

A photograph of a glass of cream with a dollop of whipped cream on top. In the background, there is a glass of milk and a plate of cookies. The text "Factors affecting quality and ripening of cream" is overlaid on the image.

# **Factors affecting quality and ripening of cream**

**Keeping quality of retail cream is more critical than milk as cream usually receives more severe heat treatment than milk.**

**Milk is usually pasteurized one day, delivered the next, and consumed a day or two later, while cream has to be separated, standardized, cartoned and distributed (through retail dairy organization and then sold through super markets or shops).**

**Dairies aim at a keeping quality of 14 days at  $<5^{\circ}\text{C}$ .**



# Factors effecting the production of good quality cream

1.

- Production of clean milk from animals have better keeping quality

2.

- Milk procured from farmers needs immediate cooling to prevent growth of psychrotrophs

3.

- Separation and processing the milk under hygienic conditions

4.

- Wrong choice of temperature for heat treatment

5.

- Prompt cooling of cream and its storage at lower temperature

6.

- Transport of cream to the dairy under lower temperature

## Microbiological Quality of Cream

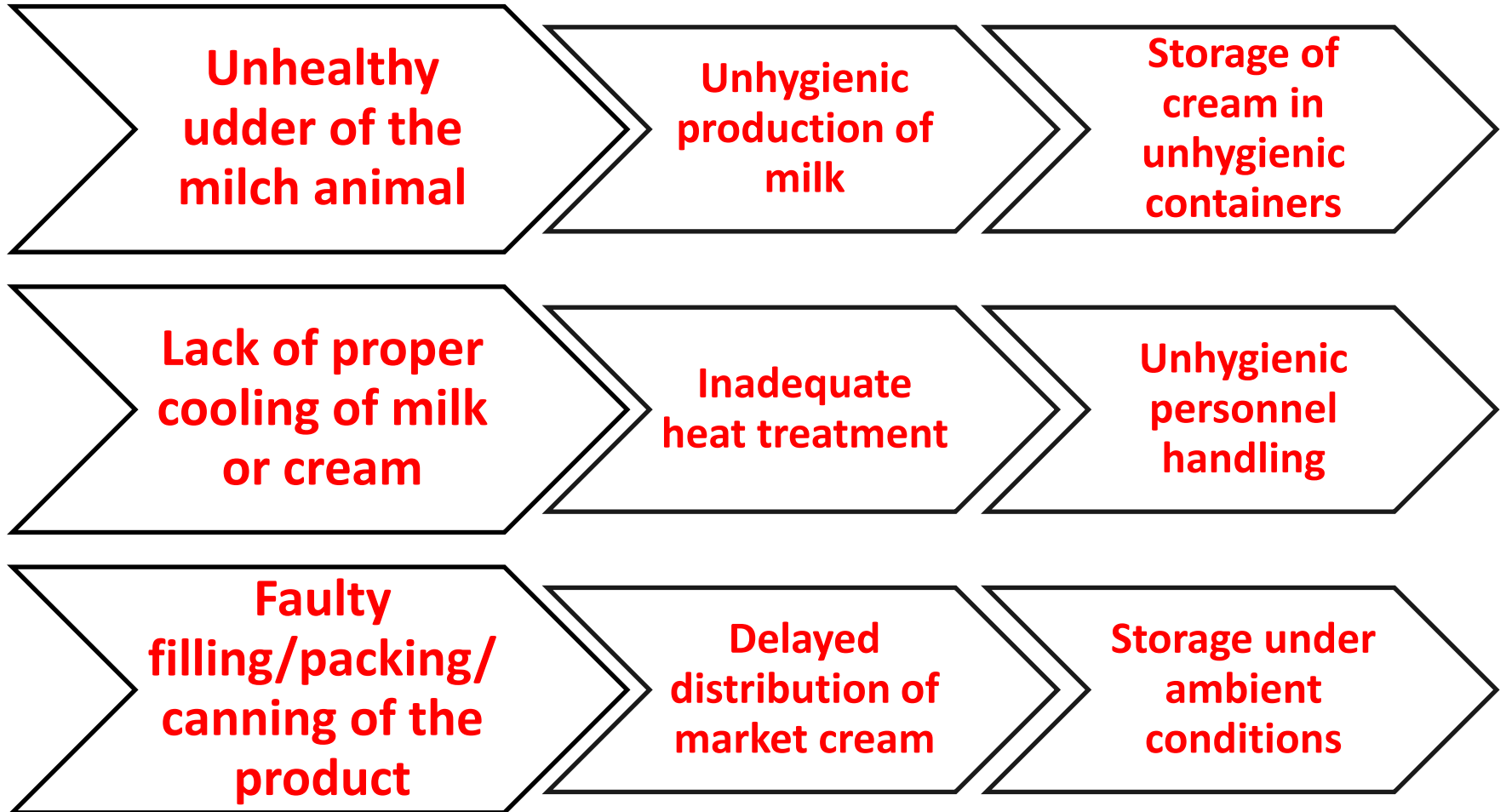
Cream presents more problems than milk because of longer storage and erratic distribution pattern.

- Microflora of cream processed in an unclean plant include a very high number of psychrotrophs.
- If not cooled rapidly  $<5^{\circ}\text{C}$ , staphylococci, lactobacilli and *B. cereus* predominate.
- Prolonged storage at low temperature: Psychrotrophs and Psychrophiles (proteolytic and lipolytic) mainly pseudomonads which enter product as contaminants from dirty water.
- Holding cream at  $5^{\circ}\text{C}$  results in the predominance of *Pseudomonas*, *Acinetobacter* and *Achromobacter* and at  $30^{\circ}\text{C}$ , *Bacillus*, *Micrococcus* and *Staphylococcus* predominate.
- Coliforms in refrigerated cream multiply slowly at  $3-5^{\circ}\text{C}$  and may increase 100-1000 folds in few days.

# Relationship between Microbiological Quality and Condition of Cream

<b>Microbial Counts</b>	<b>Interpretation of Quality</b>
<b>High total count and high coliforms</b>	<b>Inadequate heat treatment/unhygienic manufacture and storage at high temperature</b>
<b>High total count but low coliforms</b>	<b>Good hygiene but storage at high temperatures</b>
<b>Low total count but high coliforms</b>	<b>Poor hygiene in manufacture but storage at low temperatures</b>
<b>Low total count and coliforms but high yeasts</b>	<b>Good hygiene except contamination from fruits</b>
<b>Low total count and coliforms but high molds</b>	<b>Good hygiene except aerial contamination</b>
<b>Low total count and coliforms but high aerobic spores</b>	<b>Cream made from milk having high spore count</b>

# Causes of Microbial Defects



# Defects in Cream, their Causes and Prevention

## Table Cream:

Name of Defect	Causes	Prevention
(a) Flavour Cooked	Excessive heating of cream during pasteurization.	Proper heating of cream during pasteurization
Highly acid/sour	i. Using sour milk for separation ii. Acid development in cream	(i). Using fresh, sweet milk for preparation.  (ii). Neutralization of cream.
Oxidized/oily/ Metallic/Tallowy	Fat oxidation due to direct contact of milk with copper or iron, exposure of milk or cream to sunlight, etc.	i. Proper tinning of milk or cream holding vessels, or using aluminium alloy or stainless steel as contact surface  ii. Vacuum pasteurization of cream
Rancid	Fat hydrolysis due to lipase action in milk or cream	Inactivating lipase by proper pasteurization of milk and cream

## Flavour Defects

## Table Cream:

Name of defect	Causes	Prevention
Feathering in hot coffee	<ul style="list-style-type: none"><li>i. Excessive homogenization pressure</li><li>ii. Using sour cream</li><li>iii. Addition of salts</li></ul>	<ul style="list-style-type: none"><li>(i). Proper homogenization pressure</li><li>(ii). Using sweet cream</li><li>(iii). Avoiding addition of salts</li></ul>

## Miscellaneous





# Manufacturing Cream:

## Flavour Defects

Name of defect	Causes	Prevention
Barny	(i). Poor ventilation of milking byre/barn  (ii). Not keeping milk properly covered during production	(i). Proper ventilation of milking byre/barn  (ii). Keeping milk properly covered during production
Bitter	(i). Intake of bitter weeds by milch animals  (ii). Lipase activity during (raw) cream separation  (iii). Growth of Proteolytic bacteria in cream	(i). Eradication of off ending weeds.  (ii). Checking lipase activity by avoiding the 'danger zone(38-49 <sup>0</sup> C) in cream separation.  (iii). Storage of cream at 5 <sup>0</sup> C(40 <sup>0</sup> F) or below to check bacterial growth.
Cheesy	Growth of Proteolytic bacteria leading to casein break down.	Storage of cream at 5 <sup>0</sup> C(40 <sup>0</sup> F) or below to check bacterial growth.
Coarse-acid/sour	Uncontrolled acid development in cream	Storage of cream at 5 <sup>0</sup> C(40 <sup>0</sup> F) or below to check acid development
Cooked , Feed and weed Rancid Oxidized etc.	Feeding of milk tainting feeds and weeds within 3 hours before milking.	(i). Avoid Feeding of milk tainting feeds and weeds soon milking  (ii). Eradication of milk tainting weeds.  (iii). Vacuum pasteurization of cream
Fruity	Development of by-products of growth of certain un-desirable micro-organisms	Storage of cream at 5 <sup>0</sup> C(40 <sup>0</sup> F) or below to check microbial growth.
Utensil	Using dirty utensils	Using well cleaned utensils
Yeasty	Growth of lactose fermenting yeasts	Storage of cream at 5 <sup>0</sup> C(40 <sup>0</sup> F) or below to check yeast growth