

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

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- 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**
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**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**

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- 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**
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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**
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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