

Animal Systems Pathway Test Blueprint

I. Animal Health and Physiology

A. Understand how animal growth, development, and environmental interactions affect animal production.

1. Understand the process of animal growth and development.
 - a. Identify stages of life and how environment and human interaction influence average life span.
 - b. Analyze growth factors and their effects on production enterprises.
2. Explain cell structure and function.
 - a. Identify cellular structures and their functions.
 - b. Identify DNA structure.
 - c. Analyze the processes of mitosis and meiosis.
3. Understand the skeletal system.
 - a. Identify major parts.
 - b. Describe anatomical functions.
4. Understand the muscular system.
 - a. Identify major parts.
 - b. Describe anatomical functions.
5. Understand the digestive system.
 - a. Identify major parts.
 - b. Describe anatomical functions.
6. Understand the circulatory system.
 - a. Identify major parts.
 - b. Describe anatomical functions.
7. Understand the respiratory system.
 - a. Identify major parts.
 - b. Describe anatomical functions.
8. Understand the endocrine system.
 - a. Identify major parts.
 - b. Describe anatomical functions.
9. Understand the nervous system.
 - a. Identify major parts.
 - b. Describe anatomical functions.

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| 10. Understand the reproduction system. |
| a. Identify major parts. |
| b. Describe anatomical functions. |
| c. Describe the phases of the reproductive cycle. |
| 11. Understand the interaction between anatomical systems and the impact on animal health. |
| a. Describe interactions with other systems. |
| b. Evaluate how changes affect the individual systems and a healthy animal. |
| B. Understand the impact of disease, parasites, and physiological disorders on animal health. |
| 1. Identify signs of diseases, parasites, and physiological disorders and recommend appropriate treatment. |
| a. Recognize observable signs of a healthy animal. |
| b. Identify signs of illnesses and disorders for specific parasites, diseases, and disorders of animals. |
| c. Describe proper administration routes and techniques within a treatment protocol. |
| 2. Identify routes of disease transmission and methods of prevention and control. |
| a. Identify causative agents of disease transmission. |
| b. Recognize common management practices for disease prevention. |
| c. Describe the principles of biosecurity. |
| 3. Describe the principles of immunity and vaccines and their roles in maintaining animal health. |
| a. Describe the immune system's response to disease or vaccination. |
| b. Define the role of colostrum and the immune response in newborn animals. |
| c. Compare and contrast types of vaccines. |
| C. Demonstrate an understanding of animal behavior as it applies to animal care and use. |
| 1. Recognize differences in animal behavior. |
| a. Identify types of animal behavior. |
| b. Analyze how behavior affects animal well-being, productivity, and profitability. |
| c. Analyze the effect management systems have on animal behavior. |
| 2. Analyze the impact of environmental conditions on animal production. |

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a. Identify the environmental influences on livestock within different management systems (e.g., intensive and extensive).

b. Describe how animals adapt to environments.

3. Identify proper techniques and facilities for handling and restraining animals.

a. Recognize proper animal handling and restraining principles.

b. Identify safety procedures for working with animals.

c. Identify proper types of facilities for various livestock operations.

II. Animal Industry and Management

A. Understand structure and significance of animal agriculture systems.

1. Define major components of animal systems.

a. Identify segments and distribution channels of animal agriculture.

b. Define the function of agriculture industry segments (e.g., producers, processors, consumers, etc.).

c. Identify local, regional, national, and global variations in animal production.

d. Analyze the historical changes in productivity and efficiency within animal systems.

2. Describe the role of animal agriculture industry in society.

a. Define animal science and the importance of animal systems.

b. Describe techniques to ensure food safety.

c. Identify various cultural perspectives and issues in agriculture that affect animal systems.

3. Describe the process and movement of products from farm to table.

a. Define distribution channels (e.g., wholesalers, local markets, direct markets, retailers, government, institutions, restaurants, hotels, and catering).

b. Trace the movement of animal products through the distribution channels.

c. Define the concepts of vertical and horizontal integration.

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

1. Understand the fundamentals of inheritance and their application to livestock production.

a. Apply terms associated with genetics.

b. Diagram how characteristics are inherited (e.g., Punnett square).

2. Explain the process of animal selection and the role selection plays in improving animal systems.

a. Select an animal for a specific purpose based on genotype and phenotype.

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b. Describe commonly used breeding systems (e.g., purebreeding, crossbreeding, and composite breeds).

c. Describe how genetic selection tools are used in breeding systems (e.g., expected progeny differences, pedigrees, and performance data).

3. Understand current reproductive technologies and their application in an animal breeding program.

a. Identify technologies used in animal reproduction.

b. Describe how artificial insemination, estrus synchronization, embryo transfer, and cloning are used to improve livestock/reproductive management.

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

1. Analyze the digestive process and its impact on animal rations and feedstuffs.

a. Compare the three types of digestive systems.

b. Select feedstuffs that are appropriate for each digestive system.

2. Identify common nutrients and their role in animal growth and development.

a. Identify the six essential nutrients.

b. Identify the importance of each nutrient and its function.

c. Describe how nutrients are used in the body (e.g., maintenance, growth, lactation, work, and reproduction).

3. Identify nutritional requirements of livestock and the impact of stages of production and environmental condition.

a. Determine the specific nutritional needs for each species, environmental condition, and stages of production.

b. Select appropriate feedstuffs to meet nutritional requirements of animals.

c. Balance a two-ingredient feed ration utilizing the Pearson Square method.

4. Describe feed classification and composition.

a. Compare and contrast common types of feedstuffs (e.g., roughages and concentrates, additives, and supplements).

b. Identify ways to improve relative feed value in feedstuffs.

c. Recognize the purpose and benefits of feed additives and growth promoters.

d. Interpret information on a feed tag/label.

III. Animal Selection and Product Evaluation

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

1. Understand the use of taxonomic principles in animal agriculture.

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| a. Define taxonomic terms used in animal agriculture. |
| b. Identify the common industry terms used for age and sex classification of animals. |
| c. Identify the common industry terms used for market classification or use of animals. |
| 2. Understand and apply concepts of external animal anatomy. |
| a. Identify parts of the animal (e.g., stifle, hock, and brisket). |
| b. Relate body parts to function and purpose. |
| 3. Evaluate breed characteristics and apply them in animal selection scenarios. |
| a. Identify common breeds in agriculturally important animal species. |
| b. Describe breed characteristics and purpose. |
| 4. Evaluate animals for a given production scenario. |
| a. Describe criteria for evaluating animals. |
| b. Evaluate market and breeding animals for a specific purpose. |
| c. Evaluate production scenario and select livestock for practical application. |
| B. Evaluate animal products to meet industry and consumer demands. |
| 1. Identify commercial cuts of meat and poultry. |
| a. Identify primal cuts. |
| b. Identify common retail cuts. |
| c. Explain the importance of cut identification as it relates to animal production. |
| 2. Understand yield grade calculation and the impact percent yield has on industry. |
| a. Define yield grade and the factors that influence it. |
| b. Calculate dressing percentages. |
| c. Evaluate carcass indicators to determine yield grade. |
| 3. Understand quality grade calculations and the impact they have on industry. |
| a. Define quality grade and the factors that influence it. |
| b. Evaluate carcass indicators to determine quality grade. |
| 4. Understand the role of food product grading and inspection to provide consistency in food quality and safety. |
| a. Identify purposes of food grading and inspection. |
| b. Determine types of grading systems based on different products (e.g., milk, eggs, poultry, and wool). |