Tennessee CTE

Large Animal Science Technologies (2022)

History of Domestication 1	1	History of Large Animal Domestication: Research the history of large animal domestication including defining and applying industry-specific terminology to classify animals in the correct taxonomy. Justify the historical uses and roles of domesticated animals, and compare historical processes of large animal domestication. 1.1
Economic, Occupational, and Technological Implications 2	1	Economical Implications: Determine the general economic impact of the large animal industry by investigating both recreational and business implications of large animal domestication. 2.1
	2	Career Exploration: Explore and compare local and regional career opportunities in the large animal industry and evaluate labor data to predict the employment outlook. Describe the knowledge, skills, and abilities necessary for a diverse range of careers in large animal sciences. 2.2
	3	Business and SAE Financial Recordkeeping: Accurately maintain an active recordkeeping system and apply proper accounting and financial records as they relate to a large animal science supervised agricultural experience (SAE) program or enterprise. Demonstrate the ability to summarize business records such as individual enterprise budgets, profit and loss statements, inventory management, transportation cost, and other specific reports by completing SAE and related financial applications. 2.3
	4	Emerging Technologies: Examine specific technologies that have evolved within the large animal industry (such as, but not limited to equipment, housing, procedures, and healthcare) and evaluate the economic and societal implications of each. 2.4
Personal and Occupational Health and Safety 3	1	Diseases: Identify, research, and determine the significance of zoonotic diseases associated with large animals. Compare and contrast findings relating to a specific disease. Justify the use of different methods of infection control in the prevention or management of zoonotic diseases and evaluate the efficacy of existing large animal biosecurity measures. 3.1

2 **Health Requirements and Regulations: Correctly identify and summarize laws and regulations that pertain to large animal health and safety from state and national legislation. Describe health requirements and necessary documentation for large animal transportation and change of ownership.** 3.2

3 **Safety and Operational Procedures: Review common laboratory safety procedures for tool and equipment operation in the large animal laboratories, including but not limited to accident prevention and control procedures. Demonstrate the ability to follow safety and operational procedures in a lab setting and complete a safety test with 100 percent accuracy.** 3.3

4 **Personal and Animal Safety: Demonstrate the ability to follow procedures precisely, attending to special cases or exceptions noted in appropriate materials, and apply them to the following areas:** 3.4

- a animal restraint and handling, 3.4.A
- b techniques for transportation, 3.4.B
- c appropriate use of chemicals (such as pesticide, fungicide, disinfectants), and 3.4.C
- d differentiate between effective methods for handling large animals and methods proven to be less effective. 3.4.D

Animal Ethics 4

1 **Fundamental of Animal Rights and Welfare: Identify the fundamental philosophies related to animal rights and animal welfare. Compare the impact of specific persons, organizations, and legislation related to animal rights and welfare of large animals.** 4.1

2 **Analyzing Ethical Issues: Debate specific issues by forming and supporting claims and counterclaims with specific data and evidence. Issues related to animal rights and animal welfare may include, but are not limited to:** 4.2

- a abuse and/or neglect, 4.2.A
- b environmental implications, 4.2.B
- c consumer product implications, 4.2.C
- d exhibiting and showing, and 4.2.D
- e global animal ethics issues and their relation to local problems. 4.2.E

Nutrition and Digestive Systems 5

1 **Digestive Systems: Differentiate between ruminant and non-ruminant animals and monogastric and polygastric animals, comparing and contrasting their anatomical and physiological differences. Explain the relationships of digestive system types to the ability of an animal to digest and absorb different classes of feed.** 5.1

2 **Nutritional Requirements: Research nutrient requirements of the large animal diets and organize them into various nutrient groups. Differentiate between roughages and concentrates and their nutritional values.** 5.2

	3 **Interpreting and Recommending Feed Rations: Interpret feed labeling and evaluate factors such as life stage and activity level to determine the nutritional needs and then recommend balance rations for each large animal species, justifying recommendations with evidence from the text.** 5.3
	4 **Nutritional Diseases: Diagnose the symptoms of nutritional diseases relevant to large animals and recommend the appropriate control procedures.** 5.4
Genetics, Reproduction, and Genomics 6	1 **Reproductive Systems: Research the major components of male and female reproductive systems in large animals to distinguish the function of reproductive organs, endocrine glands, and hormones. Compare the physiological changes that occur across different species during reproductive phases, including the estrous cycle, fertilization, gestation, parturition, and lactation.** 6.1
	2 **Principles of Genetics and Genomics: Explain how the role of heritability, selection intensity, generation interval, and other advanced principles of genetics (such as DNA testing for disorders) apply to predict gene and trait transfer in large animal species. Principles include but are not limited to:** 6.2 a economically important traits in production animals (i.e. artificial reproduction methods), 6.2.A b interpretation and utilization of animal performance records (i.e. Expected Progeny Difference [EPD]), and 6.2.B c hybrid vigor. 6.2.C
	3 **Advancements with Genomics: Compare and contrast the advances in the livestock industry by using genomic markers and genomic EPDS. Explain how genomics impacts the acceleration of genetic selection, mapping of complex traits, mapping of disease structures, and improved consistency of progeny outcomes.** 6.3

Fundamental Care and Health of Horses 7

1 **Domestication, Care, and Health: Synthesize research on the historical importance of horses, noting major economic, social, and medical advances impacting domestication. Compare and contrast the different horse breeds and hybrids. Demonstrate conceptual understanding and technical skill in current practices of comprehensive health care and management for the following:** 7.1

- a Design appropriate facilities based on an assessment of needs and present plans in a visual format. 7.1.A
- b Compare appropriate owner/handler responses to behaviors and instincts to ensure safety of both handler and animal in a variety of situations. 7.1.B
- c Distinguish between clinical signs of proper health and poor health, justifying explanations with data and evidence. 7.1.C
- d Using quantitative reasoning and appropriate units, calculate appropriate rations based on animal characteristics (age, weight, breed, activity level) and nutritional needs. 7.1.D
- e Illustrate the reproductive cycle graphically, and summarize available breeding methods and current reproductive technologies. 7.1.E
- f Research common diseases and parasites and their effects on the health of horses, and draw evidence from the most recent medical literature to recommend the best prevention or control measures. 7.1.F

Fundamental Care and Health of Cattle 8

1 **Domestication, Care, and Health: Synthesize research on the historical importance of cattle, noting major economic, social, and medical advances impacting domestication. Compare and contrast among different cattle breeds. Demonstrate conceptual understanding and technical skill in current practices of comprehensive health care and management for the following:** 8.1

- a Design appropriate facilities based on an assessment of needs and present plans in a visual format. 8.1.A
- b Compare appropriate owner/handler responses to behaviors and instincts to ensure safety of both handler and animal in a variety of situations. 8.1.B
- c Distinguish between clinical signs of proper health and poor health, justifying explanations with data and evidence. 8.1.C
- d Using quantitative reasoning and appropriate units, calculate rations based on animal characteristics (age, weight, breed, activity level) and nutritional needs by creating systems of equations that describe numerical relationships. 8.1.D
- e Illustrate the reproductive cycle graphically, summarize available breeding method, and current reproductive technologies. 8.1.E
- f Research common diseases and parasites and their effects on the health of cattle, and draw evidence from the most recent medical literature to recommend the best prevention or control measures. 8.1.F
- g Evaluate the economic implications of livestock management practices (such as dehorning). 8.1.G

Fundamental Care and Health of Small Ruminants (Sheep, Goats, Alpacas, and Llamas) 9

1 **Domestication, Care, and Health: Synthesize research on the historical importance of small ruminant breeds, noting major economic, social, and medical advances impacting domestication. Compare and contrast among different sheep, goat. alpaca, and llama breeds. Demonstrate conceptual understanding and technical skill in current practices of comprehensive health care and management for the following:** 9.1

a **Design appropriate facilities based on an assessment of needs and present plans in a visual format.** 9.1.A

b **Compare appropriate owner/handler responses to behaviors and instincts to ensure the safety of both handler and animal in a variety of situations.** 9.1.B

c **Distinguish between clinical signs of proper health and poor health, justifying explanations with data and evidence.** 9.1.C

d **Using quantitative reasoning and appropriate units, calculate appropriate rations based on animal characteristics (age, weight, breed, activity level) and nutritional needs by creating systems of equations that describe numerical relationships.** 9.1.D

e **Illustrate the reproductive cycle graphically, and summarize available breeding methods and current reproductive technologies.** 9.1.E

f **Research common diseases and parasites and their effects on the health of sheep and goats, and draw evidence from the most recent medical literature to recommend the best prevention or control measures.** 9.1.F

Fundamental Care and Health of Swine 10

1 **Domestication, Care, and Health of Swine: Synthesize research on the historical importance of swine, noting major economic, social, and medical advances impacting domestication. Compare and contrast among different swine breeds. Demonstrate conceptual understanding and technical skill in current practices of comprehensive health care and management for the following:** 10.1

- a Design appropriate facilities based on an assessment of needs and present plans in a visual format. 10.1.A
- b Compare appropriate owner/handler responses to behaviors and instincts to ensure the safety of both handler and animal in a variety of situations. 10.1.B
- c istinguish between clinical signs of proper health and poor health, justifying explanations with data and evidence. 10.1.C
- d Using quantitative reasoning and appropriate units, calculate appropriate rations based on animal characteristics (age, weight, breed, activity level) and nutritional needs by creating systems of equations that describe numerical relationships. 10.1.D
- e Illustrate the reproductive cycle graphically, and summarize available breeding methods and current reproductive technologies. 10.1.E
- f Research common diseases and parasites and their effects on the health of swine, and draw evidence from the most recent medical literature to recommend the best prevention or control measures. 10.1.F

Fundamental Care and Health of Poultry 11

1 **Domestication, Care, and Health of Poultry: Synthesize research on the historical importance of poultry, noting major economic, social, and medical advances impacting domestication. Compare and contrast among different poultry breeds. Demonstrate conceptual understanding and technical skill in current practices of comprehensive health care and management for the following:** 11.1

- a Design appropriate facilities based on an assessment of needs and present plans in a visual format. 11.1.A
- b Compare appropriate owner/handler responses to behaviors and instincts to ensure the safety of both handler and bird in a variety of situations. 11.1.B
- c Distinguish between clinical signs of proper health and poor health, justifying explanations with data and evidence. 11.1.C
- d Using quantitative reasoning and appropriate units, calculate appropriate rations based on bird characteristics (age, weight, breed, activity level) and nutritional needs by creating systems of equations that describe numerical relationships. 11.1.D
- e Illustrate the reproductive cycle graphically, and summarize available breeding methods and current reproductive technologies. 11.1.E
- f Research common diseases and parasites and their effects on the health of poultry, and draw evidence from the most recent medical literature to recommend the best prevention or control measures. 11.1.F