

Meat Science & Technology

Subject Code: 011020

Course and Unit Descriptions

Course Description:

Learners will apply food chemistry and microbiology to processing, preservation, packaging, storage and marketing of meat products. Learners will design and implement a quality assurance program that meets legal compliance. Learners will evaluate carcass composition, assign quality grades, and examine valued-added products. Learners will demonstrate knowledge of safety regulations and operate and maintain equipment and facilities. Learners will practice customer service and sales techniques while understanding the scope and importance of business regulations.

Unit: Safety

Students will demonstrate proper safety procedures and protocols and will administer first aid and demonstrate a proper respond to an emergency when necessary.

Benchmark: 4.1 Safety Procedures

Level 2: Follow safety procedures in specific situations with specialized tools and equipment, evaluate situation and take corrective action

Indicators

- 4.1.01 Demonstrate knowledge of safety rules and regulations
- 4.1.02 Interpret safety signs and symbols
- 4.1.03 Model safe attitudes and behaviors (e.g., lifting, climbing)
- 4.1.04 Identify safety hazards and take corrective measures
- 4.1.05 Use safety equipment in accordance with established procedures
- 4.1.06 Follow established procedures for the administration of first aid and contact emergency medical personnel when necessary

Academic Standards

English Standards: Demonstrate comprehension of print and electronic text by responding to questions (e.g., literal, inferential, evaluative and synthesizing). (Reading Process B, 8-10; Reading Process B, 11-12)

Unit: Equipment Operation and Maintenance

Students will perform inspections, lubricate and maintain equipment while following the manufacturer's recommended operating procedures and adjustment specifications.

Benchmark: 4.2 Stationary and Mobile Equipment Maintenance

Level 2: Inspect and maintain specialized machinery and equipment according to schedule

Indicators

- 4.2.01 Perform a machine condition inspection
- 4.2.02 Lubricate machinery and equipment
- 4.2.08 Maintain machinery, equipment, instruments and facility cleanliness, appearance, and safety

Academic Standards

English Standards: Use appropriate self-monitoring strategies for comprehension. (Reading Process C, 8-10; Reading Process C, 11-12)

Math Standards: Apply mathematical knowledge and skills routinely in other content areas and practical situations. (Mathematical Processes B, 8-10)

Benchmark: 4.3 Equipment Operation

Level 2: Inspect and safely operate specialized equipment with some limitations to adjustments and functions

Indicators

4.3.01 Follow manufacturer's recommended operating procedures and adjustment specifications

4.3.03 Perform pre-operation inspection and adjustments

4.3.06 Perform post-operating inspection and adjustments

Academic Standards

English Standards: Demonstrate comprehension of print and electronic text by responding to questions (e.g., literal, inferential, evaluative and synthesizing). (Reading Process B, 8-10; Reading Process B, 11-12)

Math Standards: Apply mathematical knowledge and skills routinely in other content areas and practical situations. (Mathematical Processes B, 8-10)

Unit: Sanitation and Cleanliness

The learner will identify contaminants, contamination points and differentiate among the types of pathogens. The learner will explain and implement safety and security programs that address control, remediation and prevention.

Benchmark: 5.4 Contaminants

Level 2: Assess affected area, determine the source and type of contaminant, and respond appropriately

Indicators

5.4.02 Explain and implement programs and policies related to contaminants

5.4.03 Identify, comply with and implement contaminant control, remediation and prevention practices (e.g., biological, radiological, sanitation, buffer strips for run-off)

Academic Standards

English Standards: Use multiple resources to enhance comprehension of vocabulary. (Vocabulary F, 8-10; Vocabulary E, 11-12)

Math Standards: Estimate and compute various attributes, including length, angle measure, area, surface area and volume, to a specified level of precision. (Measurement E, 8-10)

Science Standards: Describe how human activities can impact the status of natural systems. (Life Sciences G, 9-10)

Social Studies Standards: Evaluate the consequences of geographic and environmental changes resulting from governmental policies and human modifications to the physical environment. (Geography B, 11-12)

Benchmark: 6.5 Food Safety and Security

Level 2: Develop a food safety and security plan addressing facility needs and contamination points

Indicators

6.5.02 Establish and implement procedures for preoperational inspection and cleaning (e.g., Sanitation Standard Operating Procedures [SSOPs], visual, ATP swabs, sanitation swabs, nonpathogenic tests)

6.5.03 Identify sources and types of food-borne illness and food-borne pathogens (e.g., salmonella, E. coli 0157:H7, listeria) and how they enter the food supply

6.5.05 Develop and implement a pest control system

- 6.5.06 Conduct Good Manufacturing Practices (GMP) audit, review findings and implement corrective actions
- 6.5.11 Conduct product hazard analysis and ingredient hazard analysis
- 6.5.12 Identify the key activities of a traceback/recall program

Academic Standards

- English Standards: Use multiple resources to enhance comprehension of vocabulary. (Vocabulary F, 8-10; Vocabulary E, 11-12)
- Math Standards: Construct convincing arguments based on analysis of data and interpretation of graphs. (Data Analysis F, 8-10)
- Science Standards: Explain the structure and function of ecosystems and relate how ecosystems change over time. (Life Sciences F, 9-10)

Unit: Safety and Security

Students will recognize the sources and causes of contamination and develop the protocols to implement bio-security procedures.

Benchmark: 6.5 Food Safety and Security

Level 2: Develop a food safety and security plan addressing facility needs and contamination points

Indicators

- 6.5.02 Establish and implement procedures for preoperational inspection and cleaning (e.g., Sanitation Standard Operating Procedures [SSOPs], visual, ATP swabs, sanitation swabs, nonpathogenic tests)
- 6.5.03 Identify sources and types of food-borne illness and food-borne pathogens (e.g., salmonella, E. coli 0157:H7, listeria) and how they enter the food supply
- 6.5.04 Prevent/control food-borne illness through environmental monitoring
- 6.5.06 Conduct Good Manufacturing Practices (GMP) audit, review findings and implement corrective actions
- 6.5.07 Identify hazards and critical control points
- 6.5.11 Conduct product hazard analysis and ingredient hazard analysis
- 6.5.12 Identify the key activities of a traceback/recall program

Academic Standards

- English Standards: Use multiple resources to enhance comprehension of vocabulary. (Vocabulary F, 8-10; Vocabulary E, 11-12)
- Math Standards: Construct convincing arguments based on analysis of data and interpretation of graphs. (Data Analysis F, 8-10)
- Science Standards: Explain the structure and function of ecosystems and relate how ecosystems change over time. (Life Sciences F, 9-10)

Unit: Production Processing

Learners will use principles and practices of food processing and packaging to develop solutions for problems in food production, handling and storage. Learners will process products using heat preservation, cold processing, food irradiation, fermentation, milling, and hydrogenation processing techniques.

Benchmark: 6.3 Food Production and Processing

Level 2: Process a food item using basic preparation techniques (e.g., mixing, grinding)

Indicators

- 6.3.03 Describe function and types of packaging operations, equipment and materials and use in manufacturing food products (e.g. metal, glass, paper, plastic, film, laminates, edible coatings)

- 6.3.04 Compare and contrast reduced oxygen packaging (ROP) and processes and use in the manufacturing of food products (e.g. controlled atmosphere and modified atmosphere packaging, desiccants)
- 6.3.05 Describe key food processing operations (e.g., mixing, grinding, pumping, washing, etc.)
- 6.3.06 Describe storage and distribution methods for non-shelf-stable product
- 6.3.08 Describe the initial processing of animals and animal products and the basis for product grading
- 6.3.10 Process food products through biological processing (e.g. fermenting, enzymes, microbes)
- 6.3.13 Process food products through mechanical processing (e.g., cut, grind, heat, homogenize, texturize, extrude, mill, mix)
- 6.3.14 Process food products through chemical processing (e.g. hydrating, hydrogenating and tenderizing)
- 6.3.15 Identify energy resources utilized in the processing of a food product

Academic Standards

- English Standards: Use multiple resources to enhance comprehension of vocabulary. (Vocabulary F, 8-10; Vocabulary E, 11-12)
- Math Standards: Apply mathematical knowledge and skills routinely in other content areas and practical situations. (Mathematical Processes B, 8-10)
- Science Standards: Explain the characteristics of life as indicated by cellular processes and describe the process of cell division and development. (Life Sciences B, 9-10)

Unit: Business Operations

Students will develop a comprehensive marketing plan and skills in customer relations.

Benchmark: 3.1 Marketing

Level 2: Develop and market a product or service to maximize profits and optimize cost

Indicators

- 3.1.01 Select target market and consumers
- 3.1.04 Select channels of distribution
- 3.1.05 Set prices using supply and demand curves and commodity and non-commodity pricing
- 3.1.07 Promote products and services

Academic Standards

- English Standards: Produce functional documents that report, organize and convey information and ideas accurately, foresee readers' problems or misunderstandings and that include formatting techniques that are user friendly. (Writing Applications C, 11-12)
- Math Standards: Use algebraic representations, such as tables, graphs, expressions, functions and inequalities, to model and solve problem situations. (Algebra D, 8-10)
- Social Studies Standards: Analyze how scarcity of productive resources affects supply, demand, inflation and economic choices. (Economics A, 11-12)

Benchmark: 3.10 Business Regulation, Law and Related Issues

Level: (not selected)

Indicators

- 3.10.03 Identify local, state and federal regulations relative to compliance
- 3.10.04 Assess business liability and describe the consequences of noncompliance
- 3.10.08 Assess the impact of issues affecting the industry and recommend solutions

Academic Standards

- English Standards: Demonstrate comprehension of print and electronic text by responding to questions (e.g., literal, inferential, evaluative and synthesizing). (Reading Process B, 8-10; Reading Process B, 11-12)

Math Standards: Construct convincing arguments based on analysis of data and interpretation of graphs. (Data Analysis F, 8-10)

Social Studies Standards: Evaluate the consequences of geographic and environmental changes resulting from governmental policies and human modifications to the physical environment. (Geography B, 11-12)

Benchmark: 3.2 Sales and Customer Service

Level 2: Use sales techniques to close the sale of a product/service and handle complex customer issues

Indicators

- 3.2.01 Identify key components to organize a sale
- 3.2.03 Forecast sales and delivery times
- 3.2.04 Prospect for new customers
- 3.2.07 Utilize suggestive selling and selling up techniques
- 3.2.12 Utilize follow-up activities/strategies and provide post-sale service
- 3.2.13 Handle customer complaints

Academic Standards

English Standards: Use a variety of strategies to enhance listening comprehension. (Communication A, 8-10; Communication A, 11-12)

Math Standards: Estimate, compute and solve problems involving real numbers, including ratio, proportion and percent, and explain solutions. (Number G, 8-10)

Benchmark: 3.5 Purchasing and Inventory

Level 2: Manage inventory based on budgeting and sales forecasting

Indicators

- 3.5.01 Explain the nature and scope of purchasing
- 3.5.03 Evaluate and select vendors
- 3.5.05 Record inventory usage

Academic Standards

English Standards: Use multiple resources to enhance comprehension of vocabulary. (Vocabulary F, 8-10; Vocabulary E, 11-12)

Math Standards: Write and solve real-world, multi-step problems involving money, elapsed time and temperature, and verify reasonableness of solutions. (Measurement F, 8-10)

Benchmark: 3.9 Emotional Intelligence

Level 2: Exhibit techniques to control emotional reactions to people and situations

Indicators

- 3.9.02 Identify how individual actions impact others
- 3.9.03 Manage personal emotions, behavior and appearance to maintain professionalism
- 3.9.04 Describe and exhibit appropriate ethical behavior
- 3.9.06 Employ appropriate coping skills to prevent/handle workplace conflicts
- 3.9.07 Recognize, respect and utilize the diversity among people and cultures
- 3.9.08 Foster positive working relationships

Academic Standards

English Standards: Use a variety of strategies to enhance listening comprehension. (Communication A, 8-10; Communication A, 11-12)

Social Studies Standards: Analyze how issues may be viewed differently by various cultural groups. (People in Societies A, 11-12)