

SRI VENKATESWARA UNIVERSITY
B.Sc. DEGREE COURSE IN DAIRY SCIENCE
SEMESTER SYSTEM WITH CBCS
SEMESTER IV
W.E.F. 2021-2022
COURSE IV : DAIRY CHEMISTRY

THEORY

(3 Credits)

Unit-1: Composition of Milk: Introduction to dairy chemistry, Definition of milk as per FSSAI, composition of cow milk, differences in the composition of milk from buffalo, goat, sheep, human. Colostrum: Significance, Composition, difference between normal milk and colostrum

Constituents of milk: Minor and major constituents; proteins, casein, whey proteins, NPN compounds, milk fat, triglycerides, phospholipids, sterols, fat globule membrane, enzymes in milk and their significance

Factors affecting composition and yield of milk –Species, Breed, individuality, Stage of lactation, Age of the animal, Season, Interval between milking, Stage of milking, Feed, Estruses, Exercise, Milker and Drugs.

Physico-chemical properties of milk- Colour, Flavour, Density and Specific gravity, Freezing point, Boiling point, Surface tension, Viscosity, Specific heat, Refractive index, Electrical conductivity, Germicidal property, PH and acidity, Ionic balance

Unit-2: Nutritive value of milk.

Physicochemical constants of milk fat, RM value, Polenske Value, saponification value, Iodine number, Refractive index Platform tests; Tests for detection of adulteration of milk; Preservatives and Neutralizers.

FSSAI Specifications for milk.

Unit-3: Cleaning and sanitation of dairy equipment: Types of cleaning and sanitizing agents, mode of action, different types of cleaning methods, (i) Hand washing, (ii) Mechanical washing (iii) Cleaning in place (CIP). Environmental hygiene in dairy plant, personnel hygiene;

DAIRY MICROBIOLOGY

Unit-4: Definition, Microscopy – Simple, Compound - bright-field microscopy, Structure and functions of prokaryotic cells; Taxonomy of Microorganisms - Classification,

nomenclature, identification; Differences between cell wall of Gram positive and Gram negative bacteria

Sources of contamination of milk and their control: exterior of the animal, interior of the udder, utensils, water, milker, flies and insects, soil and manure, milking barn, cattle shed and surroundings. Methods of clean milk production

Sources and Significance of specific groups of microorganisms in milk i.e. psychrotrophic, mesophilic, thermophilic and thermophilic bacteria - their morphological and biochemical characteristics

Types of Microorganisms in milk such as acid producing, gas producing, protein splitting, fat splitting microbes; Pathogens associated with raw milk and inert organisms. Chemical changes observed during storage of milk and abnormal fermentations observed in milk: souring, gassy fermentation, proteolysis, lipolysis, ropiness, and flavour fermentations

Bacterial growth curve; factors affecting growth of bacteria, Common nutrient requirements and nutritional types of microorganisms

Unit-5: Milk borne diseases: bacterial, viral and other diseases

Microbiological examination of milk: direct microscopic count, standard plate count, methylene blue reduction test, resazurin reduction test and coliform test.

Microbiological grading and legal standards of raw and processed milk.

Practical:

1. Microbiological equipment; autoclave, hot air oven, incubator centrifuge, colorimeter, laminar airflow, membrane filter.
2. Staining of Microbes: Simple staining- methylene blue and Differential staining (Gram)
3. Preparation of commonly used growth media liquid and solid
4. Grading of raw milk by direct microscopic count.
5. Grading of raw milk by standard plate count
6. Grading of raw milk by coliform counts
7. Grading of raw milk by methylene blue reduction time.
8. Grading of raw milk by resazurin reduction test
9. Enumeration of psychrophilic and thermophilic microorganism in milk
10. Enumeration of thermophilic and spore counts in milk
11. Grading of pasteurized milk by total viable count, coliform and methylene blue reduction time
12. Estimation of Fat in milk
13. Estimation of SNF in milk
14. Estimation of Specific gravity in milk
15. Estimation of acidity in milk

16. Estimation of pH in milk
17. Estimation of Protein in milk using Pyne's constant.
18. Estimation of Surface tension in milk
19. Estimation of Viscosity in milk
20. Analysis of milk using electronic method
21. Tests for detection of adulteration of milk;
22. Tests for Preservatives and Neutralizers.
23. Comment on the quality of given milk sample

Reference books :

1. Dairy Microbiology – R K Robinson
 2. Milk products preparation and quality control - C P Ananthakrishnan
 3. Food Microbiology - W C Frazie
 4. Dairy chemistry and Animal Nutrition - M M Roy
 5. Text of practical Dairy Chemistry - N K Roy
 6. Fundamentals of Dairy Chemistry - Webb Johnson and Alfred
 7. Dairy chemistry and Physics - Pieter Walstra, Robert Jenness
 8. Fundamentals of Dairy Chemistry - Noble P Wong
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B.Sc. DEGREE COURSE IN DAIRY SCIENCE

IV SEMESTER - W.E.F. 2021-22

COURSE IV : DAIRY CHEMISTRY

MODEL QUESTION PAPER

Time: 3 hours

Marks: 75

marks

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer any five of the following questions in Part A.

Part B consists of 5 Units. Answer one full question (A or B) from each unit (i.e., Q.No 9 from Unit – I, Q.No 10 from Unit – II, Q.No 11 from Unit – III, Q.No 12 from Unit – IV, Q.No 13 from Unit – V). Each question carries 10 marks.

PART – A

Answer any *Five* of the following question.

(5X5=25M)

1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	

(P.T.O)

PART - B

Answer All The Questions. Each question carries 10 marks (5X10= 50M)

9.	(A) OR (B)
10.	(A) OR (B)
11.	(A) OR (B)
12.	(A) OR (B)
13.	(A) OR (B)

Suggested outcomes for the course Dairy Development and Co-operatives

(5 units with each unit having 12 hours of class work. At the end of the course the student will demonstrate the following)

The students will be able to

A. Remember and explain in a systematic way (Knowledge and comprehension*)

In this course the students are equipped with the knowledge and comprehension through the below given modes.

The students are made to understand on various principles involved in successful dairying and on advantages of dairying.

Different methods of procuring, transporting, pricing and marketing of milk are communicated to the students.

The students are made to understand on anand pattern of cooperative dairy industry where the milk producing farmer is considered as part and parcel of the society and on how the system runs in 3 tier structure. They are also made to understand on the role of private dairies in India.

They are educated with various dairy development programmes which are implemented in India including Operation Flood Program, Key Villiage Scheme and also on the statistical analytical picture on dairy industry in India.

Economics of maintaining a dairy farm are taught to the students and umpteen number of cost estimate problems on milk production are solved by the students in this course.

B. Understand uses (Application **)

Through this course the student on understanding on the various advantages involved in starting of a dairy farm he is so encouraged to be an entrepreneur.

C. Critically explains, judges and solves (Analytical, Evaluative and Problem Solving***)

The students on understanding the profitability on establishing a dairy farm is made to analyze, evaluate and lot of opportunity is given to them in problem solving.

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COURSE V : DAIRY DEVELOPMENT AND CO-OPERATIVES

(3 Credits)

Unit-1 : Advantages of Dairying. Principles involved in successful dairying. Systems of dairy farming-Mixed farming and Specialized dairy farming – organic farming system.
(10 Lectures)

Unit-2: Methods of procurement of milk; Transportation of milk; Pricing of milk, Marketing of milk.(10 Lectures)

Unit-3: Cooperative Dairying-Structure of Dairy cooperatives- Anand pattern - Primary milk producer's cooperative society; District milk producer's cooperative union; State level dairy development cooperative Federation, objectives and functions - Milk and milk products order MMPO(1992)- Role of private dairies in India. (20 Lectures)

Unit-4: Dairy development programs implemented in India. Statistical analysis of progress in development of Dairy industry in India, Operation Flood Program., Key village scheme(10 Lectures)

Unit-5: Economics of maintaining Dairy farm- Income and expenditure in dairy farms- Estimating the production cost of milk. (10 Lectures)

Note: On Farm training for one month (four hours a day) is compulsory during 1st to 4th semester (Students would go in batches without effecting the regular class work) and a comprehensive training report should be submitted as mandatory requirement while appearing for IV semester practical exam which would carry 20 marks out of 50 marks as weight age.

Practical' s :**(2 Credits)**

1. Identification of feeds and fodders.
2. Computation of rations.
3. Hay making.
4. Silage making.
5. Estimation of dry matter of feed or fodder
6. Record keeping
7. Preparation of project reports for various sizes of dairy farm
8. Calculations on cost of milk production
9. Calculating the cost of milk production: exercises for various sizes of farms.

Reference books:

1. Text book of Animal Husbandry - G C Benarjee
2. Principles and practices of Dairy Farm –Jagdish Prasad
3. Animal Nutrition and feeding practices –DrSurendra K .Ranjhan
4. Dairy Chemistry and Animal Nutrition – M M Roy
5. Dairy Management in India -Madhan Mohan

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IV SEMESTER - W.E.F. 2021-22

COURSE V : DAIRY DEVELOPMENT AND CO-OPERATIVES

MODEL QUESTION PAPER

Time: 3 hours

Marks: 75

marks

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer any five of the following questions in Part A.

Part B consists of 5 Units. Answer one full question (A or B) from each unit (i.e., Q.No 9 from Unit – I, Q.No 10 from Unit – II, Q.No 11 from Unit – III, Q.No 12 from Unit – IV, Q.No 13 from Unit – V). Each question carries 10 marks.

PART – A

Answer any *Five* of the following question.

(5X5=25M)

1.	
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3.	
4.	
5.	
6.	
7.	
8.	

(P.T.O)

PART - B

Answer All The Questions. Each question carries 10 marks (5X10= 50M)

9.	(A) OR (B)
10.	(A) OR (B)
11.	(A) OR (B)
12.	(A) OR (B)
13.	(A) OR (B)