

ANIMAL SCIENCE

Curriculum Content Framework

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Curriculum Content Framework

ANIMAL SCIENCE

Grade Levels: 10, 11, 12

Course Code: 491180

Prerequisite: None

Course Description: Topics covered in Animal Science include animal biotechnology, animal behavior, classification, consumer concerns, animal welfare, genetics, scientific selection, reproduction, growth and development, nutrition, meat science, and diseases. Opportunities are provided for students to participate in FFA and supervised experience activities.

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Unit 1: Overview of Animal Science 7 Hours

Terminology: agricultural animal, Career Development Event (CDE), cattle, equine, goat, poultry, sheep, swine

CAREER AND TECHNICAL SKILLS What the Student Should be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
1.1 Define terms	1.1.1	Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]
1.2 Examine the importance of animal production in the United States	1.2.1 Use reference materials to locate information on the scope of animal production in the United States and Arkansas	Foundation	Listening	Comprehends ideas and concepts related to animal science [1.2.1]
	1.2.2 List major types of agricultural animals in the United States		Reading	Locates pertinent information in documents such as manuals, graphs, and schedules to perform tasks [1.3.18]
	1.2.3 Use a map to locate major geographical regions of production for each type of agricultural animal	Interpersonal	Speaking	Participates in conversation, discussion, and group presentations [1.5.8]
	1.2.4 Investigate and assess emerging technology in animal agriculture and give an oral report in class	Personal Management	Cultural Diversity	Comprehends ideas and concepts related to animal science [2.2.1]
			Career Awareness, Development and Mobility Integrity/ Honesty/ Work Ethic	Explores career opportunities [3.1.6] Follows established rules, regulations, and policies [3.2.5]
		Thinking	Knowing How to Learn	Applies new knowledge and skills to animal science [4.3.1] Develops personal learning strategies—note taking, clustering related items, flash cards, etc. [4.3.2]
1.3 Describe products obtained from animals	1.3.1 List products obtained from animals and classify as food or non-food product	Foundation	Writing	Takes notes from various sources [1.6.18]
	1.3.2 List animal products produced in the local community	Personal Management	Career Awareness, Development, & Mobility	Comprehends ideas and concepts related to animal science [3.1.3]
		Thinking	Decision Making	Generates options/alternatives [4.2.6]

			Knowing How to Learn	Locates appropriate learning resources to acquire or improve knowledge and skills [4.3.3]		
1.4	Identify career opportunities in animal science	1.4.1	Research a career in animal science to determine educational requirements, working conditions, and salary	Foundation	Reading	Uses standard occupational resource materials [1.3.22]
		1.4.2	Prepare an oral report on a career in animal agriculture	Personal Management	Speaking Career Awareness, Development, & Mobility	Uses written resources (books, dictionaries, directories, computers, Internet) to obtain factual information [1.3.23] Asks questions to clarify information [1.5.3] Sets well-defined and realistic personal/career goals (short-term and long-term) [3.1.11]

1.5	Identify appropriate FFA activities and supervised experiences in animal agriculture	1.5.1	List FFA activities available in animal science	Foundation	Listening	Receives and interprets verbal messages [1.2.8]
		1.5.2	Observe the exposition of animals at a fair or other event	Personal Management	Integrity/ Honesty/ Work Ethic	Complies with safety and health rules in a given work environment [3.2.2]
		1.5.3	Observe an animal being groomed for showing	Thinking	Organizational Effectiveness Knowing How to Learn	Presents personal skills as benefits for company objective [3.3.7]
		1.5.4	Plan and/or expand supervised experiences in animal agriculture			Processes new information as related to workplace [4.3.5]
		1.5.5	Keep records on FFA and supervised experience participation			

Unit 2: Safety with Animal Agriculture

5 Hours

Terminology: animal-related injury, occupational safety, personal safety, zoonotic disease

CAREER AND TECHNICAL SKILLS What the Student Should be Able to Do			ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description	
2.1 Define terms	2.1.1	Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]	
2.2 Discuss the meaning and importance of safety and safe work with animal agriculture	2.2.1 Relate examples of safety hazards in animal agriculture	Foundation	Reading	Distinguishes between fact and opinion [1.3.11]	
	2.2.2 Have students name examples of accidents that have occurred locally in animal agriculture		Speaking	Asks questions to obtain information [1.5.4]	
	2.2.3 Identify diseases that are transmissible from animals to humans and the precautions to follow to minimize such transmission				
2.3 Identify hazards in animal agriculture	2.3.1 Survey hazardous situations in local animal agriculture facilities and prescribe the appropriate safety measures to be taken and propose ways of eliminating or reducing the risk of these hazards	Foundation	Reading	Analyzes and applies what has been read to specific task [1.3.2]	
	2.3.2 Develop a list of practices to reduce animal aggression and provide appropriate animal restraint	Personal Management	Integrity/ Honesty/ Work Ethic	Complies with safety and health rules in a given work environment [3.2.2]	
2.4 Describe the importance of personal safety	2.4.1 Identify and properly use appropriate PPE with animal agriculture	Thinking	Problem Solving	Comprehends ideas and concepts related to safety with animals [4.4.1]	
	2.4.2 Calculate the cost of PPE for an individual involved in animal agriculture	Foundation	Arithmetic/ Mathematics	Calculates dollar amounts [1.1.7]	
	2.4.3 Work together with others to promote safety in animal agriculture	Interpersonal	Negotiation	Works to resolve conflict between two or more individuals [2.5.3]	
	2.4.4 Gain a satisfactory score on an animal science safety test				

Unit 3: Genetics and Animal Breeding 12 Hours

Terminology: cell, chromosome, crossbreeding, gene, genetics, genotype, heredity, phenotype, purebred breeding, reproduction

CAREER AND TECHNICAL SKILLS What the Student Should be Able to Do			ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge		Application	Skill Group	Skill	Description
3.1	Define terms	3.1.1	Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]
3.2	Discuss Mendel's contributions to the study of genetics	3.2.1	Foundation	Listening	Listens for long-term contexts [1.2.7]
		3.2.2	Thinking	Science Creative Thinking Knowing How to Learn	Applies knowledge to complete a practical task [1.4.3] Prepares presentation based on subject research, interviews, surveys [4.1.10] Applies new knowledge and skills to genetics and animal breeding [4.3.1]
3.3	Identify the parts of and explain the functions of cells, chromosomes, and genes	3.3.1	Foundation	Writing	Presents answers/conclusions in a clear and understandable form [1.6.13]
		3.3.2	Personal Management	Career Awareness, Development, and Mobility Integrity/ Honesty/ Work Ethic	Meets defined goals and objectives [3.1.9]
		3.3.3			Chooses ethical course of action [3.2.1]
3.4	Differentiate between genotype and phenotype	3.4.1	Foundation	Speaking	Organizes ideas and communicates oral messages to listeners [1.5.7]
		3.4.2	Thinking	Knowing How to Learn	Develops personal learning strategies—note taking, clustering related items, flash cards, etc. [4.3.2]
3.5	Compare purebred breeding and crossbreeding	3.5.1	Foundation	Reading	Distinguishes between fact and opinion [1.3.11]
		3.5.2	Personal Management	Career Awareness, Development, and Mobility	Explores career opportunities [3.1.6]

			Integrity/ Honesty/ Work Ethic	Follows established rules, regulations, and policies [3.2.5]		
3.6	Identify factors to consider in selecting breeding animals	3.6.1	Discuss Expected Progeny Differences (EPDs) in a herd of animals	Foundation Thinking	Reading Decision Making	Identifies relevant details, facts, and specifications [1.3.16] Comprehends ideas and concepts related to genetics and animal breeding [4.2.2] Generates options/alternatives [4.2.6]
3.7	Describe reproduction processes in agricultural animals	3.7.1	Label the major parts of male and female reproductive systems	Foundation	Science	Constructs model to depict basic concept of genetics and animal breeding of genetics and animal breeding [1.4.11]
		3.7.2	Identify animals by gender	Personal Management	Responsibility	Comprehends ideas and concepts related to genetics and animal breeding [3.4.2]
		3.7.3	Plan a breeding program to assure the production of baby animals at the desired time			
3.8	Explain artificial insemination and identify its advantages and disadvantages	3.8.1	Observe the artificial insemination of an animal	Foundation	Speaking	Communicates a thought, idea, or fact in spoken form [1.5.5]
		3.8.2	Identify methods used in artificial insemination of animals	Interpersonal Personal Management	Cultural Diversity Integrity/ Honesty/ Work Ethic	Comprehends ideas and concepts related to genetics and animal breeding [2.2.1] Complies with safety and health rules in a given work environment [3.2.2]
3.9	Discuss genetic engineering and its effect on animal agriculture	3.9.1	Prepare a report on genetic engineering and its effect on one aspect of animal agriculture	Foundation	Speaking	Communicates a thought, idea, or fact in spoken form [1.5.5]
		3.9.2	Use a local animal producer who has used biotechnology methods to discuss these as related to animal agriculture	Interpersonal Personal Management	Cultural Diversity Career Awareness, Development, and Mobility	Comprehends ideas and concepts related to genetics and animal breeding [2.2.1] Explores career opportunities [3.1.6]

Unit 4: Nutrition and Feeding of Agricultural Animals

10 Hours

Terminology: anemia, balanced ration, bloat, carbohydrates, concentrate, fats, feed, feedstuffs, milk fever, mineral, nutrition, protein, ration, total digestible nutrients (TDN), vitamin, vitamin deficiency, water

CAREER AND TECHNICAL SKILLS What the Student Should be Able to Do			ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application		Skill Group	Skill	Description
4.1 Define terms	4.1.1		Foundation	Reading	Applies/Understands technical words that pertain to a subject [1.3.6]
4.2 Explain the importance of proper animal nutrition and the use of nutrients by animals	4.2.1 Develop a nutrition plan for an animal based on its age, sexual condition, and activity		Foundation	Science	Applies knowledge to complete a practical task [1.4.3]
	4.2.2 Review the tag or label on an animal feed to assess the extent to which it meets nutrient needs		Personal Management	Reading Organizational Effectiveness	Comprehends written information for main ideas [1.3.7] Applies knowledge to implement work-related system or practice [3.3.4]
4.3 Compare the differences in ruminant and nonruminant digestive systems	4.3.1 Label the parts of a ruminant and a nonruminant (monogastric) digestive system		Foundation	Science	Applies knowledge to complete a practical task [1.4.3]
			Thinking	Knowing How to Learn	Applies new knowledge and skills to feeding livestock [4.3.1]
4.4 Identify the functions of nutrients in feedstuffs	4.4.1 Prepare a short report on the functions of nutrients with agricultural animals		Foundation	Writing	Adapts notes to a proper form [1.6.1]
			Thinking	Knowing How to Learn	Applies new knowledge and skills to feeding livestock [4.3.1]
4.5 Discuss the major classes of nutrients and describe the role of each in animal nutrition	4.5.1 Distinguish between the nutrients needed for energy, growth, and good health		Foundation	Reading	Analyzes and applies what has been read to a specific task [1.3.2]
	4.5.2 Observe the label on feed for the presence of nutrients in appropriate amounts		Personal Management	Responsibility	Comprehends ideas and concepts related to nutrition and feeding of agricultural animals [3.4.2]
4.6 Classify livestock feedstuffs	4.6.1 Identify samples of feedstuffs by class		Foundation	Reading	Uses appropriate materials and techniques as specified [1.3.20]
	4.6.2 Identify locally-available feedstuffs for animals		Thinking	Decision Making	Generates options/alternatives [4.2.6]

4.7	Describe the methods and forms of processing feeds	4.7.1	Observe different forms of manufactured feed such as meals and pellets	Foundation	Writing	Analyzes data, summarizes results, and makes conclusions [1.6.2]
		4.7.2	Identify forms of feed appropriate for age and size of animals	Personal Management	Integrity/ Honesty/ Work Ethic	Complies with safety and health rules in a given work environment [3.2.2]
		4.7.3	Tour a feed mill to observe how feeds are processed	Thinking	Creative Thinking Knowing How to Learn	Combines ideas or information in a new way [4.1.2] Applies new knowledge and skills to feeding livestock [4.3.1]
4.8	List factors to consider when evaluating feeds	4.8.1	Study feed tags to determine the ingredients of feed	Foundation	Writing	Communicates thoughts, ideas, or facts in written form in a clear, concise manner [1.6.6]
		4.8.2	Using feed tags, determine which type of animal and stage of growth that feed is best for	Personal Management	Integrity/ Honesty/ Work Ethic	Complies with safety and health rules in a given work environment [3.2.2] Follows established rules, regulations, and policies [3.2.5]
4.9	Explain the process of balancing rations	4.9.1	Balance rations using the Pearson Square method, the Net Energy method, and the computer method	Foundation	Arithmetic/ Mathematics	Applies addition, subtraction, multiplication, and division to real-world situations [1.1.1]
		4.9.2	Consider the cost of a ration in selecting ingredients for balancing nutrients	Thinking	Decision Making	Calculates/Estimates rations [1.1.8] Evaluates information/data to make the best decision [4.2.5] Generates options/alternatives [4.2.6]
4.10	Identify diseases that result from poor nutrition	4.10.1	List nutritional diseases found in your community	Foundation	Reading	Analyzes and applies what has been read to specific task [1.3.2]
		4.10.2	Name examples of animals that have suffered from nutritional diseases and indicate how the animals manifested the signs	Thinking	Science Reasoning	Applies scientific principles related to nutrition and feeding of agricultural animals [1.4.5] Comprehends ideas and concepts related to nutrition and feeding of agricultural animals [4.5.2]

Unit 5: Facilities and Equipment in Animal Production

8 Hours

Terminology: compost, fence, lagoon, nutrient management plan, silo, squeeze chute, ventilation

CAREER AND TECHNICAL SKILLS What the Student Should be Able to Do			ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description	
5.1 Define terms	5.1.1	Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]	
5.2 Identify facility and equipment needs with animal species	5.2.1 Develop a facility and equipment plan for production of an animal species	Foundation	Writing	Analyzes data, summarizes results, and makes conclusions [1.6.2]	
	5.2.2 Calculate the costs associated with acquiring and/or constructing the needed equipment	Thinking	Arithmetic/ Mathematics Problem Solving	Calculates dollar amounts [1.1.7] Comprehends ideas and concepts related to animal facility and equipment needs	
5.3 Discuss considerations in selecting sites for animal production facilities	5.3.1 Develop a facility plan that includes the following considerations: wind direction, drainage, central location, and purpose	Foundation	Writing	Communicates thoughts, ideas, or facts in written form in a clear, concise manner [1.6.6]	
	5.3.2 Construct a poster or bulletin board that depicts various animal facilities	Thinking	Problem Solving Seeing Things in the Mind's Eye	Revises plan of action indicated by findings [4.4.9] Organizes and processes images—symbols, pictures, graphs, objects, etc. [4.6.2]	
5.4 List the factors to consider when designing facilities for animal production	5.4.1 Design a facility suitable for both animal use and storage of feed and equipment	Foundation	Writing	Applies/Uses technical words and concepts [1.6.4]	
		Thinking	Problem Solving Reasoning	Revises plan of action indicated by findings [4.4.9] Uses logic to draw conclusions from available information [4.5.6]	
5.5 Discuss environmental conditions best suited to various animal species	5.5.1 Determine where various animal species can be produced	Foundation	Science	Analyzes environmental issues (ecology, pollution, waste management) [1.4.2]	
	5.5.2 Relate animal needs and climate to need for facilities to provide shelter and protection	Thinking	Seeing Things in the Mind's Eye Problem Solving	Organizes and processes images—symbols, pictures, graphs, objects, etc. [4.6.2] Draws conclusions from what is read and gives possible solutions [4.4.4]	

5.6	Compare different types of construction materials used in buildings for animal production	5.6.1	Identify appropriate construction materials for animal facilities based on species	Foundation	Reading	Applies information and concepts derived from printed materials [1.3.3]
		5.6.2	Investigate type of flooring as related to animal well-being	Thinking	Problem Solving	Demonstrates logical reasoning in reaching a conclusion [4.4.2]
5.7	Compare various types of silos and other feedstuff storage facilities	5.7.1	Investigate feed storage requirements and devise a plan for an appropriate facility	Foundation	Speaking	Communicates a thought, idea, or fact in spoken form [1.5.5]
		5.7.2	Calculate losses of feed when stored improperly	Thinking	Arithmetic/ Mathematics Decision Making Reasoning	Applies a mathematical formula to solve a problem [1.1.3] Comprehends ideas and concepts related to livestock buildings and equipment [4.2.2] Sees relationship between two or more ideas, objects, or situations [4.5.5]
5.8	Compare various types of fencing used with livestock	5.8.1	Develop a plan to install a fence that is appropriate for a given species of animal	Foundation	Speaking	Asks questions to obtain information [1.5.4]
		5.8.2	Determine amounts of materials and costs of fencing a given area	Thinking	Arithmetic/ Mathematics Reasoning	Chooses appropriately from a variety of mathematical techniques [1.1.11] Sees relationship between two or more ideas, objects, or situations [4.5.5]

Unit 6: Animal Management Practices 10 Hours

Terminology: animal identification, castration, debeaking, dehorning, hormone implant, producer quality assurance (PQA), sheering, tail docking, vaccination

CAREER AND TECHNICAL SKILLS What the Student Should be Able to Do			ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge		Application	Skill Group	Skill	Description
6.1	Define terms	6.1.1	Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]
6.2	Discuss the importance of animal management	6.2.1 Identify animal management practices used with various species	Foundation	Reading	Comprehends written information for main ideas [1.3.7]
		6.2.2 Observe the use of animal management practices on a farm or ranch	Thinking	Reasoning	Applies rules or principles to a new situation [4.5.1]
6.3	Describe the purpose and importance of producer quality assurance programs	6.3.1 Identify species with quality assurance programs	Foundation	Reading	Applies information and concepts derived from printed materials [1.3.3]
		6.3.2 List requirements of quality assurance programs			
		6.3.3 Relate participation in quality assurance programs to marketing animals and animal products	Personal Management	Integrity/ Honesty/ Work Ethic	Chooses an ethical course of action [3.2.1]
		6.3.4 Investigate income differences received for animals and products under quality assurance programs			
6.4	Select and use appropriate animal identification methods	6.4.1 Investigate animal identification methods appropriate for well-being of various species	Foundation	Reading	Comprehends written information for main ideas [1.3.7]
		6.4.2 Use/install an animal identification method	Thinking	Problem Solving	Demonstrates logical reasoning in reaching a conclusion [4.4.2]
		6.4.3 Prepare a poster or other display of animal identification methods			
6.5	Determine and use appropriate methods of caring for new-born and young animals	6.5.1 Investigate management practices needed with newborn and young animals	Foundation	Reading	Applies information and concepts derived from printed materials [1.3.3]
		6.5.2 Select well-being methods of castration, dehorning, and tail docking	Thinking	Reasoning	Extracts rules or principles from written information [4.5.4]

6.6 Select and use appropriate growth and production enhancements	6.6.1 Identify growth hormones for a given species of animal	Foundation	Reading	Draws conclusions from what is read [1.3.12]
	6.6.2 Investigate issues associated with the use of growth enhancers	Thinking	Reasoning	Uses logic to draw conclusions from available information [4.5.6]

Unit 7: Animal Health 12 Hours

Terminology: bacteria, carrier, disease, fungi, health, isolation, parasite, poison, protozoa, sanitation, quarantine, virus, vital signs

CAREER AND TECHNICAL SKILLS What the Student Should be Able to Do			ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description	
7.1 Define terms	7.1.1	Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]	
7.2 Discuss the producer's responsibility in keeping animals healthy and providing for their well-being	7.2.1 Identify the normal vital signs of common animal species	Foundation	Writing	Uses language, style, organization, and format appropriate to subject matter, purpose, and audience [1.6.19]	
	7.2.2 Identify conditions for keeping and producing animals that provide for their well-being	Personal Management	Science Career Awareness, Development, & Mobility	Applies scientific principles related to animal health [1.4.5] Establishes and implements a plan of action [3.1.5]	
7.3 Identify the signs of health and causes of disease in animals	7.3.1 Investigate and report to the class a common livestock disease	Foundation	Science	Constructs hypothesis [1.4.11]	
	7.3.2 Prepare a report on the signs of good health in a common animal species		Speaking	Participates in conversation, discussion, and group presentations [1.5.8]	
	7.3.3 Use a chart to summarize the signs of disease for a selected species	Thinking	Problem Solving	Revises plan of action indicated by findings [4.4.9]	
	7.3.4 Check the vital signs of an animal as related to the presence of disease			Recognizes/defines problem [4.4.8]	
7.4 Explain how disease is transmitted among animals	7.4.1 Research and write a short report that describes the role of sanitation and isolation in animal disease	Foundation	Writing	Applies/Uses technical words and concepts [1.6.4]	
	7.4.2 Distinguish between contagious and noncontagious diseases	Thinking	Reasoning	Comprehends ideas and concepts related to animal health [4.5.2] Extracts rules or principles from written information [4.5.4]	
7.5 Discuss the role of environment on animal health	7.5.1 Identify environmental factors that influence animal health	Foundation	Speaking	Participates in conversation, discussion, and group presentations [1.5.8]	
	7.5.2 Prepare a housing and facility plan for an animal species	Thinking	Problem Solving	Recognizes/Defines problem [4.4.8]	

	7.5.3	Select an appropriate preconditioning program for a given animal species				
7.6	Identify protective measures that can be taken against parasites and disease	7.6.1	Observe an animal production facility as related to parasite and disease infestation and prepare a report on your findings	Foundation	Science	Acquires and processes scientific data [1.4.1]
		7.6.2	Investigate a vaccination program for a given animal species, such as dog or horse	Thinking	Problem Solving Decision Making	Revises plan of action indicated by findings [4.4.9] Generates options/alternatives [4.2.6]
7.7	Discuss federal regulations related to animal disease control	7.7.1	Interview a veterinarian about the prevention and treatment of animal diseases	Foundation	Science	Acquires and processes scientific data [1.4.1]
				Thinking	Problem Solving Decision Making	Revises plan of action indicated by findings [4.4.9] Generates options/alternatives [4.2.6]
7.8	Explain the purpose and practices of quarantine	7.8.1	Determine how quarantine laws in your local area affect animal production and marketing	Foundation	Writing	Presents own opinion in written form in a clear, concise manner [1.6.14]
		7.8.2	Relate the role of isolation in disease prevention	Thinking	Reasoning Seeing Things in the Mind's Eye	Uses logic to draw conclusions from available information [4.5.6] Visualizes a finished product [4.6.4]

Unit 8: Marketing Animals and Animal Products

7 Hours

Terminology: auction market, beef checkoff, demand, electronic marketing, forward contracting, futures, marketing, options, Packers and Stockyards Act, private treaty, shrinkage, supply, terminal market

CAREER AND TECHNICAL SKILLS What the Student Should be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
8.1 Define terms	8.1.1	Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]
8.2 Discuss the marketing of agricultural animals in the United States	8.2.1 Identify agricultural animal marketing channels in the local area	Foundation	Writing	Adapts notes to a proper form [1.6.1]
	8.2.2 Prepare a report on the history of agricultural marketing	Personal Management	Arithmetic/ Mathematics	Calculates percentages, ratios, proportions, decimals, and common fractions [1.1.10]
	8.2.3 Compare the percentage of the food dollar that goes to marketing with the food dollar that goes to the producer		Responsibility	Comprehends ideas and concepts related to marketing livestock [3.4.2] Pays close attention to details [3.4.8]
8.3 List common methods of marketing livestock	8.3.1 Outline the similarities and differences between auction, direct, electronic, and terminal markets	Foundation	Writing	Records data [1.6.16]
		Interpersonal	Coaching	Comprehends ideas and concepts related to marketing livestock [2.1.1]
8.4 Discuss considerations in handling and transporting animals	8.4.1 Create working facilities for livestock to decrease stress before shipping to market	Foundation	Writing	Organizes information in an appropriate format [1.6.10]
	8.4.2 Prepare a report on the way to handle and transport a species of animal	Interpersonal	Teamwork	Comprehends ideas and concepts related to marketing livestock [2.6.1]
		Thinking	Creative Thinking	Uses imagination to create something new [4.1.1]
8.5 Explain the role of federal and state agencies in agricultural animal product marketing	8.5.1 Interview a marketing specialist with the Cooperative Extension Service, Farm Bureau, commodity group, or other agency or association to determine government roles and regulations in marketing agricultural animal products	Foundation	Speaking	Adapts notes to a proper form [1.6.1]
			Writing	Uses language, style, organization, and format appropriate to subject matter, purpose, and audience [1.6.19]

			Interpersonal	Leadership	Comprehends ideas and concepts related to marketing livestock [2.4.2]
8.6	Identify sources of animal market news	8.6.1	Locate current animal product market news on the Internet and in the local newspaper and compare prices for a week	Foundation Personal Management	Reading Responsibility Comprehends ideas and concepts related to agricultural animal market information [3.4.2]
8.7	List factors that influence market supplies and prices of agricultural animals	8.7.1	Look in local media for current events affecting animal product prices	Foundation Personal Management Thinking	Writing Responsibility Knowing how to Learn Presents own opinion in written form in a clear, concise manner [1.6.14] Pays close attention to details [3.4.8] Applies new knowledge and skills to marketing livestock [4.3.1]
8.8	Discuss futures and options trading as related to agricultural animal marketing	8.8.1	Collect and interpret information on futures and options in animal product marketing	Interpersonal	Coaching Comprehends ideas and concepts related to marketing livestock [2.1.1]
		8.8.2	Interview a producer who has used futures and options in marketing	Thinking	Creative Thinking Combines ideas or information in new way [4.1.2]

Unit 9: Meat and Animal Byproducts 8 Hours

Terminology: byproduct, convenience preparation, Kosher, processing, vacuum sealing, yield grade

CAREER AND TECHNICAL SKILLS What the Student Should be Able to Do			ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description	
9.1 Define terms	9.1.1	Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]	
9.2 Describe the general procedures in processing animals and products	9.2.1 Identify procedures that may be involved in processing meat animals by species and indicate the importance of each procedure	Foundation	Reading	Applies information and concepts derived from printed materials [1.3.3]	
		Thinking	Decision Making	Comprehends ideas and concepts related to meat animal processing [4.2.2]	
9.3 List the federal grades and qualities of meat	9.3.1 Outline the differences among prime, choice, select, standard, commercial, utility, cutter, and canner 9.3.2 Explain the kosher process and determine the availability of Kosher products in your area	Foundation	Writing	Organizes information into an appropriate format [1.6.10]	
		Interpersonal	Cultural Diversity	Respects others' personal values, cultures, and traditions [2.2.4]	
		Thinking	Knowing How to Learn	Applies new knowledge and skills to meat and animal byproducts [4.3.1] Uses available resources to apply new skills [4.3.6]	
9.4 Explain how the price of meat is determined	9.4.1 Calculate meat yield percentage for selected animal species	Foundation	Reading	Comprehends written specifications and applies them to a task [1.3.9]	
	9.4.2 Compare the amount of meat imported and exported by the United States		Arithmetic/ Mathematics	Applies computation skills to meat and animal byproducts [1.1.5]	
9.5 Discuss trends in processing meat	9.5.1 Visit a large supermarket to observe various retail cuts and forms of processed meat	Interpersonal	Cultural Diversity	Respects others' personal values, cultures, and traditions [2.2.4]	
9.6 List important byproducts obtained from animals	9.6.1 Compare byproducts from various animal species	Foundation	Reading	Comprehends written information for main ideas [1.3.7]	
		Thinking	Creative Thinking	Combines ideas or information in new way [4.1.2]	
9.7 Identify important food and personal safety practices with meat processing	9.7.1 Discuss the meaning of spoilage	Foundation	Reading	Uses written resources to obtain factual information [1.3.23]	

	9.7.2 List sources of spoilage and ways of preventing meat spoilage	Personal Management	Responsibility	Pays close attention to details [3.4.8]
	9.7.3 Describe personal sanitation practices followed by individuals in meat processing		Integrity/ Honesty/ Work Ethic	Complies with safety and health rules in a given work environment [3.2.2]

Unit 10: Business Aspects of Animal Production 7 Hours

Terminology: budget, corporation, credit, management, manager, partnership, sole proprietor

CAREER AND TECHNICAL SKILLS What the Student Should be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
10.1 Define terms	10.1.1	Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]
10.2 Discuss major types of business organizations found among animal production enterprises	10.2.1 List real-life examples of each of the three types of business organizations (ways of doing business)	Personal Management	Organizational Effectiveness	Comprehends the organization's modes of operation [3.3.5] Identifies characteristics desired by organization [3.3.6]
10.3 Explain the meaning and importance of management in animal production	10.3.1 Relate success of an animal production enterprise to the management quality	Foundation Interpersonal	Speaking Negotiation	Communicates a thought, idea, or fact in spoken form [1.5.5] Comprehends ideas and concepts related to the management of animal production enterprises [2.5.2]
10.4 Describe personal characteristics of a good manager	10.4.1 Identify important human relations skills used by managers 10.4.2 Prepare a report on the role of management in the profitability of an animal production enterprise	Foundation Personal Management Interpersonal	Listening Integrity/ Honesty/ Work Ethic Teamwork	Listens for content [1.2.3] Describes desirable worker characteristics [3.2.3] Describes/Explains significance of integrity, honesty, and work ethics [3.2.4] Works effectively with others to reach a common goal [2.6.6]
10.5 Describe types and sources of credit in the animal production business	10.5.1 Invite a loan officer to talk to the class about types and sources of credit	Foundation Thinking	Listening Decision Making	Evaluates oral information/presentation [1.2.2] Comprehends ideas and concepts related to credit [4.2.2] Identifies pros and cons to assist in decision-making process [4.2.7]
10.6 Explain the importance of record keeping in an animal production business	10.6.1 Practice keeping records of supervised agricultural experience programs	Foundation	Writing	Presents answers/conclusions in a clear and understandable form [1.6.13]

	10.6.2 Determine the financial information needed to prepare federal and state tax reports	Personal Management	Organizational Effectiveness	Identifies characteristics desired by organization [3.3.6]
	10.6.3 Review Federal and state publications that cover tax regulations for animal production enterprises			Promotes the goals and values of the organization [3.3.8]
10.7 Discuss considerations in setting up a budget for an animal production business	10.7.1 Develop a record keeping system and budget using a computer	Foundation Thinking	Arithmetic/ Mathematics Problem Solving	Expresses mathematical ideas and concepts orally and in writing [1.1.23] Devises and implements a plan of action to resolve a problem [4.4.3]
10.8 Describe the role of insurance with an animal production business	10.8.1 Use the services of a local insurance agent who writes insurance for animal production enterprises to identify coverage typically found in the local area	Foundation Thinking	Reading Decision Making	Comprehends written information, and applies it to a task [1.3.8] Considers risks when making a decision [4.2.3] Evaluates information/data to make the best decision [4.2.5]

Unit 11: Ethical Issues in Animal Production

4 Hours

Terminology: ethics, mutation, well-being

CAREER AND TECHNICAL SKILLS What the Student Should be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
11.1 Define terms	11.1.1	Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]
11.2 Relate the meaning and importance of animal well-being	11.2.1 Implement appropriate animal well-being practices in supervised experience programs	Foundation	Listening	Comprehends ideas and concepts related to ethical issues of livestock production [1.2.1]
	11.2.2 Differentiate between animal welfare and animal rights	Thinking	Reasoning	Determines which conclusions are correct when given a set of facts and a set of conclusions [4.5.3] Uses logic to draw conclusions from available information [4.5.6]
11.3 Discuss ethical considerations in animal production	11.3.1 Organize a debate among class members on the use of cloning and genetic engineering with animals (Note: Allow time for investigation of all sides of the issues that are involved.)	Foundation	Writing	Analyzes data, summarizes results, and makes conclusions [1.6.2]
	11.3.2 Identify different points of view on the production and use of animals for human food		Speaking	Communicates a thought, idea, or fact in spoken form [1.5.5]
	11.3.3 Debate issues associated with cloning and genetic engineering with animals		Listening	Evaluates oral information/presentation [1.2.2]
	11.3.4 Role-play situations involving different opinions on the production and use of animals	Interpersonal	Cultural Diversity	Respects others' personal values, cultures, and traditions [2.2.4] Works effectively with men and women from diverse backgrounds—ethnic, social, educational, etc. [2.2.5]
11.4 Examine issues related to exhibiting animals	11.4.1 List the positive and negative issues concerning livestock showing and determine a reasonable position	Foundation	Writing	Communicates thoughts, ideas, or facts in written form in a clear, concise manner [1.6.6]
	11.4.2 Determine costs associated with preparing and showing animals	Thinking	Reasoning	Determines which conclusions are correct when given a set of facts and a set of conclusions [4.5.3.] Sees relationship between two or more ideas, objects, or situations [4.5.5]

Glossary

Unit 1: Overview of Animal Science

1. agricultural animal—species of animals produced on farms and ranches for useful products
2. Career Development Event (CDE)—an activity sponsored by the FFA offering members opportunity to display competencies gained in agriculture education classes
3. cattle—male or female Bovine raised for the production of beef and/or milk
4. equine—animals of the genus Equus raised for work, recreational, or other uses
5. goat—any ruminant of the genus Capra that is produced for milk, meat, fiber, or other use
6. poultry—any species of fowl that is raised for the production of meat, eggs, and/or other products, including chickens, ducks, turkeys, and other species
7. sheep—Ovine animals raised for the production of meat and fiber
8. swine—animal of the family Suidae raised for the production of pork

Unit 2: Safety with Animal Agriculture

1. animal-related injury—an injury to humans caused by an animal
2. occupational safety—promoting safety in the work place
3. personal safety—promoting the protection of individuals from injury
4. zoonotic disease—a disease communicable from animals to humans under natural conditions; also know as zoonosis

Unit 3: Genetics and Animal Breeding

1. cell—the basic unit of life
2. chromosome—a strand of genetic material that contains genetic code
3. crossbreeding—the breeding of two different pure breeds
4. gene—a unit of inheritance composed of DNA
5. genetics—the study of heredity
6. genotype—genetic makeup of an animal
7. heredity—the passing of traits from parents to offspring
8. phenotype—the outward expression of a gene
9. purebred breeding—the breeding of animals within the same breed
10. reproduction—the process by which new organisms are derived normally involving the union of the male and female sex cells

Unit 4: Nutrition and Feeding of Agricultural Animals

1. anemia—a deficiency of hemoglobin, iron, or red blood cells often due to nutrition
2. balanced ration—a daily allowance of livestock feed mixed to contain suitable nutrients to promote normal development, maintenance, lactation, or gestation
3. bloat—a severe distension of the abdomen by gas; two types: dry and frothy
4. carbohydrates—any certain organic chemical compounds of C, H, and O which include sugar and starches
5. concentrate—feed that is high in energy and low in fiber
6. fats—the oily or greasy substances found in certain plants
7. feed—a source or product containing nutrients that support animal life and productivity
8. feedstuff—a feed ingredient
9. milk fever—paralysis due to an imbalance of blood calcium, sugars, or magnesium
10. mineral—a chemical compound or element of inorganic origin
11. nutrition—the process by which an animal ingests and uses nutrients in food materials
12. protein—any of a large number of complex organic compounds of amino acids that is an essential part of all living things
13. ration—the food an animal consumes in a 24-hour period
14. total digestible nutrients (TDN)—all nutrients consumed by an animal that are digested and used
15. vitamin—an organic substance that performs specific and necessary functions in relatively small concentrates in an organism
16. vitamin deficiency—a disease caused by the lack of one or more vitamins in the diet
17. water—the most valuable natural resource

Unit 5: Facilities and Equipment in Animal Production

1. compost—decomposing manure used as a soil additive
2. fence—a structure for confining animals or protecting property
3. lagoon—a body of water established for anaerobic decomposition of organic waste
4. nutrient management plan—a plan that establishes the quantities of animal manure and other wastes that may be applied to land based on the nutrient contents of the wastes
5. silo—a pit, trench, aboveground horizontal structure, or vertical cylinder structure of relatively airtight construction into which green crops, such as corn, grass, legumes, or small grain and other feeds, are placed and converted into silage for later use
6. squeeze chute—a device for safely securing a large animal for administration of a health or management practice
7. ventilation—to provide fresh circulating air

Unit 6: Animal Management Practices

1. animal identification—attaching or altering an animal so that its identity is known; methods include tags, tattoos, brands, DNA, and notching
2. castration—removing the testicles of a male to prevent unwanted breeding and promote desired growth
3. debeaking—removing the tip of the beak of a baby chick to deter unwanted pecking and cannibalism
4. dehorning—removing the horns or horn-developing tissue of an animal
5. hormone implant—a small pellet of hormone substance placed under the skin of an animal
6. producer quality assurance (PQA)—a program that guides animal producers in selecting management practices to produce a quality animal product in which its well-being is considered
7. sheering—removing the hair or wool from an animal
8. tail docking—removing the tail from an animal
9. vaccination—administering a vaccine

Unit 7: Animal Health

1. bacteria—single-cell microorganisms that cause disease in animals
2. carrier—any organism that carries disease
3. disease—a condition of pain, deterioration, injury, or other condition that constrains normal body functions
4. fungi—plant-like organisms that have no chlorophyll
5. health—the condition of an organism as related to normal life functions
6. parasite—an organism that lives in or on a host
7. poison—any substance toxic to the animal
8. protozoa—a group of one-cell organisms sometimes classified as one-cell animals, including amoebae and paramecia
9. sanitation—aseptic clean condition
10. quarantine—a period of time livestock are held away from other animals
11. virus—a self-reproducing agent that is smaller than bacteria and can multiply only within living cells of a host
12. vital signs—an indication of the living condition of an animal, including breathing, pulse rate, and body temperature

Unit 8: Marketing Animals and Animal Products

1. auction market—livestock are sold by public bidding with the animal going to the highest bidder
2. beef checkoff—an established \$1 per head fee for every head of beef sold in the United States
3. byproduct—a product made from part of an animal that is not used for food
4. demand—the amount of product buyers will purchase at a given time for a given price
5. electronic marketing—a form of auction selling used mainly for feeder cattle
6. forward contracting—a marketing procedure of a producer and buyer entering into an agreement well before a product is produced
7. futures—an agreement to take or make delivery of a product in the future at a specified price; involves futures trading on a commodity exchange
8. marketing—the processes and functions of moving animals and animal products from the producer to the consumer so that consumer demand is satisfied
9. options—a contract between producer and buyer conveying the right to sell within a specific time
10. Packers and Stockyards Act—a federal law that is administered by the USDA that deals with the movement of livestock across state lines
11. private treaty—a sale made directly between a producer and buyer
12. shrinkage—loss of weight that occurs when livestock are moved to market
13. supply—amount of product that producers will offer for sale at a given price at a given time
14. terminal market—livestock sold directly to the packer

Unit 9: Meat and Animal Byproducts

1. convenience preparation—using processing methods that simplify food preparation
2. Kosher—a special way of preparing meats for consumption required by Jewish law
3. processing—all of the steps or procedures in preparing a product for human use
4. vacuum sealing—a process of packaging by removing air and sealing in plastic
5. yield grade—determined by amount of edible product

Unit 10: Business Aspects of Animal Production

1. budget—the amount of capital set aside for a given period
2. corporation—an agreement for carrying out a farming enterprise as an entity distinct from the individuals that control it
3. credit—ability to borrow money
4. management—all of the decisions and organization activities needed in successfully producing animals and operating an animal production enterprise
5. manager—the operator who conducts, controls, and directs the livestock operation
6. partnership—an association of two or more people who operate the business
7. sole proprietor—owned and operated by one individual

Unit 11: Ethical Issues in Animal Production

1. animal well-being—caring for animals so that their needs are met and they do not suffer
2. ethics—treatment of livestock to ensure maximum production and optimal welfare of the animals
3. mutation—an accident of heredity in which an offspring has different characteristics than the genetic code intended