AALBORG UNIVERSITY
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ICD Sydney 2012

What a waste – FoodServInSPIRe project at Aalborg University Hospital


DANMARK
NORGE
Skagerrak
Skagen
Læsø
Ålborg
Anholt
SVERIGE
Kattegat
Århus
Jylland
Samsø
Sejerø
København
Esbjerg
Kongeå
Fanø
Rømø
Åbenrå
Odense
Fyn
Sjælland
Christiansø
Bornholm
Rønne
Møn
Ærø
Langeland
Falster
Lolland
Østersøen
Nordsøen
Eider
TYSKLAND
POLEN
50 km

929 beds

74500 admissions/year

560000 ambulatory visits

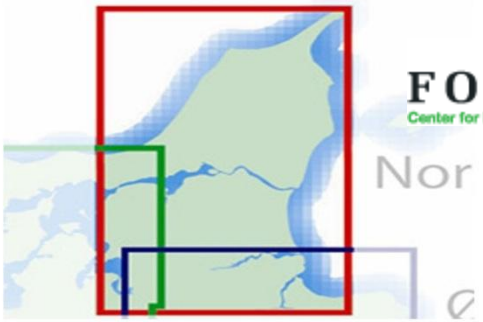
6500 employees

Aalborg University Hospital

Centre for Nutrition and Bowel Diseases - CET

MENU MEAL SCIENCE & Public Health Nutrition

AAU-MENU



FOOD DESIGN
Center for Food Science, Design and Experience

Food waste from a Danish hospital kitchen

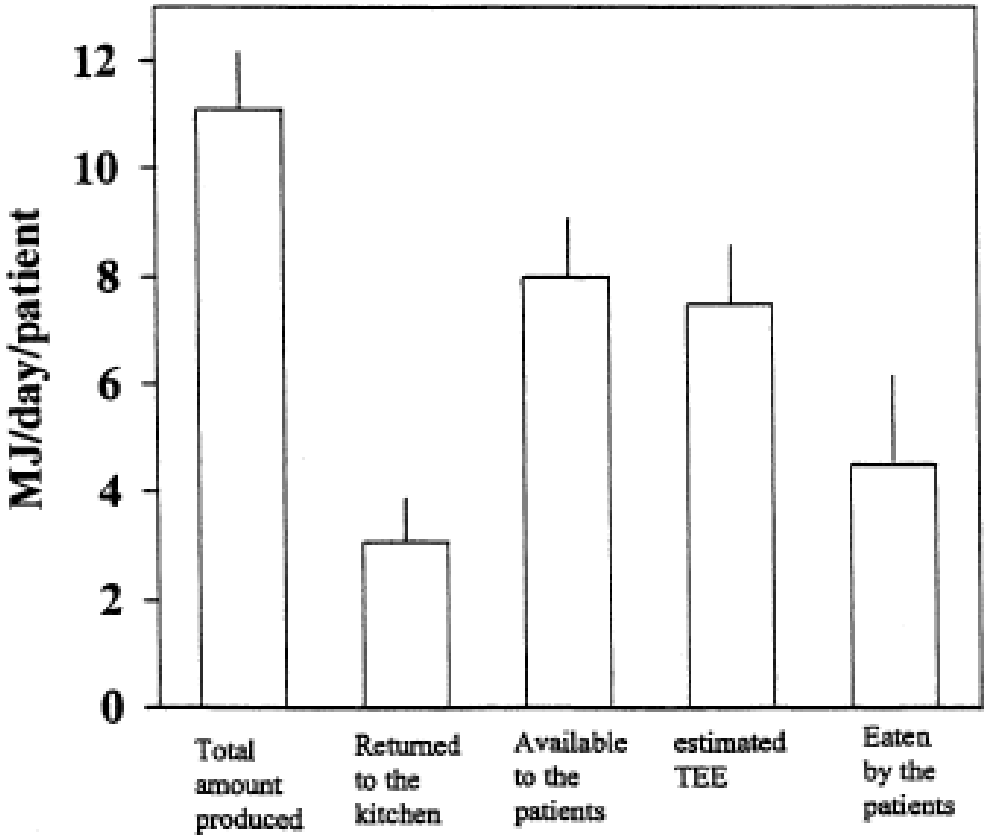
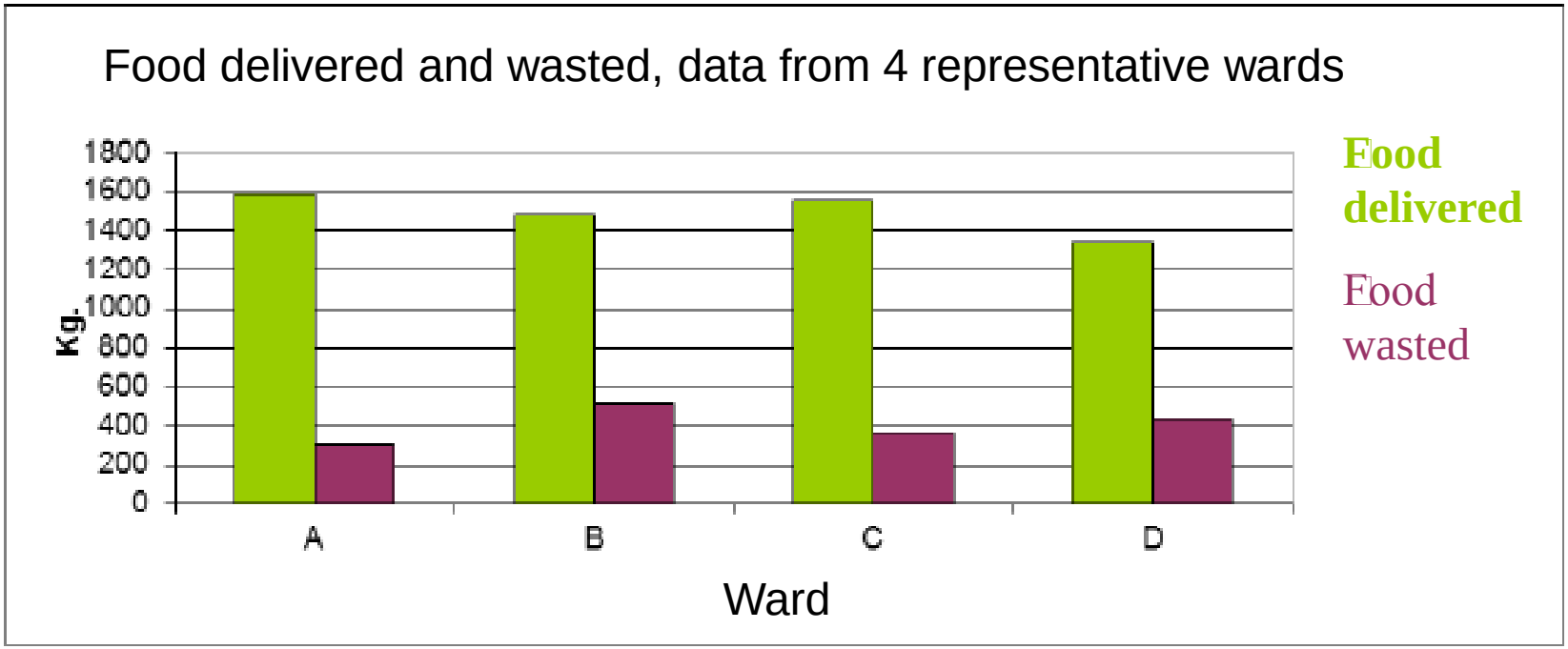


Fig. 1 Energy content, given as MJ/day/patient in the total amount of food produced, the amount of food returned to the kitchen uneaten, and the amount available to the patients on the ward (from study I); also the estimated TEE and the amount of energy actually eaten by the patients (from study II).

Almdal T et al. Clinical Nutrition, 2003

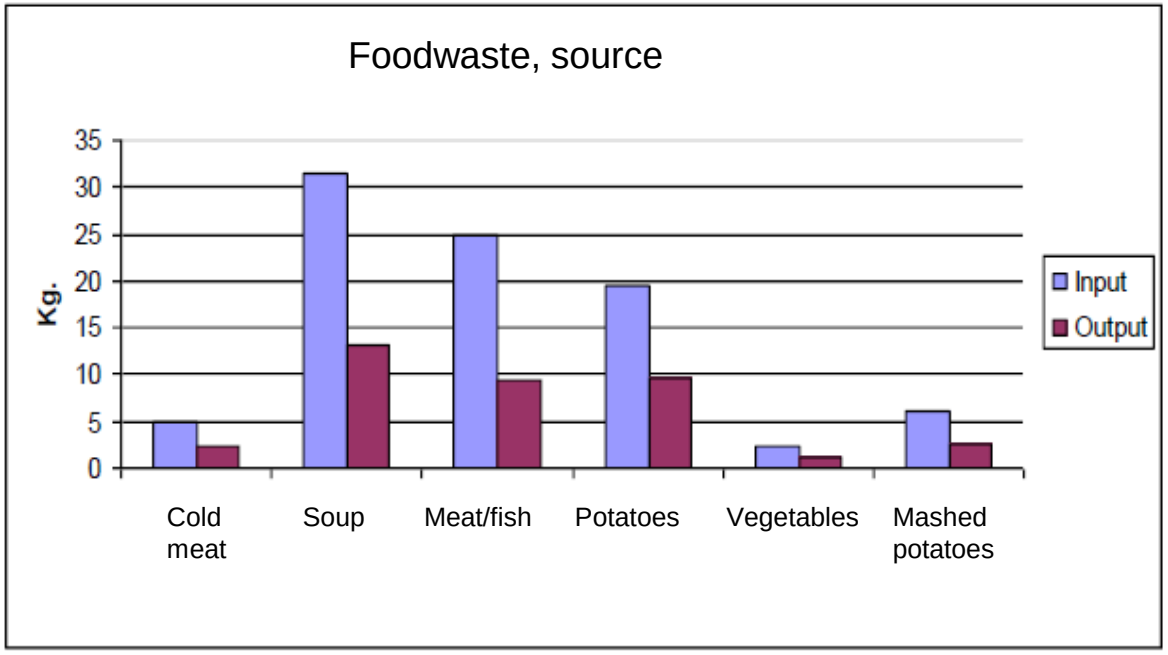
Trolley waste – experiences from a pilotproject in North Denmark Region



Total: 27,2 % waste

Kollerup SS & Larsen SB, 2012

Trolley waste – experiences from a pilotproject in North Denmark Region



Kollerup SS & Larsen SB, 2012

Experiences from Aalborg University Hospital

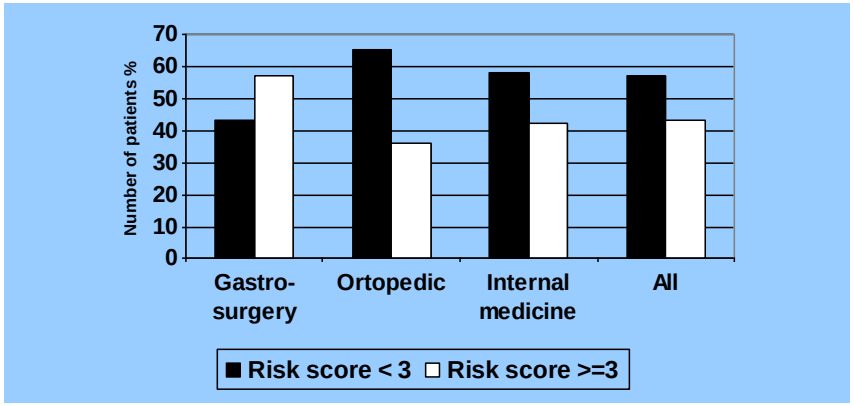
Waste from:

- Plates: patients not able to eat the whole portion or do not like the food
- Trolley: Service staff is ordering 20 % more than actual patients
- Production: estimated portion size and actual portion size do not match
- Dairy products at the wards: to many pieces taken out for patients, and then wasted because of hygenic rules
- Food in store is getting too old – both in central kitchen and at the wards

Observational studies from Pernille Nørbak,
Catering leader at the Central Kitchen

The other side of waste – patients in hospitals are at nutritional risk…

Incidence in Danish hospitals:



Rasmussen HH, 2004

Patients[1] nutritional intake at Aalborg University Hospital:

	2009	2010	p >
Energy > 75 %	52	68	0.007
Protein > 75 %	33	52	0.001

[1]Patients at nutritional risk (NRS-2002)

Unpublished data from the MORE project

FoodServInSPIRe project
conceptual framework

More **local food** - more attraction more experience

Increased **energy** and **protein** intake

Better **result** of & decreased **length** of hospital stay

Real time **monitoring** of food demand

Precise **forecasting** of food demand

ICT facilitated use of food & patient **data**

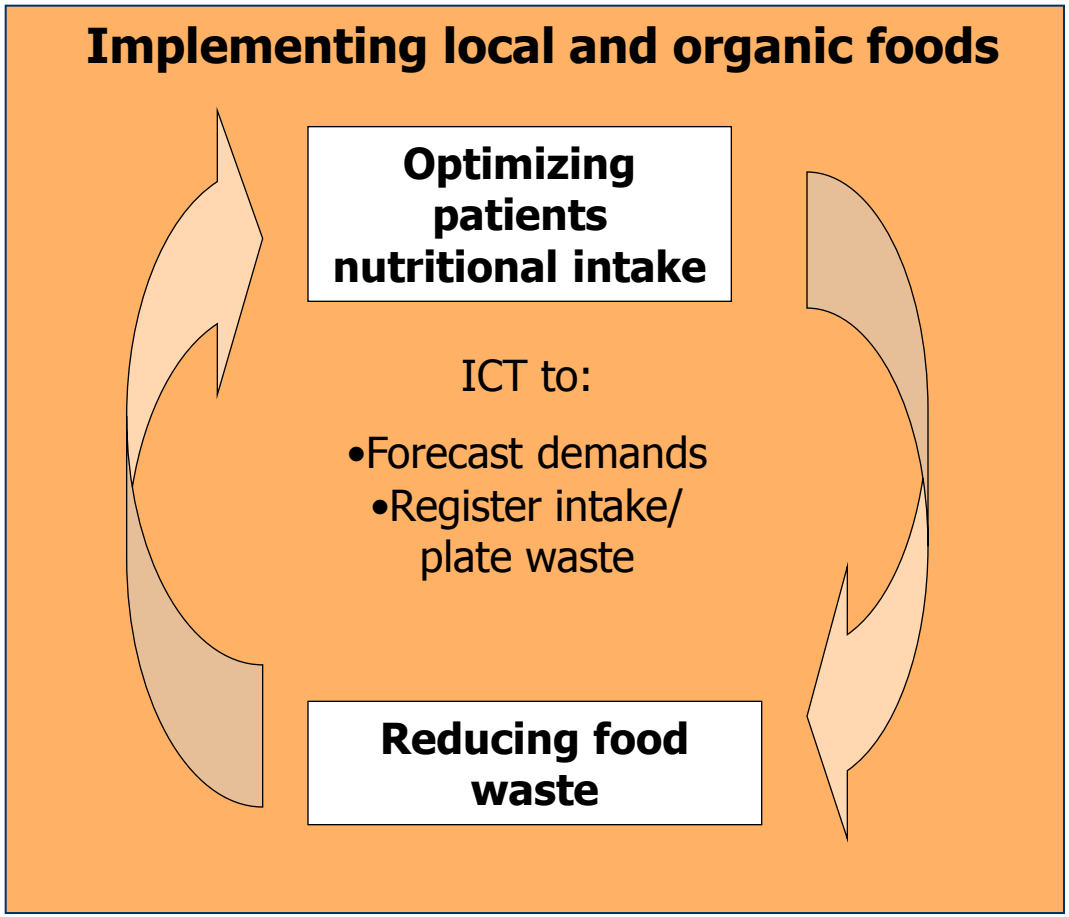
Decreased food **waste**

Clean **CPU Tech**

Sustainable hospital food service
(environment, cost wise & nutrition wise)

FoodServInSPIRe

Better food at hospital



3 ph.d. students:

Dorte Ruge

Dwi Budungisari

Kwabena Ofei

FoodServInSPIRe project
workplan 1/2

- Identification of sources of food waste in selected hospital foodservice environments
- Investigation on legal aspects of local food supply concepts
- Investigation on cooking routines in hospital catering production unit (HCPU)
- Development of local food supply concept in cooperation with FoodServInSPIRe
- Mapping of IKT routines in selected hospital foodservice environments
- Development project: Alternative use of by products
- Study: waste dependancy of ”convenienceness”

FoodServInSPIRe project
workplan 2/2

- Development of model for realtime monitoring of food demand based on

  Food status: Remote food outlets at ward

  Patient status: Preferences & nutritional status on admission
- Development of intervention
- Baseline study (pre – intervention)
- Follow-up study (pre – intervention)

The food service production chain

Hospital wards

Daily food ordering:

-number of pt.s
-staff experience
-unexpected needs

Central kitchen

Calculation of portions, recepies, staff experience

Food production

Bulk portions in trolley

Trolley returns to kitchen with bulk waste

Food served from trolley

Plate waste for garbage can

FoodServinSPIRe:
Integrated Modelling of Hospital Food Service Production Chains

We have data/knowledge about:

- Pt. nutritional status and nutritional needs (NRS-2002)
- Nutritional components of foods and meals
- Production system

We need more (precise) information about:

- Nutritional intake
- Individual preferences
- What kinds of food/meal generate most waste
- Waste and relation to nutritional status, preferences, production system, serving system, ordering system, staff knowledge, pt. knowledge…

Research Questions

Can patient's portion size preference be predicted and applied in the forecasting system to order bulk meal and minimize food waste?

Kwabena Ofei, Ph.D. Student

ICT application in patient's meal ordering

Patient's profile

Hospital menu cycle

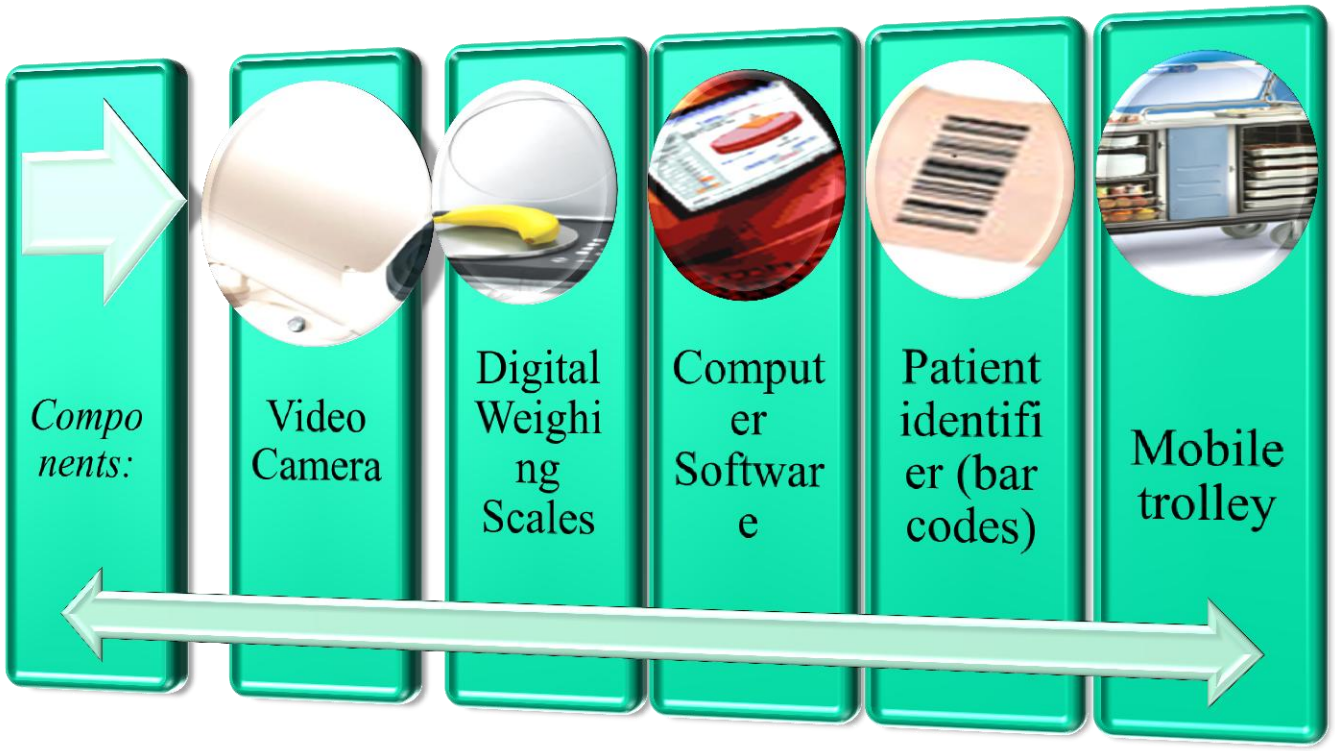
Patient's availability

Source of food products

Patient's portion size preference

Kwabena Ofei, ph.d. student

ICT in application of intelligent monitoring tool



Kwabena Ofei, ph.d. student

Criteria for selecting best model to forecast patients meal demand

Historical Data - to be generated from the monitoring tool	• Portion size • Food intake • Plate waste
Model accuracy- choose best model	• Quantitative(Time series meth) vrs Qualitative (Intuition)
Model simplicity of computation	• Should be easy to use by foodservice staff

Kwabena Ofei, ph.d. student

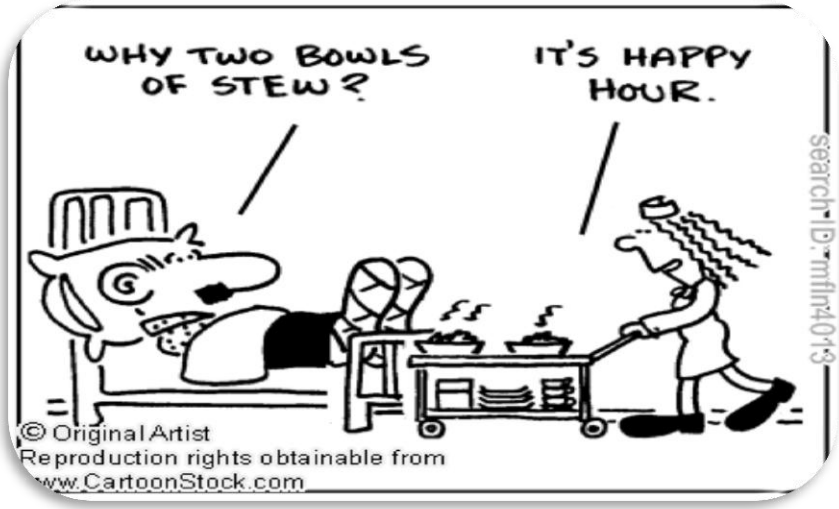
Expected Outcome:

Increase the accuracy of forecasting meal demands
Reduce food waste from bulk meal service
Improve food intake and dietary assessment
Minimize work load related data collection and forecasting

In conclusion

- Huge potential savings in waste reduction
- Need for environmental focused food science
- Focus on ”metaproduct” features
- Need for holistic benchmarking
- Intelligent ICT
- Role of story telling experience economy
- Strengthening evidence driven innovation in food service

FoodServInSPIRe
Better food at hospital



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Mette Holst
Pernille Nørbak
Dorte Ruge
Our partners
DSF
RTI
AAU

Read more on

www.menu.aau.dk/