Colorado CTE

Animal Science (2015): Grades 9, 10, 11, 12, Higher Education

Adopted 2015

Understand structure and significance of animal agriculture systems ANSC.01

01. Understand the history and global significance of animal systems ANSC.01.01

- a. Define major components of animal systems ANSC.01.01.A
- b. Define the major trends and relationship of animal systems to global agriculture production ANSC.01.01.B
- c. Identify various cultural perspectives in agriculture and the impact on animal systems ANSC.01.01.C
- d. Understand current cultural perspectives, global trade, and environmental impact of agriculture and the impact on animal systems ANSC.01.01.D

02. Identify segments, and distribution channels of animal agriculture industry and relate these to the efficiencies of the agriculture production ANSC.01.02

- a. Define agriculture industry segments (producers, processors, consumers, etc) and distribution channels ANSC.01.02.A
- b. Explain the local, regional, national and global agriculture production and the role of animal systems at each level ANSC.01.02.B
- c. Describe the movement of agriculture products through industry segments and industry distribution channels ANSC.01.02.C
- d. Analyze the changes in animal systems management to the efficient production and distribution of agriculture products ANSC.01.02.D

03. Describe the role of animal agriculture industry in society ANSC.01.03

- a. Define animal science and animal systems and determine the importance of the animal systems ANSC.01.03.A
- b. Explore local, regional, national and global animal production and define biosecurity, biotechnology ANSC.01.03.B
- c. Describe techniques to insure biosecurity in our animal production ANSC.01.03.C
- d. Integrate concepts of Animal Science into other agricultural pathways ANSC.01.03.D

04. Describe the process and movement of products from farm to table. ANSC.01.04

- a. Define Distribution Channels (Wholesalers, Local Markets, Direct Markets, Retailers, Government, Institutions, Restaurants, Hotels, Catering) ANSC.01.04.A
- b. Describe the movement of products through channels ANSC.01.04.B
- c. Illustrate the impact of the distribution channels ANSC.01.04.C
- d. Design a new distribution channel (vertical integration) ANSC.01.04.D

Integrate principles of classification and selection in the management practices of the animal industry ANSC.02

01. Understand the use of taxonomic principles in animal agriculture ANSC.02.01

- a. Define common taxonomic terms and explain the importance of taxonomic classification ANSC.02.01.A
- b. Demonstrate the correct use of scientific animal names ANSC.02.01.B

02. Understand and apply concepts of external animal anatomy ANSC.02.02

- a. Identify body components ANSC.02.02.A
- b. Relate body components to function & purpose ANSC.02.02.B

03. Evaluate breed characteristics and apply them in animal selection scenarios ANSC.02.03

- a. Identify common breeds in agriculturally important animal species ANSC.02.03.A
- b. Understand breed characteristics and purpose ANSC.02.03.B
- c. Select an animal for a specific purpose and environment ANSC.02.03.C
- d. Appraise & evaluate economic value of animals for various application in animal agriculture ANSC.02.03.D

04. Evaluate animals for a given production scenario ANSC.02.04

- a. Describe procedure for evaluating animals ANSC.02.04.A
- b. Evaluate market and breeding animals for a specific purpose ANSC.02.04.B
- c. Develop rationale for evaluation of livestock for purpose ANSC.02.04.C
- d. Evaluate production scenario and select livestock for practical application ANSC.02.04.D

Understand how animal growth, development and environmental interactions impact animal production ANSC.03

01. Understand the process of animal growth and development ANSC.03.01

- a. Distinguish growth processes in animals ANSC.03.01.A
- b. Define life span and relate it to living condition; explain the stages of life ANSC.03.01.B
- c. Analyze the growth factors that affect production enterprises ANSC.03.01.C
- d. Explore the role that humans have in each of the life stages of agriculturally important animals ANSC.03.01.D

02. **Explain cell structure and function** ANSC.03.02

- a. Describe the basics of an animal cell and describe the cellular organelles and their functions ANSC.03.02.A
- b. Identify and explain DNA structure and replication processes ANSC.03.02.B
- c. Diagram and label the cell cycle (mitosis and meiosis) and have understanding of each phase ANSC.03.02.C
- d. Select and use appropriate technologies to gather, process, and analyze data and to report information related to an investigation ANSC.03.02.D

03. **Understand the role of the circulatory system its interactions and impact on animal health** ANSC.03.03

- a. Identify major parts and their functions ANSC.03.03.A
- b. Relate functions to other systems ANSC.03.03.B
- c. Determine how changes affect the individual systems and a healthy animal ANSC.03.03.C

04. **Understand the role of the digestion system its interactions and impact on animal health** ANSC.03.04

- a. Identify major parts and their functions ANSC.03.04.A
- b. Relate functions to other systems ANSC.03.04.B
- c. Determine how changes affect the individual systems and a healthy animal ANSC.03.04.C

05. **Understand the role of the endocrine system its interactions and impact on animal health** ANSC.03.05

- a. Identify major parts and their functions ANSC.03.05.A
- b. Relate functions to other systems ANSC.03.05.B
- c. Determine how changes affect the individual systems and a healthy animal ANSC.03.05.C

06. **Understand the role of the excretory system its interactions and impact on animal health** ANSC.03.06

- a. Identify major parts and their functions ANSC.03.06.A
- b. Relate functions to other systems ANSC.03.06.B
- c. Determine how changes affect the individual systems and a healthy animal ANSC.03.06.C

07. **Understand the role of the immune system its interactions and impact on animal health** ANSC.03.07

    a. Identify major parts and their functions ANSC.03.07.A

    b. Relate functions to other systems ANSC.03.07.B

    c. Determine how changes affect the individual systems and a healthy animal ANSC.03.07.C

08. **Understand the role of the integumentary system, its interactions and impact on animal health** ANSC.03.08

    a. Identify major parts and their functions ANSC.03.08.A

    b. Relate functions to other systems ANSC.03.08.B

    c. Determine how changes affect the individual systems and a healthy animal ANSC.03.08.C

09. **Understand the role of the lymphatic system its interactions and impact on animal health** ANSC.03.09

    a. Identify major parts and their functions ANSC.03.09.A

    b. Relate functions to other systems ANSC.03.09.B

    c. Determine how changes affect the individual systems and a healthy animal ANSC.03.09.C

10. **Understand the role of the muscular system its interactions and impact on animal health** ANSC.03.10

    a. Identify major parts and their functions ANSC.03.10.A

    b. Relate functions to other systems ANSC.03.10.B

    c. Determine how changes affect the individual systems and a healthy animal ANSC.03.10.C

11. **Understand the role of the nervous system its interactions and impact on animal health** ANSC.03.11

    a. Identify major parts and their functions ANSC.03.11.A

    b. Relate functions to other systems ANSC.03.11.B

    c. Determine how changes affect the individual systems and a healthy animal ANSC.03.11.C

12. **Understand the role of the respiratory system its interactions and impact on animal health** ANSC.03.12

    a. Identify major parts and their functions ANSC.03.12.A

    b. Relate functions to other systems ANSC.03.12.B

    c. Determine how changes affect the individual systems and a healthy animal ANSC.03.12.C

13. **Understand the role of the skeletal system its interactions and impact on animal health** ANSC.03.13

    a. Identify major parts and their functions ANSC.03.13.A

    b. Relate functions to other systems ANSC.03.13.B

    c. Determine how changes affect the individual systems and a healthy animal ANSC.03.13.C

14. **Understand the role of the reproduction system its interactions and impact on animal health** ANSC.03.14

    a. Identify major parts and their functions ANSC.03.14.A

    b. Relate functions to other systems ANSC.03.14.B

    c. Determine how changes affect the individual systems and a healthy animal ANSC.03.14.C

Explain the role of genetics and reproductive management in animal systems ANSC.04

01. **Understand the principles of sexual reproduction** ANSC.04.01

    a. Identify the parts of the male and female reproductive systems and describe gamete production, define fertilization, gestation, and parturition ANSC.04.01.A

    b. Describe the phases of the female reproductive cycle ANSC.04.01.B

    c. Compare hormone action involved in the reproductive cycle; identify their sources, effects, and purposes ANSC.04.01.C

    d. Evaluate the effects of manipulating the hormones in a reproductive system ANSC.04.01.D

02. **Understand the fundamentals of inheritance and their application to livestock production** ANSC.04.02

    a. Define terms associated with genetics ANSC.04.02.A

    b. Explain how genetics relates to improvement in livestock production ANSC.04.02.B

    c. Diagram and explain how characteristics are inherited ANSC.04.02.C

    d. Diagram and explain the role of genetics with sex determination, linkage, crossover, and mutation ANSC.04.02.D

03. **Explain the process of animal selection, and the role selection plays in improving animal systems** ANSC.04.03

- a. Explain selection, goals for selection and why and how selection has been used in animal systems ANSC.04.03.A
- b. Select an animal for a specific purpose based on genotype and utilize the punnet square to project genetic outcomes ANSC.04.03.B
- c. Select an animal for a specific purpose based on genotype and phenotype ANSC.04.03.C
- d. Apply selection principles to a group of animals ANSC.04.03.D

04. **Understand current reproductive technologies and their application in an animal breeding program** ANSC.04.04

- a. Identify technologies used in animal reproduction ANSC.04.04.A
- b. Explain the procedures used in artificial insemination, embryo transfer, and cloning ANSC.04.04.B
- c. Demonstrate the steps of artificial insemination and embryo transfer ANSC.04.04.C
- d. Develop a breeding system utilizing current ANSC.04.04.D

Understand the impact of disease, parasites and physiological disorders on animal health ANSC.05

01. **Identify signs of diseases, parasites and physiological disorders and recommend appropriate treatment** ANSC.05.01

- a. Recognize signs of proper function of body systems ANSC.05.01.A
- b. Identify signs of illnesses and disorders for specific parasites, diseases & disorders of animals ANSC.05.01.B
- c. Describe treatment protocol and proper administration routes and techniques ANSC.05.01.C
- d. Determine treatment protocol including alternative methods of treatment (massage and acupuncture) ANSC.05.01.D

02. **Identify routes of disease transmission and their impact on disease control** ANSC.05.02

- a. Recognize signs of good health & disease conditions ANSC.05.02.A
- b. Classify diseases, identify causative agents of transmission, including zoonotic diseases ANSC.05.02.B
- c. Recognize common management practices for disease prevention, including biosecurity issues ANSC.05.02.C
- d. Design a program of disease prevention including biosecurity plans for production operations ANSC.05.02.D

03. Explain the principle of immunity and it's role in maintaining animal health ANSC.05.03

a. Identify components of immune system & understand role in disease prevention ANSC.05.03.A

b. Describe the outcomes of the immune response & common immunological disorders ANSC.05.03.B

c. Understand the role of colostrum and the immune response in newborn animals ANSC.05.03.C

d. Understand the principles of vaccination & design immunization protocol for all production animals ANSC.05.03.D

Describe the principles of nutrition and digestion and the role within an animal system ANSC.06

01. Analyze the digestive process it's impact on animal rations and feedstuffs ANSC.06.01

a. Compare the three types of digestive systems and the major species that have each ANSC.06.01.A

b. Select feedstuffs that are appropriate for each system ANSC.06.01.B

c. Trace the breakdown of feedstuffs through the digestive process ANSC.06.01.C

d. Evaluate the chemical processes happening in the digestive cycle (organic acids, protein digestion) ANSC.06.01.D

02. Identify common nutrients and their role in animal growth and development ANSC.06.02

a. Identify common nutrients ANSC.06.02.A

b. Discuss the importance of each nutrient and its function ANSC.06.02.B

c. Determine the correct amounts of each nutrient needed for each species ANSC.06.02.C

d. Compare the metabolic rate of each nutrient ANSC.06.02.D

03. Identify species nutritional requirements and the impact of stages of production and environmental condition ANSC.06.03

a. Identify compare and contrast common feeds for each species nutritional requirements ANSC.06.03.A

b. Determine the specific nutritional needs for each species, environmental condition, and stages of production ANSC.06.03.B

c. Evaluate symptoms of nutritional deficiencies ANSC.06.03.C

d. Improve management system to correct nutritional deficiency ANSC.06.03.D

04. Describe feed classification and composition ANSC.06.04

a. Compare and contrast common types of feedstuffs (roughages and concentrates, additives, supplements) ANSC.06.04.A

b. Determine the relative nutritional value of feedstuffs as a result of different processing methods ANSC.06.04.B

c. Select appropriate feedstuffs for animals based on factors such as the environment and economy ANSC.06.04.C

d. Determine ways to improve relative feed value in feedstuffs ANSC.06.04.D

05. Explain feed additives and growth promoters role in animal production ANSC.06.05

a. Explain the purpose and benefits of feed additives and growth promoters ANSC.06.05.A

b. Discuss how feed additives and growth promoters are administered ANSC.06.05.B

c. Explain how feed additives and growth promoters impact the growth process ANSC.06.05.C

d. Research the benefits and precautions that should be used with feed additives and growth promoters ANSC.06.05.D

Apply understanding of animal behavior to animal care and use ANSC.07

01. Understand animal behavior ANSC.07.01

a. List and describe types of animal behavior ANSC.07.01.A

b. Explain through examples the nine major behavior patterns and how they are interrelated ANSC.07.01.B

c. Summarize how behavioral activities affect animal well-being, productivity, and profitability ANSC.07.01.C

d. Evaluate management system's affect on animal behavior ANSC.07.01.D

02. Observe and recognize signs of health in animals ANSC.07.02

a. Compare the observable signs of healthy animals to the observable signs of unhealthy animals ANSC.07.02.A

b. Explain the benefit to producers of content and healthy animals ANSC.07.02.B

c. Perform simple health-check evaluations on animals ANSC.07.02.C

d. Design a health maintenance and disease prevention plan for animals in confined environments ANSC.07.02.D

03. Analyze the impact of environmental conditions on animal production ANSC.07.03

a. Identify the environmental influences on livestock, intensive management systems, and extensive management systems ANSC.07.03.A

b. Describe how animals adapt to environments and how that affects management practices ANSC.07.03.B

c. Describe how genetics, nervous system functions, and behavior systems affect an animal's ability to adapt to an environment ANSC.07.03.C

d. Explain how producers may assist animals' adaptations to the environment ANSC.07.03.D

04. Understand proper techniques for handling and restraint of animals ANSC.07.04

a. Identify proper animal handling and restraining principles ANSC.07.04.A

b. Outline safety procedures for working with animals by species ANSC.07.04.B

c. Design an animal facility that allows for easy and safe handling and restraint ANSC.07.04.C

05. Understand the need for safe and efficient handling of animals through facility design and management ANSC.07.05

a. Identify types of facilities for given production scenarios ANSC.07.05.A

b. Analyze facilities for functionality and safety ANSC.07.05.B

c. Make recommendations for improvements; analyze current laws relating to facilities and management ANSC.07.05.C

d. Design a facility incorporating all phases of production (from processing to waste management) ANSC.07.05.D

Understand principles of carcass evaluation and grading ANSC.08

01. Evaluate carcasses for industry and consumer demands ANSC.08.01

a. Use visual appraisal to predict the quality and yield grade of a carcass ANSC.08.01.A

b. Define measurement tools to predict the quality and yield grade of a carcass ANSC.08.01.B

c. Use measurement tools to predict the quality and yield grade of a carcass ANSC.08.01.C

d. Predict carcass quality based on live animal evaluation and husbandry practices ANSC.08.01.D

02. **Understand yield grade calculations and the impact of percent yield on industry production standards** ANSC.08.02

- a. Define yield grade and calculate dressing percentages ANSC.08.02.A
- b. Explain yield grade factors ANSC.08.02.B
- c. Evaluate carcass indicators to determine yield grade ANSC.08.02.C
- d. Analyze production of percent yield of meat products and the impact on the goals of the animal industry ANSC.08.02.D

03. **Identify commercial cuts of meat** ANSC.08.03

- a. Identify wholesale cuts ANSC.08.03.A
- b. Identify retail cuts ANSC.08.03.B
- c. Explain the importance of cut identification ANSC it relates to animal production ANSC.08.03.C

04. **Quality grade animals and determine the importance of quality in the animal/meat production process** ANSC.08.04

- a. Define quality grade ANSC.08.04.A
- b. Explain quality grade factors ANSC.08.04.B
- c. Evaluate carcass indicators to determine quality grades ANSC.08.04.C
- d. Analyze impact of quality grades on production and the goals of the animal industry ANSC.08.04.D