

South Plains College
Common Course Syllabus: AGRI 1311
Revised SPRING 2024

Department: Science

Discipline: Agriculture

Course Number: AGRI 1311

Course Title: Dairy Science

Available Formats: internet

Campuses: Levelland

Course Description: This course is a survey of the dairy industry, including dairy breeds, standards for selection and culling, herd replacements, feeding, management, physiology, and health maintenance. This course teaches food value for milk; tests for composition and quality; and use and processing of market milk and dairy products.

Prerequisite: None

Credit: 3 Lecture: 3 Lab: 0

Textbook: **Dairy Production and Processing**
John R. Campbell, Robert T. Marshall
Publisher: Waveland Press, Inc.
Edition/Year: 2016
ISBN: ISBN-10: 1-4786-1120-0
Additional information: none
Type: Required resource

Supplies: Access to a computer and the internet. Course delivery is via Blackboard.

Core Curriculum Objectives addressed:

- **Communications skills**—to include effective written, oral and visual communication
- **Critical thinking skills**—to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
- **Empirical and quantitative competency skills**—to manipulate and analyze numerical data or observable facts resulting in informed conclusions
- **Personal Responsibility**—to include the ability to connect choices, actions, and consequences to ethical decision-making.

Student Learning Outcomes:

Upon completion of this course and receiving a passing grade, the student will be able to define and understand the practical application of the following:

- Identify Breeds of Dairy Cattle
- Understand the overview of the Dairy Industry
- Understand Dairy genetics
- Understand Basic Ruminant Nutrition
- Introduced to Nutritional requirements Understand the Digestive system
- Comprehend the importance of feed quality
- Basic female reproduction and parturition
- Anatomy and Physiology of the Mammary Gland
- Milk quality
- Disease Security
- Marketing and Milk Products

Student Learning Outcomes Assessment: Comprehensive assessments and online evaluation are used to evaluate student outcomes.

Course Evaluation: Upon completion of this course and receiving a passing grade, the student will be able to:

Have a basic understanding of the learning outcomes.

Attendance Policy: Even though this is an online or hybrid class, students still have to access the course on a regular basis. The Blackboard software used to manage this course tracks student logins, tracking when and where the student has been in the course. Accessing this course on a regular basis is extremely important in order to meet the objectives of this course.

[Students are expected to attend all classes in order to be successful in a course. The student may be administratively withdrawn from the course when absences become excessive as defined in the course syllabus.

When an unavoidable reason for class absence arises, such as illness, an official trip authorized by the college or an official activity, the instructor may permit the student to make up work missed. It is the student's responsibility to complete work missed within a reasonable period of time as determined by the instructor. Students are officially enrolled in all courses for which they pay tuition and fees at the time of registration. Should a student, for any reason, delay in reporting to a class after official enrollment, absences will be attributed to the student from the first class meeting.

Students who enroll in a course but have "Never Attended" by the official census date, as reported by the faculty member, will be administratively dropped by the Office of Admissions and Records. A student who does not meet the attendance requirements of a class as stated in the course syllabus and does not officially withdraw from that course by the official census date of the semester, may be administratively withdrawn from that course and receive a grade of "X" or

“F” as determined by the instructor. Instructors are responsible for clearly stating their administrative drop policy in the course syllabus, and it is the student’s responsibility to be aware of that policy.

It is the student’s responsibility to verify administrative drops for excessive absences through MySPC using his or her student online account. If it is determined that a student is awarded financial aid for a class or classes in which the student never attended or participated, the financial aid award will be adjusted in accordance with the classes in which the student did attend/participate and the student will owe any balance resulting from the adjustment.]

Plagiarism and Cheating: Students are expected to do their own work on all projects, quizzes, assignments, examinations, and papers. Failure to comply with this policy will result in an F for the assignment and can result in an F for the course if circumstances warrant.

Plagiarism violations include, but are not limited to, the following:

1. Turning in a paper that has been purchased, borrowed, or downloaded from another student, an online term paper site, or a mail order term paper mill;
2. Cutting and pasting together information from books, articles, other papers, or online sites without providing proper documentation;
3. Using direct quotations (three or more words) from a source without showing them to be direct quotations and citing them; or
4. Missing in-text citations.

Cheating violations include, but are not limited to, the following:

1. Obtaining an examination by stealing or collusion;
2. Discovering the content of an examination before it is given;
3. Using an unauthorized source of information (notes, textbook, text messaging, internet, apps) during an examination, quiz, or homework assignment;
4. Entering an office or building to obtain unfair advantage;
5. Taking an examination for another;
6. Altering grade records;
7. Copying another’s work during an examination or on a homework assignment;
8. Rewriting another student’s work in Peer Editing so that the writing is no longer the original student’s;
9. Taking pictures of a test, test answers, or someone else’s paper.

Student Code of Conduct Policy: Any successful learning experience requires mutual respect on the part of the student and the instructor. Neither instructor nor student should be subject to others’ behavior that is rude, disruptive, intimidating, aggressive, or demeaning. Student conduct that disrupts the learning process or is deemed disrespectful or threatening shall not be tolerated and may lead to disciplinary action and/or removal from class.

Note: The instructor reserves the right to modify the course syllabus and policies, as well as notify students of any changes, at any point during the semester.

Course Outline:

Section One

Lesson title: **The Dairy Industry**

Topics: Introduction / Factors Influencing the Dairying Industry Worldwide / Development of the Dairy Industry in the United States / Milk Production in the United States / Main Branches of the Dairy Industry in the United States / Importance of the Dairy Industry to the US Economy / World Production of Milk / Sustainability of Dairy Agriculture / Summary

Reading: Chapter 2

Section Two

Lesson title: **Breeds of Dairy Cattle**

Topics: Introduction / Origins of Dairy Cattle / What Is a Dairy Breed? / Ayrshire / Brown Swiss / Guernsey / Holstein–Friesian / Jersey / Milking/Dairy Shorthorn / Red and White / Why Purebreds? / Choosing a Dairy Breed / Summary

Reading: Chapter 3

Section Three

Lesson title: **Dairy Herd Records**

Topics: Introduction / Brief History of Production Testing / Benefits of Production Testing / The DHI System / How a Typical DHIA Operates / Standardizing Milk Production Records / Dairy Production Records / Summary

Reading: Chapter 4

Section Four

Lesson title: **Breeding Dairy Cattle**

Topics: Introduction / A Brief History of Genetic Selection in Dairying / Genetic-Economic Indexes / Genomics / Genetic Evaluation Using Sire Indexes / Genetic Evaluation Using Other Tools / Selecting Dairy Females / Evaluating Breeding Value of Dairy Bulls / Heritability Estimates / Keys to Genetic Progress in Breeding Dairy Cattle / Mating Systems for Dairy Cattle / Methods of Producing Desired Offspring / Summary / Caveats

Reading: Chapter 6

Section Five

Lesson title: **Dairy Herd Replacements**

Topics: Introduction / The Need for Dairy Herd Replacements / Determining the Best Method of Replacement / Contributions of Colostrum to Calves / Alternatives to Fresh Milk for Calves / Early Weaning and Once-a-Day Feeding / First Breeding of Dairy Heifers / Diseases of Calves / Dehorning and Removing Extra Teats / Summary

Reading: Chapter 7

Section Six

Lesson title: **Feeding Dairy Cattle**

Topics: Introduction / Animal Uses of Nutrients / The Mysterious Vital Rumen / Providing Energy for Dairy Cattle / Providing Protein for Dairy Cattle / Providing Lipids for Dairy Cattle / Energy and Protein Deficits / Feeding High Levels of Concentrates / Providing Minerals for Dairy Cattle / Providing Vitamins for Dairy Cattle / Providing Water / Guidelines for Profitable Feeding / Feeding Silage / Agricultural Chemicals and Feed / Summary

Reading: Chapter 8

Section Seven

Lesson title: **Physiology of Reproduction in Dairy Cattle**

Topics: Introduction / Parts of the Male Reproductive Tract / Parts of the Female Reproductive Tract / Forming an Egg / Fertilization and Gestation / Parturition / Postpartum Mating / Detecting Estrus / Importance of Timing in Conception / Reproductive Efficiency / Reproductive Irregularities / Breeding Problems and Genetic Progress / Reproductive Biotechnologies / Summary

Reading: Chapter 9

Section 8

Lesson title: **Physiology of Lactation**

Topics: Introduction / Growth and Development of Mammary Glands / Circulatory Aspects of Milk Secretion / How Milk Is Made / How Milk Is Discharged (Excreted) / Milk Letdown / Residual (Complementary) Milk / Hormonal Control of Lactation / Merits and Limitations of Rapid Milking / Intensity and Persistency of Lactation / Marathon Milking / Regression (Involution) of Mammary Glands / Merits of a Dry Period / Immune Milk / Summary

Reading: Chapter 10

Section 9

Lesson title: **Principles of Milking and Milking Equipment**

Topics: Introduction / Principles of Milk Withdrawal / Preparing the Cow for Milking / Milking Rate / Importance of Fast Milking / The Function of Vacuum in Milking / Overmilking / Pulsation / Narrow-Bore versus Wide-Bore Teat Cup Liners / Machine Stripping / Teat Cup Flooding / Pipeline Milking Systems / The Four-Way Milking Cluster / Robotic (Automatic) Milking Systems / Bulk Milk Cooling and Storage / Clean and Sanitary Milking Equipment / Maintenance of Milking Equipment / Summary

Reading: Chapter 11

Section 10

Lesson title: **Milking Facilities, Housing, and Equipment**

Topics: Introduction / Milking Parlors / Dairy Cattle Housing and Shelter / Feeding Systems / Disposing of Dairy Wastes / Summary

Reading: Chapter 12.

Section 11

Lesson title: **Dairy Herd Health and Bovine Mastitis**

Topics: Introduction / The Veterinarian and Herd Health / Vaccination and Herd Health / Diseases Affecting Reproduction / Metabolic Diseases of Dairy Cows / Nutritional Diseases / Respiratory Infections / Anaplasmosis (Rickettsemia) / Blackleg (Black Quarter) / Cowpox (Vaccinia) / Displaced Abomasum / Foot Rot (Necrotic Pododermatitis) / Hardware Disease / Lumpy Jaw (Actinomycosis) / Pinkeye (Infectious Conjunctivitis) / Tuberculosis and Paratuberculosis / Warts (Verrucae) / Winter Dysentery (Winter Diarrhea) / External Parasites / Internal Parasites / Poisoning / Summary

Introduction / Causes of Mastitis / Physical Response to Bacterial Infection / Characteristics of Major Types of Mastitis / Susceptibility to Infection / Environmental Factors That Influence the Incidence of Mastitis / Detecting Mastitis / Mastitis Therapy / Prevention of Mastitis / Bacteria Counts Associated with Mastitis / Decision Tree for Treatment of Mastitis / Summary

Reading: Chapter 13-14

Section 12

Lesson title: **Dairy Beef, Goats, and Sheep**

Topics: Introduction / Nutrient Profile of Lean Beef / Breeding and Crossbreeding for Dual Purposes / Slaughter and Consumption Trends / Veal Production / Finishing Systems / Carcass Yield / Meat Quality / Summary

Introduction / Major Dairy Goat Breeds of the United States / Reproductive Aspects of Goats / Characteristics of Goat Milk / Milking Dairy Goats / Major Diseases of Goats / Management / Dairy Goat Industry and Organizations / Summary

Introduction / World Sheep Milk Production and Trade / Dairy Sheep Breeds of North America / Reproduction of Dairy Sheep / Composition and Characteristics of Sheep Milk / Milking Dairy Ewes / Milk Production of Dairy Ewes / Major Diseases and Parasites of Sheep / Feeding Dairy Sheep / Management of Dairy Sheep / Dairy Sheep Associations of North America / Summary

Reading: Chapters 15,17, and 18

Section 13

Lesson Title: **Marketing Milk and Products**

Topics: Introduction / Market Prices / The Demand for Milk and Milk Products / Promoting the Benefits of Milk and Educating the Public / Dairy Cooperatives / Risk Management / Federal Milk Marketing Orders / Prices and Formulas / Production Controls / Problems in Intermarket Movement of Milk / Hauling Milk / Sales and Distribution of Dairy Products / Summary

Reading: Chapter 20

Section 14

Lesson Title: **Determining the Composition of Milk and Milk Products; Microbes, Milk, and Humans; Milk Quality and Safety**

Topics: Introduction / Sampling / Protein / Milkfat / Lactose / Minerals / Total Solids and Nonfat Solids / Multicomponent Methods / Summary

Introduction / Understanding Microbiology / Groups of Bacteria Important to the Dairy Industry / Viruses and Bacteriophages / Molds / Yeasts / Effects of Microorganisms on the Shelf Life of Dairy Products / Summary

Assignments

All assignments are to be submitted as an attachment (word file) through Blackboard. Assignments are due by the designated date, and will be docked 10% of point value for each day they are late, unless prior arrangements have been made.

Grading

Major Exams - 15 per semester (weekly work) @ 100 each Assignments. ~1500 semester points

Changes to this Syllabus

This is a living syllabus. The instructor reserves the right to modify the syllabus during the semester with written or email announcements. It is the student's responsibility to stay apprised of such announcements.

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For information regarding official South Plains College statements about intellectual exchange, disabilities, non-discrimination, Title IX Pregnancy Accommodations, CARE Team, and Campus Concealed Carry, please visit <https://www.southplainscollege.edu/syllabusstatements/>.