Module 02 - lecture 04c

# Food technologies that prevent contamination

# Additional operations and aspects of importance

- Packaging
- Hygienic design of factories, lines and equipment
- Cleaning and disinfection

# Packaging

- Prevent re contamination
- Protect solid food against moisture uptake
- Maintain low oxygen atmosphere
- Protect food against light

# Packaging of liquids

## *Conventional process*

- no heat treatment of pack for acid food e.g. juice filled at 90° C or above
- heat treatment of sealed packages for low acid foods

## *Aseptic process*

- separate pasteurization of package and food
- filling in aseptic atmosphere

# Packaging material disinfection

**Heat :** steam 180 - 230° C for 3 minutes

**Chemicals :** hydrogen peroxide (+ heat or ethanol)

**Radiation**

***Prerequisite is cleanliness***

# Packaging material (1)

*Glass bottles :*

- alcoholic beverages
- juices and other drinks
- carbonated soft drinks

*Metal cans :*

- carbonated soft drinks, beer

# Packaging material (2)

***Laminated cardboard :***

- **milk and other dairy products**

***Plastic bottles :***

- **dairy products, juices, carbonated beverages**

# Packaging of liquids, potential problems

*Glass bottles*

- inadequate rinsing and cleaning
- glass splinters
- seal

*Metal container*

- corrosion

*PE and PET*

- adsorption of flavour by PE and residues of acetaldehyde in PET bottles

# Packaging of solids (1)

***Solid foods can be differentiated in :***

- **Non - deformable products :**
  - **low water activity < 0.70**

    **toast, biscuits, hard cheese,**
- **Deformable products:**
  - **high water activity >0.70**
    **meat products, pastry,**
    **sandwich loaves, soft cheese**
  - **powders**

# Packaging of solids (2)

***Major causes of alteration***

- **Water vapour (moisture)**
- **Oxygen**
- **Light**
- **Chemicals**

# Packaging of solids (2 cont.)

***Major causes of alteration***

- **Water vapour (moisture)**
- **Oxygen**
- **Light**
- **Chemicals**

# Packaging of solids (3)

***Criteria for selection of the packaging material***

- **thickness**
- **type**
- **structure**

  **i.e. mono - or multilayer, coated or metalized**

# Packaging - Key messages

- The purpose of packaging is to protect the food from change in quality, including microbiological and physico-chemical alterations
- The major causes of alterations are water vapour or moisture, oxygen, light and chemicals
- Hazards can be associated with packaging material or processes
- Packaging material must be chosen as a function of the preservation process, stability and characteristics of the food