

**Dairy Milk Processing,
Milk Production, Milk
Composition, Milk
Treatment, Fermentation,
Chemistry of Milk**

Introduction

India is the world's largest producer of milk, and is the leading exporter of skimmed milk powder, yet it exports very few other milk product. It is the world's largest consumer of dairy products, consuming almost 100% of its own milk production. The ever increasing rise in domestic demand for dairy products and a large demand-supply gap could lead to India being a net importer of dairy products in the future. Milk has been an integral part of Indian food for centuries.

The largest structures in the fluid portion of the milk are "casein micelles": aggregates of several thousand protein molecules with superficial resemblance to a surfactant micelle, bonded with the help of nanometer-scale particles of calcium phosphate.

Each casein micelle is roughly spherical and about a tenth of a micrometer across. There are four different types of casein proteins: α s1-, α s2-, β -, and κ -caseins. Collectively, they make up around 76–86% of the protein in milk, by weight. Most of the casein proteins are bound into the micelles.

Demand for milk and milk proteins in developing countries is growing with rising incomes, population growth, urbanization and changes in diets. The growing demand for milk and milk proteins offers a good opportunity for producers (and other actors in the dairy chain) in high-potential, peri-urban areas to enhance their livelihoods through increased production.

Global milk protein concentrate market is segmented on the basis application and region. Based on the application milk protein concentrate is segmented into nutritional beverages, infant formula, dietary products, frozen food, yogurts, bakery and confectionary. Of which nutritional beverages is expected to be the leading segment, followed by other segments owing to the health benefits associated with the consumption of nutritional beverages coupled with the rising consumer awareness related to the nutritional food products.

Proteins play an important role in nutrition, taste, allergies, texture, structure, processing and yield performance. In the food industry, proteins are a key element of our diet and an important ingredient for food technologists. The total protein component of milk is composed of numerous specific proteins. Isolated milk protein products represent an important and valuable source of protein ingredients due to their recognized superior nutritional, organoleptic and functional properties. Milk protein is a rich source of essential amino acids and they have been the subject of intensive research for an effort to unravel their molecular structure and interactions,

relationship between structure and functional attributes, interactions of proteins during processing and, more recently, their physiological functions. Free fatty acids (FFA) in fresh milk normally amount to less than 1% of the total milk fat, yet they are important because of their effect on milk flavour. Now a day, the processing of milk is part of a highly organized and controlled dairy industry, which produces and markets a multitude of dairy products. Functional milk proteins are perfectly suited for use in the dairy sector of food production and the modern food processing industry is placing more and more emphasis upon the utilization of protein ingredients to provide specific functional properties to a wide range of formulated foods.

In recent years, there has been a great deal of progress in the understanding and management of milk proteins across the production chain.

Some of the fundamentals of the book are surface tension of milk, lactose chemistry, milk proteins, phosphorylation of milk proteins, comparative aspects of milk proteins, utilization of milk proteins, heat stability of milks, heat stability of homogenized concentrated milk, lysinoalanine in milk and milk products, heat coagulation of type a milk, syneresis of heated milk, fatty acids in milk, milk gel assembly, mechanical agitation of milk, natural, leucocyte and bacterial milk, grass and legume diets and milk production.

This book provides a complete overview and offers insights into topics for more in-depth reading on milk and milk proteins. The book covers chapters on milk proteins, biosynthesis & secretion of milk proteins, utilization, types of milk proteins, phosphorylation, milk glycoproteins and many more. It is hoped that this book will be very helpful to all its readers, students, new entrepreneurs, food technologist, technical institution and scientists.

Table of Contents

1. SURFACE TENSION OF MILK

Materials and their analysis, Surface tension measurements, Instrumentation, Measurements

2. LACTOSE CHEMISTRY

Selective esterification reactions,
Selective acetalation reactions

3. MILK PROTEINS

Heterogeneity and fracticmation, Microheterogeneity, Post-secretion proteolysis in milk, Molecular characteristics of the milk proteins, Ion-binding and precipitation of caseins, The casein micelle, Micettar demobilization, Acidification, Addition of calcium, Alcohol, Proteolysis, Heat coagulation, Commercial milk protein products, Functional properties of whey proteins, Solubility, Emulsion properties, Gelling properties, Whipping and gelling properties, Viscosity, Chemical and enzymic modification of whey proteins , Chemical modification,

Enzymic modification, Functional properties of caseins and caseinates, Solubility, Emulsion properties, Gelling properties, Whipping and foaming properties, Viscosity, Chemical and Enzymic Modification of Caseinates, Chemical Modification, Enzymic modifications

4. MILK PROTEIN BIOSYNTHESIS AND SECRETION

The Lactating Mammary Gland, Precursors, Milk Protein Biosynthesis, Molecular aspects, Alteration of proteins, Milk Secretion, Structures involved, Membrane flow, Other Proteins in Milk, Blood proteins, Cellular constituents, Conclusion

5. PHOSPHORYLATION OF MILK PROTEINS

6. MILK GLYCOPROTEINS

k-Casein, Heterogeneity, Chymosin-sensitive linkage and primary structure, Localization and linkage of the sugar part,

Structure of the carbohydrate part, Phylogenetic aspects concerning the sugar part, Evolution of the sugar part as a function of development, Location of the sugar part in the secondary structure of k-casein, Role of the sugars in k-casein, Lactotransferrin

7. COMPARATIVE ASPECTS OF MILK PROTEINS

Kinds of Proteins in Milk,
Caseinate Micelles

8. UTILIZATION OF MILK PROTEINS

General requirements of food protein products, Functional properties of food protein products, General properties of milk protein products, Preparation and properties of casein curd and caseinates, Production and properties of co-precipitates, Production and properties of lactalbumin, Enzymic modification of lactalbumin, Production and properties of whey protein concentrates, Production and properties of milk protein blends

9. HEAT STABILITY OF MILKS

Experimental Methods, Results and Discussion,
Effects of b-Ig, Effects of urea, Conclusions

10. HEAT STABILITY OF HOMOGENIZED MILK

Materials and Methods, Results and Discussion, Preliminary experiments, Effect of Homogenization pressure, Homogenisation of skim-milk, Homogenization temperature and MFO size distribution, Seasonal effects, Addition of urea, Effect of changes in the mineral equilibrium on the heat stability of homogenized milk, Influence of SH-group interactions

11. HEAT STABILITY OF HOMOGENIZED CONCENTRATED MILK

Materials and Methods, Results and Discussion

12. HEAT STABILITY OF EVOPORATED MILK

Materials and Methods, Results and Discussion, Comparisons among milks of normal Whey protein content, Effect of Low whey Protein Concentration, Controls

13. HEAT STABILITY OF MILK WITH HCHO

Materials and Methods, Milk supply, Caseinate systems, Chemicals, Heat treatment of milk samples, Amidination of milk proteins, Determination of N, Determination of N-acetylneuraminic acid (NANA), Polyacrylamide gel electrophoresis (PAGE), Available lysine and formal titration, Determination of heat stability, Results and Discussion, Effect of ECHO on HCT-pH profile of skim milk and caseinate systems, Possible mechanism of HCHO action , Modification of lysine, Crosslinking action of HCHO

14. HEAT STABILITY OF CONCENTRATED SKIM-MILK

Materials and Methods, Results, Discussion

15. CATIONIC DETERGENT ON HEAT STABILITY OF MILK

Materials and Methods, Milk supply, Caseinate systems, Materials, Determination of heat stability, Results, Discussion

16. ARGININE RESIDUE AND HEAT STABILITY OF MILK

Materials and Methods, Milk supply, Lactose-free milk, Reagents, Determination of heat stability, Results, Effect of glycerols on heat stability, Effect of arginine-modifying agents on heat stability, Effect of lysine-modifying agents on heat stability, Effect of other modifying agents on heat stability, Discussion,

17. KEEPING QUALITY OF PASTEURIZED MILK

Experimental, Sampling at the dairies, Preparation of the milks for storage, Storage conditions, Bacteriological techniques, Spoilage, Effectiveness of the cleaning and disinfection procedure used for the laboratory pasteurizing plant, Results, Bacteriological quality of the raw and the freshly pasteurized milks, Effect of psychrotrophic PPC on the keeping quality of HTST-pasteurized milk,

Effect of psychrotrophic PPC on the keeping quality of HTST-pasteurized milk, Psychrotrophic PPC in HTST-pasteurized milk in finished milk tanks and after filling into retail containers, Discussion

18. LYSINOALANINE IN MILK AND MILK PRODUCTS

Conditions for the formation of LAL, Influence of structure, Influence of pH, temperature and time, Effect of multivalent cations, Inhibition of LAL formation, Determination of Lal, LAL content of milk and milk products, Biological effects and human health implications, Conclusion

19. 4-CASEINS IN RAW MILK

20. PROTEOLYSIS IN UHT MILK

Materials and Methods, Isolation of a proteinase-containing fraction, Determination of proteolytic activity, Experimental trials, Results and Discussion

21. PROTEOLYSIS IN MASTITIC MILK

Materials and Methods, Results , Discussion

22. EQUILIBRIA OF CA AND PHOSPHATE IN MILK

23. HEAT COAGULATION OF TYPE A MILK

Symbols and Definitions used, Theory, Discussion

24. TITRIMETRIC STUDIES ON MILK PRODUCTS

Results, Practical examples

25. OESTRUS AND MILK PRODUCTION

Experimental, Animals, Oestrus, Milk production, Observations, Results, Milk production, Relationships with behaviour, Discussion

26 IMMUNOREACTIVE b-CASOMORPHIN IN MILK

Materials and Methods, Incubation of milk with bacteria, Extraction procedure, Chromatography, Radioimmunwassays, Results,

27. SYNERESIS OF HEATED MILK

Materials and Methods, Carboxymethylation of whole casein, Artificial micelle milk, Heat treatment, Syneresis, Rennet coagulation time (RCT), RESULTS, Effect of preheating on syneresis, Effect of preheating temperature, Influence of whey proteins on the response of AMM to heat, Nature of the interaction between κ -Ig and K-casein, Discussion

28. NITROGEN CONTENT OF HUMAN MILK

Nitrogen Content of Human Milk, Materials and Methods,, Sample material, Sampling procedure, Absorbance measurements, N content, Results and Discussion, Linearity of the method, Applicability of the method to milk stored in human milk banks, Applicability of the method to human expressed milk

29. STIMULATION OF MILK LIPOLYSIS

Experimental, Methods, Variation between cows, Effect of high cell count, Effect of proteolysis, Results, Variation between cows, Effect of high cell counts, Effect of proteolysis, Materials and Methods,

30. ANALYSIS OF INDIVIDUAL FREE FATTY ACIDS IN MILK

Materials and Methods, Preparation of Amberlyst 26 ion exchange resin, Extraction of lipid, Adsorption of FFA, Preparation of methyl esters, Gas chromatography conditions, Preparation of FFA mixture, Properties of the resin, Application to milk, Results and Discussion, Properties of the resin, Interference from phospholipid, Capacity of the method over the range of FFA in most milks, Application to milk

31. BEHAVIOUR OF S. LACTIS IN COW'S AND EWE'S MILK

Materials and Methods, Results and Discussion, Composition of milk, Generation time, Acid production

32. MILK TREATMENT AND CURD STRUCTURE

Experimental, Preparation of processed milks, Analyses of milk, Measurement of formation, properties and structures of curds, Cheese-making and analyses of cheeses, Results, Effect of treatments on milk fat globules and casein micelles, Relations between milk treatment and formation, structure and properties of curd, Cheesemaking properties of processed milks, Discussion

33. FERMENTATION OF GOATS MILK

Materials and Methods, Starter cultures, Milks, Chemical analyses, Bacteriological analyses, Results, Discussion

34. LIPOLYSIS IN DEEP FROZEN RAW SHEEP'S MILK

Materials and Methods, Results , Free fatty acid concentrations, Lipoprotein lipase activity, Hexane-extractable fat concentration, Discussion

35. MILK GEL ASSEMBLY

Experimental, Results , Qualitative description of gel formation, Quantitative observations of gel formation, Discussion

36. FLAVOUR VOLATILES IN HEAT-TREATED MILKS

Experimental, Procedure, for preparation of milk, Collection of volatiles, Gas chromatography, Identification of volatiles, Organoleptic assessment of heated milk, Results , Recovery experiments, Non-sulphur compounds, Sulphur compounds, Organoleptic assessment, Isolation of volatiles, Concentrations relative to threshold, Correlation between sensory evaluation of milk and its chemical composition

37. MECHANICAL AGITATION OF MILK

Materials and Methods, Experimental and Results, Influence of temperature of milk and speed and duration of agitation on substrate activation and lipolysis, Discussion

38. MILKS FROM RYEGRASS OR LEGUE DIETS-II

Materials and Methods, Chemical analysis and coagulation properties, Data handling, Results, Discussion

39. NMR SPECTRA OF COW'S MILK

Experimental, Materials, Methods, Results, P NMR spectrum of milk, Effect of pH on the. spectrum of milk, Line-broadening in P NMR spectra of milk, Discussion

40. NATURAL, LEUCOCYTE AND BACTERIAL MILK

Materials and Methods, Isolation of PMN leucocytes and preparation of cell homogenates, Psychrotrophic bacteria and proteinase production, Determination of caseinolytic activity, Effect of processing on leucocytes in skim milk, Isolation of bovine plasminogen, Determination of proteinase specificities towards casein, Electrophoresis, Results, Growth of psychrotrophic bacteria and production of proteinases in milk,

Proteinase activity of leucocytes and of natural milk proteinase in milk, Effect of processing on leucocytes in skim milk, Casein hydrolysis profiles, Discussion

41. MILK FROM RYEGRASS OR LEGUME DIETS-I

Materials and Methods, Results, Discussion

42. GRASS AND LEGUME DIETS AND MILK PRODUCTION

Materials and Methods, Animals, Experiment 1 , Pre experimental treatment of animals, Experimental treatment, Measurements, Sample preparation and analysis, Calculation and expression of results, Statistical analysis, Experiment 2 , Animals, Pastures, Measurements, Sample preparation and analysis, Statistical analysis, Results , Discussion, Milk production and composition, Intake and nutrient flow, Grass and legume forage for milk production

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