



DIVISION BIOECONOMY

Leading the transition to a circular
bioeconomy

Research Institutes of Sweden
RISE BIOECONOMY



Three have become one - RISE

The RISE institutes Innventia, SP and Swedish ICT have merged in order to become a stronger research and innovation partner for businesses and society.



Value chains



Human-Product Interaction Laboratories (HPI lab)



To investigate how people see, feel, think and interact with packaging/ products,

Consists of a **perception laboratory**, which meets the viewing standard for the graphic industry, and a **usability laboratory**



- Perception
- Product semantics
- Eye tracking
- Usability tests
- Surveys



Active ageing - meal solutions for health and quality of life for elderly.

Active ageing as defined by WHO:
the process of optimizing opportunities for health, participation and security in order to enhance quality of life as people age.

It allows people to realize their potential for wellbeing throughout their lives and to participate in society according to their needs, desires and capabilities, while providing them with adequate protection, security and care when they need assistance



Projektet är finansierat av VINNOVA och ett samarbete mellan:



NINE

BILLERUDKORSNÄS

Electrolux

medirest

ICA



KSK

INNVENTIA

PRO

TR
THERMO KING

Findus

KRINNOVA
INCUBATOR & SCIENCE PARK

SP

Food design: Small enriched meals



- **Snittvärde**
- **565 kcal**
- **23 g protein**
- **0,3 g lakos/100 g**



- **Snittvärde**
- **325 kcal**
- **17 g protein**
- **5 µg D-vitamin**

Package design: The role of inspiring and informative packaging




BILLERUDKORSNÄS



Vi utmanar konventionella förpackningar för en hållbar framtid

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Method

- An iterative approach to packaging concept design was used, where sensory and usability factors were targeted.
- Survey on packaging requirements for ready meals were conducted (n=90, 65-78 yrs).
- Ethnographic studies and deep interviews in the home environment among (n=4, 70-88 yrs).
- Usability studies focusing on microwaving and ease of opening of ready meal packaging (n=8, 71-86 yrs).
- Evaluation of design concepts with 2 focus groups (n=14 , 65-79 yrs)



Malnutrition is common among elderly due to low appetite

Malnutrition is common among elderly due to low appetite. Appetite is highly connected to age, health and social activities

47%

does not finish the whole meal

"It is difficult to vary the food, because you are accustomed to cook certain recipes"

- Astrid, 70

"Food is a necessity rather than an experience"

- Greta, 88



The material shall make the content visible and appetizing.

"Soup in jars (like creme fraiche jars) feels unstable. I prefer them in Tetra Pak "

– Astrid, 70

"The paper gets wet and trashy but feels more genuine than the plastic which is processed further"

- Astrid, 69

"I usually have a hard time getting up the plastic so then I use my Fiskars scissor, it's a great scissor" - Rut, 88



87%
says eco friendly
packaging is
important/very
important

Easy open, easy reclose



" "The new milk tetra that is glued is the worst packaging ever, they get such a strange shape when they are opened and it is easy that the milk splash out"
– Astrid, 69

"There is a small tab to pull and it's really hard. Even the home care personnel say it is hard; they can help to open the package "
- Arne, 88

91 %
says easy opening packaging is important/very important

Strategies for effective waste handling

"With 2 litre pack of Bravo juice, I pack down a 1.5-liter milk pack inside of it, and inside of that, I squeeze a 1 litre tetra pack. On the side, I may then even have room for a some trash as well “

– Astrid, 69

"I've learned to get everything out from the package, squeezing everything out and fold up from the bottom, it's important to make the package as small as possible“

– Rut, 88

I try to pile together trays which are hard into the corner of the trash bin and in these I put the other boxes so that they are all packed in together”

- Eva, 70

67 %

says it is important/very important that packaging don't take up too much space in the garbage bin.



Conclusions

- A meal is a social activity that preferably is shared with others
- In order to stimulate appetite, the packaging and the meal inside must attract all senses through sight, scent, taste, texture and appearance
- Packages divided into different compartments are preferred.
- A large opening tab (2x2 cm) as the elderly often have problems with fine motor skills
- An opening tab with different grip options.
- Clearly marked grip surfaces that "stand out" from the package.



Thermal analysis showed that the ready meal packaging when heated could reach 96 degrees on certain areas. Grip surfaces and flaps were significantly lower in temperature. Elderly have slower reaction which increases the risk of burns.



<http://biosmart-project.eu>



BIOSMART concept

- Active and smart bio-based and compostable packages, addressing the needs of fresh and pre-treated food applications
 - light weighting,
 - reduced residues,
 - shelf life monitoring
 - longer shelf life,
 - easier waste handling
- Approach for selectively integrating
 - super-hydrophobic surfaces
 - microencapsulated phase change materials
 - barrier coatings, sensing devices
 - new bio-active antimicrobial and antioxidants, into all-bio-based multilayer flexible plastic packages.

Activities

- Three generic packaging systems are selected with specific performance needs as defined by current multi-material (e.g. pouches, terrines and cardboard/thin film tray).
- The associated life cycle assessments for the different possible scenarios include the economic feasibility.
- A consumer survey 2018 in four European countries addressing “credence variables” (safety, health, greenness etc) for smart and active packaging.
- Sensory analysis of packed food and evaluation of packaging systems with consumers
- Ultimately, this consolidated knowledge is captured in a material selection and packaging performance simulation App. through optimization of all possible variables to meet selected key performance indicators (KPI).



THANK YOU!

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