Appendix L

AGRICULTURE, FOOD, AND NATURAL RESOURCES (AFNR)
YOUTH APPRENTICESHIP

ANIMAL PATHWAY
LARGE ANIMAL/HERD UNIT
UNIT 4

Unit 4: Animal Pathway
Large Animal/Herd

Competency
1. Clean and groom animals

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when the learner:

- Reviews the specific requirements required for cleaning & grooming
- ***Safely handles the animal***
- Wears appropriate clothing and footwear
- Assembles the cleaning & grooming solutions, tools, and equipment
- Brushes and/or rubs down animal thoroughly
- Clips the nails carefully OR cleans and trims hooves if applicable and allowed by worksite professional
- Clips or shears hair as required
- Checks for signs of infection as you clean and groom
- Dips or bathes animals, top to bottom, with appropriate bathing solutions and scrubbers
- Sprays animals with disinfectant and insecticides
- Cleans ears careful not to go too deep into the ear canal
- Dehorns young males if applicable and allowed by worksite professional
- Reports unusual observations to the worksite professional
- Documents cleaning and grooming process as required

Learning Objectives

- Identify animal parts from a diagram or on a real animal
- List possible signs of infection that can be observed when grooming an animal
- List the safety precautions and proper use of grooming tools that you will use with the animal(s) that you work with
- Compare disinfectants, parasitic dips, and insecticides used in cleaning animals
- Explain safety precautions required for nail and hoof trimming
- Describe processes for nail and hoof trimming
- Describe processes for ear cleaning
- Describe processes for clipping and shearing
- Identify trimming procedures according to the animal's structural features
- Describe processes for brushing and bathing
- Define the role of a farrier
- Compare methods of dehorning and when to use each method
- Explain why males are dehorned

Comments:

Unit 4: Animal Pathway
Large Animal/Herd

Competency

2. Feed and water animals

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when the learner:

- Feeds and waters animals regularly and consistently as required by facility
- Consults appropriate diet plan for animals' developmental stage or health
- ***Mixes feed, additives and/or medicines***
- Offers feed to animal(s) in appropriate manner for animal
- Replaces or freshens water supplies in containers, tanks, at a natural source or with watering systems as required
- Ensures any watering systems are insulated, adjusted for height and flow rate and supplies are adequate
- Heats or insulates water to keep from freezing if needed
- Observes appearance and behavior of eating and drinking
- Documents feeding and watering times
- Periodically, cleans feed containers as needed to remove spoiled food and/or manure

Learning Objectives

- Explain the components of Good Manufacturing Practices and how these components prevent feed contamination and ensure proper mixing
- Explain the different phases of an animal's life cycle
- Compare the various types of digestive systems (mono-gastric, ruminant, avian, pseudo-ruminant) found in herd or food animals
- Identify the major parts of the digestive system and describe their functions
- Explain the functions of feed
- Identify the various feed types and characteristics
- Analyze suitable common feed ingredients including forages, roughages, concentrates, and supplements
- Compare and contrast the types of feedstuffs (roughages, concentrates, and supplements/additives)
- Distinguish between good quality and poor quality feedstuffs
- Explain the purpose and benefits of feed additives and growth promotants
- Explain how herd animals are fed
- Discuss the proper nutrient and water requirements for your livestock at the various stages of production
- Identify the role of the NRC (National Research Council) for nutrient requirements in research animals

Comments:

Unit 4: Animal Pathway
Large Animal/Herd

Competency

3. Mark or tag animals

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when the learner:

- Reviews the specific requirements required for marking & tagging the animal
- ***Safely handles the animal***
- Wears appropriate clothing and footwear
- Assembles the appropriate tools and equipment
- Marks animal using brands, tags, paints or tattoos
- Cleans and sanitizes marking equipment if applicable
- Observes animals for infection for a few days

Learning Objectives

- Identify tools and methods for identification of individual animals and groups/pens
- Discuss why animals are marked
- List common methods of marking
- Compare methods of identification for cattle, swine and sheep
- List common earmarks for cattle
- Explain guidelines for timing of ear tagging/marking

Comments:

Unit 4: Animal Pathway
Large Animal/Herd

Competency

4. Herd and/or patrol/monitor animals

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when the learner:

- Periodically moves animals from one location to another according to facility requirements
- Moves animals in manner to reduce agitation and anxiety
- Herds animals separated from group back to group
- Patrols land and animals for wandering, grazing, behavior, predators, etc.
- Uses trained dogs to ward off predators if applicable

Learning Objectives

- Explain why animals are herded or moved around
- Describe methods for moving the animals that you work with
- List methods to keep animals calm when moving
- Discuss the role of rangeland use in effective animal production
- Explain how rangeland use practices affect pasture production, erosion control and ecosystem balance
- Define carrying capacity
- Explain how to manage rangelands for different animal species and locations
- Describe the pasture and grazing requirements for the animal(s) you work with
- Describe liabilities associated with animal trespass
- Explain liabilities associated with animals on roads

Comments:

Unit 4: Animal Pathway
Large Animal/Herd

Competency

5. Monitor animal food and water supplies

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when the learner:

- Stores feed appropriately at correct temperature and conditions until needed
- ***Mixes feed, additives and/or medicines*** when needed
- Ensures adequate supplies of feed and water
- Observes feed and/or water consumed by the group of animals
- Records consumption of feed and water as required by your facility
- Replenishes feed and water supplies as required
- Re-orders and mixes feeds to maintain stocks of feed and water source as needed
- Examines animals regularly with worksite professional to determine animal performance
- Reviews feed consumption records
- Discusses method and frequency of feeding with worksite professional in order to enhance feed utilization or animal performance
- Tests water supplies periodically as required with worksite professional

Learning Objectives

- List the common forms and types of feed utilized by your facility
- Describe proper feed storage and handling practices of feed
- Explain the importance of monitoring feed and water consumption by a group of animals
- Describe the function of feed consumption records
- Calculate cost and return analysis of feeding program
- Calculate cost per unit of nutrition of feeds
- Describe how byproducts (dried distiller's grains, corn gluten meal, etc.) can be used in livestock rations
- Discuss the importance of clean and safe water supplies for animal production
- Describe how water systems are evaluated for safety

Comments:

Unit 4: Animal Pathway
Large Animal/Herd

Competency

6. Assist to optimize animal performance and production

Performance Standard Condition

Competence will be demonstrated

- at the worksite
- while assisting a worksite professional

Performance Standard Criteria

Performance will be successful when the learner:

- Researches optimum performance for a given animal species
- Assesses an animal to determine if it has reached its optimum performance level
- Reviews the facilities to ensure appropriate environment for production of a given species of animal
- Makes appropriate changes in an animal's environment in order to achieve optimum performance
- Records animal performance
- Compares performance measurements to feed variations
- Assists to develop procedures that produce consistently high-quality animals so that both profit and animal safety are maximized

Learning Objectives

- Identify good performance or desired traits (e.g., performance) for a given animal species
- Identify reasons why some animals perform better than others
- Identify factors that can be manipulated to control a given animal's performance
- Identify a given species' desirable production numbers (e.g., birth weight, rate of gain, age of maturity, age of sexual maturity)
- Discuss the importance of feed analysis
- Discuss ways to adjust feed processing that may enhance consumption and digestion
- Identify the steps in balancing a ration to optimize animal performance
- Discuss how nutritional information is used in developing rations
- Develop balanced rations using the Pearson square method
- Compare advantages and disadvantages of growth stimulants
- Describe methods other than growth stimulants to improve efficiency and rate of gain
- Define what is meant by extra-label use and veterinary feed directive drugs
- Describe the FDA ruling on extra label use of drugs in medicated feeds

DAIRY

- Analyze the production practices involved in the care of dairy calves from birth to weaning
- Analyze the production practices involved in the care of dairy replacement heifers, lactating cows, and dry cows
- Describe the common dairy feeding systems, such as the total mixed ration system
- Determine the importance of body condition scoring, and describe how it is used to modify feeding practices
- Examine the role of Dairy Herd Improvement Associations

SWINE

- Analyze production practices involved in the care of pigs in feeder pig production
- Examine factors that affect profitability in pork production
- Describe the feed rations utilized in each stage of swine production

CHICKEN

- Describe the feed rations utilized in each area of chicken production

EQUINE

- Describe the types of feedstuffs fed to equine
- Analyze the nutritional requirements of equine

Comments:

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Competency

7. Collect and process animal products and by-products

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when the learner:

- Reviews the specific requirements required for collecting and processing animal products or by-products
- ***Safely handles the animal***
- Wears appropriate clothing and footwear
- Assembles the appropriate tools and equipment
- Prepares and ***safely handles animal(s)*** if needed
- Collects animal product safely and in a manner consistent with safe and sanitary practices
- Cleans any tools or equipment used
- Documents collection amounts

MILKING

- Prepares vacuum pump, lines, and vacuum controller
- Evaluates rate, ratio and action of pulsation system
- Evaluates size & maintenance of claw, teatcups, and liners
- Evaluates milk lines, receiver jars, bulk tank, & milk metering devices
- Moves cows in consistent, stress free manner to milking area
- Uses proper pre-milking hygiene
- Properly and adequately stimulates cows for milk preparation
- Attaches teat-cups in timely manner after stimulation
- Adjusts teat-cups as required
- Evaluates cows for complete milking
- Properly removes claw
- Cleans animals and equipment as required post-milking
- Documents amount of milk harvested
- Properly cools and stores milk

OTHER FOOD/FIBER

- Eggs
- Wool/Fur
- **NOTE:** Butchering of MEAT is NOT considered an agriculture activity for minors per DWD 270.12(18)

Learning Objectives

- Investigate the role of contract production and vertical integration in the agriculture industry

MANURE

- Define manure, and examine its worth as fertilizer, compost, or a source of methane

- Determine how the composition and quantity of manure varies according to species and other factors, such as the amount and type of feed
- Describe the manure-management practices utilized by livestock operations, including the application of manure as fertilizer

MILKING

- Summarize animal movement through the milking center
- Review milking operation hygiene
- Outline the correct milking procedures
- Describe parlor performance
- Analyze the production practices involved in the care of dairy replacement heifers, lactating cows, and dry cows
- Identify the types of milk
- Explain how milk is graded and classified
- Describe samples of milk for flavor and odor

EGG

- Describe the egg grading and classification system
- Explain the role of candling in determining egg quality

POULTRY

- Describe the poultry carcass grading system, and analyze production factors that affect carcass quality
- Identify the cuts of meat found on a poultry carcass
- Investigate the role of contract production and vertical integration in the poultry industry

MEAT

- Identify the average dressing percentages for cattle, sheep, rabbits, and hogs
- Determine factors that affect dressing percentage
- Practice calculating dressing percentages
- Describe the beef grading system; analyze factors that affect quality and yield grades; and practice calculating yield and quality grades
- Demonstrate the ability to estimate quality and yield grades of live animals

Comments:

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Competency

8. Assist with reproductive selection

Performance Standard Condition

Competence will be demonstrated

- at the worksite OR in the classroom in a simulated setting
- while assisting a worksite professional
- NOTE: A simulated setting should ONLY be used IF there is no possibility of skill performance at the worksite

Performance Standard Criteria

Performance will be successful when the learner:

- Identifies the facility's goals for genetic improvement
- Identifies the genetic traits needed to improve the profitability of the animal group noting the genealogy, traits, and desired offspring characteristics
- Reviews the testing and production records of the animal
- Consults USDA sire summaries to predict production improvement
- Identifies the source of the desired group of genes
- Selects animal(s) based on breeding soundness

Learning Objectives

- Explain how agricultural animals are classified scientifically
- Discuss how traditional farm animal breeds were developed
- Summarize the importance of genetics to the animal industry
- Explain how producers use genetics to produce the type of animal they want
- Define basic Mendelian principles: dominance, recessive, incomplete dominance, etc.
- Describe how heritability is used in animal selection
- Compare phenotype and genotype characteristics
- Describe how dominant and recessive genes function
- Interpret an animal pedigree
- Explain how to select superior animals
- Summarize how performance data is used in the selection process
- Explain the use of quantitative breeding values (EPDs) in selection of genetically superior breeding stock
- Discuss the implications of genetic variation
- List and describe the Predicted Transmitting Ability (PTA) used in the dairy industry
- Outline future trends in the genetic field

Comments:

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Competency

9. Assist with reproductive breeding and/or birthing

Performance Standard Condition

Competence will be demonstrated

- at the worksite OR in the classroom in a simulated setting
- while assisting a worksite professional
- NOTE: A simulated setting should ONLY be used IF there is no possibility of skill performance at the worksite

Performance Standard Criteria

Performance will be successful when the learner:

- Reviews the specific requirements required for breeding
- ***Safely handles the animal***
- Wears appropriate clothing and footwear
- Assembles the appropriate tools and equipment
- Prepares and ***safely handles animal(s)*** as needed

ARTIFICIAL INSEMINATION BREEDING- or Other according to procedure

- Attaches rubber collecting sheaths to genitals and stimulate to induce ejaculation
- Examines semen to assess density & motility
- Mixes with prescribed diluents
- Packages and labels semen
- Stores semen for storage or shipment in dry ice or liquid nitrogen
- Measures semen into calibrated syringes
- Inserts syringes into inseminating guns
- Injects semen into female animal vagina
- Documents semen used and animals bred

BIRTHING

- Assembles equipment needed
- Provides fresh water and feed
- Readies a source of heat for the newborn
- Prepares bedding for the newborn
- Moves female to birthing area
- Observes female frequently
- Refills feed and water as needed
- Observes delivery without interfering
- Observes behavior of newborn
- Records times of birth and placental expulsion if applicable
- Disposes of placental membranes as required
- Encourages newborn to nurse

Learning Objectives

REPRODUCTION

- Identify structures and functions of reproductive systems

- Explain the role of estrogen, progesterone, testosterone, prolactin, oxytocin, and prostaglandin in reproduction
- Analyze the reproductive cycle of animal(s) that you work with
- Describe signs of estrus in the animal(s) that your work with
- Describe the physical characteristics of large animals in heat
- Describe the fertilization process
- Describe length of reproductive cycles for females
- Identify reproduction management practices (e.g., male to female ratios, age and weight for breeding, fertility and soundness for breeding, heat synchronization, flushing)
- Describe the procedure for determining an animal's breeding readiness
- Explain common animal reproductive problems

METHODS

- Compare natural and artificial breeding methods
- Discuss the pros and cons of breeding through natural cover and artificial insemination
- Compare AI (Artificial Insemination) and MOET (multiple ovulation and embryo transfer), as a means of genetic improvement
- Explain reproductive breeding management practices such as estrous synchronization, superovulation, flushing, and embryo transfer

PREGNANCY & POST-PARTUM

- Discuss animal care during gestation, parturition, and lactation
- Identify characteristics of pregnancy
- Identify length of the gestation period for animals that you work with
- Explain the normal characteristics of birthing for the animal(s) that you work with
- Discuss expected behavior and care of newborns
- Identify length of lactation period

Comments:

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Competency
10. Assist to prevent the spread of animal diseases

Performance Standard Condition

Competence will be demonstrated

- at the worksite
- while assisting a worksite professional

Performance Standard Criteria

Performance will be successful when the learner:

- Consults bio-security and livestock health plan
- Keeps herd as closed as possible
- Tests new livestock for disease
- Isolates and monitors new livestock for the recommended period
- Follows strategic vaccination and pest prevention program
- Assists to administer prevention product to animal in feed, water, injection, drench, bolus, or spray/pour skin treatment
- Regularly sanitizes loading areas and transport vehicles
- Follows rodent and pest control measures

Learning Objectives

- Describe the herd management plan at your facility to maintain & improve herd health
- Compare the life cycle stages of internal and external parasites
- Identify common internal and external parasites that affect livestock
- Describe diseases common parasites cause
- List methods used to control parasites in herd disease management
- Explain how cleanliness affects disease control
- Compare antiseptics and disinfectants
- Describe types of vaccines available
- Identify the care and use of instruments (multi-dose hypodermic syringe, hypodermic syringe and needle, drench gun, balling gun) used to administer vaccines and pharmaceuticals
- Describe preventative measures and methods to prevent broken needles
- Identify common diseases found in agricultural animals
- Discuss appropriate treatment methods for common diseases
- List preventive measures for controlling and limiting the spread of diseases and parasites among animals
- Describe signs of pests that can be observed in the facilities
- Discuss economic impact of disease in a herd
- Explain the health risk of animal disease to humans
- Discuss consumer concerns with animal production practices relative to human health
- Define biosecurity
- Explain the importance of biosecurity to the animal industry
- Discuss regulatory procedures to ensure biosecurity of the animal industry

- Explain landowner rights in regard to the destruction of animals

Comments:

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Competency
11. Operate equipment & machinery safely

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when the learner:

- Operates only equipment that he/she is trained on
- Verifies tool/equipment is available for use and in working order
- Verifies tool/equipment is current for preventative maintenance and/or calibration
- Verifies safety equipment and any Personal Protective Equipment (PPE) needed for tool/equipment use
- Inspects tool/equipment and work area for safety considerations
- Sets up and prepares tool/equipment for safe operation including lubrication and fluid level checks
- Wears the required Personal Protective Equipment (PPE) at all times as required for the operation of the tool/equipment
- Operates tool/equipment safely with guarding devices if applicable in the manner required for the job task
- Monitors tool/equipment for safe operation while operating
- Follows procedures for clean up and shut down after use
- Investigates and promptly reports abnormal tool/equipment conditions
- Shuts down and labels any tool/equipment that is not operating as expected, if applicable
- Stores tools

Learning Objectives

- List the various tools and equipment used at your worksite such as herding vehicles, cleaning & grooming tools, animal by-product collection equipment, cutting and non-cutting hand tools, sawing machines, diagnostic tools, etc.
- Outline applications of each tool and equipment
- Demonstrate the proper usage of a tool or piece of equipment
- Describe and demonstrate the safety requirements for each tool and equipment
- Discuss start up and shut down procedures for each tool/equipment you will operate
- Describe emergency shutdown procedures for the tool/equipment you will operate
- Describe the characteristics of a tool in need of maintenance
- Explain how to recognize and address malfunctions for the tool/equipment you will operate
- Describe how to recognize wear and tear on equipment components
- Describe regulations for the use of tools and equipment at your facility
- Explain Lock Out/Tag Out indications and procedures

Comments:

Unit 4: Animal Pathway
Large Animal/Herd

Competency
12. Clean and service equipment & machinery

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when the learner:

- Performs required cleaning and preventive maintenance (PM) on equipment as required by schedule
- Reviews safety requirements and PM procedures first
- Sets up and prepares tool/equipment for safe operation including lubrication and fluid level checks if applicable
- Maintains fluid levels
- Calibrates metering, monitoring, and sensing equipment
- Refers to technical information manuals for inoperative equipment
- Checks correct amount and types of lubricant, fuel amount, coolant amount, belt tension, temperatures, pressures, gaskets & seals, leaks, etc., as pertinent to your worksite equipment
- Arranges for service of vehicles as needed with worksite professional if applicable

Learning Objectives

- Define preventative maintenance
- List common agricultural equipment and machinery requirements
- List which tools and equipment require calibration and/or safety certification
- Describe how to use the repair manual to apply repairs and look up parts information
- Describe physical principles of operations of hydraulic systems
- Describe the general operation of electrical systems (circuits design, starting, charging, and safety circuits)

Comments:

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Competency
13. Maintain facilities

Performance Standard Condition

Competence will be demonstrated

- at the worksite

Performance Standard Criteria

Performance will be successful when the learner:

- Identifies and select appropriate building materials
- Insulates facility
- Installs fencing
- Installs glass, ridged plastic panels and/or film plastic
- Constructs with concrete, stone, and brick
- Paints or protects with coatings
- Assists to install plumbing equipment, plumbing fixtures, electrical wiring components and electrical fixtures
- Constructs with wood and metal
- Complies with government regulations and applicable codes

Learning Objectives

- List common agricultural facility requirements
- Identify parts of a basic plan or blueprint
- List local code enforcement agencies and procedures
- Identify materials used in agricultural construction/fabrication
- Describe safety precautions to be taken when working with electrical wiring and fixtures

Comments: