Livestock Production Management

8012 36 weeks

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Course Description

Suggested Grade Level: 11 or 12

Course includes instruction in agricultural mechanics, with emphasis placed on the application of mechanical skills to farm power and machinery, as well as on soil and water management, supervised farming programs, and leadership training.

As noted in Superintendent's Memo #058-17 (2-28-2017), this Career and Technical Education (CTE) course must maintain a maximum pupil-to-teacher ratio of 20 students to one teacher, due to safety regulations. The 2016-2018 biennial budget waiver of the teacher-to-pupil ratio staffing requirement does not apply.

Task Essentials Table

8012	Tasks/Competencies
⊕	Identify the role of supervised agricultural experiences (SAEs) in agricultural education.
⊕	Participate in an SAE.
⊕	Identify the benefits and responsibilities of FFA membership.
⊕	Describe leadership characteristics and opportunities as they relate to agriculture and FFA.
○	Apply for an FFA degree and/or an agricultural proficiency award.

○	Plan a farm structure.	
○	Maintain farm machinery.	
○	Operate major farm machinery.	
○	Plan a farm water system.	
○	Assist with the installation of a farm water system.	
○	Repair farm equipment and tools.	
⊕	Design a cropping program.	
⊕	Analyze soil test reports.	
⊕	Interpret soil map.	
○	Describe irrigation systems.	
○	Prepare seedbeds.	
○	Identify types of crop damage.	
○	Plan a cultivation program.	
⊕	Develop crop marketing and risk management plans.	
○	Describe the harvesting of crops.	
○	Dry grain.	
⊕	Identify anatomy and physiology of livestock species.	
⊕	Develop a plan for raising livestock.	
⊕	Explain product safety and security procedures.	
⊕	Describe livestock facilities and equipment.	
⊕	Investigate livestock improvement plans.	
⊕	Describe care of breeding stock.	
⊕	Explain methods of restraining and handling livestock.	
⊕	Compare types of common livestock bedding materials.	
⊕	Explain biosecurity as it relates to livestock production.	
⊕	Describe procedures for loading and transporting livestock.	

⊕	Identify common methods for treating injured livestock.	
⊕	Develop a parasite control program.	
⊕	Describe vaccine handling, storage, and usage.	
⊕	Identify treatments for common livestock diseases.	
⊕	Explain methods of disposing of dead animals.	
⊕	Outline procedures for fitting and showing livestock.	
⊕	Complete production record forms.	
⊕	Complete farm income and expense record forms.	
⊕	Evaluate livestock, poultry, and dairy animals.	
⊕	Explain the process of culling animals.	
⊕	Describe procedures for caring for newborn livestock.	
⊕	Explain weaning procedures.	
⊕	Explain rationale and methods for humane dehorning, castrating, identifying, and docking.	
⊕	Develop a feeding program for livestock.	
⊕	Identify agricultural markets.	
⊕	Calculate the cost of a livestock operation.	
⊕	Describe the process by which cows are artificially inseminated.	
⊕	Identify practices to improve fertility in the herd.	
⊕	Describe procedures and rationale for removing extra teats from heifers.	
⊕	Explain procedures to control mastitis in cattle.	
⊕	Outline procedures for trimming hooves of cattle.	
⊕	Identify milk quality or grade standards.	
⊕	Explain the operation of milking equipment.	
⊕	Describe recommended milking practices.	
⊕	Describe recommended management of dry cows.	
⊕	Outline procedures to care for piglets from birth to weaning.	

⊕	Identify recommended procedures for weaning pigs.	
⊕	Evaluate swine production systems.	
⊕	Describe the pork quality assurance (PQA) management and techniques.	
○	Determine ages of horses.	
○	Explain measurements used to describe horses.	
○	Describe methods for grooming a horse.	
○	Explain procedure for proper care of a horse's feet.	
○	Explain the nutrient requirements of horses.	
○	Identify common horse diseases and disorders and their treatments.	
○	Identify methods and characteristics used to market horses.	
○	Identify horse tack items.	
⊕	Describe procedures for harvesting fiber.	
⊕	Explain marketing options for sheep and goats.	
⊕	Describe predator control methods.	
⊕	Identify grades of poultry products.	
⊕	Explain digestion in poultry.	
⊕	Describe stages of poultry embryology.	
⊕	Evaluate production systems for poultry.	
⊕	Explore niche marketing options.	
⊕	Identify local resources.	

Legend: ⊕Essential ○Non-essential ⊖Omitted

Note: Competencies 39-43 have been added to ensure compliance with federal legislation: National FFA Organization's Federal Charter Amendments Act (Public Law 116-7, https://www.congress.gov/116/plaws/publ7/PLAW-116publ7.pdf). All inquiries may be sent to cte@doe.virginia.gov. Students are provided opportunities for leadership, personal growth, and career success. Instruction is delivered through three major components: classroom and laboratory instruction, supervised agricultural experience (SAE) program, and student leadership (FFA).

Curriculum Framework

Task Number 39

Identify the role of supervised agricultural experiences (SAEs) in agricultural education.

Definition

Identification should include

- defining an SAE program as *an opportunity for students to consider multiple careers and occupations in the agriculture, food, and natural resources (AFNR) industries, learn expected workplace behavior, develop specific skills within an industry, and apply academic and occupational skills in the workplace or a simulated workplace environment*
- researching the Foundational SAE
    - career exploration and planning
    - personal financial planning and management
    - workplace safety
    - employability skills for college and career readiness
    - agricultural literacy
- researching the Immersion SAE
    - entrepreneurship/ownership
    - placement/internships
    - research (experimental, analytical, invention)
    - school business enterprises
    - service learning
- developing a plan to participate in an SAE, based on personal and career goals
- researching available awards and degrees, based on SAE participation.

Teacher resource: SAE Resources, National Council for Agricultural Education

Process/Skill Questions

- What are examples of SAEs related to this course and in the AFNR industries?
- Where can a copy of the Virginia SAE Record Book be found?
- What is an Immersion SAE?
- How does a placement/internship SAE differ from an ownership/entrepreneurship SAE?
- How does an SAE provide relevant work experience and contribute to the development of critical thinking skills?
- How is the SAE an extended individualized instructional component of a student's Career Plan of Study?
- How can an SAE be used to provide evidence of student growth and participation in authentic, work-related tasks?

- What are the four types of SAEs?
- What are the advantages of participating in work-based learning experiences and projects?
- How does one choose an appropriate SAE in which to participate?

Task Number 40

Participate in an SAE.

Definition

Participation should include

- developing, completing, or continuing a plan to participate in an SAE as a work-based learning experience, based on personal and career goals
- documenting experience, connections, positions held, and competencies attained, using the *Virginia SAE Record Book*
- researching available awards and degrees, based on SAE participation.

Teacher resources:
FFA SAE
The Agricultural Experience Tracker

Process/Skill Questions

- What are the advantages of participating in work-based learning experiences and projects?
- How do SAEs help prepare students for the workforce?
- What are some examples of SAEs in AFNR?

Exploring Leadership Opportunities through FFA

Task Number 41

Identify the benefits and responsibilities of FFA membership.

Definition

Identification should include

- benefits
    - listing opportunities to participate in community improvement projects and career development events (CDEs) and leadership development events (LDEs)
    - exploring leadership development opportunities

- responsibilities
    - researching the responsibilities of FFA officers, committees, and members
    - locating resources that guide participation in FFA activities
    - explaining the FFA Creed, Motto, Salute, and mission statement
    - explaining the meaning of the FFA emblem, colors, and symbols
    - explaining significant events and the history of the organization.

Process/Skill Questions

- How does one become an FFA member?
- What is the FFA's mission and how does it accomplish its mission?
- What are the benefits and responsibilities of FFA membership?
- What five FFA activities are available through the local chapter?
- What are some significant events in FFA history? How have these events shaped membership over time?
- What is the FFA program of activities (POA), and how is it used?

Task Number 42

Describe leadership characteristics and opportunities as they relate to agriculture and FFA.

Definition

Description should include

- examples of successful leaders
- types of leadership
    - autocratic
    - participative
    - laissez-faire
    - servant
    - followership
- positive leadership qualities and traits of successful leaders
- opportunities for participating in leadership activities in FFA
- demonstrating methods for conducting an effective meeting.

Process/Skill Questions

- Who are some successful leaders in the agriculture industry?
- What qualities make a successful leader?
- What are leadership traits?
- What is the difference between positive and negative leadership?

Task Number 43

Apply for an FFA degree and/or an agricultural proficiency award.

Definition

Application should include

- identifying types of FFA degrees
    - Greenhand
    - Chapter
    - State
    - American
- identifying proficiency award areas
    - entrepreneurship
    - placement
    - combined
    - agriscience research
- exploring CDEs and LDEs related to this course
- identifying all SAE criteria to be eligible for the award
- identifying the type of award
- applying for an FFA award.

Teacher resource: FFA Agricultural Proficiency Awards

Process/Skill Questions

- Where are the awards and their application criteria located?
- What are the benefits of winning an FFA award?
- What are the benefits and requirements of an FFA degree?
- What FFA awards are available?
- How does the FFA degree program reward FFA members in all phases of leadership, skills, and occupational development?
- What is the highest degree that can be conferred upon an FFA member at the national level?
- What are the requirements for a Greenhand FFA degree?

Using Mechanics in Agricultural Production

Task Number 44

Plan a farm structure.

Definition

Plans should include

- identifying the types of buildings/structures used in production agriculture
- selecting the type of building/structure to meet the needs of a production agriculture operation

- site preparation
- identifying the parts of the building (truss, joist, rafters, foundation, etc.)
- mechanical systems/diagrams needed in the structure including water, electrical and ventilation
- estimating cost of the build/structure
- constructing the building/structure.

Process/Skill Questions

- What factors will help to determine which type of building/structure to use?
- What considerations should be taken when selecting a site for an agricultural building/structure?
- Why must mechanical systems (plumbing, electrical, and ventilation) be planned prior to starting construction?
- What local permits are required before building a structure?
- How many quotes should you get before building a structure?

Task Number 45

Maintain farm machinery.

Definition

Maintenance may include

- establishing service schedules based on farm machinery operator's manual
- recording service work performed on machinery (e.g., oil changes, filter changes, greasing, fluid level checks, tire pressure)
- servicing a tractor based on procedures in the operator's manual
- preparing a farm implement/machinery (tillage, planting, or harvesting) for field work based on procedures in the operator's manual
- selecting lubricants and fuel appropriate for production agriculture.

Process/Skill Questions

- Why is it important to service farm machinery according to the operator’s manual?
- Are all lubricants and fuel created equal?
- Why is it important to keep records of service work performed on farm machinery?
- How can servicing farm machinery save money?

Task Number 46

Operate major farm machinery.

Definition

Operating farm machinery should include

- following all safety procedures in the operator's manual
- using the farm machinery in production agriculture following all recommended safety and procedures for operation
- determining ways to become more efficient when using machinery in production agriculture.

Process/Skill Questions

- What factors should be considered before operating farm machinery?
- How can the piece of farm machinery be used safely and efficiently?
- Why should a safety walk-around be performed by the operator before starting to operate a piece of farm machinery?
- What are signs of a good machinery operator?

Task Number 47

Plan a farm water system.

Definition

Planning a farm water system should include

- identifying types of water and irrigation systems
- determining the source of water to be used in the system
- determining the need for the water or irrigation system in a specific agricultural operation (watering livestock or irrigation by trickle/drip line, overhead, center pivot, etc.)
- designing and laying out the system to meet the needs of the operation
- determining cost of the watering system.

Process/Skill Questions

- What factors should be considered when selecting a watering or irrigation system?
- Why is the source of the water to be used an important factor when designing a watering or irrigation system?
- Why would an agricultural operation choose a trickle/drip line irrigation system over a center pilot irrigation system?
- What restrictions may be in place when an area is experiencing a drought?
- How do you ensure that the water source doesn’t go dry or become polluted?

Task Number 48

Assist with the installation of a farm water system.

Definition

Assisting with the installation of a farm water or irrigation system should include

- selecting the appropriate water or irrigation system
- designing and determining cost of the system
- installing mechanical systems needed for watering and irrigation system (e.g., pumps, pressure switches, pressure tanks, regulators, lines, valves, timers, livestock fountains, sprinkler heads)
- testing the system for leaks and proper operation.

Process/Skill Questions

- What factors should be considered when installing farm watering systems?
- Why are controls (e.g., pressure switches, valves, timers) important on water systems?
- What is the most inhibiting factor when installing water systems for production agriculture operations?
- What is the most effective way of checking for leaks?

Task Number 49

Repair farm equipment and tools.

Definition

Repairing farm equipment and tools should include

- identifying repairs needed
- consulting service or shop manuals for the specific type of farm equipment
- determining proper procedures to perform repairs which could include woodworking, hot or cold metal working, or welding
- following safety procedures and guidelines for the repair to be performed
- performing repair on farm equipment or tool
- testing the piece of equipment or tool to check if the repair is complete.

Process/Skill Questions

- Why is it important for farmers to be able to repair farm equipment?
- What should you consider when deciding whether to perform a repair or to call a professional mechanic?
- Why is it important to repair an identified problem sooner than later?
- Why would a farmer choose to repair farm equipment instead of buying new equipment?
- Where should you look for safety precautions and instructions before repairing equipment?

Using Plant Science in Agricultural Production

Task Number 50

Design a cropping program.

Definition

Design should include

- selection of crops to be grown
- layout (e.g., row, pasture, hay, wildlife habitat, timber, vegetable, specialty)
- suitability testing of the soil
- selection of markets
- selection of seed.

Process/Skill Questions

- How do markets influence the development of a cropping program?
- What criteria are used in seed selection?
- What are the benefits of crop insurance?
- How are a field's needs determined prior to seeding?

Task Number 51

Analyze soil test reports.

Definition

Analysis should include

- taking a sample from the soil where the crop will be grown
- reviewing the soil report
- evaluating the soil report for pH, levels of nitrogen (N), potassium (K), phosphorus (P), calcium (Ca), magnesium (Mg), and sulfur (S)
- determining fertilization needs.

Process/Skill Questions

- How can an extension agent assist with soil test reports?
- What data in a soil test report helps determine fertilization needs?
- At what pH should a field's soil be for certain seeds?
- How does the pH of soil affect nutrient availability?
- What does pH measure?
- When should lime be added to soil?
- What is a soil amendment?
- What are macronutrients? Micronutrients?

Task Number 52

Interpret soil map.

Definition

Interpretation should include

- identifying various soils
- reading a soil profile
- use of a soil pit.

Process/Skill Questions

- What are the consequences of failure to interpret a soil map correctly?
- How is the soil pit used in testing?
- What is a soil profile?
- What is soil structure? Why is it important to understand the structure of the soil being analyzed?

Task Number 53

Describe irrigation systems.

Definition

Description should include the benefits of various irrigation systems, including

- pivot
- surface
- subsurface
- drip
- solid set, or permanent
- linear movement
- traveling gun.

Process/Skill Questions

- What are the advantages and disadvantages of the various irrigation systems?
- What crops are best served by a drip irrigation system? A subsurface system? A traveling gun system?

Task Number 54

Prepare seedbeds.

Definition

Preparation should include

- conventional tillage
- no-till
- organic crop production.

Process/Skill Questions

- What are the advantages and disadvantages of no-till farming?
- How do no-till yields compare with yields from conventionally tilled land?
- Why might a planter choose organic over no-till or conventional tillage?

Task Number 55

Identify types of crop damage.

Definition

Identification should include damage by

- weeds
- insects
- disease
- drought
- rain
- snow, sleet, and ice
- frost
- wind.

Process/Skill Questions

- What are the most common insects that damage crops in your area?
- How can crop insurance protect farmers against crop damage?
- What are some methods for reducing and/or eliminating crop losses caused by insects?

Task Number 56

Plan a cultivation program.

Definition

Plan should include

- equipment
- methods of cultivation (e.g., no-till, conventional tillage, organic).

Process/Skill Questions

- What equipment is needed to prepare land for cultivation?
- What is the difference between a cultivation program and a cropping program?

Task Number 57

Develop crop marketing and risk management plans.

Definition

Development should include

- various means of marketing a crop (e.g., local, terminal, marketing board, hedging, futures market)
- marketing plan for local markets and for futures markets
- risk management program to protect against losses.

Process/Skill Questions

- How are crop insurance and risk management programs related?
- How do futures markets operate?

Task Number 58

Describe the harvesting of crops.

Definition

Description should include

- inventory of harvested crops
- methods of testing crops for harvest readiness
- determination of proper harvesting date
- methods used to harvest given crops.

Process/Skill Questions

- How is the proper harvesting date determined?
- What are possible consequences of harvesting a crop too early or too late?
- How does one ensure that equipment will be operational at harvest time?

Task Number 59

Dry grain.

Definition

Drying grain should include

- removing excess moisture
- determining weight loss incurred.

Process/Skill Questions

- What are the common methods for removing excess moisture from grain?
- Why does weight loss occur when drying grain?
- Why does moisture have to be removed from grain?

Raising and Managing Livestock

Task Number 60

Identify anatomy and physiology of livestock species.

Definition

Identification should include the following systems:

- Reproductive
- Muscular
- Skeletal
- Digestive
- Respiratory
- Endocrine
- Circulatory
- Urinary

Process/Skill Questions

- How does it benefit a livestock manager to understand the anatomy and physiology of the species being raised?
- How many bones make up each species?
- Why is it so important to understand the urinary system in livestock animals?

Task Number 61

Develop a plan for raising livestock.

Definition

Development should include

- analyzing available resources
- selecting the most suitable production enterprise for local climate and markets
- designing a production enterprise system for an animal product.

The enterprise may include the following livestock species:

- Beef cattle–stockers, cow/calf, feedlot, seed stock, grass fed, natural
- Dairy cattle–heifer grower, organic, traditional, seasonal, veal, grass fed
- Swine–seed stock, farrow-to-finish, feeder pigs, finishers
- Sheep and goats–fiber, meat, seed stock, dairy, feedlots
- Equine–breeding, training, boarding
- Poultry–turkeys, chickens, organic and specialty, ducks, free-range
- Specialty–aquaculture, bees, worms, alpacas and llamas, bison, oxen, mink, ostriches, pigeons, emus

Process/Skill Questions

- What considerations should be taken when choosing a livestock species?
- What percentage of livestock enterprises in Virginia are classified as specialty?
- How much land is necessary for specific livestock?
- What animal production enterprise would be better suited for your locality?
- Which agencies are good resources for support when starting a livestock production enterprise?

Task Number 62

Explain product safety and security procedures.

Definition

Explanation should include safety and security procedures related to

- handling
- transportation
- storage requirements and guidelines
- record keeping (e.g., Country of Origin Labeling [COOL], disease outbreak)
- state and federal regulations and guidelines
- humane slaughter/handling.

Process/Skill Questions

- What safety precautions should be taken when transporting cattle? Swine? Poultry?
- How can good record keeping be beneficial during a disease outbreak?
- What qualifies as humane slaughter?

- What are the state and federal guidelines for slaughtering livestock?

Task Number 63

Describe livestock facilities and equipment.

Definition

Description should include the design and uses of facilities and equipment for the humane treatment of livestock, as well as facilities' and equipment's roles in aiding production. Facilities and equipment may include

- farrowing, growing, and finishing facilities
- fencing
- handling equipment
- gestation crates
- chutes and headgates
- tilting table
- dipping vat
- cattle guard
- feedlots
- feed storage and processing
- feed bunks
- corrals
- confinement barns/houses (warm and cold)
- milking equipment
- feeding equipment
- docking and castration equipment
- tack.

Process/Skill Questions

- How have livestock facilities and equipment evolved over the past 30 years?
- What issues have been raised concerning the humane conditions of livestock facilities and equipment?
- What are the best chutes and headgates for different livestock?
- What is the importance of castrating livestock?
- What basic maintenance is necessary for facilities and equipment?

Task Number 64

Investigate livestock improvement plans.

Definition

Investigation should include

- measurable goals for a livestock enterprise
- objectives for reaching goals

- benchmarks for obtaining livestock production goals
- means of assessment.

Process/Skill Questions

- What are the most common goals of a livestock enterprise?
- How is an enterprise's success assessed?
- How are benchmarks established for a livestock production?

Task Number 65

Describe care of breeding stock.

Definition

Description should include

- nutritional needs for breeding stock at different times of the year
- types of vaccinations
- vaccination schedules
- breeding exams
- breeding soundness exam.

Process/Skill Questions

- How do nutritional needs for breeding males differ from nutritional needs for non-breeding livestock?
- What role do breeding males play in the success of a livestock enterprise?

Task Number 66

Explain methods of restraining and handling livestock.

Definition

Explanation should include

- the importance of safety procedures and practices when working with livestock
- restraining techniques, tools, and equipment
- the types of hazards related to livestock handling
    - chemical
    - heat and humidity
    - handling
    - zoonosis
    - facilities
    - fire

- humane practices
- personal protective equipment
- flight zone.

External resource from the National Ag Safety Database: "Working Safely with Livestock," Thomas Bean, Ohio State University Extension

Process/Skill Questions

- What advances in equipment have led to more humane handling of livestock?
- What are possible effects of improper handling of livestock?
- What tools are commonly used to restrain livestock?

Task Number 67

Compare types of common livestock bedding materials.

Definition

Comparison should include

- various materials used for livestock bedding
- cost benefits of each type of livestock bedding
- identification of best bedding material for given conditions and livestock species.

Process/Skill Questions

- What bedding material is most suitable for horses? For cattle? For sheep?
- What are the advantages and disadvantages of various bedding material?
- What health issues can be caused by the wrong bedding material?

Task Number 68

Explain biosecurity as it relates to livestock production.

Definition

Explanation should include

- defining *biosecurity*, *bioterrorism*, *agroterrorism*, and *agrosecurity*
- transportation methods
- facilities
- record keeping
- disease traceability
- quarantine

- human health and safety.

Process/Skill Questions

- How can disease and infection be traced?
- How can transportation methods be developed to address biosecurity concerns?
- What precautions should be taken to prevent disease outbreaks in livestock?
- What biosecurity measures are taken on the state and national levels to prevent diseases from entering individual states and the country?

Task Number 69

Describe procedures for loading and transporting livestock.

Definition

Description should include

- humane methods
- potential hazards
- Pork Quality Assurance (PQA), Beef Quality Assurance (BQA), and Youth Meat Quality Assurance (YMQA) transporting standards.

Process/Skill Questions

- How much space should be allotted for each animal during transport?
- When transporting livestock, what hazards are commonly overlooked?

Task Number 70

Identify common methods for treating injured livestock.

Definition

Identification should include

- medications, such as antibiotics
- wound dressing and bandaging materials
- veterinarian consultation
- dart guns.

Process/Skill Questions

- What injuries can be treated without the help of a veterinarian?
- Which "over-the-counter" medications can be used to treat injured livestock?

Task Number 71

Develop a parasite control program.

Definition

Development should include

- identification of internal and external parasites of
    - beef cattle
    - swine
    - sheep
    - goats
    - horses
    - poultry
    - dairy cattle
- methods of testing
- diagnosis of livestock's condition
- comparison of parasite treatment programs
- identification of favorable parasite conditions
- medication rotation to prevent resistance
- prescription of a treatment program for a given situation.

Process/Skill Questions

- What parasites are commonly found among livestock in your area?
- How effective are vaccinations against parasites?
- Why should parasite treatments be rotated?
- How should prescription treatments be stored?
- What agencies can help with identifying insect or parasite problems?
- What are the major steps for controlling parasites?

Task Number 72

Describe vaccine handling, storage, and usage.

Definition

Description should include

- registered vaccines commonly used at the local, state, and federal levels
- vaccination products and administration techniques
- PQA, BQA, and YMQA sheets to record vaccinations.

Process/Skill Questions

- What vaccinations are recommended for breeding livestock?

- How are vaccination records used in the sale of livestock?

Task Number 73

Identify treatments for common livestock diseases.

Definition

Identification should include

- causes, symptoms, prevention, and control of common diseases of
  - beef cattle
  - swine
  - sheep
  - goats
  - horses
  - poultry
  - dairy cattle
  - alternative animals (llamas, alpacas, elk, bison, rabbits, ratites)
- prevention strategies for each disease
- treatment options for each disease
- good management practices that help prevent diseases and parasites.

Process/Skill Questions

- What are the most common diseases among livestock in your area?
- How effective are common preventive measures against diseases?
- What practices should be included in a good herd health plan? Why is consultation with a veterinarian important in developing the plan?
- Why is it important to follow proper procedures for storing and handling vaccines?
- Why is the timing of the vaccination important?
- How can vital signs (e.g., temperature, pulse rate, respiration rate) in animals help detect health problems?

Task Number 74

Explain methods of disposing of dead animals.

Definition

Explanation should include

- comparison of various disposal options
- environmental impacts of each option
- state and local regulations addressing legal methods for dead animal disposal.

Process/Skill Questions

- Which method of disposal is most friendly to the environment?
- Who regulates the disposal of dead livestock?

Task Number 75

Outline procedures for fitting and showing livestock.

Definition

Outline should include

- fitting procedures and rules for local livestock shows
- ethics related to fitting livestock for shows.

Process/Skill Questions

- Why are ethics an important element in the fitting of livestock for shows?
- In what livestock shows would you consider participating?

Task Number 76

Complete production record forms.

Definition

Completion should address forms for all species and include

- defining terms used in production records (e.g., *birth weight*, *weaning weight*, *yearling weight*, *average daily gain* [ADG], *feed conversion*)
- computing production weight standards (e.g., 205-day weight, 365-day weight, ADG)
- using spreadsheet programs to record and calculate production records.

Process/Skill Questions

- What are some consequences of failure to complete production record forms?
- How can production weight records help the livestock manager?
- Why is it important to know the expected progeny differences (EPDs) of livestock?

Task Number 77

Complete farm income and expense record forms.

Definition

Completion should include

- identifying the parts of an income statement
- computing the income, expenses, and profit/loss of the farm
- analyzing income statements for the strengths and weaknesses of the farm.

Process/Skill Questions

- How often should income/expense records be updated?
- What can income statements communicate about a farm's strengths and weaknesses?

Task Number 78

Evaluate livestock, poultry, and dairy animals.

Definition

Evaluation should include

- defining terms used in livestock evaluation
- classifying livestock according to the United States Department of Agriculture (USDA) grading system
- assessing breeding livestock
- presenting reasons for selection orally.

Process/Skill Questions

- What persons are most qualified to evaluate livestock?
- How are breeding livestock evaluated?
- For which FFA competitions might this course prepare you?

Task Number 79

Explain the process of culling animals.

Definition

Explanation should include

- reasons for culling animals from the herd
- criteria used to cull animals
- marketing techniques to maximize income from the sale of cull animals.

Process/Skill Questions

- Who might want to purchase an animal that has been culled? Why?
- How often should a farm manager consider culling?

Task Number 80

Describe procedures for caring for newborn livestock.

Definition

Description should include

- birthing process
- potential problems and appropriate responses
- newborn checklist (vaccinations, record keeping, feeding, housing) to ensure proper care.

Process/Skill Questions

- Why does caring for newborn livestock require so much time?
- Does a veterinarian need to be present during the birth process? Why, or why not?

Task Number 81

Explain weaning procedures.

Definition

Explanation should include

- process of weaning for various species
- benefits of a well-developed weaning plan.

Process/Skill Questions

- How is it determined when an animal should be weaned?
- What are the consequences of failure to have a weaning plan?

Task Number 82

Explain rationale and methods for humane dehorning, castrating, identifying, and docking.

Definition

Explanation should include

- timing
- techniques and tools used to dehorn, castrate, identify (i.e., branding, tattooing, notching), and dock livestock

- defense of humane dehorning, castration, identification and docking.

Process/Skill Questions

- What is the purpose of docking?
- Why is it important to be able to identify livestock?
- Why is castration important and essential?
- What issues related to humane treatment are raised when discussing dehorning? Castration? Docking?

Task Number 83

Develop a feeding program for livestock.

Definition

Development should include

- analysis of sources of livestock feed and their nutritional value
    - energy nutrients (carbohydrates, fats, and oils)
    - proteins
    - vitamins
    - minerals
    - water
- balance a ration to meet the needs of livestock
    - using the Pearson Square
    - using algebraic equations
- feed ration to meet the needs of livestock
- design of a feed processing and storage system to maximize feed quality and minimize feed loss
- creep feeding
- pasture rotation management.

Process/Skill Questions

- What is a nutrient?
- What are feed additives? Why are they used?
- What are growth promotants? Why are they used?
- What are roughages? Concentrates?
- Why is it essential for an animal to receive the proper amount of nutrients in the right proportion?
- What are micronutrients? Why are they important?
- What resources are available for guidance when developing a feeding program?
- What are the total costs associated with choosing livestock feed (not just the price of the feed)?

Task Number 84

Identify agricultural markets.

Definition

Identification should include

- domestic markets
- global markets
- economic impact
- trade agreements
- food safety and security regulations.

Process/Skill Questions

- What benefits are associated with operating in global markets? What problems might arise?
- What benefits are associated with operating only in domestic markets? What problems might arise?
- How have trade agreements affected agriculture production in the past 25 years?

Task Number 85

Calculate the cost of a livestock operation.

Definition

Calculation should include

- determining the income and operational and fixed costs of a livestock enterprise
- preparing a livestock enterprise budget
- analyzing a livestock enterprise budget for strengths and weaknesses
- comparing the budget to local, state, and national averages or standards.

Process/Skill Questions

- What components make up the total cost of a livestock operation?
- What is the average cost of a dairy cattle operation in your area? A poultry operation? A beef cattle operation?

Producing Beef and Dairy Cattle

Task Number 86

Describe the process by which cows are artificially inseminated.

Definition

Description should include

- estrous cycle of a cow
- reproductive parts of a cow
- hormones essential for reproduction
- methods of estrous synchronization (and advantages and disadvantages of each)
- artificial insemination techniques
- methods used to influence the sex of the calf.

Process/Skill Questions

- What are some benefits of artificial insemination?
- What methods are used to influence the sex of a calf?

Task Number 87

Identify practices to improve fertility in the herd.

Definition

Identification should include

- potential causes of infertility (e.g., lack of proper minerals, stress, poor nutrition, genetics)
- methods of increasing fertility
- selection of highly fertile cattle
- use of fertile bulls/semen
- nutritional program designed for fertility.

Process/Skill Questions

- Are there any drawbacks to increasing fertility? Explain.
- How are highly fertile cattle identified?

Task Number 88

Describe procedures and rationale for removing extra teats from heifers.

Definition

Description should include

- reasons for removal
- humane methods of removal.

Process/Skill Questions

- Are there consequences of failure to remove extra teats? Explain.
- What adverse effects can result from the removal of teats?
- When should the extra teats be removed?

Task Number 89

Explain procedures to control mastitis in cattle.

Definition

Explanation should include

- symptoms
- causes
- treatment methods
- management measures for dry cows
- well maintained milking equipment
- clean turn-out lots and loafing shed areas.

Process/Skill Questions

- What are common causes of mastitis?
- What measures can be taken to manage dry cows?
- How might poorly maintained equipment contribute to mastitis?
- How can heifers be infected?
- What are four types of bacteria that cause the infection?
- What are the economic consequences of mastitis infections?
- What management practices can be put in place to reduce or eliminate the sources of infection?

Task Number 90

Outline procedures for trimming hooves of cattle.

Definition

Outline should include

- importance of trimming hooves
- hoof, foot, and leg soundness examinations
- genetic causes of foot growth and hoof problems
- importance of selecting livestock with healthy feet
- selection of a qualified hoof trimmer.

Process/Skill Questions

- What are some consequences of failure to trim hooves regularly?
- How can you be sure you are selecting livestock with healthy feet?

Task Number 91

Identify milk quality or grade standards.

Definition

Identification should include

- listing the grades and standards of milk
    - Grade A
    - Grade B
- measures of milk quality
    - sight and odor
    - bacterial limits
    - somatic cell count (SCC)
    - presence of antibiotics
    - cooling temperature
    - sediment
    - standard plate count (SPC)
    - preliminary incubation count (PI count)
    - laboratory pasteurization count (LPC)
    - coliform count (CC)
- listing the requirements for attaining the particular grades and standards
- listing acceptability tests and analyzing the test results
    - recent producer history
    - percent TA (acidity)
    - Direct Microscopic Somatic Cell Count (DMSCC)
    - SPC
    - PI
    - antibiotic screening test
    - sample temperature
    - sample freezing point
    - equipment
    - sanitation
    - food safety
    - milk flavor identification and evaluation (taste and odor)
        - acid
        - bitter
        - feed
        - flat/watery
        - foreign
        - garlic/onion
        - malty
        - no defect
        - oxidized
        - rancid
        - salty
    - California Mastitis test
        - mixture liquid, no precipitate

- slight precipitate tends to disappear with paddle movement
- distinct precipitate but does not gel
- distinct gel formation
- strong gel formation, which tends to adhere to paddle and forms distinct central peak.

Process/Skill Questions

- What is the purpose of having grades and standards of milk?
- What effects do production practices have on grades and standards?
- Who regulates the quality standards of milk?
- What is the *Grade A Pasteurized Milk Ordinance*?
- What are the differences between Grade A and Grade B milk?
- Are there economic incentives to convert to Grade A production? Explain.

Task Number 92

Explain the operation of milking equipment.

Definition

Explanation should include the importance of maintaining the following components to ensure proper operation:

- Vacuum
- Milker unit
  - pulsator
  - teat cup shells and liners (inflations)
  - milk receptacle
- Electrical systems
- Air lines
- Sanitation systems

Process/Skill Questions

- What are some recent developments/improvements in milking equipment?
- How often should milking equipment components be cleaned?
- How important is water in the cleaning of milking equipment?
- What resources are available when more than regular maintenance is needed?
- Why is it important to establish a consistent routine for using milking equipment?
- What temperature should milk be cooled to and in what time period?
- Why is it essential to establish a preventive service schedule for the maintenance of wear and tear parts?

Task Number 93

Describe recommended milking practices.

Definition

Description should include

- cleaning and massaging the udder
- pre-dipping and post-dipping udders
- stripping and cleaning the teats
- pre-milking by hand in a test cup to check for flocculation or blood
- milking treated and sick cows separately and after all healthy cows have been milked
- removal of milking machine at appropriate time
- importance of employing good milking techniques.

Process/Skill Questions

- Should milking cows be milked on a regular schedule? Explain.
- What are some consequences of failure to strip and clean a cow's teats?
- What is flocculation?

Task Number 94

Describe recommended management of dry cows.

Definition

Description should include

- rations for dry cows (balanced diet)
    - forages
    - grain
- monitoring of body condition
- complete health care program
- scheduling of dry days
- timing of calving.

Process/Skill Questions

- What is the purpose of scheduling dry days?
- How long should the dry period be? Explain.
- How does the dry period affect lactation in the future?

Producing Swine

Task Number 95

Outline procedures to care for piglets from birth to weaning.

Definition

Outline should include

- events involved in the birthing of piglets
- potential problems and appropriate responses
- newborn checklist to ensure proper care
- piglet processing: vaccination, worming, iron shots, needle teeth clipping, docking, castration, and ear notching.

Process/Skill Questions

- When should piglet processing take place?
- What are some possible consequences of failure to follow a newborn checklist?
- What is a supplemental feeding program for piglets?

Task Number 96

Identify recommended procedures for weaning pigs.

Definition

Identification should include

- pig weaning plan to consider climate, feed, and facilities
- process of weaning pigs.

Process/Skill Questions

- Why is it important to have a well-developed weaning plan?
- When should pigs be weaned?

Task Number 97

Evaluate swine production systems.

Definition

Evaluation should include

- purebred
- commercial

    - feeder pig production
    - buying and finishing feeder pigs
    - farrow-to-finish
- various swine management systems (e.g., confinement, pasture-based, combination)
- comparison of gestation crates, sow pens, and pasture systems and their effects on farm productivity and profit.

Process/Skill Questions

- What are the advantages and disadvantages of swine management systems that are pasture-based? Confinement-based?
- How much space is needed for a minimal swine production system?

Task Number 98

Describe the pork quality assurance (PQA) management and techniques.

Definition

Description should include

- need for PQA training
- PQA techniques and protocols in every sector of the swine industry
- justification of PQA techniques in swine production.

Process/Skill Questions

- Where is PQA training provided?
- What elements of swine production are not covered by PQA?

Producing Horses

Task Number 99

Determine ages of horses.

Definition

Determination should be based upon

- teeth characteristics and placement
- normal growth patterns.

Process/Skill Questions

- What are the characteristics of young horses' teeth? Of elderly horses' teeth?
- How should teeth be cared for at different ages?

Task Number 100

Explain measurements used to describe horses.

Definition

Explanation should include

- the term *hand*, or four inches, the common measurement unit for horses
- classifications of sizes: miniature, pony, light, draft, hybrids.

Process/Skill Questions

- What size horses are commonly classified as miniature? Pony? Light? Draft?
- How does a horse's size dictate the uses of the horse?

Task Number 101

Describe methods for grooming a horse.

Definition

Description should include

- types of brushes and grooming tools
- grooming practices and procedures.

Process/Skill Questions

- Why is it so important to groom a horse?
- What type of brush should be used for caked-on mud?
- What type of brush should be used around the face and legs? On the mane and tail?
- Why is it important to use a soft bristle brush after a hard bristle brush?

Task Number 102

Explain procedure for proper care of a horse's feet.

Definition

Explanation should include

- common foot injuries
- common foot diseases
- common foot care tools
- common foot care procedures.

Process/Skill Questions

- Why is proper foot care so important?
- What injuries or diseases can result from lack of foot care?
- What are the parts of a horse's foot?

Task Number 103

Explain the nutrient requirements of horses.

Definition

Explanation should include

- necessary nutrients (i.e., proteins, water, vitamins, minerals, fats, and carbohydrates)
- types of feed, such as forages, grain, and pellets
- conversion of feed to energy
- illnesses related to diet.

Process/Skill Questions

- What are some common illnesses caused by nutrient deficiencies?
- How is diet related to colic and founder?
- How are nutrient requirements for an active, competitive horse different from that of a pet?

Task Number 104

Identify common horse diseases and disorders and their treatments.

Definition

Identification should include

- colic
- founder

- equine protozoal myeloencephalitis (EPM)
- heaves
- navicular syndrome
- botulism
- equine herpesvirus (EHV)
- Coggins testing
- parasites
- West Nile virus.

Process/Skill Questions

- What equine diseases are commonly found in your area?
- What are the most common causes of death in horses?
- What is the importance of a Coggins test? What does it detect?

Task Number 105

Identify methods and characteristics used to market horses.

Definition

Identification should include

- a horse's characteristics, such as age, size, uses, and genetics/pedigree
- contracts, cost shares, or investments
- public or private ownership
- business
- pleasure
- therapy
- slaughter.

Process/Skill Questions

- Why might a person purchase a horse as an investment?
- Why should a buyer ride a horse before purchasing it?
- What is the importance of a horse's pedigree?

Task Number 106

Identify horse tack items.

Definition

Identification should include

- western tack--saddle, saddle pad, head stall, bridle, girth, cinch
- English tack--saddle, saddle pad, bridle, girth, stirrup leathers, stirrups, irons
- helmet
- brushes
- halter
- bits
- lead rope
- lunge rope.

Process/Skill Questions

- Why is it important to care for and store tack properly?
- What is the difference between a bridle and a halter?
- What are the differences and similarities between English tack and western tack?

Producing Sheep and Goats

Task Number 107

Describe procedures for harvesting fiber.

Definition

Description should include

- machine shearing procedures
- blade shearing procedures
- combing (e.g., cashmere-producing goats).

Process/Skill Questions

- What fibers are produced by sheep and goats?
- Why are fibers harvested from sheep and goats?
- What are the advantages/disadvantages of the varying harvesting methods?

Task Number 108

Explain marketing options for sheep and goats.

Definition

Explanation should include

- possible products for marketing (e.g., milk products, fiber, meat, pets, brush clearing/grazing)
- direct sales
- ethnic markets
- livestock auctions.

Process/Skill Questions

- Are there available markets for any of the items produced by sheep/goats nearby?
- How is a direct sales market developed?
- What are the key holidays and dates that drive the ethnic market for sheep and goat sales?

Task Number 109

Describe predator control methods.

Definition

Description should include

- common predators of sheep and goats
- methods to prevent predation problems
- counter measures for predation occurrences.

Process/Skill Questions

- How is the predator type determined?
- How can facilities be planned or managed to help prevent predation issues?
- Who can assist the sheep/goat owner in dealing with predator damage?

Producing Poultry

Task Number 110

Identify grades of poultry products.

Definition

Identification should include

- the eight quality grades for ready-to-cook broilers
- the four grade classes for eggs (i.e., AA, A, B, and inedible)
- the six weight classes for eggs, based on ounces per dozen
- interior egg quality factors, including most common defects
- exterior egg quality factors, including most common defects.

Process/Skill Questions

- What are the USDA standards for ready-to-cook chickens?
- What are the USDA standards for ready-to-cook turkeys, ducks, and geese?
- What is a Haugh unit, and how it is used to measure egg quality?
- What are the three major exterior quality standards for eggs?

Task Number 111

Explain digestion in poultry.

Definition

Explanation should include

- examining the digestive tract of the nonruminant, similar to that of other animals, but including several special organs
- identifying the crop, gizzard, proventriculus, cloaca, ceca, and vent
- identifying the major feed ingredients most popular for poultry rations.

Process/Skill Questions

- How do chickens digest ingested food when they have no teeth?
- What are the functions of the crop and gizzard?
- What are the functions of the two blind pouches known as ceca?
- What three products from a bird's body pass out of the body through the vent?

Task Number 112

Describe stages of poultry embryology.

Definition

Description should include

- defining *area pellucida* and *area opaca*
- defining *amnion*, *allantois*, *proventriculus*, and *umbilicus*
- exploring the daily growth of the embryo during incubation.

Process/Skill Questions

- What are some of the major developments visible under a microscope during the first 24 hours of incubation?
- What day does the heart form and start to beat?
- What day is it possible to see the embryo becoming covered with feathers?
- What day is it possible to see the beak, claws, and scales becoming firm?
- What are the differences in incubation periods of the various types of poultry?

Task Number 113

Evaluate production systems for poultry.

Definition

Evaluation should include

- defining *broilers* and *layers*
- defining *vertical integration*
- identifying the three general types of chicken enterprises
- exploring the recent popularity of small backyard poultry flocks
- explaining alternative production processes.

Process/Skill Questions

- What aspects of production does the company own and control, and what does the grower supply in most vertical integration contracts?
- How much of modern broiler production in the United States is integrated?
- Why are U.S. export markets important regarding broilers but not eggs?
- How have consumer trends in the consumption of poultry changed production over the last 30 years?
- What are some advantages and disadvantages of raising poultry?

Producing Specialty Animals

Task Number 114

Explore niche marketing options.

Definition

Exploration should include

- determining needs, wants, or requirements provided by specialty animals that are being underserved
- developing strategies to supply goods and services that meet those needs, wants, or requirements.

Process/Skill Questions

- What specialty animals are not readily available or produced in this locality?
- Is there a way to generate income from the specialty animal? Explain.
- Can this enterprise develop into more than a hobby? Explain.

Task Number 115

Identify local resources.

Definition

Identification should include

- breeders
- local experts
- feed sources
- veterinarians
- extension agents
- other producers
- professional associations.

Process/Skill Questions

- Who would be able to supply foundation stock?
- Where can necessary equipment and supplies be obtained?
- How can more information about specialty animals be gathered?

SOL Correlation by Task

39	Identify the role of supervised agricultural experiences (SAEs) in agricultural education.	English: 11.3, 11.5, 12.3, 12.5
40	Participate in an SAE.	English: 11.5, 11.8, 12.5, 12.8
41	Identify the benefits and responsibilities of FFA membership.	English: 11.5, 11.6, 11.7, 11.8, 12.5, 12.6, 12.7, 12.8
42	Describe leadership characteristics and opportunities as they relate to agriculture and FFA.	English: 11.5, 12.5 History and Social Science: VUS.8, VUS.9, VUS.10, VUS.11, WHII.8, WHII.10, WHII.11

43	Apply for an FFA degree and/or an agricultural proficiency award.	English: 11.5, 12.5
44	Plan a farm structure.	History and Social Science: GOVT.1 Mathematics: A.4, A.9, G.14
45	Maintain farm machinery.	
46	Operate major farm machinery.	Mathematics: A.4, A.5, A.9
47	Plan a farm water system.	History and Social Science: WG.1, WG.2, WG.3 Mathematics: A.4, A.9, G.14 Science: ES.8d
48	Assist with the installation of a farm water system.	
49	Repair farm equipment and tools.	
50	Design a cropping program.	History and Social Science: WG.1, WG.2, WG.3
51	Analyze soil test reports.	Mathematics: A.9, PS.8 Science: ES.8a
52	Interpret soil map.	History and Social Science: WG.1, WG.2, WG.3
53	Describe irrigation systems.	English: 11.5, 12.5
54	Prepare seedbeds.	
55	Identify types of crop damage.	History and Social Science: VUS.10
56	Plan a cultivation program.	
57	Develop crop marketing and risk management plans.	English: 11.5, 12.5 History and Social Science: GOVT.1, GOVT.9, GOVT.15, VUS.10
58	Describe the harvesting of crops.	English: 11.5, 12.5
59	Dry grain.	
60	Identify anatomy and physiology of livestock species.	Science: BIO.4d
61	Develop a plan for raising livestock.	History and Social Science: WG.1, WG.3, WG.16, WG.18
62	Explain product safety and security procedures.	English: 11.5, 12.5 History and Social Science: VUS.8 Science: BIO.4d
63	Describe livestock facilities and equipment.	English: 11.5, 12.5 History and Social Science: VUS.8
64	Investigate livestock improvement plans.	
65	Describe care of breeding stock.	English: 11.5, 12.5
66	Explain methods of restraining and handling livestock.	English: 11.5, 11.8, 12.5, 12.8 History and Social Science: VUS.8
67	Compare types of common livestock bedding materials.	

68	Explain biosecurity as it relates to livestock production.	English: 11.5, 12.5
69	Describe procedures for loading and transporting livestock.	English: 11.5, 12.5
70	Identify common methods for treating injured livestock.	
71	Develop a parasite control program.	History and Social Science: WG.1, WG.2, WG.3 Science: BIO.4d, BIO.4e, BIO.4f
72	Describe vaccine handling, storage, and usage.	English: 11.5, 12.5 Science: BIO.4d, BIO.4e, BIO.4f
73	Identify treatments for common livestock diseases.	Science: BIO.4d, BIO.4e, BIO.4f
74	Explain methods of disposing of dead animals.	English: 11.5, 12.5 History and Social Science: GOVT.15, WG.1, WG.2, WG.3
75	Outline procedures for fitting and showing livestock.	English: 11.6, 12.6
76	Complete production record forms.	Mathematics: A.3, A.4, A.5
77	Complete farm income and expense record forms.	History and Social Science: VUS.10
78	Evaluate livestock, poultry, and dairy animals.	
79	Explain the process of culling animals.	English: 11.5, 12.5
80	Describe procedures for caring for newborn livestock.	English: 11.5, 12.5
81	Explain weaning procedures.	English: 11.5, 12.5
82	Explain rationale and methods for humane dehorning, castrating, identifying, and docking.	English: 11.5, 12.5
83	Develop a feeding program for livestock.	Mathematics: A.9
84	Identify agricultural markets.	History and Social Science: VUS.8
85	Calculate the cost of a livestock operation.	History and Social Science: GOVT.1, GOVT.15
86	Describe the process by which cows are artificially inseminated.	English: 11.5, 12.5
87	Identify practices to improve fertility in the herd.	
88	Describe procedures and rationale for removing extra teats from heifers.	English: 11.5, 12.5
89	Explain procedures to control mastitis in cattle.	English: 11.5, 12.5
90	Outline procedures for trimming hooves of cattle.	English: 11.6, 12.6
91	Identify milk quality or grade standards.	
92	Explain the operation of milking equipment.	English: 11.5, 12.5
93	Describe recommended milking practices.	English: 11.5, 12.5
94	Describe recommended management of dry cows.	English: 11.5, 12.5
95	Outline procedures to care for piglets from birth to weaning.	English: 11.6, 12.6
96	Identify recommended procedures for weaning pigs.	
97	Evaluate swine production systems.	
98	Describe the pork quality assurance (PQA) management and techniques.	English: 11.5, 12.5

99	Determine ages of horses.	
100	Explain measurements used to describe horses.	English: 11.5, 12.5
101	Describe methods for grooming a horse.	English: 11.5, 12.5
102	Explain procedure for proper care of a horse's feet.	English: 11.5, 12.5
103	Explain the nutrient requirements of horses.	Mathematics: A.3, A.4 Science: BIO.2
104	Identify common horse diseases and disorders and their treatments.	
105	Identify methods and characteristics used to market horses.	
106	Identify horse tack items.	
107	Describe procedures for harvesting fiber.	English: 11.5, 12.5
108	Explain marketing options for sheep and goats.	English: 11.5, 12.5
109	Describe predator control methods.	English: 11.5, 12.5
110	Identify grades of poultry products.	
111	Explain digestion in poultry.	English: 11.5, 12.5
112	Describe stages of poultry embryology.	English: 11.5, 12.5 Mathematics: A.9
113	Evaluate production systems for poultry.	
114	Explore niche marketing options.	History and Social Science: GOVT.16, VUS.10
115	Identify local resources.	

FFA Information

The National FFA is an organization dedicated to preparing members for leadership and careers in the science, business, and technology of agriculture. Local, state, and national activities and award programs provide opportunities to apply knowledge and skills acquired through agriculture education.

For additional information about the student organization, see the National FFA website and the Virginia FFA Association website.

The following leadership development events are available for this course:

- Agricultural Issues
- Employment Skills
- Extemporaneous Public Speaking
- Parliamentary Procedure
- Prepared Public Speaking

The following career development events are available for this course:

- Agricultural Communications
- Agricultural Sales
- Agronomy
- Agricultural Technology & Mechanical Systems
- Dairy Cattle Evaluation and Management

- Environmental & Natural Resources
- Farm and Agribusiness Management
- Floriculture
- Food Science and Technology
- Forestry
- Horse Evaluation
- Marketing Plan
- Meats Evaluation and Technology
- Nursery/Landscape
- Poultry Evaluation
- Veterinary Science

Entrepreneurship Infusion Units

Entrepreneurship Infusion Units may be used to help students achieve additional, focused competencies and enhance the validated tasks/competencies related to identifying and starting a new business venture. Because the unit is a complement to certain designated courses and is not mandatory, all tasks/competencies are marked "optional."

Appendix: Credentials, Course Sequences, and Career Cluster Information

Industry Credentials: Only apply to 36-week courses

- Animal Science II Examination
- Animal Systems Assessment
- Beef Quality Assurance Examination
- College and Work Readiness Assessment (CWRA+)
- Customer Service Specialist (CSS) Examination
- Food Safety & Science Certification Examination
- Fundamentals of Animal Science Certification Examination
- Meat Evaluation Certification Examination
- National Career Readiness Certificate Assessment
- Principles of Livestock Selection and Evaluation Certification Examination
- Production Agriculture Assessment
- Workplace Readiness Skills for the Commonwealth Examination

Concentration sequences: *A combination of this course and those below, equivalent to two 36-week courses, is a concentration sequence. Students wishing to complete a specialization may take additional courses based on their career pathways. A program completer is a student who has met the requirements for a CTE concentration sequence and all other requirements for high school graduation or an approved alternative education program.*

- Agricultural Business Fundamentals I (8022/36 weeks)
- Agricultural Business Management III (8026/36 weeks)
- Agricultural Business Operations II (8024/36 weeks)
- Agricultural Fabrication and Emerging Technologies (8019/36 weeks)
- Agricultural Production Technology (8010/36 weeks)
- Agricultural Structural Systems (8017/36 weeks)
- Applied Agricultural Concepts (8072/18 weeks)
- Applied Agricultural Concepts (8073/36 weeks)
- Equine Science (8015/18 weeks)
- Equine Science (8080/36 weeks)
- Equine Science, Advanced (8094/36 weeks)
- Introduction to Animal Systems (8008/36 weeks)
- Introduction to Plant Systems (8007/36 weeks)
- Introduction to Power, Structural, and Technical Systems (8016/36 weeks)
- Operating the Farm Business (8014/36 weeks)
- Small Animal Care I (8081/18 weeks)
- Small Animal Care I (8083/36 weeks)
- Small Animal Care II (8084/36 weeks)
- Veterinary Science I (8088/36 weeks, 140 hours)
- Veterinary Science II (8089/36 weeks, 140 hours)

Career Cluster: Agriculture, Food and Natural Resources	
Pathway	**Occupations**
Agribusiness Systems	**Agricultural Commodity Broker** **Agricultural Economist** **Agricultural Loan Officer**

Career Cluster: Agriculture, Food and Natural Resources	
Pathway	**Occupations**
	Agricultural Products Sales Representative **Farm Products Purchasing Agent and Buyer** **Farm, Ranch Manager** **Farmer/Rancher** **Feed, Farm Supply Store Sales Manager**
Animal Systems	**Agricultural Products Sales Representative** **Animal Breeder, Husbandry** **Animal Geneticist** **Animal Nutritionist** **Animal Scientist** **Aquacultural Manager** **Poultry Manager** **Veterinarian** **Veterinary Technician**
Environmental Service Systems	**Agricultural Products Sales Representative** **Environmental Compliance Inspector** **Environmental Sampling and Analysis Technician** **Secondary School Teacher** **Toxicologist**
Food Products and Processing Systems	**Food Scientist**
Natural Resources Systems	**Fisheries Technician**
Plant Systems	**Certified Crop Advisor** **Soil and Plant Scientist**
Power, Structural, and Technical Systems	**Agricultural Engineer** **Agricultural Equipment Operator** **Agricultural Equipment Parts Manager** **Agricultural Equipment Parts Salesperson**