



CVM UNIVERSITY

Aegis: Charutar Vidya Mandal (Estd.1945)

FACULTY OF ENGINEERING & TECHNOLOGY

Effective from Academic Batch: 2024-25

Programme: Bachelor of Technology (Dairy Technology)

Semester: VI

Course Code: 202200604

Course Title: Fat Rich Dairy Products

Course Group: Professional Core Course

Course Objectives: To understand processing conditions of different types of fat rich dairy products (cream, butter, and ghee) and chemical analysis of it. There is also a growing market for specialty products like low-fat spreads and flavored butters, driven by consumer preferences for healthier and premium options.

Teaching & Examination Scheme:

| Contact hours per week | | | Course Credits | Examination Marks (Maximum / Passing) | | | | |
|------------------------|----------|-----------|----------------|---------------------------------------|----------|----------|----------|----------|
| Lecture | Tutorial | Practical | | Theory | | J/V/P* | | Total |
| | | | | Internal | External | Internal | External | |
| 3 | 2 | 0 | 4 | 50 / 18 | 50 / 17 | 25 / 9 | 25 / 9 | 150 / 53 |

* J: Jury; V: Viva; P: Practical

Detailed Syllabus:

| S. N. | Contents | Hours |
|-------|--|-------|
| 1 | Introduction to fat rich dairy product Status of fat rich products, Types of fat-rich dairy products in India and abroad. Definition and legal standards of cream, butter, ghee and butter oil | 6 |
| 2 | Cream production, processing and quality evaluation Efficiency of cream separation and factors affecting it; control of fat concentration in cream. Planning and operating a cream production unit neutralization, standardization, pasteurization, and cooling of cream. Operation of cream separator. Preparation and properties of table cream, sterilized cream, and whipped cream, plastic cream, frozen cream, and chip-dips (cultured cream) Factors affecting quality and ripening of cream. Packaging, storage, and distribution of cream, Quality and preservation of cream. Defects (non-microbial) in cream and their prevention | 10 |
| 3 | Butter production, processing and quality evaluation Introduction, Classification and Composition of Butter, Different types of Butter available in Indian Market. Theory of churning and legal standards and technology of butter manufacture by batch, and continuous butter churner, construction of churner. Over-run in butter; control of fat loses in buttermilk. Packaging and storage; transportation; defects in butter. CIP of butter churner | 12 |



| | | |
|---|---|----|
| 4 | Special butters and related products Manufacture, packaging, storage, and properties of whey butter, flavoured butter, whipped butter. Renovated butter/fractionated and polyunsaturated milk fat products, vegetable oil-blended products and low-fat spreads. Manufacture, packaging, storage, and characteristics of margarine | 8 |
| 5 | Ghee and butter oil Ghee making by batch and industrial processes, innovations, preparation, production, packaging, preservation and storage; Quality and Grading of ghee. Composition and changes during manufacture of fat constituents in ghee, Manufacture of butter oil, packaging and storage, CIP of ghee section | 9 |
| | Total | 45 |

List of Practical:

| S. N. | Experiment Title |
|-------|---|
| 1. | Separation of cream by cream separator |
| 2. | Evaluation of fat and acidity in cream |
| 3. | Standardization of cream |
| 4. | Preparation of sterilized cream |
| 5. | Manufacturing of desi butter (Makkhan) |
| 6. | Study the preparation of ghee from cream and butter |
| 7. | Determination of acid value in ghee |
| 8. | Estimation of saponification value in ghee |
| 9. | Detection of adulterations in ghee and butter |
| 10. | Industrial visit (operation of continuous ghee plant) |

Reference Books:

| | |
|---|---|
| 1 | Anantkrishnan, C. P. and Srinivasan, M. R.1964. Milk Products of India. ICAR Publications, New Delhi. |
| 2 | Aneja, R. P., Mathur, B. N., Chandan, R. C. and Banerjee, A.K. 2002. Technology of Indian Milk Products. A Dairy India Publication, Delhi |
| 3 | Bhattacharyya, D. K., Pal, P. K. and Ghosh, S. 2000. Isopropanol Fractionation of oil butter and characteristics of fractions. JAOCS 77: 1215-1218. |
| 4 | S.K De, S.1980. Outlines of Dairy Technology. Oxford University Press, Delhi. |

Supplementary learning Material:

| | |
|---|---|
| 1 | PDF: Status-and-types-of-fat-rich-dairy-products-in-India-and-abroad.pdf |
| 2 | PDF: Definition-and-legal-standards-efficiency-of-cream-separation-and-factors-affecting-it-control-of-fat-concentration-in-cream.pdf |
| 3 | PDF: Ghee making batch and industrial processes, innovations in ghee production |
| 4 | PDF: Procedure, packaging, and preservation of ghee |
| 5 | PDF: Composition and changes during manufacture of fat constants in ghee |



Pedagogy: Following one or more points can be incorporated as relevant pedagogy methods.

- Direct classroom teaching
- Audio Visual presentations/demonstrations
- Assignments/Quiz
- Continuous assessment
- Interactive methods
- Seminar/Poster Presentation
- Industrial/ Field visits
- Course Projects

Suggested Specification table with Marks (Theory) (Revised Bloom's Taxonomy):

| Distribution of Theory Marks in % | | | | | | R: Remembering; U: Understanding; A: Applying; N: Analyzing; E: Evaluating; C: Creating |
|-----------------------------------|-----|-----|-----|-----|---|---|
| R | U | A | N | E | C | |
| 15% | 15% | 25% | 20% | 20% | - | |

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes (CO):

| S.N. | Course Outcome Statements | %weightage |
|------|---|------------|
| CO-1 | To understand the processing of fat rich dairy product | 15 |
| CO-2 | To demonstrate working of cream separator, butter churner, continuous butter churner and pre-stratification process in ghee | 15 |
| CO-3 | To examine the quality evaluation of fat rich dairy products according to prescribed standard | 25 |
| CO-4 | To appraise the production of renovated butter and low fat spread targeting health benefits of consumer | 20 |
| CO-5 | To develop the processing of ghee residue and butter milk for utilization of by-products in order to achieve sustainability and wastage reduction | 20 |

Curriculum Revision:

| | |
|--------------------------------|-----------|
| Version: | 2.0 |
| Drafted on (Month-Year): | June-2022 |
| Last Reviewed on (Month-Year): | - |
| Next Review on (Month-Year): | June-2025 |