

# FILLING AND PACKAGING

# Main factors causing deterioration during storage

- **Mechanical forces (impact, vibration, compression or abrasion)**
- **Climatic influences causing physical/chemical changes (UV light, moisture vapour, oxygen, temp. changes, etc.)**
- **Contamination by microorganisms, insects, soil**
- **Pilferage, tampering, adulteration**

**Therefore, there is a need for packaging.....**

## Packaging helps to:

Protect the food to a pre-determined degree  
for the extended shelf life

Advertise foods at the point of sale



# Why use packaging?

- Extend shelf life
- Safe and efficient transportation
- Reduce product waste due to contamination
- Provide customers with information (sometimes a legal requirement)
- Entice the customer to purchase



**Contain : Protect : Communicate : Market**

## Thus, the basic requirements of packaging material are

### The package:

- should not contaminate product.
- should allow efficient and economical operation on production line.
- should be resistant to breakage.
- should be cost effective.
- should be aesthetically pleasing.
- should have a functional size and shape.
- should retain the food in convenient form.
- should be suitable for easy disposal or reuse.



**The main factors considered for package selection are light, heat, moisture and gases, microorganisms and insects.**

## Two main groups of packaging materials

*Shipping containers*, which contain and protect the contents during transportation and distribution (e.g. wooden, metal or fibre-board cases, crates, barrels, drums and sacks)

*Retail containers* (or consumer units) which protect and advertise the food in convenient quantities for retail sale and home storage (e.g. metal cans, glass bottles, jars, paperboard cartons, flexible plastic bags, sachets and overwraps)





## Types of packaging for milk products

Product	Type of packaging
Milk and milk products	<ul style="list-style-type: none"><li>• PE pouches</li><li>• LDPE and PVC bottles</li><li>• Bottles made from LDPE can be used at temperature of up to 120°C and bottles made from polycarbonate up to 150°C.</li><li>• Glass bottles</li><li>• Board laminated with aluminum foil and coated with PE on the inside (for aseptic processing)</li></ul>
Cultured milk products	<ul style="list-style-type: none"><li>• Glass bottles</li><li>• Cartons</li><li>• Unplasticised PVC or PS (coloured to give light protection)</li></ul>

## Types of packaging for milk products

Product	Type of packaging
<b>Unripened soft cheese</b>	<ul style="list-style-type: none"><li>• <b>Deep drawn containers made of hard PVC or impact resistant PS with welded or sealed closures of the same materials or sealed with coated aluminium foil.</b></li><li>• <b>Grease proof paper or aluminium foil laminated to paper is suitable for soft cheeses which are expected to develop slimy surfaces.</b></li><li>• <b>Aluminum foil prevents cheese from drying.</b></li><li>• <b>Laminated films of polyester, aluminum and polythene are also used.</b></li></ul>

## Types of packaging for milk products

Product	Type of packaging
<b>Cheese made from cultured milk</b>	<ul style="list-style-type: none"><li>• <b>Weather proof cellulose</b></li><li>• <b>Polypropylene films</b></li></ul>
<b>Processed cheese</b>	<p><b>Hot filled into aluminum cups which are coated with a protective lacquer.</b></p> <p><b>It may also be wrapped in heat sealed lacquered aluminum foil.</b></p>

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Product	Type of packaging
<b>Butter</b>	<ul style="list-style-type: none"><li data-bbox="508 311 1692 448">• Laminated al. foil (9 <math>\mu\text{m}</math>) and genuine parchment (50 <math>\text{g}/\text{cm}^2</math>).</li><li data-bbox="508 476 1835 762">• Paper improved by plastics (PE, PVDC) and waxes (paraffin 10 <math>\text{g}/\text{m}^2</math>) is also used, but does not give sufficient light protection.</li><li data-bbox="508 791 1696 858">• Laminate of aluminum and polythene</li></ul>

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Product	Type of packaging
<b>Evaporated milk</b>	<p><b>Cans made of electrolytically tinned mild steel which are closed either by soldering or by a seamed-on-lid.</b></p> <p><b>The thickness of the tinned steel is between 0.15 and 0.25 mm, depending on the size of the can.</b></p> <p><b>The tin layer deposited electrolytically can weigh 15 g/m<sup>2</sup> and this represents a layer thickness of between 1 and 2 μm.</b></p> <p><b>Glass bottles with crown cork closures are also used.</b></p>

## Types of packaging for milk products

Product	Type of packaging
Dried milk	<ul style="list-style-type: none"><li>• <b>Cartons lined with aluminium foil on the inside and outside</b></li><li>• <b>Aluminum PE foil bags</b></li><li>• <b>Plastic coated paper bags</b></li><li>• <b>Tin can with or without an inner bag</b></li><li>• <b>For long storage times, a membrane of aluminum foil is used in addition to the snap-on lid to provide an additional seal.</b></li></ul>

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<b>Dried milk</b>	<b>Fat containing milk powders are often packed in an atmosphere of inert gases (e.g. 80% N<sub>2</sub> and 20% CO<sub>2</sub>). The residual oxygen content should be less than 3%.</b>
<b>Bulk packing</b>	<b>Sacks made of kraft paper, laminated with various materials such as parchment, polythene. aluminum, cellulose. bitumen, wax or paraffin.</b>

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<b>Ice-cream</b>	<p><b>Most bulk ice cream is packaged in a linerless bleached sulphite board carton, coated with wax or polyethylene-wax blends for protection from moisture and oxygen.</b></p> <p><b>Plastic containers made of PE are also used.</b></p>



**Thank You**