



# Global Perspectives on Food Waste

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Seminar on Food Waste

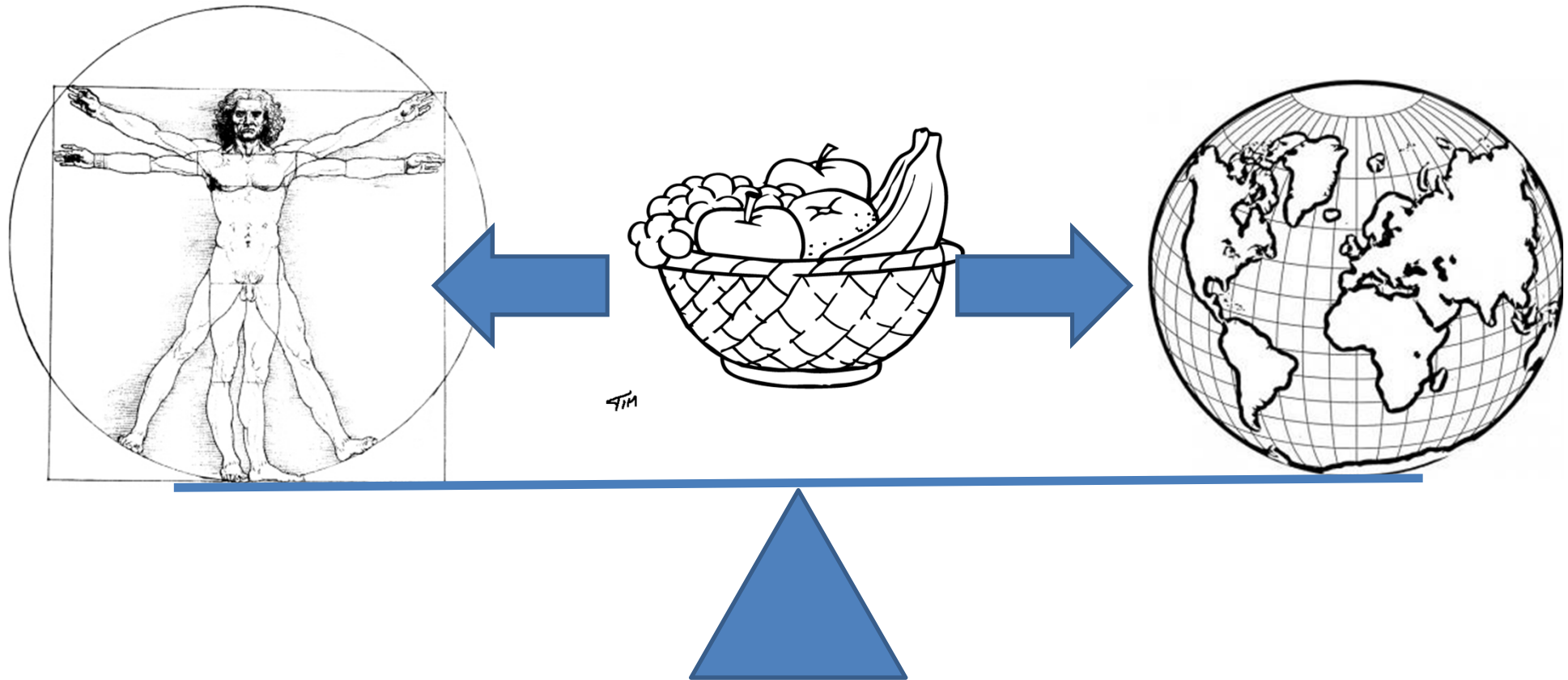
24th of April 2013

09.00-15.00

**Abstract:** Food waste is global challenge resulting in considerable impact on the climate. This presentation take global perspective and look at food waste in the context of public food. It report on two concrete projects that deals with climate impact and food wast in hospital food system – the FoodTura and the FoodServInSPIRe projects. It gives examples of different approaches to curbing food waste and climate impact and concludes by listing recommendations for what the public food sector can do.



# Food activities of mankind: Double effect



# Tristram Stuart: The global food waste scandal

- [http://www.ted.com/talks/tristram stuart the global food waste scandal.html](http://www.ted.com/talks/tristram_stuart_the_global_food_waste_scandal.html)

# UK foodservice

## 340.000 trucks of food waste

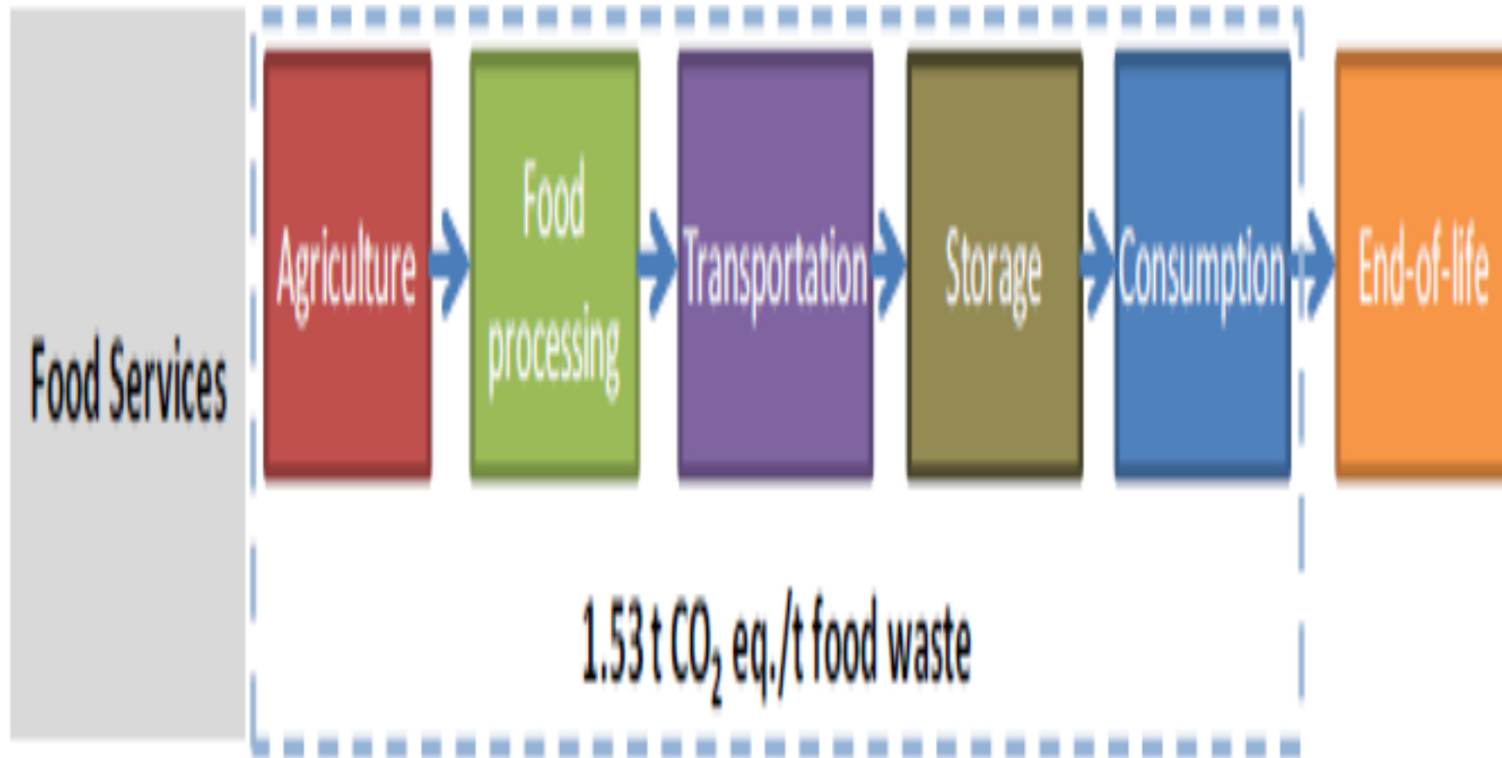


- Restaurants, hotels, pubs and quick service restaurants (QSRs) serve a large number of individual consumers. [WRAP research](#) estimates that in 2009 UK pubs, restaurants, take-aways and hotels produced around 3.4 million tonnes of waste. Of this, 1.5 million tonnes of this was sent to landfill and has an associated carbon impact of around 4 million tonnes of CO<sub>2</sub>e. WRAP estimates the costs associated with avoidable food waste to be more than £720 million.

<http://www.wrap.org.uk/content/hospitality-and-food-service-wraps-work-0>

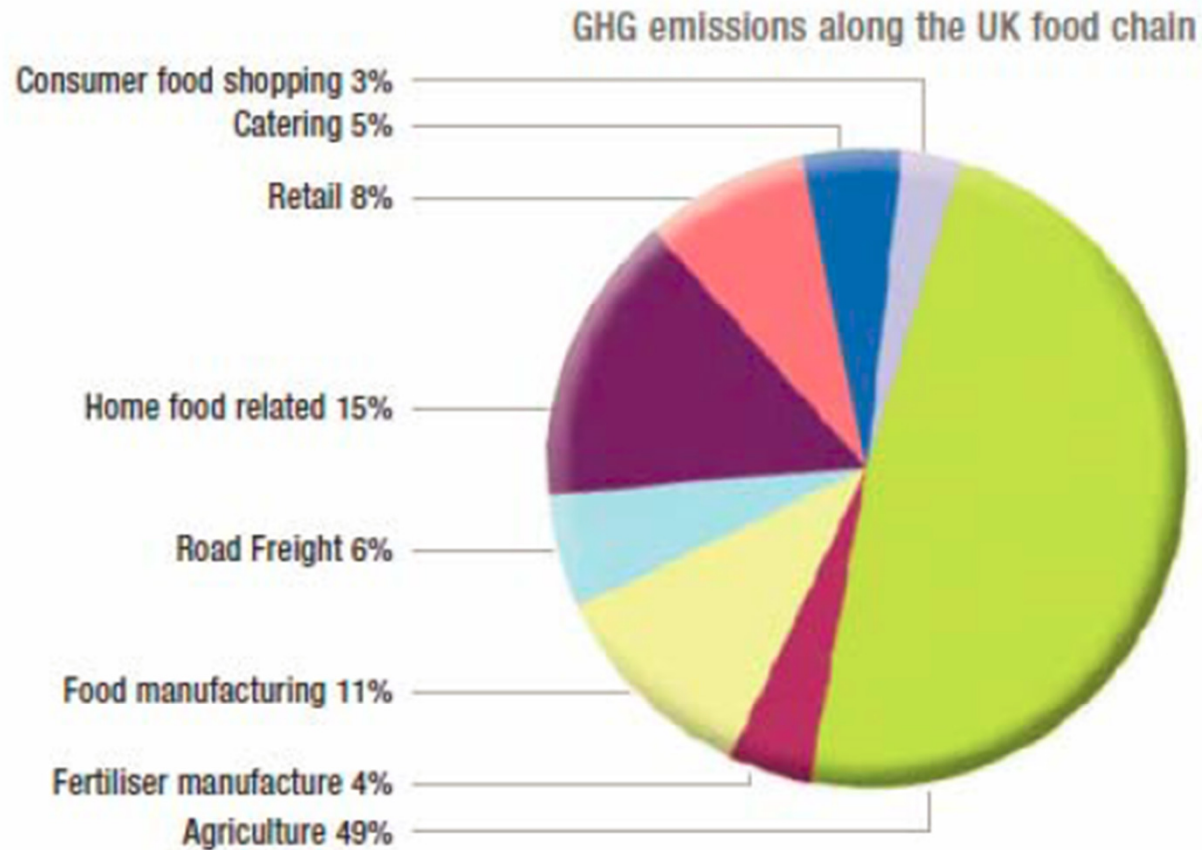


# Food waste = CO2 emission



Ofei, K cited from ETC/SCP working paper  
1/2009

# Contribution of catering



UK: comparable data (CIAA, 2008)



# Climate mitigation advice for catering

- A substantial amount of vegetable products and a limited amount of animal products
- A strategy for reduction of the food waste
- Products from organic agriculture and/or from conventional farms with a low surplus of nutrients
- Local products grown within the seasons
- Organic local seasonal sourcing
- Greenhouses should be heated with renewable energy

# Increased focus on public food

## New climate strategies

- Public procurement: approx 10% of total
- Public foods approx: 5-6 billion DKR/y
- Municipalities and regions needs to do annual climate strategies
- Climate strategies are linked to an area
- Coordinated in Kommune Kontakt Rådene (KKR)

# Example: Lyngby-Taarbæk catering

- City Hall and Annex cafeterias in the Danish municipality of Lyngby-Taarbæk.
- Using life cycle assessment emissions was estimated at 7.29 and 5.67 kgCO<sub>2</sub>-eq/kg from the City Hall and Annex cafeterias, respectively.
- Analyzing ten recipes, it was found an average 35.7% fewer emissions per unit mass from 'heart healthy' over traditional Danish recipes.

Project Number: 42-PRC-3054

ANALYSIS OF GREENHOUSE GAS EMISSIONS RELATED TO FOOD: A STUDY  
OF TWO CAFETERIAS IN THE DANISH MUNICIPALITY OF  
LYNGBY-TAARBÆK

An Interactive Qualifying Project  
submitted to the Faculty  
of the

WORCESTER POLYTECHNIC INSTITUTE



# Carbon eq recommendations

- 800 g/meal
- Used by Mat Klimat/KLIMP in city of Malmö



**Marine Stewardship Council**  
Certificeret bæredygtigt fiskeri

# Example: Climate Balance tool (NL)

## Klimaatweegschaal

De manier waarop voedselproducten worden gemaakt, bewaard en bereid heeft invloed op het klimaat. Hoeveel invloed verschilt per product. De Klimaatweegschaal maakt dat inzichtelijk. Stel hieronder een maaltijd samen. Geef aan hoe je de gebruikte producten bewaart en bereidt. Je ziet direct hoe jouw maaltijd scoort op de Klimaatweegschaal. Klik voor een toelichting op de blauwe bolletjes in de score. Kijk daarna eens hoe je score verandert door andere producten of bereidingswijzen te kiezen.

Aardappel, pasta of rijst	Bewaarmethode	Bereidingswijze	9% 12% 80%
Aardappel rauw	Niet gekoeld	Koken / stomen	
Groente	Bewaarmethode	Bereidingswijze	
Bonen sperzie- in blik glas	Niet gekoeld	Koken / stomen	
Vlees	Bewaarmethode	Bereidingswijze	
Varkensvlees	Koelkast	Bakken / braden / wokken	

Invloed op het klimaat voor bovenstaande maaltijd per persoon.



**i** De resultaten zijn aanklikbaar voor uitgebreide informatie over het product.

**///** De arcering geeft het gemiddelde aan van de categorie waar het product toe behoort.

**↓** De rode lijn geeft de voorgaende waarde van het product ter vergelijking.

# Example: Menu Tool (SE)

	Friday, 26. September 2008
	KTH Research Project Database
<b>&gt;&gt; KTH Research Projec...</b>	<b>PROJECT</b>
<ul style="list-style-type: none"><li>&gt; Architectural and Civil Engineering</li><li>&gt; Chemistry and biotechnology</li> <li>&gt; Computer Science &amp; Information Technology</li><li>&gt; Electrical Engineering</li><li>&gt; Mathematics</li><li>&gt; Physics and Energy</li><li>&gt; Production and Mechanical Engineering</li><li>&gt; Social Sciences</li></ul>	<b>MenuTool - Developing an interactive tool for environmental menu planning, evaluating it and making recommendations for further use</b> (*Add to Infobox)
	 <b>Research Leader: Annika Carlsson-Kanyama</b>
	 <b>Industrial Ecology</b>
<b>OVERVIEWS</b>	<p>In MenuTool a prototype version of an interactive tool for environmental menu planning is developed and tested. The project is carried out in collaboration between researchers from the Division of Industrial Ecology at KTH and the Department of Home Economics, Göteborg University. A consultancy firm, Energivision, will develop the interactive digital instrument. The goal is to increase the capacity for environmental menu planning mainly among the interested citizens and school pupils. Results from a previous research project where the</p>

# EcoNutrition food table

impact per 100 grams

Food	Energy	Fat	Carbo	Protein	Vitamins	Minerals	CO <sub>2</sub> eqv.
Artichoke							
Asparagus							
Aple							
Barley							
...							
...							
...							

# Food waste: 6 settings

1. Primary production
2. Manufacturing
3. Logistics
4. Domestic
5. Retail
6. Food service

# Meals served per year

in the hospitality industry in Denmark

<b>Sector</b>	<b>Meals/y (1000)</b>
Restaurants	241 000
Canteens/catering	150 000
Captive catering	250 000
<b>Total</b>	<b>641 000</b>

**1. Miljøstyrelsens key figure of 125 g food waste per meal gives a total of approx. 80 000 tons a year.**

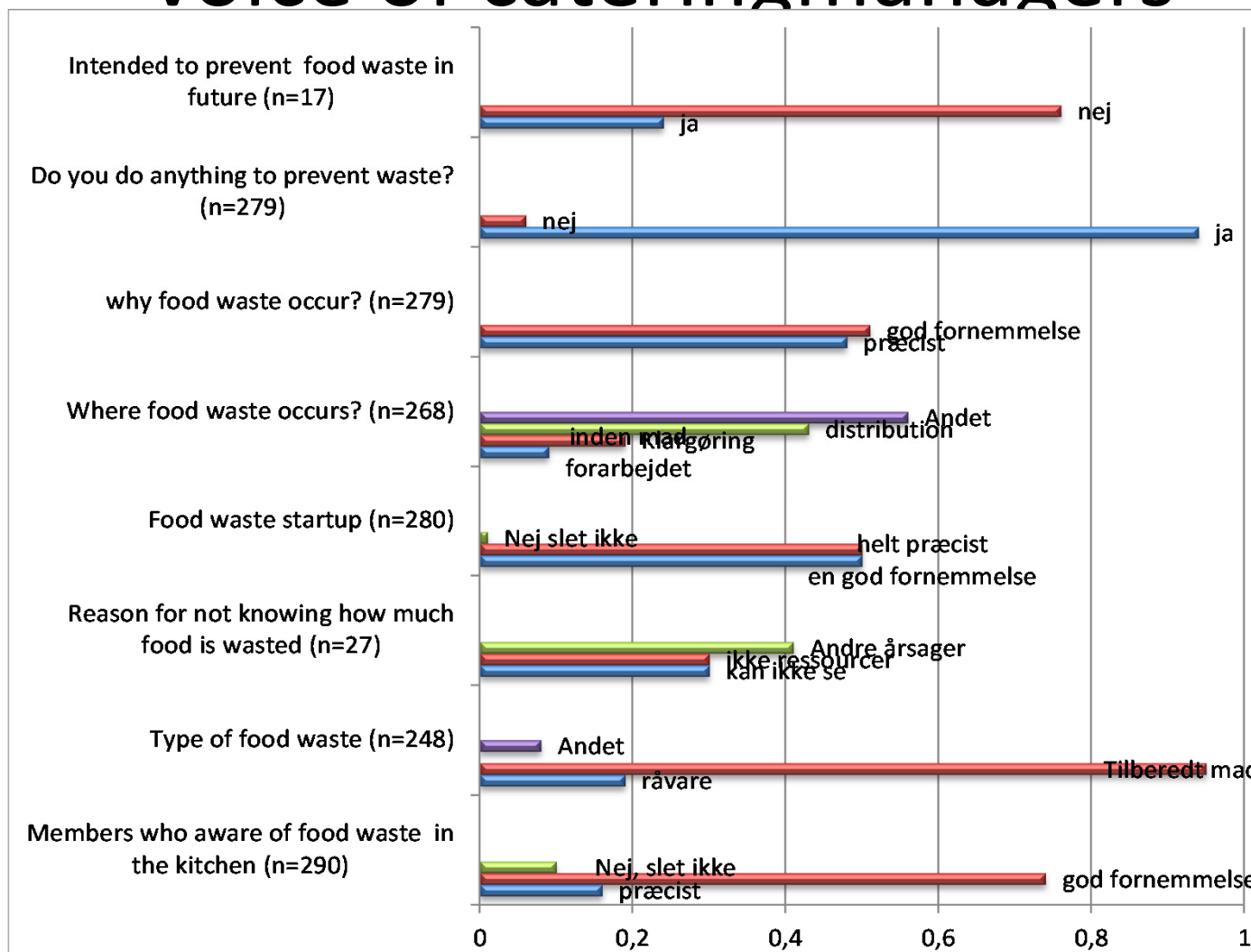


# Food waste & settings

	<b>Skøn over mængden af madaffald (ton)</b>
<b>Fødevareproducenter</b>	Ukendt
<b>Grossist og Engros</b>	Ukendt
<b>Detailhandel</b>	Min. 46.000
<b>Storkøkkener</b>	Min. 21.000
<b>Husholdninger</b>	Ca. 475.000

**5. Source : Kjær, B. Werge, W (2010). – Forundersøgelse af madspild i Danmark - Miljøstyrelsen Copenhagen Ressource Center .**

# Why food waste: voice of catering managers



Krydstabuleringer fra kostforbundets undersøgelse

# The potential

Estimate on preventable food waste t/y

Land	Total mængde madspild	Undgåeligt madspild
Denmark	140 000	94 000
Finland	140 000	94 000
Norway	140 000	94 000
Sweden	260 000	174 000
<b>Total</b>	<b>680 000</b>	<b>456 000</b>

3. Source: Report prepared for the Nordic Council of Ministers Prevention of food waste in restaurants, hotels, canteens and catering Project number: 2010.03.04. Date: 11. May 2012

# IntraGovernmental agencies call for action

The image is a collage of three overlapping web pages. The top page is from the European Commission, showing a breadcrumb trail: European Commission > DG Health and Consumers > Overview > Food and Feed Safety. The main navigation includes Food Law, Animal Nutrition, Labelling & Nutrition, Biotechnology, Novel Food, Chemical Safety, Biological Safety, Official controls, Food waste, and Food improvement agents. A 'Food waste' sub-header is visible. The middle page is from 'norden', featuring a search bar and a navigation menu with items like NEWS AND EVENTS, ABOUT NORDIC CO-OPERATION, THEME, and THE NO. The bottom page is from the UNEP News Centre, dated Tue, Jan 22, 2013, with the headline 'Think, Eat, Save: UNEP, FAO and Partners Launch Global Campaign to Reduce Food Waste'. The article text states: 'Consumers, Food Industry and Government All Have Role to Play in Reducing 1.3 Billion Tonnes of Food Wasted or Lost Each Year'. It includes social media sharing buttons for Email (4), Tweet (2), Facebook Share (7), and LinkedIn Share (0). A photograph of a person's hands sorting through fresh produce like cucumbers and tomatoes is visible at the bottom right.

FAO:

## **SAVE FOOD - Global Initiative on Food Loss and Waste Reduction**

- **Awareness raising** on the impact of, and solutions for food loss and waste.
- **Collaboration** and coordination of world-wide initiatives
- **Policy, strategy and programme development** for food loss and waste reduction.
- **Investment programmes and projects**, implemented by private and public sectors.

# AAU-MENU action 1

- Awareness raising:
- 110 participants
- Overwhelming media coverage

  
AALBORG UNIVERSITET

Personer  Websider

Søg



## Stort køkken – stort madspild?

Seminaret "Stort køkken – stort madspild?" satte den 21. august 2012 fokus på årsager og strategier til at reducere madspild i storkøkkener. Her var udveksling af gode eksempler, inspiration og diskussion af udfordringer og ikke mindst potentialer.

Konference om årsager og strategier til at reducere madspild i storkøkkener.

Tidspunkt og sted: tirsdag d. 21. august. Fredrik Bajers Vej 7A, lokale B3-104 9220 Aalborg.

Stor køkkener spiller en vigtig rolle for bevidsthed, dannelse og sundhed i det moderne

[FORSIDE MENU](#)

[OM MENU](#)

[FORSKNING](#)

[AKTUELLE PROJEKTER](#)

[AFSLUTTEDE PROJEKTER](#)

[PUBLIKATIONER](#)

[PRÆSENTATIONER](#)



# AAU-MENU action 2

## Prevention of food waste in large scale institutions and hospitals – insights from interviews with Danish foodservice professionals

- Exploratory study 3 executive catering managers in institutions and hospitals.
- A protocol for interviews with set themes was developed.
- 4 cases was selected and presented at the conference Stort køkken .....
- 2<sup>nd</sup> version of the interview protocol was developed on the basis of these presentations and the insights from first interviews.
- Final part of the conference was organised as a cafediscussion on predefined themes
- Outcome of disussions were summarized and used as input for the development of the version 2.0 of the protocol
- As the final step interviews using the ver 2.0 of the interview frame was carried out
- All interviews was carried out with
  - catering managers in the Catering Production Unit (CPU) of the institution
  - catering staff in CPU's
  - staff at the wards responsible of for the decentral serving of food.

# Barriers: Excerpt from interviews

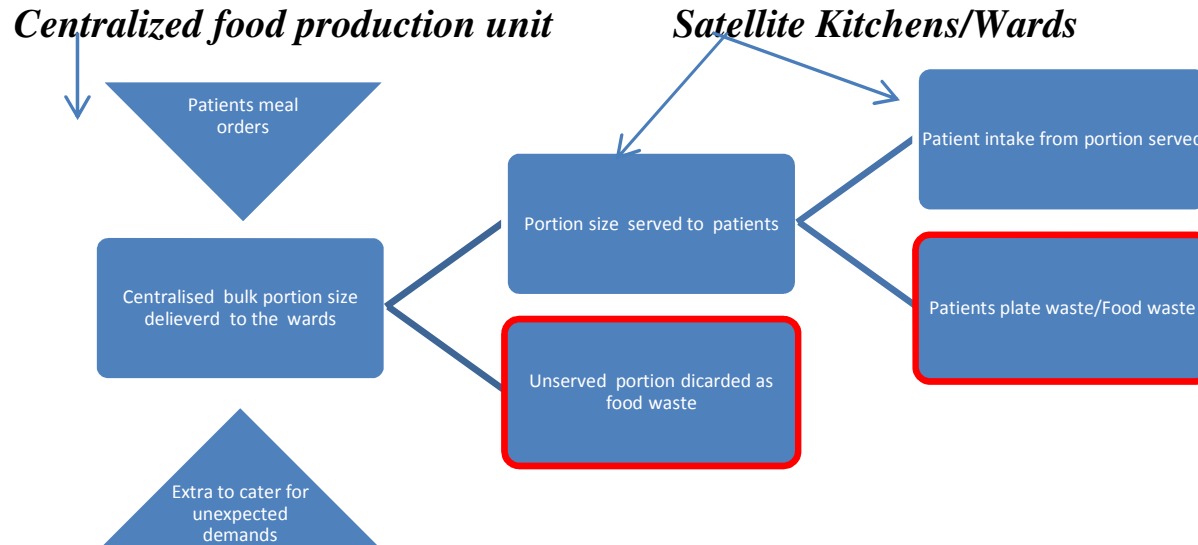
- Don't know exact no of patients
- Buffet serving creates extra waste since there should be food for all
- Reduction is impossible with transdisciplinary coop
- Food waste is inherent in system
- Food waste is a hidden ressource

Mirka Genzmar & Janni Nielsen: interviews foretaget på tre storkøkkener i Storkøbenhavn

# AAU-MENU action 3

## FoodServInspire: Reducing Food waste

- Analysis of the centralized meal system in relation to meal ordering, forecasting and portioning of meals for wards and food waste.



Kwabena Ofei

# Different approaches

- Technological
- Behavioural
- Organisational
- Monitoring
- Cultural
- Waste2value

# The awareness approach



<http://mindremadspild.dk/deltagere/andre>

[Hjem](#) >> [Charter](#) >> [De støtter charteret](#) >> [Organisationer tilsluttet charteret](#) >>

## Organisationer tilsluttet charteret

Andre

- Aalborg universitet, Måltidsvidenskab & Folkesundhedsernæring (MENU)
- Københavns Åbne Gymnasium
- The Sociallab
- Driftchef, Mogens Fosses, Bedøveren

# The nudging approach

**VÆRDI BEVISET**

# 1 - JANUAR 2012

**MISSION MULIG**  
Renosyd er på en mission. Den handler om værdi – og vi har brug for dig som agent!  
*Side 4*

**NU FÅR DU NYE BEHOLDERE**  
I løbet af foråret bliver din gamle skrædderspand skiftet ud med to værdibeholdere – én til emballage og én til restaffald. Se hvordan og hvorfor.  
*Side 6*

**DET SKER I SKELLET**  
Fra den 1. maj skal du stille dine nye værdibeholdere i skellet, den dag vi kommer for at samle dem. Se hvordan du kan gøre det nemt – og nydeligt.  
*Side 8*

**renosyd** <sup>25</sup>



# The Techno approach

AIRVENTION



# **The cultural approach**

## Nutrition first, then waste

### **Brugeren først og derefter klimaet:**

*”Patientens overlevelse... Og så kikker vi på det andet senere hen, ik’?!”.*

# The awareness raising approach

## Food Waste on hospitals

### DK:

- 25-30% (Almdal, Viggers, Beck, & Jensen, 2003).

### AUS:

- Up till 50% Williams, P., Walton, Plate waste in hospitals and strategies for change, e-SPEN, the European e-Journal of Clinical Nutrition and Metabolism 6 (2011) e235ee241

### England:

- England: 3.5% - 15%. (BBC News, 2008).
- England: 1,416 patienter: Tilbudt: 2,007 kcal: 23% ikke indtaget → 1,536 kcal.
- 1707 patienter. Ca 25% saf maden belv ikke spist
- 43% af de 1707 patienter spiste mindre en minimumsanbefalingen

# The monitoring approach



Courtesy of  
Kwabena Ofei.

# The organisational approach

HerLev Godt intervention that reorganised the hospital catering system resulted in a significant drop in food waste

Friel M, Nielsen M.A, Biltz C, Gut R, Mikkelsen, B E, Almdal T. Reorganization of a hospital catering system increases food intake in patients with inadequate intake. Scan J Food Nutr 2006; 50 (2): 83–8.



# The educational approach

- **Master of science in  
Integrated Food Studies**
- **[www.menu.aau.dk](http://www.menu.aau.dk)**



2012: Uptake 50 students  
2013: Uptake 50







## Integrated Food Studies...

...offers a holistic approach toward meals and food systems combining natural science, design and social science traditions.

- Food Policy, Innovation and Networks
- Public Health Nutrition
- Design and Gastronomy



# The FoodScape Lab hands on food waste studies



Foto: Armando Perez Cueto, Sept 7, 2012

# Food waste: where?

- Before: 6-10%
- Under: 15-45% in servingsituation

Ofei, K cited from

Williams, P.,Walton, K. Plate waste in hospitals and strategies for change. e-SPEN, the European e-Journal of Clinical Nutrition and Metabolism 6 (2011) e235ee241

Engstrom,R and Carlsson-Kanyama, A.Food losses in foodservice institutions examples from Sweden, Food Policy 29(2004) 203-213

# What food service can do?

- Menuplanning and utilisation of food
- W2V. Re use traditional by products.
- Procurement and inventory management
- Manage shelf life
- Organising inventory and storage facilities
- Use own semipreps
- Manage according to prefs
- Use NRS 2002
- On line monitoring
- Portioncontrol

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- salary of 50 nurses. The percentages of food wastage per hospital differ extremely, from 3.5% as the most efficient to almost 15%. The main reason the inefficient hospitals gave for having more food wastage, was that they offered more choice in the menu for patients (BBC News, 2008).





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# Visual IT assisted Methods in Cross-disciplinary Studies

September 11-12 and October 7, 2013  
Aalborg University, Copenhagen



**Organiser:** Thomas Bjørner, Associate Professor, Department of Architecture, Design and Media Technology. **Co-organisers:** Bent Egberg Mikkelsen, Professor & Research coordinator, AAU-MENU. Lise Busk Kofoed, Professor, Department of Architecture, Design and Media Technology

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AAU-MENU, CET, EIR, [Foodtura](#), [FoodServInSPIRe](#) præsenterer

**Fremtidens mad til mange  
ernæring, [regionalitet](#) & teknologi**

Kan innovation og samarbejde mellem forskning, erhvervsliv og sygehus  
hjælpe os til bedre mad på sygehus

**24. juni 2013**

*Tid: Kl. 9-15.30.*

*Sted: Sundfakultetet*