Abstract:

on mobile between digital Memory the insights from Penetration • 22 • 89 • 88 • 82 • 52 • 82% • 92% • 10th • 74% • 92% • 2017 • 82% • 74% of Danish consumers own a mobile phone/smart phone • 88% of Danes carry out digital self-service • 88% of Danes do e-Shopping • 22% of internet users between 16 and 74 are skeptical about IT security • Penetration of wearables and according to Statista - the sale of smart watches has risen by 141 percent in recent years • 52% of information workers across 17 countries report using + 3 three devices for work.

Digitalisation & nutrition facts & figures DK/Nordics

• Between 82% and 92% of the population use mobile ICT devices daily.
• 89% of Danish consumers own a mobile phone/smart phone
• 88% of Danes carry out digital self-service
• 88% of Danes do e-Shopping
• 22% of internet users between 16 and 74 are skeptical about IT security
• Penetration of wearables and according to Statista - the sale of smart watches has risen by 141 percent in recent years
• 52% of information workers across 17 countries report using + 3 three devices for work.

Digitalisation & nutrition

• Devices such as smartphones touch pads, etc. are increasingly used by consumers for self-tracking of lifestyle and the number of research studies applying such devices is growing (see for example: Jia et al 2011; Moulos et al 2015).
• New wearable devices that can objectively assess behaviours (Jia et al 2012, Jia et al 2013, Sun et al 2014) have been developed
• Signals such as biosignals, GPS, mobile positioning, Wi-Fi and Bluetooth are examples of signals and protocols that offer new potentials.

Two potentials in digitalisation

• Monitoring
• Assisting

The digital nutrition lab

FoodScape Lab & Aalborg University Nutrition center

Digital health and nutrition support services for the elderly.

Mikkelsen, BE, Professor of Nutrition & Public Food systems, Aalborg University
Nutritional monitoring – how
According to the NRS*2002
• Screen all at admission
• Make actions and follow up plans for the 30-40% at risk
• Monitor daily
• Keep records
• Allow for retrospective evaluation

*Nutritional Risk Screening tool

New imaging technologies for food identification

Other systems
• ASA24 – Automated Self Administered 24hdr
• TADA: Technical Assisted Dietary Assessment
• Diet Data Recorder System (DDRS)
• Smart Plate
• Smart Fork
• TelSpec

http://www.tadaproject.org/
From DIMS 1.0 to 1.5


Can the DIMS approach be learnt?
Training course at Fudan, Shanghai, 2016

Is the DIMS robust in practice?
The Herlev stress test

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Is the DIMS saving time?
The Aalborg feasibility study

- Reduces the time spent on NM from 15 to 4 minutes
- Patients at nutritional risk produced increased amounts of plate waste, with less energy & protein intake when compared to patients not at nutritional risk.
- It can be used in co-creation mode improving accuracy
Is the DIMS accurate?
Validation Study 1: Herlev Hospital

**Intervention:**
- Front End Nutrition & Meal support
- Meal hosting

**Results:**
- No significance pre- og post test
- DIMS functions well with a trained operator
- Meal hosting requires training

Acknowledgements:
DIMS Caring manager: Michael Albing, Nielsen

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Is the DIMS accurate?
Validation 2: Odense University Hospital

**Hypothesis**
- High correlation between DIMS data and standard weighed method

**Results:**
- Correlation: DIMS total energy/standard total energy (r=0.990 and p value = 0.01)
- Correlation: DIMS total protein/standard total protein (r=0.974 and p-value=0.01)

Acknowledgements: Dr. Rudolf Scheller, Geriatric dept 2, Odense University

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Conclusion:

**eNutrition devices development lessons learnt**
- “Everything is simple - once you know it”
- Hospital wards are busy
- Convenience & plug’n play is key
- Retrospective datasight rated high
- Seamless interfacing is a must
- Must run in the cloud

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Conclusion: next steps

- Work to be done: algorithms, machine learning and imaging
- Cross disciplinarity needed
- Device flexibility: big screen, table, phones
- Open standards/API’s is key
- Privacy issues needs to be dealt with
- eEnvironment and data security at hospital is a challenge
- Take2market is a challenge of its own

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Eating, Ageing, Digitalisation. Place
A smart home to elderly

- Dutch company Sensara & financed by 5 health insurers investing in preventive health
- Goal: to reduce the cost of moving citizens to elderly homes. Ageing in place is the mantra. Elderly installed 8 sensors in their home
- Wrist band & sensors
- Individual going out of bed, to the toilet

- An app pings if algorithm sees something strange.
- Big data does predictions:
  - increased toilet visits can flag up a urinary-tract infection,
  - changes in gait can predict an impending fall, the leading cause of death or injury among older adults.
- Only things missing: food consumption recording
Eating, Ageing, Digitalisation
The eating robot
• The case of Bestic

Thanks for your attention
感谢您的关注
read more about the Aalborg approach

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stay updated on www.capfoods.aau.dk

Conference
Eating & nutrition in ageing societies
The Nordic approach
Shanghai, Fudan University, November, 2017
Organised by
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