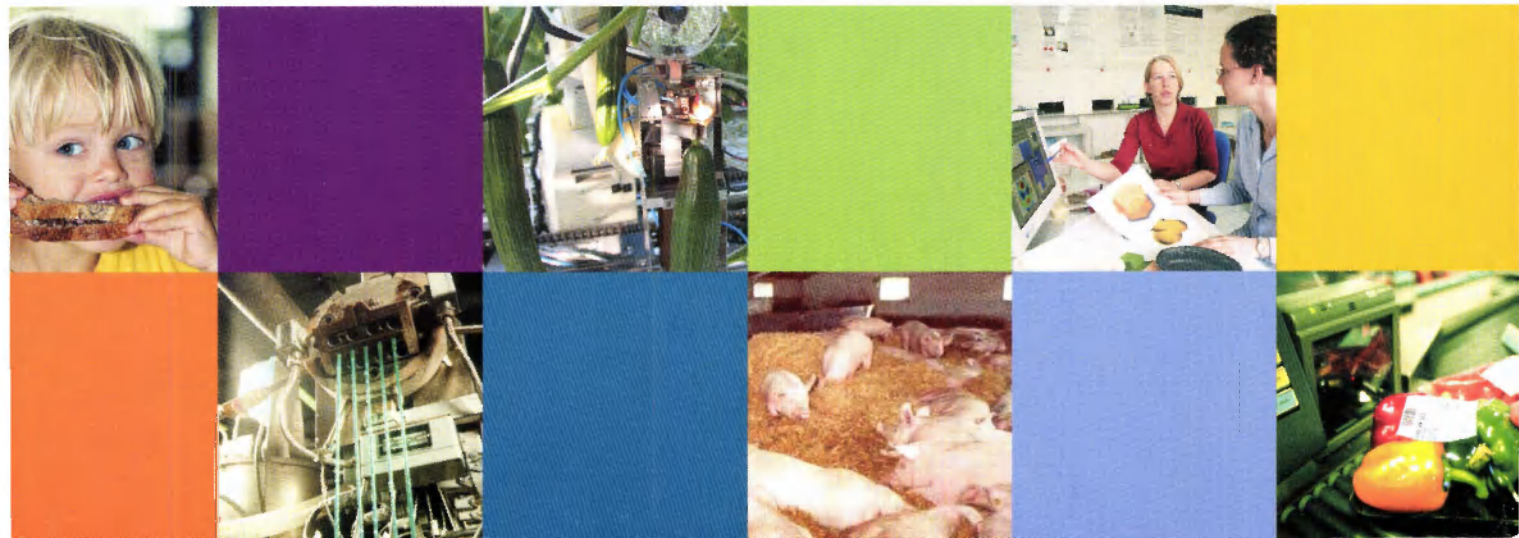# Retail Logistics

- Management of Perishables -

Introduction & Overview

Dr Henri Luitjes[*]
Ir Frans-Peter Scheer
Drs Ing Joost Snels

Nr. 403

[*]To whom correspondence should be addressed

Retail Logistics

- Management of Perishables -

Introduction & Overview

Dr Henri Luitjes[*]
Ir Frans-Peter Scheer
Drs Ing Joost Snels

Nr. 403

[*]To whom correspondence should be addressed

Colophon

Title	Retail Logistics – Management of Perishables
Authors	Henri Luitjes, Frans-Peter Scheer, Joost Snels
A&F number	403
ISBN-number	-
Publication date	September 2005
Confidential	yes
OPD-code	-
Approved by	Dr. Henri Luitjes

Het kwaliteitsmanagementsysteem van Agrotechnology & Food Innovations B.V. is gecertificeerd door SGS International Certification Services EESV op basis van ISO 9001:2000.

Contents

Retail Logistics – Management of Perishables

Retail Logistics – Management of Perishables -

Introduction & Overview

Foreword

The retail sector is one full of action, characterised by fast changes and increases in leaps of technological innovation. This is a dynamic sector in which the downturn in the economy and price wars have exerted extra pressure on retailers. Companies have to respond with extreme measures under such circumstances. The demanding and fickle consumer requires a flexibility in organisation, while the economic recession and strong competition place high requirements on the efficiency of the retail enterprise.

The findings which I have described here are the result of various projects carried out in the food retail chain. These experiences have led to a better insight into the area of retail logistics, especially in the area of perishables.

Here, an introduction is followed by an overview of an approach to improve the appearance of fresh products in the store. A few tools involved in this approach are also described.

Yours sincerely,

Henri Luitjes

From Grocer to Supermarket

From Dried groceries to Fresh products

From Fresh-out–cold-Mother-Earth to Product differentiation

Result: Shrinkage rears its head

From Logistics to Fresh Logistics

AGROTECHNOLOGY & FOOD INNOVATIONS
WAGENINGEN UR

The grocer occupied an important position in the 1940's. He was specialised in the sale of dried groceries. The upcome of the supermarket brought along an increase in the range of such assortments, together with the upcome of the fresh product segment, followed by the non-food segment. Today, fifty percent of the turnover of supermarkets is determined by the fresh product segment, which is growing at the expense of dried groceries. Fresh is no longer a product from the cold earth, but more and more an imported product processed into ready-to-eat foodstuff.

The concept of shrinkage has only appeared in recent years due to product differentiation. As a result, many products from the fresh segment have been degraded to the waste bins even before they can reach their final destination. The fundamentals of the logistics profession are based on dried groceries while the logistics of fresh products specifically demand another approach, known as 'fresh logistics'.

Fresh logistics from a retail perspective

consumer

Demand

Supply

Supply Chain

OUT OF STOCK

AGROTECHNOLOGY & FOOD INNOVATIONS
WAGENINGEN UR

The aim of fresh logistics is to increase the freshness of the product in the shelf and to reduce shrinkage by bringing demand and supply closer to each other, and at the same time maintain an agreeable service level . The retailer's shelf is of central importance as it is here that the demanding consumer meets the supplying chain.

There are four general objectives in fresh logistics:

1. To increase the freshness of the products on the display shelf;
   fresh becomes super fresh
1. To increase the returns of the display shelf
2. To decrease shrinkage and yet maintain an agreeable service level
3. To decrease out-of-stock situations

These objectives are to be achieved by a proven approach, described here in this brochure.

To improve the position of fresh products, many variables have to be managed. From the perspective of the shelf, these variables can generally be put into three categories:

1) First, one must have insight into the customer's behaviour, sales variations and price reductions. Specifically for fresh products, the selection behaviour of the consumer in relation to different expiry-codes is important.

2) Afterwards, the person who orders has to compromise between fully-stocked shelves (low out-of-stock) and minimum product loss (low shrinkage). The category manager will optimise the assortment in his category.

3) Last but not least, the supply chain has to deliver the right products at the right time. Particularly important for fresh products is a good shelf life with minimum throughput time.

Within these three categories, various variables can be distinguished, some of which are mentioned in the above diagram.

The scope in the Dutch food retail sector

- Turnover: € 25 billion a year
- Turnover in fresh products (50 %): € 12.5 billion a year
- Product shrinkage: (5 %): € 0.6 billion a year
- We estimate that the value of food not consumed by consumers is even more.

In the USA, food retail shrinkage is between
$ 30 and $ 40 billion a year.

Turning food into trash.
Water, we save. Energy, we conserve. But food, it seems, we can waste, junk and bin and no-one cares.

AGROTECHNOLOGY &
FOOD INNOVATIONS
WAGENINGEN UR

The total turnover of the Dutch food retail sector in 2004 was 25 billion euros, half of which was fresh products. Based on our various research efforts, we estimate the average shrinkage for fresh at about 5%. This means that over 600 million euros worth of products do not pass by the cash register per jaar, because they are discarded or suffer price reductions. The total shrinkage in the chain, up to and including the consumer, is estimated at 1 billion euros. In the USA, this estimate is 120 billion dollars, of which the food retail sector specifically accounts for 30-40 billion dollars.

While the government initiates many measures to motivate society to save energy and water on the one hand, food is being thrown away thoughtlessly on the other, and no-one seems to make much fuss about this. Changes are however on the way. As the economic situation declines and oil prices rise, cost saving has become critically important. Discarding food is considered more and more a problem. Besides causing a big loss to the economy, it is also socially unacceptable. Energy and water involved in production, packaging and distribution are also destroyed in the process.

Approach: Fresh picks up speed

Objectives
1. Fresh becomes super fresh
2. Balance between shrinkage and out-of-stock
3. Best practice: Bench marking among shops

Fresh cockpit
1. From data to information
2. Record and analyse (fresh monitor)
3. Simulation of potential improvements
4. Fresh quality in practice and its potential

Embedded solution
1. Visor for fresh
2. Integrated permanent approach
3. Current information made-to-order
4. From information to knowledge

AGROTECHNOLOGY &
FOOD INNOVATIONS
WAGENINGEN UR

Fresh scores for a retailer. It can set you apart from others. The approach is characterised by focussing on the shelf with fresh products. Such products can be fresher. This is achieved with more insight into a) the how and why of the current situation (fresh monitor), b) formulating, testing and implementing improvement possibilities, and c) the product itself, including the how and why of the composition and packaging.

This approach can be likened to the situation in a cockpit where much information about the current course is available but where many new situations also present themselves to be tried out in the simulator. The simulator is a safe one, where failures can occur, but not accidents.

The essence of this approach is a sustainable and embedded solution, i.e. to speed up improvements in handling of fresh products is to support a stated objective with the use of tools and processes. These tools and processes are upbeat, like the newest visors worn by pilots.

Concepts such as shrinkage and out-of-stock can be compared to weeds. Since you cannot get rid of them at one go, you need a good procedural solution.

Speeding up: Basic steps

Define goals
freshness, shrinkage, OOS, turnover

Take responsibility

Collect data (registration)

Analyse data like Shrinkage
from data to information

Embedded Solution
freshness, shrinkage, OOS and turnover

AGROTECHNOLOGY &
FOOD INNOVATIONS
WAGENINGEN UR

The approach has five basic steps, beginning with the setting up of goals and definations. Previous projects have proven that this ordering leads to the best results. It may be tempting to take off directly with step 4 or 5 but in practice, this often leads to insufficient responsibility allocation or to a bad insight because of the lack of registration. In the latter case, a solution would be chosen to manually monitor a few shops temporarily; this a) gives very little generic information, and b) is very time-consuming.

Step 1: Define Goals

Setting up of goals & definitions

- **Freshness of the Shelf**
- **Turnover**

- **Shrinkage**
- **Out-of-stock**

Example: Shrinkage

# Purchase	# Sales	# Price reduction and discard
4	1	3

Shrinkage (purchase value) = 3 / 4 * 100% = 75 %

Shrinkage (turnover) = 3 / 1 * 100 % = 300 %

AGROTECHNOLOGY &
FOOD INNOVATIONS
WAGENINGEN UR

In step 1, the goals are defined. For example, the % shrinkage for an article group is stated. Goals can also be set up regarding the freshness of the shelf expressed as the average expiry date of the products on the shelf.

At the same time, concepts belonging to step 1, such as shrinkage and out-of-stock are defined.

Shrinkage can be defined in different ways. We refer to shrinkage as value reduction due to quality deterioration.

Shrinkage is also calculated in different ways. The most feasible methods are in relation to purchase value or in relation to turnover. In the latter, the shrinkage percentage can be higher than 100%.

Step 2: Take responsability

1.	Category management	assortment, pricing policy, shelf layout
2.	Replenishment	unit of order, order time, lead time
3.	Store management	quantity ordered, assortment, price reduction
4.	Supplier	shelf life, lead time, unit of order

Who is/are responsible?

**Describe this responsibility in terms of
turnover, profit, freshness, shrinkage and OOS.**

AGROTECHNOLOGY &
FOOD INNOVATIONS
WAGENINGEN UR

When a store looks good as regards its fresh products, this achievement is the combined result of many. Standalone optimisations can sometimes work adversely. For example, the effects of a longer shelf-life can be negated by someone else's order behaviour in which bigger orders are being placed. Therefore, cooperation among, eg. category management, replenishment, store management and the supplier would be mutually reinforcing. Who is the anchor man in the retail organisation? Who takes (or gets) the overall responsibility?

One cannot rule out the existence of opposing interests. It is also possible that the responsibility within the organisation is greatly divided, making it difficult to pinpoint and manage the sources of shrinkage. For whoever is responsible, this is an important area to pay attention to.

Step 3: Collect data (registration)

2 | POS

Schap

Store

Warehouse

1

Replenishment

Data collection begins at the Store!

Data path 1 and 2 from registration

3
Shrinkage & OOS

Data path 3 from registration
or from using the
WUR data discovery tool

AGROTECHNOLOGY &
FOOD INNOVATIONS
WAGENINGEN UR

No data, no information! No history, no future!

Step 3 consists of an approach in which data is registered and centralised. Data collection begins at the DC and the store. At the DC, replenishments to the store is registered. In the store, sales is recorded via the cash register. If shrinkage and OOS have not been registered in the past, the data discovery tool can be used to resolve such matters retrospectively. This method even makes it possible to predict shrinkage and OOS, thus enabling better control of these costs.

Step 3: Register Shrinkage

```
.  Initial stocks
+  deliveries
-  regular sales
-  non-scans cashier
-  defects caused by damages     ⎫
-  theft                         ⎬  Total Shrinkage
-  articles reduced in price     ⎫  ⎬
-  articles exceeding the expiry date ⎬ Shrinkage
=  Final stocks
```

AGROTECHNOLOGY &
FOOD INNOVATIONS
WAGENINGEN UR
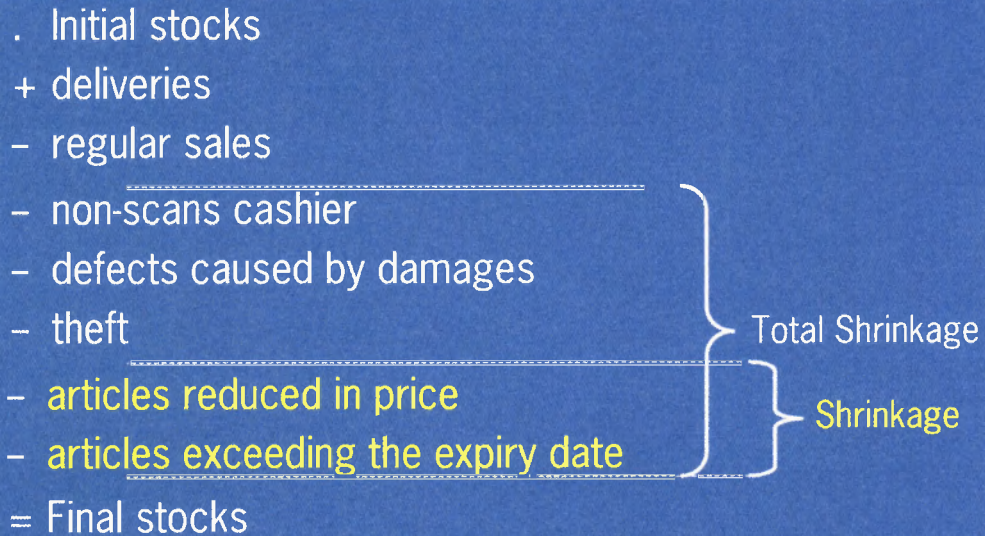
Below is a short account of the details needed in order to obtain an adequate insight into the degree of shrinkage at the levels of article, store and day. These details can eventually be aggregated, e.g. per week, instead of per day.

Basic details (cashier)
Quantity sold at article and day level
Including articles reduced in price

Turnover at article and day level
Including the turnover of articles reduced in price

Price shrinkage
Price shrinkage can be determined if one of the following fields is known:
Day price of the article
Number of articles sold against the full day prices at article and day level
Number of articles sold against reduced prices at article and day level

Shrinkage (product loss)
Shrinkage can be determined either by manual count or registered by scanning the articles before they are thrown away.

Total shrinkage
The determination of total shrinkage (including, e.g. theft) can be an alternative if shrinkage (product loss) cannot be registered.
Total shrinkage is determined by registering the following fields:
Day stocks at store level
Deliveries (quantity ordered or delivered)

Shrinkage (today) = [deliveries(yesterday) + day stocks(yesterday)] - [quantity sold(today) + day stocks(today)]

If information is not available centrally due to, eg. non-registration of shrinkage or difficulty in information gathering, the data discovery tool can be used to resolve the degree of freshness of the shelf, shrinkage and OOS.

The determination of total shrinkage requires information which is already collected during the ordering stage. The electronic processing of such data makes it possible to offer an order advice in the future (closed bookkeeping).

Step 4: Analyse data
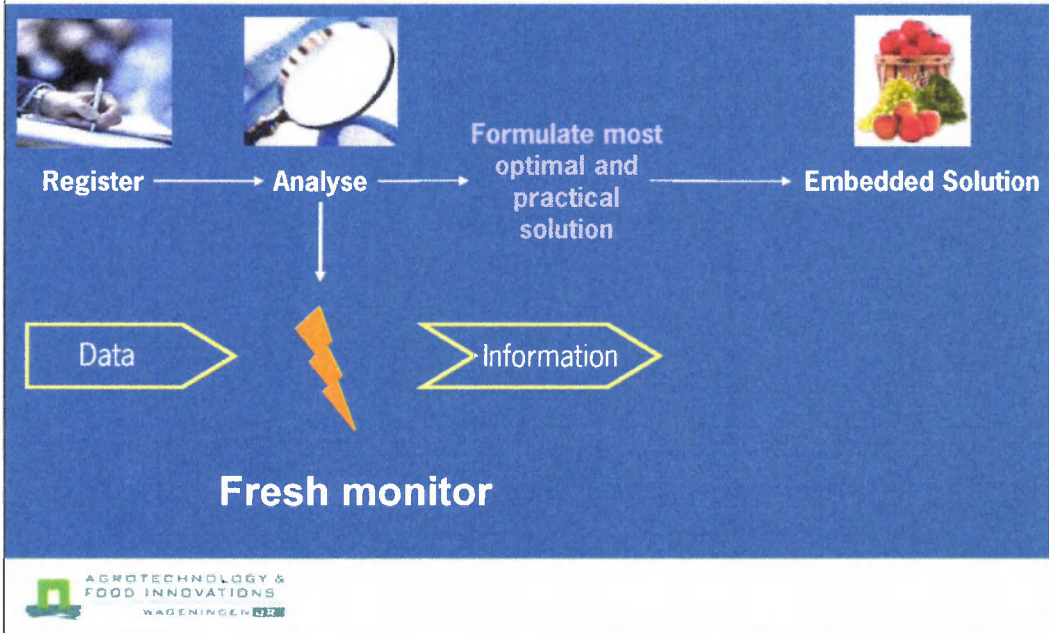
In step four, data is converted into information with the help of the fresh monitor. The monitor gives insight into the freshness, turnover, shrinkage and OOS for each article, each dag and each store. Any random cross-section can be made. In this way, benchmarking among stores can be easily done.

The following is a short description of the fresh monitor.

Fresh monitor

- Insight into *shrinkage* and *out-of-stock* at product and store level and over time
- The influence of *selective shopping* of the *consumer*
- The relation with sales and *sales variation*
- The relation with the *assortment* (breadth and depth)
- Packaging and quality (*shelf life*)
- The relation with *Replenishment* (service level, unit of order)

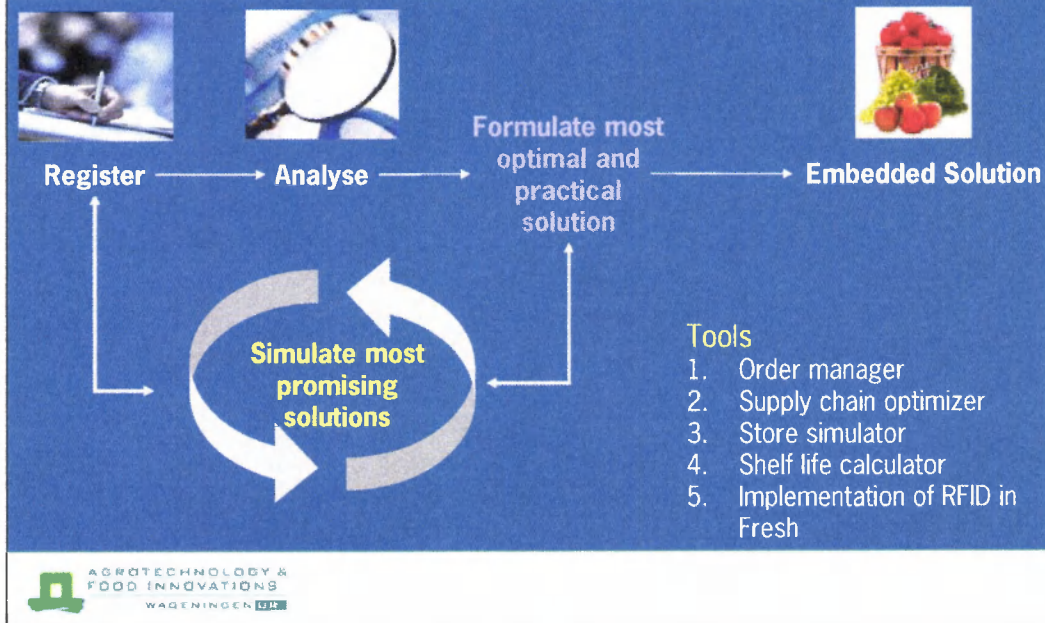AGROTECHNOLOGY & FOOD INNOVATIONS
WAGENINGEN UR
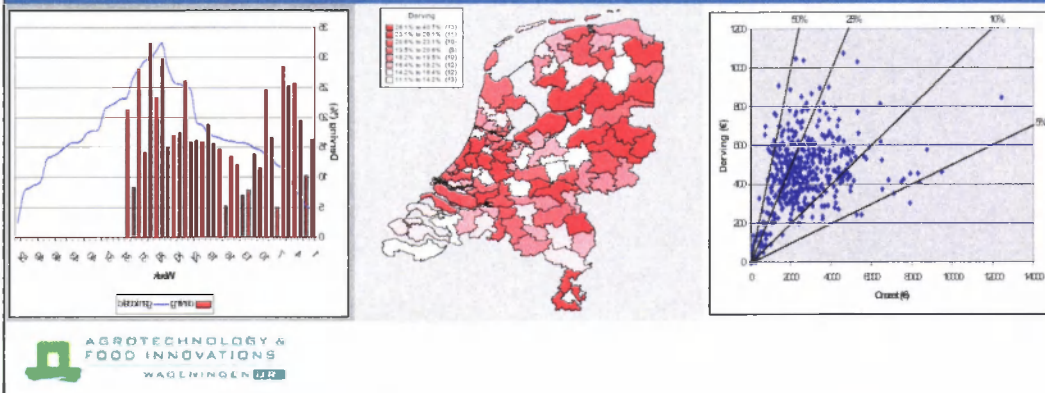
Collecting data is one side of the coin; transforming this data into information is the other. WUR has developed an application to transform shrinkage data into practical information.The model we use zooms in from category to item level, and from store to formula level. The advantage of this method is that insight into the roots of the shrinkage process can be obtained. As it often happens, shrinkage is a phenomenon which does not occur uniformly, and one can go so far as to observe that 80% of all shrinkage can be attributed to 20% of the stores. The shrinkage monitor can show us for which stores and which products there is most room for improvement.

The diagram at top left shows shrinkage as a function of turnover. Each dot represents a store. It is clear that as turnover increases, shrinkage decreases. The differences in %-shrinkage among the stores at the same turnover can be directly seen. In this example, shelf display is the same for all stores. What can be the cause of such shrinkage differences among stores?

To find out the answer, one has to knock at the doors of specific stores. By using the monitor, it is easy to group stores into, e.g. postal codes (diagram at below right), average floor areas. The diagram at below left shows shrinkage as a control element in management reports, including comparisons with previous periods.

The effect of an implemented improvement measure can be made directly visible with the shrinkage monitor.
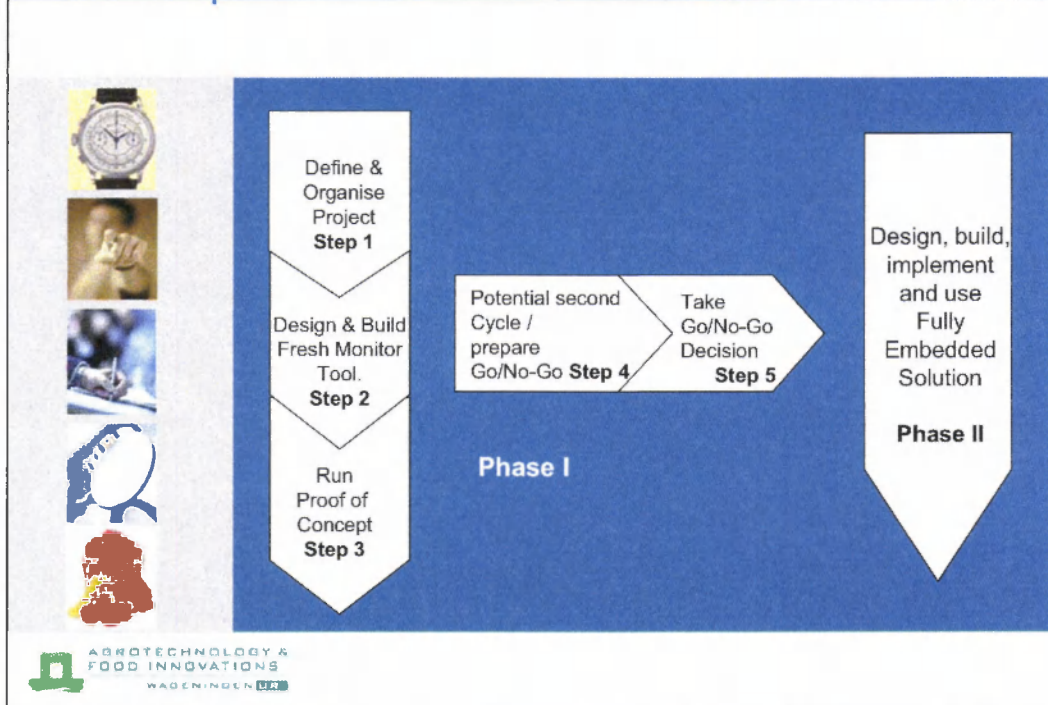
Step 5: Embedded Solution

Register → **Analyse** → **Formulate most optimal and practical solution** → **Embedded Solution**

Simulate most promising solutions

Tools
1. Order manager
2. Supply chain optimizer
3. Store simulator
4. Shelf life calculator
5. Implementation of RFID in Fresh

AGROTECHNOLOGY & FOOD INNOVATIONS
WAGENINGEN UR

In step 5, the method to be adopted to reduce shrinkage will be described. After the analysis phase, the most promising areas will be defined and worked upon first. Results of the interventions can be monitored with the shrinkage monitor.

The difference between the traditional method and the alternative one lies in the application of simulation models in the latter. The use of simulation models makes it highly possible to evaluate the effects of the various solutions quickly. By simulating a situation beforehand, the risks during actual introduction can also be minimised. The chapter on simulation tools will describe examples where models are used to simulate complete situations.

The advantage of such a chain simulation is that local optimisation can be expressed in the effects on, e.g. freshness of the shelf, shrinkage, OOS and turnover, enabling one to gain more insight into what works and what not. As such, information becomes knowledge for those involved in the processes. We may therefore speak of an embedded solution here.

Road-map to Embedded Solution

- This proposal describes Phase I **in the road to an 'embedded' solution** (i.e. a solution that is fully integrated in the day-to-day *processes*, regular *organisation*, standing *application & infrastructure environment*, regular *reporting & award cycle*).

This Phase I ('Proof of Concept') has 5 steps:

1. The project will start with a short (2 weeks) project-definition.
2. Next, the Fresh Monitor tool will be developed from demo to production version (design & construction).
3. Then, a first 'improvement cycle' will be run as a test or 'Proof of Concept' (selected category, selected stores).
   - The reports generated by the Fresh Monitor will be analysed.
   - Potential interventions will be identified.
   - Interventions will be prepared and selected.
   - Interventions will be implemented.
   - Reports to monitor the effects of the interventions are generated and analysed again.
   - An evaluation report will be generated (results, lessons learned, recommendations).
4. The outcome of this first 'improvement cycle' will determine whether or not a second test cycle is required before a final go/no-go decision will be taken.
5. As the final step in this Phase, the Proof of Concept will be concluded with a decision whether or not to make this approach part of the regular operating model.

- Phase II (Roll out of the fully embedded solution) will be based on **(1) the fresh monitor, (2) best practices for waste reduction, (3) interrelation with customer service and OOS-management, (4) continuous improvement approach.**

Leading the way in the project method is the interrelation among the four elements - infrastructure, applications, people and processes. From our position in Wageningen-UR, a partnership has been entered into where all four elements can be well represented. The chosen partner is IBM because IBM is an organisation which attaches much importance to innovation and science, as can be seen in its tradition of having produced several Nobel Price winners. Within this cooperation, Wageningen-UR provides the knowledge of fresh logistics while IBM is more specialised in business intelligence and matters relating to organisational aspects and project management.

Simulation Tools

Product description

Product description

Order manager
Can be employed to improve ordering (manually) and to facilitate automatic delivery by the development of an algorithm

Supply chain optimiser
Instrument used to optimise links in the process

Store simulator
Instrument which can simulate logistics processes at store level, including the shopping consumer

Shelf life calculator
Instrument which gives insight into the shelf life of fresh products

AGROTECHNOLOGY & FOOD INNOVATIONS
WAGENINGEN UR

The following is a review of available tools for strengthening the position (profit, sales) of fresh products.

Available tools:

During the proof of concept - an extremely interactive phase for those involved - a workshop will be carried out to locate the most successful scenarios. Generally, 20% of the articles are responsible for 80% of the shrinkage, out-of-stock, sales and margin. Such a focus (Pareto) will therefore enable results to be achieved fast and effectively.

By developing improved scenarios and quantifying the effects, choices can be made in a follow-up phase. The choices would then be subjected to more in-depth examination and thereafter be implemented. Simulations play an important role in this matter so that the operations, with their already existing heavy workloads, would not be overloaded. Since little fieldwork can be carried out during the research, simulations would be used to bring out reality and find out the effects of measures taken. Simulation would also minimise risks during actual implementation.

Products which can be used are, for example, the order manager, supply chain optimiser, store simulator and the shelf life calculator. These products will now be elaborated upon one by one.
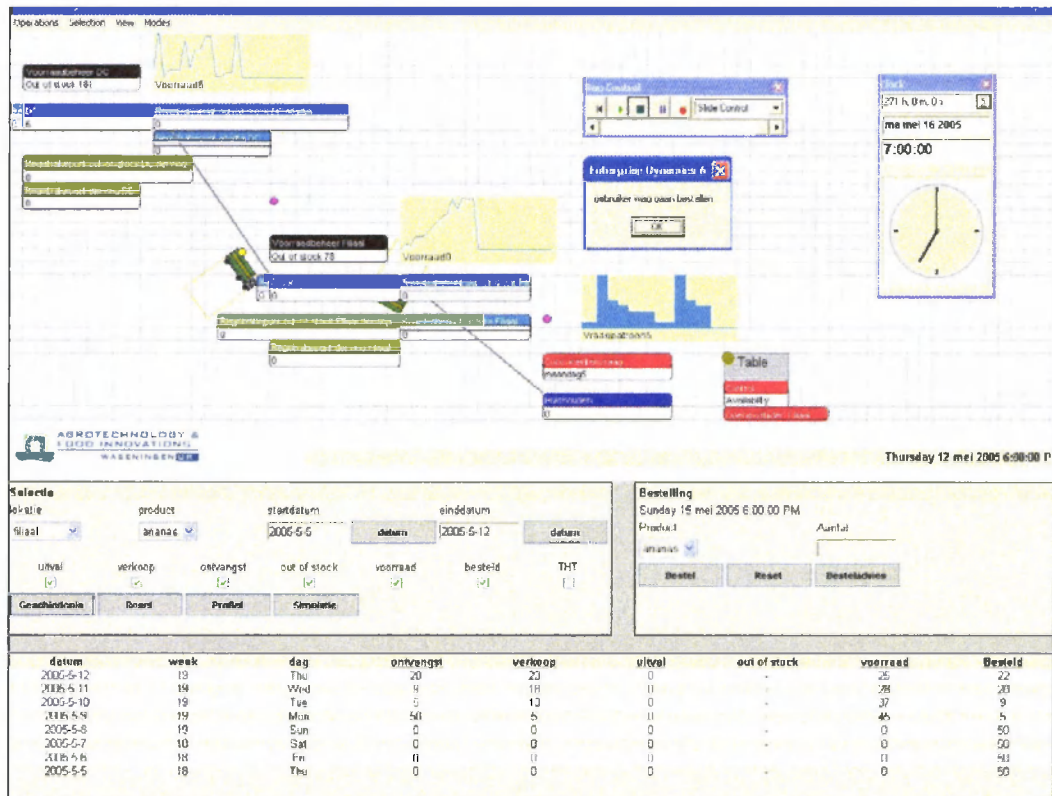
Order manager

- How much, how often and how soon do I have to order?
- What is the optimum replenishment level?
- Automatic delivery routines
- Order trainer (Coach)
- Influence of shelf life and ordering based on shrinkage and OOS
- Influence of selection behaviour of the customer
- Influence of sales evaluation

AGROTECHNOLOGY &
FOOD INNOVATIONS
WAGENINGEN UR

One reason often named as a cause of shrinkage is the incorrect ordering of products at store level. Ordering is no easy task, given the product quantities and the workload. The order manager can be used to assist in the ordering process. In this simulation tool, order algorithms can be developed and optimised. These order algorithms can be used for automatic delivery or for providing ordering advice.

The tool can also be used in the training of ordering fresh products.

The order manager directly indicates the effect of order behaviour on shrinkage and OOS.

Example of the order manager in which the bottom screen is visible to the user, and the top screen indicates how the chain is implemented in the model.

Supply Chain Optimiser

- What is the influence of consumer behaviour and sales variation?
- Choices: the classic inventory system, cross docking, or direct delivery?
- Where should I locate my DC's and what should their set-up be?
- What shelf life should I demand from my suppliers?
- What is an attainable lead time?

AGROTECHNOLOGY &
FOOD INNOVATIONS
WAGENINGEN UR

The supply chain optimiser represents a logistics optimisation tool which can be used to calculate chains. This tool allows various improvement scenarios to be quantified. For example, what is the financial effect of extending the shelf life with one day? Will the returns justify financing a technological improvement (e.g. gas packaging)? Even location issues can be handled. This tool is also capable of linking logistics processes to the quality progress of fresh products. For example, the effect of environmental influences in the chain can be judged more appropriately. The desired shelf life can also be established, which will then lead to decisions concerning technological aspects.

In short, many logistic issues, in combination with quality progress, can be answered by using this tool. The simulation can be set up specifically to handle strategic considerations and to work them out in detail before these are adopted in practice.
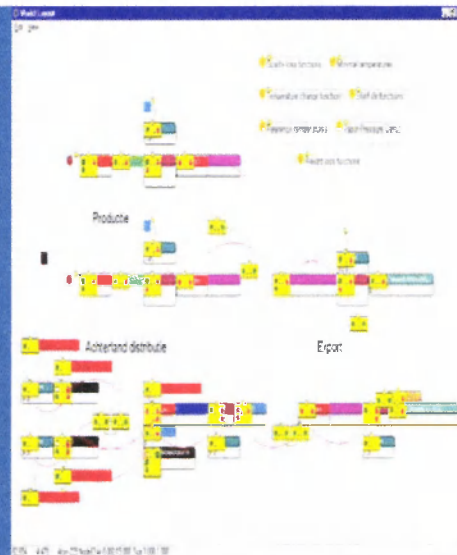
The Supply Chain Optimiser is specifically set up for fresh product chains by simulating the product's quality progress.

Store Simulator

- How do I equip my shop?
- Shelf allocation (footage, stock)
- How large should the shop's storage area be?
- When do I replenish my shelves?
- How many cashiers should be employed?
- When and to what extent do I have to reduce the price?
- How can I tackle the selection behaviour?
- How should I store the product?

AGROTECHNOLOGY &
FOOD INNOVATIONS
WAGENINGEN UR

The store simulator is a simulation tool which takes the logistics process to the level of the pushcart. Elegantly put, the work processes of the tool begin with the behaviour of the customer. This means that logistic processes at branch level can be zoomed in.

This product can be used to tackle issues with extremely diverse characteristics. Issues such as: how do I equip my shop, up to how to influence the consumer's selection behaviour.

The tool is also suitable for optimising the effect of shelf space allocation, e.g. for fresh products. Such allocation can influence the stock levels and in so doing, also the OOS and shrinkage situation. Questions concerning price reductions can also be best answered with this tool. The simulation is carried out based on existing information which has been put into databases.

One of the important scenarios where shrinkage can be reduced is the one involving improvement of the product quality, thus prolonging the shelf life. This tool quantifies the concept of shelf life to make it a parameter towards which one can intentionally steer.

What effects do environmental conditions or packaging concepts have on shelf life in the chain? What improvements can be potentially achieved by prolonging shelf life? How can shelf life become a logistics parameter comparable to lead time? Can RFID assist me in this? How about packaging (modified atmosphere)? These and other questions can be answered using expert knowledge.

The expert knowledge around packaging technology is intensively present in Wageningen-UR; expert knowledge is also encapsulated in other products developed. The tools vary from palmtop applications to extensive web applications.

Shelf Life Calculator
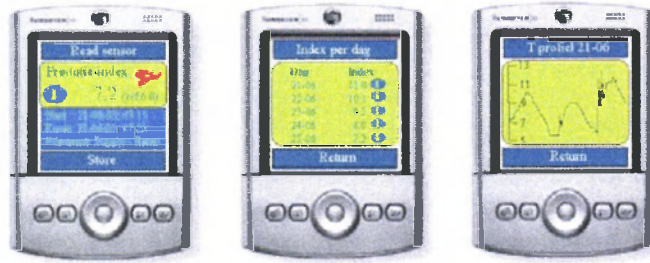
Prestatie index over de meetperiode vergeleken met de referentie. → Prestatie index wordt berekend over de meetdagen. → Temperatuurprofiel in de tijd over een specifieke meetdag.

Disk met software inclusief kwaliteitverloopmodel voor vers product.

Datalogger.

Meetsnoer

To obtain insight into the shelf life progress of the product in the chain, the fresh-chain-performance-index has been developed. This index is determined by registering the time and the temperature of goods in the chain and then linking these to quality decay of the product. The registration takes place with modern and very small sensors which can also save these measurements. By using a Palmtop-computer, the data can be read and made product specific. This is done by using quality decay models. The result is an index which indicates how the quality of, e.g. meat, tomatoes, bananas, cheese, yogurt, etc. could degrade as a result of temperature and duration of time spent in the chain.

The shelf-life calculator makes the actual shelf-life of a product-chain combination objective. Afterwards, one can determine if an investment in shelf-life prolongation would give the desired advantages. Insight into the latter can be obtained with the already mentioned supply chain optimiser.

Shelf Life Calculator

Temperatuurprofiel

Locatie		Tijd (uren)	Temperatuur (°C)
1. verpakken		4	6
2. opslag expeditie		44	6
3. transport naar distributiecentrum		30	6
4. opslag distributiecentrum		12	7
5. transport naar winkelfilialen		4	10
——			
——			
——			
Schaptemperatuur			6

Keuze Vlees

vleessoort	schnitzel
Initieel kiemgetal	4.09
Acceptatie grens	7

bereken
opslaan
Geschiedenis
reset
Help

Resultaten

Gebruikte parameters

Type Vlees	schnitzel
A	4.09
C	3.47
αb	0.18
βb	0.14
αm	17.74
βm	-0.17

Gebruikte temperatuurprofiel

Locatie	Tijd (uren)	Temp (°C)
verpakken	4	6
opslag expeditie	44	6
transport naar distributiecentrum	30	6
opslag distributiecentrum	12	7
transport naar winkelfilialen	4	10
Schaptemperatuur		6
Aantal schakels in temperatuur profiel	5	
Duur van de keten (dagen)	3.92	

Houdbaarheid (dagen)

9

Schapleven (dagen)

5

AGROTECHNOLOGY & FOOD INNOVATIONS
WAGENINGEN

In the example above, the duration and temperature in specific chain links can be entered, and the system can then calculate the shelf life for fresh meat products. The system is fed by expert models which can predict the shelf-life of fresh, gas-packed meat. This system can be extended with other expert models for fresh products. This application is easy to use by organisations via the Internet. For example, the quality control department can use this tool to judge the effect on a fresh product caused by an altered initial quality and/or chain conditions and/or duration.

RFID[+] - a future initiative -

RFID[+]
This is RFID with extra information about fresh products, e.g. shelf life

- Name
- Location
- How are you?

Aim
To reduce shrinkage and OOS by better stock control

- ID (barcode)
- Location
- Shelf life

AGROTECHNOLOGY & FOOD INNOVATIONS
WAGENINGEN UR

The world is becoming smaller and more complex - the former due to increased mobility; the latter due to product differentiation. All of these is determined by how we live. The cell phone is, among others, used to communicate who and where you are and how long it would take for you to reach your destination.

This same phenomenon is happening in the logistics of products. We are no longer satisfied with the barcode, nor with information which says who I am. We also want to know where my product is, who has produced it and with which source materials. In short, tracking & tracing is a growing necessity. Technology such as RFID can fulfil this necessity, but has it painted the future or do developments keep changing the painting? One of the most frequently asked questions in a conversation is "how are you?". Due to the enormous increase of fresh articles, it is becoming more important to also ask such a question concerning these products. What is the quality of fresh products that are delivered to me; in other words: how much time do I have to sell this product? This is a question that the retailer has to ask himself if he wants to tackle his shrinkage problems.

With RFID+ , one can ask the product how it is doing, (i.e. concerning its quality) at any desired moment. We refer to RFID+ as the sum of logistics and quality. By attaching, e.g., a temperature sensor to an RFID tag, both temperature and time profiles can be communicated. Such RFID tags already exist.

Track record

Track record

- Packaging of fresh products:
    - Hendrix Meat Group and Laurus
    - Introduction of packaging for shelf-life prolongation at Super de Boer and Edah
    - Logistics advantages of a later expiry date; less shrinkage, adjustment time
    - Influence of consumer behaviour (Last In First Out as opposed to FIFO) on fast-moving (e.g.minced meat) and slow-moving (e.g.shoulder cuts) meat products

- Vers-pan:
    - Hessing Groenten, CoopCodis, Bakker-Logistiek and The Greenery
    - Reduction of shrinkage and out-of-stock by logistics optimisation: e.g. shorter throughput time, improved planning and prolonged shelf life
    - Applicability of FEFO (First Expired First Out) in logistics; in other words, management based on shelf life

AGROTECHNOLOGY &
FOOD INNOVATIONS
WAGENINGEN UR

To give an impression of our track record, a number of project descriptions have been added here.

Track record

- Bio-varken:
  - Organic pork chain from the Groeneweg to Albert Heijn
  - Shrinkage for organic meat is high in comparison to normal meat, due particularly to the low turnover rate of organic products.
  - The effects of various measures are quantified before the best scenario which can be applied in practice is tested in an actual pilot.

- Reduction of product loss in the fresh cut vegetables chain

  - Fresh cut vegetables from Groentehof to Jumbo supermarkets
  - Reduction of shrinkage by prolonging shelf life
  - A decision support model has been developed to calculate the effects of an undertaking (packaging, conditioning, throughput time) in relation to the remaining shelf life and shrinkage

AGROTECHNOLOGY &
FOOD INNOVATIONS
WAGENINGEN UR

Contact details

- Wageningen University & Research Centre (www.wur.nl)
  Bornsesteeg 59, 6700 AA Wageningen
  www.vers.nl for recent publications and project descriptions

Dr. Henri Luitjes
Senior Consultant
Henri.luitjes@wur.nl
+31 317 475309

Ir. Frans-Peter Scheer
Project manager
Frans-peter.scheer@wur.nl
+31 317 478552

Drs. Ing. Joost Snels
Project manager
Joost.snels@wur.nl
+31 317 477527

AGROTECHNOLOGY &
FOOD INNOVATIONS
WAGENINGEN UR

31

Colophon

Title	Retail Logistics – Management of Perishables
Authors	Henri Luitjes, Frans-Peter Scheer, Joost Snels
A&F number	403
ISBN-number	-
Publication date	September 2005
Confidential	yes
OPD-code	-
Approved by	Dr. Henri Luitjes

Het kwaliteitsmanagementsysteem van Agrotechnology & Food Innovations B.V. is gecertificeerd door SGS International Certification Services EESV op basis van ISO 9001:2000.

Contents

Retail Logistics – Management of Perishables