
1.1 Introduction

1.2 Composition of milk lipids

1.2.1 Fatty acids

1.2.2 Triacylglycerols

1.2.3 Mono- and diacylglycerols and free fatty acids

1.2.4 Phospholipids

1.2.5 Minor constituents

1.3 Origin of milk lipids

1.3.1 Biosynthesis and origin of the fatty acids in milk lipids

1.3.2 De novo synthesis of fatty acids

1.3.3 Uptake of fatty acids from the blood

1.3.4 Desaturation of fatty acids

1.3.5 Synthesis of triacylglycerols

1.4 Factors affecting the composition of milk lipids

1.5 Intracellular origin of milk lipid globules and the milk lipid globule membrane

1.5.1 Secretion of milk lipid globules

1.5.2 The milk lipid globule membrane

1.5.3 Lipids of the milk lipid globule membrane

1.5.4 Proteins of the milk lipid globule membrane

1.5.5 Enzymes of the milk lipid globule membrane

1.6 Physicochemical stability of milk lipid globules

1.6.1 Size distribution of milk lipid globules

1.6.2 Colloidal stability of milk lipid globules

1.6.3 Creaming of milk lipid globules
1.6.4 Coalescence of milk lipid globules
1.6.5 Homogenisation and properties of homogenised milk lipid globules
1.6.6 Temperature-induced changes in milk lipid globules
1.7 Crystallisation and melting of milk triacylglycerols
1.8 Conclusions

References

2 Milk Fat Nutrition (P.W. PARODI).

2.1 Introduction
2.2 Conjugated linoleic acid
2.2.1 Origin of rumenic acid
2.2.2 CLA nutrition
2.2.3 CLA as an anticancer agent
2.2.4 Rumenic acid and mammary tumour prevention
2.2.5 CLA, RA and colon tumour prevention
2.2.6 Rumenic acid and the prevention of atherosclerosis
2.2.7 Trans fatty acids and coronary heart disease
2.2.8 Rumenic acid and immunomodulation
2.2.9 Rumenic acid and type 2 diabetes mellitus
2.2.10 Rumenic acid as a growth factor
2.3 Sphingolipids
2.3.1 Sphingolipids in colon cancer prevention
2.3.2 Sphingomyelin and cholesterol absorption
2.3.3 Sphingomyelin and the immune system
2.3.4 Sphingolipids and intestinal diseases
2.4 Butyric acid
2.5 Branched chain fatty acids
2.6 Fat-soluble components
2.6.1 The vitamins
2.6.2 Cholesterol
2.6.3 Other interesting components
2.7 Further nutritional benefits
2.8 Perceived nutritional negatives for milk
2.8.1 Milk fat and coronary artery disease
2.8.2 Saturated fatty acids
2.8.3 Fat intake and cancer
2.8.4 Dietary fat and obesity
2.9 Conclusions

References

3 Separation and Standardisation of the Fat Content (M. GUNSING, H.C. VAN DER HORST, D. ALLERSMA AND P. DE JONG).

3.1 Introduction
3.2 Overview of the history of milk fat separation
3.3 Physical models
3.4 Standardisation of the fat content of milk
3.5 Conclusion

References

4 Cream and Related Products (M.A. SMIDDY, A.L. KELLY AND T. HUPPERTZ).

4.1 Introduction
4.2 Cream processing
4.2.1 Separation
4.2.2 Standardisation
4.2.3 Heat treatment
4.2.4 Homogenisation
4.2.5 Quality of cream

4.3 Whipping cream
4.3.1 Production of whipping cream
4.3.2 Whipping of the cream
4.3.3 Characterisation of whipped cream
4.3.4 Influence of processing conditions on whipping characteristics of cream
4.3.5 Compositional factors affecting whipped cream characteristics
4.3.6 Influence of stabilisers and emulsifiers on whipping characteristics of cream

4.4 Aerosol-whipped cream
4.4.1 Production of aerosol-whipped cream
4.4.2 Properties of aerosol-whipped cream

4.5 Cream liqueur
4.5.1 Composition of cream liqueur
4.5.2 Processing of cream liqueur
4.5.3 Shelf-life of cream liqueur

4.6 Cultured, fermented or sour cream
4.6.1 Background
4.6.2 Production of cultured, fermented or sour cream

4.7 Coffee cream
4.7.1 Processing of coffee cream
4.7.2 Properties of coffee cream

4.8 Other cream products
4.8.1 Frozen cream
4.8.2 Dried cream

4.9 Conclusion

References

5 Butter (R.A. WILBEY).

5.1 Introduction

5.2 Cream preparation

5.2.1 Sweet cream

5.2.2 Ripened/fermented/cultured cream

5.2.3 Modifications of cream ageing

5.3 Batch churning

5.4 Continuous butter manufacture

5.4.1 Cream feed to buttermaker

5.4.2 Conversion to butter-grains

5.4.3 Working

5.4.4 Salting

5.5 Alternative processes for cultured butters

5.6 Alternative technologies for continuous buttermaking

5.6.1 Low-fat route

5.6.2 Shearing high-fat cream

5.7 Recombined butter

5.8 Reduced-fat butters

5.9 Spreadable butters

5.10 Packaging

5.11 Flavoured butters

5.12 Quality issues
5.13 Concluding comments

References


6.1 Introduction

6.2 Definitions and properties

6.3 Production statistics

6.4 Anhydrous milk fat/butteroil manufacture processes

6.4.1 Principles

6.4.2 Manufacturing options

6.4.3 Quality of milk fat during and post manufacture

6.5 Milk fat fraction

6.5.1 Process options

6.5.2 Fraction properties

6.6 Ghee

6.6.1 Introduction

6.6.2 Methods of manufacture

6.6.3 Packaging

6.6.4 Chemical composition

6.6.5 Flavour

6.6.6 Physicochemical properties

6.6.7 Texture

6.6.8 Thermal oxidation

6.6.9 Shelf-life of the product

6.6.10 Nutritional aspects

6.6.11 Ghee as a medicine
6.7 Conclusion
6.8 Acknowledgements

References

7 Production of Yellow Fats and Spreads (B.K. MORTENSEN).

7.1 Introduction
7.2 Legislations
7.3 Dairy fat spreads
7.3.1 Introduction
7.3.2 Production technologies
7.3.3 Quality aspects
7.4 Blends and blended spreads
7.4.1 Introduction
7.4.2 Production technologies
7.4.3 Quality aspects
7.5 Products with modified functionality
7.5.1 Introduction
7.5.2 Production technologies
7.5.3 Applications
7.6 Nutritionally modified products
7.6.1 Introduction
7.6.2 Production technologies
7.7 Conclusions

References

8 Cream Cheese and Related Products (T.P. GUINEE AND M. HICKEY).

8.1 Introduction
8.2 Background and development
8.3 Definitions and standards of identity
8.3.1 Background and evolution
8.3.2 European legislation
8.3.3 UK legislation
8.3.4 Irish legislation
8.3.5 US legislation and standards
8.3.6 Canadian legislation and standards
8.3.7 German cheese legislation with particular reference to cream cheese-type products
8.3.8 Danish cheese legislation with particular reference to cream cheese-type products
8.3.9 French cheese legislation with reference to some cream cheese-type products
8.3.10 Italian standard on Mascarpone
8.3.11 Cheese legislation in Australia
8.3.12 Codex Alimentarius – international standards for cheese and cream cheese
8.4 Cream cheese
8.4.1 Principles of manufacture
8.4.2 Manufacture stages
8.4.3 Recombination technology
8.5 Basic characterisation of the structure and rheology of cream cheese
8.6 Factors affecting the properties of cream cheese
8.6.1 Homogenisation of cheese milk
8.6.2 Holding of hot curd at high temperature while shearing
8.6.3 Homogenisation of the heated cream cheese
8.6.4 Cooling rate
8.6.5 Addition of whey protein
8.6.6 Hydrocolloids
8.6.7 Composition
8.7 Related cheese varieties
8.7.1 Mascarpone
8.7.2 Neufchâtel and Petit-Suisse
8.7.3 Kajmak
8.8 Conclusion
References

9 Microbial Production of Bioactive Metabolites (S. MILLS, R.P. ROSS, G. FITZGERALD AND C. STANTON).

9.1 Introduction
9.2 Short-chain fatty acids
9.2.1 Background
9.2.2 Production of short-chain fatty acids in the colon
9.2.3 Role of short-chain fatty acids in health and disease
9.3 Gamma amino butyric acid
9.3.1 Introduction
9.3.2 Gamma amino butyric acid effects
9.4 Overall conclusion
9.5 Acknowledgements
References

10 Trouble Shooting (B.B.C. WEDDING AND H.C. DEETH).

10.1 Introduction
10.2 Milk
10.2.1 Transmitted flavours
10.2.2 Chemical flavours
10.2.3 Flavours associated with oxidation
10.2.4 Flavours associated with heat treatment
10.2.5 Bacterial flavours
10.2.6 Lipolysed flavour
10.2.7 Proteolysis
10.2.8 Antibiotics

10.3 Cream
10.3.1 Transmitted flavours
10.3.2 Microbiological defects
10.3.3 Defects associated with oxidation
10.3.4 Physical defects and stability
10.3.5 Lipolysis
10.3.6 Defects associated with whipped cream
10.3.7 Defects associated with coffee cream
10.3.8 Defects associated with UHT cream
10.3.9 Defects associated with sterilised cream

10.4 Butter
10.4.1 Microbiological defects
10.4.2 Cultured butter
10.4.3 Butter churning defects
10.4.4 Oxidative defects
10.4.5 Physical defects

10.5 Dairy spreads
10.5.1 Fat phase structure
10.5.2 Microbiological defects
10.5.3 Oxidative defects

10.6 Cream cheese
10.6.1 Microbiological defects
10.6.2 Emulsion stability
10.6.3 Flavour defects
10.6.4 Texture defects
10.6.5 Oxidative defects

10.7 Conclusion

References

Index