

Common Course Syllabus

Department: Science

Discipline: Agriculture

Course Number: 1311

Course Title: Dairy Science

Credit: 3 **Lecture:** 3 **Lab:** 0

This course satisfies a core curriculum requirement: No

Prerequisite: None

Available Formats: Online

Campuses: Levelland

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: This course requires a computer and internet. It is delivered via Blackboard.

Course Specific Instruction:

This course is an online course, which means that you will access course information and respond to me and/or other students through the use of the Internet. I use Blackboard to deliver and manage this course. It is a software package that was written to help manage online courses. Please do not let yourself become overwhelmed or spend hours of your time trying to figure out how to access something. You have many sources available to you for help. You can contact me by: e-mail, telephone, or come by my office.

Attendance Policy

Even though this is an online class, students still have to access the course on a regular basis. The Blackboard software used to manage this online 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. You will feel more at ease with the materials if you stay in touch with what is going on.

Response Times

I will respond to any questions you may have in the following manner. If I receive an e-mail from you Monday through Thursday, before 4:00 p.m., and Friday before 12:00, I should respond to you that day. If I receive an e-mail after 4:00 p.m., I will respond to you the next day. There are times when I will be online after normal business hours, so please go ahead and send your questions and I will answer them if I am online. I will check my e-mail throughout the weekend unless I am out of town. I will let you know ahead of time if I am going to be gone.

Course Hardware/Software Requirements

Pentium or better computer with 128 MB of RAM. Comparable specifications for a Macintosh. Windows 2000, ME, or XP or OS operating system Internet access (High speed preferred) Email address Adobe Acrobat Reader (you can get a free download) RealPlayer (free download) Power Point or Power Point viewer

Academic Integrity

It is the aim of the faculty of South Plains College to foster a spirit of complete honesty and a high standard of integrity. The attempt of any student to present as his or her own, any work which he or she has not honestly performed, is regarded by the faculty and administration as a most serious offense and renders the offender liable to serious consequences and possibly suspension.

Cheating

Dishonesty of any kind of examinations or on written assignments, illegal possession of examinations, the use of unauthorized notes during an examination, obtaining information during an examination from the textbook or from the examination paper of another student.

Plagiarism

Offering the work of another as one's own, without proper acknowledgement, is plagiarism. Therefore, any student who fails to give credit for quotations or essentially identical expressions of material taken from books, encyclopedias, magazines and other reference works, or from the themes, reports or other writings of a fellow student, is guilty of plagiarism.

Attendance & Assignment Policies

Students are expected to log on to WebCT on a frequent basis. A regular class meets two or three days a week with three or more hours of lecture a week. You may decide to work offline with the material, but you should log in the class several times a week to check the calendar, email, participate in discussion groups and to take quizzes and tests.

Assignments

All assignments are to be submitted as an attachment (word file) through WebCT. 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.

Students with Disabilities

Students with disabilities, including but not limited to physical, psychiatric, or learning disabilities, who wish to request accommodations in this class should notify the Disability Services Office early in the semester so that the appropriate arrangements may be made. In accordance with federal law, a student requesting accommodations must provide acceptable documentation of his/her disability to the Disability Services Office. For more information, call or visit the Disability Services Office at Levelland Student Health & Wellness Center 806-716-2577, Reese Center (also covers ATC) Building 8: 806-716-4675, Plainview Center Main Office: 806-716-4302 or 806-296-9611, or the Health and Wellness main number at 806-716-2529.

Diversity Statement

In this class, the teacher will establish and support an environment that values and nurtures individual and group differences and encourages engagement and interaction. Understanding and respecting multiple experiences and perspectives will serve to challenge and stimulate all of us to learn about others, about the larger world and about ourselves. By promoting diversity and intellectual exchange, we will not only mirror society as it is, but also model society as it should and can be.

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

Introduction / Historical Background / Diseases Transmissible to Humans through Milk / Regulations and Responsible Organizations / Food Additive Regulatory Program / Safety of Milk Products on a Global Scale / Regulatory Standards for Grade "A" Milk / Adulterants of Public Health Significance / Clean and Sanitary Cows and Equipment / Summary

Reading: Chapters 22-24

Student Learning Outcomes/Competencies:

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:

Define Dairy Science

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

ADA Statement

Students with disabilities, including but not limited to physical, psychiatric, or learning disabilities, who wish to request accommodations in this class should notify the Disability Services Office early in the semester so that the appropriate arrangements may be made. In accordance with federal law, a student requesting accommodations must provide acceptable documentation of his/her disability. For more information, call or visit the Disability Services Office in the Student Health & Wellness Office, 806-716-2577.

Note to Students with disabilities: If you have a disability-related need for reasonable academic adjustments in this course, provide the (Instructor) with a letter of accommodation from Disability Services Office. If you need immediate accommodations or physical access, please arrange to meet with the Disability Services Office before the next class meeting.