Dairy Science &Technology

(Animal Husbandry and Dairying)

Microbiology of cream

Professor (Dr.)Devesh Gupta

Professor and In charge (Department of Dairy Science &Technology),

J.V.(P.G.) College, Baraut(Baghpat) U.P.

PDF Notes 2026

J.V.(P.G.) College, Baraut(Baghpat) U.P.

Cream is the fat-rich portion of milk obtained on keeping it undisturbed for sometime (gravity separation) or on centrifuging.

PFA 1955 (Amended 1985)-The product obtained from cow or buffalo milk or combination thereof which contains not less than 25% milk fat.

Average chemical Composition of cream:

Fat: 10% – 48% (higher percentage = thicker cream)

Moisture: 57.7% – 80.3% (varies inversely with fat content)

Protein: 2.0% – 3.0%

Lactose (Carbohydrate): 2.8% – 4.3%

Ash (Minerals): 0.5% – 0.7%

Common Cream Fat Levels:
Low Fat Cream: Not less than 25% fat.

Medium Fat Cream: Not less than 40% fat to 59%.

High Fat Cream: Not less than 60% fat.

Microbiological standards-1.Raw cream-plate count/ml or gm. below 4,00,000 very good, coli form count should not be more than 10.

Pasteurized cream-plate count/ml(or g) should not exceed 60,000 and coli form count/ml or gm not more than 10.

Type of Micro organism- Microorganisms in cream are categorized based on their origin and thermal stability:
(A) Bacteria-
Original Flora: Micrococci, Streptococci (lactic and non-lactic), Corynebacteria and sporeformers (aerobic/anaerobic) derived from raw milk.

Contaminating/Spoilage Bacteria:Pseudomonas, Alcaligenes, Acinetobacter and Aeromonas-These can produce lipases and proteases that cause off-flavors (bitterness, rancidity).

Pathogens-Staphylococcus, Salmonella.

(B)**Yeasts and Molds**: Common species include Candida pseudotropicalis, Torulopsis sphaerica and Geotricum candidum.

F**actor affecting the microbiological quality of cream** –

1. Raw milk quality 2. Separation process 3. Heat treatment 4.Holding of cream before and after processing 5.Packaging & Storage.

Microbiological defects in cream their causal organism-

Defect	Cause	Causal Microorganism(s)
Souring	Fermentation of lactose into lactic acid	Lactococcus lactis, Lactobacillus *species., Bacillus cereus*
Rancidity	Hydrolysis of milk fat into free fatty acids	Pseudomonasfragi, Alcaligenes, Acin etobacter
Bitterness	Breakdown of proteins into bitter peptides.	Pseudomonas fluorescens, Bacillus cereus.
Yeasty	Production of CO2 and alcohol; common in raw or old cream.	Candida pseudotropicalis, Torulopsis sphaerica.
Moldy	Surface growth; often looks like colored mats	Geotrichum candidum
Sweet Curdling	Coagulation without souring; caused by rennet-like enzymes.	Bacillus cereus, Bacillus subtilis.

Prevention/Control Measures of Microbiological defects-
The control of these defects relies on Microbiological Quality Control strategies across the production chain:

- **Raw Material Quality**: Ensuring the Microbiology of Cream starts with raw milk containing low bacterial and spore counts. Healthy udders and hygienic milking are essential.
- **Effective Pasteurization:** Heating cream is Critical Control to eliminate vegetative pathogens and most spoilage organisms.
- **Equipment Hygiene**: proper cleaning and sanitation of a cream separators, pipelines, and storage tanks prevents post-pasteurization recontamination.
- **Temperature Management**: after processing and maintaining storage temperatures below 5°C slows the growth of bacteria.
- **Aseptic Packaging**: Using sterile packaging material and automated machines reduces human contact and aerial contamination.

References- Comprehensive Dairy Microbiology –V.K.Batish et.al.

Research Gate.