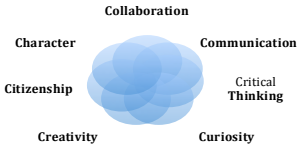
Content Area: Agriscience DRAFT	Course: Agriscience Production Year B	**Grade Level: 11/12**
	**R14 The Seven Cs of Learning** 	

Unit Titles	**Length of Unit**
• *Introduction to Food Science*	1-2 weeks
• *Chemistry of Food*	2-3 weeks
• *The Safety of Our Food*	2-3 weeks
• *Food Processing and Preservation*	2-3 weeks
• *Food Health and Security*	2-3 weeks
• *Preference and Product Availability*	2-3 weeks
• *Food Product Development*	2-3 weeks
• *SAE*	1-2 weeks
• *Introduction to Meat Science*	1-2 weeks
• *Harvesting of Livestock*	2-3 weeks
• *Meat Fabrication*	2-3 weeks
• *Meat Evaluation*	2-3 weeks
• *Meat Science and Safety*	3-4 weeks
• *Meat Grading*	1-2 weeks

Strands	Course Level Expectations
Food Science	• Demonstrate competence in the application of scientific principles and practices involved with Food Science and Safety. • Understand the areas of food science including food safety, food chemistry, food processing, food product development, and marketing.
Meat Science	• Demonstrate competence in the application of scientific principles and practices involved with Meat Science. • Understand the areas of meat science including industry scope, harvesting of livestock, meat Fabrication, meat evaluation, meat science and safety, and meat grading techniques.

Unit Title	Introduction to Food Science	**Length of Unit**	1-2 weeks

Inquiry Questions **(Engaging & Debatable)**	• What is food science and why would someone study it? • How and why do scientists use the five senses in food science? • How does a consumer evaluate food preference using the senses? • What food processing or preservation techniques have had an impact on current food products?
Standards*	**Food Products and Processing Systems (FPP):** **FPP.04:** Explain the scope of the food industry and the historical and current developments of food product and processing. **FPP.04.02:** Evaluate the significance and implications of changes and trends in the food products and processing industry in the local and global food systems.
Unit Strands & Concepts	Sensory evaluation, The five senses, Food science through history The science of how a person tastes foods with his or her senses. Consumer preference
Key Vocabulary	Aroma, Canning, Consumer preference, FDA, Fermentation, Flavor, Food adulteration, Food preservation, Food processing, Food science, FSIS, Mouthfeel, Palatability, Savory, Sense, Sight, Smell, Taste, Texture.

* The agriculture, food and natural resources (AFNR) industry standards

Unit Title	• Introduction to Food Science	**Length of Unit**	1-2 weeks

Critical Content: **My students will Know…**	**Key Skills:** **My students will be able to (Do)…**
• that sensory properties of food influence consumer preference and acceptance. • that organization and record keeping are important to success in food science. • that discoveries about food have driven advances in food processing and preservation.	• observe and identify three common foods using the five senses. • determine acceptability and preference of foods using sensory evaluation. • develop and keep an Agriscience Notebook to record and store information. • develop a Laboratory Notebook to record observations and protocols. • work collaboratively to develop a timeline of food science discoveries. • determine the date and significance of a food science discovery, scientist, organization, and/or event.

Assessments:	• Formative and Interim Assessments • Performance Assessment: Food Science History Project
Teacher Resources:	❖ Various Primary Industry Resources

Unit Title	Chemistry of Food	**Length of Unit**	2-3 weeks

Inquiry Questions **(Engaging & Debatable)**	1. How does food change over time? 2. What factors influence changes that occur in foods? 3. How can microorganisms be detected in food? 4. What causes spoilage and decay in food and why does matter to people? 5. How does the pH of a food influence how it is used in recipes?
Standards	**Food Products and Processing Systems (FPP):** **FPP.03**. Apply principles of science to the food products and processing industry. **FPP.04.** Select and process food products for storage, distribution and consumption.
Unit Strands & Concepts	• Structure of nutrients • Functions of nutrients in food preparation • The effect nutrients have on the sensory characteristics of food products • Ingredient substitution and evaluating changes in food products using different ingredients
Key Vocabulary	Acid, Base, Catalyst, Chemical change, Incubator, Inoculate, Melanin, Mixture, pH, Phase change, pH scale, Physical change, Products, Reactant

Unit Title	Chemistry of Food	**Length of Unit**	2-3 weeks

Critical Content: My students will Know…	**Key Skills: My students will be able to (Do)…**
• that the amounts of lipids, carbohydrates, proteins, and water in a food product influence sensory characteristics. • that ingredients have varying functionalities in food products. • that different ingredients can be used to produce the same product. • that food is constantly reacting with its environment. • that foods change over time due to chemical reactions, physical changes, microbiological growth and/or enzymatic activity. • that pH is an essential solution property that influences chemical reactions, properties, quality, and safety of food.	• render fat from assorted meat products to determine the amount of lipids present. • conduct sensory evaluations to ascertain how the amount of lipid, carbohydrates, proteins, and water affect sensory characteristics of food. • examine properties and sensory characteristics of various starches for the ability to withstand time and temperature changes. • dehydrate hotdogs and deli ham to determine the percentage of water in each food product. • examine elasticity of gluten in different flours. • research and determine the functions of ingredients in a basic cake recipe. • substitute ingredients in a recipe and use sensory analysis to determine acceptance of substitute ingredients. • observe foods of various ages to determine changes that have occurred over time. • culture swabs taken from food samples to determine the presence of microorganisms. • prepare a bread recipe and observe changes to the ingredients that occur during the mixing and baking of the bread.

Assessments:	• Performance Assessment: Food Chemistry Project
Teacher Resources:	❖ Various Primary Industry Resources

Unit Title	The Safety of Our Food	Length of Unit	2-3 weeks

Inquiry Questions (Engaging & Debatable)	• How are HACCP systems implemented throughout the food industry? • What are microbiological organisms and how can they be helpful? • Why is it important to understand how to manipulate microbial growth in food science? • What ways can pathogens cause foodborne illnesses?
Standards	**Food Products and Processing Systems (FPP):** **FPP.01.** Examine components of the food industry and historical development of food products and processing. **FPP.02**. Apply safety principles, recommended equipment and facility management techniques to the food products and processing industry.
Unit Strands & Concepts	• Good Manufacturing Practices (GMPs) • Personal Hygiene • Cleanliness and sanitation of the workspace • Cross Contamination • Allergens • Hazard Analysis and Critical Control Points (HACCP) • USDA Food Regulations • Physical, chemical, and microbial hazards • Foodborne pathogens
Key Vocabulary	Calibrate, Control point, Corrective action, Critical control point, Critical limit, HACCP, Hazard analysis, Monitor, Validation, Verification, Aerobic, Anaerobic, Bacteria, Food infection, Food spoilage, Incubation period.

Unit Title	The Safety of Our Food	**Length of Unit**	2-3 weeks

Critical Content: My students will Know…	**Key Skills: My students will be able to (Do)…**
• that personal hygiene is a critical GMP that is easily controlled • that good manufacturing practices can promote safe preparation and handling of food. • that allergens are food safety concerns and need to be addressed with proper food preparation and handling. • that HACCP utilizes seven basic principles to assure potentially hazardous products do not reach the consumer. • that HACCP concepts are used in all phases of food production and processing. • that HACCP is a framework for assessing and/or preventing risks associated with physical, chemical, and biological hazards in food design and manufacturing systems. • that microbiological organisms can have positive and negative effects on foods and people. • that microbial growth can be manipulated using temperature, pH, water activity, competitive exclusion, and chemical agents. • that pathogens can cause illness or death when present in food.	• develop a poster outlining proper protocols for a personal hygiene topic and present information to class. • observe photographs of food science situations to determine what GMPs are being followed and identify those that are not. • prepare foods using different sanitation methods and test for cross contamination. • research the principles of a HACCP plan and develop a Prezi presentation and handout to be used as an informational resource for other students. • determine the HACCP principle explained in a scenario and justify the reasoning for that choice. • collaborate as a team and follow steps to develop a HACCP plan for ham and cheese sandwiches. • research bacteria, mold, and yeast and record growth factors, appearance, and inhibiting methods. • observe microorganisms and sketch the observations. • prepare agar for microbial growth and inoculate the agar with yeast. • develop and conduct a protocol testing factors affecting microbial growth. • research foodborne pathogens to discover diseases pathogens can cause and prevention methods to control pathogens.

Assessments:	• Performance Assessment: HACCP Food Safety Project
Teacher Resources:	❖ Various Primary Industry Resources

Unit Title	Food Processing and Preservation	Length of Unit	2-3 weeks

Inquiry Questions (Engaging & Debatable)	• What is food processing and what are the best methods? • What are the basic principles in food preservation and why is it so important? • What is irradiation? • What are the roles of the FDA involving food safety and quality? • How and why are foods graded for quality?
Standards	**Food Products and Processing Systems (FPP):** **FPP.02.** Apply safety principles, recommended equipment and facility management techniques to the food products and processing industry. **FPP.03.** Apply principles of science to the food products and processing industry. **FPP.04.** Select and process food products for storage, distribution and consumption.
Unit Strands & Concepts	Food Processing, Raw Commodities, Preservation and packaging techniques, Product Shelf life, Food Preservation, Maintaining quality while preventing spoilage, Preservation methods Pasteurization and non-thermal methods of preservation The safety of the food supply, Food Processing and Preservation Regulations, Quality Grading standards of food products, Standards of identity
Key Vocabulary	Chemical property, Drying, Evaporation, Forming, Heat exchange, Packaging, Physical property, Refractometer, Separating, Shelf life, Acidification, Biotechnology, Concentration, Dehydration, Heat transfer, Heat treatment, Irradiation, Pasteurization, Adulteration, Consistency, Grading standard, Specific gravity, Standard of identity.

Unit Title	Food Processing and Preservation	**Length of Unit**	2-3 weeks

Critical Content: My students will Know…	**Key Skills: My students will be able to (Do)…**
• that processing is a system that physically or chemically changes the inherent characteristics of agricultural products prior to consumption. • that specific unit operations are dependent upon the chemical and physical properties of the raw food commodity. • that processing methods are dependent upon the end uses of the agricultural products. • that agricultural commodities are processed and separated into components used for further processing or for consumption. • that the five basic food-processing principles that achieve preservation are moisture removal, heat treatment, low-temperature treatment, acidity control, and non-thermal processes. • that food preservation controls microbial growth and enzymatic reactions, extending the shelf life of a food while changing its quality and usability. • that a variety of federal, state, and local agencies govern the manufacture and sale of food. • that agricultural commodities are graded based on their quality and usability, triggering some food products to have quality grading standards. • that certain food products must meet legal standards of identity.	• Investigate methods used in processing poultry and determine what products can be derived from a raw commodity. • Evaluate microbial growth of buttermilk and heat-treated buttermilk. • Manipulate pH levels of apples to inactivate enzymatic reactions and extend shelf life. • Remove water from fruit to study the effects of water on microbes. • Observe rate of deterioration of food products at room temperature, refrigeration, and freezing. • Assess sensory characteristics of food products after processing. • Examine non-thermal processing methods in the food science industry and write a technical research paper on non-thermal processing methods. • Evaluate differences of minimally processed food products to processed food products and develop a conclusion statement on the effects of processing on food products. • Research regulatory agencies and the laws that they regulate. • Determine which agency is responsible for regulating specific food products. • Evaluate milk samples to determine if the product has been adulterated and types of adulterants.

Assessments:	• Performance Assessment: Food Processing Project
Teacher Resources:	❖ Various Primary Industry Resources

Unit Title	Food Health and Security	Length of Unit	2-3 weeks

Inquiry Questions (Engaging & Debatable)	• Why is it important to understand how to read a nutrition label? • What is traceability? • What is food security and food defense? • How does the United States protect the food supply from intentional adulteration? • How is the Department of Homeland Security involved in food defense?
Standards	**Food Products and Processing Systems (FPP):** **FPP.01.** Examine components of the food industry and historical development of food products and processing. **FPP.03**. Apply principles of science to the food products and processing industry.
Unit Strands & Concepts	Laws and regulations regarding food labels, Food labels and nutrition guidelines, Mechanics of developing a food label for a food product, Food security , The Effect of Poverty on nutrition Food defense
Key Vocabulary	Food label, Health claims, Information panel, Nutrient content claims, Nutrition label, Nutritionist, Principal display panel, Recommended dietary allowance (RDA), Traceability, Department of Homeland Security, Food defense, Food insecurity, Food security, Food terrorism.

Unit Title	Food Health and Security	Length of Unit	2-3 weeks

Critical Content: My students will Know…	Key Skills: My students will be able to (Do)…
• that food labels provide required and useful information such as, ingredients, nutrition, claims, traceability, warnings, and proper food handling for consumers. • that recommended dietary allowances provide guidelines for proper intake of macromolecules for health, depending upon gender and different life stages. • that foods are analyzed and labeled based on their composition of various molecules. • that safe and nutritious food, necessary to maintain health, is not equally accessible to everyone. • that the U.S. food supply needs protection from intentional adulteration.	• dissect a nutrition label and examine each part to learn how to use a label to help consume a balanced diet. • investigate a food label to determine how to find required information and consumer warnings. • compare various food labels for nutrient content and healthy guidelines. • determine recommended dietary guidelines for a specific set of individuals and develop a menu that contains the necessary nutrients for a healthy diet. • recommend alternative foods for individuals with dietary restrictions. • research ingredients in a recipe to determine nutrient contents of each ingredient and develop a nutrition panel for the food product produced by the recipe. • analyze statistics about food insecurity in the United States. • examine statistics of food insecurity within their community. • develop solutions to possible situations of food insecurity in their community. • evaluate vulnerabilities toward intentional adulteration of a packing plant in the United States. • develop a food defense plan. • consider possible ways to attack the food supply.

Assessments:	• Performance Assessment: Food Security Project
Teacher Resources:	❖ Various Primary Industry Resources

Unit Title	Preference and Product Availability	Length of Unit	2-3 weeks

Inquiry Questions (Engaging & Debatable)	• Why do factors such as price, nutrition, and availability affect how consumers choose their • food products? • How does convenience affect the choices consumers make on food product purchases? • How can biases or other non-relevant factors affect sensory evaluations? • What technologies do researchers use in food marketing? • What types of media are used in food marketing and how does social media impact our behavior? • What is the purpose of food packaging and food positioning?
Standards	**Food Products and Processing Systems (FPP):** **FPP.01**. Examine components of the food industry and historical development of food products and processing. **FPP.03.** Apply principles of science to the food products and processing industry. **FPP.04.** Select and process food products for storage, distribution and consumption.
Unit Strands & Concepts	Food marketing, Farm to fork, Principle of the "four P's" (price, product, place, and promotion), Shelf life, Food product Promotions, Seasonality of Food Products, Retailer planograms
Vocabulary	Acceptance test, Bias, Consumer behavior, Counter balancing, Descriptive analysis, Discrimination test, Psychological, Advertisement, End cap, Marketing, Placement, Planogram, Price, Product, Promotion, Target audience

Unit Title	Preference and Product Availability	**Length of Unit**	2-3 weeks

Critical Content: **My students will Know…**	**Key Skills:** **My students will be able to (Do)…**
• that consumers choose food based on lifestyle factors including price, availability, convenience, culture, and nutrition. • that sensory evaluations must be carefully constructed and executed to reduce factors or biases that are not relevant to the test objective. • that different sensory evaluation techniques determine consumer preference and acceptance. • that food marketing uses technology and media to influence consumer behavior. • that food packaging both protects food and attracts consumers. • that food retailers position products based on shopping behaviors and consumer trends.	• Evaluate a menu and consider choices based on nutrition, price, convenience, and culture. • Choose food products based on lifestyle. • Participate in sensory evaluation modeling factors to identify biases. • Discuss how non-relevant factors can manipulate the perception of panelists. • Construct and conduct a specific sensory evaluation and collect data to analyze the outcome of the evaluation. • Develop an instructional guide explaining the steps and key points of a specific sensory evaluation. • Investigate different advertisements and determine how the marketer addressed product, price, place, and promotion. • Develop a food package to withstand a crush test, a drop test, and a water test while identifying the product and attracting consumers. • Explore a store or market selling an assigned food product and evaluate the planogram and how the retailer marketed the product.

Assessments:	• Performance Assessment: Food Packaging Project
Teacher Resources:	❖ Various Primary Industry Resources

Unit Title	Food Product Development	Length of Unit	2-3 weeks

Inquiry Questions **(Engaging & Debatable)**	1. What are the stages in the food product development process? 2. How do food scientists determine the needs for a new food product? 3. What is a food trial? 4. How does a food scientist develop a formulation? 5. Why is consumer testing necessary when developing a new food product? 6. What is new food product validation?
Standards	Food Products and Processing Systems Career Pathway Content Standards **FPP.02.01:** Apply principles of nutrition and biology to develop food products that provide a safe, wholesome and nutritious food supply for local and global food systems. **FPP.02.02:** Apply principles of microbiology and chemistry to develop food products to provide a safe, wholesome and nutritious food supply for local and global food systems. **FPP.02.03:** Apply principles of human behavior to develop food products to provide a safe, wholesome and nutritious food supply for local and global food systems. **FPP.03:** Select and process food products for storage, distribution and consumption. **FPP.03.01**: Implement selection, evaluation and inspection techniques to ensure safe and quality food products. **FPP.03.02**: Design and apply techniques of food processing, preservation, packaging and presentation for distribution and consumption of food products.
Unit Strands & Concepts	Consumer Demand, New Product Development, Product definition, Implementation and Introduction, Consumer Testing
Vocabulary	Food trend, Food trial, Formulation, Prototype, Validation, Consumer Demand

Unit Title	Food Product Development	**Length of Unit**	2-3 weeks

Critical Content: **My students will Know…**	**Key Skills:** **My students will be able to (Do)…**
• that food product development moves through a series of processes to transform from an idea to a tangible food product. • that finished food products must be validated against the original concept.	• Choose a new food product to develop • Apply food processes necessary to develop a tangible food product from an idea. • Justify that a developed product meets consumer needs. • Develop a display to highlight new food product.

Assessments:	• Performance Assessment: Food Product Development Project
Teacher Resources:	❖ Various Primary Industry Resources

Unit Title	SAE Proficiency	**Length of Unit**	1-2 weeks

Inquiry Questions (Engaging Debatable):	• How does record keeping relate to evaluation of goals? • How does a student quantify growth? • How does a student describe and document success?
Standards	**Career Ready Practices (CRP):** **CRP.01.** Act as a responsible and contributing citizen and employee. **CRP.01.01**. Model personal responsibility in the workplace and community **CRP.01.02** Evaluate and consider the near-term and long-term impacts of personal and professional decisions on employers and community before taking action. **CRP.01.03.** Identify and act upon opportunities for professional and civic service at work and in the community. **CRP.02.** Apply appropriate academic and technical skills. **CRP.02.01.** Use strategic thinking to connect and apply academic learning, knowledge and skills to solve problems in the workplace and community. **CRP.02.02.** Use strategic thinking to connect and apply technical concepts to solve problems in the workplace and community.
Unit Strands & Concepts	Record keeping, Descriptive writing, Evaluation of goals and success,
Key Vocabulary	Proficiency, financial report, income, expenses, career success, placement, scope, expenditures, gross earnings, net earnings, liabilities, net worth

Unit Title	SAE Proficiency	**Length of Unit**	1-2 weeks

Critical Content: My students will Know…	**Key Skills: My students will be able to (Do)…**
• utilize AET • describe and explain the student's' SAE • calculate hours worked and money earned • list skills and identify growth • calculate gross and net income • evaluate goals	• create a comprehensive PowerPoint presentation • create a expense report and earning report • write descriptive paragraphs • assemble a collage • create a resume • describe and quantify success

Assessments:	• **Summative:** Final Submission of Proficiency Application. Grades with the National FFA rubric • **Performance Assessment:** SAE PowerPoint Presentation
Teacher Resources:	❖ Various Primary and Industry Resources ❖ National FFA ❖ AET

Unit Title	Introduction to Meat Science	Length of Unit	1-2 weeks

Inquiry Questions (Engaging & Debatable)	• What are the major sectors of the U.S. Meat Industry? • How does Meat Science relate to other segments of the agricultural industry in the U.S? • What careers are available in the U.S. Meat Science Industry?
Standards	**Agriculture, Food & Natural Resources Career Cluster (CS):** CS.02 Evaluate the nature and scope of the Agriculture, Food & Natural Resources Career Cluster™ and the role of agriculture, food and natural resources (AFNR) in society and the economy. CS.05 Describe career opportunities and means to achieve those opportunities in each of the Agriculture, Food & Natural Resources Career Pathways. CS.06 Analyze the interaction among AFNR systems in the production, processing and management of food, fiber and fuel and the sustainable use of natural resources.
Unit Strands & Concepts	Meat Science Overview, Beef, Sheep and Lamb Production Segments, Career Exploration Food Science
Vocabulary	Meats, Inspection, Grading, Harvesting, Rendering, Carcass Traits, Wholesale Cuts, Retail Cuts

Unit Title	Introduction to Meat Science	**Length of Unit**	1-2 weeks

Critical Content: **My students will Know…**	**Key Skills:** **My students will be able to (Do)…**
• that the meats industry is a multi-billion dollar industry in the U.S. • that there are over a hundred different career titles related to the meats and food science industry • that there are several federal and state standards and laws that regulate the U.S. Meat industry	• Become familiar with all aspects of the meat science industry • Explore a segment of the U.S. Meats Industry • Interview meats industry professionals in the local area • Visit several local meats industry businesses

Assessments:	• Performance Assessment: Meat Science Industry Project
Teacher Resources:	❖ Various Primary Industry Resources

Unit Title	Harvesting of Livestock	Length of Unit	2-3 weeks

Inquiry Questions (Engaging & Debatable)	• How are livestock harvested? • What are the federal and state regulations and laws concerning humane slaughter of livestock? • How are wholesale and retail cuts from beef, lamb and pork similar?
Standards	**Food Products & Processing Systems Career Pathway (AG-FPP):** **FPP.01** Develop and implement procedures to ensure safety, sanitation and quality in food product and processing facilities. **FPP.02** Apply principles of nutrition, biology, microbiology, chemistry and human behavior to the development of food products. **FPP.03** Select and process food products for storage, distribution and consumption. **FPP.04** Explain the scope of the food industry and the historical and current developments of food products and processing.
Unit Strands & Concepts	Slaughtering process of livestock, History of meat Inspection, Federal and state meat inspection standards Identification of retail cuts, wholesale cuts and meat by-products of cattle, swine and lamb.
Key Vocabulary	Holding Pen, Exsanguination, Scalding, Evisceration, Carcass, Inedible Rendering, Grading, USDA, FSIS, Primal Cuts, Sub Primal Cuts, Health Claim, By-product

Unit Title	Harvesting of Livestock	**Length of Unit**	2-3 weeks

Critical Content: **My students will Know…**	**Key Skills:** **My students will be able to (Do)…**
• that the livestock harvesting process includes several steps to ensure the safety of the processor and to minimize the stress of the animals involved. • the strict federal and state laws governing the entire livestock harvesting process. • how beef, lamb and pork carcasses are fabricated into several wholesale and retail cuts.	• describe the livestock harvesting process. • explain federal and state meat inspection standards. • identify retail and wholesale cuts of meat correlated to • major muscle groups and meat byproducts. • visit a local butcher shop.

Assessments:	• Performance Assessment: Hoof to Plate Project
Teacher Resources:	❖ Various Primary Industry Resources

Unit Title	Meat Fabrication	Length of Unit	2-3 weeks

Inquiry Questions (Engaging & Debatable)	• What determines the tenderness of a cut of meat? • How are beef, pork and lamb carcasses fabricated into retail cuts? • How are retail cuts packaged to extend shelf life?
Standards	**Food Product and Processing Systems Career Pathway (AG-FPP):** **FPP.01** Develop and implement procedures to ensure safety, sanitation and quality in food product and processing facilities. **FPP.02** Apply principles of nutrition, biology, microbiology, chemistry and human behavior to the development of food products. **FPP.03** Select and process food products for storage, distribution and consumption.
Unit Strands & Concepts	beef fabrication, pork fabrication, lamb fabrication
Vocabulary	Fabrication, Forequarter, Chuck, Rib, Foreshank and Brisket, Short loin, Sirloin, Round, Flank and Plate, Loin Knife, Whizard Knife, Skinner, Smokehouse, Vacuum Packaging

Unit Title	Meat Fabrication	**Length of Unit**	2-3 weeks

Critical Content: My students will Know…	**Key Skills: My students will be able to (Do)…**
• that there are specific yet similar wholesale and retail cuts of beef, pork and lamb. • that the quality of a retail cut can be determined by the method of cutting and the location of the cut within the carcass. • where each retail cut comes from in a beef, pork and lamb carcass. • how to break down a carcass into wholesale cuts for beef, pork and lamb. • how to fabricate a beef, pork and lamb carcass from wholesale cuts to retail cuts. • how to safely sharpen knives used for meat cutting. • how to safely operate the band saw	• demonstrate forequarter fabrication process from carcass into retail. • identify the primal and sub-primal cuts of the beef forequarter. • demonstrate basic techniques for identification of beef retail cuts. • demonstrate the hindquarter fabrication process from carcass into retail cuts. • demonstrate techniques for identification of beef retail cuts. • describe the primal, sub-primal and retail cuts of the beef hindquarter. • learn the steps involved in fabricating hog carcasses. • learn about lean recovery, ground pork and lean trim products. • understand how by-products are rendered into edible and in-edible by-products. • practice the steps taken to ensure products are produced in a safe and sanitary environment. • breakdown and fabricate a beef, pork and lamb carcass.

Assessments:	• Performance Assessment: Carcass Fabrication Project
Teacher Resources:	❖ Various Primary Industry Resources

Unit Title	Meat Evaluation	Length of Unit	2-3 weeks

Inquiry Questions (Engaging & Debatable)	• How do beef, pork and lamb carcasses differ? • What are the primary factors in evaluating beef, pork and lamb carcasses, wholesale cuts and retail cuts? • How does meat evaluation lead to tender, tasty and nutritious meat on the consumer's plate?
Standards	**Animal Systems Career Pathway (AS) & Food Product and Processing Systems Career Pathway (AG-FPP):** **AS.06** Classify, evaluate and select animals based on anatomical and physiological characteristics. Food Products & Processing Systems Career Pathway (AG-FPP) **FPP.02** Apply principles of nutrition, biology, microbiology, chemistry and human behavior to the development of food products. **FPP.03** Select and process food products for storage, distribution and consumption.
Unit Strands & Concepts	Beef Quality Grading, Beef Yield Grading, Beef, Pork and Lamb Carcass Judging Beef, Pork and Lamb Wholesale Cut Judging, Beef, Pork and Lamb Retail Cut Judging, Comparative Meat Judging
Key Vocabulary	Quality Grade, Marbling, Ossification, Maturity, Cutability, KPH fat, Yield Grade, Round Face, Ilium, Ischium

Unit Title	Meat Evaluation	**Length of Unit**	2-3 weeks

Critical Content: **My students will Know…**	**Key Skills:** **My students will be able to (Do)…**
• The major factors to consider when evaluating beef, pork and lamb carcasses, wholesale cuts and retail cuts. • How to distinguish between desirable and undesirable cuts of meat. • How to select the best carcass, wholesale cut and retail cut based on indicators of quality for muscle and fat content. • How to explain and justify their placings on classes of carcasses, wholesale cuts and retail cuts.	• Define the major factors utilized in carcass grading as well as carcass and cut evaluation. • Understand and practice the fundamentals of judging beef, pork and lamb. • Evaluate beef, lamb and pork carcasses, wholesale cuts and retail cuts. • Prepare and present written and oral reasons for placing classes to justify their selections.

Assessments:	• Performance Assessment: Meats Judging and Evaluation Project
Teacher Resources:	❖ Various Primary Industry Resources

Unit Title	Meat Science and Safety	Length of Unit	3-4 weeks

Inquiry Questions (Engaging & Debatable)	• How is the meat we consume processed safely? • What allows the consumer to feel confident that meat is safe for consumption? • How are animals cared for from birth to processing? • What nutritional benefits do meats contain? • How is meat processed, cooked and stored properly? • How can the consumer prevent foodborne illnesses?
Standards	**Food Products & Processing Systems Career Pathway (AG-FPP):** **FPP.01** Develop and implement procedures to ensure safety, sanitation and quality in food product and processing facilities. **FPP.02** Apply principles of nutrition, biology, microbiology, chemistry and human behavior to the development of food products. **FPP.03** Select and process food products for storage, distribution and consumption.
Unit Strands & Concepts	Legislation and History, Animal Care and Handling, Meat Nutrition, Purchasing Meat Meat Storage and Handling, Meat Cookery, Processed Meats, Food Safety
Key Vocabulary	Halal, Kosher, HACCP, Withdrawal Period, Residue Levels, Sarcomere, Myosin, Actin, Overwrap, Modified Atmosphere Packaging (MAP), Vacuum Packaging, Dry Aging, Wet Aging, Organic Meat, Freezer Burn, Cross-Contamination

Unit Title	Meat Science and Safety	**Length of Unit**	3-4 weeks

Critical Content: **My students will Know…**	**Key Skills:** **My students will be able to (Do)…**
• the history of meat inspection and the related legislation • how to properly handle food production animals from birth to processing • the nutritional components and benefits of meat as a food source • how to properly handle, wrap and store meat products • how to properly cook and prepare meats • how to properly produce and preserve processed meats • how to analyze food safety practices • how to determine causes of foodborne illnesses	• explore legislation and history in relation to the meats industry. • demonstrate animal care and handling techniques. • identify the nutritional content and benefits of meat. • consider consumer options when purchasing meat. • describe meat storage and handling practices. • practice meat cooking methods. • identify and describe meat additives and processed meats. • analyze and practice food safety practices. • determine the causes of actual cases of foodborne illnesses.

Assessments:	• Performance Assessment: Food Safety Project
Teacher Resources:	❖ Various Primary Industry Resources

Unit Title	**Meat Grading**	**Length of Unit**	1-2 weeks

Inquiry Questions (Engaging & Debatable)	• How and why is meat graded? • What is the difference between yield and quality grading and why it matters? • How does the yield grade and quality grade affect the taste and tenderness of meat?
Unit Strands & Standards	**Animal Systems Career Pathway (AS) & Food Product and Processing Systems Career Pathway (AG-FPP):** **AS.06** Classify, evaluate and select animals based on anatomical and physiological characteristics. Food Products & Processing Systems Career Pathway (AG-FPP) **FPP.02** Apply principles of nutrition, biology, microbiology, chemistry and human behavior to the development of food products. **FPP.03** Select and process food products for storage, distribution and consumption.
Key Concepts	USDA quality grades for beef carcasses, Skeletal maturity, Lean maturity Marbling scores, USDA grade standards for quality and yield grading,USDA Yield Grades for beef carcasses, Pork and lamb carcass grading
Key Vocabulary	Quality Grade, Maturity Grade, Ossification, Lean Maturity, Marbling, Yield Grade, Cutability, PYG, Finish, HCW, KPH Fat, Ribeye Area

Unit Title	Meat Grading	**Length of Unit**	1-2 weeks

Critical Content: **My students will Know…**	**Key Skills:** **My students will be able to (Do)…**
• The factors that affect yield and quality grading of beef carcasses • How each factor relates to the final yield and quality grade of a beef carcass • How an animal is fed leading up to slaughter affects the final yield and quality grade of the resulting meat product • How to properly determine the final yield and quality grade of a beef carcass.	• Introduce the USDA grade standards for beef carcasses. • Define the major factors utilized in quality grading beef carcasses. • Provide a thorough understanding of beef carcass quality grading. • Define the major factors utilized in beef carcass yield grading. • Explain the USDA yield grade standards for beef carcasses. • Accurately calculate final USDA beef carcass yield grades.

Assessments:	• Performance Assessment: Beef Carcass Grading Project
Teacher Resources:	❖ Various Primary Industry Resources