

Discipline: Agriculture	Sub-discipline: Animal Science
General Course Title: Milk Production and Technology	Min. Units: 3 Semester
Proposed Suffix: L	
<p>Course Description: Study of milk and milk product consumption and the economics of milk production; mammary system anatomy, the physiology of milk secretion, the composition and the properties of milk including factors of production. Evaluation of milking parlors and equipment, systems analysis and operation are also included in this course. Milk testing, sanitation, quality control, udder health and treatment as well as dairy mathematics are included. Laboratory required.</p>	
Required Prerequisites or Co-Requisites ¹	
Advisories/Recommended Preparation ²	
<p>Course Objectives: <i>At the conclusion of this course, the student should be able to:</i></p> <ul style="list-style-type: none"> • Outline the history and development of the milk industry. • Analyze the composition and properties of milk. • Identify and explain udder anatomy, physiology and factors affecting the production and composition of milk. • Analyze quality control and regulations in production and processing (HACCP). • Describe milk secretion and the factors affecting quantity and quality of milk. • Discuss milking equipment, facilities, operation and proper milking procedures. • Explain the food value and uses of milk and milk products. • Explain udder health, infection and treatment. • Discuss the principles of marketing milk and milk products, the consumption trends and the importance of product research. • Describe the pricing structure and government regulation as it affects supply and demand of dairy products. • Outline the importance and proper use of drugs and the effects of residues in milk. 	
<p>Course Content:</p> <ol style="list-style-type: none"> 1. Development of the Dairy Industry <ol style="list-style-type: none"> a. Historical development b. Inventions in production and processing c. Impact on the dairy industry d. Contribution to society 2. Economics of Milk Production <ol style="list-style-type: none"> a. The scope of the dairy industry b. Milk producing regions c. Milk and milk products produced d. Impact on animal agriculture 3. Udder Anatomy and Physiology <ol style="list-style-type: none"> a. Anatomy of the udder b. Physiology of milk production c. Hormones affecting milk secretion d. Factors affecting milk quality <p>Milk Production and Technology (Content Continued)</p>	

¹ Prerequisite or co-requisite course need to be validated at the CCC level in accordance with Title 5 regulations; co-requisites for CCCs are the linked courses that must be taken at the same time as the primary or target course.

² Advisories or recommended preparation will not require validation but are recommendations to be considered by the student prior to enrolling.

4. Consumption and Marketing Trends
 - a. Milk and milk products consumed
 - b. Trends in product consumption
 - c. Relationship between sales and quality
 - d. Milk as a source of food
5. Milk Composition and Properties
 - a. Chemical composition of milk
 - b. Importance of milk solids to quality
 - c. Properties found in milk
 - d. Calculating milk components
6. Milk Testing
 - a. Types of services available
 - b. Management information from testing
 - c. Effects on breeding and marketing animals
 - d. Analyzing test data and records
7. Milking Facilities and Equipment
 - a. Types of milking facilities
 - b. Selection of equipment
 - c. Costs of building and purchasing equipment
 - d. Techniques in maintaining and operating a system
8. Milk Processing
 - a. Regulations for shipping and processing milk and milk products
 - b. Bacteria and somatic cell counts
 - c. Pasteurizing, homogenizing and standardizing milk
 - d. Processing dairy products
9. Udder Health and Drugs
 - a. Mastitis control
 - b. Understanding degrees of infection
 - c. Identifying classes and use of drugs
 - d. Analyzing the effects of residues in milk
10. Government Regulations
 - a. Sanitation requirements
 - b. Standards for bacteria counts
 - c. Requirements for cleaning and sanitizing
 - d. State and county inspections
11. Marketing and Research
 - a. Developing new products
 - b. Packaging and distributing
 - c. Sales promotion and research
 - d. Quality control and food safety

**Milk Production and Technology
(Content Continued)**

12. Careers in the Dairy Industry
 - a. Opportunities for employment

b. Preparing for a career in milk processing c. Careers in related areas d. Future employment trends	
Laboratory Activities: Individual Laboratory Activities are designed to support course objectives.	
Methods of Evaluation: Lecture Comprehensive Quizzes and Exams Written Critical Thinking Scenarios Problem Analysis and Solution Research and Term Papers	Methods of Evaluation: Laboratory Laboratory Skill Validation by Observation Laboratory Reports Laboratory Research Projects and Reports Laboratory Skill Practicum Exams
Typical Textbooks, Manuals, or Other Support Materials <u>The Fluid Milk industry 3rd ed.</u> , Henderson, James Lloyd. The AVI Publishing Company. ISBN 0-87055-090-X. <u>Mastitis Counter-Attack.</u> Philpott, National Mastitis Council. Local Ag. Extension agents may provide additional resources.	
Statewide Articulation: CPSLO-DSCI 134, other universities as lower division elective	
FDRG Lead Signature:	Date:
Mark E. Bender, PhD CSU Stanislaus	
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