How to expand the expiry date to reduce food waste

Ulla Lindberg

SP Technical Research Institute of Sweden

Swedish Institute for Innovative Retailing (SIIR), University of Borås, Sweden

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HOW TO EXPAND THE EXPIRY DATES TO REDUCE FOOD WASTE?

COULD A LOWER TEMPERATURE IN THE FOOD CHAIN AFFECT THE WASTE?

Outline
1 Background
2. Methodology
- Literature survey
- Analytic model
- Interview (producers and retailers)
3 Discussion, conclusion and future work
The main objective is to better understand how food waste in the retail system and in households could be affected by a lower temperature in the cold chain.
Refrigeration is needed

- Many perishables products are distributed cold
- A reliable robust cold chain will maintain the quality and safety of storage, handling and transport
Energy use in the cold chain depends on

- The particular methods of cooling i.e. refrigeration
- Temperature requirements for the different steps

Each step, along the cold chain, has environmental impact and will provide input for better understanding for further improvements for the efficiency along the cold chain.
Supermarkets

- significant energy users, 3% of total electricity use in Sweden.
- Storage of refrigerated food, 40-50% of total electricity use
- Interactions between display cabinet / ambient
- Coldest area were open vertical display cabinets
- Infiltration can be reduced by doors
Whole Chain 100 %

- Raw product
- Storage / Production
- Supermarket
- Household, Recycle (Waste)

upstream  
downstream
The directive on waste, all EU member states

The Swedish national waste plan, aiming to reduce food waste by at least 20% by 2020

Includes the entire chain other than primary production

Reducing food waste - benefits for both the environment and economic
Current legislation in Sweden requires food producers to label their products with **Best-before dates** or **Expiry dates**, and with appropriate **storage temperatures**.

“Best before” date related to quality
“Use by” date related to safety

confusion over date labels is widely recognised for its contribution to household food waste
METHODOLOGY

Analytic model
predictive model – RTD salad

Interview studies:
- Food producers
- Representatives of supermarkets

Questions based on refrigerated products:
Green salad - RTE, shelf life about 6-9 days
Packed cooked meat – sliced ham, shelf life about 30 days
Mincemeat – producer-packed, shelf life about 4-5 days
Milk – not UHT, shelf life about 7 days
For the RTE salad - storage temperature not exceed 4-5 °C

Predictive model illustrates impact of transportation in temperatures
Supermarket
• Eight stores
• Indications

Producers
• Seven major swedish food companies
Questions about

- storage of the chilled food
- how much waste they have
- how they think a lower temperature could affect waste

The questions related to the four refrigerated products

‘food waste’ being defined as food that has been discarded instead of being sold or eaten”
Questions

- Would a lowered temperature in the cold chain reduce the store's food waste?

- Would extended expiry dates on the products (due to lower storage temperatures) reduce the store's food waste?
Questions

- Are there any hot spots in the cold chain, and do you trust the temperature along the cold chain?

- How could a lower temperature along the chain be used; what would be the consequences of a lower temperature.
Predictive model

**Constant temperature**
- 4 °C shelf life 12-13 days
- 6 °C shelf life shorten to 8-9 days
- 8 °C shelf life shorten to 6-7 days

**Transportation time**
- 8 h at 19.6 °C shorten shelf life by one day, 11- 12 days
- 1 h 15 min at 11.9 °C no detectable effect on shelf life
Analytic model

The overall storage temperature has a significant greater effect on durability than has consumer transportation to the home.
Technical Aspects

Time and temperature big impact
– defrost, transportation

Different technique and technical installations
– maintainance, choice

Cost-benefit
- for investment costs need to be considered
- energy-efficient measures save money, different aspects
  short/ longterm
For the part of the cold chain for which retailers are responsible, it has been shown that fitting doors to cabinets permits a more even temperature.
Non-Technical aspects in Supermarket

- Lower temperature alone, make no difference of waste
- Important reason for waste, poor planning of ordering the food
- Longer shelf life in combination with extended expiry dates, resulting from lowered temperature, would reduce food waste in the stores.
Producers

- Do not calculate for safety margins in their cold chain
- Monitor the chain by installing temperature loggers
- All have similar procedures for predicting dual date labelling
- Storage study is performed (under controlled conditions in laboratory) at the labelled temperature
- Disadvantages of longer shelf life – loss of consumer confidence
If the temperature in the cold chain ought to be lower:

- further investigation is needed in order to find where and how this can best be done
- investment costs, in order to fulfill lower temperatures, need to be considered
- Increase awareness of and learn more about temperature variations
- Quality vs time

For the part of the cold chain for which retailers are responsible, it has been shown that fitting doors to cabinets permits a more even and lower storage temperature than without doors.
DISCUSSION, CONCLUSION, FUTURE WORK

Several factors with impact
Behaviour
Package
Process development
Quality for the product – sensory and arom
Microbiological aspects
LCC / LCA
Planning
Economy, business models
Logistic
Water efficiency
Customers, consumers
Small and Large industry among other aspects…
Further investigation is needed in order to find where and how this can best be done.
In Sweden are different ongoing discussions about lowering the temperature in the food chain.

**Initiated**
Swedish Environmental Protection Agency
Swedish National Food Agency
BeLivs Innovation Cluster – purchaser group of main retailers in Sweden
Among many others
THANKS FOR YOUR ATTENTION, QUESTIONS?

Contact: Ulla Lindberg
E-post: ulla.lindberg@sp.se
Web: www.sp.se