Arkansas CTE

Animal Systems: Animal Science (2020)

Examine Career and FFA Opportunities associated with Animal Science. 1

1 **Evaluate and implement the steps and requirements to pursue a career opportunity in Animal Science.** 1.1

1 Examine the educational, training and experiential requirements to pursue a career in Animal Science (e.g., degrees, certifications, training, internships, etc.). 1.1.1

2 Analyze personal skillset and create a plan for obtaining the required education, training and experiences to obtain a career in Animal Science. 1.1.2

2 **Assess the opportunities in Animal Science available through Career Development Events, Supervised Agricultural Experiences and other FFA activities.** 1.2

1 Examine the Livestock Evaluation, Horse Evaluation, Poultry Evaluation and Veterinary Science Career Development Events for opportunities to exhibit skills needed in Animal Science. 1.2.1

2 Research ways that Animal Science or the skills needed may be implemented as a Supervised Agricultural Experience, and other FFA activities that might involve Animal Science. 1.2.2

Analyze historic and current trends impacting the animal systems industry. 2

1 **Evaluate the development and implications of animal origin, domestication and distribution on production practices and the environment.** 2.1

1 Identify and summarize the origin, significance, distribution and domestication of different animal species. 2.1.1

2 Research and summarize major components of animal systems (e.g., livestock, companion animals, etc.). 2.1.2

2 **Assess and select animal production methods for use in animal systems based upon their effectiveness and impacts.** 2.2

1 Identify and categorize terms and methods related to animal production (e.g., sustainable, conventional, humanely raised, natural, organic, etc.) 2.2.1

2 Analyze the impact of animal production methods on end product qualities (e.g., price, sustainability, marketing, labeling, animal welfare, etc.) 2.2.2

3 Research and examine marketing methods for animal products and services (e.g., conventional, niche markets, locally grown, etc.). 2.2.3

3 **Analyze and apply laws and sustainable practices to animal agriculture from a global perspective.** 2.3

1 Distinguish between the types of laws pertaining to animal systems. 2.3.1

Utilize best-practice protocols based upon animal behaviors for animal husbandry and welfare. 3

1 **Demonstrate management techniques that ensure animal welfare.** 3.1

1 Explain the implications of animal welfare and animal rights for animal systems. 3.1.1

2 Research and summarize the challenges involved in working with animals and resources available to overcome them (e.g., tools, technology, equipment, facilities, animal behavior signals, etc.). 3.1.2

2 **Analyze procedures to ensure that animal products are safe for consumption (e.g., use in food systems, etc.).** 3.2

1 Identify and categorize tools, technology and equipment used in animal husbandry and welfare to help provide an abundant and safe food supply. 3.2.1

2 Research and summarize animal production practices that may pose health risks. 3.2.2

3 Evaluate the effectiveness of animal and/or premise identification programs for a given species. 3.2.3

Design and provide proper animal nutrition to achieve desired outcomes for performance, development, reproduction and/or economic production. 4

1 **Analyze the nutritional needs of animals.** 4.1

1 Identify and summarize essential nutrients required for animal health and analyze each nutrient's role in growth and performance. 4.1.1

2 Differentiate between nutritional needs of animals in different growth stages and production systems (e.g., maintenance, gestation, natural, organic, etc.). 4.1.2

3 Differentiate between nutritional needs of animal species. 4.1.3

4 Correlate a species' nutritional needs to feedstuffs that could meet those needs. 4.1.4

2 **Analyze feed rations and assess if they meet the nutritional needs of animals.** 4.2

1 Compare and contrast common types of feedstuffs and the roles they play in the diets of animals. 4.2.1

2 Determine the relative nutritional value of feedstuffs by evaluating their general quality and condition. 4.2.2

3 Examine the importance of a balanced ration for animals based on the animal's growth stage (e.g., maintenance, newborn, gestation, lactation, etc.). 4.2.3

4 Examine the purpose, impact and mode of action of feed additives and growth promotants in animal production. 4.2.4

5 Compare and contrast methods that utilize feed additives and growth promotants with production practices that do not (e.g., organic versus conventional production methods). 4.2.5

3 **Utilize industry tools to make animal nutrition decisions.** 4.3

1 Identify and categorize tools and equipment used to meet animal nutrition needs and ensure an abundant and safe food supply. 4.3.1

2 Examine and summarize the meaning of various components of feed labels and feeding directions. 4.3.2

Apply principles of animal reproduction to achieve desired outcomes for performance, development and/or economic production. 5

1 **Evaluate animals for breeding readiness and soundness.** 5.1

1 Identify and categorize the male and female reproductive organs of the major animal species. 5.1.1

2 Analyze the functions of major organs in the male and female reproductive systems. 5.1.2

3 Compare and contrast how age, size, life cycle, maturity level and health status affect the reproductive efficiency of male and female animals. 5.1.3

4 Assess and describe factors that lead to reproductive maturity. 5.1.4

5 Evaluate reproductive problems that occur in animals. 5.1.5

2 **Apply scientific principles to select and care for breeding animals.** 5.2

1 Summarize genetic inheritance in animals. 5.2.1

2 Compare and contrast the use of genetically superior animals in the production of animals and animal products. 5.2.2

3 Identify and summarize inheritance and terms related to inheritance in animal breeding (e.g., dominate, co-dominate, recessive, homozygous, heterozygous, etc.). 5.2.3

4 Demonstrate how to determine probability trait inheritance in animals. 5.2.4

5 Identify and summarize genetic defects that affect animal performance. 5.2.5

6 Identify and summarize different needs of breeding animals based on their growth stages (e.g., newborn, parturition, gestation, gestation lengths, etc.). 5.2.6

7 Analyze the care needs for breeding stock in each stage of growth. 5.2.7

3 **Apply scientific principles to breed animals.** 5.3

1 Identify and categorize natural and artificial breeding methods (e.g., natural breedings, artificial insemination, estrous synchronization, flushing, cloning, etc.) 5.3.1

2 Analyze the materials, methods and processes of artificial insemination. 5.3.2

3 Demonstrate artificial insemination techniques. 5.3.3

4 Identify and summarize the advantages and disadvantages of major reproductive management practices, including estrous synchronization, superovulation, flushing and embryo transfer (e.g., cost, labor, equipment, etc.) 5.3.4

5 Analyze the processes of major reproductive management practices, including estrous synchronization, superovulation, flushing and embryo transfer. 5.3.5

6 Examine the use of quantitative breeding values (e.g., EPDs, Performance records, pedigrees) in the selection of genetically superior stock. 5.3.6

Evaluate environmental factors affecting animal performance and implement procedures for enhancing performance and animal health. 6

1 **Design animal housing, equipment and handling facilities for the major systems of animal production.** 6.1

1 Differentiate between the types of facilities needed to house and produce animal species safely and efficiently. 6.1.1

2 Identify and summarize equipment, technology and handling facility procedures used in modern animal production (e.g., climate control devices, sensors, automation, etc.) 6.1.2

2 **Comply with government regulations and safety standards for facilities used in animal production.** 6.2

1 Identify and summarize the general standards that must be met in facilities for animal production (e.g., environmental, zoning, construction, etc.). 6.2.1

Classify, evaluate and select animals based on anatomical and physiological characteristics. 7

1 **Classify animals according to taxonomic classification systems and use (e.g., agricultural, companion, etc.).** 7.1

1 Explain the importance of the binomial nomenclature system for classifying animals. 7.1.1

2 Compare and contrast major uses of different animal species (e.g., agricultural, companion, etc.). 7.1.2

2 **Apply principles of comparative anatomy and physiology to uses within various animal systems.** 7.2

1 Research and summarize characteristics of a typical animal cell and identify the organelles. 7.2.1

2 Analyze the functions of each animal cell structure. 7.2.2

3 Examine the basic functions of animal cells in animal growth and reproduction. 7.2.3

4 Identify and summarize the properties, locations, functions and types of animal cells, tissues, organs and body systems. 7.2.4

5 Compare and contrast animal cells, tissues, organs, body systems types and functions among animal species. 7.2.5

3 **Select and train animals for specific purposes and maximum performance based on anatomy and physiology.** 7.3

1 Identify and summarize how an animal's health can be affected by anatomical and physiological disorders. 7.3.1

Apply principles of effective animal health care. 8

1 **Design programs to prevent animal diseases, parasites and other disorders and ensure animal welfare.** 8.1

1 Identify and summarize specific tools and technology used in animal health management. 8.1.1

2 Explain methods of determining animal health and disorders. 8.1.2

3 List and summarize the characteristics of wounds, common diseases, parasites and physiological disorders that affect animals. 8.1.3

4 Identify and summarize characteristics of causal agents and vectors of diseases and disorders in animals. 8.1.4

2 **Analyze biosecurity measures utilized to protect the welfare of animals on a local, state, national and global level.** 8.2

1 Summarize the importance of biosecurity to the animal industry at multiple levels (e.g., local, state, national, global). 8.2.1

2 Analyze procedures at the local, state and national levels to ensure biosecurity of the animal industry. 8.2.2

3 Identify and describe zoonotic diseases including their historical significance and potential future implications. 8.2.3

Analyze environmental factors associated with animal production. 9

1 **Design and implement methods to reduce the effects of animal production on the environment.** 9.1

1 Identify and summarize the effects of animal agriculture on the environment (e.g., waste disposal, carbon footprint, air quality, environmental efficiencies, etc.). 9.1.1

2 **Evaluate the effects of environmental conditions on animals and create plans to ensure favorable environments for animals.** 9.2

1 Research and summarize environmental conditions that impact animals (e.g., weather, sources of water, food resources, etc.). 9.2.1

2 Identify and summarize methods for ensuring optimal environmental conditions for animals. 9.2.2