Ohio CTE: Agricultural and Environmental Systems

Animal Science

Nutrition: Analyze, formulate, prepare, and administer a ration for a population of specific animal species based on the economics, nutrition, and availability of feedstuffs and evaluate the feed's effects on animals, and animal products. 2.1

1. **Identify the traditional and alternative types, compositions, quality, and compatibility of feedstuff, feed additives, and feed byproducts.** 2.1.1
2. **Describe the role of nutrients and nutritional requirements of different animal life processes and species.** 2.1.2
3. **Collect a feedstuff sample and interpret the data to determine the quality.** 2.1.3
4. **Identify and address major nutrient deficiency and toxicity symptoms.** 2.1.4
5. **Identify the biological and non-biological contaminants (physical, chemical, biological, and radiological) found in feedstuffs and their impacts on animals.** 2.1.5
6. **Formulate and prepare rations and diets for different stages of an animal's life.** 2.1.6
7. **Calculate performance indicators (feed efficiency, average daily gain, minimum energy required) in relation to the cost, quality, and availability of feeds.** 2.1.7
8. **Select and determine the feeding and watering practices and systems, based on the animal population, purpose, and requirement.** 2.1.8

Body Systems: Describe the interrelationships of animal body systems with growth, development, health, maintenance, reproduction, and production. 2.2

1. **Describe external anatomical parts and their functions within different species.** 2.2.1
2. **Compare and contrast the anatomical parts of the digestive system(s) and describe their physiology within different species.** 2.2.2
3. **Identify anatomical components of nerve tissue and the nervous system, including regions of the brain, spinal nerves, and the sympathetic and parasympathetic system, and describe their physiology.** 2.2.3
4. **Identify the anatomical components of the skeletal system, including the types and forms of bones, and describe their physiology.** 2.2.4
5. **Identify the anatomical components of the muscular systems, including striated, cardiac, and smooth muscle and describe their physiology.** 2.2.5
6. **Compare and contrast bone growth, muscle growth, and fat deposition in relation to developmental patterns.** 2.2.6

	7 Describe the components of the cardiovascular system and their functions, including factors affecting blood flow. 2.2.7
	8 Identify and describe the physical characteristics, components, and functions of blood. 2.2.8
	9 Identify and describe the integumentary system (e.g. skin, hair, nails, wool, feathers, scales), related structures, functions, and cycles. 2.2.9
	10 Identify and describe the function and components of the respiratory system and pulmonary ventilation and the factors influencing respiratory rates. 2.2.10
	11 Identify and describe the urinary system structure and function, including excretion and osmoregulation. 2.2.11
	12 Compare and contrast between the male and female reproductive system, structures, and function. 2.2.12
	13 Describe the endocrine system, its structure, and the role of hormones. 2.2.13
	14 Identify and describe the immune system and lymphatic system's role in immunity. 2.2.14
	15 Identify the anatomy and describe the physiology of the mammary system. 2.2.15
Care and Management: Apply animal care, management, and record procedures to ensure husbandry and welfare, including managing environmental conditions to ensure health and performance. 2.3	1 Identify species-specific terminology (gender, age, reproductive status). 2.3.1
	2 Identify, classify, evaluate, and select animal species or breeds for a desired outcome. 2.3.2
	3 Determine the biotic and abiotic factors (e.g. air, ventilation) that impact the animal's environment. 2.3.3
	4 Apply concepts of pest control and nuisance animal control, sanitation, and disinfection procedures for animals' care and management. 2.3.4
	5 Perform species-specific animal identification techniques for traceability and records. 2.3.5
	6 Calculate a facility or habitat's carrying capacity and its impact on animal health. 2.3.6
	7 Identify and recognize predator-prey relationships and implement control measures. 2.3.7
	8 Evaluate and perform animal care procedures aligned with industry standards throughout the life of the animal. 2.3.8

	9 Monitor and evaluate the quality of an animal's habitat and implement corrective methods as needed. 2.3.9
	10 Recognize common restraints and tack devices for handling including their use and adjustments. 2.3.10
	11 Groom animals through brushing, bathing, and therapeutic treatments. 2.3.11
	12 Assess the nails and hooves of animals and understand the practice of trimming and treating for specific species. 2.3.12
	13 Compare and contrast different standards of grooming and styling techniques for specific animal species and breeds. 2.3.13
	14 Identify and recognize normal and abnormal dental structures and conditions. 2.3.14
Recognizing Diseases and Disorders: Evaluate animal conditions for species-specific diseases and disorders to assess an animal's health and welfare. 2.4	1 Identify common infectious and noninfectious causes of diseases and disorders within different species. 2.4.1
	2 Identify abnormalities in the skeleton, body form and functions and identify associated symptoms. 2.4.2
	3 Describe the clinical signs that are associated with an abnormality caused by environmental factors (e.g. heat stress, standing condition, air quality). 2.4.3
	4 Assess clinical signs of animals and identify diseases caused by microorganisms (e.g., parasites, viruses, bacteria, fungi, protozoa). 2.4.4
	5 Describe zoonotic diseases and explain the health risk on humans and animals. 2.4.5
	6 Implement disease prevention methods and procedures including the use of personal protective equipment. 2.4.6
	7 Utilize voided specimens to determine animal health by performing urinalysis and fecal floatation with centrifugation. 2.4.7
	8 Understand the principles of imaging and diagnostics through the use of X-ray and ultrasound equipment and techniques. 2.4.8
	9 Apply principles of image physics and perform ultrasound techniques. 2.4.9
	10 Differentiate between active and passive immunities and identify immunization schedule per species. 2.4.10
Animal Health: Implement preventive measures, treatment,	1 Obtain and interpret an animal's vitals. 2.5.1

and maintenance options for species-specific diseases and disorders to improve an animal's health and welfare. 2.5	**2** Apply concepts of body condition scoring to assess an animal's general health and nutrition status. 2.5.2
	3 Recognize the preventative measures or treatments needed to maintain animal health. 2.5.3
	4 Apply basic principles of first aid. 2.5.4
	5 Inventory, store, and dispose of pharmaceutical drugs by category, class, and label. 2.5.5
	6 Describe the routes of administration for medications (oral, IM, IV, SQ) and the process of drug absorption, distribution, metabolism, withdrawal, and excretion. 2.5.6
	7 Interpret and follow label directions for the dosage, route of administration, and withdrawal period. 2.5.7
	8 Simulate the administration of drug treatments and vaccines, following quality assurance guidelines, and monitor common adverse effects and potential problems associated with administration. 2.5.8
	9 Prepare a sterile surgical environment, prepare patients for surgery, and conduct post- operative procedures. 2.5.9
	10 Describe advantages, disadvantages, and adverse side effects of commonly used preanesthetic and anesthetic agents. 2.5.10
	11 Identify and prepare sterile surgical instruments commonly used for surgery and post- operative procedures. 2.5.11
Population Management: Manage reproduction practices in animal populations across habitats to achieve the desired outcomes and specific goals. 2.6	**1** Identify factors that lead to reproductive maturity and select animals for reproductive readiness. 2.6.1
	2 Compare and select superior individuals based on phenotype. 2.6.2
	3 Compare and select superior individuals based on breeding values and heritability of the desired traits. 2.6.3
	4 Identify normal and abnormal signs of parturition and recommend appropriate management practices. 2.6.4
	5 Understand the rationale to manipulate an animal's reproductive processes to support breeding (e.g., sex-sorted semen, heat synchronization, nutritional flushing, light cycling, natural and selected breeding). 2.6.5
	6 Understand the rationale for selecting breeding methods (e.g., artificial insemination, embryo transfer, natural selection, selective breeding, invitro fertilization, cloning). 2.6.6

7 **Describe requirements and environmental influences during different stages of gestation within different species.** 2.6.7

8 **Describe ethical and responsible animal population management practices (e.g., spaying, neutering, heat suppression, relocation, reintroduction, hunting, containment, culling, euthanasia).** 2.6.8