

17FT026 DAIRY TECHNOLOGY

Hours Per Week :

L	T	P	C
3	1	-	4

Total Hours :

L	T	P	WA/RA	SSH/HSB	CS	SA	S	BS
45	15	-	15	30	-	5	5	-

Course Description and Objectives:

This course deals with handling, processing, preservation of milk and milk products. The objective of this course is to impart knowledge about milk, milk processing methodologies, processing equipments, byproduct utilization and to bestow skills in the application of biological, chemical, biochemical, and engineering sciences in processing and preservation of milk and milk product.

Course Outcomes:

The student will be able to:

- Understand and describe the inherent compositional variability of milk composition
- Learn the milk processing methodologies
- Gain knowledge about the various milk processing equipments
- Understand the production of various products and its byproducts.

SKILLS:

- ✓ Determine physicochemical properties of milk
- ✓ Perform standardization of milk for different .
- ✓ Select suitable packaging material for spice products
- ✓ Identify adulteration in spice and plantation crops

UNIT-I

Dairy Chemistry and Microbiology: Introduction, Milk - composition, food and nutritive value, Physico-chemical properties. Buying and collection of milk – transportation of milk – milk reception – contaminants -Milk reception in dairies, Quality and Quantity tests at reception -Applications of enzymes in dairy industry

UNIT-II

Milk Processing: Milk processing flow sheet – Filtration / clarification, Storage of milk, Standardization – simple problems in standardization, Homogenization, Pasteurization – Types of pasteurization process. Equipments used in each process - Cream separating centrifuges, Pasteurizers (Heat Exchangers), Homogenizers, Bottle and pouch fillers, Milk Chillers, Plant piping, Pumps.

UNIT-III

Manufacture of Dairy Products: Manufacture of Cream, Butter, Ghee, Milk, powder, Cheese – Types and Defects in cheese. Quality aspects of these products. Equipments used for manufacture of each product like Butter churn, ghee boiler, Spray and Drum Dryers, Product in sanitizing equipment etc.

UNIT-IV

Manufacture of Ice Cream and other Dairy Products: Manufacture of Ice cream – Chemistry and technology – Microbiology of ice cream – Quality aspects. Manufacture of paneer, Toned Milk, Sweetened Condensed milk, Khoa. Extraction of casein from milk – properties - composition and industrial uses. Production of lactose.

UNIT – V

Fermented dairy products: Fermented products – Yoghurt, Curd, acidophilus milk, butter milk. Dairy plant sanitization – Cleaning in place – bottle and can washing, cleaning of tankers and silos – Detergents and sanitizers used. Energy use in Dairy plant - sources and cost of energy, Control of energy losses and Energy conservation.

TEXT BOOKS:

1. Sukumar De, Outlines of Dairy Technology, Oxford University Press, India (1980)
2. Tufail Ahmad: Dairy Plant Systems Engineering KitabMahal, Allahabad, India (1985)
3. Edger Spreer & AxelMixa: Milk and Dairy Product technology Mercel dekker Inc. N.Y. (1998)
4. National Institute of Industrial Research, Modern Technology of Milk processing and Dairy products, II Edition, NIIR Publications, India, 2004.

REFERENCE BOOKS:

1. Arthur W. Farral: Engineering of Dairy and food Products (II Edition 1970) Robert E. Krieger Publishing Co. New York
2. Garret Smit: Dairy Processing (Improved Quality) Woodhead Publishing Ltd. CRC Press (2003).
3. W.M. Clunie Harvey and Harry Hill: Milk Products Bio Tech Books, New Delhi (1999) Department of Food Processing Engineering
4. Prof. H.G. Kessler: Food Engineering and Dairy Technology Verlag Kessler Publishing House, Germany (1981).

ACTIVITIES:

- o Perform an experiment on various platform tests conducted in dairy industry
- o Study on various regulatory standards implemented in dairy UNIT.