CVM UNIVERSITY
Aegis: Charutar Vidya Mandal (Estd.1945)

FACULTY OF ENGINEERING & TECHNOLOGY

Effective from Academic Batch: 2022-23

Programme: Bachelor of Technology (Dairy Technology)

Semester: VI

Course Code: 202200602

Course Title: Condensed and Dried Milk

Course Group: Professional Core Course

Course Objectives: The course of condensed & Dried Milk intends to familiarize students with the manufacturing process of milk powder and recent technology used at industrial level. The course aims to provide the knowledge of instantization and milk powder characteristics, as it is desirable in milk powder to make it instant soluble. The emphasis is to make students aware of various defects produced in milk powder and to design its prevention method for longer shelf life of product.

Teaching & Examination Scheme:

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

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

Detailed Syllabus:

SN	Contents	Hours
1	**Status of condensed and evaporated milk** History, Status and scope in India and abroad, Definition and legal standards: Condensed milk, Sweetened condensed milk and evaporated milk. Grading and quality of raw milk for condensed and evaporated milk	7
2	**Manufacturing process of condensed and evaporated milk** Manufacturing techniques for evaporated milk including pilot sterilization test, Sweetened condensed milk and recombined sweetened condensed milk	7
3	**Processing effects in condensed and evaporated milk** Physico-chemical changes taking place during manufacture of condensed milk, Heat stability of milk and condensed milk, Physico-chemical properties of condensed milk and role of stabilizers in the stability of condensed milk, Defects in condensed milks, their causes and prevention. Recent advances with reference to freeze concentration and membrane concentration	8
4	**Dried milk** History and status in India and abroad, Prevention of Food and Adulteration (PFA), Bureau of Indian Standard (BIS) and International Standards for dried milk Grading and quality of	7

Opp. Shastri Maidan, Beside BVM College, Vallabh Vidyanagar, Dist: Anand, Gujarat - 388120
(O): 02692-238001 | Email: adminoffice@cvmu.edu.in | www.cvmu.edu.in

	raw milk for dried milks, whey powder	
5	**Manufacturing process of milk powder** Manufacture of skim milk powder (SMP), whole milk powders and heat classified powders, spray dryer, roller dryer, instantization, powder characteristics, packaging of Milk powder. Manufacture of infant foods, malted milk foods and other formulated dried products; Tea and coffee powder	**8**
6	**Quality management of milk powder** Physico-chemical changes taking place during manufacturing and storage of dried milk, Physical properties of dried milk, Defects in dried milk during manufacture and storage, their causes and prevention, Management of condensed and dried milk.	**8**
	Total	**45**

List of Practical:

1	Proximate analysis of concentrated and dried milk (e.g. moisture, T.S., Fat)
2	Estimation of lactose in milk powder
3	Estimation of physical properties of dried milk (bulk density, solubility index)
4	Manufacturing of SMP by spray drying / roller drying
5	Preparation of instant milk powder
6	Formulation of plain concentrated milk
7	Determination of interstitial air in milk powder
8	Preparation of sweetened condensed milk
9	Manufacture of evaporated milk
10	Visit to milk drying plant

Reference Books:

1	Milk and Milk processing by Shivashraya Singh, New India Publishing Agency
2	An introduction to Dairy Technology by Sandeep Tomar, Pragun Publication
3	Outlines of Dairy Technology by De Sukumar, Oxford Publication
4	Dairy Science and Technology by Pieter Walstra, Taylor & Francis

Supplementary learning Material:

1	Handbook of Milk powder manufacture https://www.scribd.com/document/442888526/handbook-milk-powder-manufacture-pdf
2	ecoursesonline.iasri.res.in
3	https://www.agricultureinindia.net/dairy-science/condensed-milk/condensed-milk-composition-nutritive-value-properties-grading-and-uses/20244

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

Opp. Shastri Maidan, Beside BVM College, Vallabh Vidyanagar, Dist: Anand, Gujarat - 388120
(O): 02692-238001 | Email: adminoffice@cvmu.edu.in | www.cvmu.edu.in

- 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%	25%	20%	15%	15%	10%	

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):

Sr.	Course Outcome Statements	%weightage
CO-1	To understand the current status and various quality guidelines related to condensed and dried milk	10
CO-2	To interpret the Technology of condensed, evaporated milk, SMP and WMP using appropriate drying techniques for its large scale production	25
CO-3	To examine the powder characteristics, associated defects and its prevention method for producing longer shelf life product	25
CO-4	To evaluate the Technology of other dried products i.e. infant foods, malted milk foods and formulated dried products having huge potential of growth among different consumer groups due to health benefits	20
CO-5	To formulate the value added dried milk powder for its feasibility in dairy industry.	20

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

Opp. Shastri Maidan, Beside BVM College, Vallabh Vidyanagar, Dist: Anand, Gujarat - 388120
(O): 02692-238001 | Email: adminoffice@cvmu.edu.in | www.cvmu.edu.in