High quality and long shelf life:

A good marriage or a constant challenge?

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Introduction

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Hessing is a leading producer in the Netherlands of

- **convenience products**
- **fresh juices**
- **meal solutions**

for Retail and Foodservice

- **Family owned company**
- **4 production facilities**
- **Turnover € 180.000.000 / year**
- **Production > 3.500.000 CU / week**
- **> 500 different product recipe’s**
- **Own logistics and transport**

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Who is Chris Rietveld?

- An independent consultant and interim manager
- With more than 30 years experience in food industry
- Who has been managing director of all 4 Hessing plants
- And is still working for Hessing as interim manager on the integration of a new plant

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Focus of this presentation:

As many scientific and commercial aspects of the packaging of fruit and vegetables have been highlighted by other speakers, the focus of this presentation will be on:

- Fresh cut salads, vegetables and fruit
- Effect of processing in relation to shelf life
- Aspects of industrial processing
- Packaging and development

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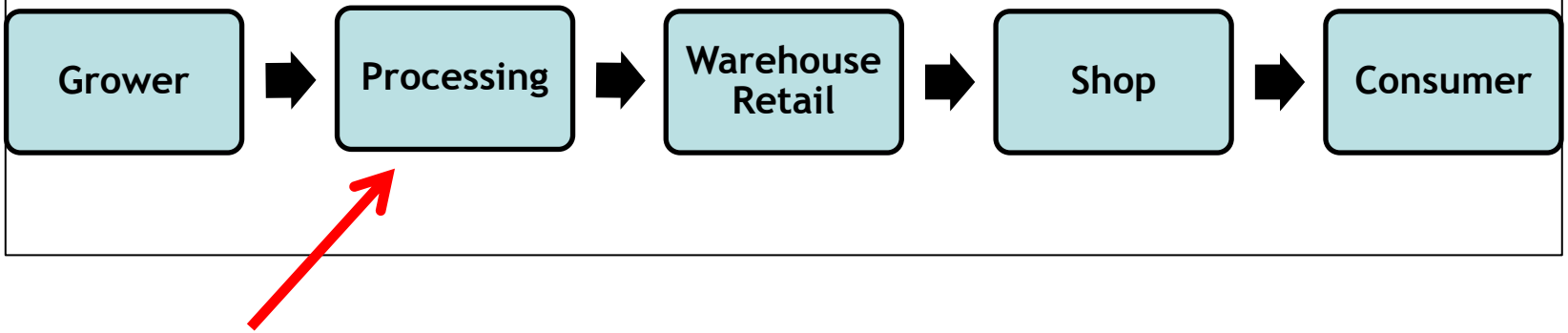
Supply chain fresh cut fruit and vegetables



Processing:

- Cutting: cleaning + cutting in the right size (hand/machine)
- Washing: minimum 2 times in ice water
- Drying: mechanical (centrifuge) or with air
- Mixing: dry or wet mixing for blended products
- Packing: bag or tray

Aspects that influence the shelf life of packed fruit and vegetables

- *Quality of raw materials*
  - source
  - season
  - time between harvesting and processing

- *Type of raw materials*
  - hard or soft product
  - regular or biologic

- Recipe
  - mixtures: difference in shelf life of components
  - interaction of components in the package
  - toppings: loose in the package or pre-packed

Aspects that influence the shelf life of packed fruit and vegetables

- *Processing*
  - mechanical treatment
  - sharpness of knives
  - management of washing water: temperature, cleanliness
  - processing facilities: air quality, temperature
  - hygiene: equipment, people

- *Packaging*
  - material: kind of material
  - permeability: specific per product
  - sealing: tightness

Aspects that influence the shelf life of packed fruit and vegetables

- *Logistics*

  - handling of product
  - both raw materials and finished products
  - daily fresh delivery

- *Temperature management during total supply chain*

  - a low temperature is of great importance
  - supply chain shows several critical points

Packaging

The aspects on packaging for both consumer and producer are many:

- Design: appeal to consumer
- Contents: good product, meeting expectations
- Distinction: shape, material, colour
- Protection: mechanical, biological, shelf life
- Food safety: cooling, hygiene, foreign bodies
- Sustainable: light, recyclable, compostable
- Price: as low as possible, but perfect quality

Packaging and shelf life

- Since fresh cut fruit and vegetables are “alive” products, respiration continues in the packaging

- Respiration varies per product and must be controled in order to achieve maximum shelf life

- Methods:
  - create protective atmosphere in the packaging: balancing the O_2 / CO_2 content
  - create a breathable packaging by perforation of the foil: the number and size of perforations vary per product

But:
the real shelf life effect of breathable packaging does not only depend on the number and size of perforations, it is always combined with:

- Product quality
- Initial gas composition
- Moisture content
- Addition of protective gas
- Type of packaging material
- Thickness of the foil
- Mechanical treatment of the product

These are all known aspects. But what do they mean for a producer?

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What does this all mean for the industry?

- Product development
  - constant focus on improving shelf life
  - balancing customers demands

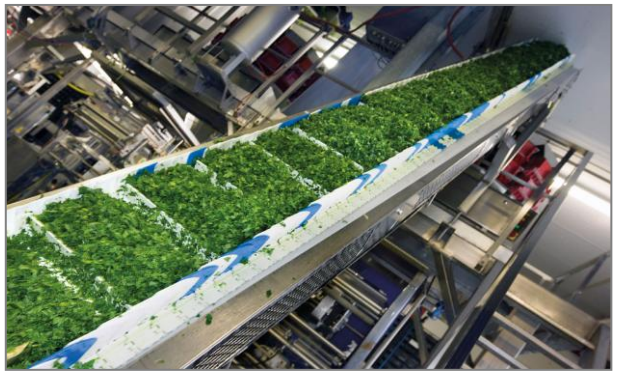
- Investments in equipment
  - in-line perforation: laser, heat, mechanical
  - reduction of mechanical affection

- Design of packaging
  - design and shelf life properties should be balanced

What does this all mean for the industry?

- Choice of packaging material
  - depends on product
  - together with customer

- Economics
  - best product – lowest price
  - reduction of waste



Techniques to secure or improve shelf life

- Commonly used
  - addition of gas
  - removal of oxygen
  - perforated foil
  - choice of packaging material
  - reduction of mechanical affection of the product
  - temperature management (industry and retail)

- Current developments
  - HPP (High Pressure Processing) of fruit juices
  - PEF (Pulsed Electric Fields) Processing
  - In line measurement of respiration and adapting perforation

Summarized:

- Packaging is important for realization of shelf life of packed fruit and vegetables
- However the effect of optimum packaging can be (much) reduced by not optimum aspects as raw materials, processing and cooling
- Continuous research will contribute to further optimization of shelf life. However: daily fresh delivered products with a long shelf life will be a constant challenge

Joint efforts of all stakeholders in the world of fruit and vegetables will contribute in optimization of shelf life

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Thank you for your attention

Questions?