### Essential Questions:

1. How are anatomical and physiological characteristics used to classify, evaluate, select and manage animals?
2. Why do we evaluate and select animals based on scientific principles of animal production?
3. How do health care and animal nutrition to ensure the proper growth, development, reproduction and economic production of animals?
4. How do animal handling procedures and facilities ensure the safety of animals, producers and consumers of animal products?

### Essential Vocabulary:

- alimentary canal
- ammonia
- anatomy
- anemia
- animal husbandry
- animal well-being
- antibiotics
- biosecurity
- bladder
- blood
- bones
- breeding readiness
- calorie
- cardiac muscle tissue
- cartilage
- castration
- cervix
- circulatory system
- clitoris
- cloaca
- concentrates
- connective tissue
- copulation
- cowper’s gland
- crossbreeding
- crude protein
- dehydration
- diet
- digestive system
- dry matter
- epididymis
- euthanasia
- excretion
- fallopian tubes
- fecal examination
- feed analysis
- feeding standards
- feedstuffs
- fertilization
- fever
- flight zone
- follicles
- funnel
- gametes
- gestation
- grade animal
- grazing
- heart rate
- heterosis
- hormones
- hybrid vigor
- hypothermia
- inbreeding
- incubation
- infectious disease
- infundibulum
- isthmus
- labia majora
- labia minora
- lactation
- legumes
- ligaments
- lighting
- line breeding
- magnum
- manure
- muscle tissue
- muscular system
- nervous system
- nervous tissue
- neutering
- non-ambulatory
- nutrient management
- oogenesis
- organ system
- organs
- outcrossing
- ova
- ovary
- oviducts
- palatability
- papilla
- parturition
- penis
- physiology
- prostate gland
- puberty
- purebred
- quality assurance
- range condition
- range site
- ration
- reflections
- rendering
- reproductive health management
- reproductive system
- respirations
- respiratory system
- roughages
- ruminants
- scrotum
- semen
- seminal vesicles
- sheath
- skeletal muscle tissue
- skeletal system
- solitary behavior
- spawning
- spaying
- sperm
- spermatogenesis
- spermatozoa
- stethoscope
- stocking rate
- stress
- tendons
- testicles
- testosterone
- the zone of influence
- urethra
- urinary system
- urine
- uterine horns
- uterus
- vagina
- vas deferens
- venereal disease
- ventilation
- vital signs
- vulva
- zygote

### Essential Understanding

The student will demonstrate competence in the application of scientific principles and practices to the production and management of animals.

AS.01. The student will examine the components, historical development, global implications and future trends of the animal systems industry. (AG1)

AS.02. The student will classify, evaluate, select and manage animals based on anatomical and physiological characteristics.

<table>
<thead>
<tr>
<th>Prior Background Knowledge Required</th>
<th>Students will know....</th>
<th>Students will understand that...</th>
<th>Students will be able to...</th>
</tr>
</thead>
<tbody>
<tr>
<td>computer experience</td>
<td>how to classify animals according to hierarchical taxonomy and agricultural use.</td>
<td>anatomy and physiology can be used to determine meaning of animal production.</td>
<td>explain the importance of the binomial system of nomenclature. (GP)</td>
</tr>
<tr>
<td>basic Math and ELA skills</td>
<td>how to apply principles of comparative anatomy and physiology to uses within various animal systems.</td>
<td>the animal body is organized in terms of cells, tissues, organs, organ systems.</td>
<td>identify major animal species by common and scientific names. (GP)</td>
</tr>
<tr>
<td>basic speaking and listening skills</td>
<td></td>
<td></td>
<td>identify basic characteristics of animal</td>
</tr>
</tbody>
</table>
- how to select animals for specific purposes and maximum performance based on anatomy and physiology.

Vocabulary:
- anatomy
- animal well-being
- blood
- bones
- cardiac muscle tissue
- cartilage
- circulatory system
- connective tissue
- digestive system
- excretion
- hormones
- ligaments
- muscle tissue
- muscular system
- nervous system
- nervous tissue
- organ system
- organs
- physiology
- reproductive system
- respiratory system
- skeletal muscle tissue
- skeletal system
- tendons
- urinary system

- there are four basic tissue types (epithelial, connective, muscle, and organ).
- there are major organ systems found in vertebrate animals.

- compare and contrast animal cells, tissues, organs and body systems. (Meats) (AA)
- explain the relationship of animal tissues to growth, performance and health. (AHH)
- explain the importance and uses made of animal tissues in the agriculture industry. (Meats)
- describe the properties, locations, functions and types of animal organs. (AA)
- compare and contrast organ types and functions among animal species. (AA)
- relate the importance of animal organs to the health, growth and reproduction of animals. (LRE) (AA)
- describe the functions of the animal body systems and system components. (AA)
- compare and contrast body systems and system adaptations between animal species. (AA)
- identify ways an animal’s health can be affected by anatomical and physiological disorders.
AS.03. The student will provide for the proper health care of animals.

<table>
<thead>
<tr>
<th>Prior Background Knowledge Required:</th>
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</tr>
</thead>
<tbody>
<tr>
<td>• computer experience</td>
<td>• how to prescribe and</td>
<td>• animal health can be</td>
<td>• perform simple health-</td>
</tr>
<tr>
<td>• basic Math and ELA skills</td>
<td>implement a prevention</td>
<td>described through visual</td>
<td>check evaluations on</td>
</tr>
<tr>
<td>• basic speaking and</td>
<td>and treatment program</td>
<td>and tangible observations.</td>
<td>animals. (AHH)</td>
</tr>
<tr>
<td>listening skills</td>
<td>for animal diseases,</td>
<td>• vital signs can be utilized</td>
<td>• perform diagnostic tests</td>
</tr>
<tr>
<td>• basic collaboration tools</td>
<td>parasites and other</td>
<td>when detecting sickness.</td>
<td>to detect health problems</td>
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<td></td>
<td>disorders.</td>
<td>• there are common</td>
<td>in animals. (AHH)</td>
</tr>
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<td></td>
<td>• how to provide for the</td>
<td>emergency medical</td>
<td>• identify common diseases,</td>
</tr>
<tr>
<td></td>
<td>biosecurity of</td>
<td>situations and possible</td>
<td>parasites and physiological</td>
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<td>agricultural</td>
<td>solutions.</td>
<td>disorders that affect</td>
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<tr>
<td></td>
<td>animals and production</td>
<td></td>
<td>animals. (AHH)</td>
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<td>facilities.</td>
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<td>• explain characteristics</td>
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<td>of causative agents and</td>
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<td>vectors of diseases and</td>
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<td></td>
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<td></td>
<td>disorders in animals.</td>
</tr>
<tr>
<td>Mycaert.com</td>
<td></td>
<td></td>
<td>(AHH)</td>
</tr>
</tbody>
</table>

Vocabulary:
• anemia
• animal husbandry

(Meats) (AHH)

- compare and contrast desirable anatomical and physiological characteristics of animals within and between species. (AA)
- create a program to develop an animal to its highest potential performance. (Meats)
- develop efficient procedures to produce consistently high-quality animals, well suited for their intended purposes. (AHH)
<table>
<thead>
<tr>
<th>AS.04. The student will apply principles of animal nutrition to ensure the proper growth, development, reproduction and economic production of animals.</th>
<th>Prior Background Knowledge Required:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• computer experience</td>
</tr>
<tr>
<td></td>
<td>• basic Math and ELA skills</td>
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<tr>
<td></td>
<td>• basic speaking and listening skills</td>
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<td></td>
<td>• basic collaboration tools</td>
</tr>
<tr>
<td>Students will know....</td>
<td>Students will understand that...</td>
</tr>
<tr>
<td>• how to formulate feed rations to provide for the nutritional needs of animals.</td>
<td>• feedstuffs play an important role in the diets of animals.</td>
</tr>
<tr>
<td>• how to prescribe and administer animal feed additives and growth</td>
<td>• distinguishing between good quality and poor quality feedstuffs exist helps in the selection of</td>
</tr>
</tbody>
</table>
### Vocabulary:
- antibiotics
- calorie
- concentrates
- crude protein
- diet
- dry matter
- feed analysis
- feeding standards
- feedstuff
- feedstuffs
- hormones
- legumes
- palatability
- range condition
- range Site
- ration
- rendering
- roughages
- ruminants
- stocking rate

### AS.05. The student will evaluate and select animals based on scientific principles of animal production.

<table>
<thead>
<tr>
<th>Prior Background Knowledge Required:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• computer experience</td>
</tr>
<tr>
<td>• basic Math and ELA skills</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Students will know....</th>
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<tbody>
<tr>
<td>• how to evaluate the male and female reproductive systems in selecting</td>
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</table>

<table>
<thead>
<tr>
<th>Students will understand that....</th>
</tr>
</thead>
<tbody>
<tr>
<td>• age, size, life cycle, maturity level and health status affect the</td>
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</table>

<table>
<thead>
<tr>
<th>Students will be able to....</th>
</tr>
</thead>
<tbody>
<tr>
<td>• explain the male and female reproductive organs of the major animal species.</td>
</tr>
</tbody>
</table>
- basic speaking and listening skills
- basic collaboration tools

Animals.
- how to evaluate animals for breeding readiness and soundness.
- how to apply scientific principles in the selection and breeding of animals.

Vocabulary:
- alimentary canal
- bladder
- breeding readiness
- castration
- cervix
- clitoris
- cloaca
- copulation
- cowper’s gland
- crossbreeding
- epididymis
- fallopian tubes
- fertilization
- follicles
- funnel
- gametes
- gestation
- grade animal
- heterosis
- hybrid vigor
- inbreeding
- incubation
- infectious disease

Reproductive efficiency of male and female animals.
- there are certain methods used to castrate and neuter animals, that are more beneficial than others.
- the phases of reproductive development in the life of an animal are used to determine an animal’s readiness for breeding.
- reproduction management practices affect reproductive performance.
- there are common breeding systems used in livestock production.

(AA)
- describe the functions of major organs in the male and female reproductive systems. (AA)
- explain how age, size, life cycle, maturity level and health status affect the reproductive efficiency of male and female animals. (AA) (WH)
- summarize factors that lead to reproductive maturity. (AA)
- discuss the importance of efficient and economic reproduction in animals. (LRE)
- evaluate reproductive problems that occur in animals. (LRE)
- explain genetic inheritance in agricultural animals. (LRE)
- define natural and artificial breeding methods. (AA)
- explain the processes of natural and artificial breeding methods. (AA)
- explain the use of quantitative breeding values (e.g., EPDs) in the selection of genetically superior breeding stock. (LRE)
- compare and contrast quantitative breeding value
- infundibulum
- isthmus
- labia majora
- labia minora
- lactation
- linebreeding
- magnum
- neutering
- oogenesis
- outcrossing
- ova
- ovary
- oviducts
- papilla
- parturition
- penis
- prostate gland
- puberty
- purebred
- reproductive health management
- scrotum
- semen
- seminal vesicles
- sheath
- spawning
- spaying
- sperm
- spermatogenesis
- spermatozoa
- testicles
- testis
- testosterone
- urethra
- urine
- uterine horns
- uterus

| Differences between genetically superior animals and animals of average genetic value. (LRE) |
| Explain the advantages of major reproductive management practices, including estrous synchronization, superovulation, flushing and embryo transfer. (LRE) |
| Discuss the uses and advantages and disadvantages of natural breeding and artificial insemination. (LRE) |
| Explain the materials, methods and processes of artificial insemination. (LRE) (AA) |
AS.06. The student will prepare and implement animal handling procedures for the safety of animals, producers and consumers of animal products.

Prior Background Knowledge Required:
- computer experience
- basic Math and ELA skills
- basic speaking and listening skills
- basic collaboration tools

Students will know that:
- how to demonstrate safe animal handling and management techniques.
- how to implement procedures to ensure that animal products are safe.

Vocabulary:
- biosecurity
- euthanasia
- quality assurance
- the zone of influence

Students will understand that:
- facility and attitude considerations should be made when handling livestock.
- the use of “Best Management Practices” ensures animal health and nutrition.

Students will be able to:
- discuss the dangers involved in working with animals. (AHH)
- outline safety procedures for working with animals by species. (AHH)
- interpret animal behaviors and execute protocols for safe handling of animals. (AHH)
- design programs that assure the welfare of animals and prevent abuse or mistreatment. (AHH)
- implement quality-assurance programs and procedures for animal production. (AHH)
- identify animal production practices that could pose health risks or are considered to pose risks by some. (Meats)
- discuss consumer concerns with animal production practices relative to human health. (AHH) (LRE)
AS.07. The student will select animal facilities and equipment that provide for the safe and efficient production, housing and handling of animals.

<table>
<thead>
<tr>
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<th>Students will be able to...</th>
</tr>
</thead>
<tbody>
<tr>
<td>• computer experience</td>
<td>• how to design animal housing, equipment and handling facilities for the major systems of animal production.</td>
<td>• the Cattle Industry's Guidelines for the Care and Handling of Cattle include facilities.</td>
<td>• critique designs for an animal facility and prescribe alternative layouts and adjustments for the safe and efficient use of the facility. (AHH)</td>
</tr>
<tr>
<td>• basic Math and ELA skills</td>
<td>• how to comply with government regulations and safety standards for facilities used in animal production.</td>
<td>• facility and attitude considerations should be made when handling livestock.</td>
<td>• design an animal facility, focusing on animal requirements, efficiency, safety and ease of handling. (AHH)</td>
</tr>
<tr>
<td>• basic speaking and listening skills</td>
<td>• nonambulatory</td>
<td></td>
<td>• identify equipment and handling facilities used in modern animal production. (AHH)</td>
</tr>
<tr>
<td>• basic collaboration tools</td>
<td></td>
<td></td>
<td>• explain how modern equipment and handling</td>
</tr>
</tbody>
</table>

Animalcaretraining.org

Vocabulary:
• flight zone
• lighting
• nonambulatory
AS.08. The student will analyze environmental factors associated with animal production.

<table>
<thead>
<tr>
<th>Prior Background Knowledge Required:</th>
<th>Students will know...</th>
<th>Students will understand that...</th>
<th>Students will be able to...</th>
</tr>
</thead>
<tbody>
<tr>
<td>• computer experience</td>
<td>• how to reduce the effects of animal production on the environment.</td>
<td>• environmental concerns are associated with manure application.</td>
<td>• evaluate the effects of animal agriculture on the environment. (RM) (PM)</td>
</tr>
<tr>
<td>• basic Math and ELA skills</td>
<td>• how to evaluate the effects of environmental conditions on animals.</td>
<td>• there are proper techniques to odor management.</td>
<td>• outline methods of reducing the effects of animal agriculture on the environment. (RM) (PM)</td>
</tr>
<tr>
<td>• basic speaking and listening skills</td>
<td></td>
<td></td>
<td>• implement measures to reduce the impact of animal agriculture on the environment. (RM) (PM)</td>
</tr>
<tr>
<td>• basic collaboration tools</td>
<td></td>
<td></td>
<td>• identify optimal environmental conditions for animals. (RM)</td>
</tr>
</tbody>
</table>

Agednet.com
LA011

Vocabulary:
• ammonia
• grazing
• manure
• nutrient management

facilities enhance the safe and economic production of animals. (AHH)
• list the general standards (e.g., environmental, zoning, construction) that must be met in facilities for animal production. (AHH)
• evaluate an animal facility to determine if standards have been met. (AHH)
• design a facility that meets standards for the legal, safe, ethical and efficient production of animals. (AHH)

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