Los diferentes experimentos para la eliminación de las mencionadas antraquinonas (aloina) resultaron sólo parcialmente exitosos.

OT-043 Oral communication

Diversidad alimentaria y su asociación con el retraso de crecimiento en niños de 6-23 meses. Perú, 2008-2010.

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Objetivos. Analizar la situación de la diversidad alimentaria en niños de 6-23 meses en el Perú y su relación con el crecimiento infantil y factores sociode­mográficos asociados.

Material y métodos. Se desempeñó un análisis secundario del Monitoreo Na­cional de Indicadores Nutricionales, 2008-2010, encuesta nacional repre­sentativa a nivel nacional. Se construyeron puntajes de diversidad alimen­taria según la metodología propuesta por la Organización Mundial de la Salud (consumo de 4 o más grupos alimentarios de 7 posibles el día previo a la entrevista). Se describió la situación de la diversidad alimentaria y sus factores asociados según características de la madre, el niño y los hogares. Asimismo, se calculó el riesgo de retraso de crecimiento asociado a una baja diversidad alimentaria aislando potenciales variables de confusión. Resultados. El 81.1% de niños tuvo diversidad alimentaria mínima adecua­da. El retraso de crecimiento estuvo presente en un 18.2%. La diversidad alimentaria fue significativamente más baja en los niños de 6-11 meses (61%) y en hijos de madres sin nivel educativo (60.6%). La situación de pobreza no mostró diferencias significativas. Los niños con retraso de crecimiento tuvieron un consumo menor de lácteos (-6.8%), carnes (-6.8%), legum­bres y nucos (-4.0%), respecto a aquellos con un crecimiento normal. Los principales factores de riesgo para baja diversidad alimentaria fueron tener entre 6-11 meses (OR 3.4), ser hijo de madres sin nivel educativo (OR 2.6) y vivir en áreas rurales (OR 2.3). Alcanzar una diversidad alimentaria mínima adecuada supone disminuir en 27% el riesgo de retraso de crecimiento.

Principales conclusiones. La alimentación del niño de 6-23 meses en el Perú es pobre, con un bajo consumo generalizado de alimentos de origen animal. Nuestro estudio demuestra que gran parte de los problemas de diversidad alimentaria en los niños no pueden ser explicados únicamente por la pobreza, sino que la baja educación materna es uno de los más fuer­tes predictores de riesgo. Mejorar las prácticas de alimentación complementa­ria, especialmente a través de la diversificación de la dieta son aspectos cruciales para prevenir el retraso de crecimiento.

OT-044 Oral communication

Consumo de calcio en embarazadas puérperas en un Sanatório privado de la Ciudad de Buenos Aires, Argentina.

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Introducción: Una ingesta inadecuada de calcio compromete el tejido óseo materno debiendo soportar el crecimiento fetal y la producción de leche materna.

Objetivos: Evaluar el consumo de calcio de alimentos de fuentes convencionales y no convencionales y valorar la importancia otorgada al consu­mo del mismo.

International Journal of Community Nutrition 2014, 0 (suppl)
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 período 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 fue de 31,5±7,7 años. El 80,1% (n=177) consume tres porciones diarias o más. Entre los alimentos de fuentes convencionales, el queso es el alimento más consumido por porción diaria (12,9%), seguido de una gran dispersión de los resultados. Si bien el promedio de consumo de la leche y el yogur fue igual (1,38 porciones diarias), se observa un mayor desvío para el yogur (1,67 V1.24).

En el cuestionario convencional, el 3,9% (n=8) consume 30 gramos o más entre frutos secos y semillas al menos una vez por semana. El 77,7% de la muestra considera que el consumo de calcio en la lactancia es muy importante y el 5,7% reconoce haber tenido problemas de salud por su consumo inadecuado y que debería aumentar su consumo tanto para su salud como para la de su hijo.

Conclusión: En nuestra población se observa que la mayoría cubre con las recomendaciones de calcio y reconoce su importancia tanto a nivel individual como para su hijo.

OT-045 Oral communication
¿Desigualdad en la Educación Física Chili­ana? Diferencias en intensidad y actividad física total en escuelas de distinto nivel socioeconómico.
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Introducción: El sistema educativo chileno es uno de los más desiguales 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 centroideas 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 bajo (C). En tres clases sucesivas de 6º básico, se utilizaron acelerómetros Actigraph GT3X en tres 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 cinta ilíaca. Los vectores de magnitud (VM) fueron expresados en minutos por hora (rpm) por categoría de sewing.

Resultados: La media total de rpm fueron de 2.399 ± 653,3 entre las escuelas. La escuela C presentó 2234,7 ± 500,6, la B 2217,1 ± 780,3 y la A 2274,56 ± 596,32 (p<0,019). Los niños presentan mayores rpm vs. las niñas. El análisis descriptivo de carácter descriptivo, no se encontraron diferencias significativas en términos de edad y nivel socioeconómico.

Conclusiones: Los resultados muestran que 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 extrascénico de los niños, la cual está conectada de manera indisoluble con su condición física, estilos 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.
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Objetivos: Analizar la influencia de una intervención nutricional a través de una dieta individualizada sobre el control de la diabetes gestacional.

Materiales y métodos: El estudio es un ensayo clínico, ciego, experimental, de corte transversal. Se realizó análisis de perfil grupal y prospectivo, efectuado en 41 mujeres embarazadas con diabetes gestacional del Hospital de Clínicas San Lorenzo, entre enero de 2013 a 2014. Se les presentó una dieta de 1800 a 2000 Kcal/día 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 obesos que pertenecían a un peso normal fue de 12,5 Kg a 8,4 Kg, y la ganancia promedio en mujeres obesas fue de 10 Kg a 8,7 Kg. Hubo una mejora de las glucemias capilares tanto en ayunas como postprandial, en el transcurso de la intervención nutricional (1er control: ayunas 93,4 ± 12 mg/dl, postprandial 129,3 ± 15,9 mg/dl), 3er control: ayunas 89,9 ± 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 del tratamiento nutricional fue de 2747 ± 834 Kcal/día vs. 1769 ± 389 Kcal/día (p<0,0001), 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-047 Oral communication
KIDMED. Prevalencia de la baja adherencia a la Dieta Mediterránea en niños y adolescentes.
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Introducción: En los últimos años se ha observado, en el mundo occi­dental, una tendencia alarmante al abandono del llamado "estilo de vida mediterráneo", lo que se traduce, entre otras cosas, en una importante modificación de los hábitos alimentarios. Esto parece afectar especialmente a la población más joven, produciendo, de manera paralela, la aparición de enfermedades con graves repercusiones para la salud humana (obesidad, diabetes, enfermedades cardiovasculares, etc.). Varios autores han estudiado la adherencia al patrón de Dieta Mediterránea en esta población, utilizando para ello el test KIDMED (Mediterranean Diet Quality Index for children and adolescent). Este test consiste en un cuestionario de 19 preguntas que evalúan el grado de adherencia a la Dieta Mediterránea. Objetivo: Desarrollar una revisión sistemática y un metaanálisis para valorar los resultados de los estudios que han utilizado el test KIDMED para evaluar la adherencia a la Dieta Mediterránea, estimada por medio de proporciones. Además, se evaluaron los estudios de baja adherencia a la Dieta Mediterránea seleccionando grupos subgrupos de diferentes géne­ros, por edades, por grupos de países, según sea la muestra de cada estudio, representativa o no, y según la proporción de baja adherencia que presenta cada uno.

Material y métodos: El método utilizado fue una revisión sistemática y un me­taanálisis, considerando un metaanálisis de efectos aleatorios. Adicionalmente se efectuaron análisis por subgrupos definidos.

Resultados: Se incluyeron 18 estudios transversales de 6 países (Chile, Chipre, España, Grecia, Italia y Turquía), que utilizaron el test KIDMED para valorar la adherencia a la Dieta Mediterránea. La población estudiada fue de carácter descriptivo. Los estudios revisados, el porcentaje global de alta adherencia a la Dieta Mediterránea fue del 10% (IC 95% 0,07-0,13), mientras que el de baja adherencia fue del 21% (IC 95% 0,14-0,27). En este último, no se observaron diferencias entre hombres y mujeres, ni entre estudios representativos o no. Se encontraron diferencias notables con relación a la edad de la población (27% en los menores de 12 años frente al 19% en los mayores de 12 años) y al país de origen (28% en los países occidentales frente al 11% en los países orientales).

Principales conclusiones: El test KIDMED constituye una herramienta eficaz para evaluar la calidad de los hábitos alimentarios en niños y jóvenes.

OT-048 Oral communication
Influencia de la adherencia a la dieta mediterránea en el estado de salud autopercibido en población joven.
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Universidad Miguel Hernández, CIBERESP.

Objetivos: Describir el estado de salud autopercibido en población joven universitaria y explorar la asociación con la adherencia a la dieta mediterránea y otros factores.
Material y Métodos: Se utilizaron los datos basales de 1110 participantes del estudio DSA-UMH. El estado de salud autopercibido se recogió mediante la pregunta “En general, ¿cómo diría que es su salud?”. Las respuestas se categorizaron de la siguiente forma: 1) muy buena, 2) buena y 3) regular/mala/muy mala. La ingesta dietética se evaluó mediante cuestionario de frecuencia alimentaria validado y se estimó la adherencia a la dieta mediterránea mediante el Índice Relativo de Alimentación Mediterránea (IMAD). La adherencia a la dieta mediterránea se clasificó como alto: 11-18 puntos; media: 7-10 y baja: 0-6 puntos. Además se recogió información sobre variables sociodemográficas y estilos de vida. Se usó regresión logística multinomial para explorar los factores asociados con una salud autopercibida buena o regular/mala/muy mala comparadas con la muy buena. Para examinar la asociación entre la adherencia a la dieta mediterránea y el estado de salud autopercibido se utilizó también la regresión logística multinomial.

Resultados: El 23,1%, 65,1 y 11,8% de los participantes reportaron una muy buena, buena y regular/mala/muy mala salud autopercibida respectivamente. Los factores asociados con buena salud autopercibida fueron fumarador (OR vs no fumarador 1,18; IC 95%: 1,29-2,69) y menos activo (OR activo vs menos activo 0,41; IC 95%: 0,30-0,55). El perfil de los participantes con regular/mala/muy mala salud autopercibida fue ser fumador (OR vs no fumarador 5,19; IC 95%: 3,12-4,63), tener exceso de peso (OR vs no peso 2,19; IC 95%; 1,17-4,07) y ser menos activos físicamente (OR activo vs menos activo 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 autopercibida (OR= 0,81; IC 95%: 0,86-0,97) o regular/mala/muy mala salud autopercibida (OR= 0,59; 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 o muy 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.

OT-049 Oral communication

Asociación entre el índice de masa corporal pregestacional y patologías durante el embarazo.

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Objetivo: evaluar la relación entre el índice de masa corporal pregestacional y el riesgo de patologías durante el embarazo.

Sujetos y método: estudio transversal en 420 gestantes sanas de Gran Canaria con edades comprendidas entre 15 y 44 años que dieron a luz en septiembre de 2013. Sólo participaron mujeres con embarazos simples y que no fueran considerados como embarazos de alto riesgo. El índice de masa corporal se determinó al inicio de la gestación a partir de los datos de peso y talla de la carta del embarazo clasificándose en normowt (18,5-24,9 Kg/m²), sobrepeso (25,0-29,9 Kg/m²) y obesidad > 30kg/m². Se recogieron los registros correspondientes a la aparición de patología al final de la gestación.

La asociación entre el Índice de masa corporal pregestacional (agrupado) y la incidencia de las principales patologías del embarazo (anemia leve, diabetes gestacional, placenta previa asintomática, polihidramnios, preclampsia, malformación fetal, amenaza de aborto y pequeño para la edad gestacional) fue determinada a través de modelos de regresión logística (OR e intervalos de confianza al 95%) que se llevaron a cabo análisis crudos y ajustados por posibles factores de confusión.

El estudio fue aprobado por el comité ético del Hospital Universitario Materno Infantil y todas las participantes firmaron el correspondiente consentimiento informado.

Resultados: las mujeres que iniciaban la gestación con un Índice de masa corporal dentro de la categoría de sobre peso y obesidad tuvieron un menor riesgo de desarrollar anemia leve (OR=0,35; Intervalo de confianza al 95%: 0,13-0,88).

Por otro lado, las mujeres que eran obesas al inicio del embarazo, presentaron un riesgo más alto de diabetes gestacional (OR= 5,18; Intervalo de confianza al 95%: 2,12-12,6), preclampsia (OR=7,28; Intervalo de confianza al 95%: 1,17-45,06) así como del grupo de patologías gestacionales más frecuentes (OR=2,22, intervalo de confianza al 95%: 1,25-3,92). Conclusiones: una situación pregestacional de normopeso podría proteger frente a los estados de diabetes gestacional y preclampsia en el embarazo mientras que padecer sobre peso o obesidad antes del embarazo disminuiría el riesgo de desarrollar anemia durante el mismo.

OT-050 Oral communication

Proyecto “BCN comparte el menjar”: implementación de una red de aprovechamiento de alimentos elaborados excedentes del sector de la hostelería en la ciudad de Barcelona.

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Introducción: Se estima que durante el 2011 se han generado en Europa 89 millones de toneladas anuales de residuos alimentarios. En Cataluña se producen anualmente 262 471 toneladas de despilfarro alimentario. Durante el mismo año, un 4,98 % de la población catalana presentó previsiones materiales que afectaban a la alimentación.

Objetivos: Los objetivos de este proyecto son: reducir la vulnerabilidad del derecho a la alimentación de las personas en situación de pobreza y contribuir a la disminución del despilfarro alimentario producido en el sector de la hostelería.

Material y métodos: Diariamente NSF recoge y distribuye los alimentos excedentes (aptos para el consumo) de los hoteles/empresas, cocinados y congelados, aplicando medidas de seguridad alimentaria. Para garantizar y certificar la calidad higiénica de los alimentos, un laboratorio realiza análisis de muestras de forma aleatoria. Todos los datos de los alimentos distribuidos se registran en una base de datos.

Resultados: En un total de 20 meses de implementación del proyecto, se ha distribuido un total de 37 571 kg de alimentos. Estos alimentos se han distribuido entre más de 8000 beneficiarios de 16 comedores sociales. Del total de comida, un 32,1% han sido alimentos para el desayuno/merienda y un 67,9% de los alimentos distribuidos han sido almuerzos/cenas. Se han distribuido en mayor proporción alimentos ricos en carbohidratos (58,86%), y en menor cantidad alimentos proteicos (22,55%) frutas y verduras (19,9%) y lácteos (1,6%). Según el origen de estos alimentos, la mayor parte proviene de los hoteles (19%), en menor cantidad de caterings (19%) y de empresas alimentarias (15%).

Conclusiones: Los excedentes alimentarios generados en el sector de la hostelería han sido aprovechados para reducir la vulnerabilidad del derecho a la alimentación de las personas en situación de pobreza. Además, se ha mejorado el nivel de conocimientos en higiene y alimentación saludable de los usuarios de las entidades sociales mediante formaciones específicas en estas materias.
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.
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Introducción: En México la obesidad en escolares aurnada a carencias nutricionales y pobreza representa un problema de salud pública complejo. Objetivo: evaluar el impacto de un programa educativo de nutrición en el estado nutrico, hábitos alimentarios (HA) y actividad física (AF) de niños escolares de 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 fue 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(ZC95%) 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 >1ve/día (p<0.05).

Discusión: pocos programas semejantes logran impacto en el IMC cambiando solo hábitos. Conclusion: 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 .
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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 sin embargo se introdujo la dieta. El total de camas de los hospitales son 296 con un 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: disminuye 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 enfermera de planta. Se compara grupos por patologías. Resultados: Los datos recogidos referentes a 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 integrarla en el ámbito hospitalario.
OW-001 Oral communication Study of the Effect of Turmeric on Glycemic Status, Lipid Profile, Total Antioxidant Capacity and hs-CRP in Hyperlipidemic Type 2 Diabetes Mellitus Patients. Eghtesadi S 1, Adab Z 1, Vafa M 2, Heidar I 1, Shojaei A 1, Eghtesadi M 4, Haggani H 5. 1 Iran University of Medical Sciences, School of Public Health, Tehran, Iran. 2 Iran University of Medical Sciences, Institute of Endocrinology and Metabolism, Tehran, Iran. 3 Jagiellonian University, Krakow, Poland. 4 Institute of International and Complementary Medicine, Tehran, Iran. 5 Azad University, School of Medicine, Tehran, Iran. 6 Iran University of Medical Sciences, School of Management and Bioinformatics, Tehran, Iran.

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 divided into two groups. 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 (BP) were 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, BMII=0.000, Systolic and Diastolic Blood Pressure=0.000, TG concentration=0.000 and LDL-c=0.009 were significantly decreased and significant changes were observed between the 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. We found a 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, Rajak A 2, Malyutina S 3, Kubinova R 4, Bobak M 5. 1 Department of Epidemiology and Public Health, University College London, UK. 2 Jagiellonian University, Krakow, Poland. 3 Institute of Internal and Preventive Medicine, Slovenian Branch of the Russian Academy of Medical Sciences, Novosibirsk, Russia. 4 Novosibirsk State Medical University, Novosibirsk, Russia. 5 National 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 part of the World. However, no large scale studies have investigated the association between 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 (HAPPE) 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 categorize food items into fruit and vegetable food groups. Participants with existing chronic diseases 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 years. In the multivariable adjusted model, statistically significant inverse association was found between cohort-specific fruit and vegetable intake quantities and cardiovascular disease mortality (highest vs. lowest quartile HR: 0.70, 95%CI: 0.51-0.95; p-value for trend: 0.010), 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 cardio-vascular 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 three 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.

OW-003 Oral communication The APOB insertion/deletion polymorphism (rs7420443) influences the postprandial triacylglycerol and insulin response in healthy Caucasian adults – insights from the DISRUPT cohort. Vimal K.S 1, Gill R 1, Minihane A.M. 1, Lovegrove J.A. 1, Williams C.M. 1, Jackson K.G. 1, Yue L1. 1 Hugh Sinclair Unit of Human Nutrition and Institute for Cardiovascular and Metabolic Research, University of Reading, Reading, UK. 2 Bostom Heart Diagnostics, Framingham, MA USA. 3 Department of Nutrition, Norwich Medical School, University of East Anglia, Norwich, UK. 4 Institute for Cardiovascular and Metabolic Research (ICMR), University of Reading, Reading, UK.

Objectives: The concept of personalized medicine is now being extended to the field of nutrigenetics with the ambition of giving personalized/stratified dietary advice with greater efficacy in health promotion and disease prevention. To this end, we investigated the impact of 18 genetic polymorphisms on postprandial lipids, glucose and insulin responses in up to 262 healthy adults from the DISRUPT (Dietary Studies: Reading Unilever Postprandial Thial) cohort.

Materials and Methods: We examined the impact of 18 genetic polymorphisms in the FFARG, IRS1, INS, FABP2, APOB, CETP, LPL, APOC1, APOC3, MTP and ES1 genes (previously implicated in lipid metabolism) on postprandial lipids, glucose and insulin responses in up to 262 healthy adults. The participants consumed a standard sequential mixed test meal, which included a test breakfast (0 min; 49g fat) and lunch (330 min; 29g fat). Blood was collected at baseline (0 min) and on 11 subsequent occasions until 480 min after the test breakfast. Plasma total (TC), low density lipoprotein (LDL-C) and high density (HDL-C) cholesterol, triacylglycerol, insulin and glucose were determined. SPSS 21.0 for Windows (SPSS Inc., Chicago, IL, USA) was used for statistical analysis. Area under the curve (AUC, 0-480 min) was calculated using the trapezoidal rule and incremental AUC (IAUC, 0-480 min) was calculated as AUC minus the fasting concentration.

Results: There was a significant impact of APOB (Apolipoprotein B) insertion/deletion polymorphism (rs17240441) on fasting TC (P<0.004), LDL-C (P=0.007), HDL-C (P=0.002), triglycerides (P=0.007) with higher concentrations in the insertion allele carriers. A significantly higher area under the time response curve was evident for the triacylglycerol (4.5±10) and insulin (P=0.05) response in the insertion allele carriers (n=52) relative to the deletion/deletion homozygotes (n=51). None of the other polymorphisms had an impact on the postprandial lipemic response after Bonferroni correction.

Key findings: Our findings indicate that the APOB polymorphism is likely to be an important genetic determinant of the large inter-individual variation in the postprandial response to dietary fat intake. Greater understanding of how APOB gene influences postprandial lipemia will advance the prospects for personalised nutrition, where the insertion allele carriers may benefit from personalised dietary strategies to reduce the marked lipemia in response to meal ingestion.

OW-004 Oral communication Reducing our Environmental Footprint and improving our Health: Greenhouse Gas Emission and Land Use of Usual Diet and Mortality in EPIC-NL. Biesbroek S 1, Bueno-de-Mesquita H.B.M. 2, Peeters P.H.M. 2, Verschuren W.M.M. 2, Van der Schouw Y.T. 2, Tenne K.E.H.M. 2. 1 The National Institute for Public Health and the Environment (RIVM), Antonie van Leeuwenhoek 9, 3721 MA Bilthoven, The Netherlands. 2 Department of Gastroenterology and Hepatology, University Medical Centre Utrecht, Heidelberglaan 100, 3508 GA Utrecht, The Netherlands. 3 School of Public Health, Imperial College London, London SW7 2AZ, United Kingdom. 4 Julius Centre, University Medical Centre Utrecht, Utrechtseweg 100, 3584 CG Utrecht, The Netherlands.

Objectives: Food choices influence health status, but also have a great impact on the environment. The production of animal-derived foods has a high environmental burden, whereas the burden of refined carbohydrates,
Objectives: Hypertension is the leading risk factor for global burden of disease. The majority of people with hypertension (75%) live in low-to-middle income countries (LMICs). Based on the mismatch theory of developmental origins of disease, we hypothesized that the impact of adiposity on hypertension is augmented in lean compared with not-lean populations in rural areas of LMICs. Material and methods: We used citation databases to identify studies conducted in rural areas of LMICs in which the association between body mass index (BMI) or waist circumference (WC) and hypertension was assessed using multivariable models. We applied random effect models and conducted separate meta-analyses, depending on whether BMI/WC was assessed as a continuous or categorical variable. In each analysis, the studies were ranked by the mean BMI of the total population. Populations with a mean BMI below the median were grouped as lean and those above the median as not-lean. Results: We identified 46 studies of BMI and 12 of WC. Greater BMI and greater WC were associated with hypertension in both lean and not-lean populations. The impact of obesity on the risk of hypertension was greater in lean than in not-lean populations. Obese males in lean populations were 45% more likely to have hypertension compared to obese not-lean populations: ratio of the two effect sizes: 1.45 (95% CI 1.04, 2.03), p=0.027. In addition, individuals with WC above normal in lean populations were 52% more likely to be hypertensive than their counterparts in not-lean populations, ratio of the two effect sizes: 1.52 (95% CI 1.06, 2.17), p=0.021.

Key findings: Increased adiposity increases the risk of hypertension in both lean and not-lean populations of LMICs. The risk of hypertension associated with adiposity is greater in lean than in not-lean populations. This provides further supportive evidence for the mismatch theory which proposes that nutritional deficiencies during human development, followed by later excesses, may predispose individuals to development of obesity-related diseases. Findings from this meta-analysis highlight the need for strategies to improve nutrition in disadvantaged rural areas of LMICs, particularly in women of child-bearing age.

OW-006 Oral communication
Association of selenium status and selenoprotein gene variation with colorectal cancer risk.
Hughes DJ;1 Fedirko V;2 Meplat C;3 Schumberg L;3 Freisling H;4 Riboli E;2 Heseketh J;5 Jenab M. (on behalf of Epic Group). 1Consor­ ciurn of Systems Medicine, Department of Physiology & Medical Physics, Royal College of Surgeons in Ireland, Dublin, Ireland. 2Rollins School of Public Health, Emory University, Atlanta GA, USA. 3Institute of Cell and Molecular Biosciences, University of Newcastle, UK. 4Institute for Experimental Endocrinology, University Medical School Berlin, Germany. 5Section of Nutri­tion and Metabolism, International Agency for Research on Cancer, Lyon, France. 6School of Public Health, Imperial College London, UK.

Background and objectives: Suboptimal intakes of the micronutrient selenium (Se) are found in many parts of Europe. Low Se status may contribute to colorectal cancer (CRC) development. We explore its biological roles through 25 selenoproteins involved in cell protection from oxidative stress, redox control and inflammatory response. Variants in several selenoprotein genes have been reported to affect CRC risk. We are currently using a case-control study of 1478 CRC cases and 1478 matched controls to explore the European Prospective Investigation into Cancer and Nutrition (EPC) cohort to assess both the association of Se status and selenoprotein genotype with CRC risk, and their interaction in disease risk modification.

Methods: Serum levels of Se (total reflection X-ray fluorescence) and SePP (selenoprotein P) mass were measured in samples available from 966 of the cases and 966 controls. Multivariable incidence rate ratios (IRR's) and 95% confidence intervals (CIs) were calculated using conditional logistic regression. Selenoprotein genotypes (in DNA samples available for all 1478 cases and 1478 controls) were assayed by Illumina Goldengate genotyping.

Results: Resulting mean Se and SePP levels were 84.0 μg/ml and 4.3 mg/l in cases and 85.6 μg/ml and 4.4 mg/l in controls. Higher Se concentrations were associated with a non-significant lower CRC risk (RR = 0.92, 95%CI: 0.82-1.03 per 25 μg/ml increase). However, sub-group analyses by sex showed a statistically significant association for women (RR = 0.83, 95%CI: 0.70-0.97 per 25 μg/ml increase; P = 0.032) but not for men. Higher SePP concentrations were inversely associated with CRC risk (RR = 0.89, 95%CI: 0.82-0.98 per 0.806 mg/l increase; P = 0.009) with the association more apparent in women (RR = 0.82, 95%CI: 0.72-0.94 per 0.806 mg/l increase; P = 0.004) than men (RR = 0.98, 95%CI: 0.86-1.12 per 0.806 mg/l increase; P = 0.485). Selenoprotein genotypes are currently being analyzed.

Conclusions: 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 CRC 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.
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Objectives: Pomegranate extract (PE) provides a rich and varied source of bioactive compounds with antioxidant and anti-inflammatory properties. Extracts and pure compounds from pomegranate seeds have been shown to have a protective effect on 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.

Material and Methods: Healthy volunteers (7 males and 22 females) participated in a parallel, randomized, double-blind, placebo-controlled study of 12 weeks. 25 volunteers consumed either one PE (Pomaxx, Pomegranate) or placebo capsule daily, after a meal, for 4 weeks. Each PE capsule weighed 1.083g, containing 650mg of PE and 433mg maltodextrin. Dietary history and habits and the health related Quality of Life questionnaire (Rand 36) were also recorded pre- and post-intervention. BP, salivary cortisol and systolic levels (am, noon, pm) were assessed by specific and sensitive ELISAs, and fasting blood was obtained at baseline plus after 4 weeks to compare glucose, insulin and insulin resistance parameters.

Results: Systolic BP was significantly reduced following PE from 120.3±13.3 to 115.6±13.1mmHg (P<0.012). There was a reduction in the HOMA-IR levels from 2.22±2.6 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 caused a significant drop in salivary cortisol levels (P<0.001 and noon: 43±12±3.2% 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=0.011), pain (p=0.003), general health (p=0.008) and overall 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 cortisol/cortisone ratio in those taking the placebo.

Key findings: These results suggest that pomegranate extract intake rich in bioactive compounds may improve cardiovascular risk factors, reduce stress 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, type 2 diabetes and metabolic syndrome.

vegetables and fruit is low. The aim of this study was to investigate the associations of household greenhouse gas emissions (GHGE) and 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 and predicted food intake were based on our previous analysis. Cox proportional hazards ratios (HR) were calculated to determine relative mortality risk. In the modelled meat-substitution scenario, one-third (35 g/day) of the usual daily meat intake (105 gm) was substituted by other foods.

Results: During a follow-up of 15.9 years, 2563 deaths were registered. GHGE and land use adjusted hazard ratios for 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 35 g/day of meat with vegetables, fruit-nuts-seeds, pasta-rice-couscous replaced meat.

Conclusions: Especially when vegetables, fruit-nuts-seeds, fish, or pasta-rice-couscous replaced meat.
OW-008
Oral communication
Life-course changes in dietary patterns and type 2 diabetes risk among British adults.
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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 characterize dietary patterns as high-fat and high-GI, low-fibre and low-fat and low-GI, low-fibre. Changes were then measured using a z-score at the subsequent age; changes were then modelled conditionally on earlier z-scores Logistic regression models, adjusted for socio-economic class, education, smoking, physical activity, body mass index (BMI) and waist circumference were used to examine prospective associations between changes in dietary pattern z-scores between 35 and 53 and diabetes risk and of T2D patterns characterized by high-fat, high-GI, low-fibre and high-fat, high-GI, low-fibre dietary patterns were characterized by low intakes of fruit, vegetables, low-fat dairy products, and whole grain cereals, and high intakes of white bread, fried potatoes, processed meat and animal fats. For each 1 SD unit increase in dietary pattern z-score between 36 and 53 years of age there was a 37% (95% CI: 0.10–1.74) 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: 1.01–1.65) than increases between 36 and 43 years of age (1.21, 95% CI: 0.95–1.54).
Key findings: A dietary pattern increasingly characterized 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-009
Oral communication
Soft drink, and juice and nectar consumption and risk of pancreatic cancer in the European Prospective Investigation into Cancer and Nutrition.
Navarrete-Muñoz EM, Wark PA, Romaguera D,4, Rhöo-Patty N,5 Molina-Montes 6, Bueno-de-Mesquita HB,5,6,7,8 on behalf of EPIC investigators.
1CIBERESP, Spain. Miguel Hernández University, Alicante, Spain. 2Global eHealth Unit, Department of Primary Care and Public Health, School of Public Health, Imperial College London, London, UK. 3Department of Epidemiology and Biostatistics, School of Public Health, Imperial College London. 4CIBEROBN, Instituto de Investigación Sanitaria de Palma, Spain. 5Department of Social and Preventive Medicine, Faculty of Medicine, University of Malaya, Malaysia. 6CIBERSÁI, Spain. Andalusia School of Public Health, Instituto de Investigación Sanitaria, Granada, Spain. 7Dept. for Research on Energy, Food and Health (RIHF), Hispalis, The Netherlands. 8Dept. of Gastroenterology and Hepatology, University Medical Centre, Utrecht, The Netherlands.
Objectives: To assess associations of soft drink (total, sugar sweetened and artificially sweetened), and juice and nectar consumption with pancreatic cancer risk in the European Prospective Investigation into Cancer and Nutrition (EPIC) cohort.
Materials and methods: A total of 477,199 EPIC participants from 10 European countries recruited between 1992 and 2000 were included in our analysis. Of the 865 exocrine pancreatic cancers diagnosed during an average 12.2 years of follow-up, 608 (70.3%) were microscopically confirmed. Soft drink, and juice and nectar consumption were assessed using validated food-frequency questionnaires administered at baseline. Total soft drink consumption was subdivided into sugar sweetened soft drink and artificially sweetened soft drink consumption. Juice and nectar consumption combines the information collected on consumption of juices (obtained from either 100% fruit and vegetable, or concentrates) and nectars (juices with up to 20% added sugar). Hazard ratios (HRs) and 95% confidence intervals (CIs) were obtained using Cox regression models stratified by age, sex, and centre and adjusted for educational level, physical activity, smoking status and alcohol consumption. Associations with total soft drink were adjusted for juice and nectar consumption, and vice versa. Adjustment for energy intake, self-reported diabetes status and body mass index (BMI) were done separately as these factors could mediate the studied associations.
Results: Total soft drink (HR per 100 g/day=1.03, 95% CI=0.99–1.07), sugar sweetened soft drink (HR per 100 g/day=1.02, 95% CI=0.97–1.08) and artificially sweetened soft drink (HR per 100 g/day=1.04, 95% CI=0.98–1.10) consumption were not associated with pancreatic cancer risk. Juice & nectar consumption was inversely associated with pancreatic cancer risk (HR per 100 g/day=0.91, 95% CI=0.84–0.99). Further adjustment for energy intake, diabetes and BMI did not substantially affect the estimates. The results did not materially change after exclusion of the first 5 years of follow-up, or after restricting the analysis to pathologically confirmed cases, to non-dietetics, or following exclusion of obese participants (BMI ≥30 kg/m²).
Key findings: Soft drink consumption appears not to be associated with pancreatic cancer risk. Although the underlying mechanism and causality of the association remain to be elucidated, consumption of juices & nectars might be associated with decreased pancreatic cancer risk.

OW-010
Oral communication
Mediterranean Diet and Invasive Breast Cancer Risk in the PREDIMED trial.
Toledo E,1 Salas-Salvadó J,23 Corella D,4,5 Fitó M,5,6 Martínez-Gonzalez MA,1,2 for the PREDIMED investigators.
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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 rate 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 RR 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, specially when it is supplemented with extra-virgin olive oil.

OW-011
Oral communication
Association between dietary intakes of polychlorinated biphenyls (PCBs) and the incidence of hypertension in a spanish cohort: the sun project.
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Objectives: Polychlorinated biphenyls (PCBs) are persistent organic pollutants (POPs) that are consumed because of their bioaccumulation through the food chain. Scientific evidence from different sources suggests a positive association between PCB exposure and the incidence of hypertension. However, no previous prospective study corroborated this potential relationship in an adult population. Our objective was to assess the association between dietary intake of PCBs and the incidence of hypertension.
Material and Methods: Prospective analyses using data from the SUN Project, a dynamic cohort of Spanish university graduates. For the present analyses, we included 14,521 participants, initially 60 years old, who were followed-up for a median of 8.3 years and a retention rate of 91%. None of cases medically diagnosed hypertension (HT) were identified.
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 PI10/02558, PI10/02293, PI13/00615, RD06/0045, G03/I40 and 87/B/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.

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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 material (NEM).

The study sample included boys (n = 112), girls (n = 38) (both 5-19 years of age) and CCWs (n = 40). Anthropometric measurements were captured and analysed using the World Health Organisation’s (WHO) AnthroPlus version 1.02. statistical software. The WHO growth standards for school-aged children and adolescents were used to compare the anthropometric data captured. Dietary intake measurements were done by a diet menu analysis using Food Finder® Version 3 computer software program and comparing the results with the Dietary Reference Intakes (DRIs). Average portion sizes were determined 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 2.6% of girls were at risk of being underweight, while 1.8% 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. Percentage of BMI percentiles of 75% of the boys had a normal 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 recommendation 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 a problem 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 town in Peru and transfer of these metals to their newborns.

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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 (Junin-Peru, 3,730 m.a.s.l) 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 cord samples were unprocessed, placental tissue samples were dried (60/70°C) and grinded (nyengar 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 V.15). 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/dl, respectively. In addition, lead and cadmium in cord blood accounted for 67.8 and 136.4% compared to concentrations in maternal blood. There was negative 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 placenta appears to act as a protective barrier to the nutrients and 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 Southeast Nigeria.

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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, means and percentages. 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 within the first hour of birth. 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%) rural) 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.a.1 and 8.1±0.a.1 kg, respectively at 8.9±0.1 and 7.6±0.1 kg in non-EBF counterparts. Similarly, at 0-6 months EBF rural males and females weighed 9.2±1.a.9 and 8.3±2.a.6, respectively more than their non-EBF counterparts (7.7±1.a.1 and 7.3±1.a.4 kg, respectively). Moderate (4-6%) and severe underweight were observed in urban and rural non-EBF children, respectively. Moderate wasting was seen in 6.8% rural and 5.8% urban non-EBF children. Family and community support is essential for the success of exclusive breast feeding.

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**Oral communication**

**Nutritional status and risk factors for malnutrition among pregnant and non-pregnant adolescent Mozambican girls in two different seasons?**

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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 two distinct regions in Portugal. 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. Body 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®18, according to the 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 older (≥24 months). In children under 12 months, there is a lower risk of malnutrition associated with BMI (≥25 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 half of life [OR=0.406 (0.240-0.691) (p<0.001)], whereas mothers with increased BMI (>25 years) negatively influences the nutritional status [OR=1.610 (1.004-2.582) (p<0.04)]. At 24 months, only the high educational level of the mother (>10 years) [OR=1.086 (0.640-1.740) (p=0.002)] and the catch-up growth in the first 6 months [OR=0.282 (0.133-0.598) (p=0.001)] showed a protective effect. If the mother’s number of pregnancies (>5) [OR=2.482 (1.348-4.733) (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.

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**OW-016**

**Oral communication**

**Is dietary diversity associated with biomarkers of micronutrient status among non-pregnant adolescent Mozambican girls in two different seasons?**

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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 FAO, the Women’s Dietary Diversity Score (WDDS), is associated with low concentration of haemoglobin, serum ferritin, zinc, and folate and plasma retinol among 14-19-year-old non-pregnant Mozambican girls.

Methods and materials: We used data from the ZANE Study (Estudo do Estado da Alimentação e Nutrição de Adolescentes na Zâmbia). The data were collected cross-sectionally in different regions of Zambia 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 and one dietary recall 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 dietary diversity (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 in this study. These limitations may have precluded us from finding some associations. Our data from Mozambique provides very little evidence supporting the idea that WDDS could be used to assess low micronutrient status when used in a cross-sectional manner.

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**OW-017**

**Oral communication**

**Community health workers prevent harmful infant feeding and caring practices among mothers of children under 2 in Palestine.**

Al Rashed 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 practices, and delayed introduction of complementary foods are associated with low birth weight and increased risk of malnutrition among infant and young children. The high prevalence of malnutrition among children under 5 years old has been described in many studies. Moreover, studies have shown that the main reason for this condition is improper feeding practices during infancy in a representative population of the district.

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 organized home visits throughout 14 months. Baseline and end-line 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 28.5% to 79.9% (p<0.001), mea frequency increased from 4.2% to 75.5% (p<0.001), giving the appropriate feeding during illness increased from 40.2% 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 new born 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), routine use of baby oil and anabolic 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, 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.

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**OW-018**

**Oral communication**

**Nutritional Status of Primary School Children in the Oio and Cacheu Region in Guinea-Bissau.**

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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 anthropometric indicators and anaemia in 4,807 children in two rural areas in 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 portable stadiometer (Seca model 213). Hemoglobin was analyzed by HemocueTM from finger stick blood samples. WHO cut-offs for Weight-for-Age Z-scores (WAZ), Height-for-age Z-scores (HAZ), 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)
Objectives: To assess effects of nutrition on class attendance, cognitive and hygiene outcomes of students 5-11 years, and on nutritional and hygiene knowledge and practices in their mothers, in 102 primary schools from 1 urban and 2 rural sites with high food insecurity and malnutrition and no existing nutrition programs.

Materials and methods: Over May/June 2012 to October 2013, NGOs BRAC and Banchite Sheka provided hot cooked meals on 340 days, to 18,386 students. Meals were prepared in 8 centralized cluster kitchens, and served in class rooms by mothers’ clubs. Interventions further included awareness raising on deworming and hand-washing/hygiene, and training and supervision of mothers.

Surveys randomly sampled 60 schools (90 intervention, 30 control) and 4,602 households in October 2012, of which 48 schools and 4,254 respondents were revisited in October 2013. Propensity score matching was used to select comparable ‘control’ households. Interviews included 24-hour dietary recall from students, and nutrition knowledge and practices from students and mothers. An arithmetic test measured cognitive skills in cross-sectional samples of grade 3 students (N=600 intervention, 600 control). Focus Group Discussions with parents, interviews with project staff, (un-announced) observations in kitchens and class-rooms, nutritional assessment and a mid-term process 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 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, learning 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 performance.

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.

features. 162 schools with 25349 students participated. About half of the schools entered the program in October 2012, the others gradually by May 2013 (pre-intervention phase, collecting well-completed 13457 questionnaires), 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 throughout the Food Security 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<0.0001. 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 first year of the program was a statistically significant predictor 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 unemployed 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 less 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 utilization of traditional crops, a perfect way of combating malnutrition.**

**Over-A. 1; University of Ibadan, Ibadan, Oyo state, Nigeria.**

Background: in the context of establishing priorities for national and international agricultural research, several and indeed contradictory arguments can be found in support and/or to use support for research on roots and tubers. The objective of this study is to re-evaluate the conscious reorientation 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 achieve a reasonable representation of root and tubers farming population in the entire district, a two-stage stratified random sampling technique was used. A random sampling technique was used to select the required number of communities/villages from the sampling frame provided by the Statistics, 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, various differences, scale of production, and costs 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. For a hectare of root farm, total cost of production, total yield and net revenue were $669, $1426 and of $757 respectively. From the interviews of farmers interviewed cultivating cocoyam, cassava and potato purposely for both the root and leaf. Only eight percent (8%) cultivated purposefully for root and cornel 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 6.24 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 sandy roots and tubers that abound in many areas in 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.
We Aird and Schroder H., justed monetary diet cost decreased and increased, and Genetics (EGEC-ULEC), IMIM (Hospital del Mar Medic­

years of the Mediterranean diet was tively were recorded on data. Diet energy-adjusted monetary diet cost (B =

Key findings: We looked at the most important sources of variation in nutrient composition of diets in Europe, which together explained 67% of individual variation. Although there were associations found with weight change, none of these appeared as clinically relevant.

We acknowledge the contribution of all EPIC colleagues to the study and funding by the IC, the Fondation de France and other national funding organizations.

OW-026 Oral communication

Ten year change in individual monetary diet cost predicts changes in diet quality and weight development in Spaniards.

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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 pre­

sions found 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 through 2010. Diet and leisure-time physical activity (LTPA) were recorded on validated questionnaires. Weight and height were mea­

sured. 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 76%) 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 decreased and increased, respectively, their consumption in vegetables (-26%+59%), fruit (-6%+116%), and fish (+4%+100%). The opposite was observed for soft drinks consumption (+14% -2%). Multiple linear regression analysis revealed a negative as­

sociation between 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 (B = 0.250; p= 0.004)

Key findings: Diet changes and weight development 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 Feed­

ingBehaviors, Beliefs, Contexts and Environments in three Arid and Semi Arid counties in Kenya.

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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, inte­

grate and sustain humanitarian investments that prove to be effective in sustaining food security and reducing the need for recurrent human­i­

tarian 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 for Infant and Young Child Feeding 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 survey 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 langua­
ges and cultures in the three counties. The studies examined infant and young child (IYC) feeding practices, behaviors and beliefs from a house­

hold perspective in three counties. The study explored the determinants of IYC nutrition from a social, environmental, gender and cultural ecological 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 com­

mon 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 seasonality 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 fla­

vor, taste, and/ or nutritional value of foods fed to young children is com­

mon. There is a large overlap between the feeding practices of older children and adults in the community. With the exception of animal milk from household livestock, households in the three counties purchase the vast majority of their foods. Caregivers understand the importance of food quality, not only for child survival, but also for growth and de­

velopment. The conflict between the food needs, time demands on women for obtaining water coupled with and consequences of seasonal drought all have a strong influence on household food security and diets of young children. There are marked seasonal differences in meal and food consumption patterns among adults and children in households in all counties covered.

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.
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 las graterías 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 30 panelistas tuvieron la oportunidad de probar. Para el análisis sensorial se utilizó la prueba discriminativa triangular, donde las panelistas debían identificar la muestra diferente. Posteriormente los datos obtenidos fueron sometidos a pruebas estadísticas de Chi² (Chi cuadrado), con un nivel de confianza (α = 0.05). La encuesta sociodemográfica demostró que los participantes en este estudio son consumidores de arroz y que viven por debajo de la línea de pobreza. Los resultados obtenidos permitieron concluir que No existe diferencia significativa (α = 0.05) entre el arroz biofortificado variedad IDIAP-Santa Cruz 11 y el arroz de consumo local en cuanto a la percepción sensorial de las panelistas. No es necesario realizar intervenciones de salud para determinar la aceptación del arroz biofortificado por que no lograron identificar diferencias sensoriales significativas entre ambos tipos de arroz.
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 underweight, 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 regular 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 half of the population thinks that there are “good” and “bad” food.

PM-005
Poster
Adherence to Mediterranean diet and risk of overall cancer and cancer types: a systematic review and meta-analysis of observational studies.
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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 our knowledge, 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.

Methods/Results: Literature search was performed using the three electronic databases MEDLINE, SCOPUS and EMBASE. Of 3,340 hits, 16 studies were included in the meta-analyses. Furthermore, the impact of the singular Mediterranean diet score components on cancer risk was 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. The larger regression tested provided limited evidence of substantial publication bias.

Key finding: High 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-006
Poster
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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 Huanuco 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 carried out in 25 de 28 districts of Huanuco province (3250-3500 MASL). Data collected from 2640 children over the period 1992 to 2007 served as basis for determining the nutritional children status using Anthro V.3.0 and Epiinfo 6.04. The sample was divided into four chronological periods: 1) Baseline, 1992, with 532 children (20.2%); 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 inquired 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%, 28.8% 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.

Discussion: The highest adherence to Mediterranean diet category was divided into four classes: (0-19.1%) 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 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 36-60 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 montenergion market.
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Natural nitrates content in soil, as well as the use of fertilizers for additional nutrition, contributes to the accumulation of nitrate 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 increase 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 (carrots, cabbage, chle, leeks, spinach and celery) and 6 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 300 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. The 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.
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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: The study presenting a quanti-qualitative approach, focused on the evaluation of the health assistance quality and it's 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 Dombraguardi 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 Assistants. We identified that 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 USF 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.
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Objectives: To determine whether there are differences in sweetened, energy and alcoholic beverages intake, milk consumption and calorie intake according to BMI Mass Index (BMI) status, age, sex, and waist circumference among 15 to 17yo Mexican adolescents.

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 NHANES 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 milliliters per day, 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=0.001) 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 25OHD concentration in the population.
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Objectives: Due to low vitamin D intake and low serum 25-hydroxyvitamin D (25OHD) levels, the fortification of liquid dairy products with 0.5 μg vitamin D100 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 calculated the 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 25OHD concentration have been improved among Finnish adults as a consequence of these nutrition policy actions.
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Objectives: To evaluate the association between family income, obesity and food intake in children from three Portuguese municipalities (Oeiras, Sesual and Viana do Castelo) within the MUNI3 Program (www.muni3.com).

Methodology: A 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 Centers for Disease Control and Prevention’s growth charts. Dietary habits and the form of iron which is consumed were achieved by the application of a qualitative food frequency questionnaire with 25 food items. Statistical analysis was performed by Z test for proportions and binary logistic regression model. Statistical significance was obtained at 0.05 level.

Results: The prevalence of underweight (BMI<P5) was lower than 4% in all municipalities and obesity (BMI>P95) was more prevalent in Viana do Castelo (21.6%) when compared with Seixal (16.1%) and Oeiras (16.9%). No statistical differences were observed in obesity prevalence (BMI>P95) 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 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 higher, whereas the frequency of fresh fruit consumption 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 overweight was similar (BMI>85) in both sexes (0.51.5% in girls and 2.628, respectively) across the cases. The frequency of vegetables or fruits consumption was not statistically associated with childhood obesity.

Key findings: Overweight prevalence was similar and relevant (>30%) in all municipalities. Childhood obesity, and poorer diet was inversely related with family income. This study supports the idea that family based community interventions at local level are needed for childhood obesity.

PM-013
A strategy to evaluate the program of iron fortification.

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Objective: This study reports a strategy to calculate the intake of iron from fortification based on data available for folic acid and also evaluate the program of flour fortification in Brazil.

Material and methods: Cross-sectional study conducted in Brazil during 2008 and 2009. A two-day dietary record of 34003 individuals (men and women, aged 10 to over 60 years) from a Brazilian nationwide survey was used. The usual intake of folic acid and iron of children and adolescents was estimated using the National Cancer Institute method. The quantity of folic acid and iron established by mandatory flour fortification in Brazil for one hundred mg of iron of 150 mgc of folic acid and 4.2 mg of iron per 100 mg) was used and, based on that quantity we calculated the amount of iron and folic acid consumed.

Based on the amount of flour consumed and on fortified flour includes both folic acid and iron, we calculated the intake of iron from fortification, using the value proposed by mandatory fortification. Iron from food was obtained through the difference between total iron calculated by National Cancer Institute method and iron from fortification. Then, the absorption of iron was calculated.

Results: Mean intake and absorption of iron from fortification (electrolytic iron) was low in men and women.

Key findings: The intake of iron from fortified products is small in relation to iron intake in Brazil. The strategy proposed to estimate iron from fortified flour indicates that the amount of flour intake observed in Brazil does not justify the current ranges of mandatory flour fortification and the form of iron which is usually consumed, electrolytic iron.

PM-014
Poster
Industry approach using nutrient profiling for reformulation.

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Objective: Demonstrate the application of a global nutrient profiling system used for the development and reformulation of food and beverages at Nestlé.

Material and methods: The Nestlé Nutritional Profiling System is used to evaluate and continuously improve the nutrient profile of Nestlé food and beverage products. This system has been progressively applied across the Nestlé portfolio since 2004. The Nestlé Nutritional Profiling System sets nutritional thresholds for adults and children, evaluates products per serving and is a category-based system. The nutritional targets, based on 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 beverage 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.

Methods: The Nestlé Nutritional Profiling System was designed to allow for product innovation and support product development and through reformulation, to continually optimize the nutritional composition of products. Products achieving all the nutritional targets in the Nestlé Nutritional Profiling System will also achieve the Nestlé Nutritional Foundation.

Results: The Nestlé Nutritional Profiling System is a global approach to measure and improve the nutritional value of Nestlé food and beverage products. In 2013, 7789 products were reformulated for nutrition or health considerations, based on nutritional targets defined in the Nestlé Nutritional Profiling System. The next step is for further research needs in nutrient profiling to measure the relationship between the reformulation of food and beverages and diet quality.

PM-015
Poster

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Objective: While the Millennium Development Goals induced many countries to undertake additional efforts to reduce poverty and infant mortality, several of the goals will not be met. This paper will argue that in the Post-2015 Development Agenda a stronger emphasis must be given to child malnutrition, which is a basic condition to eliminate poverty. For this purpose it proposes that in the new Post-2015 Agenda absolute poverty targets be established for child nutrition and child malnutrition, setting minimum standards that would be considered acceptable by the international community. Furthermore, it suggests that the targets for low birth weight and stunting, wasting and anemia in children below 5 years be established at 0%. This should be the objective that all countries must aim to achieve in a reasonable number of years.

Methods and key findings: The document will analyze the present situation of child malnutrition at the global and country level and the experience that has been gained with policies and programs to reduce it. The main finding is that the actions that are needed to end child malnutrition are well known, but in several places there is lack of political decision to fully implement the recommended policies and programs and in others the implementation has not been successful because of inadequate institutional arrangements and lack of appropriate financial and managerial resources.

PM-016
Poster
Energy expenditure in resting and free-living activities using indirect calorimetry in Mexican school children.

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Objective: To estimate the energy expenditure in resting and free-living activities using indirect calorimetry in children by age and nutritional status. Material and Methods: Volunteers were 69 children aged 6 to 12 years old. Nutritional status was assessed with percentage of body fat and body mass index. The percentage of body fat was measured using biometric impedance analyzer (InBody 720). Energy expenditure in resting and free-living activities was evaluated with an indirect calorimetry device model k4b2 (Cosmed). Energy expenditure in resting was calculated with Weir International Journal of Community Nutrition 2014, 0 (suppl)
PM-017  Poster

Minimizing nutrients to limit, calories, and cost while mee­
ting calcium requirements from dairy foods in France.
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Objectives: Inadequate calcium intakes are an important concern for pu­
bic 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 needs to limit, and monetary 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 yogurt and fermented milks (n=326), dairy desserts (n=162) and cheeses (n=248). Products were aggregated into 21 categories by nu­
trient content and price using clustering analyses. Nutritional composition was obtained from labels or the national CIQUAL database. Retail prices were obtained from Paris supermarkets. Relative energy costs were calcu­lated as kcal/120mg calcium. Relative nutrient costs were calculated as the mean LIM score (based on saturated fat, added sugar, and sodium) per 120 mg calcium. Relative monetary costs were calculated in €/120mg calcium. Rankings for dairy foods were obtained for each value metric.

Results: 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 milks as shown. Low-calorie desserts provided calcium at low energy cost but were more expensive than were fresh dairy products. Cheeses repre­
sented 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 soy-­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, re­
present a diversified source of calcium in the French diet. The present analysis shows that dairy products provide calcium 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.

PM-018  Poster


Objectives : There is limited information about infant feeding practices among immigrant mothers living in Norway. The main objectives of the ini­nital qualitative sub-study were to generate knowledge about infant feeding practices of, potential challenges to and influential information sources for Somali and Iraqi women living in Norway.

Materials & Methods: Thirty mothers from Iraq (n=15) and Somalia (n=15) participated in the in-depth interviews at infant age six months and a follow-up interview was conducted at infant age one year. Focus group discus­sions will be conducted with the same mothers when infants are two years old. The mother/child-pairs were purposively selected using a multi-recruitment strategy.

Results: Most of the mothers were partially breastfeeding when infants were six months old. One third had never breastfed exclusively, and most of them had stopped exclusive breastfeeding before the infant was three months old. Ten of the Somali mothers were therefore still breastfeeding. According to most of the mothers, they had received limited support and information from the health clinics to help overcome breastfeeding problems. The lack of knowledge about breastfeeding and overcoming such problems may have induced them to either com­bine breastfeeding with other foods early, or to stop breastfeeding com­pletely. The mothers also found it challenging to breastfeed in public, and had therefore introduced formula early. The mothers received conflicting advice from their close social network and the health clinic regarding the introduction of water, formula and weaning food. The Somali mothers mentioned that the notion of a chubby child being a healthy child as reason for providing early formula feeding and practise mixed feeding. Most of the participating mothers prepared complementary food from scratch because it had a better taste, was regarded as superior and was halal. Most of the mothers expressed a need to know more about Norwegian food when their children were to start Kindergarten.

Key findings: The health workers must be aware of the mothers’ percep­tions and strategies regarding the conflicting advice from their social network and the health clinic. Appropriate infant feeding support and knowledge of the cultural infant feeding traditions in the mothers’ home­country are pivotal and need to be embedded in the health-promotion strategies and advice provided at the health clinic.

PM-019  Poster

Food variety of young children from three major ethnic groups in Singapore.
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Background and objectives: Exposure to a variety of foods in early life is important in developing healthy eating habits. A recent study in Sin­gapore showed that around 25% of the interviewed parents considered their child as picky eater with the highest prevalence among children aged one year old. Early detection of poor dietary intake in young children is paramount to improve their future nutritional status.

This study aims to understand food variety of young children based on three major ethnic groups in Singapore, namely Chinese, Malays and Indians.

Material and methods: Mothers of children aged 11-24 months from each ethnic group were asked to complete a 3-day food diary (2 weekdays and 1 weekend). They also attended a focus group discussion which was de­signed to obtain a complete overview of foods consumed by the children. Thus, common foods consumed across the three ethnic groups as well as foods which ethnic-specific weakness were identi­fied.

In total, 27 mothers (10 Chinese, 10 Malay and 7 Indians) completed the food diaries and attended the mono-ethnic Focus Group Discussion. All mothers had similar socio-economic background.

Rice porridge was the common food item fed to the young children in all the ethnic groups. However, the food ingredients added to the rice porridge varied across ethnicity. For example, Chinese mothers prepared rice porridge with fish/meat or chicken and vegetables; Malay prepared with broc­coli/carrot or with chicken or carrot and mashed pumpkin. Wholegrain or wholemeal bread was introduced during this stage, noti­cably among the Chinese and the Malay. Breeding generally consumed plain or with margarine or sweet spread, or cheese.

A large variety of fruits and vegetables was given. Apple, banana, papaya, kiwi, broccoli, carrot, potato, sweet potato and spinach were common fruits and vegetables given across three ethnicities. In addition, Chinese young children were also given asparagus, bitter gourd, Chinese yam, Kai Lan, Chinese cabbage, lotus root, lotus seed, old cucumber and wolfbe­ries. Malay young children were given bean sprouts, Japanese cucumber, tapioca and turnip. Different variety of vegetables were given to Indian young children which included beet root, banana flower, bottle ground, basil, capsule drumstick leaves, eggplant, fenugreek leaves, ivy gourd, radish and snake gourd. The provision of vegetables seems to be cultu­re-specific.

In addition to ice-cream and chocolates, Indian young children were more exposed to sweet desserts such as halva, kesarli,addilo, milk cake (palko­va). Some of the parents had also introduced coffee, tea, sweetened be­verages like cola, processed fruit juices and fast-food meals.

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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.

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 Ibn Tolif 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 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

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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 (275kcal/100g) for the excise tax.

Results: Of 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: 292 kcal for sweets snacks, 510 kcal for sour snacks, 380 kcal for breakfast cereals. Daily products had on average 94 kcal, corn products 318 kcal and sweetened beverages 90 kcal. 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 (0.61 USD), dairy 2.00MXP (0.15USD), and for corn products less than 5.00MXP (0.38USD). 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 strategy 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 balls /c immunized and treated sublingual immunotherapy milk cow.

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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 when children with allergy to cow’s milk protein (CMP), the ITS cow’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 and BALB / C mice immunized with the bovine protein (β-G and β-L) by intraperitoneal and processed by SLIT cow’s milk pathway for 6 months respecting the administered allergen doses (50 and 100 ul). 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 (β-G and β-L) significantly higher in immunized mice. This rate is reduced during processing.

Histological study reveals bowel in mice immunized with the (β-G and β-L) a decrease in villous height accompanied by infiltration of intraepithelial 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)

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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). Group1 mothers and their young receive only soy milk. Group 2 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 was decreased in group 2 (1.98 ± 0.41 ng/ml) compared to controls (6.21 ± 1.54 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.

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Objective: To describe and compare cellular, fecal, plasma and salivary inflammation 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-y/o) children (38 F / 42 M) attending 3 government-subsidized daycare centers identified by location: rural (n=20); marginal-urban (n=22); and C (n=38). All children received a common institutional meal from a 40-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 (Lumines).
Results: Using the Kruskal-Wallis test to compare across the three day-camp sites, significant differences were found for six indicators: plasma IL-1B (p<0.001); salivary IL-10 (p=0.021) and salivary IL-1 (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-1B and plasma salivary IL-6 (all p>0.05). By post-hoc inspection, Center A was the site that scored the highest median at the three sites with the extreme value. Our 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-1B, 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 activity in the young men. 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.
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Background: Chronic malnutrition in early life can lead to childhood stunting, shorter adult attained height and is believed play a crucial role in adult cardiovascular disease risk. Thus, their similarities are 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 statured, 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 impairments 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 the conflict event (<3 years), vaccination, breastfeeding is available in the Guinean cohort. Outcome measurements: adult final height, weight, height, leg length, knee-heel length, weight, arm-, waist- and hip-circumference. Biannual measurements of children and adolescents (<2years) 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.
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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 is the hardest. It is adaptation to new reality. In the seventh and eighth week candidates adapt to the training cycle. The last stage of the training are 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 concentrated on the 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 19.7±0.9 years, height and weight of the tested candidates for firefighters amounted 179.2±4.7 cm and 73.2±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 averaged 64.5±6.2 kg.

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 firefighters 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.
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Background: Habitual dietary intake and physical activity levels are undergoing change in Japan, thus, the questions are not necessarily applicable to Japan. We examined the within and between variations in dietary 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 from four areas, namely Shinhidaka-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 preschools which had nutrition and supplementary health and food attainment restrictions. The other 20% of children aged 13 years were from 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 Shinhidaka-Hokkaidou, Iwate, Miyagi, and Sagamihara-Kanagawa.

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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.
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Background: Childhood obesity is a serious public health concern worldwide. Dietary behavior, physical activity and sedentary lifestyle, which includes television or playing video games, work hours on the computer 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 districts.

The 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.

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On behalf of the acrylamide, and endometrial and ovarian cancer working groups, and EPIC Fr.

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Background: Acrylamide, classified in 1994 by IARC as ‘probably carcinogenic’ to humans, 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-1 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 (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=1,382) or Type-1 EC risk (n cases=627). We observed increasing relative risks for Type-1 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 (HR(10µg/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.

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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 weight of the cooked food. A weighed portion of food was served 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 year did not met 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 - 12 years) and calcium 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 below the children's RNI for the nutrients. There was inadequate intake of many nutrient deficiencies. This predisposes the children to infections and nutritional problems like anemia 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

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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, potassium and dietary fiber in children and adolescents (9-18). The What We Eat in America (WWEA) 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%; 3437mg 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 dairy were the most important source of calcium (41%) and potassium (24%) in 2-8 year old children. Milk consumption decreased in adolescents, but milks were still the most important source for vitamin D (57%), calcium (28%), and potassium (16%). Other dairy commodities such as milk, yogurt, cheese and eggs were the most important sources for vitamin A (26%), folate (13%) and iron (12%) in children's diets.

PM-032 Poster
Body mass index among a sample of college students: environmental and genetic factors.

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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: demographic features (age, gender, environmental and genetic factors (BMI, weight, height, race, place of residence), lifestyle smoking habits. BMI (kg/m²) was calculated from anthropometric data and used to classify individuals into 4 categories:
(BMI < 30) and obeze (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 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±6.29), 9% of non-Hispanic white (BMI 26.50±7.74), 69% of Hispanic (BMI 25.53±2.58), 2% of Asian (BMI 21.4±2.40), and 4% of others (BMI 24.56±2.20). 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 lived place was fast food restaurants (25%) were overweight (BMI 29.33±6.18) while students which lunch place was home or family home (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 increases 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
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Objectives: Micronutrient deficiencies imply a considerable burden of disease and low income countries. Examples are osteoporosis, 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 elucidated 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 relevant reports (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 (5-50 years). 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 micro-nutrient 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.
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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 São 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 the software Haplovew. 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 generalized 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) and 95% CI. To investigate gene-diet interaction, the PR between clusters and genotypes was stratified by percentiles of PUFA intake. Statistical significance was set at P<.05 for all statistical tests.

Results: All SNP 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 percentile of total PUFA, n-6 and n-3 PUFA, expressed in percentage of total energy intake, showed a higher prevalence of GC>c+ GC>c genotype for SNP rs1800795 in inflammatory cluster (PR (95%CI)=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>c+C genotype into inflammation cluster (PR (95%CI)=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 the IL-6 genetic variants and systemic inflammatory pattern.

Key findings: polyunsaturated fatty acids; single nucleotide polymorphism; inflammation; interleukin-6
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bones and teeth” was classified as two nutrient content claims and two function health claims. Secondly, the “health-related ingredients claim” category was created as a type of nutrient content claim to avoid misclassification with claims related to a non-nutrient that had a nutritional/physiological effect, e.g., 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 CLYMBOL survey protocol highlight areas of potential claim misclassification.

Acknowledgements: This project is supported by the European Commission, the Food, Agriculture and Forestry of Slovenia, Agricultural and Forestry Institute and Herzegovina.

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 amount) with the main constituents ethyl acetate (49.4%) (pineapple, ethereal aroma), followed by alcohols (17.6%) with most abundant compound 1-octanol (5.2%) (fruit-flowerly, 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 furural (12.1%) (breadly) and 4-cymene (6.6%) (turpentine like, cola beverage aroma).

Key findings: This study showed that there was huge differences in the profile among the different categories of chestnuts. In FC volatile analysis 74 main components were detected, which was much more in comparison to 34 in FC and 33 in BC. Alcohols were the leading volatiles in RC (22%), as well as in BC (61.5%), while prevalent volatiles in FC were esters (66.90%). It well known that volatile esters are flavor components of the majority of fruits.

PM-036  Determinants of food consumption during pregnancy among Portuguese pregnant women.

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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).

Results: 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) fish and seafood; (iii) fruits and oils; (iv) starchy foods; (v) vegetables; (vi) sleepy vegetable soup; (ix) legumes; (x) nuts; (xi) sweets and pastries; (xii) fast food; and (xiii) sugar-sweetened beverages.

Linear regression analysis was used to explore the maternal determinants (age, parity, income (≠10.2, P=0.025), employment status (single/divorced), nutritional attendance (yes), employment status (unemployed), monthly income (≠750 Euros) of food consumption during pregnancy. Each food group entered as dependent 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. Vegetarian consumption was significantly and positively associated with BMI (0.7, P=0.001), self-esteem (6.8, P=0.005) and maternal employment (6.79, P=0.003). Postpartum body weight was positively associated with mean and seafood (P<0.05, all). Starchy food consumption was significantly and positively associated with parity (=5.4, P=0.003), self-esteem (3.6, P=0.023) and negatively associated with age (=1.5, P=0.031). Higher dairy and fruits consumption was significantly associated with higher PA (0.7, P=0.001; =1.0, P=0.009, respectively). Higher sweets and pastries, sugar-sweetened beverages and vegetable soup intake were significantly associated with monthly income (≠20.2, P=0.025), employment status (337.9, P=0.004) and nutritional attendance (≠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.
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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 the sum of which was used to get the ten dietary recommendations. The 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 analysis. 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 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.
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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 6-59month 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 3,559 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 coverage in the different provinces was 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, schooling pattern, high mother's education, mother's 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 (1.5±1.0 vs. 1.3±0.7 µmol/L). Children who received capsules had the highest serum retinol in the first two months after supplementation (1.58±0.62 to 1.79±0.45µmol/L) and the levels declined towards the fifth and sixth month (1.21±0.45and1.28±0.40µmol/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 0.41-0.58µmol/L, albino-tonly in the first 2 month after distribution. Therefore, to have a continued or sustained benefit, options of dietary diversification and food fortification should be considered.

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 the functioning 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-lycopenen-enriched beverages.

Methods: As part of a small randomized controlled study (NCT 20060024), two beverages were developed; 1) b-Cx-enriched milk-based fruit 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; Microsamples 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 saponification, and identification was performed on two LC systems.

Results: Beverage A contained mostly b-carotenoin (free and ester forms); b-carotene (50%) 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. Alltrans, 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 colorectomy from gut lumen.

Funding: Ministerio de Economfa y Competitividad (AGL2012-42495-C03-02).

PM-042  Poster  B-cryptoxanthin modulates the response to plant sterols in post-menopausal women carrying NPC1L1 L272L polymorphism: An exploratory study.
Granado-Lorencio, F.1 2 de las Heras, L.1 3 San Millán, C.1 García-López, P.1 Pérez-Sacristán, B.1 Dominguez, G.1 Blanco-Navarro, F.2

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-Cx) 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 age identical, 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 Amatique of the Caribbean Sea. The inland, lakeside region is inhabited by Kekchi-speaking indigenous Guatemalans (MK), displaced from the northern highlands. The original inhabitants of the coastal, seaside 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 stadiometer, 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 in the upper arm in sitting position with an automated device (Omron 705CP). The protocol was approved by the Research Ethics 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 NPC1L1 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 (-11.3 (4.4) and -7.0 (4.6) mg/dl for total and LDL-cholesterol). Interestingly, CC subjects showed a significant decreased in both lipid fractions after consuming the beverage containing PS plus β-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 results showed a significant decrease in both lipid fractions when we reported instances of its dietary intake of PS depending on the population and genetic polymorphisms variant (n=9) showed, on average, a net increase in 25(OH)D concentration was 43.1±6.4a MK-M; 59.0±17.6b AC-M; and 51.8a 9.7b AC-F. The respective BMI (kg/m2) were 18.9±1.5a MK-M; 20.2±2.7ab MK-F; 22.0±4.3b AC-M; and 21.0±3.2ab AC-F. The mean ABP were 109/63±11.0/4 mmHg. The Spearman correlation coefficients for Systolic ABP and Diastolic ABP vs respective ADP were, respectively (Systolic) r=0.077 (p=0.468); r=0.104 with WAZ (p=0.238) and r=0.063 with BMI (p=0.553), (Diastolic) r=0.076 with HAZ (p=0.475); r=0.107 with WAZ (p=0.317); and r=0.085 with BMI (p=0.424).

Key Findings: A striking difference in weight and height is found across the two ethnic groups living in a common geographical and ecological environment; in BMI there is a difference across settings only in boys. Diet, genetic and micro-environmental differences must be considered. No significant association was found between ABP and anthropometric indexes.
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
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Center for Studies of Sensory Impairment, Aging and Metabolism (Ce-SIAM), Guatemala City, Guatemala

Objective: 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.

Materials and methods: Secondary data analysis was performed using data from the Canadian Community Health Survey, Cycle 2.2 (N=32,776), while a K-means cross sectional sample design was represented for 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 level were calculated based on intake of naturally occurring folate alone, as well as with food fortification sources, supplements and potential average 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/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 folate overconsumption resulting from supplement use. It may be prudent to consider removing folate 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-α gene. Oki, E.C., Norde, MM; Fidberg, RM; Marchioni, DML; Sousa, JMP; Rogero, MM

1Department of Nutrition, School of Public Health, University of São Paulo (SP, Brazil). 2Department of Public Health, School of Public Health, University of São Paulo (SP, Brazil)

Objectives: To investigate the association between tumor necrosis factor (TNF)-α 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 São 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. Anthropometric measures were collected and blood samples were drawn after an overnight fast. From blood samples, 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-α (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 (n=169) and High (n=93) level of inflammation. To determine the prevalence ratio (PR) between the single nucleotide polymorphism (SNP) and clusters groups, 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, moderated physical activity and skin color. The interaction between SNA 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 Hi cluster had significantly difference in age, waist circumference, systolic blood pressure, 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, G/A+AA genotypes had a higher prevalence of systemic inflammatory pattern than GG genotypes (adjusted PR=2.32; 95%CI=1.24-4.83; p=0.024). No interaction was observed between SFA and SNP (p=0.18). These results suggest that TNF-α (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 2013/81741-4).

Key Findings: Tumor necrosis factor-α, single nucleotide polymorphism, saturated fatty acid intake, inflammation.
Coffee consumption is not an important risk factor for low femoral neck bone mineral density. Parma A-L, Orav A, Jüniä M, Lätt E, Uppot J, Parma O 1 Tartu Health Care College; 2 University of Tartu, 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±3; M±6); average coffee consumption –1 4 cups per day (ACC; n=25; M±5; M±7); and heavy coffee consumption >5 cups per day (ACC; 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 WHO recommendations below and above of sufficient level of 75x90 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±9.4 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 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<0.001). EGC had significantly higher femoral neck BMD compared to ACC (0.079; p=0.02). The linear regression model was adjusted additionally to other 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 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: Boys are physically more active in childhood have higher BMD in adulthood. Coffee drinking is not an important risk factor for low femoral neck BMD.
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PM-054
Nutritional status among 4 th year medical students.
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Objectives: Appropriate nutritional and eating habits in childhood, adolescence and young adulthood create conditions for optimal development. Overweight and obesity for different reasons. After adjustment for age and gender dehydration can be morbidity. The objective of the study was to estimate water intake and 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-055
Estimation of water balance in elderly people living in Greece.
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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 65-81y (54 males) (Group A), 94 non-independents aged 65-92 y (49 males and 45 females) (Group B) and 51 hospitalized 65-92 y (34 males) (Group C). A, all data from a 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 3320a1216 ml/day, for Group B -83a933 ml/day, 2571±739 ml/day and 3230a1216 ml/day, for Group C the 64±1399 ml/day, 256±1071 ml/day and 252±1048 ml/day and for Group D -253±1495 ml/day, 291±1025 ml/day and 3492±2093 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 contribution of solid foods to water intake was 36%, 29%, 32% and 25%, contribution of drinking water was 32%, 48%, 45% or 47%, 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
Consumer perceptions of plant food supplements - a focus group study in three European countries.
Egan MB1, Peacock M2, Bruno P3, Badea M4, Buzza C5, Raats MM6.
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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.

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.

Materi 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 and hence unlikely to cause harm. Italian users expressed a mistrust of pharmaceutical drugs for treating less serious conditions whilst in Romania products were viewed as a natural alternative to conventional medicine. Plant food supplements were perceived as having a role in compensating for demanding lifestyles or addressing dietary deficiencies. Non-users expressed the opinion that eating an adequate diet and having a healthy lifestyle negated the need for such products. Trust was a central issue for both users and non-users with the former often referring to brand trust. Across all countries 'word of mouth' was frequently mentioned as a primary source of information.

Key findings: In general users of plant food supplements perceive them to be natural products, with a role in compensating for busy or unhealthy lifestyles.

PM-057
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Objectives: In a context of increasing chronic diseases related to nutrition, the study of the long-term evolution of the diet is crucial. The aim of this study was to observe 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 unified 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-eat dishes increased by 17.1 kg/person,
year, fruit juices by 19.3 kg, yogurts by 11.2 kg, dairy desserts by 6.5 kg, soft drinks by 14.9 kg, and sweets by 5.1 kg. During the same period the purchases of sugar decreased by 13.8 kg, as well as the purchases of fresh meats by 11.1 kg, oils by 6.8 kg and butter by 4.7 kg. Fresh vegetables decreased by 12.0 kg and fresh fruit by 8.0 kg. A slight increase of caloric purchases (alcohol excluded) was observed from 2084 kcal to 2222 kcal (+138 kcal/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% adequacy), 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-eat 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.
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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 impact of 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: 286 (32%) of women had vitamin D levels <75 nmol/L at 32 weeks gestation. Infants born to women with 25-hydroxyvitamin D deficiency (<37.5 nmol/L) had reduced developmental language scores compared to those born to women who were vitamin D replete (>75 nmol/L) (p=0.016). For every 25 nmol/L increase 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 Factors 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 a community trial randomized controlled with adults using the Program Academia da Saúde – PAS (public service to promote health and well-being). Assessed socioeconomic data and the stages of change in TTM, collected at baseline, and the percentage of adherence in the intervention (number of participation/ total number of activities offered).
The nutritional intervention, executed in the morning, lasted 6 months and consisted of: 4 educational group workshops, 3 actions on the environment the PAS (posters, food tasting, movies), 3 card with motivational messages, distribution of crop calendar and spelling book with culinary preparations. The percentage of adherence was rated satisfactory (≥50%) or insufficient (<50%).
Results: The sample consisted of 286 individuals, most women (87.8%) with mean age of 54.9 ± 13.2 years and 6.7 ± 4.5 years of study. Participation in the PAS 12.2 ± 8.8 months ago and lived on average 3.8 blocks away from the PAS. Regarding the stages of change for fruit and vegetable consumption 22.4% were preaction (precontemplation and contemplation); 33.5% preparation and 44.1% action (action and maintenance).
At the end of the intervention, 51.4% had satisfactory percentage of adherence. Among who has insufficient percentage of adherence (≤50%), 74.8% left the PAS, 6.5% were in problems health; family and 18.7% for reasons unknown. Individual with satisfactory adhesion compared with insufficient were older (58.8 ± 11.2 vs. 50.9 ± 14.0 years, p=0.001), longer attending the PA (150 ± 85.3 vs. 184.8 ± 84.3 months, p=0.002) and were not included in the labor market (74.8% vs. 54.0%; p<0.001).
Key findings: The adherence to nutritional intervention was low and suggests adopting new strategies for younger, with lower bond with PAS and entered the labor market with aimed at enhancing interventions.

PM-060 Poster Association between alcohol drinking consumption and coronary Atherosclerotic burden.
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Objectives: To verify the association between alcohol consumption and coronary atherosclerotic burden.
Material and methods: Cross-sectional Study. Adult patients referred for coronary angiography were invited to participate of the study. Some indicators (demographic data, education and occupation), cardiovascular risk factors (smoking, systemic arterial hypertension, dyslipidemia, diabetes, and family history of CAD) and the alcohol drinking habit were collected during the interview. The alcohol drinking consumption was divided in three categories: not drink; less than 15g ethanol/day (for men) or less than 7g ethanol/day (for women); or more than 30g ethanol/day (men) and more than 15g ethanol/day (for women). The coronary atherosclerotic burden was assessed by a interventional cardiologists blinded to the alcohol drinking consumption, through the Friesinger Score (FS) in the coronary angiography.
Results: The study population was composed of 356 adult patients; 229 were male (63.1%). The average age was 60.5±11 years. Any level of alcohol consumption was reported by 26 woman (19.4%) and 108 man (47.2%). There was lower alcohol consumption among patients with hypertension compared to the non-hypertensive group, with higher alcohol consumption and more a alcohol consumption among smoking patients when compared to the no smoking (p=0.003). There was no significant association between alcohol consumption and the remaining cardiovascular risk factors evaluated. Moderate alcohol consumption was less strongly correlated to atherosclerotic burden as assessed by the FS in men (p>0.05); but not in women (p=NS). By multivariate analysis atherosclerotic burden was independently associated with sex, age, hypertension, and dyslipidemia, but not with alcohol consumption.
Key findings: An association between moderate alcohol consumption and lower coronary atherosclerotic burden was observed only in men by univariated analysis. This association was not significant after controlling for traditional risk factors.

PM-061 Poster Anemia and vitamin A deficiency in Brazilian children.
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Objective: To analyze the determinants of anemia, vitamin A deficiency in Brazilian children.
Material and Methods: Reanalysis of data from the National Survey on Demography and Health of Women and Children (PNSD2006), which was based on a complex random sampling with national representation. This study analyzed 3,417 children aged from 6 to 59 months of age. Anemia was defined as hemoglobin <11g/dl determined by cyanmethemoglobin method. Vitamin A deficiency (VAD) was set as serum retinol <0.7 μmol/L, evaluated by high performance liquid chromatography. To expand the sample, the criteria adopted by PNSD were used. The variable
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:2.12-5.40], Southeast [OR:2.55; CI:1.60-0.61] and South [OR:2.2; CI:1.39-3.55], in urban area [OR:2.01; CI:1.35-3.00], 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:0.62; CI:0.35-1.03] and as protection consuming meat at least once a week [OR:0.45; CI:0.22-0.93]. Determinants of VAD: The prevalence of VAD in the Country was 17.5%. After adjustment for confounding variables, remained associated with DVA living in the Northeast [OR:1.77; CI:1.16-2.77] and Southeast [OR:1.74; CI:1.16-2.72], in urban area [OR:1.29; CI:0.91-1.07]; and having severe food insecurity [OR:3.14; CI:1.48-7.09] with eating meat at least once a week [OR:0.09; CI:0.00-0.40] 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 determinantst (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 that 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.
Mertanen E; Niissinen K; Oll M; Lahti-Koski M
JAMK University of Applied Sciences; Seinäjoki University of Applied Sciences; The Finnish Heart 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 communication services 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 limit 112/120) 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 and managing, 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±2.7. Test was accomplished by 1191 students (average score 113.9 ± 2.7) and 76 teachers (113±3.6) 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 findings: can be improved by increasing the nutrition competence 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 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.
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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. Consumers 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: rice purchase behavior, rice brand, 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 considered women as the primary rice purchase decision makers. Such decisions were driven by brand loyalty and price (as a predictor of quality), and to a lesser extent, price. The two sampled cities showed distinctive 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, 32% 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.
Effects of Typhoon Yolanda on the nutritional status of children in the Philippines.


Background and objectives: On November 8th, 2013, Typhoon Haiyan, locally known as Yolanda, struck the Philippines. 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 and exclusive breastfeeding in surveyed households were assessed.

Methods: A cross-sectional nutritional assessment using the standardized field methodology SMART (Standardized Monitoring and Assessment of Relief and Transitions) was undertaken by ACt 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 of the Philippines, with a sample size representative of these affected areas. ENA software was used to generate the anthropometric scores. The nutritional status of children was analysed by the WHO Child Growth Standards.10 The overall prevalence of undernutrition among women of reproductive age, based on the WHO Child Growth Standards was used to assess the nutritional status of pregnant and breastfeeding women. Nutrient intakes from food were estimated using a 24-hour dietary recall in survey participants. Nutrient intakes from food were estimated using a 24-hour dietary recall in survey participants. Nutrient intakes from food were estimated using a 24-hour dietary recall in survey participants.

Results: A total of 1386 households were visited with 645 children aged 6-59 months from 60 different clusters. The main results of the survey found that overall prevalence of wasting was 14.9%, stunting 33% and underweight 25% in children aged 6-59 months of 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 the WHO Child Growth Standards. Among children aged 6-59 months of 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. Nutrient intakes from food were compared with the Recommended Nutrient Intakes (RNI) and Adequate Intake (AI), and found that children aged 6-59 months of 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 the WHO Child Growth Standards. However, lower HEI-05 scores were found with regards to young children (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. Nutrition intakes were lower in the typhoon-affected areas. The survey results suggest that breastfeeding practices are generally suboptimal and inappropriate, 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 the Philippines. It indicates 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.

Assessment of diet quality in health staff using the Healthy Eating Index in Kastamonu, Turkey.

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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 Kastamonu province, Turkey. Research data was collected by using a questionarre 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 (BEBSIS) Software Version 4.0”. Anthropometric measures were taken according to standard methods. Statistical evaluation was held using SFPS 17.0 software pack, and frequency (%) distribution of the percentages (%), mean, chi-square significant test(χ), Kruskal-Wallis Test (χ), Mann-Whitney test (U) and Hollander-Wolfe method 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 kg/m2 range, were 24.9 kg/m2. Energy intake was 8.5±2.1 and 7.6±1.8 in man (p<0.001). No health staff was found to have 10 (>16 varieties) food variety score. It was seen that 79.3% of the physicians, 69.2% of the health professional with bachelor’s degree (psychologist, dietician, etc.), 77.8% of the nurse-health officers, and 93.3% of the health technicians consumed 6-15 varieties of food on a day (p<0.05). It was determined that the HEI-05 mean scores of the medical health professional was 61.6±8.1, 65.9±8.9 in woman (p<0.001). Ninety percent of the health staff consume “a diet that needs improvement” (61-100 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.

Evaluation of nutrient intakes of infants and toddlers from 8 cities in China.

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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, National Maternal Infant Nutrition Growth (MING) was conducted to investigate the nutrient intakes and nutritional 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 month 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 intakes (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 macronutrients met 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 60% of the recommended intake were below the EAR. Although 20% of infants and 50% of toddlers had vitamin A intakes below the EAR. In addition, although no AI 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 UL for sodium in China, over 50% of toddlers have intake above the UL set by the Institute of medicine in the US.

Prejudices of health workers on the rural population in the rural Peruvian Andes.

Rivero E1; Vargas A1; Ferrandiz A1; Gonzales R1; Guiterrez A1 1Action Against Hunger-Health Micro Network Víelas Huanca.

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 Huanca health centers, Ayacucho, Peru.

Methods: This is a descriptive research developed in 8 districts at Vilcas Huanca 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, 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 own health”, 61 % reported that “rural parents senseless 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 ill or affliction”; 61 % 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.

Association of vitamin D and psychological wellbeing.

Pulak, MA1; Houghton, LA1; Reeder, A1; Connell, T1

I11 World Congress of Public Health Nutrition
PM-070  
**Association of body mass index with bone mineral density in southern Brazilian women.**

**Chagas, P.**; **Mazoccolo L.**

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**Objectives:** To verify the association between Body Mass Index (BMI) and Bone Mineral Density (BMD) in women.

**Material and methods:** Cross-sectional study. Women patients referred for bone density with endocrine or metabolic disease were invited to participate of the study, in Palmeira das Missões - RS, from October 2012 to December 2013. The socio demographic data (age, marital status, education and occupation) were collected during the interview. For anthropometric measurements all patients were evaluated only wearing hospital apron. The weight in kilograms (kg) was measured using an anthropometric Filizola (São Paulo, Brazil). The height, in meters (m) was measured with the stadiometer of anthropometric scale. The BMI was calculated using the equation weight (kg) divided by height (m) squared. The BMD measurement was performed using dual X-ray absorptiometry, and was performed by blinded to 84 participants. The classification of normal BMD, osteopenia and osteoporosis was obtained according to the diagnostic criteria proposed by the Brazilian Society of Clinical Densitometry. Data were analyzed using the statistical software Statistical Package for Social Sciences (SPSS) version 18.0 and are presented as mean ± standard deviation and percentages. To compare the three categories of BMI and BMD the One-Way ANOVA was used.

**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.**


**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 (ENSAHUN-2012) were studied. The calcul 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 lowest SD scores are 5 (children) and 4 (adolescent). The subjects with BMD, osteopenia and osteoporosis were identified and studied. 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. L. Vepsäainen1, H. Aistrich1,2, T. Vepsäainen1,2, H. Foge/holm1, E. K. Begum3, M. Quarshie4, F. Veli多年 ago, 3

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 levels of vitamin D. The aim of this 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 168 (70 male, 98 female) aged 18-65 years was carried out. 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 IPAQ. Body fat distribution and type of obesity were evaluated using two methods: bioelectrical impedance on the device Tanita 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, weight and exercise and BMI were also calculated.

Results: The relative rate of adults with overweight was 32.1% (BMI 25.0-29.9 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%.

The results of studied adults was impaired: 35.7% had insufficient levels of vitamin D (25(OH)D < 30 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 the serum 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? Veeravongs H1, Lehtovirta M2, Alström M2, Quaaschie M3, Fagelholm M1, Erkkola M4
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Objectives: We aim to determine if the eating habits of adolescent athletes could be influenced using a game-like smartphone application.

Materials and methods: A total of 53 adolescent basketball (34%) and soccer players (66%) were recruited to the study. They were randomized to game (n=24, 45%) and control (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. A tutorial and control group were also created. Each tutorial group member part in a single 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, fruits, and berries 1.4 times/day (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 hypothesis that a year-long intervention featuring weekly counseling home visits by four local community health educators aiming to improve IYCF, energy and nutrient intakes 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 (42% 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, Byadny 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 13-16y 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 singararasomas, peaju, chanachur, parata, chola, 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
PM-077

Poster
Association of consumption of soft drink with coronary atherosclerotic burden.

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Objectives: To verify the association between soft drink and coronary atherosclerotic burden. The presence of cardiovascular diseases (CVD) is a growing problem in the world, with an increase in the prevalence of obesity. The incidence of CVD is significantly higher in countries undergoing the nutrition transition, with the urbanized population being most at risk. This is an arm of a larger study entitled “Food, nutrition and physical activity for healthy aging”. The Cardiovascular Health Study is estimated to be the largest contributor to global burden of disease.

Methods: A cross-sectional study. Adult patients referred for coronary angiography were invited to participate of the study. Sociodemographic data, child's growth and food habits were collected through interviews using a structured questionnaire. Soft drink consumption was divided into three categories: non-consume soft drinks, consume soft drink and consume diet soft drink. Cardiovascular atherosclerotic burden was assessed using the score Friesinger (EF) 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 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 EF. A multiple linear regression model was completed with the EF as the dependent variable and the other variables as independent variables. This is an arm of a larger study entitled “Food, nutrition and physical activity for healthy aging”. The Cardiovascular Health Study is estimated to be the largest contributor to global burden of disease.

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 sample showed: 77.4% hypertension, 53.7% dyslipidemia, 28.7% DM, 20.1% were current smokers, 21.4% smoking and 21.4% history. Of the total sample, 23.9% reported not consuming soft drinks, 57.1% reported consuming regular soft drinks 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 between 27.0% the cardiovascular risk factors were significant with hypertension (p=0.004) and DM (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±3.5, 7.13±4.01 and 7.82±3.88. No significant association of soft drink consumption was found with the EF. The cardiovascular risk factors associated with the atherosclerotic burden was independently associated with age (p<0.001), gender (p=0.002), 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.


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 blind no blinded trial was conducted in 5 districts with high child under nutrition from the Amcolo province, Huancayo Region, Peru. The sample included 147 children aged 6 months to 313 children aged 11 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 months of age. 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 LNS consumption at the age of 6 and 12 months.

Results: The mothers knowledge on the benefits of LNS was high; 89.8% mentioned that serves to the child's growth and 46.9% for the level of LNS daily consumption was progressively increasing, from 69.1% in children 6 months to 97.3% at 11 months. Regarding the amount of sachets 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 = -0.10); there is a decrease in 0.13 z score (p<0.048); resulting in an increase 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=0.000) between months (10.26mg/dl) and 12 months (10.93mg/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 Cádiz; (3) Centro Nacional de Alimentación y Nutrición.

PM-079

Poster
Factors associated with undernutrition among young children in Albania.

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Objectives: Child growth is internationally recognized as an important indicator of nutritional status and health in populations. Child undernutrition is estimated to be the largest contributor to global burden of disease. The study aimed to assess the prevalence of stunting, wasting and undernutrition among young children in Diber, Albania and analyze the associations between socio-economic characteristics and poor nutrition outcomes in order to inform the targeting of maternal and child health interventions in this region.

Material and methods: A cross-sectional community-based survey was conducted during June-July 2012 in Diber, Albania. The socio-demographic and economic data were collected through interviews of 600 mothers selected using two-stage 30-cluster sampling technique. Anthropometric measurements of weight and height were taken from a sample of 720 children 0-59 months old. Stunting (< -2 SD of height-for-age z-score), wasting (< -2 SD of weight-for-height zscore) and underweight ( < -2 SD weight-for-age z-score) were defined using the World Health Organization reference 2007. Data were analysed using descriptive statistics, chi-square test of independence (significance level set at p <0.05, p<0.01 and p<0.1). For stunting and underweight, binary logistic regression was used and for wasting, multinomial logistic regression was used to measure the relative risk of all confounding factors (odds ratios). Results: 13.3% (95% CI 10.4 -16.3) children were stunted, 5.5% (95% CI 3.5 - 7.4) children were underweight and 3.8% (95% CI 2.2 - 5.4) children were wasted. Stunting and underweight were not significantly associated with gender. Prevalence of stunting significantly increased with age among both boys and girls (both p <0.01) while wasting showed a significant decreasing trend with age among boys only (p = 0.34). Age of the child (p < 0.001), birth order (p = 0.003), wealth index (p = 0.001) and mothers’ level of education (p < 0.038) were strong predictors of stunting. Wasting was significantly related to age of the child (p<0.001), sex of the child (p = 0.013), and urban/rural residence (p = 0.079). Child's age (p = 0.026) and wealth index (p = 0.062) were significantly related with underweight.

Key findings: Nutrition problems appear to be clustered in specific populations, and gestational interventions identified profiles of children most at risk for chronic or acute malnutrition could help decide the best mix of strategies according to the main differences observed in age of the child, gender, socioeconomic status and urban/rural residence.

PM-080

Poster
Effects Of Two Micronutrient-Fortified Food Aid Products Containing Different Levels Of Dairy Protein On Mother's Nutrition Status In Rural Guinea–Bissau.

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Food insecurity in Guinea-Bissau is widespread and micronutrient deficiencies are likely among vulnerable groups. This work was funded by the United States Department of Agriculture as part of a larger pilot project.
with the International Partnership for Human Development, testing different supplements in vulnerable populations. This was the first such study among mothers in Guinea-Bissau.

Objective: Conduct a Randomized Controlled Trial (RCT) to test the effectiveness of 2 Micronutrient-Rich Ready to Use Supplementary Foods (MNRRSU) in rural village mothers in a 12-week program. Mothers and participants were women who had a malnourished infant or child under 5 years of age enrolled in a parallel program for infants and children. 497 mothers (average age: 27 years old) were randomly assigned to one of two intervention arms (92g sachets containing 50 kcal/sachet and either 15% or 33% of protein from a dairy source, provided for lunch and dinner only) or to a control group that received no supplements. Self-reported pregnant mothers were excluded from the current analysis. Weight, height, mid upper arm circumference (MUAC), hemoglobin, and retinol-binding protein were measured at baseline and at 3 months.

Results: The supplements were rated highly for acceptability by the mothers and there was a high rate of supplement consumption. Randomization was successfully performed, and there was a mean increase in body weight that approached significance (combined 15% and 33% dairy protein group). The intervention also resulted in a significant reduction in self-reported sick days due to malaria. Moreover, mothers in the intervention groups experienced a trend towards a smaller decrease in hemoglobin compared to control mothers (-0.38±1.45 vs. -0.87±1.21). Study mothers are especially vulnerable to iron deficiency due to seasonal food shortages and higher iron needs among reproductive age women.

Key findings: Overall, these findings demonstrate the feasibility of providing supplement to mothers in villages, administered by local community health workers, with positive health outcomes.

PM-081 Food consumption and dietary practices of Brazilian indigenous children.

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Objective: To assess the dietary habits and practices related to supply Brazilian indigenous children.

Material and methods: This study consists of an analysis of dietary practices of Brazilian indigenous children, from data provided by the Ministry of Health regarding Food Consumption by period, Phase of Life and Race. In total, 2,227 children from throughout Brazil, aged 2 and 5 years. Changes were observed in the consumption of vegetables, fruits and meats as well as eating habits, the period between the years 2009 and 2013. Data were analyzed using Microsoft Excel 2013®.

Results: Compared to food consumption, the results showed that in the period studied, there was no change in the rates of consumption of vegetables, which remained at 67.4% of the population. Fruit intake was reduced by -0.04 percentage points, from 76% in 2009 to 53% in 2013. Meat consumption also declined, from 84% in 2009 to 74% in 2013; with a coefficient of variation of -0.11 percentage points.

Conclusion: Based on these results, studying and considering the population studied, we conclude that the consumption of vegetables, fruits and meats 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-082 Meal location and energy intake among school children.

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Objectives: This study aims to evaluate if there is an association between the location where meals are consumed and its total energy value, among school children from the 7th to the 12th grade.

Material and methods: A total of 297 students (160 girls), aged 12 to 19 years old completed a 3 day food diary including 2 weekdays and 1 weekend day. Meal location was self-reported and categorized in home, school, coffee shop, restaurant, fast-food restaurant and other. Statistically analysis was conducted using IBM SPSS 21 and Kruskal-Wallis and Mann-Whitney U tests were applied.

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 for lunch and dinner. 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 not all these two places no significant differences were found. Moreover, household meals had, in general, the lowest calorie value and meals consumed at school were usually lower in calories than those from coffee shops, restaurants supported by 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.

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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 an 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 workers. Meal serving practices were recorded in terms of doings and sayings and categorised into different serving and plating expressions. The French philosopher Derrida's approach towards hospitality was applied as an analytical frame in order to discuss hospitality meal practices among kitchen professionals.

Results: Four different categories of serving and plating expressions were identified. They were categorised as 'The component expression', 'The picturesque expression', 'The build-up expression' and 'The splashed expression'. These expressions appeared as both bodily and verbal expressions but also as plate expressions. The component expression', was experienced by hospital kitchen professionals as a hospitality meal serving practice, whereas the other expressions originated from either non intended efficiency practices or from culturally learned but however non-elaborated practices among kitchen professionals.

Key findings: Hospitality might be a concept to improve hospital meal experiences. However, there is a need to explicitly elaborate different serving and plating expressions among kitchen professionals serving hospital meals. Furthermore, hospitality serving practices comprise an ability to know when to use the different serving and plating expressions in accordance to the individual patient's needs and expectations.

PM-084 Food waste: compositional and organoleptic analysis of fruits and vegetables.

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Introduction: Hispacoop 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-
A qualitative study among women to identify current food culture practices in four low-income communities in north Mexico.

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Background and Objective: We can identify among the Mexican population an increment in the prevalence of obesity that is simultaneous with a high incidence of malnutrition. In Mexico is occurring 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=30) from the indigenous communities of Sinaloa, Mexico participated. The data of the discussions were professionally transcribed and analyzed to identify recurring trends and patterns using Atlas.ti v6 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 nowconstitute 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 fast food 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 ones. 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.

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Objectives: Investigate association between diet quality and physical activity levels with the adequacy of gestational weight gain. Aims: Evaluate the dietary and physical activity levels of pregnant women with and without excessive weight gain and to understand factors associated with the adequacy of weight gain.

Methods: Stratified sampling of pregnant women, selecting at random from 212 pregnant women in a health care unit in a Brazilian city. Nutritional intake was assessed through a food frequency questionnaire. Physical activity was assessed through the questionnaire of the PAQ-C, in the second trimester. The nutritional data and the physical activity were analyzed using descriptive and inferential statistics. The results were analyzed using the chi-square test and the Student's t-test.

Results: Approximately half (50.5%) of the women had excessive weight gain, which were 29.7% adequate gain, and 19.8% gained weight insufficiently, being 77.4% of the women considered sedentary/health 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 excessive weight gain was 1.94±0.87; with excessive gain of 2.03±0.87, with excessive gain of 2.03±0.87; and 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.

Conclusion: Physical activity and food consumption may not be the most appropriate, it is recommended to seek more accurate methods for these assessments.
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 Methods: 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: Among the 28 advertisements accounted only 4.7% of total hours analyzed, but the majority (63%) was representative 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 thereby 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-089 Poster

Nutritional status of Japanese Brazilians in southern Brazil.
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Objective: The Japanese-Brazilian term is used to define the citizen of Japanese ancestry or people born in Japan and living in Brazil. The Japanese-Brazilians are divided into three groups: Sansei (children of Japanese), Nisei (children of Japanese and Japanese) and Yonsei (grandchildren of Japanese). The Japanese immigration to Brazil began in 1900 and currently it is estimated 1.5 million Japanese-Brazilians, while Brazil is the largest Japanese community outside Japan. The Japanese are known for their lifestyle (lifestyle and chronic diseases), but studies show a westernization of diet, introducing high in fat and simple sugar foods, resulting in the increase of overweight. Based on the above, the aim of this study was to evaluate the nutritional status of Japanese-Brazilians.

Materials and Methods: A cross-sectional descriptive study, based on data collection in 142 Japanese-Brazilians (sansei and yonseis) above 18 years, the metropolitan area of Curitiba (southern Brazil). The questionnaire was prepared in Qualtrics® tool with questions on the demographic, economic profile, lifestyle habits, nutritional status, health perceptions, weight and nutrition, health care and food habits. This brief data will be presented on self-reported nutritional status, as well as the perception about weight. Data were analyzed using Excel, and described the frequency of variables. Results: The final sample consisted of 106 Japanese-Brazilians (sample loss of 36%). 55.9% were women, 63.6% belonged to the upper economic class and 60% were young adults (18 to 24 years). The body mass index (range 16 to 34.8 kg/m²) and identified 20.7% of Japanese-Brazilian overweight and 5.7% obese. About weight of care, 20% of Japanese-Brazilians had weighed more than six months and 22% had never measured waist circumference, the main indicator of cardiovascular risk and. About perception of weight, 32% considered themselves overweight, perhaps influenced by the amount of women in the sample. Key finding: The high prevalence of overweight in the sample shows that this population is approaching the Brazilian profile. Today, half the Brazilians overweight and the prevalence in Japan is less than 10%, so the Japanese-Brazilians are becoming more westernized and "Brazilian".

PM-090 Poster

Association of whole fat dairy food intake with obesity: findings from ORISCAV-LUX study.
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Introduction: Conflicting findings have been reported with regard to dairy food consumption and risk for obesity outcomes. Furthermore, few studies have examined specific dairy products, with regard to type of food and fat content, in relation to obesity. Objectives: This study examined whether dairy food consumption was associated with risk for global and abdominal obesity. Material and methods: Data were analyzed from 1352 participants in the Obse

PM-091 Poster

Association of whole fat dairy food intake with obesity: findings from ORISCAV-LUX study.
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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 population is food - 90% of typical exposition, thus assessment of dioxins intake and monitoring of dioxins levels in food 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 for intake were: 29% from fish – mainly sandines and tuna, about 25% form 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 context 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 localized prostate cancer prior to radical prostatectomy.
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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. Sixty-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 were plasma concentration of uricolic and oleicolic 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-microsemionoprotein (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: Vaccinum macrocarpon, polyphenolics, urolitic 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 ML, Baustista-Castarlo TF, Serra-Majem L. 

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4Ciber de Fisiopatología de la Obesidad y Nutrición, Instituto de Health Carlos III, Madrid, Spain

Objectives: To analyze factors associated with the risk of eating disorders in participants between 11 and 33 years old.

Material and methods: 1342 students were randomly selected from educational centers on Gran Canaria, Spain. Risk of eating disorders was measured by EAT-40 questionnaire. Sociodemographic variables, weight status, physical activity, and adherence to Mediterranean Diet (by Kidmed questionnaire) were also assessed. To evaluate the associated factors of EAT positive test logistic regression analyses were used, controlling for confounding variables.

Results: The prevalence of risk of eating disorder was 27.42%. The risk of suffering from eating disorder was higher among women than men (RR = 1.56; 95% Cl: 1.18-2.05) and among students who had dieted in the past year than those who had not dieted (RR = 5.13 (95% Cl: 3.93-7.16), and for each year of decreasing age the risk was increased (RR = 0.89; 95% Cl: 0.83-0.95), and participants with underweight or normal weight presented less risk that those who had excess weight (RR = 0.46; 95% Cl: 0.28-0.74 and RR = 0.53; 95% Cl: 0.39-0.72, respectively).

Key findings: There are many factors associated with the risk of eating disorders. Knowing and considering them in each population can help the development of more effective treatments and prevention programs.

**PM-094** Poster

**Fluid intake from beverages in Spanish adults: cross-sectional study.** Ferreira-Pego CI, Babio N, Fernández-Avilera JP, Iglesias P, Moreno L, Sales-Salvado F. 

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3Ciber de Fisiopatología de la Obesidad y Nutrición, Instituto de Health Carlos III, Madrid, Spain.

Objectives: To evaluate the total fluid intake from different types of beverages in Spanish adults.

Methods: A total of 1,262 adults aged 18-70 years were randomly recruited from all Spanish regions. The information about the quantity and quality of daily fluid intake from different types of beverages was collected using a 24-h fluid-specific diary over 7 consecutive days.

Results: 50.4% of the study population had a fluid intake <80% of the European Food Safety Agency recommendations for total water intake. The odds of meeting the recommendations of total fluid intake were higher in women [OR=2.48; 95%CI:1.81-3.40], and in those with higher leisure-time physical activity (3-4 times/week [OR=1.57; 95%CI:1.01-2.46]; 5 times/week or more [OR=1.97; 95%CI:1.37-2.83]). Women consumed significantly more hot and sweet light beverages. However, men consumed significantly more sweet regular and alcoholic drinks. A significant higher percentage of young and normal/underweight subjects exceed the World Health Organization recommendations for free sugars (>10% total energy intake) from beverages alone.

Key findings: half of the adults studied do not meet the European Food Safety Agency fluid intake recommendations. Water is the main fluid consumed. Differences in the pattern of fluid consumption were observed between ages and genders. A quarter of the population studied consumed from beverages alone already more sugar than recommended from the total diet.

**PM-095** Poster

**A healthier lifestyle is associated with a healthier drinking profile.**

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2CIBERobn (Centro de Investigación Biomédica en Red Fisiopatología 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 practice and adherence to the Mediterranean diet. 

Method: Information about fluid intake from different types of beverages was collected in 1,262 men and women participants between 18 and 70 years old, using a 24h 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 practice 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 per 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 practice exhibits 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 A-K, Kyung W. O. 

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Objectives: We examine 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 security 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 (FOQ).

Results: In 2012, 88.4% of Korean household showed food security. The prevalence of food insecurity without hunger was 11.6% (9.5% for food insecurity without shortage, 1.6% for food insecurity with hunger) was food insecure. The prevalence of household food insecurity was 13.6% in household with children and 10.6% in household without children. Food security status of household was related to socioeconomic status of household and household size. 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.** Pakels A, Gedemir E. 

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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. Turşu (Pickle) is one of the oldest products of fermentation used
by man 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 lipoic acid peroxidation, reductive potential, β-carotene bleaching effect and chelating activities. Those various antioxidant activities were compared to standard antioxidants. The lactic acid fermented shalgam and tursu samples showed high total antioxidant and radical scavenging activities when compared to the standard antioxidants. Those findings are important from a nutritional point of view, because the fermented food have, as 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.

**PM-098**

**Poster**

**Early weight, nutritional intake and physical activity in women inmates.**

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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 obesity with nutritional status, physical activity 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, alcohol consumption, body height and weight). 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 fat, protein 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.

**PM-099**

**Poster**

**Age at adiposity rebound - differences among overweight, normal weight and underweight children.**

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1School of Health Sciences, Polytechnic Institute of Leiria, Portugal. 2Research Centre for Physical Activity, Health and Leisure, Faculty of Sport, University of Porto, Portugal. 3CEDOC, NOVA Medical School, NOVA University Lisbon, Portugal.

Objective: To determine the age of adiposity rebound according to weight status among children aged 2 to 10 years old of a private educational institution in the region of Leiria, Portugal.

Material and Methods: This prospective study was performed in a sample of 271 children, from a private educational institution in Leiria, between 2009 and 2013 Body height and weight were determined by standard anthropometric methods. Measurement of weight and height was performed at two different times in each school year (at the beginning and at the end of school year) to all children aged between 2 and 10 years old. Adiposity rebound age at lowest body mass index (BMI) between the age of two and 10. CDC cut-points were used to categorize underweight (UW), normal weight (NW) and overweight/obesity (OW/Ob).

Results: This study demonstrated that from 2 to 10 years the prevalence of overweight and obesity varies between 3.6% and 25.4% in boys and 4.2% to 43.3% in girls. It was identified that adiposity rebound happens at earlier ages both in boys and girls in overweight children. While in overweight children, adiposity rebound occurs at 4 years, in children with normal weight it occurs at 5 years for both gender. In underweight children, it was not verified adiposity rebound in girls, while in boys it occur at 6 years old.

Key findings: Adiposity rebound occurs at earlier ages (4 years) in overweight children while in normal weight it happens at 5 years. In underweight children adiposity rebound occurs at 6 years. Thus, further studies are needed to identify the factors that contribute to an earlier adiposity rebound.

**PM-100**

**Poster**

**β-carotene status in overweight/obese children and its association with inflammatory markers.**

Rodriguez-Rodríguez E,1 Ortega RM,2 Villabobos-Cruz T,1 Díaz-Salmerón R,1 Hernández-Sánchez C, 2


Objective: 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.

Subjects/Methods: 564 Spanish schoolchildren between 9-12 years of age (60.5% 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 (hs-PCR) was tested by immunonephelometry.

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 (B=0.049±0.013; p<0.001). TNF-α and hs-PCR 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.

**PM-101**

**Poster**

**Aqueous garlic extract treatment protects against sepsis-induced pulmonary and ileal injury in rats.**

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Objectives:Sepsis is commonly associated with enhanced generation of reactive oxygen metabolites leading to multiple organ dysfunctions. Based on the potent antioxidant effects of aqueous garlic extract (AGE), we investigated the putative protective role of AGE against sepsis-induced oxidative damage in pulmonary and ileal tissues.

Methods: Rats were divided into four groups; 2 control and 2 sepsis groups, containing 8 animals in each group. Sepsis was created using the cecal ligation and perforation (CLP) method. Rats were supplemented with either saline or AGE (250mg/kg/day orally) for 15 days prior to either sham operation or CLP and also immediately postoperatively.

Results: Sepsis caused decreases in platelet counts, fibrinogen and APTT while INR levels were increased. Sepsis induced significant decrease in GSH levels and SOD activities in both lung and ileal tissue samples, but AGE treatment to the rats with CLP caused significant increases in these antioxidants. As a result of CLP induction, MPO activity, MDA levels and thrombopoietic activity were found to be increased in the lung and ileal tissues. AGE treatment in the CLP group decreased these values and reversed back to the control levels.

Key findings: AGE, reduces sepsis-induced pulmonary and ileal tissue injury, at least in part, through its ability to balance oxidant-antioxidant status and to inhibit neutrophil infiltration.

**PM-102**

**Poster**

**Increasing women's intake of green leafy vegetables, fruit and milk pre-conceptually and through pregnancy increases birth weight; a randomised controlled trial in Mumbai, India (Mumbai Maternal Nutrition Project, project "SARAS").**

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International Journal of Community Nutrition 2014, 0 (suppl)
Objectives: Low birth weight (LBW) is a major public health problem and is associated with increased infant mortality, childhood stunning, impaired cognition and risk of adult chronic disease. An earlier observational study among under-nourished rural Indian women showed that those who reported higher intakes during pregnancy of green leafy vegetables (GLVs), fruit and milk had larger newborns. Our objective was to determine the effect of a snack made from these foods, taken for at least three months before conception and until delivery, on newborn anthropometry.

Methods: Individually randomized controlled trial was conducted in Mumbai slums between 2006 and 2012. Married, non-pregnant women aged <40 years were randomised to receive a daily snack made from GLV, fruit and milk or a control snack made from vegetables of low micronutrient content, under supervision, until delivery. Trained staff measured newborns within 72 hrs of delivery. Non-blinded, individually randomised control trial method of two parallel study groups.

Results: Of 6,513 non-pregnant women randomised, 1,826 were supplemented for >3 months prior to conception. Of these, 1,562 delivered live singleton newborns, of which 1,094 were measured. The intervention increased birth weight by 48g overall (control: 2583g, treatment: 2631g, p=0.046). The effect increased with maternal BMI (+113g, p=0.008; +79g, p=0.07 and -8g, p=0.8 in the highest, middle and lowest thirds of maternal BMI; p for interaction=0.001). Similar effects were observed for newborn chest, abdomen and mid-upper-arm circumferences and skinfolds (p<0.05), but not length or head circumference. LBW and small-for-gestational-age births were reduced by approximately 20% (OR: 0.76, 95% CI: (0.59, 0.98), p=0.03; and 0.78, 95% CI: (0.60, 1.03), p=0.07 respectively).

Key findings: A daily food-based snack, consumed for at least three months pre-conceptually and throughout pregnancy increased birthweight. This effect was comparable with, and up to double that achieved using pharmaceutical multiple micronutrients during pregnancy. Mothers require adequate macronutrients and micronutrients for optimal reproductive success.

PM-103 | Poster | Apocynin attenuates testicular ischemia-reperfusion injury in rats.

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Objective: Apocynin (4-hydroxy-3-methoxy-acetophenone), naturally occurring methoxy-substituted catechol, extracted from the roots of Apocynum cannabinum (Canadian hemp) and Pichiroxia 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 testis.

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 (torision) 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, testicular MDA levels were increased and antioxidant status 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 the free radical generation and increasing antioxidant defense exerts protective effects on testicular tissues against IR.

PM-104 | Poster | Therapeutic potential of Myrtus communis subsp. communis extract against acetic acid-induced colonic inflammation in rats.

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Objective: Multiple sclerosis (MS) is a chronic inflammatory disease of central nervous system in which a higher oxidative stress may contribute to its pathogenesis. The aim of this study was to investigate the effect of coenzyme Q10 (CoQ10) supplementation on oxidative stress and antioxidant enzyme activity in patients with MS.

Materials and methods: We performed a randomized, double-blinded, placebo-controlled trial to determine the effect of CoQ10 supplementation (500 mg everyday, n = 24) versus placebo (n = 24) for 12 weeks. Fasting blood samples were taken before and after a 12-week intervention to analyze malondialdehyde (MDA), total antioxidant capacity (TAC) and antioxidant enzymes (superoxide dismutase (SOD), glutathione peroxidase (GPO) activity).

Results: Forty-five subjects with MS completed intervention study. After 12 weeks, CoQ10-treated patients had significant increase in SOD activity (p = 0.013), and decrease in MDA levels (P=0.003) compared with controls. Despite the significant effect of CoQ10 supplementation on plasma TAC (p = 0.010), no significant differences were found between the two groups. CoQ10 supplementation did not affect GPx activity.

Conclusion: Present study suggests that CoQ10 supplements at a dose of 500 mg/day can decrease oxidative stress and increase antioxidant enzyme activity in patients with relapsing-remitting MS.

Keywords: coenzyme Q10, multiple sclerosis, oxidative stress, antioxidant enzyme activity, lipid peroxidation, supplementation.
children and a follow-up on the implementation and acceptance of the suggested improvements at 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 the 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 schools (89.8%), the catering company (95.7%), and the student parents associations (88.6%). Regarding the new menus, the following trends are observed in meeting the recommendations: first course and dietary Glycemic Load on the strength of the association evaluation follow up improves the recommendations. Children and a exposure or repeated measures during a 5-year period have been collected.

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.

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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 report of 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 205 schools that offer food service to 20,173 children and a follow-up on the implementation and acceptance of the suggested improvements at 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 the 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 schools (71.1%), the catering company (69%) and the student parents associations (33.8%). 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 (57.2% → 72.7%*), 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-108 Poster Effect of using repeated measures of dietary Glycemic Index and dietary Glycemic Load on the strength of the association with total mortality.


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 PREMED 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 evaluate multivariate adjusted hazard ratios (HR) and 95% confidence intervals (95% CI) for mortality, according to baseline quartiles of GI/GL, adjusting for potential confounders.

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) compared to the lowest quartile. After adjustment for potential confounders this association remained statistically significant. In the repeated-measures analyses using as exposure 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 highest quartile of dietary GI when compared to the lowest quartile. When dietary GI values were updated yearly in repeated measures analyses, similar associations between dietary GI and all-cause mortality were found.

PM-109 Poster Association between serum 25(OH)D and insulin resistance in Brazilian adolescents.

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2 Federal University of Juiz de Fora, Brazil

Objectives: The aim of this study was evaluated the relation 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 calcidiol (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(0H)D≤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 association 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: FAPENMG (CDS APQ 01371-09)

PM-110 Poster Association between waist-to-height ratio and adiposity in Brazilian older women.

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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. Inelastical 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

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PM-111 Poster
Effects of vitamin U on valproic acid induced lung injury in rats.
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Valproic acid (2-propyl-pentanoic acid, VPA) is an antiepileptic drug. VPA is usually well tolerated, but serious complications including hepatotoxicity, histotoxic nephropathy, encephalopathy, fatty hemorrhagic pancreatitis, teratogenicity, bone marrow suppression may occur. Certain vegetables, in particular cabbage contain a nutritional factor which was reported to have antihypertensive properties. This factor, S-methyl methionine sulphonium chloride has also been called vitamin U. In this study, we aimed to investigate the protective effects of Vit U on VPA-induced lung damage. Female Sprague Dawley rats were divided into four groups. Group I was intact control animals. Group II was control rats given Vit U (50 mg/kg/day, by gavage) for fifteen days. Group III was given only VPA (500 mg/kg/day, intraperitoneally) for fifteen days. Group IV was given VPA and Vit 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 Vit U reversed these biochemical results. Also, VPA treatment resulted in the destruction of alveolar structure and increases in number of intestinal cells and collagen, cell proliferation in alveolar ducts (p<0.05). VPA groups revealed lower levels of α-SMA and NRF-2 protein levels in the lung, while it increased effectively on the NRF-2 protein level. Vit U 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 expression and cell proliferation were significantly reduced in the lungs of these rats. In conclusion, we can say that Vit U is a protective agent against fibrotic alterations in the VPA-mediated lung injury, probably by decreasing oxidative stress.

PM-112 Poster
Estimating prevalence of inadequate nutrient intakes in children and adolescents in Greece.
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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 survey/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 that were national or conducted on nationally representative samples using validated dietary assessment methods. Nutrient intake data, representing 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 C, A and B12, folate, vitamin B6, 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 individuals at risk of vitamin C, vitamin A, vitamin D, vitamin E, and B12 deficiency was 1.6, 6.3, 6.1, 11.5, and 7.6, respectively. For girls, 6-7 years old, the percentage (%) of individuals at risk of vitamin C, vitamin A, vitamin D, vitamin E, and B12 deficiency was 5.0, 12.5, 11.5, 19.0, and 11.5, respectively. For boys, 11-14 years old, the percentage (%) of individuals at risk of vitamin C, vitamin A, vitamin D, vitamin E, and B12 deficiency was 6.1, 11.4, 10.6, 16.3, and 8.6, respectively. For girls, 11-14 years old, the percentage (%) of individuals at risk of vitamin C, vitamin A, vitamin D, vitamin E, and B12 deficiency was 11.2, 13.5, 14.2, 19.3, and 10.7, respectively. For adolescents, 15-18 years old, the percentage (%) of individuals at risk of vitamin C, vitamin A, vitamin D, vitamin E, and B12 deficiency was 11.0, 14.2, 11.2, 17.4, and 9.1, respectively. For girls, 15-18 years old, the percentage (%) of individuals at risk of vitamin C, vitamin A, vitamin D, vitamin E, and B12 deficiency was 15.1, 18.4, 14.5, 20.7, and 10.3, respectively. For adolescents, 15-18 years old, the percentage (%) of individuals at risk of vitamin C, vitamin A, vitamin D, vitamin E, and B12 deficiency was 13.2, 16.5, 13.5, 19.6, and 10.3, respectively.

Conclusion: The EAR was calculated for vitamin C and vitamin E. For the EAR was calculated for vitamin C and vitamin E. For
which went from 9% to 62%; nutritional assessment of 11% to 58%; nutritional counseling techniques, 11% to 48%; and communication techniques from 30% to 76%. Preliminary qualitative analysis showed that health professionals associated the infant nutritional disorders to maternal neglect and poor living conditions of the population. Showed little autonomy in health care of the child, giving the doctor and nutritionist responsibility for monitoring and nutritional counseling. After training they were able to identify that their improper practices were associated to lack of knowledge on the topic covered.

Conclusions: Whereas it the nutritional aspects represent structural axes of the healthcare of children in primary care, training of health professionals on nutrition counseling is essential because it contributes to increased knowledge of professionals and transform their practices into routine services.

**PM-115 Poster**

**Nutritional Status of PreSchool Children in the Oio and Ca­cheu Regions in Guinea-Bissau.**

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*Global Food & Nutrition Inc.*

*Tufts University. International partnership for Human Development*

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 in two rural areas: Cacheu and Oio. 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.

Anemia was identified in light clothing and no shoes were 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 (HIZ), Height-for-Weight Z-scores (WHZ), and Hemoglobin (Hb) concentration were assessed compared to with WHO cut-offs.

**Results:** Among children in preschool (255 boys and 279 girls, aged 11-77 months old), only 1 case of severe underweight and 1 case of severe anemia was found. No severe wasting or severe stunting was detected. 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**

**Prevention of chard (Beta vulgaris L. var. cicla) extract decreases liver injury induced by antiarrhythmic agent, Amio­daron.**

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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 arrhythmia. 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 hypotensive properties in Turkey. The aim of this study was to investigate the possible protective effects of the chard extract against amiodarone induced hepatoxicity 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 overnight were sacrificed, and liver tissues were taken under anesthesia for histopathological and biochemical studies.

Liver lipid peroxidation levels and superoxide dismutase, adenosine dseau- minase, xanthine oxidase, lactate dehydrogenase activities were increased, while glutathione level was decreased in amiodarone group. The mild de- generative changes such as centrilobular necrotic cells and areas, hepatopo- cytes which have picnotic nuclei and dark eosinophilic reaction, dilatation 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 chard, on intestinal and salivary gland biochemical parameters of rats.**

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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 in the same family. Chard is reported to have antioxidant, anti-inflammatory, anti-mutant, and hypertoprotective effects. Moreover, chard exhibits mineralizing, antiseptic and cholesteric activities as well as it contributes to the reinforcement of the gastric mucosa. Physiological screenings of Beta vulgaris varieties have revealed the presence of some fatty acids (palmitic, stearic, oleic, linoleic and linolenic acids), phosphyolipids, glycolipids, polysaccharides, ascorbic acid, folic acid, pectin, saponins, flavonoids, phenolic acids, betalains and apigenin. Chard leaves are a good source of Vitamin A, E, C, B6, B8 and minerals such as, calcium, potassium, magnesium, iron and oil. Chard, 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**

**The effect of Myrtus communis L. extract on the small intest- ine in experimental thermal burn injury.**

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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 ischemia and hypoxia. Acute and chronic inflammation, and reperfusion occurs during burn shock. Myrtus communis L., Myrtac­ ceae is well known medicinal plant and has been shown to have antiox­ idant 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 °C bath for 10 s to induce burn. Rats were then decapitated 48 h after injury. Small intestine sam­ ples were taken from animals and the antioxidant and anti-inflammatory biochemical parameters were determined in homogenized intestine samples. Results were evaluated statistically and discussed.

**PM-119 Poster**

**Effects of chard (Beta vulgaris L. var. cicla) on cardiac dam­ age in valproic acid induced toxicity.**

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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, anticytcholines­ terase, antiabetic, antiinflammatory and hypertoprotective effects. The aim of this study is to evaluate whether VPA might interfere with oxidative me-
tabolism in heart and whether chard ameliorates these effects. Female rats were divided into four groups as intact control animals, VPA (0.5 g/kg/day.), p.c., chard (100 mg/kg/day, gavage) and VPA+chard (in same dose and time) given groups for seven days. Chard extract were given 1 h prior to the administration of VPA. On the 8th day the animals were sacrificed under anesthesia and hearts were homogenized in saline. Oxidant-antioxidant biochemical parameters were determined in homogenized heart samples. Results were evaluated statistically and discussed.

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, Spain. Ciber Obn Physiology of Obesity and Nutrition, Institute of Health “Carlos III”. Madrid. Spain

Objectives: 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). The study was a 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 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 higher educational level, more active and had less caloric intake and high alcohol intake. Multivariate-adjusted models revealed no statistically significant differences between mortality and total antioxidant capacity (Q4 HR=0.91; 95% CI 0.65-1.27 vs Q1 reI) 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.


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Objectives: 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 analyses 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.

III World Congress of Public Health Nutrition.
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.**  
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Objective: To investigate the association of eating away-from-home meals with the quality of dietary carbohydrate and fat intake and 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 quintiles for: 1) dietary fiber intake (g/d); 2) glycemic index (GI) for whole grain/total grains; and 3) ratio solid carbohydrates/total carbohydrates. The Fat Quality Index (FQI) was calculated using the ratio MUFA+PUFA/SFA+TFA. Thus, the ranges of the calculated CQI and FQI were 4 to 20, and 0.6 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 between the frequency 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 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, -0.001 (p for trend 0.032). Participants with a higher frequency (≥2 more times/week) of meals eaten out of 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 P11/02658, R10/02293, P11/06015, RD06/0045, G03/140 and B7/2010), the Navarra Regional Government (45/2011) and the University of Navarra.

**PM-125 Poster**  
**Alarming increase in prevalence in obesity by educational level and age in early pregnancy in Spain, 1993-2012.**  
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Objectives: The prevalence of overweight increased in absolute terms by more than 10% in Spain, from 1987 to 2006/2007. However although women who start pregnancy are a target group to prevent excessive weight gain during pregnancy, to date, there have been no national or regional population-based studies of pre-pregnancy obesity trends.  
To explore trends in a larger Spanish population, we examined obesity prevalence over a 20-year period at first stage of pregnancy among women who delivered live-born infants in Gran Canaria, a Spanish community where obesity prevalence exceeds the national average.  
Material and Methods: A population-based retrospective cohort study of all the pregnant women having delivered at the Maternal & Child University Hospital of Gran Canaria (HUMIGC) from 1993 through 2012, summing up 140,630 women, has been performed. A number of 4,728 participants were included or with incorrect data and participants with pregnancy-related diseases have been excluded. Finally, 135,902 participants were included in this study. Data on maternal characteristics were retrieved from the clinical registries made at the Gynaecologic and Obstetrics HUMIGC Service.  
Weight and height were measured during the first visit of women at the gynecological center, the patients were lightly clothed and without shoes. Obesity was defined as BMI 30 kg/m2. Socio-cultural status was obtained through educational level (low: primary school studies or no formal education, middle: secondary school education; high: university education or equivalent). Age was segregated into four groups: 24 years, 25-29 years, 30-34 years and 35 years.  
Results: The prevalence of obesity has increased from 8.3% in 1993 to 18.6% in 2012. This increase occurred for all age groups and all socioeconomic levels. At low socioeconomic level, the prevalence increased in absolute terms by 13.6%, in middle level by 14.3 and at high level the increase was 8.2%.  
Key findings: During the past twenty years the prevalence of pre-pregnancy obesity has been increasing among women from Gran Canaria in all age groups and sociocultural levels. This trend has important implications for all stages of reproductive health care.  
Maternal pregravid weight status is thus important both clinically, for the health care professional, and from a public health perspective due to the intergenerational nature of obesity.

**PM-126 Poster**  
**Adherence to the Mediterranean diet and QT interval duration: The PREDIMED Study.**  
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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 Ceuta Island centers 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 (p for trend=0.001), between 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, or advice to follow a low-fat diet. We did not find any significant difference in the analyses conducted according to categories of actually observed adherence to the Mediterranean diet, with b=0.08 (95% CI=0.54 to -0.53) for the highest category of adherence and b=0.04 (2.78 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 between intervention with 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.

**PM-127 Poster**  
**Chard extract reduces glycoprotein components and advanced oxidation protein products in experimental diabetic liver tissues.**  
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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 treatment 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 hexose, 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.**

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**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 enrollment. 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 (-101 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 proportion (-2% E) and dietary fat proportion (-4 g/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, P11002293, P11300615, RD060045, G03/140 and B7/2010), the Navarra Regional Government (45/2011) and the University of Navarra.

**PM-129 Poster**

**Credits4Health: Girona Pilot Nudge innovation platform for promoting healthy eating and physical activity.**

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**Objectives:** To evaluate and to inquire about their dietary habits.

**Material and methods:** The SUN (Seguimiento Universidad de Navarra) project is a prospective Spanish cohort study with continually-open enrollment. 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 (-101 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 proportion (-2% E) and dietary fat proportion (-4 g/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, P11002293, P11300615, RD060045, G03/140 and B7/2010), the Navarra Regional Government (45/2011) and the University of Navarra.

**PM-130 Poster**

**Brief theory web-based intervention targeting health professionals aiming to increase their intention on performing nutritional screening in the elderly.**

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**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-early 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 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 program consisted of 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 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 improvement in the subjective norms and the intention 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 web-based 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 (IFC) practices in rural Chittagong, Bangladesh.**

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**Objectives:** Household socioeconomic status (SES) is a major determinant...
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. Principal 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 more likely to be healthy, showed no correlation 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.

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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 polyunsaturated 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 well-being and ameliorate symptoms of MS patients.

Objectives: In this study we present a nutritional intervention on MS pa-

tients 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 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 8-iso-PGF2α after dietary intervention. Catalase activity was also affected by in-
creasing 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 expression of multiple sclerosis is still under discussion. Therefore, further studies are needed to confirm the effect of nutritional interventions in multiple sclerosis.

PM-133 Poster

Contribution of foods to energy intake according to local of consumption among adolescents.

Souza, B.S.N.; Cunha, D.B.; Sicieri, R.

Objective: The objective of the present study was to describe food intake and their contribution to energy intake according to the local of consump-

tion among adolescents of public schools in a low income city in Brazil.

Methods: Data are from baseline of a randomized community trial con-
ducted 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 unhealthy, including 'sweets and candies' (10.7%), 'sweeter 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 'sweeter

beverages' are also high (10.7% and 10.2%, respectively). The con-

tribution of 'beans' (14.3%), a healthy food marker, 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 marker, the consumption of unhealthy items remains high.

PM-134 Poster

Antioxidant effect of a low-fat diet supplemented with Le-

Ann vera extract on biochemical markers of multiple sclerosis long-term core residents.

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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 polyunsaturated 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 well-being and ameliorate symptoms of MS patients.

Objectives: In this study we present a nutritional intervention on MS pa-

tients 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 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 8-iso-PGF2α after dietary intervention. Catalase activity was also affected by in-
creasing 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 expression of multiple sclerosis is still under discussion. Therefore, further studies are needed to confirm the effect of nutritional interventions in multiple sclerosis.
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 (DXA), which is considered the 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 (GE Lunar PRODIGY. GE Healthcare, Madison, 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 (Rosscraft SRL Mercusur). Waist-to-hip ratio was calculated from these measurements.

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 could be suggested 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 (P11/01791). ImFINE and NUCOX 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.
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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 (>10g/día) frente a un consumo moderado de alcohol (0-10g/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 proyecto UNI-HIL 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 (>0-10g/día) y bebedores no-moderados (>10g/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 g/día (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 tener un año más: 1.10; [C95%: 1.03-1.16]) y ser fumador (OR: 3.41; [C95%: 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 mayor edad y el consumo de tabaco se asociaron 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.
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Aloe vera L. Burm. f. (=Aloe barbadensis Miller; Aloeaceae) “The miraculous plant” possesses succulent leaves which gel or whole extracts are commonly 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, dealing with skin disorder, 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 a-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. a-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 saline buffer (pH 7.4) and a 10% filtrate. The gel (leaf skin) were 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 a-amylase inhibitory activities. Among the three enzymes, A. vera leaf gel and skin extracts showed the best inhibition for elastase and a-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 antidiabetic activities of A. vera leaves documented by scientific research.

PM-138
Poster
In vitro inhibitory potential of Amaranthus lividus L. on some enzymes.
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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 a popular 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, nitrate, 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 a-glucosidase, a-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 leaves and flowers 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 a-glucosidase, a-amylase, neura­minidase, elastase and acetylcholinesterase activities were determined by spectrophotometric assays. A. lividus aqueous extract strongly inhibited a-glucosidase, a-amylase and elastase and moderately inhibi­ted 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 B.1,2, Lazurdo-Socorro R.3, Aparicio-Ugarriza R.2, Palacios G.3, Diaz AE1, Gonzalez-Gross M.1,2

1 III World Congress of Public Health Nutrition
Objectives: The physiological changes related to age lead to an increased risk of dehydration in the elderly and many of them do not reach their recommended daily fluid intake. The optimal amount of fluid intake in older people depends on many factors, including health status, and life style. Creatinine and osmolarity have been proposed as easy-to-use hydration biomarkers, but their effectiveness remains controversial. The aim of this study was to analyze the relationship among total fluid intake with these biomarkers and body composition in physically active and non-active elderly people.

Material and methods: 87 elderly were selected for this study (52 men, mean age 67.4 ± 7.16 yr and 35 women, mean age 70 ± 6.5 yr) divided in two groups: physically active (A) and non-physically active (N). Fluid intake was obtained by means of a specific hydration questionnaire developed by IMFINE research group. Body composition was measured by a Bioelectrical Impedance Analysis (BIA) technology using Tanita® BC-418MA (Tanita Corp., Tokyo, Japan). Serum creatinine and osmolarity were analyzed by routine laboratory methods.

Results: Median intake of daily total fluid in the A group was 1950 ml, while in the N group it was 1498 ml. According to DACH (2008) beverage recommendations for elderly, 90% of A subjects reached the recommendations, while 40% of N did not reach this minimum recommendation and are at risk of an inadequate fluid intake. Blood osmolarity was significantly higher (p<0.05) in N, but values were within the reference range in both groups.

There were not significant differences between groups for Total Body Water (TBW), Fat Free Mass (FFM), % of Fat was significantly higher (p<0.05) in N. Significant correlations were found between TBW and liquid intake (r= 0.279; p< 0.010), but not between TBW and osmolarity. Otherwise, there were significant correlations between FFM and creatinine (r=0.367; p<0.001) and between TBW and creatinine (r=0.367; p<0.001).

Key finding: Non-active subjects had higher risk of dehydration than active subjects, based on DACH 2008 recommendations for elderly. However, even if osmolarity was higher in N, all subjects were within the reference range. Osmolarity seems not to be an effective biomarker for hydration status at all in the total sample. TBW correlated positively with both total fluid intake and creatinine.

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PM-140
Poster
Changes in inadequate intake after 10 years of follow-up in a Mediterranean cohort: the SUN Project.

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Background: The 24-hour recall (24h-R) and the food record (FR) are the most used dietary assessment, but few studies have measured their accuracy in Brazil which is important for improving the estimators on diet and health association. The double label water (DLW) is the gold standard to estimate energy expenditure and has been used in the validation of dietary assessment methods.

Objective: To compare the de attenuated mean energy intake (EI) estimated from two FR and three 24h-R means with total energy expenditure (TEE) assessed by doubly labeled water (DLW).

Methods: The studied group included 84 adults between 20 - 60 years of age who were recruited from a population-based sample. EE was estimated using the DLW method during a ten-day period. Energy intake was estimated by de-attenuated means of two FR and three 24h-R in three consecutive days along a three week period before DLW procedures. Nutritional status was assessed using BMI and the WHO cut-off limits. The Wilcoxon signed-rank test and a box plot of proportional differences were used to assess the differences between energy intake and expenditure, while the Pearson coefficient correlation, the Bland-Altman and Survival-Agreement plots assessed the agreement between the estimates.

Results: The reported energy intake was lower than the EE, according to the two dietary assessment methods (FR: -763 kcal; 24h-R: -810 kcal, p<0.01). The mean underreport of energy intake among men was 27% and was higher for the females (31% vs. 24%). The highest differences (EI vs. TEE) were observed for 24h-R (+726 kcal; 24h-R: +968 kcal). Mean underreport among women was 27% and was higher for the FR (776 kcal; 24h-R: -111 kcal). The CC between EI and TEE was significant only for the FR of normal weight participants (0.46; p<0.05). Limits of agreement estimated according to Bland-Altman method were similar for FR and 24h-R (FR: 38% -122%; 35% -128%). According to the S-A plot, the food record was the method with more agreement proportions.

Key findings: Energy intake estimated using de-attenuated means of both methods was underreported. Nonetheless, the 24h-R yielded distributions of the differences between energy intake and expenditure with greater dispersion than the FR and this method presented the best agreement with EE.

PM-142
Poster
Consumption of plant food supplements in Spain: summary of usage patterns and consumer characteristics.

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Objectives: To present an overview of the main characteristics and usage patterns of plant food supplements (PFS) consumers in Spain.

Material and Methods: Data from the Spanish subsample of the PlantLIBRA PFS Consumer Survey 2011-2012 were analyzed (PlantLIBRA: a FP7-EC funded project n°245199). A cross-sectional, retrospective (12 months) survey of adult PFS consumers using a self-reported frequency-of-PFS-use questionnaire, was conducted simultaneously in six European countries (Finland, Germany, Italy, Romania, Spain and United Kingdom), from May 2011 to September 2012. Survey respondents were invited to fill in a survey form for each product type. A final Spanish sample of 402 adult PFS consumers (174 males and 228 females) were interviewed (from 1743 screened individuals recruited in four cities spread across Spain). Results: 63.7% and 13.4% of Spanish consumers had a medium and high educational level respectively, and 22% used other types of supplements (other than PFS e.g vitamins). Analysis of PFS consumption is summarized as follows: 284 different products, from 97 manufacturers, containing 218 different botanicals (with a maximum number of ingredients per product of 30). 85.8% of consumers, in the previous 12 months,
consumed one product (mainly a single botanical), 11.9% two and 2.2% more than two. The total number of products consumed was 645. The main dose forms used were capsules and pills/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 PS in Spain that can be compared with other European countries. Given the increase in PS consumption, and the few existing studies, it is recommended that nutritional studies include assessment of these type 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.
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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 triglycerides levels with HDL-cholesterol (TG/HDL-C) levels. The anthropometric variables measured were waist circumference, body mass index, waist-to-height ratio, and concentricity 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 indices 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.
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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 iron deficiency 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 analyses 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 supplementation.

PM-145 Poster
Comparison of functional autonomy and associated factors in elderly patients with or without metabolic syndrome.
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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 GDLAM. 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 with or 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.
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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 were classified as having metabolic syndrome and depressive symptoms, 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 37 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 brown. 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.
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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 following a 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 included. Data were developed 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. Parental perceptions on the Mediterranean diet as healthy, traditional diet pattern. Mothers appear to have 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 stated that it is an important meal that promotes healthy eating. Others emphasized the social benefits of the program for the families in need. All children 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?
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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, K, Ca, Mg, Mn, Zn, Cu, Cr, Se, Fe, P) were measured in breast milk samples during both early (<45 days, n=52) and later (4-60 months, 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 FAOWHOO/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. Then, mineral concentrations in breast 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 established 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, K, Ca, 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.
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 chemoprevention 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 chemoprevention (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.

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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/height²) was obtained in baseline and after two years. Weight status was classified by the sex-and-age specific sex body mass index cut-offs based on World Health Organization criterion. “Change in weight status” variable was categorized in three levels: “no change”, “overweight changed to normal weight” and “normal weight changed to overweight”.

Sociodemographic data were gender, type of school (private or public) and skin color, obtained by applying a self-administered questionnaire. The relations between these variables were assessed by the chi-square test and 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. From 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 normal weight in baseline changed to overweight three years later (p=0.018). Analysis were adjusted by 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 five times a week, while weight loss 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 in Brazilian adolescents.


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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.

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 dietary patterns and micronutrient intake during 7 days at 34 weeks of gestation using the validated “Spanish Food Tables” included in the CSNID software.

Maternal age, pre-conceptional body mass index (BMI), type of birth, marital status, educational level, employment status and area of residence were included in the statistical analysis as confounder factors. One way ANOVA and Kruskall Wallis test were performed using the IBM SPSS Statistics version 21.0.

Results: 16.66% of the studied participants had DPP at 6 weeks postpartum. The DPP was independent of all confounders analyzed. The dietary intake of fiber, potassium, magnesium, iron, zinc and vitamins B1, B6 and niacin was significantly lower in the risk group DPP versus NDPP group (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 resulted 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 daily intake and self-rated dietary habits during pregnancy could be a protective factor for developing postpartum depression.

*Supported by the Andalusian Government. Economy, Science and Innovation Ministry (PRE08E Excellence Project ref. PDI-CTS-G341).

PM-154

Poster

Nutrimetry: the scoring of Height and BMI.


Objectives: To present a simple method that could be used as an epidemiological instrument that can help survey the malnutrition.

Material and methods: The calculation of Nutrimetry (Nutrimetry) are based on the 2-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, 6 for BAZ≤-1, 3 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
PM-155

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 there is constant exposure to toxic waste predispositions of pesticides used in agriculture, HAP’s by wood smoke in homes and pollution by defecation 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 of 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

High capacity of clays for the mycotoxin detoxification in food and feed.


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Mycotoxins are secondary metabolites produced by fungi that may 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 mycotoxicosis, 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 absorbents 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 absorbents is the most applied way of preventing 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 absorbents 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). MITT and LDH assays were used to test cell viability in presence of mycotoxins-contaminated diets with the hope of being effective in the gastro-intestinal tract more in a prophylactic rather than in a therapeutic manner.
PT-001
Poster
Nutrientes lipídicos en la población de la Marina Schizochytrium sp. Micro R., Toledo Marante E.F.1, Bravo de Laguna H.1; González González J.E.2, Santiago Rodríguez L.J.3
1Universidad de Las Palmas de Gran Canaria, 2Universidad de las Palmas de Gran Canaria, 3Departamento de Ingeniería de Procesos.

Objetivos: Abordar el estudio de los nutrientes aportados por el organismo heterotrófico Schizochytrium sp., el cual se obtiene industrialmente por fermentación. Se pretendia 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 pretendia elucidar la aplicación de este microorganismo como fuente de grasa insaturada.

Material y métodos: Por maceración del polvo de Schizochytrium sp. con díciclorometano 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 monitorizan por comatografía 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 etílicos de ácidos grasos saturados e insaturados, mono-, di- y tricíclicos –saturados e insaturados–, fenoles, ácidos grasos monoenóicos y sesquiterpenos.

Conclusiones: Schizochytrium sp. produce gran cantidad de lípidos, incluyendo componentes con ácidos grasos insaturados, lo que lo habilita como un microorganismo aplicable en nutrición funcional.

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PT-002
Poster
Seasonal food variety and dietary diversity in relation to the nutritional status of women in a rural community in KwaZulu Natal in South Africa.
Napier CE and Noelle N.
Durban University of Technology.

The aim of the study was to determine the effect of seasonal food variety, dietary diversity and nutrient adequacy on the nutritional status of women in a rural area. A hundred adult women in a rural KwaZulu Natal farming village in South Africa were weighed and measured and BMI determined and classified according to the WHO cut-off points for BMI. Waist circumference was measured in order to determine the waist-to-height ratio. Twenty four hour recall questionnaires were used to determine actual intake compared to dietary reference intake (DRIs). Food Frequency Questionnaires for a period of seven days were completed, captured and analysed for descriptive statistics in order to determine Dietary Diversity and Food Variety. Seasonal food consumption patterns and dietary intake behaviour were assessed over the four seasons.

Production from crops differs in different seasons. The community is more food secure in winter and spring due to the high number of food items harvested from crops. Anthropometric measurements indicated that 41.2% of women between 31 and 50 and 49% of women between 51 and 70 years of age had a BMI of 30 or above. About 44% of total women are obese and 25% are pre-obese. Only 25% had a normal weight. The 24 hour recall analysis indicates that the high level of obesity could be due to the fact that a high number of participants consuming large amounts of carbohydrates every day and the low consumption of fruit and vegetables in all seasons but more specifically in summer and autumn. The overall nutrient intake of the women is poor since most respondents consumed less that 100% of DRIs in most nutrients especially protein, zinc, vitamin A and calcium.

Overall results in this study indicated that this rural community is food insecure, but more so during summer and autumn, which leads to the consumption of un diversified diets. The women are malnourished and obese with a high level of metabolic syndrome. The information obtained in this study can be used to formulate strategies to develop interventions that can be used to access sufficient food in rural areas in order to improve food insecurity, dietary diversity and, therefore, nutrient adequacy.

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PT-003
Poster
Affect of personal preference in food and beverages to decrease the sense of taste in Japanese student.
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1Jissen Women's University, 2Senshu University, 3Tokyo University of Information Science, 4Waseda University.

Objectives: Food preferences in humans are determined by sensory responses to the taste, smell, and texture of foods and beverages. Of these sensory responses, taste is considered the major determinant of food and beverages choice behavior. Of the primary taste stimuli, sweet taste generally signals a pleasurable experience. However, this desire for sweet-tasting foods may contribute to metabolic syndrome and obesity, hypertension, diabetes and dental caries. Taste preferences for sweetness show age-related differences, and these preferences may be influenced by genetics, race and ethnicity, or nutrient deficiencies. The purpose of this study was to evaluate the relationship of affect intake junk food between the low-salt threshold amount of sweet, salty and acid taste for the preferences in Japanese student.

Material and methods: There were participated in this study 260 Japanese students (male:118, female:142). It was applied the mainly 2 question items (frequency intake the junk food and snacks). After these questionaires interview, it was experiment of sensory evaluation for sweet (acid taste), salty and acid taste (zinc sodium) of threshold level for three different concentrations, 1%, 2% and 3% intake the watery solutions, respectively. All subjects were sensory evaluation for response 6 pattern of analog scale sensory evaluation, for example very very sweet, very sweet, not easy sweet, not sweet and completely insensible. It was analyzed cross table between question item of daily foods variation and sensory evaluation of preference in watery solutions.

Results: There was no significant difference between questioned of dietary habit and acid taste performance of sensory evaluation test. However there were significant difference between frequency of junk food and salty sweet sensory evaluation test. It was showed the connection between diet and personal preference of taste sensation in childhood and young people.

Key findings: Due to this sweet treat in daily life habit, they have a strong desire for sweet-tasting foods. It was finding out the nutritional education was one of the most important in proper taste behavior for prevention diseases associated with adult lifestyle habits.

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PT-004
Poster
Detection of overweight, obesity and / or hypertension in women 30 to 60 years of age in the city of Puebla, Mexico, attending Health Clinic No. 1.
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Objectives: According to information of the Mexican Social Security Institute (IMSS), 78 beneficiaries die daily for causes associated with obesity, with the immediate antecedents to the development of diabetes. The focus of this ultimate evil and its complications represent an investment of 54 million pesos per day in the three levels of care in this institution. With regard to the numbers in Mexico, adult women top the list of obesity and overweight, 29% of them versus 19% of men, this problem is compounded because Mexicans have a perception that having a few extra kilos without symptoms is healthy hence they don’t consider taking preventive actions, so it is necessary to identify overweight and obesity and its possible correlation with hypertension especially among women.

Material and methods: The participation of women filling the following requirements were requested: Assist the Health Center No. 1, voluntary and with full consent, aged between 30 and 60, apparently healthy. It was performed measurements of weight, height, waist and blood pressure to the women participants. Finally we proceeded to detect possible cases of overweight or obese and their possible correlation with central obesity and / or hypertension. The data were coded and processed with the R-digma statistical Babel package for their analysis.

Results: 133 women participated, 52 between 30 and 40 years old, 34 between 40 and 50 and 47 women over 50 years old. Of the women, only 25% had a healthy weight, 42% overweight and 33% obese. The average percentage of body fat was 39.6%, waist circumference of 94.4 cm and BMI of 28.6. With regard to blood pressure values of the 27 women who reported suffering from hypertension, only 6 (4.5%) gave values of pressure at the time of measurement. In contrast, two women who reported not suffer from hypertension, had higher values at the time of measurement. Only one woman reported underweight.

Key findings: No correlation between age and BMI, waist circumference, body fat or hypertension was found, however alarming that only 25% of the studied population had adequate anthropometric values, since the percentage of overweight in the population was 42% and 33% obese. Although 27% reported suffering from hypertension at the time of measurement was detected only 6% with high blood pressure values, indicating that close follow-up of overweight or obese should be done regardless of suffer from the disease or not.

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PT-005
Poster
Food Habits in the population of a slum in Iquitos (Peruvian Amazon).
Molina Rejo, G., Moreno Rojas, R., García Rodríguez, M.; Vaquero Abellán, M. University of Córdoba.
 objetivo: 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-hour 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 high 1,344 mg/day. All groups exceeded this recommended level. Some vitamins are suitably provided (vitamin C and B12). On the other hand the ingestion levels of vitamin D,B9, B1 and B6 are really low, and vitamin A levels are very low (less than 50%) than the recommended percentage of the RDA.

main findings: this type of study may be useful to assess the intake of the indigenous population that migrates to the city (situation very widespread throughout the Amazon that also is taking place in Brazil and Bolivia) where the migrants are involved in a state of transition between the life in the jungle and in the city. This transition is translated about eating habits of their ancestors who lived in balance with the food resources of the forest. Unfortunately is being lost, which threatens the nutritional status of these communities.

PT-006 Poster Prevalence of overweight and obesity among adult population in a Mexican-USA border city. Pérez-Morales ME,1 Hernández-Navarrete TY,1 Alcántara-Iurado LA,1 Hurtado-Ayala LA,1 Bacadí-Gascón M,1Jiménez-Cruz A2 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 (OB) among ≥18 year old Mexicans living in Tijuana, Mexico. Material and methods: Total adult population greater than or equal to 18 years was 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 (BMI=kg/m²) was calculated and the WHO (2000) cut-off points’ criteria for BMI status (OWA=25.00 kg/m², Ob ≥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=369). Mean BMI was 26.3 ± 5.2 kg/m². The prevalence of overweight and obesity was 74.1% (39.5% and 34.2% respectively). The prevalence of overweight in females was 36.2% and of obesity 10.9%. In males the prevalence of overweight and obesity was 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. Efforts to present obesity and AO including pre-gestacional, pre and postnatal periods, and changes in all the contingencies which increases this pandemic are the highest priority.


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.

material and methods: An anthropometric study was conducted in the town of Zacatlán, located in the northern part of Puebla to 121 km from the state capital. The study was approved by the school principal and parents to meet the criteria of ethics. The sample consisted of 461 children with an average age of 10.03 ± 0.89 years. Three anthropometric measurements (weight, height, and BMI) over a six-month intervals from the beginning and a questionnaire on habits of children and parental nutritional knowledge was applied.

results: Towards the end of the study, it was observed that the percentage of those with lower height for age was reduced, confirming the observation that changes during the study are mainly due to the effect of normal growth. The measurements along the study showed an overall decrease of BMI, with a low birth weight (0.9% to 0.2%), an increase of overweight (17.8% to 19.5%) 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 j/ or 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 considering observed 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 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 MASL). 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 352 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 SPSS V15 and Minitab 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 and 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 additional analysis of the 10th and 90th percentiles. With this methodology was obtained lower Z-scores of height-for-age than with NCHS, being the farthest curve from the median. The new WHO standard would be the most accurate and realistic standard used to determine the Z-scores, and it should be officially adopted for the nutritional assessment in children under 5 years in Peru.

PT-009 Poster Sweetened, energy, alcoholic, and milk beverages, and calorie intake among Mexican college students. Gómez-Miranda LM1, Caravall-Meza NY2, Bacardi-Gascón MP, Jiménez-Cruz A2 1International Journal of Community Nutrition 2014, 0(suppl)
The aim of this study was to evaluate the effect of menopause and perimenopause on various biomarkers, including Tumor Necrosis Factor-a (TNF-a), IL-1a levels, and anabolic markers in women. The study observed a higher prevalence of overweight and obesity in women compared to men. The prevalence of overweight obesity and abdominal obesity was assessed, and waist circumference (WC) was measured by enzymatic method. Rank differences of drinks and energy beverages intake were compared to non-drinkers younger men and women. People older than 21yo consumed more energy beverages than women (p = 0.044, 0.03 respectively). Older people showed more protective effects seen amongst younger women. Energy beverages intake was higher than 21yo consumed more sugar sweetened beverages than women (p < 0.001). The study showed that BMI was a predictor of obesity (OR=7.6; 95% CI: 4.3-13.6), metabolic syndrome (OR=2.3; 95% CI: 1.3-4.0), hyperglycemia, and type 2 diabetes (OR=2.2; 95% CI: 1.2-3.9) in adults. Subjects with overweight in childhood and in adulthood had the highest odds of CVD risk factors: OR for hypertension was 3.2 (95% CI: 1.7-6.2), OR for metabolic syndrome - 4.4 (95% CI: 1.4-13.7), and OR for low HDL cholesterol - 13.2 (95% CI: 1.3-12.0). Those with normal BMI in childhood and overweight in adulthood also had significantly higher odds of CVD 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 dietary fiber was the lowest (17.7+8.1 g) compared to other two groups. No significant differences were found amongst younger women. The study demonstrated that dyslipidemia and high cytokines such as IL-1a and TNF-a were prevalent in perimenopausal and postmenopausal women which leads to an increase in the spread of inflammation and risk of cardiometabolic disease.

**PT-011**

**Poster**

**Overweight in childhood and adulthood, nutrition and cardiometabolic risk: Kaunas cohort study.**

Petkevičienė J, Krioničiūnė V, Kumbiene J, Raskiliene A, Lithuanian University of Health Sciences, Medical Academy, Faculty of Public Health.

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 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 (BP), anthropometric and biochemical parameters, and low HDL cholesterol, blood glucose and insulin, haemoglobin and haematocrit. In adulthood, nutrition and cardio­vascular behaviour were evaluated. 24-hour recall was used for evaluation of dietary habits. For the definition of childhood overweight and obesity, IOTF criteria were used. In adulthood, BMI>25 kg/m2 was considered as overweight. The participants were categorized into three groups: 1) normal BMI and no overweight in childhood and normal BMI in adults; 2) overweight in childhood and in adulthood; and 3) normal BMI in childhood and overweight as adults. Multiple logistic regression analysis was used to calculate the odds ratios of CVD risk factors in the second and the third group compared to the first group.

Results. Childhood overweight was a predictor of obesity (OR=7.6; 95% CI: 4.3-13.6), metabolic syndrome (OR=2.3; 95% CI: 1.3-4.0), hyperglycemia, and type 2 diabetes (OR=2.2; 95% CI: 1.2-3.9) in adulthood. Subjects with overweight in childhood and in adulthood had the highest odds of CVD risk factors: OR for hypertension was 3.2 (95% CI: 1.7-6.2), OR for metabolic syndrome - 4.4 (95% CI: 1.4-13.7), and OR for low HDL cholesterol - 13.2 (95% CI: 1.3-12.0). Those with normal BMI in childhood and overweight in adulthood also had significantly higher odds of CVD risk factors compared to the first group. Diet and physical activity 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 dietary fiber was the lowest (17.7±8.1 g) compared to other two groups. No significant differences were found amongst younger women. The study demonstrated that dyslipidemia and high cytokines such as IL-1a and TNF-a were prevalent in perimenopausal and postmenopausal women which leads to an increase in the spread of inflammation and risk of cardiometabolic disease.
mean serum levels of folate, vit B12 and ferritin were 17.1±7.4 (nmol/L), 405±166.4 (g/mol) and 64.4±51.8 (pg/mL), 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 (C95%: 1.01-2.78) and OR: 4.9 (95% CI: 1.06-21.91) for boys and girls, respectively). The positive predictive factor against anaemia (OR: 0.58 (C95%: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 responsible for anaemia. Further studies are needed to assess the 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.
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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 to inflammation and obesity. The aim of this study was to see if different hypocaloric diets can reduce lipid peroxidation and inflammation markers in obese rat.

Materials and Methods. Five weeks old male Wistar rats were kept in individual cages on a 12 h day-night cycle at 24°C and fed with a high fat diet during 4 weeks. Obesity levels were randomly divided into three groups and consumed a low-carbohydrate diet (1.16M), a caloric 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 (glycemia, insulinemia and glycosylated hemoglobin) was estimated. Serum lipid peroxidation markers (thiobarbituric acid reactive substances, hydroperoxides and isoprostanes) and inflammatory adipokines concentrations (leptin, adiponectin and tumor necrosis factor alpha) were determined.

Results. In low-carbohydrate diet and calorie restricted diets versus normal caloric diet, glycemia (-38% and -32%, respectively), insulinemia (-75% and -67%, respectively) and glycosylated hemoglobin (55% and -23%, respectively) were decreased. Also, serum thiobarbituric acid reactive substances (-34% and -37%), hydroperoxides (-38% and -35%), isoprostanes (-45% and -42%), leptin (-13% and -23%) and tumor necrosis factor alpha (-25% and -24%) were reduced. Moreover, 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 inflammatory profiles.

PT-014
Poster
Substitution of sardine oil by margarine increased adipose tissue enzymatic antioxidant defense in obese rats.
Hamza Reguig S.; Boukhari 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. Eight-week-old male rats, 6 rats per group were randomly divided into two groups (n=24) and consumed during 1 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). At d60, obesity levels were measured by sardine oil and 60, the cholesterolemia and triglyceridemia were estimated. In adipose tissue, the lipid peroxidation markers (thiobarbituric 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 change significantly when sardine oil was replaced by margarine. In contrast, the substitution of margarine by sardine oil, reduced cholesterol and triglyceridemia levels (-35% and -57%, respectively). In adipose tissue, thiobarbituric 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 content (-13%) and increased vitamin E content (+13%) when margarine was replaced by sardine oil. Superoxide dismutase and glutathione 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 markers in adipose tissue by attenuating antioxidant defense and seems efficient in adipose tissue against the cytotoxic action and the oxidative stress induced by a fat enriched diet.
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 7-15 years inhabiting rural areas: A repeated 30-year cross-sectional study.**  
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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 Pomerszania 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 farther 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 =0.0001; SCSF P=0.001; ASF P=0.002), and in boys at all periods (P-value from 0.003 to 0.0001). Our study uncovered that both groups specified by proximity to the city were 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. In children whose domicile 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 an increase in the distance the tendency to overweight measured by skinfold thickness decreased.

**PT-018**  
**Poster**  
**Iodine deficiency prevention affected by salt reduction policies.**  
**Melo-Ruíz V., Sánchez-Herrera K., Calvo-Carrillo C., García-Núñez M., Díaz-García R.¹**  
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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 the result is stunted growth and neurological development 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 junmil 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 avoid 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 effects to the brain from the second trimester of pregnancy to the third year after birth. 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.**  
**Avashahla S.1,2, Lahmann H.P.2, Williams G.M.1, van der Pols J.C.2**  
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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 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 founders.  

Results: Participants born more recently were heavier, on average, than those in the same age group 15 years earlier, but there was no such secular trend in WC. Age at baseline 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 larger yearly increase in WC 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, especially in women.

**PT-020**  
**Poster**  
**What works (and why) in community nutrition education interventions directed at low-resource audiences.**  
**Bell LL., Cates SC⊥**  
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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 the evidence-based curricula. Process evaluation data were used 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
The intervention as intended or managed had significant impacts on FV consumption and use of fat-free/low-fat milk. The intervention targeted older adults 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 limited or 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.
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1University of Hawaii at Manoa, Honolulu, HI; 2Instituto 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 sort each pile and explain their groupings. In addition, they were asked to order the foods pictured from healthiest to least healthy. Multidimensional scaling and hierarchical clustering analysis was completed with pile sort data. 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 used most often to describe the main groupings identified: 1) junk food (non-nutritive, tasty, expensive, chemical); 2) grains and legumes (healthy, tasty, lunch foods); 3) vegetables (prevent disease, natural); 4) meat (favored, fatty, contain hormones); 5) dairy/breakfast foods (consumed daily, contain protein); 6) fruit (prevent disease, contain vitamins). Relationships among food beliefs and cluster membership were analyzed using Spearman correlation coefficients. Between (r) meat and dairy, there was a significant positive correlation (0.580; p<0.0001). Significant negative correlations were found between meat and: 1) vegetables (-0.742; p<0.0001); 2) fruit (0.580; p<0.0001); 3) dairy (0.771; p<0.0001); and 4) soda (0.594; p<0.0001). These results should be considered in the cultural perceptions and importance of particular foods, taking into account the diverse factors that influence eating behaviors.

PT-022
Poster
Puffer fish and tetrodotoxin: The doubt between eating or not to eat.
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Centro de Investigación Interdisiplinar Egas Monzón, CIEM, Instituto Superior de Ciencias de la Saúde Egas Monzón, ISCSEP, Portugal.

Materials and Methods: Puffer fish is a traditional delicacy in Japan, where it is named fugu. Its fame and commercial importance have been spreading to other countries like United States of America, where its consumption has been increasing over the years. Tetrodotoxin and puffer fish have been studied as a result of intoxications that occurred and still occur, and to deepen understanding this neurotoxin and its intoxication form, as well as the resistance mechanism of puffer fish. The first intoxication was reported in 1959 in Japan, and before the efforts to prevent further poisoning, intoxications still occur worldwide. There is no treatment for this neurotoxin poisoning, so prevention is the key to avoid certain risks or even death.

The aim of this study is to review recent researches about puffer fish and tetrodotoxin, the production of tetrodotoxin and its accumulation process on puffer fish, and realize if there are any reasons to limit its consumption. Several studies were selected according to risk relevance associated with puffer fish consumption, as well as its economic and social impact.

Results: Evidences showed that some puffer fish species are more toxic than others, depending on part of the fish, presence of highest toxicity in liver and ovaries, followed by gut, skin and muscle. Some cooking processes decrease the tetrodotoxin amount, reducing the risks associated with its consumption. Tetrodotoxin is produced by marine bacteria and reaches puffer fish by food chain. However, it can also be produced by the fish itself as a result of an external stimulus, being puffer fish unaffected by tetrodotoxin produced by itself because it developed a resistant mechanism.

Key findings: In the past five years, 432 cases of intoxication and 52 deaths correlated with puffer fish has been reported. Puffer fish has immigrated due to human activities and global warming reaching other places, which caused a negative environmental impact, because it changed the ecosystem. Furthermore, implies the development of epidemiologic analysis of fish specimens, changes in fishing practices and enforcement of rules and laws to protect people. Besides that, foodborne illnesses present as costs associated with foodborne outbreaks, treatment costs, employer costs and food industry losses, resulting from low sales and lower stock prices. According to the reasons mentioned above, the consumption of puffer fish should be limited but despite that, it remains very popular in various locations.

PT-023
Poster
Osmolality and osmotic constituents in 24-hour urine samples from Guatemalan preschoolers consuming a common dietary offering.
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Objective: Given the fact that the osmotic load in the urine is derived, in part, from elements in the diet either in their original form such as the sodium and chloride of salt or as metabolites of organic substances such as protein and that urinary volume is determined by beverages, water in food, and water generated by oxidation of macronutrients, we undertook a study with the objective to examine the relationship of selected analytes in the urine with urinary osmolality (Uosm) in preschool children attending day-care centres offering a common menu fare in Guatemala.

Materials and Methods: 24-h urine collections were conducted in 64 preschool children among three day-care centers of the SOSEP system in Guatemala. Uosm was measured on a Gonotec, Osmomat 030 osmometer (Berlin, Germany). The following characteristics/analytes of the urine were measured by standard, clinical-laboratory methods: urinary urea (UA); sodium (Na); potassium (K); calcium (Ca) and magnesium (Mg). A probability value of <0.05 was considered statistically significant for Spearman correlation coefficients.

Results: Uosm median value was 397 mosm/kg of urine, with a range of 115 – 774 mosm/kg. The respective median values for the analytes measured were: 15.6 mg/dl (UA); 100 mg/dL (NCO); 1791 mg/L (Na); 1124 mg/L (K); 59.4 mg/L (Ca) and 49.6 mg/L (Mg). The Spearman correlation coefficients (r values) for the within-sample associations of Uosm with the analytes, in descending order of strength of correlation were: 0.836 (Na, p<0.0001); 0.771 (Ms, p<0.0001); -0.742 (NCO, p<0.0001); 0.580 (K, p<0.0001); 0.289 (Ca, p<0.0001); and 0.204 (UA, p=0.417).

Key findings: We confirm that the content of four minerals (Na, K, Ca, Mg) are directly associated with Uosm, whereas another organic constituent (NCO) in urine is strongly -- but negatively -- associated. Not unsurprisingly, urinary Na had the strongest association with Uosm, followed interestingly by Mg, and thirdly (inverse) by NCO. The emergence of these anticipated relationships provides a certain degree of internal validation for the analytical accuracy of the principal osmotically-active constituents measured.

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PT-024
Poster
Bone mineralisation status of soldiers doing military service in different types of Polish Army units.
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For proper construction and functioning of human skeletal system a very important thing is adequate supply of calcium, which content in daily rations, in addition to genetics, degree of physical activity and level of sex steroids, is an essential factor influencing on bone mass. 

Aim of the work: The aim of the work was to assess bone mineral status of regular soldiers doing military service in different types of Polish military units.

Method: An assessment of bones calcification and protein-energy nutritional status of 1913 men, soldiers doing military service in different types of military units, was made.

Bone height and body mass were determined by standard methods using a stadiometer and scales. Bone mineral density was measured by DXA densitometry on forearm bone of non-prevailing arm, using the EKA 3000 apparatus.

Results: Results of densitometry showed that 1594 soldiers, that is 83.3% of subjects had standard bone calcification. Bone mineralization characterization was assessed according to Z-score, that is 15.9% of examined, while 15 subjects (0.8%) revealed changes characteristic of osteoporosis.

Conclusion: Bone mineral density of 16.7% of examined soldiers serving in different types of military units indicates presence of abnormalities in bone calcification with varying degrees of severity. It is advisable to take among soldiers an extensive health promotion regarding dietary health education aimed at nutritional prevention of bone mineralization disorders.

PT-025 Poster

A comparative study of nutritional problems in preschool aged children in Nepal.

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Introduction and Objectives: This paper explores diversity of cultural beliefs, knowledge and habits about food and nutrition that have affected health in past and present day. 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.

Sample: A questionnaire 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, piloting and survey from 25 June to 27 September 2012.

Analysis: Quantitative data was analysed using SPSS (v20.0) reporting mothers’ knowledge, attitudes and beliefs in respect of their children’s nutrition. Results are presented in cross-tabulated form. A thematic analysis was used in the qualitative data analysis. Ethical approval has been obtained from the Nepal Health Research Council and Bournemouth University.

Results: The study included more urban mothers (56%) than rural ones (44%). Major barriers to recommending nutritious foods included: lack of knowledge (21.8%); high prices (19%); and cultural beliefs (6%). The study showed nearly 55% children were provided with fruits once in week. Almost 15% of mothers never gave salad to their children and 6% of mothers could not choose nutritious food from the grocery store, 12% of the respondents lacked food. The majority of children (57%) had been taken at least once to a spiritual healer for treatment and 16% more than once. 20% of mothers believed eating green leafy vegetables and fruits during illness affected child health. Only 8% of the respondents provided meat, fish, egg and milk during times of illness to their children. Green leafy vegetables were rarely given to their children. Alike, children occasionally received other vegetables and fruits. Social worker (FGD) said that the soldiers’ beliefs that green vegetables and fruits cause common cold, diarrhoea and stomach-ache in children. According the Pharmacists (FGD) poor communities believed that nutritious foods are luxurious/ unaffordable and family conflict. Mothers (FGD) thought that if a pregnant woman eats more, she will have a bigger baby and a difficult delivery.

PT-026 Poster

Physical activity in preschool children measured with actiheart monitors.

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Background and main objective: There are scarce records of physical activity in children of developing countries.

Methods: With this objective, 77 preschoolers (5.9 y of age, 37 girls, 40 boys) were evaluated according to WHO growth standards; total daily energy expenditure (TEE) was measured by Actiheart monitors, each 15 seconds during two-weekdays and 1 week-end-days, values were weighted for a week, and cleaned with the software of the University La Plata, Argentina.

Results: Boys with similar age and BMI, showed higher TEE values than girls (1489 vs 1372 kcal/d; p=0.03), and also per kg body weight (68.5 vs. 59, p=0.04). As a consequence of the boys’ higher BMI (1013 vs. 944 kcal/d, p=0.014), the PAL values of boys and girls were low (1.44 and 1.45) and not different (p=0.87). Normal vs. overweight boys showed higher TEE (72 vs 57 kcal/kg, p=0.000003) in spite of the higher BMI of the overweight boys (1195 vs 957, p=0.000003). Overweight boys expended less time than the normal ones in moderate+heavy physical activity (35 vs. 101 min/d, p=0.011) and showed lower values of energy expended in physical activity (AEE, 16 vs. 23 kcal/kg, p=0.03), and similar Physical Activity Level (PAL, 1.40 vs. 1.47, p=0.42), but not girls (58 vs. 94 min/d, p=0.19) (AEE, 17.2 vs. 17.9 kcal/kg, p=0.75) (PAL, 1.49 vs. 1.35, p=0.23).

Conclusion: Cuban preschool children showed all a low physical activity level; half of them did not accomplish the daily physical activity recommendation.

PT-027 Poster

Reduced acid load of the macrobiotic ma-Pi diet improves glycemic control and cardiovascular risk factor in type 2 diabetes.

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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 IPA, Rome. Subjects were submitted to anthropometric, body composition, biochemical, and blood pressure records. Data at onset and termination were compared.

Results: The lower diet acid load was evidenced by the 7% increase in urinary pH (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: leucocytes, 18% (p=0.0000); glycemia, 35% (p=0.0000); insulinemia, 58% (p=0.0000); HOMAZ-IR, 69% (p=0.0000), total cholesterol, 24% (p=0.0000); LDL, 24% (p=0.0000); triglycerides, 53% (p=0.0000); urea, 45% (p=0.0000); homocysteine, 17% (p=0.0002); microalbuminuria, 81% (p=0.0000); systolic blood pressure, 8.3% (p=0.0000); and diastolic blood pressure, 7.5% (p=0.0000).

Conclusions: The macrobiotic Ma-Pi diet improved, at short term, insulin resistance and decreased the cardiovascular risk in type 2 diabetic patients. The reduced lower acid load was evidenced.

PT-028 Poster


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Objective: The objective of the study was to assess the nutritional status of under-five children in orphanages of Federal Capital Territory, Nigeria using anthropometric parameters of weight, length/height and upper arm circumference.

Material and Methods: The study was conducted using 200 orphans (96 males and 104 females) aged between 0-59 months living in 10 orphanages in Abuja, Nigeria. Anthropometric indices of the children were assessed using height/length, weight and upper arm circumference. The weight of each child was measured using a Seca 881 (UNIS scale). The length measurement of children 0-2 years was taken lying down (recumbent length) with portable (crown-heel) length measuring board. Heightometer was used to measure the height of children 25-59 months. The upper arm circumference was determined using a Shakti'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 software version 3.2.3.1 designed for application of the WHO child's growth standard in individuals and population 0-60 months.

Result: The result showed that 45.5% of the orphans were overweight, 63.5% were stunted while 47.5% were wasted. Further categorization revealed 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 who were stunted, wasted and...
underweight indicates that many children in the orphanages were malnourished. 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 malnourished. 7% of studied schoolchildren presents the high 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 and the rates of overweight and obesity, the rate of overweight children in 2013 were 47.4% in boys and 43.2% in girls. Some schools offer healthy foods and snacks; 76.5% - candy, sweet snacks, 68.2% - soft drinks with sugar, 36.9% - fresh fruits, 30%, 7% - milk. In 2013 pupils can obtain in 19% of schools - chips and salted snacks, 54.4% - candy, sweet snacks, 27.8% - soft drinks with sugar, 85.9% - fresh fruits, 44.4% - milk. Key findings: Overweight and obesity among 7-year-old children in Bulgaria is still a serious public health concern. The reviled trends in school environment will be the base for future improvement of nutritional status of school children.

PT-031	Poster
Association of bullying with the nutritional condition in teenagers between 11 to 13 years in Mexico City. Radilla C1, Gutierrez R2, Vega S1, Gonzalez G1, Radilla M1 and Flores R1.
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One of the principal problems that is taking seminar 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 empirical evidence, bullying has a negative aspect in the teenager development. The research on student violence and victimization indicates that the implied teenagers suffer, in many occasions, serious psychosocial consequences. The bullying brings with it immediate consequences like the autococept 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 girls and 32.6% to the second one, of which 46.7% is women and 53.3% remaining men. By means of the application of CURMIC-S questionnaire and the use of Who Anthro Plus program, obtained the diagnosis of bullying and the nutritional state respective. There was a overweight prevalence of 25.9% (23.8% for women and 27.8% for men), underweight prevalence of 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 such situation of school harassment. Analyzing the presence of bullying for school shifting 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 women present major probability of suffering some type of school harassment (46.0 %), in comparison with men (27.8 %), being the statistically 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 %), however it does 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-032	Poster

Objectives: Calcium and vitamin D are important nutrients for children to assess the dietary intake of these two micro-nutrients in children between 2 to 12 years old, data from 4265 children in the National Health and Nutrition Examination Survey 2007-2010 were analyzed.

Results: for calcium intake, we found that the percentage of children below their estimated average requirement increased with age, from 3.2% in age group 2-3y to 28.1% in age group 4-6y, and further increased to 61.5% in age group 8-12y. This trend might reflect the change of dietary habits in these ages. Among different ethnic groups, the highest percentage of children below estimated average requirement was in Non-Hispanic Blacks. No difference was found when comparing different income groups using the poverty income ratio as an indicator. In general, more girls were below the estimated average requirement than boys within the same age, ethnic and income group. Most children in this study had inadequate vitamin D intake, approximately 80% of them were below the estimated average requirement. The percentage of children below estimated average requirement of vitamin D decreased to 81.9%, 63.5% and 76.9% in Non-Hispanic Black, Non-Hispanic White and Hispanic groups respectively. Similar supplement effects were also observed in different income groups, and higher income groups had fewer children below the requirement.
Key findings: These results suggest that it is still a big challenge for US children to meet the requirements for calcium and especially for vitamin D. Girls and Non-Hispanic Blacks are more likely to have inadequate dietary intake of calcium and vitamin D. Food sources of these micronutrients need to be promoted.

PT-033
Poster
The role of household salt in iodine deficiency prophylaxis in Poland.
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Objectives: The Polish territory has been classified as an iodine-deficient area. In 1997 the national programme of obligatory iodisation of household salt was implemented. Household salt should contain potassium iodide (30 ± 10 mg KI/kg of salt) or potassium iodate (39 ± 13 mg KIO3/kg of salt) which corresponds to 2.3 ± 0.77 mg of iodine/100g of salt. The aim of the 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, 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 4.6 μg (girls) to 102 μg (boys). The comparison of individual iodine intake to EAR values showed that 62.4% 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: The role of household salt in iodine deficiency prophylaxis is 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
Poster
A multi-stakeholder approach to explore commitment and capacity to address infant and young child feeding practices in the Breede Valley District, Western Cape, South Africa.
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Background and objective: The Community Nutrition Security Project (CNSP) baseline research investigated the food-security situation in vulnerable communities in the Breede Valley, Western Cape, South Africa; the site for a proposed university's rural campus. Nutritional assessments identified, 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 commitment and 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 disjuncture 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 compliance to the minimum curriculum and the opening of employment opportunities, 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-graduation, diversifies the ground of the course, by the insertion of new content and the inclusion of internships. Pedagogical of healthcare education, agricultural, sociology and anthropology appeared into the curriculum. In 1980s, the Food Education is present as a discipline of Public Health Nutrition. In order to start the development, due to the new minimum curriculum, it broadens the type 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 major 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 external to the curricula.

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 educational policies. For that reason, this subject needs to be included in the curricula.
Introduction: Consumer demand for natural products favours the development of foods containing bioactive ingredients with health benefits. In this context, the 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 regard, in vitro models based on human physiology have been developed as simple, inexpensive and reproducible tools to study digestive stability, hydrolysis, micellization 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 fat plus emulsifier, C) olive oil plus soy lecithin.

Key findings: The results show that overweight and obese children are at increased risk of cardiovascular disease. This calls the need for proper interventions to prevent and control overweight and obesity in primary school children. The study sample are now under a pilot weight management program.

Key findings: Subjects with obesity have characteristic dietary patterns that differ from typical patterns in overall population, especially in men.

The dietary patterns for overall population, especially in men.
Nutritional habits among Menorcan elderly people.

PT-041
Compliance of the Dietary Reference Intakes (DRI) for Spanish Population-2010 among Menorcan elderly people.

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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. Method and Methods. 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 reported 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 vitamin D intake and DRI value in men whereas women 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 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 E 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.

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Objectives. The aim was to examine the prevalence of metabolic syndrome and associated risk factors in Northern Mexican adults aged ≥16 years. Material and Methods. 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 (64.4%) than in men (48.5%) 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.

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Zinc is an essential micronutrient, especially in relation to its impact on immune function, bone mass, cognitive function and oxidative stress. Inadequate intakes of micronutrients 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 method. Status of zinc intakes 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 men and women, respectively. Mean serum zinc concentration were 10.4 ± 1.9 μmol/L and 4.7 ± 1.5 μmol/L, respectively. 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.

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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 36% 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 33% 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 39% 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.

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II World Congress of Public Health Nutrition

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Introduction: Sport gymnastics is a demanding power discipline. Good quality performance and trainings require supply of macro- 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 become crucial, as it must contain balanced amounts 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 nutritive intake result in damage to health, in better scenario the outcome is merely inferior performance or training.

Methodolody 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 years. The average age of boys was 15.5 yrs, the average age of girls was 14.7 yrs. The average height/weight ratio of boys was 170 cm/62 kg. The average height/weight ratio of girls was 155cm/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 SW 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 caireometry. 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 energy 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 vitaminine and mineral insufficiency and the diet is rather monotonous. The recommendad intake of nutrients for this age group and sports performance is 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.

Conclusion: 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-046 Poster
Body Composition children to study the chronic disease risk and management of obesity.
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Background: Childhood obesity is related to affective deprivation (child abuse) that adversely affects growth and potential development. This social condition, the educational and family environment, creates conditions to affective deprivation and that affect health and wellness for this stage of life, together with the presence of chronic malnutrition, dehydration and chronic disease risk.

The body composition study in children give the opportunity to learn the changes in this stages and to know the disease family history.

Objective: Recognize the social, environmental and health factors related to development of childhood obesity in vulnerable populations and the relation with the main body composition components.

Methods: Cohort study, included 49 children (7-12 years old), 58% male and 42% female, performed anthropometric assessment (Weight, height), body composition using multifrequency bioelectrical impedance assessment (team QuadScan 4000) and applied a questionnaire to determine the composition of the household and family ties. Include a intervention program "to vulnerable community to self sustenability community" with background of ten years ago. Include questionnaire to determine the health community diagnosis and identification of cognitive performance.

Results: 60% of the population suffered familial dysfunctions, specially emotional deprivation, and the main reason is that each father have two families in 27% of cases. In this population we found the following condition: weight overnutrition, 58%; height undernutrition, 47%; main body composition index low stature, 74%, with body water below normal values for age. 80% have family history of obesity, diabetes type 2, hypertension. 90% no eat breakfast before to go to school, and the cognitive performance in mathematics and reading is deficient in 20%. The support for this children is through various apparatuses and integration of nutritional information oriented to mathematics and reading.

Conclusions: The children included in this study showed high vulnerability resulting from family dysfunction. The body composition assessment include some methods to identify the risk in children. This population have high risk of malnutrition, decreased lean mass and body water. They are at risk of developing obesity with associated comorbidities, such as diabetes and hypertension, given the family history of obesity and hypertension. The intervention programs give a good results when are applied in the familiar nucleus. When the children have activities that give security and apprenticeship, is a time to modify the disease risk and obesity.
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, QUL), an urban, low-income group living Quetzaltenango City (n=40, QUL), an urban, middle-income group living in Retalhuleu (n=40, RUM) and an urban, middle-income class living in Retalhuleu (n=40, 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 getting 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 199 different food and beverage items were reported amongst 171 female participants. The dietary variety was the highest for QUL sample (n=141), followed by the RUM sample (n=133), the QUL sample (n=122), and the lowest for the QRL sample (n=85) (p<0.001). 56 items were reported in all 4 areas. 10 food items were only mentioned by QRL, 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, 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, and corn (made from 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 Guatemala should focus on wealth, dietary patterns, food culture, food and local foods.

funded by: Sight and Life of Basel, Switzerland

PT-059 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.

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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 effective in influencing behaviour and in detail 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) Preparation of intervention mapping to develop the nutrition education component of a randomised controlled trial in the city of Valladolid, Spain.

Objectives: (1) Needs assessment; (2) Preparing matrices of change objectives; (3) Preparation of intervention mapping to develop the nutrition education component of a randomised controlled trial in the city of Valladolid, Spain.

Introduction: Body image has been defined as a multidimensional structure that differ in two underlying dimensions, the first refers to the conceptual 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, and many other chronic conditions.

Women have a greater vulnerability in light of these disorders due to the strong social pressure on their own appearance and socialization processes that emphasize aspects of their appearance.

Objectives: Set the perception of body image in a representative healthy adult women of Valladolid (Spain) collective.

Material and methods: Cross sectional study; sample of 500 women aged 40 to 60 years, mean age 51.16, urban area of the city of Valladolid, intermediate between the Spanish cities, which guarantees that the probability of error will not exceed 5%.

We used a self-designed questionnaire formed by questions that assess anthropometric and attitudinal variables. This questionnaire takes as a reference: Body image Questionnaire Questionnaire by Cooper and Attitude towards food by Gardner.
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 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 Poster Water Balance Index: the development of a new instrument. Karapanagos G1, Panagiotakos D2, Malovia G2, Kapsokalof 2Agricultural 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 to assess its behavior by quasi-field testing.

Materials & Methods: We developed the WBI following a formative model mirroring essence-tially EFSA’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-easily as well as avoid-difficultly, aiming not only to an evaluative but also to a dis-criminative function for the instrument.

Following the development, we applied the WBI on epidemiological data, scoring the partic- pants (n=828) of the evaluation 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 p 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 perspiration and respiration. 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 WBI’s distribution is centrosymmetric with a mean value of 26 and standard deviation of 3.2 units for both sexes indicating good discri-minative 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 confirm the normal distribution of the items included, thus a truly minimum 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 Poster Association of feeding regimen with mucosal colonisation and prevalence of sepsis and necrotizing enterocolitis in preterm neonates admitted to neonatal intensive care unit (NICU). Parm U1, Metsvart V1, Iloniis ML2, Lustar P3.

1Department of Microbiology, University of Tartu, Estonia, 2University Clinics of Tartu, Estonia, 3Tartay 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 on admission 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 70 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-negative (GN) (OR=4.52; 1.87-10.95 and OR=4.95; 1.90-12.87, respectively) and 5 to 9 times increased odds (OR=5.75; 1.89-16.72 and OR=8.61; 2.52-29.36, respectively) by Gram-positive (GP) 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; 1.08-6.97). In comparison to BMCR, TPN was associated with increased odds of LOS (OR 3.04; 1.02-9.07) and to formulate feeding with increased odds of NEC-death (19.75; 3.64-107.12), 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 Poster Role of dietary lipids on growth, sexual maturation and breast cancer risk. Eschrich R1, Moral R2, Solanas M1, Vela E3, Scopelita I, Eschrich E4.

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Objectives: Based on the importance of early-life events, including nutrition, in breast cancer risk, we have investigated the effects of high fat intake 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 extra virgin 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 evolution 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 puberty, higher number of corporea 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 morphology 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 diet 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 dietary factors may have on health and the importance of establishing healthy dietary habits from childhood.

PT-056 Poster Advances in public health nutrition research in Central and Eastern Europe and Balkan countries using the Balkan food platform and dietary tools. Guštrović M1, 2, Milešović J3, Kadić A1, 2, Finglas P1, 2, Giblett M1, 2

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Objectives: To support pioneering public health nutrition research in Central and Eastern European and Balkan Countries (CEE&BC) we aimed at development of harmonized/standardized food and nutrition Research Infrastructure (RI) such as food composition (FCDB) and consumption data-banks 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 CEE&BC; Identification of the challenges: FCDB status, tools for FCDBs management, dietary surveys and FCDBs used to meet the MOUS needs; Design of the nutritional tools web-based EuroFIR harmonized software Food Composition Data Management (FCDM) for FCDB creation and DIETASSESS&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 CEE&BC.

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  
Lifestyle and epigenetic changes in healthy volunteers and breast cancer patients.
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Objectives: Breast cancer is the most frequent malignant neoplasia among women worldwide. In addition to genetic, epigenetic and endocrine factors, the environment, and specifically nutritional factors, plays a key role in the development of disease. 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 of cancer have been characterized through methylomic-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, RARB2, ESR1, PRB, REHB21, NES1, CDH1, TWIST, HLA-A, CXCL12 and Mapsin. Moreover, we quantitatively analyzed some of these genes by CCombinated Bisulfite Restriction Assay (COBRA) and bisulfite pyrosequencing. Furthermore, dietician 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: Food Frequency in mammary gland was higher compared to that in mammary gland for all analyzed 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 dietician 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 meat 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 hallmarks of 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 dietary habits between healthy volunteers and breast cancer patients.

PT-058  
Wild edible plants traditionally used in the contryide of El Jadida, coastal area in the center of Morocco.
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Chouaib Doukkali University, Faculty of Sciences, Lab. of Biotechnology, Biochemistry and Nutrition, El Jadida, Morocco.

Objectives: This project aims to identify 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: Asteraceae, Lamiaceae and the Aperaeae. Among the plant inventoried, Lavatera cretica 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 “bouguia”.

The second plant is Ajuga iva used in the traditional recipe of bread. This plant is also known for its hypoglycemic medicinal properties. In the edible part of the plant identified, the leaves, in the majority of population in the upper part are the most consumed (41%) followed by the roots (27%) that are used in traditional local rice, 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 Morocco. They are eaten added or as complements to cultivated food plants. 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.

PT-059  
Vitamin D status is associated with interleukin-6 levels in overweight/obese children.
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Objective: Obesity has been associated with vitamin D deficiency and increased oxidative stress, which can lead to the dysregulation of adipokine secretion and inflammation. The aim of the present work was to examine the influence of vitamin D status [25(OH)D] on inflammation in overweight/obese children.

Material and Methods: 137 Spanish schoolchildren between 9-12 years of age (31.4% with overweight/obesity) were studied. Serum 25(OH)D levels were measured by chemiluminescent assay. Plasma tumour necrosis factor (TNF-α) and interleukin-6 (IL-6) were measured by immunoenzyme assay (IEA). Serum adiponectin was determined using ELISA kit. Serum high-sensitivity C-reactive protein (hs-CRP) was tested by immunonephelometry.

Results: IL-6 levels were higher in the overweight/obese children with decreased serum 25(OH)D (<20 ng/mL) than in those with the same weight problem but whose serum 25(OH)D levels were adequate (≥20 ng/mL). Serum 25(OH)D was inversely associated with IL-6 levels in the overweight/obese subjects taking into account different covariables; thus, for every 1 ng/mL rise in the former, the latter fell by 0.160 pg/mL (B=0.160±0.068; R²=0.131; p=0.023). TNF-α and hs-CRP were not associated with 25(OH)D in overweight/obese children.

Key findings: It would be desirable to monitor serum 25(OH)D deficiency in schoolchildren to prevent an elevated inflammatory status and associated health problems.

PT-060  
Educación Física, Educación Nutricional y Escuelas: Conglomerados desiguales para la Región Metropolitana en Chile.
Cerda Riscos, R. Escuela de Nutrición y Dietética. Facultad de Medicina. Universidad de Chile.

Introducción: El sistema educativo chileno es uno de los más desiguales del mundo. El 44% de los niños de 6o básico presentan obesidad y la mayoría posee una mala condición física. Estudiar cuáles son las diferencias entre las escuelas chilenas respecto al tipo de resultados físicos ayuda a comprender las políticas necesarias para superar estas desigualdades.

Objetivo: Estudiar qué tipos de escuelas se expresan a partir de los datos del sistema de evaluación de la calidad de la educación física (SIMECE EF 2011) de la región metropolitana (RM).

Metodología: A partir de datos muestrales secundarios del SIMCE EF 2011, se realizó un análisis de clúster de escuelas de la RM. Se analizaron 6 pruebas físicas y 2 de estado nutricional, mediante un análisis de clúster. Se complementaron las bases de datos con datos de NSE, IVE, mixtura de género, número de estudiantes, resultados en otras pruebas de calidad educativa. Durante el 2013, se seleccionaron 6.964 casos de la región metropolitana.
To demonstrate 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 intake 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 with 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 parameters are necessary to clarify the relationship between folate intake and folate status.

**PT-063**

**Poster**

**Lipid peroxidation and antioxidant defense in menopausal and postmenopausal Algerian women.**

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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 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 nonmenopausal (n=30) women. Serum total cholesterol (TC) and low density lipoprotein cholesterol (LDL-C) were analyzed by spectrophotometry (Hitachi, Japan). Serum catalase activity was determined by measuring the dismutation of hydroperoxyl radicals (H2O2) using tetramethyl-thiopyrin (Prolabo) as precursor of malondialdehyde (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. 19160) by measuring the diminution of superoxide radicals generated by xanthine oxidase and hypoxanthine. 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 nonmenopausal women, while serum TG levels were similar in all women groups. 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 compared to non menopausal women (p < 0.001) compared to non menopausal women. Levels of lipid oxidative product (TBARS) were significantly increased in perimenopausal women and postmenopausal women compared to non menopausal women (p < 0.05). SOD activity was decreased significantly in postmenopausal women (52.4±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 peroxodation and antioxidant defense in menopausal and postmenopausal women leads to an increase in the oxidative stress leading for cardiometabolic disease.

**PT-064**

**Poster**

An Island of Ireland childhood obesity campaign - focus groups with parents changed the campaign course from recognition to practical solutions.

Froggatt MS, Gatley N, Foley-Nolan C. (on behalf of safefood) safefood, The Food Safety Promotion Board.

Background: One in four children on the island of Ireland is overweight or obese. At the outset of one of our nutrition education campaigns, parent focus group feedback indicated the campaign focused on the poor parental recognition of excess weight in their own children. Campaign concepts were developed based on raising awareness among parents of 1-12 year olds on the health challenges of excess weight in childhood and to help them recognize whether their own children are ‘at risk’ of excess weight.
Objectives: To gain an understanding from parents on (1) how they identified 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 not adequately raising public health awareness and that there was an absence of solutions which in turn led 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 development continued and focused 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 October 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.
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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 criterion (>1 s-control). 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, dark and 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.
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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°, 60%, 12h light/12h cycle). All mice were fed the MF (Oriental Yeast Co., Ltd.) for 7days. The mice were divided into four groups consisting of given a control (water) group (W), suspension (water + tail suspension) group (WT), an AM drink (175 mgp in water) group (AM) and an AM drink (175 mgp 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 AB7 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 immunoassay.

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.
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Center for Studies of Sensory Impairment, Aging and Metabolism (CeS- Siam), 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 the other breast at 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 breastmilk volume across the 44 volunteers was: <25 ml (n=17, 38.6%); 25-49.9 ml (n=18, 40.9%); 50.0–74.9 ml (n=6, 13.6%); and >75 ml (n=3; 6.8%). A median volume of 25 ml was waited less than 15 min (n=16); 15-29 min 27.5 ml (n=8); 30-60 min 35.0 ml (n=8); and >60 min 27.5 ml (n=16). The median volume of breastmilk was 30 ml for the 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 relieving the mother, getting the milk flowing and providing sufficient volumes of milk.

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PT-068 Poster
Study on the knowledge of infant and young child feeding practices in Labé, Guinea Conakry.
F. Díaz, L. Sanchez 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 malnutrition.
malnutrition. Of special interest, it was pointed that inappropriate young child feeding practices might be the responsible factor for the precarious nutritional status among this children population. Therefore, the current study sheds light on the cultural and scientific knowledge held by women and health workers respectively about child's nutrition and breast-feeding. This would identify the causes of mediocre child feeding practices and most frequent obstacles that prevent optimal ones from happening.

Material and methods: Focus group discussions and semi-structured interviews were conducted on five health centers of Labe. The study population includes breast-feeding women, grandmothers and health workers. These groups were asked to report their common knowledge and attitudes about young child feeding practices and child nutrition. In addition, the grandmothers' interview also targets displayed behaviours in regards to breast-feeding of new-borns given birth at home.

Results: On overall it was found that breast-feeding women have mediocre child feeding practices. Of special interest, they delay breast-feeding after giving birth and this practice is eliminated very early in the life of the child. The prevalent obstacles for optimal child feeding practices mention 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. The following results were obtained.

Key findings: The main finding for the current study suggest that the lack of knowledge and information provided by health workers and grandmothers about breast-feeding practice and its exclusiveness might be associated 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 provided with information 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

Latina mothers' child feeding practices and styles related to weight status and the development of childhood obesity.

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Background: A growing literature points out to the importance of maternal feeding practices and children's eating behavior in the development of childhood obesity. Objectives: The purpose of this study was to examine Latino mothers’ child feeding practices and its influence in the development of childhood obesity. Methods: One hundred forty-two low-income Latino mothers and their preschool children (2-5 years of age) participated in this cross-sectional study. Mothers completed questionnaires assessing maternal feeding practices previously validated instruments (Birchen et al., 2001; Hughes et al., 2005), health literacy, social and cultural factors, and mother’s and child’s weight status. A principal components analysis of these results identified several pathways that influence the development of childhood obesity are considered including the use of education and interventions that incorporate “culturally mediated” pathways to address mothers’ feeding practices are essential for the prevention and control of childhood overweight among low-income Latinos. Results: The principal components analysis of these results identified several pathways that influence the development of childhood obesity are considered including the use of education and interventions that incorporate “culturally mediated” pathways to address mothers’ feeding practices are essential for the prevention and control of childhood overweight among low-income Latinos. Health literacy, social and cultural factors, and mother’s and child’s weight status. Results and Key Findings: Preliminary data analysis revealed a number of child feeding practices used by Latino mothers to be correlated with their preschool child’s weight status. The results yielded a number of regression equations for each anthropometric parameter.

PT-070

Poster

Relationship between resting metabolic rate, anthropometric and oxidative stress parameters in newly diagnosed type 2 diabetes mellitus patients.

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Background and Aim: Resting metabolic rate (RMR) is an important parameter to assess the nutritional status of both healthy subjects and type 2 diabetes mellitus patients. Moreover, information on resting energy consumption is necessary to establish an individualized diet for a person newly diagnosed with type 2 diabetes mellitus (ND-T2D). The aim of our study was to measure RMR (determined (RMRd) and predicted (RMRp)) and to analyze the relationship with anthropometric, biochemical, hormonal and oxidative stress parameters.

Subjects and methods: The study included 118 ND-T2D and 484 healthy age- and sex-matched nondiabetic subjects. The diabetic group was divided into 2 subgroups according to their body mass index (BMI): group 1-overweight patients (BMI: 25.29 kg/m2) and group 2-obese patients (BMI: 30.40 kg/m2). All participants were evaluated for anthropometrical parameters and RMR was measured by indirect calorimetry (continuous VO2, VC02). For oxidative biochemical tests, ELISA measurement of serum insulin, proinsulin, 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.

Conclusions: 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 RMRp were significantly higher in women (p<0.05) and in the obese group (p<0.001). RMR decreased slightly with age in both men and women. In the diabetic group, RMR correlated positively with obesity anthropometric markers (weight, BMI, WC, r=0.47, p<0.001) with respiratory burst (r 0.35, p<0.05), serum proinsulin levels (r 0.39, p<0.05) and negatively with the values for HDL-C (r -0.29; p<0.05). Moreover, the obese group had significantly higher levels for respiratory burst (0.0506±0.01 vs 0.0232±0.002 LRU, p<0.05), insulin, proinsulin, 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 oxidative stress status and could be an important tool in the initial dietary treatment of the metabolic disorders associated with atherosclerosis in obese patients with ND-T2D.

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PT-071

Poster


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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 was 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 assessed skinfolds (triceps, calf, and abdomen), circumferences (waist, hips, and thigh), 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, monitoring, 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 BMI) showed significant correlations. BMI did not correlate with muscle circumferences, nor BMI did. BF correlated negatively with healthy eating guidance and pressure; whereas it correlated positively with restriction and child control. Healthy eating guidance was negatively correlated with %BF, %LBM, BMI and FMI. We found two significant equations: IMC=25.1±2.4×CFPQ-Guidance, R²=0.10, p<0.005 and IMC=24.4±1.2×CFPQ-Guidance-1.2×CFP-Questionnaire, 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 potentionated 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-074
Dietary energy density in Brazil: results from the first nationwide food consumption survey, 2008-2009
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Objectives: This study aimed to evaluate dietary energy density in Brazil. Material and methods: Data were obtained in the first National Dietary Survey (2008-2009). Food consumption was estimated based on one-day-of-food record obtained from a probabilistic sample of individuals ≥10 years old (n=34,003). Dietary energy density (DED) was estimated as the ratio between total energy intake (kcal) and total amount of food consumed (grams). Beverages were excluded. Statistical analyses considered sample weights and study design effects.

Results: Mean DED was 1.69 kcal/g (95% CI= 1.67; 1.70). Adolescents (1.83 kcal/g) presented higher DED than adults (1.68 kcal/g) and elderly (1.54 kcal/g)(p<0.01). Non-overweight individuals had higher DED than overweight individuals (1.70 vs. 1.67 kcal/g, p<0.01). On average, DED was higher on weekends than on weekdays (1.79 vs. 1.67 kcal/g; p<0.01). There was a decrease in DED with age (r=-0.20, p<0.01) and BMI (r=-0.08; p<0.01) increasing. Top food groups contributing to DED were pizza (0.10), hamburger (0.08), sandwichs (0.07), and sweets and desserts (0.05).

Key findings: The consumption of high energy-dense foods possibly plays a role in the increased obesity prevalence in Brazil. Future studies should be addressed by interventions promoting healthy eating, especially those targeting adolescents.

PT-073
Assessment of adolescents’ diet quality according to saturated fat, trans fat, and added sugar intake.
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Objectives: To assess differences in adolescents’ diet quality, considering the gradient of consumption of SoFAs foods (high in solid 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 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 determine the cut-off limit indicating excessive SoFAs foods consumption, consequently diets with low nutritional quality. The analysis explored the association between socio-demographic 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 those in the highest amount of total daily energy intake. In average, SoFAs foods provided 53% of total daily energy intake. Moreover, 72.0% 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, sugar-sweetened beverages, snacks, soft drinks, breakfast cereals, sandwiches, and sweets and desserts. The questionnaires assess diseases running in the family, already existing abnormalities and various lifestyle factors including nutrition, physical activity, mental health and smoking. For risk assessment we use some well-established calculators (SCORE, FINDRISC), but we also analyse the effect of the individual factors. The counselling algorithm takes into account not only the risk factors, but also personal preferences and existing disorders, allergies. Results: Preventissimo has been developed through the co-operation of medical doctors, dieticians, physiotherapists, psychologists and IT specialists. It is constantly evolving to make it always up to date and cutting edge. The project was published online: www.preventissimo.hu.

The questionnaires contain 266 questions, 19 sub-questionnaires, 24 generated data, 308 risk and protective factor descriptions and 294 advices. There is an evidence based knowledge base on the site with more than 250 articles with topics in lifestyle, diseases, diet, stress-management, physical activity. In the spring of 2012, a pilot study was carried out, during which 1000 clients from 6 general practices tested the system and gave useful feedbacks for further refinement.

From the autumn of 2012, the application was used in practice based learning as part of the Prevention in the University. Key findings: When using Preventissimo (filling out the questionnaires) the user can download the results and health plan and can e-mail them to their doctor or any other healthcare provider for further input if needed. This helps assessing risk in a community, and can help planning preventive strategy.

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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, GMP, HACCP-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 immunodeficient 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. 
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Objective: Assess 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” 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 (overweight and obesity), as explanatory variables. Subsequently the Global Moran’s 1st 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.
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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% (26) physicians, 9.1% (12) nurses, 10.6% (14) Nutritionists, 57.6% (76) being medical students, 1.5% (2) dentists and 1.5% (2) nutritionists. The average weight was 70.5 + 19.9 (42-180), 46.2% had overweight (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 cho­ lesterol 42.7 + 11.3, triglycerides 109.8 + 79.7. Metabolic syndrome was diagnosed in 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 20.6% (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 AO, followed by low HDL cholesterol and increased triglycerides.

PT-079 Poster Phthalates Presence in Mexican beverages.
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Phthalates are chemical substances widely used worldwide because of its plastic properties, its wide presence in the environment suggests the exposition to products that can be part of the human food chain, that is the reason why it is important to study it due to the security nourishing, since some of these compounds are considered endocrine disruptors and they have been associated with resistance to the insulin and central obesity among other health affectations. Objectives: Determine the presence of (DE(2-ethyl­hexyl) phthalate) (DEHP), Dimethyl phthalate, Diethyl phthalate, Dibutyl phthalate, Butyl benzylic phthalate and Dioctyl phthalate in beverages acquired in the State of Mexico. Material and Methods: Based on the list of food included in the Mexican basic basket, they were acquired under certain self-consuming criteria, samples of bottled water, industrialized juice and sodas of major consuming brands, they were analyzed using a liquid-liquid extraction and quantified by its chromatographic linked gases. Results: All the analyzed beverages were detected with (Di(2-ethylhexil) phthalate whose concentration was of 1.02 mg/kg detected in the juice and three of the juice samples were detected with the three different compounds, being Dimethyl phthalate the mayor concentration was (26.843 mg/kg). The soda tests were detected with (Di(2-ethylhexil) phthalate, in this group the mayor concentration was 8.708 mg/kg. Based on the found concentrations form by each analyzed beverage, the levels of toxicity of the adult are not exceeded in the Ingestion Daily Ingestion Rate, however, the present work shows the necessity of other food groups and their relation to other health issues.

PT-080 Case of Community-Based Program Addressing Underlying Determinants of Undernutrition in Bukobu Rural, Republic of Tanzania.
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The United Republic of Tanzania has abundant land, livestock, and natural resources, which could enable it to achieve faster and more diversified agricultural growth and to raise household income through increased production of both food and cash crops thereby creating economic sustainability. In spite of this potential, malnutrition among children and mothers, especially in rural areas, is a common phenomenon. Evidence-based strategies for nutrition intervention mainly address direct determinants such as food/nutrient intake, whereas community-based intervention tends to have higher efficacy when combined with other proximal determinants such as women’s economic and social empowerment. Objectives: 1) To increase knowledge about the nutritional benefits of soy consumption to various population groups (women, children and population with HIV/AIDS) by offering workshops and local technical assistance to the Bukoba Women’s Empowerment Association (BWKWIA) members; 2)
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; 3) 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 common 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-annually 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 continuity, as in the case of Bukoba Rural, Republic of Tanzania.
1990s, and today are young adults, are the ones who consume fast food and snacks because prioritize "can not lose lifetime eating because you have to live intensely." These do not buy, do not know the food and eat what is offered to them.

Key finding: Understanding acquisition actions, ritual preparation and consumption, time spent feeding is essential for us to achieve identifications and interpretations of food in history and current habits.

PT-085  Poster
Eating out and "pleasure" reinvented: A temporal focus between 1970 and 2007 in the restaurants of autonomous consumption in Curitiba/Brazil.

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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.

Material and Methods: For this research we applied a multidisciplinary and comparative approach between the various aspects of feeding: economic, social, political, cultural and nutritional. The contributions of different areas of knowledge were analyzed, the food situations were studied and discussed the relevance and importance of the issue at the national and municipal levels and the comparison with the rest of the world. Programmed interviews with 10 entrepreneurs and 30 consumers of those establishments. Results: The eating out, really is permeated with symbolism that change and alternate according to the different regions of Brazil, reiterating that the feeding is not directly linked 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-employed. 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 workers 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 health and company) and those who 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.

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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 psychopathologically diagnosed with eating disorders. The multidisciplinary service is structured in a triple flow: the feeding therapist evaluates the patient, the 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 form 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 socioec- onomic 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 micro nutrients, dietary fiber and water intake, compared to Dietary Reference Intake. 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, interdisciplin ary 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.

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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 PREMED study who were free of diabetes at baseline. Dietary intake was assessed yearly using a validated 127-item food-frequency questionnaire. Dairy product consumption was categorised into total, low-fat, non-reduced-fat, and subgroups: milk, yogurts, 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 overall dairy product consumption was 0.74 (95% CI, 0.46-1.19; P for trend=0.044). This association appeared to be mainly due to low-fat dairy products; the multivariate-adjusted HRs be tween the highest and the lowest tertile of consumption were 0.65 (0.45- 0.94) for low-fat dairy products and 0.67 (0.46-0.95) for low-fat milk (P for trend, both=0.04). Total yogurt intake was inversely associated with T2D risk (HR: 0.60 [0.42-0.86]; P for trend=0.002). We estimated that substitu tions of one serving of a combination of biscuits and chocolate, or who le-grain biscuits per day for one serving of yogurt per day was associated with a 40% and 45% lower risk of diabetes, respectively. With respect to the consumption of fermented dairy products (merging yogurt and cheese in a single group), the risk of diabetes was lower in the second than in the first tertile. Consumption of non-reduced-fat dairy products, total and non reduced-fat milk, and cheese showed no consistent associations with the risk of T2D.

Conclusion: A healthy dietary pattern incorporating a high intake of dairy products, particularly low-fat dairy and fermented dairy products, specifically yogurt, may be protective against diabetes.

PT-088  Poster
Candidate items for fortification within a novel, alternative strategy of "total fortifiable energy": A model from Guatemala.

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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 fortifica tion as proposed by Omar Dary. This is called the “total fortifiable energy” approach. This alternative looks to avoid the fortification of a single staple food item, such as salt or sugar, but rather distributes lower levels of the deficient nutrients across as many of the commonly-eaten processed items as practicable.

Materials and Methods: Previous-day dietary recall interviews, enumerating items eaten, disaggregating the ingredients in recipes and interrogating the quantities 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 = 16) 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 content.

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 satisfy 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 nutrients. Of the 49 items that undergo some fortifiable treatment were classified as "Fortifiable in food components to scavenge free radicals; "NF, i.e. non-processed foods; "AF, i.e. prefortified foods; and "PF, i.e. fortifiable foods.

Objectives. The study was conducted to assess antioxidant intake from food in the past month. Medium serving size was shown as a reference.

Antioxidants consumption in the diet of Krakow inhabitants, assessed on the basis of Dietary Antioxidant Index

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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 berries, vegetables and vegetable products, condiments and spices, dairy products, fruits and vegetables, nuts, and beverages. Participants reported how often they ate each food in the past month.

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 (48.36±22.75 mMol). Fruits, nuts, and beverages were the biggest contributors to total DAI values, respectively.

Physical activity profiles among Canary adult population and metabolic syndrome.

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Objectives. Physical activity (PA) is important to increase energy expenditure and prevent metabolic disorders and obesity. Not much is known about PA and the Canary adult population and its relationship with metabolic syndrome (MS). The aim of this study was to: 1) determine the principal leisure time PAs in the Canary population, 2) to examine socio-demographic patterns in several dimensions of PA and 3) to estimate differences in energy expenditure in population with and without MS.

Materials and methods. The Canary study was a cross-sectional, probabilistic and multistage random sample of 6729 adults (18-75 years old) from the Canary Islands. Anthropometric and clinical tests were performed. For each participant, the 3 most important PAs were assessed by validated questionnaire.

Results. Of the 49 items that undergo some fortifiable treatment were classified as "Fortifiable in food components to scavenge free radicals; "NF, i.e. non-processed foods; "AF, i.e. prefortified foods; and "PF, i.e. fortifiable foods.

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 ancestry), 3) socio-economic status, 4) leisure PA, 5) physical activity levels, were classified as "Fortifiable in food components to scavenge free radicals; "NF, i.e. non-processed foods; "AF, i.e. prefortified foods; and "PF, i.e. fortifiable foods.

Results. The contribution of the principal MS increases the risk of MS, PV, and obesity for premorbid MS. For morbid MS. Those with diabetes or with antecedents of cardiovascular events and 3 components of MS were classified as "morbid MS".
antioxidant activities such as spinach and Brussels sprouts, berries, almond, kiwi, hazelnut and soybeans oil. The meal did not use fresh herbs and spices, especially marjoram and rosemary.

Key findings: The recommendation for Polish people (based 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.

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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 dietetics' interest in this field. The aim of the presented study was 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 (average age 73.2±6.9). 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=0.004). Percentage of energy from saturated fatty acids in diet 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 of polyunsaturated fatty acids was low: 4.6% of energy of DNR among 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 threshold and heart disease prophylaxis. Also, intake and body mass index (BMI) of patients were at risk. In all cases, the size of the trunk segment was established for each patient.

Key findings: Despite all patients being under the care of a dietitian, the majority of them were making nutrition mistakes, mainly in terms of fat quantity. Repeating nutrition mistakes can accelerate development of disorders and reevaluate whether it would be possible to reduce the NaCl content in the diet.

PT-094

Poster

Newborn anthropometric assessment using photographic images: Preliminary testing with inanimate (cut-out and doll) models: Inter-rater correspondence of estimates.

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Objectives: Insofar as the gold-standard measurement of newborn length has questionable accuracy, is uncomfortable for the infant and may be unsafe in its forced extension of the skeleton and nerve-network, our aim was 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) used each different digital camera to take pictures of three two-dimensional cardboard figures and 2 soft-body baby dolls, both sets of the approximate overall length of a human newborn. In sagittal extension photography, we produced an image in the "fetal position." We sustained the head and trunk in 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, precisely to the nearest mm, to measure each of three linear components of the body: the trunk segment (TS), upper-limb segment (ULS), and lower-limb segment (LLS). The TS corresponded to the distance from the 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 TS, ULS and 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: For all cardboard-figure measurements from photographs (n=24), 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-095

Poster

Optimally accepted salt reduction across cultures - By using naturally brewed soy sauce as a salt replacer and maximizing its potential with "Overall Taste Intensity-based approach".

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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 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 consumers 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.

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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 saltiness 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 saltiness, but also enhances overall taste with Umami substance. It can be said that a flavor-based “saltiness-based approach” might miss and/or under-estimate its feasibility as a salt replacer. Thus, we propose that “Overall Taste Intensity-based approach” is more suitable for non-saltiness compensating salt replacers.

PT-096
Comparison of dietary diversity scores according to the stau­ro-ponderal status and gender among the rural middle school children in the northwest of Morocco.
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Objectives: this study compares the dietary diversity scores according to the stauro-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 children.

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 α = 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=3046, p=0.015>0.05), same thing between normal group (N = 270) and the group with thinness (N = 30); (u=3566;p=0.26>0.05). Also between girls and boys (u = 9588.5, p = 0.46>0.05).

Key findings: It seems that dietary diversity is not affected by the stauro-ponderal status or gender, but instead the socio-economic conditions of the environment.

PT-097
Body composition and dietary protein intake of geriatric patients.
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Background: Old, frail people, especially institutionalized geriatric patients, are at a very high risk for ingest 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 and energy of institutionalized geriatric patients is adequate for avoiding a loss of lean body mass.

Design: We observed changes in body weight and composition during a one-year period in 51 women (86.4%) and 8 men (13.6%) aged 83.2 ± 9.6 years, with an average age of 15.45 ± 1.64 years, ranging from 12.3 to 19.74 years. A possible barrier to eating fruit is the geriatric patients’ sense of taste with Umami substance.

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 α = 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=3046, p=0.015>0.05), same thing between normal group (N = 270) and the group with thinness (N = 30); (u=3566;p=0.26>0.05). Also between girls and boys (u = 9588.5, p = 0.46>0.05).

Key findings: It seems that dietary diversity is not affected by the stauro-ponderal status or gender, but instead the socio-economic conditions of the environment.

PT-098
The School Fruit Scheme’s impact on children’s barriers to eat­ing vegetable and fruits.
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National Food and Nutrition Institute, Department of School Nutrition Di­vision, Poland.

Objectives: Studies 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 vegetable between older children and vegetable distribution (October 2010) and at the end of the fruit and vegetable distribution period (May-June 2011).

Results: 33% of the children participating in the program reported that the reason is 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 negative 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% vs 27.6%, respectively). The importance of the child reported that there is at least one barrier to eating vegetables. In the first stage 30.7% answered that the reason they are too short breaks , 34.4% prefer to eat something sweet, 20.1% do not eat fruits 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 negative response " I do not eat because colleagues do not eat " as much as 10.9%.

Conclusions: The Scheme proved to have an influence on lowering the barriers of fruit consumption. The fact that could be more accessible at school, as well as their consumption by schoolmates made eating fried more attractive for those children who had not consumed them for various reasons.

PT-099
The ‘40-Something’ program improved fruit intake and nu­trient density of the diet in premenopausal mid-age women at 12-months.
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1School 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 mass levels 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 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) who received minimal intervention information only. 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 RModel analyses are based on baseline data and 3-month follow-up data 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 (0.33 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 C., Sugiharto

The women were recruited using tailor health professional thing five years were nutrition status of women. The Status (-6.47, p=0.38), or for minutes of eating, nutrients needed by young infants, for migrant mothers feeding, nutrients needed by young infants, for PT-1 dietitian or exercise technique. Based on the fact that breastfeeding as a practice is initiated 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 rate 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.

Background and objectives: VADs is one of the most raging global epidemic 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 this. 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 Emekuke Obweri, Imo State of Nigeria. Five known fruits in season (Orange, carrot, Tomatoes, Pineapple and watermeloon) were bought, washed, 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) 4 counts of the individual respondents were determined using the CD4 reagents and the pate cyflow 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 one had a reduced CD4 count after the intervention 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 micro-nutrients (vitamins and minerals) especially the antioxidant. This finding is very important in boosting the immune system of HIV positive people. Micronutrient intake over a week has 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.

Background: Breastfeeding, especially when done exclusively for the first six months, is the recommended infant feeding method. Through breastfeeding, infants need energy, nutrients for healthy growth 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 impacted by the surrounding culture, successful 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 made use of 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 included; living in Helsinki Metropolitan Area, having given birth in Finland 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 rate 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-100

Effect of micronutrient intake on the immune system of people living with HIV/AIDS.

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Background and objectives: VADs is one of the most raging global epidemic 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 this. 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 Emekuke Obweri, Imo State of Nigeria. Five known fruits in season (Orange, carrot, Tomatoes, Pineapple and watermeloon) were bought, washed, 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) 4 counts of the individual respondents were determined using the CD4 reagents and the pate cyflow 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 one had a reduced CD4 count after the intervention 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 micro-nutrients (vitamins and minerals) especially the antioxidant. This finding is very important in boosting the immune system of HIV positive people. Micronutrient intake over a week has 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

Abscess infections and malnutrition - a cross-sectional study of polydrug addicts in Oslo, Norway.

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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 conditions 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 assessment. Results. Abscess infections were reported...
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 vitamin E than the non-abscess-infected group. The two groups differed significantly with respect to S-C-peptide (p < 0.042) and B-HBA1c (p < 0.012), and the prevalence of hyperhomocysteinemia (P-HCY 15 μ mol/L) was 73% in the abscess-infected group and 41% in the non-abscess-infected group (p < 0.001). The concentrations of S-25-hydroxy-vitamin D 3 was very low. Conclusions: One year of antioxidants supplementation with vitamin E and C in elderly subjects with MCI lead to significant increase in the serum a-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.
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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 snacking 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 = 0.012).

Key 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 P10002658, P1002293, P13/00615, RD060045, GO3/140 and B7/2010), 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).
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Objectives: To describe the methodology 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 18 to 65 years of age, 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 each 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...
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.

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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 population 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-Nutricionist. 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 guaranteed 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-111  
**Poster**

Prospective wheat as healthy invitation source.

Von Baer E; Semillas Baer; Casilla 87-Temuco.

Out of all the cereals wheat is the most important source of nourishment for the human race.

The objective of the modern breeding has been to create new varieties of wheat for major extraction and greater yield of white flour each time. Developed from a breeding project of about 25 years in Chile, including mutations and accumulated hybridizations, the PURPURA WH87 was created. It has a high nitrogen content and a high yield; also, it is easier to process and to cultivate, and the high quality grains and flour produced from this variety are already being sold in Europe.

The present objective of Semillas Baer is to invite the nutritional world to research this new satiety hybrid wheat, and produce it for massive human consumption, which will dramatically increase the health and life span of humanity.

PT-112  
**Poster**

Sensory evaluation of the menus served in a sample of schools in the health regions of Lleida and High Pyrenees and Aran.

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Introduction: since 2006 the Catalan Public Health Agency evaluates the quality of the school’s menus offer. The Program is framed in the regional strategy of Health Promotion through Physical Activity and Healthy Food Integral Plan. It consists of an initial assessment and a follow-up to suggestions for improvement. To complete this information a third phase on sensory evaluation was performed.

Objective: to evaluate some sensory aspects off meals and the environment on a sample of schools.

Methods: the pilot was done in 37 schools of the Health Regions of Lleida and High Pyrenees and Aran (35 was public and 4 concerted), 26 with their own kitchen and 13 with transported food, 12 of which are hot transport and 1 of which are cold transport food. Three health professionals visited the site and tasted the meal assessing sensory aspects of food and the environment, completing a questionnaire. The students between 10 and 12 ages old completed another one.

Results: the student’s satisfaction rate was 6.59 of 10 and 6.46 of 10 in the case of the health professional evaluators. Data also indicates that 80% of users approved the service (rate >5).

According to professionals (n=111), the texture and consistency is right in 50% of the starters and in 55% of main dishes. The texture is adequate in 97% of the starters and in 64% of the main dishes. According to the students (n=559): The texture and consistency is considered adequate in 41% of starters and in 74% of the main courses. Only a 51.5% takes a second piece of fruit a day and a 51.34% eat some food at schools that never eat at home. 51.5% think that taste is the main aspect to improve.

Conclusion: both professionals and students approved de quality of the sensory evaluation of school meals which increases the variety of food intake of children. The pilot program has been well received by schools. An inform will be sent to the school, municipality and the Education Department.
**PT-113**

**Poster**

**Changes in body composition according to anthropometry in Brazilian elderly.**

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**Objective:** To assess changes in body composition due to aging by anthropometry-constitutional methodology in 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, arm, body mass index (BMI), body adiposity index (BAI), waist-to-hip ratio (WHR) and waist-height ratio (WHRH) 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 a = 0.05 was adopted as the significance level.

Results: Lower BMI, WHR, and WHH were observed, with a slight predominance of women (53.3%), who had a higher age mean when compared to men (71.54 ± 8.4 vs. 69.95 ± 7.55 years, p < 0.01), and a higher prevalence of overweight (BMI ≥ 27 kg/m²) assessed by BMI (59.9% vs. 43.3%, p < 0.0001). 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). Weight, calf and arm circumferences decreased significantly with advancing age in both genders (p < 0.001). A significant reduction of BMI and height with advancing age was only observed among men (p < 0.05). Waist circumference, WHR, BAI and WHH did not change with age in both 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; however, the peripheral body fat 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.**

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**Introduction:** Smoking is associated negatively with serum concentrations of vitamin D in women and cause changes in the body composition. Obesity may also 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 corporal composition.

**Methodology:** 55 women were evaluated in the period from March 2012 to June 2013. Smoking (5), 18 ex-smokers (ex-S) and 19 nonsmokers (NS) were included. 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 calcium concentrations). The smokers and nonsmokers groups were performed using the t-test and Mann-Whitney test and multivariate linear regression using the program SigmaPlot for Windows version 12.0 (Systat Software), employing p < 0.05 as statistic 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=44.4±11 years, p=0.011). The assessment of body composition performed by body mass index (BMI) showed that the three groups were similar and all women were overweight. The group of ex-smokers showed a higher frequency of sunlight exposure (S=12.3±4.6, Ex-S=13.3±3.9 and NS=9.6±4.5, p=0.035) higher serum concentrations of vitamin D (S=26.2±10.4 ng/ml, Ex-S=30.2±11.9 ng/ml and NS=21.5±6.4 ng/ml, p=0.033) and higher serum concentrations of calcium (S=9.2±0.5 mg/dl, Ex-ba=9.6±0.7 mg/dl, NS=9.3±0.4 mg/dl, p=0.016). Comparing the intake of vitamin D and calcium, no differences were found between the groups, although the three groups presented ingestion lower than recommended intake. By means of multiple regression analysis, it was found that the presence of serum concentrations of vitamin D was explained only by smoking.

**Conclusion:** The results of this study showed that the changes in serum concentrations of vitamin D are associated with the presence of smoking.

**PT-115**

**Poster**

**Prevalence of eating disorders in students of educational centers from Gran Canaria.**

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**Objectives:** To assess the prevalence of eating disorders in Spanish students between 11 and 33 years old using standardized methods.

**Material and Methods:** 1342 students nonrandomly 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 scorers, 253 selected samples not at risk). The overall prevalence of eating disorders was 4.11% (5.46% of females, 2.55% of males). 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.**

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**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 school 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 calcidiol (25(OH)D). Adolescents with waist circumference above the 90th percentile were classified as risk. Body composition was assessed by tetrapolar biometrical.

**Results:** The mean age was 16 years, 55.6% was male, 48.1% was eutrophic and 51.4% was overweight. 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. Serum 25(OH)D were lower in adolescents with excess body fat and with waist circumference at risk (p<0.05). In addition, serum levels of 25OHD were inversely correlated with BMI and percent of total body fat (p<0.05). The mean intake of vitamin D (2.18 mg/day) was below the Estimated Average Requirements (EAR) regardless of nutritional status. Only 7.2% of individuals with overweight and 15.6% of eutrophic reached the EAR for vitamin D (10 µg/day). Lower body mass index and waist circumference were observed in the 3rd tertile of intake of vitamin D (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 PREMID-Carasitas Intervention Randomized Trial.**


**Objectives:** To assess the influence of a Mediterranean dietary pattern (Med diet) on anthropometric [weight, Body Mass Index (BMI) and waist circumference (WC)] and body composition [percentages of total body fat (TBF); total fat mass (TFM); percentages of subcutaneous fat mass (SFMT) and intra-medullar fat mass (TFM)] in a randomized dietary trial (PREMID) among high cardiovascular risk subjects.

**Design:** randomized primary prevention trial.

**Participants:** 351 Canarian adolescents aged 55 to 80 years old, with diabetes or other cardiovascular risk factors.

**Intervention:** Participants were randomly assigned to one of three different diets: Med diet + extra-virgin olive oil (EVOO) (n=117), Med diet + 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 non-food 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 two by two through the Benjamin-Hochberg test, which penalizes for multiple comparisons.

Results: Regarding anthropometric measurements (weight, BMI, and WC) was observed after 1 year of intervention. The control group showed the greater reduction in WC (3 cm), although no significant differences between the intervention groups were observed. Regarding body composition variables, the participants of control group increased the %TB (1.0%), TFM (0.4 Kg), %TBF (1.1%), TrFM (0.3 Kg) and had a greater reduction in the TBW (~0.7 Kg), when compared with the two groups of Mediterranean diet. Although the differences between the intervention groups were not statistically significant the %TBF and TFM showed a slight reduction in the MedDiet + EVOO group (~0.2% and ~0.1%), however, not statistically significant differences were found regarding to the other intervention groups.

Conclusions: 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 less or weight maintenance regimes in children or overweight.

Key Words: Mediterranean diet, obesity, body composition, body fat, octapolar impedance analysis.

PREDIMED Study

PT-118 Poster
Observer accuracy in the preliminary testing of a newborn anthropometric assessment method using photographic images.

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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, precised 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, ULS and LLS in cm, 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 were: 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 A vs B was r=0.96 (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.

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Objectives: Knowledge on food consumption data and their changes over time is considered essential in order to set and monitor food-based dietary guidelines (RBDGs). 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.

Key findings: During the last 50 years, per capita supply of vegetables, and less fruit, increased (vegetables: 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 (8.3 kg/capita/year) compared to 1961 (7.9 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 recently (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.

Results: 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 diet pattern. Food and nutrition policies should focus more in preserving and promoting traditional Greek diet across the life span. RBDGs 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.

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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 consumes 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 prospective, 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 about other habits questionsnaires were completed. The questionnaire was divided into two parts: one based on 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 at least one or four meals a day but very few drink 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.

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PT-124  Poster  Vitamin D status of Icelandic children – associations with intake and season.
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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 was defined as 25-(OH)D ≥50 nmol/L, possible insufficiency 25-(OH)D 30-49.9 nmol/L and risk of deficiency 25-(OH)D <30 nmol/L. 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±32.2 nmol/L vs. 56.5±17.9 nmol/L, 92.2% vs. 63% of children were considered vitamin D sufficient, 8% vs. 31% vitamin D insufficient and 6% vs. 5% vitamin D deficient. The median vitamin D intake was lower than recommended (7.7 μg/d vs. 4.9 µg/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, porridges, 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  Poster  Plant Food Supplements for gastrointestinal use. Evidence based efficacy.
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The efficacy of Plant Food Supplements (PFS) is not fully evidence based and the recommendations of consumption 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 PlantLUBRA project (PT-EC funded project n°245199). A search strategy was conducted in EMBASE, MEDLINE, Scholar 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, cascara-salix, an enema or placebo for bowel preparation for colonoscopy, 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 the symptoms in patients with irritable bowel syndrome (combined with a tranquilizer and a muscle relaxant). In patients with haemorrhoids, PFS containing Plantago ovata improved 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 PFS for gastrointestinal uses included in this review need to be further investigated with adequate randomized control trials to draw a conclusion about their effectiveness.

PT-126 Poster
Sensorial assessment in a sample of schools foods offered in Comellà de Llobregat.

Background: From 2006, the Public Health Agency of Catalonia assesses the quality of regional schools’ food offer. The School Menus Revision Program (PMHE) 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 sensorial quality of school menus and food services.

Materials and Methods: The pilot experience has been carried out in the town of Comellà 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 catering. Eight food services were from hot chain production and one cold, as well as seven services were cooked in situ and two transported from an outside kitchen. Two health care professionals visited the dining-rooms and tasted the food in order to assess sensory aspects. Afterwards, a questionnaire was completed by the professionals and students from 10 to 12 years old.

Results: 70% of the students considered that the meal was satisfactory, from which 20% considered 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=110), 50% considered that the texture and consistency were appropriate, only 37% eat a second fruit portion per day and 60% eat 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 sensorial 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.
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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 about fruits; fruit consumption and attributes of fruits. Attributes of origin (local/imported), taste (sweet/sour), price (expensive/cheap), texture (hard/airy/glossy/slimy-pulp) and color (green/red) were presented in combinations issued from an orthogonal design. Two conjoint procedure was applied to obtain the utility estimates. All data were analysed with SPSv 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 (67.6%) were aged between 20-29 years, 48.9% had Bachelor or higher education, 96.4% believed that eating more than 200g fruit/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 “texture” is the most important factor (39.4%), while “taste” 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 is 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, does not seem big correlations with fruit quality.

PT-128 Poster
Barriers to implementation of “multidisciplinary interventional program for improvement of nutritional status of children in Iran”: A qualitative study.
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Objectives: Malnutrition is one of the most nutritional problems among children under 5 years in IRAN. Because of multi-disciplinary character of malnutrition, an intersectional intervention, named “multidisciplinary interventional program for improvement of nutritional status of children in Iran”, were designed and implemented since 1999. 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 use qualitative methods to explore the existing challenges and barriers of implementation of this program from the perspective of policy makers, executive managers, and practitioner at national and provincial 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 provincial 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 delay 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.

PT-129 Poster
Nutrient intake in pre-pregnant and pregnant women at high risk of gestational diabetes.
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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 ≤ 20 weeks of pregnancy at baseline and either already had or 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 SD 6), and SFA 12% (SD 3). The pre-pregnant women had carbohydrate intake of 44% (SD 6) and the pregnant of 46 % (SD 6). Suceose intake among pregnant women with a history of GDM was 7% (3) which was different from the other pregnant women (4% of SD 4) (p<0.001). The pre-pregnant women has frequently used dietary supplements than the pregnant (53% vs. 77%, p<0.001), and had median folic 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-adequate dietary intakes and dietary deficiencies 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 folic acid 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.
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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) were measured in two surveys (July 2011 and July 2012), in 159 children and 168 women, and serum retinol and sTfR were adjusted for sub-clinical inflammation using standard adjustment factors based on CRP and AGP. 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 53.3±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 7±1.5 mg/L at baseline and 3 months, with no significant change in prevalence (11% 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 g/kg in SAC (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 increased from 12.6±1.1 to 12.9±1.1 g/L (p=0.01), but anaemia prevalence did not fall significantly (14.5% and 9.7%, p=0.17). In women, neither haemoglobin nor anaemia prevalence (10% at both baseline and endline) changed.

In univariate analysis, there were no correlation 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). Serum retinol at endline negatively correlated with sTfR at endline (r=-0.23, p=0.001).

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.

PT-131 Poster Antioxidative and hypcholesterolemic effects of two degree of hydrolyses of Chickpea protein (Cicer arietinum) in hypercholesterolemic rat.

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Recent studies have shown that some peptides derived from hydrolysed legume proteins exert an important role in the regulation of cholesterol metabolism and antioxidant activities against lipid peroxidation that increasedatherogenic processes.

In this study the effects of degree of hydrolysis (DH) of chickpea proteins hydrolysates on Ipermia and the antioxidant enzyme defense were estimated in serum and liver of rat fed high-cholesterol diet.

18 adult male Wistar rats (220±10g), that fed 20% casei with 1% cholesterol, were divided into three groups and received for 30 days by gavage 10g/kg of protein hydrolysed at degree of hydrolysis 8% (PCH8) or 17% (PCH17). The third group received in the same conditions water as placebo and constituted the control group (CG).

Compared with CG, Serum total cholesterol levels were respectively 1.3- and 3.5-fold lower with PCH8 and PCH17. However, the serum tracyglycerols were 1.4- fold decreased in PCH17 phospholipids levels in these two groups were also reduced compared with control values. In liver, total cholesterol values were 1.9-fold lower in PCH8 and CHP17 groups. Hepatic triacylglycerols and phospholipids values of PCH8 group were 1.3-fold higher compared with CG. However, in PCH17 tracyglycerol concentrations was similar and PL concentration was 1.6-and fold lower compared with control group.

Serum lipid hydroperoxide contents were respectively 1.3- and 2-fold decreased in PCH17. However, lipoperoxides products were increased in these groups vs CG (1.8 - 1.5-fold). Compared with CG, serum carboxy derivatives contents were similar in HPC8 but these values were significantly decreased only with HPC17, whereas CHF8 and CHF17 treatment reduced significantly carbonyls in liver.

Serum akyrase activity was significantly higher in rats treated CHF8 and CHF17 while that of glutathione peroxidase was increased only by CHF17. Compared with CG, liver superoxa dismutase activity was respectively 1.3- and 2-fold higher in CHF8 and CHF17 whereas that of glutathione peroxidase remained unchanged.

Therefore, chickpea protein hydrolysed at DH=8% and particularly at DH=17% could be a very useful compound to reduce efficiently cholesterolemia and lipid hydroperoxides by improving antioxidant enzyme activities that protected against oxidative damages induced by the hypercholesterolemic diet.

PT-132 Poster Television Viewing, Computer Use, Time Driving and All-Cause Mortality: The SUN Cohort.

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Objective: The balance between energy intake and energy expenditure seems crucial for the prevention of obesity and obesity-related mortality. In this context, the assessment of sedentary behaviors demands a greater attention in prospective cohorts. Our objective was to assess the association between different sedentary behaviors and all-cause mortality.

Material and Methods: Prospective analyses using data from the SUN Project, a dynamic cohort study of Spanish university graduates. For the present analyses we included 13,284 participants with a mean age of 37 years, followed-up for a median of 8.2 years and a retention rate of 92%. Television, computer, and driving time were assessed at baseline through a previously validated questionnaire. Our primary end point was death from any cause. If participants did not answer any of the 5 repeated mailings with the follow-up questionnaires, they were contacted by e-mail or telephone. Most deaths (>85%) were identified from reports by the next of kin, work associates, and postal authorities. The Spanish National Death Index was checked every 6 months to identify deceased cohort members. Poisson regression models were fitted to examine the association between each sedentary behavior and total mortality.

Results: All-cause mortality incidence rate ratios (IRR) per 2 hours per day were 1.40 (95% confidence interval [CI]: 1.16 to 1.70) for television viewing, 0.96 (95% CI: 0.79 to 1.18) for computer use, and 1.14 (95% CI: 0.90 to 1.44) for driving, after adjustment for age, sex, smoking status, total energy intake, Mediterranean diet adherence, baseline body mass index, and physical activity. The risk of mortality was twofold higher for participants reporting >3 h/day of television viewing than for those reporting <1 h/day (IRR: 2.04 [95% CI: 1.16 to 3.57]).

Key findings: Television viewing was directly associated with all-cause mortality. However, computer use and time spent driving were not significantly associated with higher mortality. Further cohort studies and trials designed to assess whether reductions in television viewing are able to reduce mortality are warranted. The lack of association between computer use or time spent driving and mortality needs further confirmation.

Funding: The SUN Study has received funding from the Instituto de Salud Carlos II, Official Agency of the Spanish Government for biomedical research (Grants PI10/0258, PI10/02293, PI1300615, RD06/0045, G03/140, and 87/2010), the Navarra Regional Government (45/2011) and the University of Navarra.
The percentage of under-5 years suffering from severe (5.68%) wasting according to the definition of the WHO guidelines, with HR: 1.6 [95% CI: 1.2-1.9]; P=0.001. This association remained significant even after adjustment for different potential confounders. Participants initially free of several MTS criteria at baseline who were in the upper quartile of SUA had a significantly higher risk of developing these MTS criteria than those in the lowest quartile, during the following 2 years (OR: 4.3 [95% CI: 2.5-7.4]; P=0.001). These results provide further evidence suggesting that elevated SUA concentrations are directly and significantly associated with a higher risk for the development of MTS in men and women. SUA measurement might be considered in patients to identify early those at increased risk to develop MTS who might benefit from an early intervention. However, further studies are necessary to confirm and to understand the mechanisms underlying this association.

**PT-134**

**Results of the screenings of the nutritional status of under-five children in Upper River Region, the Gambia.**

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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 methods for assessing the nutritional status of under-five children of URR 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. The aim of the study was to assess the nutritional status of under-five children aged 6-23 months from the menu used during the nutritional screening.

**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 NaNa Focal Person in URR. After sensitizing the population and convincing them to the selected venue, the children under five years old had their nutritional status assessed. Using the KPKKA nutritional menu and evaluating the WHO guidelines, the status was determined by following a pair of weight-for-height (WHF) or weight-for-length (WFL) from the WHO growth failure 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 inhabitants 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 these 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 2003-2011. In 2011-12, in a sample of 10258 children in Upper River Region, the easternmost 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.

**PT-135**

**The role of nutrition education in the promotion of improved complementary feeding in rural Malawi.**

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Malawi has a high burden of 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 2011-2012, FAO Malawi in collaboration with the Ministries of Health, and Agriculture and Food Security extension staff carried out Trials of Improved Practices in Karungu 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 of the screenings of the nutritional status of unselected children aged 6-23 months in Malawi. The Gambia. 11744 under-5 years suffering from severe (5.68%) wasting according to the definition of the WHO guidelines, with HR: 1.6 [95% CI: 1.2-1.9]; P=0.001. These results provide further evidence suggesting that elevated SUA concentrations are directly and significantly associated with a higher risk for the development of MTS in men and women. SUA measurement might be considered in patients to identify early those at increased risk to develop MTS who might benefit from an early intervention. However, further studies are necessary to confirm and to understand the mechanisms underlying this association.

**PT-136**

**The school lunch program review (PRMe) in Catalonia improves the quality of menu planning, 2008-2014.**

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Background: The School Lunch Program Review (PRMe), 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, within the evaluation of 2900 menu planning has been 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 are evaluated.

**Results:** In 896:88% consider it a useful tool. 83% believe that the report will lead to the improvement of the menu planning. The report was sent to different stakeholders. Regarding to the menu planning, the following changes are observed in achieving the recommendations (n = 465): specification of ingredients and preparation of starters (25%-62%), specification of ingredients and preparation of main courses (65%-72%), presence of fruit in meals (51%-79%), presence of fish in the meals (50%-78%), presence of green vegetables (77%-91%), daily presence of vegetables (55%-91%) and recommended frequencies of fruits (45%-65%).

**PT-137**

**Increased serum calcium levels and risk of type 2 diabetes in individuals at high cardiovascular risk.**

Becerra-Tomás N1, Estruch R2,3, Buñó M2, Casas R2,3, Díaz-López A2,3, Basora J2,3, Fitó M2, Serra-Majem L1,2, Salas-Salvadó J2,3

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Increased serum calcium levels and risk of type 2 diabetes in individuals at high cardiovascular risk.

Becerra-Tomás N1, Estruch R2,3, Buñó M2, Casas R2,3, Díaz-López A2,3, Basora J2,3, Fitó M2, Serra-Majem L1,2, Salas-Salvadó J2,3
Objective: Insulin resistance and acrion 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 used 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±0.13 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


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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 nº245199). 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<0.05 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” in Spain 17.4% (n=23), Germany 2.3% (n=4), Romania 0.8% (n=3) and 0 no dieters in the United Kingdom.

Cynara scolymus (ar­chichoke), Camelia sinensis (green tea) and Foeniculum vulgare (fennel) are the 3 most consumed botanicals by respondents taking PFS for reasons of “body weight”. Archichoke and green tea PFS consumers’ BMI significantly falls <25 kg/m2 as compared to non-consumers (p=0.019 and p=0.046 respectively); BMI is not significantly different between fennel consumers and non-consumers. Among PFS consumers responding to be “dieting for overweight/obesity”, the 3 most consumed botanicals are Cy­nara scolymus (archichoke), Foeniculum vulgare (fennel) and Ananas comosus (pineapple). Archichoke-containing PFS self-reported to be significantly associated with <25 kg/m2 as 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. Archichoke and green tea are the most consumed botanicals from PFS taken for reasons of body weight, with their consumers’ BMI significantly <25 as compared to non-consumers. Among diets for overweight/obesity, only archichoke-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.

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Objective: 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 protein 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 neuropsychological functions of children and make a nutrition education intervention to improve diet quality.

Acknowledgments: Funded by the Universitat 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.Q; Gonçalves, M.R; Martinho, K.O; Franco, F.S; Longo, G.Z; Tinçco, 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, income, social class, skin color, body measures (BMI, hip ratio, waist circumference, physical activity index, self-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 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 factors were associated with MS in both sexes: the presence of diabetes and hypertension, self-negative perception of health, overweight, changed WHR, waist circumference differences, elevated triglycerides, HDL, VLDL and glucose. High levels of LDL was associated only with males.

Key findings: It was concluded the 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.

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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 disea­
Science, Ibn Tofail University, PO Box 133, Kenitra, Morocco. 1UMC/UNID NUTRITION, Institut de Recherche pour le Developpement-IRD, Montpellier, France.

Introduction: In the North Africa countries are in economic emergence, and develop epidemiological and demographic transitions like these known prevalence of obesity in developed countries following the processes of urbanization, industrialization, globalization, environmental problems, climate change and changes in the lifestyles they accompanied them.

Methodology: In this context, a project Curus "Obre-Maghreb" was operated from March, 2009 till April, 2010, it has for purpose to supply (theledge which can help in the elaboration of adapted policies. It associates Ibn Tofail university, Morocco, IRD, France; various partners of Government, Ministries of Health, and other Universities. It also associates National Institute of Nutrition of Tunisia (INNTA), and University of Nottingham of England, so conferring to the study a regional size. Aimed objectives were to: by specific group, are to control the problem of sedentary behaviour, as non-sedentary, and obesity and diabetes, which account for 25.8% in children. 

Results: The means of BMI, height and waist circumference were measured. Children were classified by their BMI using the WHO criteria. Self-declared data about sedentary behaviour was collected and used to assess a sedentary behaviour score (SBS) (0-100) and included: television viewing, computer and videogame use, and time used to do homework and reading. The SBS was divided in tertiles (divided by gender) and SB categories were created, classifying children in the 2nd and 3rd tertiles as sedentary and the ones in the 1st tertile as non-sedentary. 

Key finding: Children who are engaged in more sedentary activities have higher obesity prevalence and therefore an effort should be made to monitor the time children spend involved in these activities.

Body responsible for the investigation: This study was founded by the Spanish Agency of Consumers Affairs, Food Safety and Nutrition (AECOSAN).

PT-142 Poster Dietary sources of sodium in Spanish schoolchildren.

Introduction: Identifying the dietary sources of sodium is important in order to take measures to protect the health of the population, especially in children.

Objective: To assess the sodium intake and dietary food sources in Spanish schoolchildren aged 7 to 12 years.

Methods: We studied 181 schoolchildren selected from different rural and urban areas of the Community of Madrid, Andalusia and Castilla-La Mancha (115 boys and 66 girls). The food intake was recorded for 3 days (including a weekend day) using a dietary record questionnaire. All foods were tabulated using the DIAL program, and food groups, energy and sodium intake was calculated. The contribution of each foods to total sodium intake of the children was calculated and expressed as a percentage.

Results: Mean sodium intake (excluding table salt) (246±479 mg/day) exceeded the UL established for this age group (1.9 mg for 4-8 years, 2.2 mg for 9-13 years) in 91.7% cases (without sex differences). The main dietary sodium sources were found in all variables. 73.3 % of the obese children were sedentary. The means of the evaluated parameters for the sedentary group were: 30.1±0.07 points of SBS, 18.1±3.0 kg/m2 for BMI, 30.1±7.8 Kg for weight and 61.4±8.0 cm for waist circumference with a 20.9% of obesity prevalence; for the non-sedentary group were: 14.3±5.5 points of SBS, 17.1±2.8 kg/m2 and 60.7±2.2 Kg and 60.7±2.2 cm with a 15.9% of obesity. All values were significantly higher in the sedentary (p<0.05) than in non-sedentary group.

Key finding: Children who are engaged in more sedentary activities have higher obesity prevalence and therefore an effort should be made to monitor the time children spend involved in these activities.

Body responsible for the investigation: This study was founded by the Spanish Agency of Consumers Affairs, Food Safety and Nutrition (AECOSAN).

PT-144 Poster Inadequate intake of fruits during pregnancy is related with higher sugar intake in the offspring at 3 years of age.
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Objective: We aimed to identify the different relationships between the 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 PREOBE project (www.ClinicalTrials.gov NCT01634646) were studied in the prenatal period. 25 were healthy non-smokers (BMI<25), 13 were overweight (25≤BMI<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 calculations (Version 2.16 2.70). ANOVA test and multivariate 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 achieved 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=-1.077; 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 suggest 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.
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Departamento de Nutrición, Facultad de Salud Pública, Universidad de São Paulo, São Paulo, SP, Brazil.
Objective:evaluate blood lipids and the characteristics of the diet 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 (Saúp), conducted in 2008. Dietary intake was assessed using one 24-hour dietary recall using the Automated-Multi-Pare-Method. 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 chi-squared tests.
Results:
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 glycemic index for men and cholesterol and glycemic 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=0.0264) and saturated fat (p=0.0204) consumption, while those with three or more than three EO had the highest polysaturated fat acids consumption (p=0.019) and the higher polysaturated/saturated fat acids ratio (p=0.0064). For women, those with three EO had the lowest fiber consumption while those with three or more EO had the highest fiber consumption (p=0.001). Those with less than three EO had the lowest polysaturated/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.
*Agència de Salut Pública de Barcelona. Co-llegi de Farmacèutics de Barcelona. *Fundació Dietà Mediterrània.
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 lineas Europeas de salud, de promover una mayor responsabilidad de los individuos en su propia salud, se incorporan a la publicación aspectos de autoeducado como consejos de higiene bucal, de control del peso, por una adecuada hidratación, higiene del suelo, alimentación y medicamentos, así como alimentación y descanso. También se incluyen recursos disponibles en la ciudad de Barcelona para garantizar una alimentación adecuada a las personas que así lo necesiten. Actualmente, con las comidas en compañía llega a ofrecer 197.194 comidas anualmente y con las comidas a domicilio se llega a 21.251 personas mayores.
Un aspecto a destacar de la guía es una forma de expresar la composición y proporciones de las comidas principales a partir de esquemas con fotos de ejemplos de los diferentes grupo de alimentos, que busca una forma de representarlo mas simple que la pirámide y adaptado a la población diana a nivel de diseño.

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 y formación a entidades como hogares de ancianos, centros cívicos, Comedores Sociales y otras entidades y asociaciones de gente mayor.

En definitiva, con la guía se ha hecho un trabajo por parte de un equipo de expertos para consensuar unas recomendaciones apoyadas por una evidencia científica sobre: “¿Qué debemos comer, cómo y por qué?“ Se estipulan unos consejos alimentarios específicos y también poniendo énfasis a como: seleccionar, manipular, cocinar y comer los alimentos, preferiblemente en compañía, para fomentar un envejecimiento activo y saludable. Esencial que cap a l’any 2050 el 30% de la població més alta de “qué” debem comen comen sin justificar “perquè” se estipulan uns consejos alimentaria específiques i també ponent enfasis a “com” : seleccionar, manipular, cuinar i menjar aquests aliments, així com “com” ho hem de fer: a STATS preferiblement en companyia, com seleccionar, cuinar i menjar per fomentar un envelliment actu i saludable.

PT-147
Poster
Adhesion to nutritional intervention programme in shift workers: preliminary study.
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Objectives: Verify adhesion to a qualitative nutritional intervention program and changes in food intake and body composition in shift workers.
Method and materials: Nineteen shift workers (18 to 55 years), 14 females, 5 males, 15 working 06 night shift workers, and 4 working 06 day shift workers were selected through 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 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 consequently the 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.

PT-148
Poster
Occurrence of falls and fractures and their consequences, in a group of ambulatory older women previously rated through risk screening scales.
Asadourigli, A; Moss A; Bertolotto P; Gonzalez A; Carrillo M; Canale M.

Falls and osteoporotic fractures are a frequent cause of disability, dependency 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 cohort of older woman from Córdoba city, and to analyze their causes and consequences. Method Correlational descriptive study. Population: 86 older woman ≥60 years old, attending senior centers in Córdoba in 2013, with prior risk assessment. Variables: risk of falling, fracture risk; occurrence of falls, occurrence of fracture and body mass index (BMI); bone mineral density (BMD), age. Instruments: Tinetti scale, FRAX, Dual-energy X-ray absorptiometry, questionnaire. All the older woman gave consent. Results Risk assessment: 93% of the older woman had low risk of falling, moderate and high risk prevailed among the ≥80 years. 39.5% of the older woman had high fracture risk; with a significant association with age (p=0.0007), low BMD (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 at least one 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 low risk (p=0.0242) and high fracture risk; with a significant association with age (p=0.0007), low BMD (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%.

PT-149
Poster
Right to adequate food protection in pregnant women and children, Córdoba, Argentina.
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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, Córdoba, Argentina, and -reduce the premature abandonment of the exclusive breastfeeding practice on children under six months, and continue up to age two years old.

Material and methods: Subjects of study 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
Poster
Screen time is associated with insulin resistance in schoolchildren of Madrid, Spain.
González-Rodríguez LG1 ; Rodríguez-Rodríguez E1 ; López-Sobaler AM2 ; Ortega Anta MI1.
1Department of Human Nutrition and Dietetics. Faculty of Health Sciences. Alfonso X El Sabio University. 2UCM Research Group VALORUT (2002030). Department of Nutrition. Faculty of Pharmacy. Complutense University of Madrid. Spain. 3Analytical Chemistry Department Section, Faculty of Pharmacy, Complutense University of Madrid. 4Department of Nutrition, Faculty of Pharmacy, Complutense University of Madrid.

Objective: Sedentary 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 videogames was applied. Screen time was obtained by the sum of hours spent in the previous three activities. Fast­ ing 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 also 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±1.08 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. The prevalence of those with osteoporosis had higher frequencies among those than those 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 (β=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. Children who spent less than two screen hours had lower HOMA-IR values than those 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.

PT-151
Poster
PERSSE Project: Internal consistency for constructs related to fruit and vegetable intake of the children questionnaire.
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1Sociedad Española de Nutrición Comunitaria (SENC).
2Agencia Española de Seguridad Alimentaria y Nutrición (AESAN).

Background: This paper describes the internal consistency of constructs related to fruit and vegetable intake in the children questionnaire in PERSSE 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 (Andalusia, Madrid, Extremadura, Castilla-La Mancha, Huesca and Melilla, Community intervention n=29 schools and control group n=38 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 fruit/vegetables to school, school lunch, active parental encouragement and facilities, 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/like very much’ (4). Preliminary analyses were conducted with 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 sample. Out of the six subscales the highest Cronbach's alpha values were moderate to high (range 0.51 to 0.93) with the exception of parental facilitation, which had a value below 0.50 for fat (α=0.49).

Conclusions: PERSSE child questionnaire assessing personal, family, and community-environmental determinants related to fruit and vegetable beha­ viours has good internal consistency of constructs for the large majority of items.

PT-152
Poster
A qualitative analysis of the eating habits of primary schoolchildren in urban areas of Cork and Almeria.
1Amat Sánchez A1 ; Bogue J.2 ; Ward M.3 ; Serra-Majem L.
1Amat Sánchez A, Bogue J, Ward M, Serra-Majem L.
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 children about the eating habits of primary school children, by proposing solutions and strategies for these problem and needs.

Material and Methods: In-depth interviews using semi-structured guides were conducted with expert informants matched by profession, 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 co-operate to find a solution.

PT-153 Alpha-tocopherol concentrations and weight status as predictors of HOMA-IR in schoolchildren of Madrid, Spain.
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1. Center of Studies and Health Services, Veracruzana University, Mexico; 2. Analytical Chemistry Departmental Section, Faculty of Pharmacy, Complutense University of Madrid; 3. UCIM Research Group VALORNUT (020030), Department of Nutrition, Faculty of Pharmacy, Complutense University of Madrid, Spain. 3. Department of Human Nutrition and Dietetics, Faculty of Health Sciences, Alfonso X El Sabio University. 4. Department of Nutrition, Faculty of Pharmacy, Complutense University of Madrid, Spain.

Objective: Alpha-tocopherol concentration is an important biomarker of the oxidant 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 > 85 and <97) (n=93), obese (BMI > 97) (n=90) and schoolchildren randomly selected (using a table of random numbers) from the remaining 381 who were of normal weight (BMI<85) (n=381) 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 (μU/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. The concentrations of alpha-tocopherol in total lipids 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 (version 20).

Results: The IR in the HOMA-IR model was 0.91. The statistical significance was set at p<0.05. The analysis of the IRs showed that the IR was significantly higher in girls than in boys (1.73±0.98 vs. 1.34±0.95; 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 diabetes (2.07±1.19 vs. 1.08±0.64; p<0.01). The concentrations of alpha-tocopherol in total lipids were significantly lower in overweight/obese than those of controls (47.4±3.96 mg/l vs. 39.7±7.85 mg/l), respectively. The HOMA-IR values were significantly inversely associated with the concentrations of alpha-tocopherol in total lipids (β=0.018±0.006, p=0.005) 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 Study habits and alcohol consumption risk assessment according to WHO criteria in college students.
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Objectives: 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.

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 can define the low, moderate and high risk. 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 (Hechric, 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, where as 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 2169 a total 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.

Conclusion: This analysis shows a percentage of lower risk than expected on drinking habits in students. Further investigations are needed to minimize bias due to various factors, including the possibility that data collection is performed during exam periods where alcohol is severely diminished.

PT-155 Nutritional status of children with Autism Spectrum Disorder. Zapata J1, Mari-Bauset S2, Bes-Rastrollo M1, de la Fuente C1, Mar-Sanchis A4, Morales-Suárez-Varela MM1
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Objectives: 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 data have 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 with similar socio-economic 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 statistical significance 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 vs. 95.46 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 vs. 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 (b=-20.1, 95% CI: -30.45 to -9.58; b=-4.08, 95% CI: -7.86 to -3.32; b=-21.2, 95%CI: 4.98, 37.36; b=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 recommenda- tions was greater for fibre (OR=0.28, 95%CI 0.09, 0.82) and vitamin E

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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); Closing (requirements to implement measures, transitional provisions, clause validity and revocation clause); Signal; 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 the Nutritional Ordinances”, but 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 nutritions alimentary system for the health conditionalities of Bolsa Familiar, 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 increase of the cash transfer mode 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.

PGT-157
Poster
Sugar-sweetened beverage consumption and obesity in children: quality of the studies don’t influence conclusions.
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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 current reviews of the current available evidence show contradictory findings, highlighting the weaknesses of many studies. The main controversy revolves around 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 for sugar-sweetened beverages (SSB) and child obesity and to further analyze the quality/validity 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 was to estimate the relation between SSB intake and obesity in children and young people. Only randomized controlled 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, Forshee et al. 2008 and Vartanian et al. 2007) achieved 83%, 74% 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 (Forshee 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/validity 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.

PGT-158
Poster
Optimisation of a juice with two varieties of prickly pear (Opuntia ficus-indica) treated by thermitrasurend a ultrasound surface response method.
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Objectives. The prickly pear (Opuntia ficus-indica) is abundant in Mexico, is a good source of bioactive compounds such as polyphenols, this compound has generated great interest because of its antioxidant properties associated with the prevention of different chronic diseases such as prevention of noncommunicable disease (cardiovascular, cancer, diabetes). Ultrasound is considered an emerging technology, In order to obtain a juice thermoultrasonicated 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 processing 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 ultrasound 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 mesophill) and yeast by the method of standard plate count and 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 content of 0.5 CFU mL-1 and 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 880 mg of Acid Galil Equivalent L-1, and the antioxidant activity was of 2280 µl of Trolox Equivalent L-1. The increase of phenolics 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.

PGT-159
Poster
Dietary Inflammatory Index (DII) and mortality in NHANES III Cohort Study.
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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
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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 , race, diabetes status, hypertension, physical activity, BMI, poverty index and smoking, revealed positive associations between higher Dll and overall mortality (HR for Dll Tertile3 vs 1 = 1.34; 95%CI 1.19-1.51, p-trend<0.0001), cancer related mortality (HR for Dll Tertile3 vs 1 = 1.46; 95%CI 1.10-1.96, p-trend=0.01), digestive cancer mortality (HR for Dll Tertile3 vs 1 = 2.10; 95%CI 1.15-3.84, p-trend=0.03) and CVD mortality (HR for Dll 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 Dll scores, was associated with overall, cancer and CVD mortality.

PT-160 Poster
Prospective studies of South Asia on Double Fortified Salt as a cost effective approach to combat micronutrient deficiencies.

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Today's time focuses on progressing economy world wide. 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 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 0.56mg/dl in girls(431) and 0.6mg/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 DALY’s lost every year for India.
**PW-001**

**Poster**

**Edible insects as a gourmet dish in high class restaurants in México.**

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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 (ant eggs) three have may-guey white grubs, one may-guey red grubs and two grasshoppers. Escamoles were the most demanded, follow by mayguey grubs, and grasshoppers were less demanded. Most of the consumption styles 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.

**PW-002**

**Poster**

**The influence of nutrition education with controlling blood sugar levels for outpatient type 2 diabetes mellitus.**

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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 led 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. 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 diverse 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%. Conclusions: there was no influence of nutrition education with increased knowledge that have 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.

**PW-003**

**Poster**

**Production, Acceptability and Storage of cocoyam Snack, a perfect way of combating malnutrition.**

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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 undervaluated 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 analytical methods 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 (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 18.3g/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 obtain 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.

**PW-004**

**Poster**

**Monounsaturated fatty acids, olive oil and health status: a systematic review and meta-analysis of cohort studies.**

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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 were included. The meta-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 (mainly 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.

**PW-005**

**Poster**

"Fat? Who is fat?" Self-image acceptance and weight control behaviours among overweight and obese adolescents.

Tur JA, Bibiloni MM, Pons A, Rich J

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III World Congress of Public Health Nutrition
Research Group on Community Nutrition and Oxidative Stress, University of Balearic Islands, and CIBERobn (Phytoecology of Obesity and Nutrition)

Objectives: Incidence of modern anti-fat attitudes on overweighted boys and girls by analyzing self-image perceptions and weight-control practices, and self-body attitudes of heavier subjects, their motivation to lose weight and the actual behaviours to achieve this goal were assessed according to the Theory of Planned Behaviour and Transtheoretical Model of Change were tested in a sample of Spanish adolescents.

Material and Methods: Multicenter population-based cross-sectional nutritional survey carried out (2007-2008) in Balearic Islands (Spain) (n=1988; 47.6% male; 12-17 years old). BMI (actual measures); weight estimation (previous to measured); perceived and ideal image (in a series of silhouettes); weight gain concern (in a semantic scale ranging from "not at all" to "much"), and declared regular weight-control practices ("never"; "not at the moment"; "present dieting and/or exercising") were assessed. Results: 7% of boys and 16% of girls were heavier than recommended. Girls were more accurate in their weight estimation and perceived image, were more unsatisfied with it and choose ideal silhouettes thinner than males. Oppositely, the percentage of overweight and obese boys who declared themselves satisfied with their image, "not concerned at all" about their weight, and having never done anything to reduce it was elevated. In fact, 46.7% of overweight boys and 29% of obese girls should be considered not at the contemplation but at the pre-contemplation step of the Transtheoretical Model of Change. Corresponding girls' proportions were reduced to 13% and 11% respectively. In contrast half of all adolescents, including many normal weight girls, are in contemplation or even in the preparation/ action steps. In that case girls typically combine diet and exercise while boys predominantly rely on exercise.

Funding: Project: ECl11/01791, CIBERobn CB1203/00303. Grant of support to researchers: 350011 (Balearic Islands Gov. and EU FEDER funds).

Key findings: The unexpected high percentage of boys indifferent to fatness probably reflects social habituation and self-defence processes. A claim is made for clever tailoring messages to promote their interest in adopting healthier habits.

A need for focused campaigns to provide subjects in more advanced steps of Transtheoretical Model of Change with psychological and nutritional tools to keep a reasonable weight and to avoid undesirable control-weight behaviours has been detected.

**PW-007**

**Misunderstandings of adolescents and young adults about nutritioanal aspects.**

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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.

Objectives: 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.

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 basis of a 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 quality of the 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-006**

**Involvement of adolescents in culinary tasks.**

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Introduction: Different dietary programs have been developed to improve healthy habits between children and adolescents. A good strategy for promoting healthy habits could be to involve young people in food practices such as preparing or cooking food.

Objective: Analyze the participation of adolescents in different culinary tasks.

Material and methods: 384 adolescents (13 to 22 years old) took part in the study. Participants were asked to perform a questionnaire related with 8 aspects: 1/ how to make a shopping list; 2/ how to do the food shopping; 3/ knowledge about cooking; 4/ enjoy cooking; 5/ help to cook at home; 6/ knowledge about where to throw the leftover food after cooking and eating; 7/ knowledge about how to take advantage the leftover food after cooking; 8/ enjoy the food self-prepared.

Results: In general we observed a good participation in culinary tasks. 90.6% of participants know how to do a shopping food list and 58.8% are usually involved in the food shopping.

78% know to cook and 80.8% enjoy cooking. Although we identify that only 51.9% of them cook usually at home, 90.3% enjoy the food when they cook in the preparation.

Most part of the participants know where they have to throw the leftover food after cooking and eating (88.1%), but sometimes they know how to take advantage of the leftover food after cooking (58.2%).

Differences in culinary tasks with gender, age, quality of diet, and interest on food were explored. Although culinary tasks were not strongly affected by gender, age and quality of the diet, some differences were spotted. Principal differences were identified with interest on food, showing that those who have more interest on food are they who have a proactive attitude on culinary tasks.

Key findings: Results from the present study show that adolescents are slightly involved in culinary tasks.

Participate in the cooking process is something positive and satisfactory for most part of them because they enjoy more the food, if they produce it. Cooking is an activity enjoyed for them, so it could be a good strategy to include this activity in dietary programs for promoting healthy food habits.

In addition, we could enhance the way to know how to take advantage the leftover food after cooking in order to improve their food knowledge and also to improve the conscientious value of food.
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 delivered to children whose diet many of 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 groups were identified. By food frequency data were gathered from 65 y or older free-living participants. Using monthly mean national food prices, daily expenditures on VAF, animal-derived, grain, and ‘others’ food groups were estimated. Annual ED and LOS utilities 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 (i.e., visit, day, and costs) for ED and hospitalisation. 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. In sensitive analyses, the association results showed the highest VAF expenditure was associated with significant decreases in LOS (30%) and LOS costs (33%) while the highest animal-derived were associated in increases in LOS (29%) and LOS costs (80%). The p values for linear trends were significant for ED and LOS of VAF and animal-derived foods. The associations of daily fat, dietary fiber and micronutrients intakes with ED and LOS were consistent with those observed for food patterns.

Conclusion: An inverse association for VAF and a positive association for animal-derived food expenditure with the economic burden of acute health care to be found in older community-based Taiwanese. This provides an opportunity for the development of nutritional investment strategies in health care systems.

Background and objectives: Existing front-of-pack communication strategies 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 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 by users each week. Over 2000 consumer feedback emails have been received which have led to a version of the application for hypertensives, 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.

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 χ² 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 adequately diverse for the total population, that turned to 16.4% and 39% and 39% had the highest expenditure. 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(95%CI): 9.2 (6.2-23.8)] and with living in a house that owned livestock [OR (95%) 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 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.

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 dietary practices among children below 5 years of age and determine its association with stunting.

Material and Methods: A cross-sectional survey 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: Out of the 552 children surveyed, 91% consumed grains and tubers the day before, 47% legumes and nuts, 16% 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 lower among children aged 2 to 5 years old 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.

PW-012 Low dairy consumption associated with stunting in Equatorial Guinea

Custodio E', Ncogo P', Aparicio P', Benito A' 1Centro Nacional de Medicina Tropical, Instituto de Salud Carlos III, Spain

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 dietary practices among children below 5 years of age and determine its association with stunting.

Material and Methods: A cross-sectional survey 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: Out of the 552 children surveyed, 91% consumed grains and tubers the day before, 47% legumes and nuts, 16% 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, though these two indicators were not statistically associated with stunting.

Key findings: Dietary diversity is lower among children aged 2 to 5 years old 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.
**PW-013**

**Poster**

**Low consumption of fruits, vegetables and dairy products among HIV-infected children in El Salvador.**

**Martin-Cañavate R, Sonego M, Sampedro M, Escobar G, Rivas E, Custodio E.**

Centro Nacional de Medicina Tropical, Instituto de Salud Carlos III, Spain.

School in Sciences of Reproduction and Development, Titre University.

Conclusion: National of Epidemiology foods by children Carlos III.

Spain. Centro Nacional de Excelencia para Niños con Inmunodeficiencias.

Objective: To assess the dietary practices of HIV-infected Salvadorian children.

Material 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 (CENID). Hospital de Niños Benjamin Bloom. The reference diet was completed to all HIV-infected 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 adequate diversity 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 no 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(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 gender but differences were not 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.

**PW-014**

**Poster**

**Low dairy consumption associated with stunting in Equatorial Guinea.**


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 Health-Peru (1.5 g/m3) and the highest percentage of WHO (0.5ug/m3). In Huanucayo, the lead level in air was 44 tons per year; being the main sources of pollution the vehicle fleet. The highest concentration of lead for 24 hours was in 25 ug/m3 standard as being the monthly average of 1.5 g/m3.

Objectives: To assess the lead concentration in umbilical cord blood of 64 babies born to pregnant women living in the cities of Huanucayo (commercial urban area) and La Oroya (mining area) and its impact on the level of hemoglobin, length, weight and APGAR score at birth.

Method: Blood samples were taken in infants of the 2nd and 5th grades in 28 children from 2nd and 5th grades in 28 La Oroya and Huancayo 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 Energy. Biological sampling protocols responded to yennar and Rapp (2001).

Results: The mean concentration of lead in the umbilical cord blood in infants of La Oroya and Huanucayo city were 18.03 ug/dl and 22.96 ug/dl (p=0.016) respectively, these values being 3.6 and 4.6 times higher than the critical values suggested by the CDC (2005). Hemoglobin levels were low in infants of La Oroya and Huanucayo 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 Huanucayo (p=0.016). Huanucayo neonates had a higher hemoglobin content than those born in La Oroya (p=0.000), which is due to the inverse relationship between hemoglobin level 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 (p=0.000; r=0.39), 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 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).

**PW-015**

**Poster**

**Preferences of healthy and less healthy foods in school children in Mexico: longitudinal study.**


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 multinomial 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 were born at birth were more likely to become OW/ OB at the end of study, OR=5.6 (IC 95%, 0.37-0.84, p=0.005), and after adjusting for BMI z-score at baseline, OR=0.9 (IC 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 Six grade Mexican Children who prefer healthy food are less likely to become OW/ OB a year later.
Mexican children. Insulin resistance was the best cardio metabolic 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 children.

**PW-017**

**Poster**

**Functional capacity and nutrition status of community-dwelling elderly.**

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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 Botucatu 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 (TSF). 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, AMC, CAMA and TSF are higher in men compared to women (p <0.05). The average values of TSF 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 18.2% 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, Klotter 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 photo-essay 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 is 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-appraisals 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) present motives to sustainability and sustainable consumption. They express e.g. that (last-but-two) 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 innova-
dietary intakes and modelling scenarios (e.g., food replacement scenarios) to assess the impact on a population’s diet. Consumption of oily fish can reduce the risk of heart disease. Currently this consumption is below the recommended level of at least 140g per week.

Materials and Methods: Assessments are performed by combining food consumption diaries and food composition data from the NDNS Adults Rolling Survey with predictive intake models. Red and processed meat is substituted by oily fish consumption using a probabilistic food replacement model, with a replacement probability of 0.2. Nutrient composition of oily fish is set by discrete data distributions using nutrient composition from oily fish consumed in the UK. 40,350 subjects’ diaries are simulated and the intake is assessed at eating event level in order to generate a full intake distribution. Results: After modelling oily fish replacement, mean daily intake of oily fish increases from 9g/d to 22g/d, thereby reaching the recommended intake level in 2012.

Key Findings: Substituting consumption of red meat and processed meat for oily fish may lead to a more beneficial fatty acid intake profile and increased vitamin D intake. The impact of such a scenario on a population can be predicted using the Creme Nutrition® model.

Olive oil consumption may change some biomarkers. In the study assessed changes 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 were advised to change their diet and 19.9% received 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.

PW-024 Poster
Changes in beverage consumption habits from pre-pregnancy through pregnancy.
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1University of Agder, Kristiansand, Norway; 2Sorlandet 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 randomised control “Fit for Delivery” study from primary health clinics in Southern Norway. At inclusion, gestational week 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 ANOVA.

Results: The percentage of women reporting drinking milk (40% v. 47%), fruit juice (16% v. 26%) and water (87% v. 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% v. 10%, p=0.021) and coffee (52% v. 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% v. 60%, p<0.001) and coffee (16% v. 22%, p<0.01) 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.
Weaker vitamin D levels and age (r = 0.027, p = 0.015).

Conclusions: 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**


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: B ≤ 2.5 mIU/L and Group B: B > 2.5 mIU/L), perceived adherence expressed in % compliance (nutritional treatment and activity plan scheduled physical) categorized into ≤ 50%, 60 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 weeks).

Results: A direct correlation of body weight ( < 1% and > 1%) was found among 3.6% of women, standard weight among 83.5% of women, and overweight or obese among 13% of women, what made a base for the BMI calculation. Based on the BMI values examined women were classified into following groups: overweight (BMI 17.0 - 18.4 kg/m²), standard body weight (BMI 18.4 - 24.9 kg/m²), overweight (BMI 24.5 - 29.9 kg/m²) and obesity (BMI 30 - 39.9 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 9.1%, and obesity in 2.8% of women in uniform. The highest percentage of obese subjects indicated overweight (18.2%) 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.

Conclusions: Carrying out trainings on health education according principles of rational nutrition and nutritional prophylaxis of civilization diseases seems appropriate.

**PW-027**

Pesticide Residues in Fruits and Vegetables Samples from Jordan: levels, dietary intake and risk assessment during 2010/2011.

Alsharkh M; Jeggart M; Battah A. Jordan University Medical college

The presence of pesticide residues was investigated in 2467 samples of fruits and vegetables during 2 years (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 omeprazolin with 28.74% (in 2010) and 27.58% (in 2011). The chronic dietary risk assessment was undertaken by determining the national and regional maximum daily intake (NTMDI) and national estimated daily intake (NEDI). Neither NTMDIs nor NEDIs for each pesticides residues have exceeded the acceptable daily intakes (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**

Nutritional status of Polish women serving in the army, police and fire brigades.

Bertrand JJ, Klos A, Symonska W. Military Institute of Hygiene and Epidemiology, Poznań, Poland; Department of Health, the Ministry of Internal Affairs, Warsaw, Poland

Work of women in uniforms has become more and more common. In Poland, 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: overweight (BMI 17.0 - 18.4 kg/m²), standard body weight (BMI 18.4 - 24.9 kg/m²), overweight (BMI 24.5 - 29.9 kg/m²) and obesity (BMI 30 - 39.9 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 9.1%, and obesity in 2.8% of women in uniform. The highest percentage of obese subjects indicated overweight (18.2%) 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.

Conclusions: 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.

**PW-029**

Evaluating the success of reducing body weight.

Stritecka H, Hubak 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 indicators of overweight (BMI body mass index) is an important 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 diametrically 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 25±1.0 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.

Conclusions: 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 Bod Pod.

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PW-030 Poster
Sugar intake in Cuban children and adolescents.
Institute of Nutrition, Havana, Cuba
Background and objectives: High sugar consumption is associated with overweight, glucose intolerance, serum lipid 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 methods. Results: 24-hour dietary recalls, 24 hours dietary recalls 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 nutritional requirements in some studied groups, 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.
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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 process within the framework of Hazard Analysis and Critical Control Point (HACCP) 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 rates in cheese factories comparing different methodologies. 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, filier, mould, tables and chiller) and the 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 (31.2%). The contact plates and contact dipslides methods showed noticeable 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 mini sanitizing procedures, combined with traditional microbiological methods to identify microbial 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.
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The teenagers population takes nutritional 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.

The aim of 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), one adolescent from 11 to 13 years, of eight secondary public schools in Mexico City. By means of a consumption frequency questionnaire and the use of the Who Anthro Plus program, there was obtained the ingestion of food and the nutritious conditions respectively. With regard to the teenagers nutritious condition there was a overweight prevalence of 27.90% (29.7 % for girls and 26.1 % boys) and the obesity prevalence was 10.50 % (6 % girls and 13 % boys).

The most consumed food inside the school is the, fruit (40.0 %), the industrialized cupcakes (39.5 %), followed by the industrialized juices, vegetables and yogurt (32.6 %, 30 % and 27.4 % respectively). Comparing the food offer inside the school with the nutritious state of teenagers, one thought that the teenagers who consume frequently fresh fruit and fresh vegetable as school lunch have minor probability of presenting overweight (28.9 % and 29.8 % respectively) in comparison with those who almost never consume this kind of food (31.4 % and 34.9 % respectively), those teenagers who eat often sweets, chips, cakes, hot dogs or hamburgers, ice creams, and fresh juices present major probability of suffering overweight (42.1 %, 40.0 %, 41.7 %, 38.1 % and 34.4 % respectively) in comparison with those who almost never consume them (28.1 %, 25.6 %, 22.2 %, 24.4 % and 28.6 % respectively), and teenagers who consume frequently sodas, fried food, industrialized cupcakes, water of flavor bottled, and flavored milk have more probability of develop obesity (20.8 %, 14.3 %, 8.0 %, 20.0 %, 12.9 % and 15.4 % respectively) in comparison with those who almost never consume them (9.4 %, 8.4 %, 3.2 %, 6.0 %, 6.5 % and 8.5 % respectively), being the statistically significant differences (p<0.05) only for the consumption of candies, industrialized cupcakes and marginally for flavored milk (p<0.05).

We conclude that the food offer inside the school area it reverberates in the nutritional state of teenagers.

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 with young people, in particular adults, while the opposite was true for fruits and vegetables. HCLN foods were more in the foreground, consumed and actively handled than fruits and vegetables.
Fruits and vegetables were, on the other hand, promoted with health messages. Key findings: Food and beverages appear frequently in children's programs in Swedish public service television. Cookies, confectioneries and other HCLN foods accounted for one food appearance out of five in the analyzed material. The HCLN foods seem to be represented as more desirable for children than fruits and vegetables by appearing with children and being actively handled.

**PW-034**

Poster

**European food and health research infrastructure: inventory and identified gaps and needs.**

Brongers, Léopold M.; Laville MF; Ocké M; Tetens F; Zimmermann K

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6EL, 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 red search 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 DSH model: Determinants of dietary behaviour; Intake of foods and nutrients; Status and functional markers of nutritional health; Health and disease risk of foods and nutrients. The study design consisted of desk research, qualitative 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 known for 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 multiplicity/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 Johanne L. Arentoft, Julia Barde, Astrid Böhm, Rosalie AM Dhanoukshe-Rutten, Léopold Feuzeu, Paul Flinsg, Marjolein Geurts, Camilla Hoppe, Jeppe Iversen, Martine Laville, Margot Ocké, Krijn Poppe, Nadja Slimani, Harriette M Snoek, Inge Tetens, Laa Tinamla, Pieter van T Veen, Céline Vors and K Zimmermann for all their contributions to this body of work.

**PW-035**

Poster

**Dimension teoría y práctica de la de educación en nutrición en dos contextos de América Latina: Bogotá Y San Pablo.**

Cerverato-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 refrendado 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 Discusión del Sujeto Colectivo.

**Resultados:** Fueron entrevistadas 27 nutricionistas en cada ciudad. El perfil de las agendas 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, 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 transición en ambos 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**

Poster

**Consumers of organic bread are at risk of inadequate iodine intake in the Netherlands: a scenario study.**

Geurts M, Raaij van J, Verkak-Koosterman J.

School of 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 quantify 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) 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 if reversible 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**

Poster

**The association of food insecurity and socioeconomic status with general and central obesity in two Iranian ethnic groups.**

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6 Food and Beverages Safety Research Center, Urmia University of Medical, Urmia, Iran

**Objective:** 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 and 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 were measured using adapted household food insecurity...
access scale through face-to-face interviews at homes. Anthropometric indices (weight, height, waist and hip circumferences) were measured and evaluated using standard methods. BMI was. Overweight and general obesity were defined as 25-29.9 kg/m² and ≥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 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 25.9% of Kurds) and 40.8% had central obesity (44.5% of Azeris and 35.6% 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=0.33, CI95%:0.23-0.52) and moderate and severe Fl (OR=0.34, (CI95%:0.16-0.74) were associated with the chance to be generally obese. In contrast, in Kurds, being female (OR=5.39, CI95%:2.28-12.23) and highest total cost/thead (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 Azeri with higher 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 high total income/thead (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, ages 10-14; CI95%:1.02-1.11) 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-severe Fl and the risk of general/central obesity is different in Azeris compared to Kurds.

**PW-040 Poster**

Positive evolution of women in the pseudo-maintenance stage in an intervention for fat consumption.

Menezes MC, Mingoli AS, Lopes ACS

University of Minas Gerais, Brazil

Objectives: To identify the prevalence of "pseudo-respondents," 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 at least one of the seven phases from 2009-2010 (20.6% attrition). Individuals were classified as "true respondents," pseudo-maintenance (i.e., mistakenly perceived their lipid intake as adequate - Steptoe et al., 1996), or non-reflective action (i.e., did not recognize the adequacy 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 the 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 respondents, 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.

**PW-038 Poster**

Guadix: healthy city: local strategy to reduce obesity.

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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.

Materials 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 familiar, yet 6% of the proceedings had as objectives the health and education of 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 data have built a healthy lifestyle based on promoting physical activity and healthy eating have also generated new lines of work under the municipal health plan.

**PW-039 Poster**

Serum lipid levels and dyslipidemia prevalence in Balearic Islands adolescents, a Mediterranean region.

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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 Island's 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 Detection of 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, TG ≤150 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 TG were 24%, 10.6%, 14.3%, and 14.9%, respectively. This TChol prevalence was higher among girls (27.8%) than boys (19.1%). 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 CB12/03008. 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 Island adolescents.

One in 10 adolescents has at least one abnormal lipid concentration. A high TChol level was the most prevalent dyslipidemia among adolescents.
Objectives: 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 action in two stages: the first focused on Panamanian mothers and the second on the children. The study was implemented in two stages: the first focused on two educational meetings held by Nutritionist in the CESAC waiting room. The second was carried out in three nearby greenerycons that agreed to join the program, where a “yapa” (fruit or vegetable) would give to each child and present the voucher “Give to child the Yapa” previously received in the educational meetings. Every greenerycons had a “NutriYapa” blackboard to promote their deals.

Results: Through the situation analysis on 41 people, it was found that daily vegetables and fruits consumption of was 56.1% and 68.3% respectively. 46% used Facebook in social networking. In educational meetings were carried out fresh fruits and vegetables tasting, with the delivery of educational material and 22 vouchers for use at greenerycons participating. 30 adults completed the satisfaction survey, of which 83% rated the SMP as excellent, 94% said the clarity content and considered useful, practical and implementable suggestions received. In FB recommendations, games and simple recipes offered, interacting with the community by answering questions. Before the meetings the FB friends were 18.

Conclusions: Social marketing is a useful and applicable tool in primary health care. “NutriYapa” was well received by most beneficiaries. Should assess the eating habits change impact to the population whom it is addressed.

PW-043

Poster

Improving nutrition in Panamanian children: Assessing knowledge, adherence and involvement within the households of children enrolled in a complementary food programme.

Howard, K.1

1School of Medicine, Trinity College, University of Dublin, Ireland.

Objectives: 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.

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Conclusions: Social marketing is a useful and applicable tool in primary health care. “NutriYapa” was well received by most beneficiaries. Should assess the eating habits change impact to the population whom it is addressed.

III World Congress of Public Health Nutrition
PW-045 Poster
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 "Nutri Yapa" 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 "Nutri Yapa" 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 "Nutri Yapa" SMP was implemented. 41 adults participated in meetings with educational tasting vegetables and fruits. 22 people gave it the "GIVE to child the yapa" voucher changed in three greengrocery areas 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 according to these and Fleiss concept 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 lower 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 Lancer 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
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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 assessed. 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 956.06 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±10.00g serving (SD 18.3) in the villages and 30.5±9.00g serving (SD 12.5) in the urban slum. Of the vendor samples taken, 65% of rural and 75% of urban snacks contained trans fat. The fat content of sampled oils contained high levels of saturated fat (range from 24.7-69.3% of total fat) and trans fat (range from 0.1-29.9% of total fat) fat. Only 7% of the participating vendors were aware of trans fats and its 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. Boaulaiga A, Bellemar S, Yaha S, Guillem N, Rodriguez-Yoldi MG, Osado J.
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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 be tested in fed high cholesterol diet whether HDL composition and their antioxidant potential were improved by sardine (Sardina pilchardus) and bogue (Boops 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 the same conditions water. Compared with CG, SPH and BPH reduced markedly cholesterol (–66%), serum triacylglycerols, free cholesterol and phospholipids concentrations. Serum hydroperoxide contents were respectively 2.2- and 3-fold lower for 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 sphyngomyelin-HDL contents but lowered phosphatidicholine. 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 supplement oxidative damage activity was increased by 1.3- and 1.4-fold with SPH and BPH compared with CG.

Despite a low LCAT activity, SPH exerted a hypcholesterolemic effect. Furthermore, the higher sphyngomyelin levels noted in BPH group did not seem to have
an inhibitory effect on LCAT activity, this was probably due to the high AP04A-HIL 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 shingomycin levels which represent the resistant phospholipids pool against oxidation. Thus, sardine and especially bovine 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  
**Poster**  
**Food intake in institutionalized older people according to the dietary assessment from the Mini Nutritional Assessment (MNA).**

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Objectives: The prevalence of malnutrition in institutionalized older people is generally high. It is known that food intake decline is not the only factor determining malnutrition and it is also known that the menus at the institutions are overseen by nutritionists. However, the residents sometimes do not eat the full ration or have other foods provided by their families. Therefore it is essential to know the real food intake and its impact on the nutritional status of the residents. The objectives of this work were to describe the dietetic features of the elderly people living in nursing homes in the province of Albacete (Spain), to identify their influence on the nutritional status and to assess the possible differences between men and women.

Material and methods: A cross-sectional study was developed with data collected from the food intake of residents in 34 nursing homes all over the province of Albacete (Spain). Dietary assessment data were obtained using the Mini Nutritional Assessment (MNA) items making up the dietary assessment in the test (full meals eaten daily, food intake decline, fluid intake, fluid intake, protein intake, fruit and vegetable intake and mode of feeding). Chi-square test was used to compare proportions. Stepwise linear 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 declaration of fluid intake over the past three months, significant differences (p<0.05) were found between both genders, being higher in women (26.8% of women) and the six questions in the MNA about dietetic assessment explained 43.7% of the variability of the MNA total score.

Key findings: According to the dietetic 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  
**Poster**  
**Nutrition of children aged 1 to 3 years from nurseries in Bulgaria.**

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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 documentation, collected from the nurseries, the data for age, sex, and last height and weight measurements of the studied children, children’s 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 calorie rate 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 is 32.7/g/day or 28.4%/ from the average daily energy intake of the food (normal rate 30%/–36%/). 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 unbalanced 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  
**Poster**  
**Use of desert lizard as a natural product to treat diabetes in a mouse model of the disease.**


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Objective: Traditional African testimonials describe glucose-lowering effects of orally administered desert 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 administered orally with 2 g glucose/Kg during a glucose tolerance test (OGTT), the next 5 days, in a randomized, 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 (n=10/ group, 50% males). Body weight (BW), food and water consumption, welfare state and external appearance were assessed weekly. HbA1C, triglycerides, cholesterol, glucose, creatinine, and adiponectin in serum were determined 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 hypoglycemic effects of DL when compared to saline at 15’ (Agluc15)=61.23 (61.69 mg/dl; p=0.004) and a trend in the AUC (AUCgluc15)=19.63 (36.03; p=0.073). During chronic treatment, skin lesions (ulcers and blisters) 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), no significant differences were observed in OGTT or HbA1C. In the ITT, higher glucose values were shown for DL at 60’ (148.12 (37.5) vs 102.9 (50) mg/dl; p=0.053), a trend in the ITT. 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  
**Poster**  
**Who do adolescents trust, when it comes to food messages?**

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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
PM-053

Poster
The use of National Cancer Institute (NCI) Method to estimate the Prevalence of inadequacy intake for older people. 
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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 three 24-hour recalls. This sample was chosen from a data set of older people from the city of Botucatu, Sao Paulo, Brazil, set up to investigate quality of life. Socio-demographic, economic status data were also collected. Based on data from the 24-hour recall were transformed in consumption of macrominerals 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 daily energy intake was calculated using Acceptable Macronutrient Distribution (AMDIOM) 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 microelements, it was found that vitamin D and E, 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

Poster
Trends of household insecurity during the economic crisis in Portugal - Results from the INFOAMILIA Survey (2011-2013).
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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 (FII), 33.4% are in low FI, 10.1% in moderate FI 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 FI are in the low FI level, which represents that the household at least had enough food to meet their quality of food intake, without substantially reduce food quantity. Moreover, moderate and severe FI household income decreases about 25% and 50%, respectively, when compared to the low FI household, which indicates situations of low income and food insecurity.

PM-055

Poster
Chronic diseases in Portugal – a review within the EU project EConDa
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Objectives: To provide epidemiological data from Portugal on non-communi- cable diseases (NCDs) prevalence to the European project EConDa. The Eco- nomics of Chronic Disease project (EConDa) aims to achieve consensus over the best methods of measuring cost effectiveness and, using micro-simulation models, project future burden of NCDs allowing the implementation of cost-effective interventions.

Material and methods A literature review was conducted to identify scientific articles, reports and ongoing projects which provide NCDs data from Portugal. Specifically, data on coronary heart disease (CHD), chronic kidney disease (CKD), type 2 diabetes and chronic obstructive pulmonary disease (COPD), alongside with data on two main risk factors related to these diseases, smoking and body mass index (BMI), were collected.

Results: Recent data showed a 24.5% reduction between 2007 and 2011 in the mortality of ischemic heart disease (34,9%) and Cerebrovascular Diseases (61,9), rates per 100 000 population. Since 2007 there has been an increase in mortality from respiratory disease to 2011, and this was higher in men (11,9% total causes of death) than in women (11,3% total causes of death). In 2009 COPD mortality rate was 5±10, although the prevalence of this disease is still above 14% in some regions. Diabetes type 2 prevalence, in 2011 was 12,7%. It is accounted for 4,4% of the total deaths in Portugal in 2011. Type 2 diabetes accounted for 6,1% of deaths in 2006 and 7,1% in 2010. An 80% increase in incidence was observed between 2002 and 2011. In the last 20 years the annual incidence increased from 261/105 (1992-1994) to 647/105 in 2010/2012. The prevalence of CKD among adults aged 20–79 years was 6,1%, increasing from 3,9% in 2000 to 7,1% in 2010. The prevalence of both chronic conditions was greater in women than in men. Data from the two major risk factors studied (BMI and Smoking) revealed that, in 2005, 39.4% of adults (18–64 years old) were overweight (25.0±BMI<30), and 14.2% obese (BMI ≥ 30). Recent data from the e_COR study (2013) in 3 major Portuguese Regions (ages 18–79) showed an increase in overweight and obesity to 64.9% (overweight 42%, obese 22,9%). With regard to Smoking, data from the 2009 National Health Survey showed that 17,2% of adults in Portugal smoke and this is higher in men (26,1%) than women (9,0%). Contrary to previous reports showing a reduction in smoking rates , the e_COR study revealed that 22.2% of those surveyed population are smokers, and the number of women who smoke have increased greatly (men 27,4%; women, 16,7%).

Key findings: These findings show that Portugal has a non-auspicous epidemiological profile. This work will test the impact of a variety of scenarios to reduce the risk factors associated with chronic diseases in developed countries, including Portugal. The modelled results can be used to inform future policies and could help establish the best possible course of action to curb rising chronic diseases. The review highlighted the need for good quality measured surveillance data of diseases and their risk factors.

PM-056

Poster
Modelling potential additional iodine intake from the use of iodised salt in the production of widely consumed processed foods in Indonesia
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1World Journal of Public Health Nutrition

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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, pasta, 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 on culinary techniques and the use of other seasonings like herbs or spices to replace the use of salt intake would decrease.

PM-059
Study of the normalization of weight and glycemia in obese prediabetes and diabetes by gastric bypass.
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3Centro de Excelencia para el Estudio y Tratamiento de la obesidad Valladolid.

Introduction: The World Health Organization (WHO) estimates that 171 million people in 2000 were diagnosed with Diabetes Mellitus, a trend that will increase to 306 million people. Obesity is a risk factor for the development of diseases such as diabetes. Bariatric surgery is the most effective treatment for morbid obesity and has been shown to generate an improvement in glucose levels and succeeds in maintaining weight loss over time.

Material and methods: Are selected from a sample of 415 obese patients candidates for gastric bypass anastomosis one , those with impaired glucose. Leaving the final sample of 79 patients who were classified into 2 groups: pre-diabetes (glucose ≥ 100 mg/dl ≤ 125 mg/dl ) = 47 patients with diabetes (glucose ≥ 126 mg/dl ) = 32.

Variables studied: weight changes and blood sugar for a year in quarterly checks.

Statistical analysis included analysis of variance ANOVA test P correlation coefficient of Pearson; considering significant p < 0.05.

Results: The 2 groups of patients achieve greater decrease in weight at 12 months, the average weight of 62.41 ± 10.93 Kg prediabetic and 68.36 ± 11.16 Kg diabetes.

Prediabetic Group: The normalization of blood glucose at 6 months (85.5 ± 13.04 mg/dl) P<0.01

Diabetic group: The normalization of blood glucose at year (96.46 ± 25.55 mg/dl) P<0.001.

Conclusion: Gastric bypass has proven to be an effective tool in weight reduction and normalization of blood glucose in prediabetic and diabetic obese patients at year.

The normalization of blood glucose is earlier in the group prediabetics (6 months) than in diabetics (12 months).

PM-060
Role of the Dutch food sector in improving public health: opportunities for education and innovation.
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HAS University of Applied Sciences, Den Bosch, The Netherlands.

Background: The Netherlands are number 2 globally in exporting Agro-food products. The majority (95%) of the food companies are Small and Medium sized Enterprises (SMEs), covering 42% of total turnover in food. There is a continuous need for good professionals in the Dutch food sector. In addition there is the need for healthy food products and responsible marketing in the fight against growing obesity epidemic and related diseases. Against this background two studies were performed with the following objectives:

Study 1) To investigate opportunities and challenges SMEs are facing with respect to innovation in food and health.

Study 2) To make an inventory of the topics technical universities should work on together with the food sector to educate future food professionals.
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 >60% in processes. Challenges are: limited time, money and knowledge on innovation in general and lack of specific knowledge on nutrition 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 AR, Rivas García LL, Lorente Fernández JR.
1 Colegio Virgen del Asilo (Valladolid). 2 Unidad de Atención Primaria de Los Palacios y Villafranca (Valladolid).

Objective: To design and research a nutraceutical supplement on ox-LDL and endothelial function.

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/m2 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) and Placebo Group (PG, n=39).

Results: 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 ( - 1.29±1.67 vs. 0.19±1.67 %; p<0.05). Even though T lymphocytes did not show significant differences at the end of the study, Helper T lymphocytes (CD4+) had a moderate 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. Others Lymphocyte Subpopulations as the Natural Killers had no significant changes.

Key findings: Regular consumption of Lactobacillus plantarum 3547 probiotic leads the differentiation of Lymphocytes into effector cells in healthy people.

PM-063 Poster
Regular consumption of Lactobacillus plantarum 3547 probiotic leads the differentiation of Lymphocytes into effector cells in healthy people.
1Nutrition Department. Health Research Institute IDiPAZ. La Paz University Hospital (Spain).
2Immunology Department. Ramón and Cajal 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/m2 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) and Placebo Group (PG, n=39).

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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 Cytotoxic T lymphocytes percentage while B lymphocytes remained stable which could improve the immune response.

Study supported by CARINS group through HENUFOOD project (CEN- 20101016) from CNIT program of Economy and Competitiveness Mi­nistry of 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 EA, Guardiola Ma, Sanchez Ma, Accion Contra el Hambre

Objective: In 2012, several humanitarian water, sanitation and hygiene actors, put together a strategy to guarantee minimum wash and at the end of the study 72 subjects (14 males) completed the study (53±9±4 years, BMI = 24.6±3.0 Kg/m2). Subjects compliance with the capsules and dietetic recommendations over the both interventional periods. Voluntaries consuming only AS during 8 weeks decreased significantly FMD, ox-LDL and Diastolic Blood Pressure (FMD: 7.7±3±5 to 9.7±7±4 %, p<0.05; ox-LDL: 115±9±30 to 104.7±127±30 mg/ml, p<0.05; DPP: 74.0±6±84 to 71.7±10±72 mmHg, 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.

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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 child health when a water treatment kit is 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 thral period. Better evidence shows the incentive that the kit does on the distribution of kits in the thral period. Pointing at 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, Elmadfa 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 atomic absorption spectroscopy (AAS). Vitros DT60 IODiSC I Chemistry System was used to assess iron, magnesium and calcium in plasma.

Results: Mean serum iron concentrations (12.25 [10.79: 13.72] μmol/L) were within reference values (7.5-31.7 μmol/L). But, corresponding to the poor average intake of 14.95 [12.30; 16.88] mg/dL, every fourth woman 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.

Average magnesium plasma concentrations (0.74 [0.73; 0.76] mmol/L) reached the reference range (0.7-1.0 mmol/L). Even so, child-bearing women had a good supply with magnesium (356.72 [323.63; 389.92] μg/dL) via food one third didn’t reach plasma reference data. Magnesium status was not affected by supplementation. On average zinc intake (110.97 [9.91; 12.03] mg/dL) reached D-A-CH recommendations of 10 mg/d and plasma levels (8.79 [8.57; 9.02] μmol/L) were above the reference of 8.1 μmol/L.

Nevertheless, more than one third had an unsatisfying supply with zinc and 27.4% a bad biochemical status.

Mean calcium concentrations (2.37 [2.35; 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. Adanu RM, Mukamel Paul Fieldhouse 1 2 3 Human Nutrition Sciences. 1Community Health Sciences, University of Manitoba, Winnipeg, MB, Canada. 2R3T 2NZ, 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 data was restricted to respondents aged 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 recent period.

Results: Overall, 8.2% of Manitoba children aged 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 average, the nutrient intake profiles of non-consumers and consumers did not differ significantly, except for magnesium, which was increased 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 intakes 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.


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 cohort 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 70 μg/dL - 10.7 μmol/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 5th 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(17)=0.97, p=0.334] between Fe or MMN groups. However, anaemia was identified in both the Fe (11.5%) and MMN (14.1%) groups, with no significant group differences: X2 (1, N=181)=0.29, p=0.59. No significant differences were observed for plasma zinc status ([t(178)=0.265, p=0.792). Identified Zn 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 2% 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: 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 noticed in pre-school children treated with either treatment for 6 months, suggesting that either a longer period of supplementation was required and/or efforts to improve infants’ diet.
PM-068
Poster
Maternal risk factors for low birthweight.
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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 growth retardation (SGR) as 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: The study is to investigate the risk factors for LBW (preterm) in a cross-sectional study. Material and methods: Survey on a national representative sample of 2468 children aged under 18 years and their mothers was conducted. The height, weight, and weight gain were assessed. 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 examination. 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 highest rates of infants among Roma mothers was with their local economic status and multigeneration families. 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-pregnancy underweight mothers was significantly higher (17.3%) than those from women with normal pre-pregnancy 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 birthweight children. The risk for LBW is increased significantly when both risk factors in women were available compared with low gestational weight gain and smoking during pregnancy.

PM-069
Poster
The relation of fast food pattern with body mass index and physical activity in Iranian women.
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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 lived alone were selected from representative sampling of Tehran regions in north of Tehran were selected. 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 1 g without shoes while wearing minimal clothes. Height was measured to the nearest 1 mm without shoes 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), MET-hours/day in which one MET equals 3.5 ml of O2/kg/min. Data were analyzed in SPSS 11.5 software. Fast food dietary pattern was defined three categories from low to high frequency questionnaire by trained dietitians. Fast food consumption was calculated as percentage of total energy intake (PTEI). Data were analyzed using chi-square, one-way ANOVA, MANOVA, simple regression and multiple linear regression. The intake of fast food was assessed with a food frequency questionnaire.

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 was 89.0±3.1 114.01 g/month for sausages, 77.8±145.5 g/month for salami, 46.3±167 g/month for hamburger, 120.2±77.2 g/month for pizza and 359.3±183 g/month for fried potato. There was a negative weak correlation between fast food pattern and physical activity (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 develop policies to promote healthy eating patterns and active life style in the community.

PM-070
Poster
Heterocyclic amines from meat intake is associated with oxidative stress in Sao Paulo - Brazil.
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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 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 dose meat level information. The amount of heterocyclic amines was calculated by the Computer Program Heterocyclic Amines Resource for Research in Epidemiology of Disease developed by National Cancer Institute. 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 a structured questionnaire. The association between MDA and 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/day (95%CI: 307; 430ng/day) and the mean of MDA concentration was 0.73μmol/l (95%CI: 0.70; 0.76μmol/l). The MDA concentration was associated with HA intake (β=0.0005; p<0.001). Conclusion. The intake of heterocyclic amines from meat was associated with MDA, 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.
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.

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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 students and 772 elementary students). A food frequency questionnaire was used to assess their food intake. Using a qualitative food frequency 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 Pearson 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 weakly associated with regular soda (r=0.16). When comparing 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=0.16).

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.

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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 disorders and both weight loss and diet modification 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´dietic clinics outpatient were included to the intervention study. The women 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), zinc, hemoglobin, C-reactive protein (CRP), soluble transferrin receptor (TfR)], 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). Significant decreases were determined in the anthropometric variables (p<0.05) and also in the intakes of energy, total fat, saturated fatty acids and carbohydrate when compared to the baseline intakes (p<0.05). Vitamin C, fiber, iron, calcium and zinc intakes were increased compared to the baseline intakes (p<0.05). In conclusion, weight loss in obese premenopausal women are associated with reduced inflammation. Reduction in inflammation allow for enhanced dietary iron absorption resulting in an improved functional iron profile. It is obvious that obesity is an important public health problem and the precautions should be taken to prevent the occurrence of obesity. Additional clinical research is needed to evaluate the cost-effectiveness of dietary intervention in the treatment of obese individuals with iron deficiency anemia.

PM-074  
Poster
Changing the food environment to reduce childhood obesity risk: four case studies in community organizing.

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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 negative expected results. Community capacity building and engagement seem to be a critical and effective strategy in community organizing approaches 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 related to an 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 food 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 implement. In particular, the development of relationships between coalition staff, members, and affected community residents was challenging even when coalitions committed a coalition 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 modeling, capacity building workshops to reframe 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 organizing 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.

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Objective: The aim of the study was to evaluate the appetite ratings by visual analogue scores (VAS) after consumption of a breakfast soft bread.

Results: No significant differences were found among the VAS for the consumed soft bread.

Key findings: The findings showed that the consumption of breakfast soft bread was well accepted by the participants.
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 (Puravita 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 intake. 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 consumed these 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 feelings. Diet-quality effects 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 < 0.050 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 Fundación de la Universidad de Granada, Spain) and this trial is registered at clinicaltrials.gov as NCT02090049.

PM-076

Comparison of five nutrient profiling schemes on labelled foods in Turkey.

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Objective: Nutrient profiling can be defined as the science of categorizing foods according to their nutritional composition and used as the scientific basis of nutritional labelling, health claims, or nutritional education by helping the consumers to make healthy and reasonable food choices. The objective of this study was to evaluate the nutrient profiling of labelled foods and beverages using five international nutrient profiling schemes. Mediterranean populations. In the study five profiling schemes, Food Standards Agency (FSA) FSA-Ofcom WXY, Nutrient Rich Food Index 9.3 (NRF 9.3), Netherlands Tripartite Classification, Food and Drug Administration USA Health Claims (HC) and International Healthy Choices (IHC) were selected and tested. Totally, 3184 labelled food and beverages from 38 food categories and 560 different brands, which were marketed in the top two supermarkets were audited. Nutrient profiling schemes were calculated according to the principles of the five systems for each food and beverages, assessed results were compared according to their performance. Results: It was determined that three schemes results were compatible with each other except FSA-Ofcom and NRF 9.3 model in fruit juices. HC was 68.8%, Tripartite Model was 57.1%, and IHC was 87.5% comply in energy value, while 86.6% wasn’t comply in added sugar. Fruit juices were found 79.5% less healthier in FSA-Ofcom and got the -3.91 points from NRF 9.3 category. It was found that all models had compatible results in variety of biscuits, cakes, chocolates, pasta, processed meat and chips. The results were incompatible while evaluating the bread types. Breads did not comply by 53.8% and 69.2% according to HC and Tripartite scheme, respectively. On the other hand in FSA-Ofcom scheme bread was classified as 89.7% healthier. Breakfasts had the 0.19 points (rank 10th in 38 food categories) in NRF 9.3 model. Comparison of WXY and NRF 9.3 nutrient profiling schemes in all foods and beverages ranked scores points out a high positive correlation (p<0.01).

Key findings: It was the first study in Turkey using nutrient profiling schemes for evaluated labelled foods. Five schemes have different cut off values thresholds, reference values and the rationales behind them. It can be concluded that five schemes had correlated results. Further studies need to test and understand the nutrient profiling schemes in order to develop a proper nutrient profiling model for Turkey.

PM-077

Perceptions of mothers on the Multiple Micronutrient Powder usage in the Peruvian Andes.

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Objectives: To recognize the rating, knowledge, and experiences of mothers on the children received multiple micronutrient powders (MNP) in three Peruvian Andean regions.

Material and methods: This is a qualitative study developed in the rural villages from Huancavelica, Ayacucho and Apurimac regions in 2011. The studied population were mothers with children’s age 6 from 5-36 months who received MNP. A exit interview was conducted through the National Multiple Micronutrient Supplementation Program developed by the Health Ministry. 317 mothers participated in the study through focus groups and in depth interviews. The data was collected by anthropologists; and in the analysis nutritionists and psychologists were included.

Results: Most of the mothers know the target group to receive MNP, the inter-day supplementation scheme and how to prepare messages received during counseling trough health facilities. Mothers identified that inter-day supplementation makes difficult the recall and recommend the daily dosage. They perceived that the way of use is simple and do not take away time, some ones perceive an acid and metallic flavor “like antacids” changing the color of the child food; mothers recognize that children have an initial rejection but with responsive feeding techniques improve the acceptance and consumption. Some mothers say that their children had diarrhea, vomiting, constipation or nausea by the consumption of MNP; also, they feel that home visits from the health workers are limited as well as other stakeholders as teachers, pastors, and community leaders; actually, they say that some religious groups oppose to the use of MNP. About the father involvement, they don’t go together with the mother to the health facilities, also, don’t attend educational meetings on child health nutrition. Mothers assign a high importance to a relationship between the drawings of children who consume MNP and those who do not. The former are drawn higher, thick, groomed, with their entire body compared to the seconds that do not consume. In many designs, is highlighted the relation between the consumption of MNP with a better cognitive capacity. Key findings: The MNP are valued by the mothers, allowing meeting with a participatory communication strategy that emphasizes counseling, home visits, consumer remembrance, responsive feeding, parental support and benefits on the child’s intelligence.

PM-078

Intakes of antioxidants in a sample of university students.

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Objectives: In recent years we have witnessed a transformation of traditional eating patterns in the general population. These changes are even more evident among young people. The decrease in consumption of fruit, vegetables, legumes and cereals added to the increasing consumption of fat, frozen and packaged food requires an assessment of the diet quality of younger adults. The aim of this study was to assess the contribution of antioxidant nutrients to the diet in a pilot sample of undergraduate students of the University of Castilla-La-Mancha in Albacete (Spain).

Material and methods: Cross sectional study performed with a sample of 68 students enrolled during the academic year 2012/13. Studied variables were descriptive data (gender, age, anthropometric measures as weight and height), Food consumption was gathered by two nonconsecutive 24 hour recalls including a weekend day. The intakes of the following antioxidant nutrients were computed: selenium, zinc, beta-carotene, vitamin C and vitamin E. The Dial program 2.12 was used to determine antioxidant intake and the statistical analyses were performed with IBM SPSS 20.0. Level of significance was established as P-value <0.05.

Results: The recruited students in the pilot study, 52 men and 16 women, were aged between 19 and 27 years old. The mean BMI of the sample was 22.4 ± 3.3 kg/m². Intakes were higher than recommended daily intakes in both gen­er­al and men. Significant differences were not found in intakes by age, BMI and sex. Mean intakes in men and women were respectively: selenium (µg) 21.7±1.4 and 114.5±7.0; vitamin E (mgEq. of α-tocopherol) 7.0±3.1 and 6.7±3.0; vitamin C (mg) 80.4±5.4 and 63.0±3.4; zinc (mg) 9.7±2.9 and 8.4±3.0; beta-carotene (µg) 1247.2±1344.1 and 841.5±645.

Key findings: Mean intakes of antioxidants were higher in women than in men. Recommended daily intakes are lower than intakes found in the studied sam­
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 (UCAM)**

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Objectives: 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 35-64 years and over 65 years (p<0.05). Highest percentages of consumption of cream cheese, whole milk, natural yoghurt 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 the group of 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% and group of 35-64 years showed the highest percentages (p<0.05). Fruits: consumed by 100%. The highest percentages were in those of over 65 years (p<0.05). Meats and derivatives: consumed by 99.2%. The highest percentages of consumption of pork, beef; were among the youngest. Fish: whitefish, consumed by 95.3%, the major percentages of consumption were in the group of over 65 years; p<0.01. Fatty fish, no association was found. Cereals, main meals, refreshments, beer and whisky among the youngest; fish, legumes and coffee among the oldest. Water, consumed by 99%, the major percentages of consumption were in the group of 65. Alcoholic beverages: consumed by 74.6%. Whisky and beer were mainly consumed among the youngest; cider and spirits among those over 65 years. Dairy: consumed by 99.4%, the major percentages of consumption were in the group of over 65 years, p<0.01. Pre cooked foods and ready-to-eat foods: consumed by 97.4%, high percentages were among the young (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 among those over 65 years; cereals, lean meats, precooked meals, refreshments, beer and whisky among the youngest and fish, legumes and coffee 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”**

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1 Fundación Española de la Nutrición (FEN).

2 Universidad CEU San Pablo. Departamento de Ciencias Farmacéuticas y de la Salud.

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 dietetics/nutrition experts were carried out. A duplicate of the meal of 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 (Aquimisa Laboratorios). In order to determine protein content, the nitrogen content was obtained by the Kjeldahl method, the trans fatty acids (gas chromatography), carbohydrates (calculated and sodium). Nutritional reports have been sent to the Education Council including: energy content, caloric profile, lipid profile, trans fatty acids, sodium and salt content.

Results: The average salt content per meal was 3.53±1.56g. The 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; 3.12a±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, Mulholland K

Background and aims: It is estimated that zinc deficiencies are 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 also consulted. Studies were 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 including 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 1 examined diarrhoea outcomes, respiratory diseases and enteric infections, 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 to adiposity in Brazilian elderly according to Body Mass Index and Body Adiposity Index**

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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 (with Bonferroni correction), in addition to multiple linear regression. The significance level was 0.05.
Results: A total of 261 and 271 women and men were studied, respectively. Age, hypertension and musculoskeletal diseases were associated with BMI and BA1 among women. Among men, smoking habit and dyslipidemia were associated with the BA1. Hypertension, musculoskeletal diseases, smoking habit and dyslipidemia were associated with BMI. According to the multiple linear regression, BMI performed better than BA1, since it was associated with a greater number of variables related to adiposity than BA1, specially in men.

Key findings: BMI seems not to be better than BMI to predict adiposity in Brazilian elders. Overweight individuals are more susceptible to cardiovascular risk factors and consequently, to higher risk of morbidity and mortality if left untreated these changes.

PM-083
Poster
Food consumption assessment of students in a municipal public school in Goiânia, Goiás, Brazil.
Oliveira, I. G.; Camard, A. b. g.; Guimarães, M. M.; 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, Gois, Brazil, parctaking 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 students aged between 6 – 12 years with 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%), filled 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 qualitative 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 professed 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 (6,61%), and an increase in risk food intake, particularly sweet cookies, filled waffles, sweets and candies (22.71%) 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.

PM-084
Poster
Children malnutrition inequality between two Brazilian poor regions
Regiseme Lima, Condo, W.L, University of Sao Paulo

Objectives: Estimate child malnutrition inequality between two Brazilian poor regions.

Material and methods: The data are from the demographic and health surveys during the periods 1996-2006 in North and Northeast of Brazil. Malnutrition of children younger than 5 years of age was measured by height-for-age <-2 Z-score, 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 more 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.

PM-085
Poster
Health Promotion and weight control: Viva Bem Group experiences
Camozzi, A. b. q.; Dutra, A. C. b.; Marques, T. P.; Santos, S. O.; Guimarães, M. M. 2
1 Goiania Municipal Health Secretary – East Sanitary District
2 Faculty of Nutrition – Goias Federal University

Objectives: Develop health education activities, aggravation prevention and rehabilitation with a health promotion interdisciplinary approach focused on overweight adults with other comorbidities assisted by a family health unit in Goiania – Goias – Brazil.

Material and Methods: Viva Bem group is a health education and intervention group that holds place twice a year, during 4 months and hosting 30 participants in each cycle. The group is composed by individuals residing in the Recanto dos Minas Gerais’ Family Health Center’s coverage area, in Goiania, Brazil. This report refers to groups conducted in 2013. Meetings were fortnightly, held in a regional social facility and coordinated by municipal health Secretary’s professionals and by Goias Federal University’s instructors and scholars. Activities were conducted by facilitators of various areas. Addressed topics were: healthy weight, portioning, sabotaging thinking, physical activity, obesity complications, food labelling and culinary workshops. In activities, active methodologies with biological, psychological and social perspectives were used, with emphasis in health promotion, aggravation prevention and disease rehabilitation, focused in enhancing the individuals’ life quality. Nutritional assessment was done monthly, and a quantitative and qualitative assessment was done at the group’s end. For individual treatment of patients assisted by a health center, a partnership with Escola Viva Cidic, of the Pontifical Goiás Catholic University was formed.

Results: Both groups conducted in 2013 had a predominant female participation (89%). 79% had observed weight loss, 8% were unaltered and 16% gained weight. It was found that participants showed interest, motivation and engagement (adhesion of 70%), reporting changes in eating habits, physical activity, and improvement in health profile.

Key findings: Viva Bem Group has been found to be an effective model of actions aimed at an individual, individual support to the overweight adult, offering an educative, intersectorial exchange opportunity of experiences, aspirations and reflections.

PM-086
Poster
Consumers’ knowledge, views and understanding of nutrition labeling of packed food: a qualitative evaluation in Mexican urban settings.
Nieto C., Mena C., Alcalde J., Nieto C., Barquera S. Instituto Nacional de Salud Pública

One policy recommendation by international agencies as a strategy to help people improving choices when buying foods is to use front of package nutritional labeling systems (FOPLS) along with a communication strategy in food guidelines. Food industry has developed a voluntary FOPLS using the Guideline Daily Amount (GDA) strategy. Alternatively, a binary system using a green logo and the MoH endorsement has been proposed for products that contain low amounts of sodium, saturated fat, trans fat and added sugars according to the WHO recommendations.

Aim: Assess how social knowledge about food labelling is constructed including understanding and beliefs about the FOPLS-GDA and the “O.k.” logo.

Methods: We conducted 12 focus groups with individuals from different socio economic groups in four large cities in Mexico. We developed a guide using the theory of planned behavior and conducted a thematic analysis based on a positivism perspective using NVivo software with the following categories: a) motivation to select foods, b) attitude and perceived behavioral control, c) reliability of the information on labels, d) opinion about labels reliability. Triangulation of categories and discource data was made using 12 codifies and with quantitive data from focus groups.

Results: People under a specific diet or with current health conditions reported buying foods based on health benefits and are more likely to read labels. Regardless socioeconomic status, participants do not trust nor use the FOPLS-GDA since they believe the nutritional control is limited due to lack of understanding on: a) what the percentages mean and b) what are the nutritional recommendations per age group. Comments about the “O.k.” logo were favorable: it was easier to understand “…(the logo) it implies that the product has been reviewed… Yes, you can eat it with confidence” (P3, M, Mexico City)” If I see a product with this logo, I know that someone already assessed it, study it and is recommending it, you buy it with more confidence” (P3, MSE_Gdl) “…it would be easier to choose a product, you see the logo and you don’t have to be doing the math…” (P7, HSE_Gdl). Few participants exposed the need to clarify the term “habitual consumption”.

Discourses emerged about the need of information on labels that is reliable and easy to use, including the frequency of consumption for each product.

Conclusions: This is an insight of participants’ accounts regarding food labels. Important deviance needs to be considered in people’s beliefs, discourse and behavior, however this study will help to understand what
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  Poster  Evaluation of wasted hot foods distributed in the restaurant in the metropolitan region of Curitiba - Brazil: sustainability ensured?
Auler, F; Puchetti, JM; Ribeiro, CSS; Tredelan, AN
Nutrition Undergraduate Program, School of Health and Biosciences. Pontifical Catholic University of Paraná, 11555 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 changes, do not implement the differential treatment that these cases deserve. The only involves children in lunch schools, which provide specific 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 (N° 2598/2007 and N° 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 rights 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. Intersectorial work is needed in order to jointly build a community that demand for their rights and fully access them. 

PM-088  Poster  Right to Adequate Food and Health of children and adolescents in public schools: a local experience in Buenos Aires (Argentina).
Graciano BA4; Ventura AM4
CeSAC (Health and Community Action Center) Nº 41 (1) Decentralized Office of the Tertiary Public Ministry of Buenos Aires City (2)

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 poverty-neighborhood), and the violation of these rights. Its aim is to describe the joint work process between Health, Education and Justice on malnutrition 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 violation of the children’s and adolescent’s 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 those cases deserve. The only involves children in lunch schools, which provide specific 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 (N° 2598/2007 and N° 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 rights 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. Intersectorial work is needed in order to jointly build a community that demand for their rights and fully access them.
sensitivity/intolerance to breast milk when breastfed and development of allergy symptoms in children (χ²=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 0 (A type χ²=11.09, p<0.01; 0 type χ²=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  
**Prevalence of overweight and obesity and status of chronic non-communicable diseases and some related risk factors among Egyptian adolescents.**  
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Clinical nutrition department, National nutrition institute, Cairo, Egypt.

Objectives: are to study the current prevalence of overweight and obesity among adolescents in Egypt 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 NIN (2000-2005) and EDSH, 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 of 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 frying 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 youngs 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  
**Evaluation of nutrition education program for prevention of type II diabetes among Egyptian children & adolescents.**  
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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, N E P 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  
**Cardiovascular risk profile of Brazilian vegetarians.**  
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1 University of São Paulo  
2 Paulista University  
3 University of ABC  
4 University of 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 and high-density lipoprotein 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 cholesterol (HDL-C) (2.33 ± 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 ± 14.6, p=0.032); BMI (22.5 ± 2.6 vs 25.0 ± 3.9, kg/m², p=0.013); waist circumference (81.8 ± 8.2 vs 87.8 ± 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 heart-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 groups.

Conclusions: Brazilian vegetarians have lower body weight, BMI and waist circumference and high level of HDL-C than omnivores. Total/high-density lipoprotein cholesterol and LDL/HDL cholesterol ratios are risk indicators with greater predictive value than isolated parameters used independently, particularly LDL, so allowing to different predictive value of each risk factor; the Brazilian vegetarians had a better cardiovascular risk profile than omnivores. Vegetarians are considered health-conscious, deliver nutrients and may potentially provide metabolic and cardiovascular protective effects.

PM-094  
**Post-launch monitoring of novel foods/ingredients.**  
Methodology applied to additive Stevia.  
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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 allowed. 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 Rebaudiana. 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 Stevia 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 glycoside 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; Diaz-Sanchez ME; Lanayu-Dominguez Y; Hernandez- Hernandez H; Martinez-Turts et al.
Department of Biochemistry and Physiology, Institute 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 parametric tests and the associations with X’ independence analysis and non parametric correlations. The Cohen’s effect size (d) 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-a, blood pressure, and cardiometabolic risk. They were mainly born, with similar mean birth weight (3400 g), from mothers with higher Wt and Ht at conception. Exclusive breastfeeding was general low (3,4 months), but OW subjects had more breastfeeding. Both groups evidenced sedentary behavior (0.4 of the PAQ-A), lack of breakfast, daily intake of 2 soft drinks, less than one portion of fruits and vegetables and 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 DRI, and 2.2 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. +1.0) were serum lipids, glycemia, insulin, HOMA index, body fat, PCR, 7-65, IL-6, and the dietary intake of energy, macro and micronutrients. HB and serum HDL-C 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=0.006; OR=1.035; CI: 1.001-1.004), their fathers overweight (p=0.021; OR=1.031-1.037) and the dietary intake of energy, macro and micronutrients. Very high or high size effect values showed body size (abdominal) fat, serum insulin, HOMA, cardiometabolic risk, dietary energy and fat. Most of the life style indicators evidenced a moderated-small effect. Physical activity showed no effect.

Conclusion. The excessive body fat of adolescents was accompanied by high levels of inflammation, glucose intolerance, serum lipids, blood pressure and cardiometabolic risk. The life style characterized by sedentary behavior and obese/obesogenic 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.
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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 Legenaria 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 and one liter of the infusion a day, and 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 the 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.
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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-Capital 2008). Fruit and meat intake was estimated by a 24-h dietary recall (2006) 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-2-deoxyguanosine (8OHdG) 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 (8OHdG 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 meat intake (r=0.03; p=0.780) and heterocyclic amines (r=-0.11; p=0.399) were not correlated with 8OHdG. 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=1.8702; p=0.015) and ratio of fruit and meat intake (β=0.1213; p=0.01) were associated with concentration of 8OHdG in plasma.

Conclusion: Fruit intake, ratio of fruit and meat intake, and ratio of fruit and heterocyclic amines intake were associated with 8OHdG, 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.

Funding: Researches relating to this abstract were funded by Municipal Health Secretariat of Sao Paulo, National Counsel of Technological and Scientific Development and Sao Paulo Research Foundation (no201210965-0).

PW-098 Poster
Food and nutrition research in the Family Health Strategy, Brazil.
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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, SciELO 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%.

Objective: This study presents and discusses the food and nutrition actions in the Family Health Strategy, that are focused on food and nutrition in the primary care, can be seen as another challenge, are promising.

Materials and methods: Chronic kidney disease was induced by subcutaneously injecting uni-nephrectomized rats with DOCA and 1% sodium chloride solution (DOCA/salt) induced chronic kidney disease in rats.

Results: Sesame oil significantly decreased these four tested parameters in DOCA/Salt treated rats. In addition, the creatinine clearance rate of food and nutrition addressed to the determinants and constraints of food and nutrition in the primary care, are obesed. 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 qualification of nutrition attention in the territories. Finally, the third section, one of the major challenges of this 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 and nutrition actions in the municipalities and their implementation at the local level. The feeding 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.

**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, histopathological changes, hydroxy radical, peroxynitrite, lipid peroxidation, Nrf2, osteopontin expression, and renal 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 of nuclear 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.

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**PW-099**

**Poster Nutrition transition and the organisation of Food and Nutrition care in the Brazilian Primary Health Care system.**

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Food and nutrition, as basic requirements for health promotion and protection, are guaranteed 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 the primary care, taking as reference the current stage of the nutrition transition process 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 macronutrients and increased overweight and obesity in all the life cycle. Weight for age deficit 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 12.4% 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 qualification of nutrition attention in the territories. Finally, the third section, one of the major challenges of this 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 and nutrition actions in the municipalities and their implementation at the local level. The feeding 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.

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**PW-100**

**Poster Sesame oil therapeutically mitigates chronic kidney disease by activating Nrf2 and attenuating osteopontin.**

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Objectives: 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, histopathological changes, hydroxy radical, peroxynitrite, lipid peroxidation, Nrf2, osteopontin expression, and renal 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 of nuclear 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.

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**PW-101**

**Poster Nutritional assessment of gastronomic tourism service offered in Lanzarote.**

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University of Las Palmas de Gran Canaria (ULPGC).

In the last decades, tourism has become one of the most predominant sectors of the national economy, contributing to the increase in GDP. Although Lanzarote is not considered as a "culinary tourism" destiny, 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 observing the type of food offered, for further analysis, and to propose changes if necessary. We understand that food, as a touristic 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 touristic 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 in: 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.

**PW-102**

**Poster Difference in levels and predictors of food insecurity among urban and rural households of Kombolcha woreda of East Harerge zone, 2014.**

Araoa Penso A

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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 district, 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-rich coffee 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 assumptions were satisfied.

Findings: The Proportion of households that fall in food insecurity cate-
gory was accounted for 74.6 percent (81.5 percent rural and 47.9 per-
cent urban residents). Using household dietary diversity score, 61.7% rural households and 24.6% 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 households. 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 house-
hold food insecurity access scale the most important predictor of food in-
security among urban households were 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-105 Poster
The nutri-guardians project – joining nutrition education and entertainment at global level
Graça, P.1, Sousa, S.M.; 2, Gomez, A.C.C.1, Monteiro, S.B.1, Carvalho, R.1, Lima, R.M. 2
Directorate-General of Health, DGS 1, Faculty of Nutrition and Food Sciences, Porto University 2; Nutri Ventures Corporation 3; Directorate-General of Education, DGE 3

Nutri Ventures is the first children’s entertainment brand in the world de-
veloped 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, nutri-
tionists, dietitians, nurses and medical doctors. All the materials and con-
tented is being developed by the Nutri-Translater. 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. Edu-
cational 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 the Partnership for a Healthier America (PHA), a non-profit 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 educa-
tion without losing a sense of commitment to quality information and
scientific based evidence.

PW-104 Poster
Combined effect of cardiorespiratory fitness and sedentary behavior on overweight among adolescents.
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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 me-
tropolitan area of Rio de Janeiro, Brazil, participants of the baseline Assessment 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 classified by the sex-and-age specific body mass index cut-off (body
mass index > 30 kg/m2) based on World Health Organization criterion (> 1 z-score).
The categories de 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: Thirty-two were stratified by sex, age and type of school. Results: The prevalence of overweight was 27.2% and 53.6% presented cardiorespiratory 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 (95% CI 0.35-0.88) for girls, 0.64 (95% CI 0.45-0.92) for ado-
lescents aged from 15 to 19 years old and 0.91 (95% CI 0.39-0.97) for students from private schools.

Conclusion: The prevalence of overweight was high and most teens at
cardiorespiratory risk and sedentary behavior suggests inactive life style.
Regardless the cardiorespiratory fitness status, not having sedentary beha-

PW-106 Poster
Trends in the prevalence of major cardiovascular disease risk factors among Korean adults: Results from the Korea Na-
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Background: Mortality from coronary heart disease in Korea has increased
continuously, but there are few comprehensive national data on trend in
the prevalence of risk factors for cardiovascular disease in this population.
We examined the trends in the prevalence of major risk factors for car-
diovascular disease, including smoking, obesity, hypertension, diabetes,
and hypercholesterolemia, from 1998 through 2012 in a representative
Korean population.
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 diabetes decreased only in men (65.1 to 47.0%), whereas the prevalence of diabetes did not change over time. Conversely, 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 in order to establish strategies for improvement of these factors should be established in Korea.


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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 (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 < 0.001). 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 = 0.001). 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 (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) and protein (from 15.8% for 1998 to 15.4% for 2010-2012 in men, p for trend < 0.001; from 14.8% for 1998 to 14.4% for 2010-2012 in women, p for trend < 0.001) contribution to total energy intake decreased in both men and women. The energy intake from animal foods which considerably contribute to fat intake increased during survey years. Also, the energy intake from unhealthy food with high energy density, such as sweetened or alcoholic beverages, increased more than two fold in both men and women. Also, the energy intake in total energy intake differed by gender. This present results suggest that dietary interventions should be focused on decreasing animal foods and unhealthy food intake among Korean adults.

PW-108 Poster Latin American Survey of Nutrition and Health Study (ELANS): Study design.

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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, stratification by regions and sub-regions of each country represented, and random selection of men and women 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 declare in writing, through an informed consent procedure, that they are legally capable of providing the 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, wrist, hip and neck circumferences will be measured according to a standardized protocol. Nutritional intake evaluation will be performed using a 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.

Results: This study will result in a unique dataset for Latin America, enabling cross country comparisons in nutritional status, focusing both energy intake and expenditure. Thus, it will provide reliable information for planning of health policies and programs aimed to control nutritional inadequacies and their consequences that may be culturally adapted for implementation in Latin American countries.


Kovalskyk I.1; Fibeg M.1,2; Herrera M.1; Yépez M.C.G.1; Pareja R.G.1; on behalf of the ELANS Study Group
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Objectives: To characterize the methodology of data collection for determination of subjective- and objectively-measured physical activity, sedentary time and energy expenditure in a urban 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-reported and 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 total time 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 also be analyzed. By objective monitoring, physical activity and sedentary behavior, forty percent of the participants will be asked to wear a GT3X accelerometer at the waist on an elasticized belt, on the right mid-axillary line for 7 days (including at least 1 weekend day). Data will be expressed as average intensity and amount of time engaged in moderate- to vigorous-intensity physical activity, as well as energy expenditure in METs.

Results: The study characterizes the data collection methodology in a representative sample of urban population from Latin American countries. It will provide a unique dataset, enabling cross-country comparisons in order to understand current and changing physical activity levels, sedentary behavior and its relationship with nutritional status.

PW-110 Poster Good practice in nutrition education programs, the Uruguay case.

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The increase of nutritional diseases in latin america is a major preoccupation for governments, professionals and scientists who 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 (IACH), from the Food and Agricultural Organization (FAO), established the need of creating a data bank of information, communic-
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.

Materials and methods: 1. A list of public and private institutions that have ICEAN programs was made and each one of them response an interview. To be included in the study, the ICEAN programs must fulfilled five requirements: they must be communication 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 2 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 nutrition 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.

Objectives: a. to recruit Arab women in their towns that will record and reflect their community's food environment through photos. b. To record and voice the major causes of obesity in their communities. c. To assess the impact of the method on the students was carried out in low SES areas of Bs As, Argentina.

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 = 0.001). Furthermore, children in the intervention group reported 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 vegetables has impacted a motivational approach to a success strategy to change children's attitudes and behaviours towards a healthier diet.

2. First intervention: 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.

Results: Children's sedentary behaviours, engagement in, attitudes and barriers towards physical activities are assessed with a shorter version of the Child Health Questionnaire. Children's sedentary behaviours, engagement in, attitudes and barriers towards physical activities are assessed with a shorter version of the Child Health Questionnaire.

Key Findings: Children's sedentary behaviours, engagement in, attitudes and barriers towards physical activities are assessed with a shorter version of the Child Health Questionnaire. Children's sedentary behaviours, engagement in, attitudes and barriers towards physical activities are assessed with a shorter version of the Child Health Questionnaire.

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Objectives: 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 assess the relationship of body weight and image and BMI in professors at the Mexicali campus of UABC.

Materials and methods: Observational, transversal, and relationship study in 225 professors. A validated questionnaire was implemented, conducted in three sections, to evaluate sociodemographic and anthropometric data and images of anatomical models (Moratona) 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 underestimate weight was present. 42.5% of professors had an 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 image and body weight.

Key findings: Self perception, obesity, body image.

PW-115 Poster
Prevalence of physical activity combined with sedentary behavior among adolescents.

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Universidade Federal do Rio de Janeiro.

Objectives: This study presents and discusses the food and nutrition actions in the second section, to evaluate sociodemographic and anthropometric data and images of anatomical models (Moratona) 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).

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 level of physical activity was 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 15 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 watched television less than 2 hours per day (the healthiest case scenario) was 32.9%. On the other hand, 12.0% 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 than those from public ones (25.0% vs 10.1%, p<0.001). 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 morbidity 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.

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Health Department, University of Brasilia, 1; Food and Nutrition Department of Basic Health Care Ministry of Health and Nutrition Department, University of São Paulo, 2.

Food and nutrition, as basic requirements for life, were defined 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.

Methods: 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 16.0% 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 health attention. In the third section, one of the major challenges of this 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 and nutrition actions in the municipalities and their implementation at the local level. The fdedging 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.

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Introduction: obesity increases the risk of chronic non transmissible diseases, aects 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 sedentary behavior, 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, conform 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 Lickert's validated scale of eating habits (including 1) loss of appetite, 2) anticipation of eating, 3) loss of interest in eating, 4) loss of enjoyment from eating, 5) delay in eating, 6) dieting, 7) irregular eating, and 8) high value of food practice, food and nutrition actions.

Results: the average BMI in males and females was 25.5 kg/m². Overweight prevalence plus obesity was 48.5% (59% in males and 41.9% in females). 42.3% of students had an erroneous perception of their body image in relation to 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 43.1% 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.
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 and a healthy lifestyle were given high priority after retirement. However at the same time, 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 less awareness. A certain helpfulness and 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 to retirement. Moreover, more men-specific health promotion activities should be established/implemented to maintain quality of life of retired single men.

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/m². 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 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<0.001), number of days per week cycling (B: -0.16, SE: 0.02, p<0.001), vigorous exercise (B: -0.03, SE: 0.01), intake of dairy products (B: 0.25, SE: 0.01), total fat (B: 0.01, p<0.001), whole grain consumption (B: 0.29, SE: 0.05, p<0.001), salt intake (B: 0.59, SE: 0.04, p<0.001), fruit and vegetable intake (B: 0.11, SE: 0.05, p=0.025), sleeping time (B: -0.17, SE: 0.05, p<0.001) and smoking (B: 0.17, SE: 0.06, p<0.005). In addition, logistic regression analysis revealed that individuals living in urban compared to rural environments (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.

Objectives: To develop a new pyramid based on the Italian Mediterranean diet that takes into account the evolution of consumer habits 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 CISSCAM (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 every 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 own pyramid. Results: The first level of the pyramid importance is given to the main foods such as cereals (pasta, bread, rice), fruits and vegetables as a source of nutrients, fiber 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 monounsaturated fats. The third level fruit and vegetables 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 moderation mainly meat (beef and pork) legumes, nuts, energy-dense foods. Particular attention should be paid to consume with cereals a single dish typical of the tradition and with nutritional value for the complementarity of nutrients. Each dried 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, geographical diversity, territoriality, conviviality, pedagogy of Mediterranean culture. Furthermore, the graphical representation can be easily acknowledged and this may allow a greater adherence to the Mediterranean diet.
PW-122 Poster
Socio-demographic patterning of physical activity levels and sedentary behaviour in Chile: results from the National Health Survey.

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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 related to socio-demographic factors 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) were collected. Physical activity levels were assessed using the Physical Activity Questionnaire (PAQ-v2). 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: 21.5 to 26.7) did not meet the international physical activity recommendations (≥600 MET.min.week⁻¹). The odds of being of inactive were higher in participants aged ≥65 years compared to the youngest (≥25) age group (OR: 2.89 [2.27 to 3.68]) and higher in women than men (OR: 1.45 [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 ≥4h 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 co-related 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.

Gesser-Eddelst A, Endevelt R, Zemach M, Tirosh-Kamiенчick Y

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 (IFJU) 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 (IFJU) are more familiar with 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 strongly related to the consumption and use of 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 1; Bes-Rastrollo M 1; 2; Zape I 1,2,3; Vázquez-Ruiz Z 1; Benito-Corchón S; Martínez-González MA. De la Fuente Arrillaga C. 1Research and Prevention of 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 who graduated from many Spanish Universities.

Material and methods: We followed-up 6,496 Spanish university graduates with 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 60 g.

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 (multivariable-adjusted odds ratio [95% CI]: 2.89 [2.27 to 3.68]) and higher in women than men (OR: 2.17 [1.75 to 2.68]; P = 0.008). A significant association was observed for the same comparison regarding whole-grain bread consumption (multivariable-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, Official Agency of the Spanish Government for biomedical research (Grants P11002658, P11002293, P11003061, RD06/0045, G03/140 and 87/2010), the Navarra Regional Government (45/2011) and the University of Navarra.

PW-125 Poster
Proposal of a new index of adherence to the Mediterranean Diet.

Del Balzo V; Nigro F; Pinto A; Vitelli O; Germani A; Donini LM Sapienza University of Rome - Italy Research Unit of Food Science and Human Nutrition Dept 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 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 the test is 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 identified an 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 the scores of each domain: 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 338 hands of validated 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 animal food decreases the consumption of cereals. The consumption of cereals seems most discriminating normal weight vs. overweight / obese seems to be the median. The risk of overweight / obesity has decreased for women and increased by 5% for each year of age. This analysis supports by the choices made in terms of predictive value of BMI of the respondents.

Key findings. The new index of adherence to the Mediterranean Diet will...
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).
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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 Paulí 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 levels of undernutrition, has 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/Alive) in 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.
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Objective: To identify the places, occasions and the company that would influence the choice between locally produced or 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 or imported ones on given occasions (week day, weekend, festivities, other special occasions), places (home, work, school, street) and companies (family, friends, classmates, colleagues). All data were analysed with SPSS v22, and a p-value < 0.05 was considered significant.

Results and subjects: In total 398 Chinese people participated, but only 305 provided completed questionnaires (67% females; 67% 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 members and friends. The difference between places where they eat local or imported fruit, the company of the person they eat with and the occasion where they usually eat them are significant (P<0.001). Chinese consumers choose to eat more often local fruit than imported fruit at weekends and weekdays. However, for festival and other special occasions, they consume 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.

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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 4-8y old were: breads, rolls, tortillas (36.3%), fruits (25.3%), condiments and sauces (19.1%), cured meats/poultry (18.1%), vegetables excluding potatoes (18.0%), cheese (17.2%), while potatoes (12.3%), poultry (12.3%), fats and oils (12.1%) and dairy products (11.8%). 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 juices 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.
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Objectives: Yoghurt is a source of dietary minerals, B-vitamins and essential amino acids. The consumption of yoghurt as well as other dairy products in observational studies is associated with a reduced risk of weight 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 (4 108 years old) and adults (19 to 64 years old). Participants completed a four-day estimated food diary. “Yoghurts” included all fresh dairy and excluded dairy deserts, yoghurt jars 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 40g/d 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 than 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% v 39%; p=0.02) and adults (41% v 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, zinc, iodine and potassium.

Key findings: A diet containing yoghurt is associated with greater intakes of yoghurt in the UK using nationally representative survey data and to explore the associated dietary pattern and diet quality.
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 (MDP) in the PREMID study. Material and Methods: Cross-sectional and longitudinal analyses of 6,731 participants of the PREMID clinical trial. 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, and 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 he/she consumed in an average day. Linear regression models and ANCOVA analyses were used to analyze daily foods costs according to categories of adherence to the MDP (evaluated by 9-point Trichopoulou'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 PREMID 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 a category of Mediterranean dietary pattern were: 2.25 (2.17-2.33) for very low adherence, 2.47 (2.42-2.51) 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 slightly higher daily food costs.

Funding: The European Working Group on Sarcopenia in Older People (EWGSO), on the deterioration of physical fitness (FP) 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 FP within the framework of the elderly EXERNET multicentre 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. Physical performance was measured at the start of the study and after 1 year. Adherence to the Mediterranean diet was assessed through a validated 137-item food frequency questionnaire (FFQ). 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 5.31 kg m⁻² in women). Spanish reference values. The lowest quintiles of muscle strength (931 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 sarcopenia, sarcopenia and severe sarcopenia category, respectively. Deterioration of FP 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. The prevalence of sarcopenic stage, men obtained better results than women in all FP 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). The sarcopenia stage, severe significance differences were only found for handgrip strength and flexibility test (both, p<0.05).

Key Findings: Taking into consideration the classification proposed by the EWGSO, the elderly with severe sarcopenia have a significantly lower level of FP, which may have a negative influence on quality of life and carrying out activities of daily living. Sex differences disappear with increasing stage of sarcopenia.


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 (MDP) in the PREMID study. Material and Methods: Cross-sectional and longitudinal analyses of 6,731 participants of the PREMID clinical trial. 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, and 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 he/she consumed in an average day. Linear regression models and ANCOVA analyses were used to analyze daily foods costs according to categories of adherence to the MDP (evaluated by 9-point Trichopoulou's score) to adjust for age, sex, educational level, marital status, and occupation.

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Key Findings: On average, a higher adherence to a Mediterranean diet was associated with slightly higher daily food costs.

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Key Findings: Taking into consideration the classification proposed by the EWGSO, the elderly with severe sarcopenia have a significantly lower level of FP, which may have a negative influence on quality of life and carrying out activities of daily living. Sex differences disappear with increasing stage of sarcopenia.

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' behaviors and beliefs regarding children's optimal nutrition is crucial.

PW-134
Poster
Culinary practices in urban households in Montevideo.
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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 pate' paties 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 meats (casseroles, stews) 8%. At dinner, preparations mostly consumed were cakes, pies and pizzas (12.7%); soups and broths (10.9%); noodles and challenge (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 (23%) and cost (19%). In more than half of the households meals were not planned, and there was not interest in finding new recipes, issues that can lead to the lack of 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' behaviors and beliefs regarding children's optimal nutrition is crucial.

Key findings: By aggregating those three risks to one child, we found 697.586 households in which adults and children starved at least once during the three months period preceding the survey.

PW-136
Poster
The effect of parental gender on role modeling of eating habits.
Jimenez Ortega Al', Cuadra P', López-Sobaler AM', Nava B', Ortega RM'
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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 presenting mixed results. Additionally, it has been shown that a child's body weight seems to be influenced most 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 Materials: 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 for 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 parental 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 in 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 (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/sugar (p=0.013) and pizza or hamburger (p=0.06) consumption.

Key findings: More associations were found between food intake of mothers and daughters than with 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
Poster
The situation in selenium as a modulator of blood pressure in schoolchildren.
Jiménez Ortega Al', Cuadra P', López-Sobaler AM', Nava B', Ortega RM'
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 effect on 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 ≥90th 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±3.6 mmHg for diastolic).
Arija School of Nutrition. School of Medicine.

thyroid women. The increase in body weight was found in

with hypertension and

activity

increased in serum, but

selenium

with diabetes-high diet

with weight gain with the eu­

levels

increased in serum, but only in those children with excess of weight;

OR = 0.9550 (0.9188-0.9926).

Conclusions: We observed that the increase in serum concentrations of selenium could protect from hypertension in children with excess of weight.

Acknowledgements: Study supported by a Health Research Project from the Carlos III Health Institute (ISCIII-FISS) (Project: PI060318).

PW-138

Poster

Body Weight gain from the menopause and thyroid status.

Torresani ME, Squillace C, Maffeï L, Oliva ML, Belén L, Alorda B, Rossí ML.

School of Nutrition. School of Medicine. UBA. UBACYT Project 2012-2015.

Introduction: Menopause and the increase in serum concentrations of TSH, as well as within the reference range, may be associated with the increase in body weight.

Aim: Study the body weight gain from the menopause in women concurrent to the Foundation for Research into metabolic diseases and Endocrine Clinical Research (FREEMCA) of Buenos Aires. Argentinian women, with weight gain from the thyroid and other predictors in this stage.

Methodology: Observational cross-sectional design. Sample non-probable of postmenopausal women who first attended nutritional consultation at FREEMCA. Dependent variable: body weight gain after menopause (< 5% and ≥5%); independent variables: status thyroid (hypothyroid and euthyroid in treatment with Levothyroxine), age at menopause (≥ 47 years; 447 years), nutritional status at the beginning of the menopause (<25 kg/ m2; ≥25 Kg/m2), years in menopause (<5 years; ≥5 years) and physical activity (sedentary and active). With SPSS 15.0 statistical establishing X2, Fisher’s exact test and Pearson’s correlation with p-value<0.05.

Results: We studied 116 postmenopausal women with an average age of 59.9±6.9 years, being the age of the menopause 47.8±4.8 years. The 39.1 % reported physical activity scheduled at least three times per week. At the beginning of the menopause the 37.1 % were overweight or obes­

; there were no women with weight loss. The 34.5 % of the women suffered weight gain ≥5% from menopause. On average, the body weight increase 4.6±±.76 kg (range: 0 to 31 kg). The 31.9 % of the sample had hypothyroidism and difference was observed for weight gain with the euthyroid women. The increase in body weight was significantly associated with only and in reverse order with the years spent in menopause (r: -0.30; p: 0.001).

Conclusions: Menopausal women who took less than 5 years at this stage had significantly higher body weight gain, without associating with the same with the thyroid state and the other variables studied.

PW-139

Poster

Does depression affect on diet quality in adolescents?

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Universitat Rovira i Virgili, Reus, Spain. 2Unitat de Suport a la Recerca (USR) Reus-Tarragona. Institut d’Investigació en Atenció Primària, Jordi Gol i Gorina. 3Departament de Psicologia. Grup d’Investigació en Nutrició i Salut de vida (MEDIT-3). Research Centre for Behavioural Assessment (CRAMC). Universitat Rovira i Virgili, Tarragona, Spain

Objectives: 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 Krece 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/ high diet quality which were named “low diet quality” and “high diet quality”. We also recorded body mass index (BMI), physical activity by Krece 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 (12.40±6.95 (mean ± SD, p<0.001), whereas we

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 anthropometrical 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, males with depression were associated with low diet quality, but low socioeconomic level was associated with low diet quality (OR: 5.28 IC 95% (1.74-19.56), p=0.010).

Key findings: Depressive symptoms influence on low diet quality in female adolescents from a school-based sample, but no in males. As well, low diet quality were influenced by low socio-economic 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.

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PW-140

Poster

Alcohol consumption and risk of Non-Hodgkin Lymphoma: a meta-analysis of prospective studies.

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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

3Faculty 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). A list of eligible 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 (DerSimonian-Laird) were implemented for the 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/ SLL; Follicular NHL). Analysis was performed with STATA 13.1 statistical software; this study was funded by Wened 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 which 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: 0.77-0.95); on the other hand, significance was not reached among females (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 SLL (pooled RR=1.10, 95%CI: 0.90-1.36) or T-cell lymphomas (pooled RR=0.91, 95%CI: 0.75-1.09).

Subgroup analyses by alcoholic beverage type were rather hampered by decreased statistical power, although RRs pointed to a protective di­

rection. Specifically, the synthesis of studies yielded a pooled RR=0.89, 95%CI:0.79-1.00 for beer (p=0.048); pooled RR=0.97, 95%CI: 0.91-1.03 for wine; pooled RR=0.90, 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 depression-type associations and differential effects along with gender.

PW-141

Poster

Sodium intake in Spanish schoolchildren assessed by 24h uri­ne levels.

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Introduction: High salt intake is associated with higher blood pressure at all ages, including children. Sodium intake in Spanish adults is high, but it is unknown the current situation in Spanish children. The measurement of
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.
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Objectives: In the surgical 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 gastropasty (APOL) 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 Endosuturing 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 APOL procedure and 16 undergoing the POSE technique, were followed for 6 months. Follow-up was carried out by a multidisciplinary team (endocrinologist, psychologist and sport assessor). The outcome measures were BMI (at baseline and at 6 months) having done APOL and POSE procedure all the patients received overnight inpatient observation. Outcomes included adverse events, change in total body weight (TBW) and percentage of TBWL (%TBWL).

Results: With the endosuturing methods, patients tolerated the procedure well and achieved substantial weight loss. 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 APOL, 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 month of follow up. Weight loss for APOL, POSE and Dual Balloon was: 20.2 ± 9.6, 14.8 ± 8.1 and 14.4 ± 7.9 kg and %TBWL was: 18.4 ± 9.3, 13.5 ± 6.9 and 14.7 ± 6.9.

Key findings: Bariatric endosuturing 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.
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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 relationships between water intake and total body water and cognitive function in a group of schoolchildren.

Material and methods: This study included 97 Spanish schoolchildren (9-8 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.

Results: The water intake was: 1496 ± 116.16 mL/day and 80.4% 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 = 5.4 ± 2.5, p = 0.05). Furthermore, those children with TBW above 18 kg (50%) had a higher processing speed (boys: 139.0 ± 36.9 points; girls: 139.6 ± 39.3 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-test scores we observed that those with a higher mid-morning water intake (PS0 = 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 drank 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.

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PW-144
Poster
Maternal obesity in early pregnancy and risk of preclampsia, gestational diabetes mellitus and gestational hypertension in the pregnant population of Gran Canaria.
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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 included in the Maternal and Infant Study of the University of Las Palmas de Gran Canaria (HUMIGC) from 1993 to 2013. Outcomes were compared using multivariate analyses controlling for confounding variables. Ordinal logistic regression analyses calculating odds ratios (OR) and their 95% confidence intervals (95% CI) were fit to assess the association between socio-economic level (low, middle and high), 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: 1.87-3.05) and RR=6.69 (95% CI: 5.33-8.40).

Key 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. Policy and program lessons from two systematic reviews of feeding programs for preschoolers and school-aged children in developing countries.
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Objectives: To determine the effects of feeding programs for preschoolers and school-aged children in developing countries.

Methods: We conducted a systematic review of randomized controlled trials (RCTs) and quasi-experimental trials (QETs) that evaluated feeding programs for preschoolers and school-aged children in developing countries.

Results: A total of 135 studies were identified, of which 116 were included in the final analysis. The most common feeding programs were school-based feeding programs, home-based feeding programs, and community-based feeding programs. The most common interventions were food distribution, food supplementation, and nutrition education. The most common outcomes were anthropometric measures, health outcomes, and academic outcomes. The most common methodological quality was low. The most common conclusions were that feeding programs were effective in improving anthropometric measures, health outcomes, and academic outcomes.

Key findings: Feeding programs are effective in improving anthropometric measures, health outcomes, and academic outcomes. Further research is needed to determine the long-term effects of feeding programs and to identify the most effective interventions.
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. Billions of dollars are invested in these programs, it is essential to learn whether, how, and why they work. We report two rigorous Cost-effectiveness 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 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: 12.25 kg/year, school: 25.75 kg/year) and height (preschool: 48.57 cm/year, school: 25.147 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 supplement 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) a food-based RDI for energy (given 5) supplementation 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.

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. Absentees (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, and since the majority of children should not initiate the consumption but even moderate drinkers can benefit from the advice to follow a traditional MADP.

PW-146 

Objectives: To quantify and to evaluate the levels of ca, mg, k, na, cr, fe, mn and zn in Saffra officinalis. Results: Absellán DT, Rubio Armendáriz C, González-Weller Dalias L, Luis-González G', Gutiérrez-Fernández A', Hardisson de la Torre, A'. Toxicology Department. University of La Laguna. 38071 La Laguna, Santa Cruz de Tenerife, Spain.

Objectives: - to determine the concentration of trace elements (Fe, Mn, Cu, Zn, Cr, Mo, Co, B, Ba, Li, Sr, Ni and V) in lager beers consumed by the Spanish population.

- to estimate and evaluate the contribution to the recommended daily allowances (RDA), Tolerable Daily Intakes (TDI) and Upper Limit (UL) set by each metal considered in moderate beer consumption (330 ml/day in women and 660 ml/day in men). Material and methods: A total of 124 samples of lager beers sold in public establishments of the island of Tenerife were analyzed. Metal determination was performed by Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES).

Results: The average concentrations, in mg/L, were: Fe (0.159 ± 0.129), Mn (0.090 ± 0.049), Cu (0.211 ± 0.085), Zn (0.137 ± 0.098), Cr (0.009 ± 0.008), Mo (0.009 ± 0.006), B (0.043 ± 0.038) Ba (0.053 ± 0.040), Li (0.708 ± 0.335) Sr (0.156 ± 0.081), Ni (0.009 ± 0.004) and V (0.077 ± 0.046). In the case of Co, the concentration was below the limit of quantification. Considering the above mentioned moderate beer consumption, the estimation of the dietary intakes showed the following results for women and men, respectively: Fe (0.29 and 1.17 % of the RDA), Mn (1.65 and 2.58 % of the RDA), Cu (6.63 and 12.66 % of the RDA), Zn (0.65 and 4.07 % of the RDA), Cr (11.88 and 16.97 % of the RDA), Mo (6.60 and 13.20 % of the RDA), B (0.15 and 0.25 % of the TDL), Ba (0.15 and 0.25 % of the TDL), Sr (0.66 and 1.13 % of the TDL), Ni (0.41 and 0.71 % of the TDL) and V (1.63 and 2.79 % of the UL).

Key findings: Moderate consumption of lager beer contributes to the dietary intake of trace elements, especially Fe, Sr and Zn.
PW-149 Poster
Major dietary patterns are related to biomarkers of endothelial dysfunction.

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 makers of endothelial dysfunction.

Results: We identified three dietary patterns: Traditional (TDP), Healthy (HDP), 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; HDP 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 HDP, higher scores were inversely associated to 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.
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Objectives: Vitamin K is an essential element in the coagulation, which is also involved in gamma-carboxylation reactions of proteins as osteocalcin, whose blood pressure protective effect on pre-prodopentid bone disease. There is also evidence that vitamin K can have a benefit in controlling blood pressure. Therefore, the aim of the present study is to analyze the adequacy of vitamin K intake and its possible association with blood pressure in a representative sample of Spanish adults.

Material and methods: A sample of 418 adults (196 men and 222 women) with ages ranging from 18 to 60 years, was selected in ten Spanish provinces to constitute a representative sample of the population nationwide. The dietary study was carried using a 24-hour recall questionnaire for two days. Personal, anthropometric and health data were also collected. Dietetic data were processed using DIAL software. Blood pressure was measured using an automated sphygmomanometer, which allowed the identification of normotensive, prehypertensive (PIHTA) and hypertensive (HTA) adults, considering systolic (SBP) and diastolic (DBP) blood pressure. Results: Vitamin K intake (138.8±82.6 μg/day) was lower than the established adequate intake for the vitamin. In the 37.3% of the studied participants, fifty one point eight percent of the studied people had normal blood pressure, 36.7% pre-hypertension (SBP>130 mmHg or DBP>80 mmHg) and 11.5% hypertension (SBP>140 mmHg or DBP>90 mmHg). Systolic blood pressure in people with vitamin K intake lower than that recommended (≤17.1±4.7 mmHg) was smaller than people with vitamin K intake higher than 175% of that recommended (118.2±16.6 mmHg) (p<0.05). The same picture was seen in diastolic blood pressure (74.2±10.3 vs. 70.9±11.0 mmHg, p<0.05, respectively). The risk of hypertension in people with higher contribution to the coverage of recommended intakes of the vitamin (OR=0.930 [0.9870-0.9855]) was taking into account age and BMI as covariables. The risk of pre-hypertension also was lower in people with higher contribution to the coverage of recommended intakes of the vitamin (OR=0.967 [0.9339-0.9995]). Although vegetables are the main source of vitamin K (n=5,776, p<0.05), the consumption of this food group is not associated with hypertension and does not vary the association between vitamin K and hypertension when it is included in the logistic regression analysis (OR=0.9931 [0.9870-0.9993]).

Key findings: Vitamin K intake could be improved. Although, vitamin K intake was lower than that established as adequate in the 37.3% of the studied participants, probably a slightly higher intake than the adequate intake, besides to ensuring that all individuals meet their requierments, also could be beneficial to improve the health of the population, especially in the control of blood pressure.

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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 care districts were involved. About 50% of the 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=6.674; p=0.010). Possibly less than one portion of milk or dairy products daily (X²=5.981; p=0.028). 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 care for 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 a 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 ingesta y actividad física en adultos jóvenes y sus paralelas en países iberoamericanos? El objetivo de este proyecto es 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 (SENC). El estudio se realizará en población adulta joven como unidad primaria. El protocolo de estudio combina métodos cuantitativos, cualitativos y recogida 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.
Background: Interaction of genetic and nutritional factors in the development and progression of type 2 diabetes mellitus (T2DM) has been much discussed and assessed, and the goal of all the studies in this field is controlling and preventing late complications of T2DM. In recent years lots of investigation in the line of the association of vitamin D binding protein (DBP) genes and it's common polymorphisms with susceptibility to T2DM have been collected. The contradictory results have been obtained so far and the role of DBP polymorphisms still remains uncertain. The goal of the present study is to investigate the relationship between vitamin D status DBP polymorphisms in diabetic patients.

Methods/design: In a case-control study consisting 100 people with diabetes and 100 healthy subjects, Genotypes of two polymorphisms of DBP (Haelll and Sty) were studied using PCR-RFLP method. Biochemical data have been also collected. Information about dietary intakes of each subject during the last three months was collected using a semi-quantitative food frequency questionnaire. In this study, the frequency of two DBP polymorphisms distribution was determined in two groups. Then the frequency distribution of all genotypes of each polymorphism were found in all three genotypes (25(OH) D3 and DBP) were compared in all genotype subgroups.

Results: The concentrations of 25(OH)D3 levels in diabetic patients and healthy subjects according to the genotypes of each polymorphism, two-way ANOVA were used. A significant difference in the frequency of allele and genotype was observed. The distribution of Haelll polymorphism genotype frequency between the two groups showed no significant difference. In contrast, the frequency distribution of Sty genotype frequency between two groups was significant but in the case of this polymorphism, the mean serum 25 (OH) D3 was significantly different between diabetics and healthy subjects.

Conclusion: No association between Sty genotypes with vitamin D status was observed in this population, In the case of Haelll, a statistically significant association was observed. These data help to better understand the differences in genotype frequencies in case and control subgroups.

**PW-156 Foods of animal origin and contamination by organochlorine pesticides and polychlorinated biphenyls.**

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**Objectives:** Foodstuff of animal origin are well known to be prominent contributors to the level of contamination with persistent organic pollutants (POPs). The current study aimed to assess the role of the dietary intake of animal products as a probability factor for increased serum POPs.

**Material and Methods:** The intake of animal products (dietary variables) as a determining factor for serum POP levels was investigated using multivariate statistical models.

**Results:** Our results showed that while poultry, rabbit, and cheese consumption increases the probability of having high levels of non-DDT-derivative pesticides, sausage, yoghurt, and bacon consumption decreases the probability of having high levels of these pesticides. In addition, poultry, rabbit, eggs, cream, and butter consumption increased the probability of having detectable levels of marker PCB, while dairy dessert decreased the probability of having detectable levels of these PCBs. On the contrary, sausage and meat consumption increased the probability of having detectable levels of dioxin-like PCBs (DL-PCBs). The current results confirm that dietary intake of foodstuffs of animal origin is a relevant risk factor for accumulation of POPs (and therefore in their serum levels).

**Key findings:** Our study indicates that the analysis of dietary patterns may be useful for identifying those individuals that will probably present a high body burden of POPs. Because POPs can exert deleterious effects on human health, the identification of populations at risk of being highly contaminated is mandatory in order to implement policies that minimize the exposure to these compounds.
PW-157 Prediccion de metabolico syndrome by clinical indicators. 
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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. Were 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 qualitative 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 criteria, the most overweight. Taking into account the component of MS, we observed that the 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, being below the range that the International Diabetes Federation takes as diagnosis of metabolic syndrome.

Other 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 altered 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 a 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 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. 
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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 ethnicity were 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 sugar in sweet foods, 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. 
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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 systems 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. 
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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 experiences and viewpoints of urban women in Tehran about the program was evaluated, in urban and rural settings of Tehran. A mixed methods study was conducted. The study evaluated the effects of the cash transfer program on the 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 city 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 and decreased their hope to the future of their children which in turn could lead 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.
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PW-162

The Nutrition Sensitivity of Agriculture and Food Policies: A


Furbo J

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Background and Objectives: Nutrition-sensitive agriculture aims to maxi-
mize the positive impact of the food system on nutrition outcomes while
minimizing any unintended, negative consequences of agricultural poli-
cies and interventions for the consumer. The complex role of how agricul-
tural policies can effectively address nutrition is not yet well understood.
The current conceptual knowledge on this topic, but little un-
derstanding of how to carry concepts and policy objectives into effective
implementation and delivery of food-based approaches that impact nutri-
tional status of populations.

Methods: The purpose of this study is to contribute to the on-going dia-
logue of the gaps in our understanding of effective nutrition-sensitive
agriculture and food policies and commitments, and the food-based solu-
tions 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
UNSCN and examined the nutrition sensitivity of agriculture and food poli-
cies studied include Brazil, Malawi, Mozambique, Nepal, Senegal, Sierra Leone, South Africa, and Thailand.

Results: The analysis found that most of the country case studies demon-
strated 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 incorpo-
rated nutrition objectives, and indicators to measure progress, targeted
the vulnerable and women and focused on a diversified food production.
However, some policies did not emphasize interventions to improve pro-
cessing, storage, marketing and utilization of foods. Very few have assess-
ment impact of these 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 commitment to achieving positive nutrition outcomes, as well as
an understanding, to varying degrees, that the agricultural sector has a
vital role in achieving nutrition objectives. As we move forward into the
post-2015 era, good practices and transferrable lessons can be drawn from
each country case study. The studies collectively highlight the importance of
a cross sectoral, and multi-sectoral human resource-based and

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.

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Evaluating food intake among children has a great importance in pre-
venting 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 My Plate”. 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 ques-
tionnaire. Recommended total daily amounts of food groups of the Choos-
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 popu-
lation is vegetarian. Mean (SD) self-reported exercise was 30.3±5.6 min
formalized. Daily recommendations were based on gender and age groups.
Hence, data was separated, and means of comparison were done. For age and

PW-164

Introduction of soft drinks and industrialised beverages in

the diet of infants attending public day care centers.

Toloni, MHA 1; Longo-Silva, G 2; Meneses, RCE 3; Taddei, IAAC 3

1Federal University of Lavras, Brazil. 2Federal University of Alegoas, Brazil.
3Federal University of Sao Paulo, Brazil.

Objective: To identify the age at introduction of soft drinks and industri-
lized juices in the diet 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 inter-
viewed about the age of feeding introduction. We evaluated total intake
and 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 available 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% consum-
ing it before six months. Furthermore, 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

area in Minas Gerais, MG.

Toloni, MHA 1; Pereira, SM; Souza JN; De Angelis MCP; Pereira LJ; Am-brosano GMB; Pereira AC

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lavras Lavras, Minas Gerais, Brazil. 3Faculty of Odontology of Piracicaba,
State University of Campinas, Piracicaba, Sao Paulo, Brazil

Objective: To evaluate the periodontal and nutritional assessment of chil-
dren from a rural school district 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 socioeco-

onomic questionnaire validated in the literature with questions related to
social variables, economic and behavioral. Oral examinations were per-
fomed by two calibrated examinators, 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 brush-
ing 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 possi-
ble, 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 Krus-
kal-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 dis-
tribution tables for each measured variable. Revealing that most of the

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individuals examined were normal (79.5%), followed by overweight 12 (8.2%), already malnourished were present in 7.5% 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 disease indices observed it was found that most had examined dental plaque and bleeding sextants (level> 0), indicating gingival change. In relation to dental calculus the same trend was not observed.

Key-findings: Despite the review rural individuals present lower 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 dental plaque and bleeding sextants.

PW-166 Poster Media Strategies and Commercials Appeals for Promotion of Food Products.
Tokoni, MHA 1; Longo-Silva, G 1; Domiciano CG 2; Coelho LB 1; Pereira JAR 3; De Angelis-Pereira MC 4; Federal University of Lavras, Minas Gerais, Brazil; 2Federal University of Alagoas, Brazil; 3Federal Institute of Southeast Minas Gerais, Campus Barbacena, Minas Gerais, Brazil.

Objective: 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: alcohol, eggs, meats and meat derivatives, milk and dairy products, oils and olive oil were sought. The data were stood 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%), illusion fantasy (13.9%), family/friendship (13.2%) 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 critical 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 to present the simple and desirable composition of the product to a sensation of pleasure with 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 Poster Traffic Light Labeling: tool for understanding food labeling.
Tokoni, MHA 1; Longo-Silva, G 1; Taddei, JAC 2; Federal University of Lavras, Minas Gerais, Brazil; 2Federal University of Alagoas, Maceió, Brazil; 3Federal University of São Paulo, São Paulo, Brazil.

Objective: 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 is green. The adaptation and applications of these concepts to Brazilian consumers were based on the standards of the National Sanitary Surveillance Agency 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 Poster Development of Instructional Resources for Nutritional Education of Children aged 5 to 6Years.
Tokei, MHA 1; Pereira TS 2; Libeck B 3; Melo K 4; Longo-Silva, G 3; De Angelis-Pereira MC 4; 1Federal University of Lavras, Minas Gerais, Brazil; 2Federal University of Alagoas, Brazil.

Objective: This study is intended to report the experience of the development of three instructional resources turned to food and nutrition education of children of five to six years old by a team of the course of Nutrition of the Food Science Department 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 play 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 concerning 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 teaching materials and nature that interact with the same subject in different activities should consider the needs and constraints of the target audience. It is important to 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 Poster Understanding local narratives, attitudes, beliefs and care-seeking practices during diarrhea episodes to inform public health behaviour change strategies in San Marcos, Guatemala.
Garcia Maza R.1 and Roche M.L.2; Center for Studies of Sensory Impairment Aging and Metabolism (CeSIAAM), Guatemala City, Guatemala; 2Micronutrient Initiative, Canada.

Objective: 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. 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, confidentiality of the medical care. Key Findings: The response to an episode of infantile diarrhea has a complex basis in San Marcos. The perceived typology and related cause of diarrhoea as well as the attitudes towards the effectiveness of diarrhoea treatment influenced caregiver’s choices in care-seeking and treat-
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.
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Center for Studies of Sensory Impairment, Aging and Metabolism (CeSIAIM), 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 selected 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 as 10 µg vitamin A per gram of granulated sugar. Differences in estimated sugar intake and contribution of vitamin A between area and assessment method were compared using Kruskal-Wallis.

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 as 10 µg vitamin A per gram of granulated sugar. Differences in estimated sugar intake and contribution of vitamin A between area and assessment method were compared using Kruskal-Wallis.

Results: Differences in estimated daily intakes of fortified table sugar were 36g for the urban, 63g for the rural, and 52g for the urban, class respectively. We obtained mean daily sugar intake of 1 g/day, 0.1% using the FFQ for QUL, QUM and RUM, respectively. Using the FFQ methods, 34 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 food items 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.
Novellós Ruiz, JP; Santi Cano, MP; Rodríguez Martin, A'; Fombella Fernández, Sara; Sánchez González, Sara; García Melgar, Javier; García Jiménez, Jesús

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 (EMI -2 adaptation AMPF), 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 cutoff of adherence to the Mediterranean diet scale. The correlation between variables was obtained by Pearson test, differences between proportions with Fisher’s Chi and the different between means with Ttest 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, and the adherence index to the Mediterranean diet is 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 the 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 competition, social affiliation and challenge, personal gain or health. 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 anorexia and inversely related with 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, JM; Villagráñ Perez, SA; Novellós Ruiz, JP; Rodríguez Martin, A'; Lechuga Sancho, M; Sánchez González, S; Martín, A'; Fombella Fernández, Sara; Sánchez González, Sara; García Melgar, Javier; García Jiménez, Jesús

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Objective: To determine the prevalences of overweight (SOB) and obesity (OBS) amongst a young population, made possible looking at the parents nutrition values.

Materials 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: 994 subjects: 504 men (50.7%) and 490 women (49.3%).

A survey amongst 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.
Results: The prevalence of SSP in the ancestors was: fathers: 68.5%, mothers: 38.1%. Amongst children: SSB: 17.1%, OBS: 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 1-1.5 and are found within the following cases, with reasons for prevalence close to 2: Father SSP (RP-OBS: 1.97), Mother SSP (RP-OBS: 1.97), Mother SSB (RP-OBS: 3.28, RP-SSS: 2.99, RP-SSP: 2.06) Only Mother SSP (RP-OBS: 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 forementioned is more obvious amongst obese groups (3-5, 6-12 and 13-16). The excess weight of children and those obese are strongly related to the Mother and Father.

A Mothers excess weight has a big influence on the child. It is necessary to educate the Mother, as it of a high possibility that the excess weight and obesity of the child is due to poor alimentary habits from the family, especially the Mother.

PW-174 Poster
Anthropometric and sociocultural characteristics of the parents and the prevalence of overweight, overweight and obesity in an infant or young Spaniard.
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1Salud Pública Universidad de Cádiz, 2Hospital Universitario Puerta del Mar – Cádiz

Objectives: To determine the prevalence of overweight, 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 overweight, overweight and obesity with the obstetrical antecedents, with the eating habits and the physical activity of the child.

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 overweight 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 overweight children (6.0% vs. 3.9%); 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 excess weight (53.2%). There is a possible relationship between overweight, overweight and obesity with the weight at birth and the weight gain during pregnancy: 12% of the children overweight have overweight 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 weight.

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 overweight 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?
Djepugot E1, Nenagh CB1, Bree 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 nutritional status, and stimulates 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 coun­tries, but proper intervention studies are dearly 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 analyzed 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 math, 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.
Traissac P, Pradelles R1, El Ati J2, Aounallah-Skhirli H2, Delpeuch F, Maire B3.
1RD (Institut de Recherche pour le Développement), NUTRIPASS Research Unit, IRD-UM2-U11, Montpellier, France. 2TUNTA (National Institute of Nutrition and Food Technology), Tunis, Tunisia. 3SURVEN (Nutrition Surveillance and Epidemiology in Tunisia) Research Laboratory, 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 is crucially dependent on the socio-cultural status of the 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 and associated with the urban environment and with 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-height 30 kg/m², abdo­minal obesity Waist Circumference 88 cm. We assessed within-subject abdominal but not overall obesity (OnA) and overall but not abdominal obesity (OnO) 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 and profession), and socioeconomic factors (education, profession, 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 Abn women (25.0% [22.8-27.1]), while prevalence of OnO was residual (1.6% [1.1-2.2]). There were no adjusted associations of OnO 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=0.013) or those with manual jobs (P=0.038) were slightly less likely to be OnO. However, there was a large variability in the proportion of Abn women 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 but not overall obe­sity and this status was not associated with the urban environment and with most socio-economic status items, mildly so with individual characteristics such as menopause, parity and profession. But it was much more preva­
Adherence to the Mediterranean diet of college students and its association with obesity, hypertension and quality of life.

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Objective: assess the adherence to the Mediterranean diet of college students and analyze its association with overweight and obesity, high blood pressure and chronic disease risk.

Method: cross-sectional study of a random sample of 155 university students. BMI, waist circumference, SBP, DBP, 14-item scale of adherence to the Mediterranean diet, and Health-related quality of life SF-12 was measured. WHO cut-off points for blood pressure and BMI and waist circumference were used. We used the 75% adherence to the Mediterranean diet scale. The correlation between variables was obtained by Pearson test, differences between proportions with Fisher's test / Chi and the differences between means with T-test and ANOVA.

Results: the study group had a mean age of 21.6 years and consisted of 55% women. The mean values of BMI were 24.9 and 23.7 in men and women respectively, with values of waist circumference 85.2 cm and 75.8 cm. SBP mean were 126 mmHg and 118 mmHg in men and women (p < 0,01), and DBP mean of 77 mm Hg and DBP 75 mmHg respectively. The health-related quality of life measure (SF12) presented means values of physical health of 54.5 in men and 53.7 in women. As for mental health, the average score was 43.3 and 44.5 respectively. The score of adherence to the Mediterranean diet in college students was 5.6 (95% CI 5.3 to 5.9), with no differences between sexes. Overweight youth showed a discrete greater adherence to the Mediterranean diet (6.13) versus obese (4.94).

20% of men and 5% of women had systolic or diastolic arterial pressure incompatible with hypertension. There was a significantly lower adherence to the Mediterranean diet in young people with high blood pressure (3.36) than those with normal-high blood pressure (6.55).

Significant differences were observed in physical health related to quality of life in association with adherence to the Mediterranean diet: those with greater adherence to the Mediterranean diet better perceived physical health related to quality of life (p < 0.018).

Key findings: despite the low levels of adherence to the Mediterranean diet in university students, it maintains an inverse association with both obesity and hypertension, and a direct relationship with physical health related quality of life.
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 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.

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**PW-181**

**Diet diversification influence on metabolic disorders development in obese patients - Bioactive Food Project.**

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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.

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