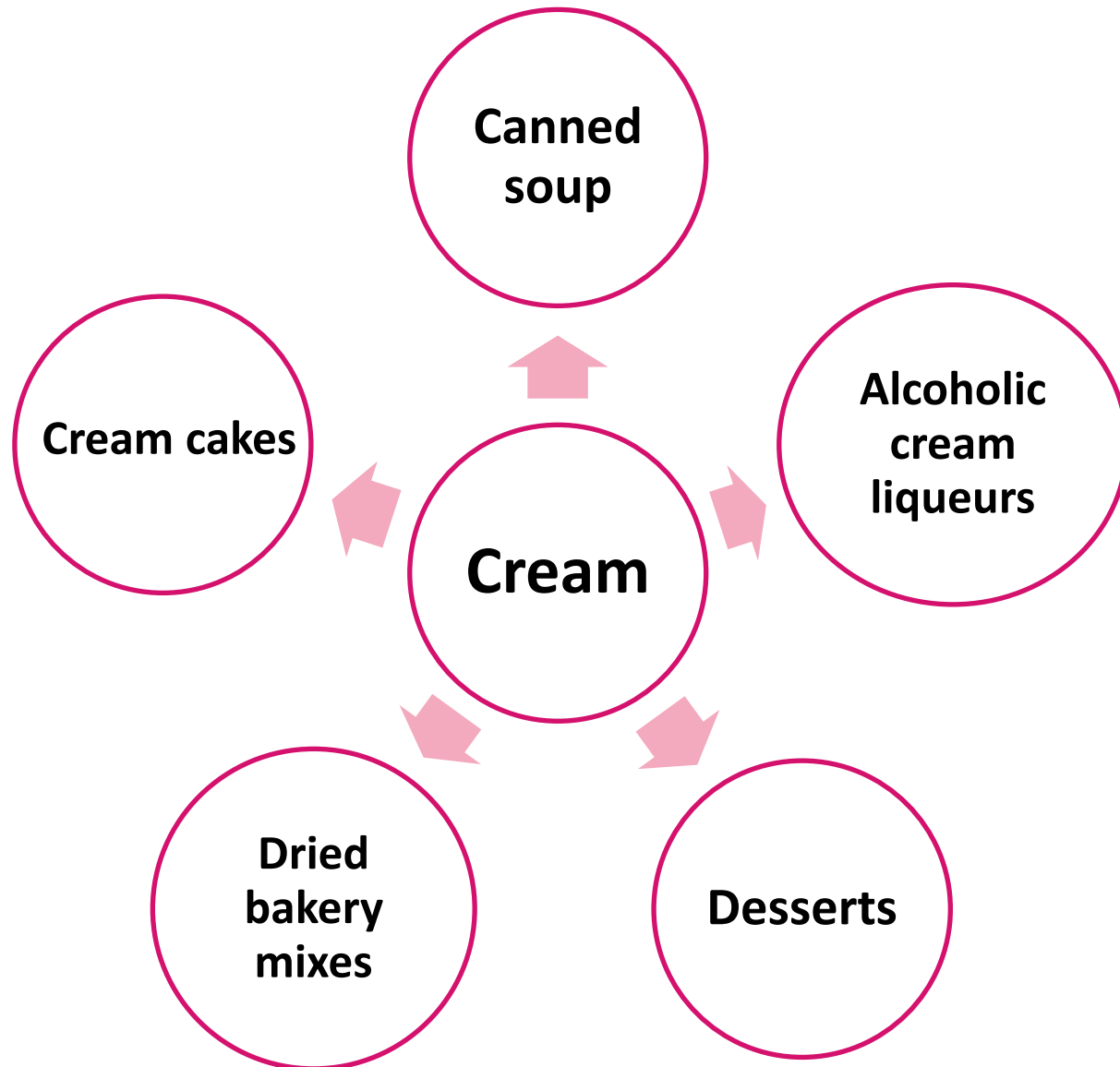




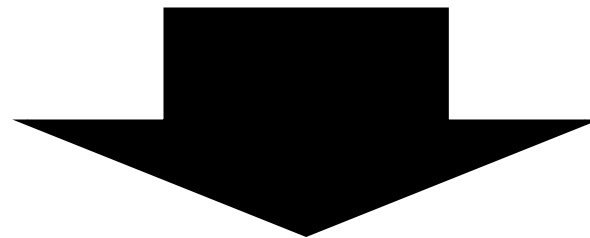
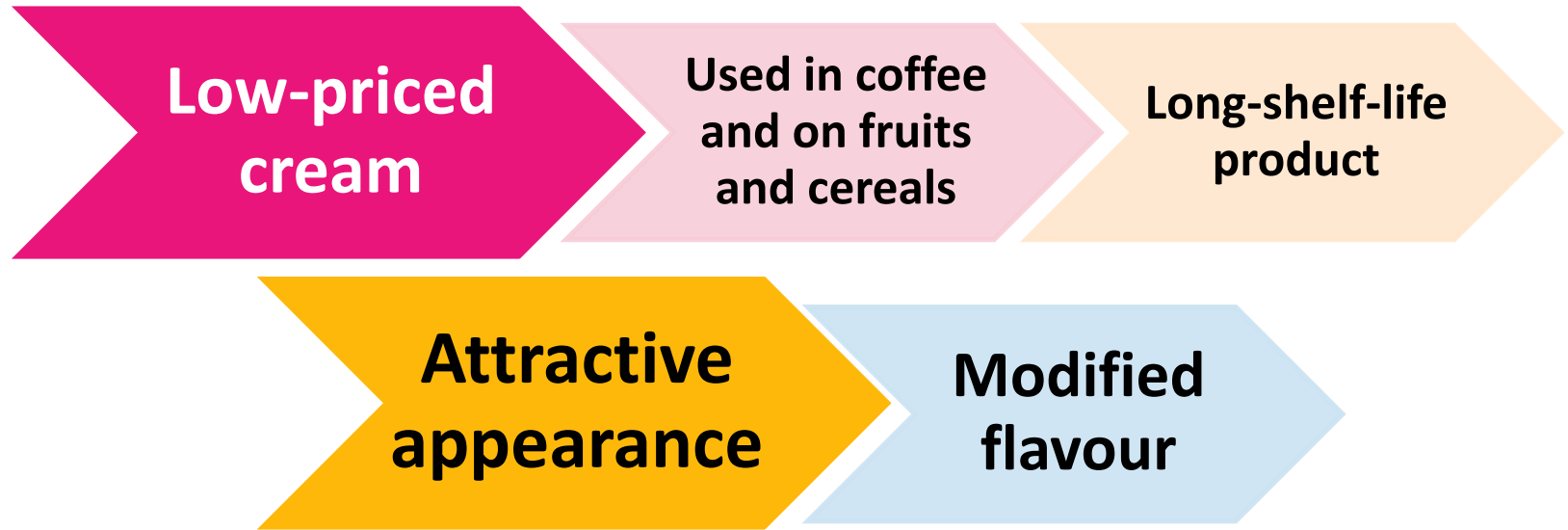
Preparation and properties of table cream, sterilized cream, whipped cream, plastic cream, frozen cream and chip-dips



Cream as an ingredient....Source of dairy fat



Coffee Cream: Properties



Processed

To minimize 'feathering', the coagulation and release of free fat that occurs when cream is added to hot coffee.

Production of coffee cream by UHT process:

- 1. Fat content to be standardized as per legal requirements.**
- 2. Standardized coffee cream must be homogenized to prevent fat layer formation in the container, thus improving taste, whitening power and stability.**
- 3. Homogenization has direct influence on the flocculation stability of coffee cream in hot coffee. Double-stage homogenization is optimal (First homogenization is done before the UHT treatment (pressure: 200 bar) and second aseptic one is done after the UHT treatment (pressure: 50 bar)).**
- 4. Filled aseptically into one-way containers of standard net volumes.**

Production of coffee cream by sterilization process:

1. First fat content is standardized, then pasteurized at 90°C, homogenized, filled into bottles, closed by crown corks and finally sterilized in retorts.
2. In the process of sterilizing cream in the pack, homogenization has to take place before the sterilization, which again is a double-stage process using pressures (200/50 bar) as per UHT process.



Sterilized Cream: Sterilized cream is packed in cans and sterilized similar to sterilized milk

1.

- Fat content is standardized, then cream is preheated to 140°C for 2 s to reduce bacterial spores.

2.

- Cream is homogenized at 50-75°C using either single or two-stage processes.

3.

- The stabilizing salts are then added to prevent the 'grainy' texture, defect that occurs following sterilization.

4.

- The cream is filled into cans which are seam closed. The cans are coated on the inside with a lacquer (epoxy-phenolic compound) suitable for both acid and non-acid foods, which prevents reactions between cream and tinned steel of the can.

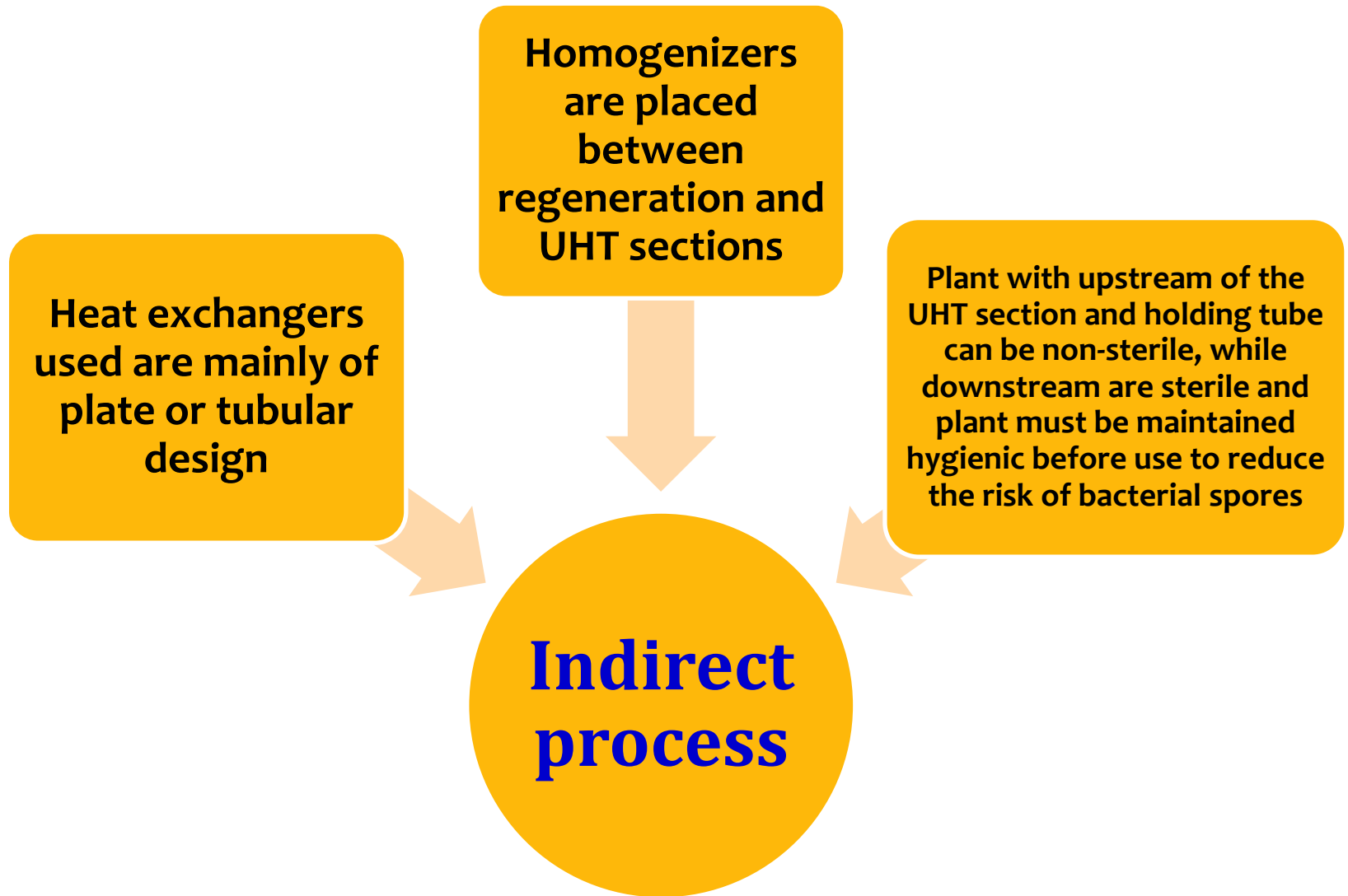


Sterilization may take place in static batch retorts, agitated batch retorts or continuous retorts.



1. For 170 g can, the time required for **static retort** is 40 min to reach 118°C, followed by further 30 min at this temperature to effect sterilization .
2. For an **agitating retort**, 23 min is required to reach 118°C followed by a further 18 min at this temperature to effect sterilization.
3. **Continuous retort** requires 26 min at 119.5°C for sterilization. After sterilization the cans are cooled with chlorinated water, dried, labeled, packed in paperboard boxes and stored at ambient temperatures prior to distribution.

UHT Cream



Direct process:

1. Cream may be UHT processed using methods of direct heat exchange.
2. Apart from diluting the cream by 10-15%, the instantaneous heating of cream and the shear effects occurring, as cream and steam are mixed, can destabilize the milk fat globules. So, homogenization is necessary to restore the emulsion.
3. Vacuum cooling section is required to remove the water added through the direct contact of cream with steam and this is placed before the homogenizer.
4. Whether cream is homogenized prior to UHT treatment or after, the product temperature should be between **50-75°C**.
5. Low-fat UHT creams require high pressure homogenization and other creams require lower pressures.

Aseptic packaging

Form-fill-seal laminated carton

- Contains aluminum layer in the laminate to preserve from the auto-oxidative influences of light.

Thermoformed containers

- Made from the coextrusion of polystyrene.
- Containers are closed with heat sealed polyethylene/aluminium laminate foil

Blow-moulded polyethylene

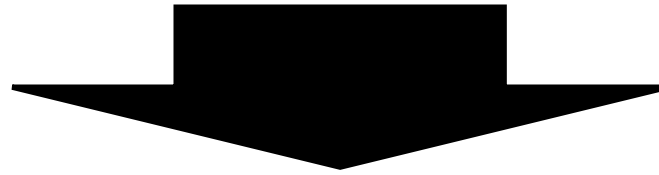
- Formed at the point of filling
- For bulk UHT cream, bag-in-box packages made from metallized plastic laminates may be aseptically filled

Whipping Cream: Properties

Food foam

**Taste and
application in
decorating and
refining of food**

**Cream is usually whipped
immediately prior
consumption, by
consumer/catering
outlets**



**Basic requirements of
product**

**Good whip ability
Good foam stability and firmness of foam
Low serum formation**

Process:

**Cream preparation and fat
standardization**



Acidification/ripening



Homogenization



Heating and cooling

1. Milk fat with majority of saturated fatty acids results in firmer foam than softer fat.
2. Fat corrections with skim milk result in reduced whippability and foam stability.
3. Foaming of proteins exist at pH of 6.4-6.2. Butter cultures can be added (0.5-2%), followed by ripening at 10-15 C. Objective of ripening is to achieve good fat crystallization/fat hardening. Total ripening time (before and after filling/packing) should be minimum of 1-2 days at temperatures $<10^{\circ}\text{C}$.
4. Two-stage homogenization is preferable for a 30% fat cream:
 - * I-Stage at 70°C and pressure of 60-70 bar
 - * II- Stage at 70°C and pressure of 15-20 bar
5. Pasteurization with a high-heat process ($>95^{\circ}\text{C}$).
6. After heating, a shock cooling is applied for fresh cream ($<10^{\circ}\text{C}$).

**Clotted and
cultured cream**

- **Used for direct consumption or as topping in salads**

Frozen cream

- **Used for reconstitution purposes as source of fat**

Clotted Cream (>55% fat): Thick, spreadable texture, nutty flavor, slightly granular texture and colour varies from pale to deep yellow.

Traditional process:

Cows' milk is strained into shallow pans which are left for 6-14 h to allow the cream to rise to the surface of the milk.



Milk with cream layer then heated in pans over a water bath, and product is held at a temperature of 82-91°C for 40-50 min



During cooling for 24 h, cream layer forms a solid crust that lifted clear of the skimmed milk beneath to yield a product often around 67% fat.

Commercial process:

Float cream method: Made in large, open top vessels often arranged in tiers.

- ✓ Involves scalding a layer of double cream poured over skimmed milk or whole milk held in shallow trays.
- ✓ The trays have jacketed bottoms which are heated with either steam or very hot water.
- ✓ Over a period of 45-60 min, the clotted cream crust develops and product then cooled for 12-18 h.
- ✓ Cream hardens and scooped clear of the milk layer and packaged.

Scald cream method:

- ✓ Mechanically separated cream with >54% milk fat content is used.
- ✓ Cream is poured into aluminum/stainless steel shallow trays to form a layer about 20 mm deep and trays are heated either in a water bath or over a low pressure steam chest.
- ✓ During scalding, cream reaches 77-85 C for 45-70 min, following which the trays are transferred on trolleys to a chilled store to cool the product.

Clotted cream may be packed in polystyrene flat-topped round containers, closed with a polyethylene/aluminum laminated foil

Frozen Cream: Objectives



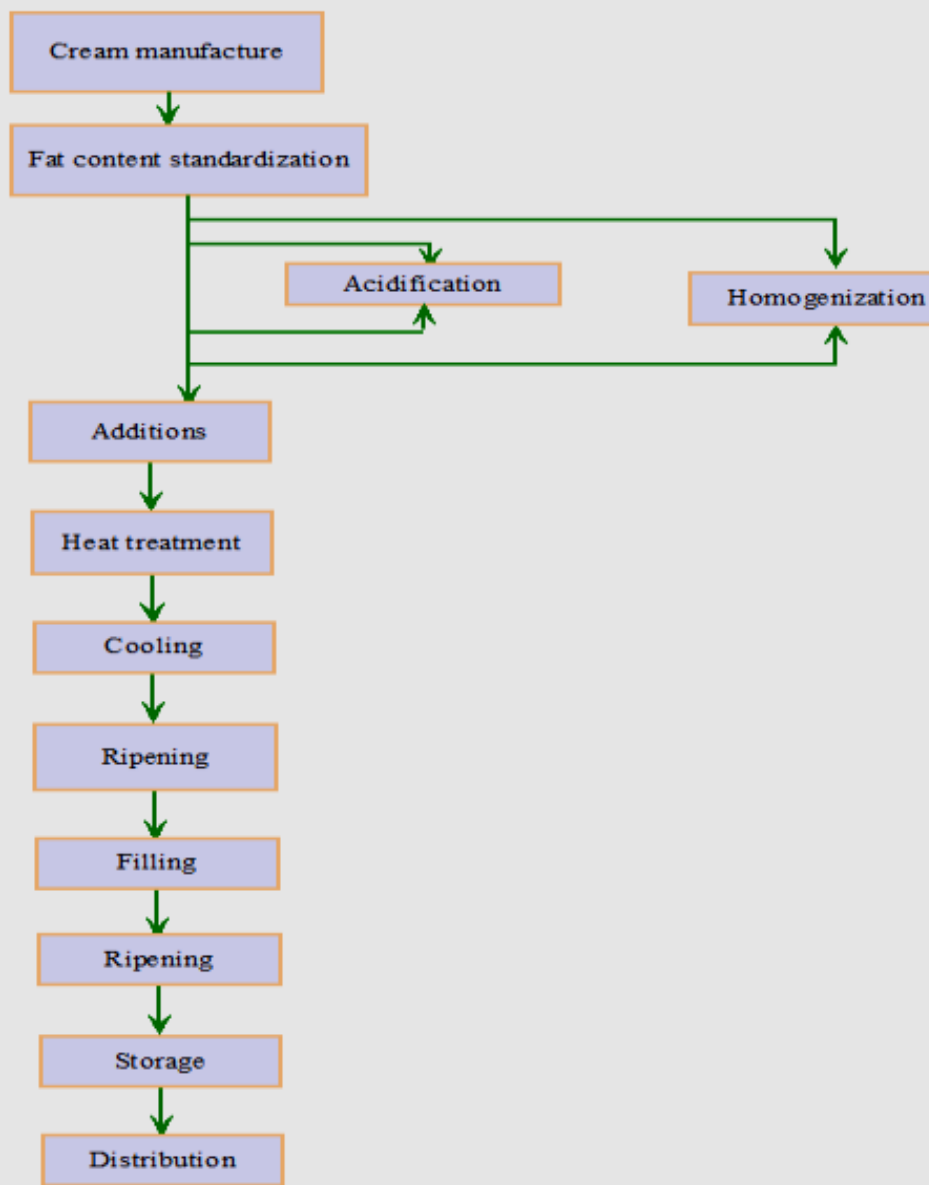
**Improve the
keeping quality
of cream during
transportation
over long
distances**

**Store surplus
cream for use
during shortage**

Method:

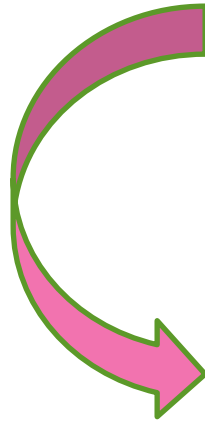
- ✓ Separate and standardize cream to 40-50% fat.
- ✓ Cream pasteurized at 75-88 C for 15s and cooled to 10 C quickly before freezing.
- ✓ Freezing may be carried out within containers, on a band to give a sheet or pellets or by direct contact with liquid nitrogen.
- ✓ Bulk storage of frozen cream in polyethylene bags may be used later to converted into butter or anhydrous milk fat.
- ✓ Cream should be frozen quickly and stored at -18 to -26 C for better keeping quality.

Cultured (Sour) Cream:



Flow diagram for manufacture of sour cream

- ✓ Involve standardization whole milk with cream to give the desired fat content, and then heating the mix to around 80°C for 30 min.
- ✓ Homogenization at 13-14 MPa and 60-80°C follows.
- ✓ After cooling to around 21°C, the cream is mixed with 1-2% of mesophilic butter culture, and incubated at 21°C until an acidity of 0.6% lactic acid has been reached (18-20 h).
- ✓ On cooling, the sour cream is then ready for packing in cartons, but care must be taken to avoid any serious deterioration in viscosity.



- 1. Sour cream mainly used in prepared foods, meat and vegetable dishes, confectioneries, less often in drinks or beverages.**
- 2. Extremely viscous product with flavor and aroma of butter milk, but with fat content of 12-30%.**
- 3. Method of consumption is similar to of normal cream.**