

## Meat Science III

<b>Primary Career Cluster:</b>	Agriculture, Food, & Natural Resources
<b>Consultant:</b>	<a href="mailto:CTE.Standards@tn.gov">CTE.Standards@tn.gov</a>
<b>Course Code(s):</b>	C18HB5
<b>Prerequisite(s):</b>	<i>Meat Science II</i> (C18HB4)
<b>Credit:</b>	1 Credit
<b>Grade Level:</b>	12
<b>Elective Focus - Graduation Requirements:</b>	This course satisfies one of three credits required for an elective focus when taken in conjunction with other Agriculture, Food, & Natural Resources courses.
<b>POS Concentrator:</b>	This course satisfies one out of two required courses to meet the Perkins V concentrator definition, when taken in sequence in the approved program of study.
<b>Programs of Study and Sequence:</b>	This is the fourth course in the <i>Meat Science</i> program of study.
<b>Aligned Student Organization(s):</b>	FFA: <a href="http://www.tnffa.org">http://www.tnffa.org</a>
<b>Coordinating Work-Based Learning:</b>	All Agriculture students are encouraged to participate in a Supervised Agricultural Experience (SAE) program. In addition, teachers who hold an active WBL certificate may offer placement for credit when the requirements of the state board's WBL Framework and the Department's WBL Policy Guide are met. For information, visit <a href="https://www.tn.gov/education/educators/career-and-technical-education/work-based-learning.html">https://www.tn.gov/education/educators/career-and-technical-education/work-based-learning.html</a> .
<b>Available Student Industry Certifications:</b>	Credentials are aligned with postsecondary and employment opportunities and with the competencies and skills that students acquire through their selected program of study. For a listing of promoted student industry credentials, visit <a href="https://www.tn.gov/education/educators/career-and-technical-education/student-industry-certification.html">https://www.tn.gov/education/educators/career-and-technical-education/student-industry-certification.html</a> .
<b>Dual Credit or Dual Enrollment Opportunities:</b>	There are no statewide dual credit/dual enrollment opportunities for this course. If interested in establishing local opportunities, reach out to a local postsecondary institution.
<b>Teacher Endorsement(s):</b>	048, 150, 448, and 950
<b>Required Teacher Certifications/Training:</b>	None
<b>Teacher Resources:</b>	<a href="https://www.tn.gov/education/educators/career-and-technical-education/career-clusters/cte-cluster-agriculture-food-natural-resources.html">https://www.tn.gov/education/educators/career-and-technical-education/career-clusters/cte-cluster-agriculture-food-natural-resources.html</a>  Best for All Central <a href="https://bestforall.tnedu.gov/">https://bestforall.tnedu.gov/</a>

## Course at a Glance

CTE courses provide students with an opportunity to develop specific academic, technical, and 21st century skills necessary to be successful in career and in life. In pursuit of ensuring every student in Tennessee achieves this level of success, we begin with rigorous course standards which feed into intentionally designed programs of study.

Students engage in industry relevant content through general education integration and experiences such as career and technical student organizations (CTSO) and work-based learning (WBL). Through these experiences, students are immersed with industry standard content and technology, solve industry-based problems, meaningfully interact with industry professionals and use/produce industry specific, informational texts.

### Using a Career and Technical Student Organization (CTSO) in Your Classroom

CTSOs are a great resource to put classroom learning into real-life experiences for your students through classroom, regional, state, and national competitions, and leadership opportunities. Below are CTSO connections for this course, note this is not an exhaustive list.

- Participate in CTSO Fall Leadership Conference to engage with peers by demonstrating logical thought processes and developing industry specific skills that involve teamwork and project management.
- Participate in FFA career and leadership events (CDE/LDE) that align with this course including Agriscience Fair, Agricultural Communications, Agricultural Issues, Agricultural Sales, Extemporaneous Speaking, Floriculture, and Prepared Public Speaking.

### Using Work-Based Learning (WBL) in Your Classroom

Sustained and coordinated activities that relate to the course content are the key to successful work-based learning. Possible activities for this course include the following. This is not an exhaustive list.

- **Standards 1.1-1.9** | Visit a local or regional processing plant and have the plant manager discuss food safety protocols and regulations.
- **Standards 2.1-2.2** | Invite a USDA inspector or local butcher to discuss the importance and process for being a USDA approved processing facility.
- **Standards 3.1-3.5** | Invite an animal geneticist to discuss the role of genomics in producing safe, high quality meat proteins.

## Course Description

*Meat Science III* is an applied course for students interested in pursuing careers in meat or food science industries. Students will study principles related to animal structural anatomy, and a broad range of skills to become butchers, meat processors or meat processor managers, in commercial or private meat processing facilities. This course will focus on the principles related to the processing and evaluation of red meat animals, meat science trends, and customer issues. Standards in this course are aligned with National Agriculture, Food, and Natural Resources Career Cluster Content Standards.

## Course Standards

### 1. Processing and Evaluation of Red Meat

- 1.1 Beef Breeds: Identify **major species and breeds of beef** utilized for red meat production. Describe and demonstrate the fabrication, processing, packaging, and quality analysis of red meats and their by-products.
- 1.2 Beef Carcass Processing: Explain **carcass preparation and fabrication procedures and identify associated equipment, safety, sanitation, and quality control procedures**. Identify wholesale and retail cuts of beef, and correlate them to major muscle groups.
- 1.3 Swine Breeds: Identify **major species and breeds of swine** utilized for red meat production. Describe and demonstrate the fabrication, processing, packaging, and quality analysis of red meats and their by-products.
- 1.4 Swine Carcass Processing: Explain **carcass preparation and fabrication procedures and identify associated equipment, safety, sanitation, and quality control procedures**. Demonstrate in a live setting or in a presentation format, the ability to identify wholesale and retail cuts of meat for swine, and correlate them to major muscle groups.
- 1.5 Sheep Breeds: Identify **major species and breeds of sheep** utilized for red meat production. Describe and demonstrate the fabrication, processing, packaging, and quality analysis of red meats and their by-products.
- 1.6 Sheep Carcass Processing: Explain **carcass preparation and fabrication procedures and identify associated equipment, safety, sanitation, and quality control procedures**. Demonstrate in a live setting or in a presentation format the ability to identify wholesale and retail cuts of meat for sheep, and correlate them to major muscle groups.
- 1.7 Venison Breeds: Identify **major species and breeds of venison** utilized for red meat production. Describe and demonstrate the fabrication, processing, packaging, and quality analysis of red meats and their by-products.

- 1.8 Venison Carcass Processing: Explain **carcass preparation and fabrication procedures and identify associated equipment, safety, sanitation, and quality control procedures**. Demonstrate in a live setting or in a presentation format the ability to identify wholesale and retail cuts of meat for venison, and correlate them to major muscle groups.
- 1.9 Further Processing: Demonstrate the ability to perform **methods of further processing fabrication for processed and value-added products** including comminuted meat products, emulsions, and cured meats. Using quantitative reasoning and appropriate units, calculate proper meat product formulations based upon required protein levels and USDA allowances for various products.

## 2. Inspection and Grading

- 2.1 USDA Guidelines: Analyze the United States Department of Agriculture (**USDA**) **inspection and grading procedures** and explain their purpose in the food industry.
- 2.2 Quality and Yield Grading: Describe the principles of **quality and yield grading**. Demonstrate the ability to perform the evaluation and grading of carcasses, wholesale cuts, and retail cuts to determine maturity, final quality grade, and final yield grade, and provide written and oral justification for evaluation conclusions.

## 3. Meat Science Trends and Consumer Issues

- 3.1 Cultural and Ethical Issues: Review company product recall notices to explore **consumer satisfaction** issues. Analyze the impact of **organic, natural, ethnic, religious-based, and other specialized processing methods** in the food industry. Compare and contrast the advantages and disadvantages of value added and specialty products, and summarize consumer interest and trends related to these products.
- 3.2 Product Development: Evaluate the use of **food batch procedures** for the purpose of economic efficiency. Describe the application of sensory evaluation methods to test food product flavor, appearance, and texture by quantitative description and simple difference testing.
- 3.3 Quality and Safety: Identify consumer concerns related to **food quality and safety** (e.g., antibiotic use, genetically modified organisms (GMOs), pesticide use, and foodborne illnesses), and discuss the economic implications when low-quality and unsafe foods enter the market.
- 3.4 Advanced Technologies: Compare and contrast the use of **advanced technologies in food production**, such as but not limited to biotechnology, irradiation, and genetically modified organisms (GMOs), citing specific textual evidence. Summarize technology principles, process effects, and consumer concerns, referencing the extent to which reasoning and evidence presented for each supports specific claims.

3.5 Research Issues: Formulate a hypothesis regarding a current **food science issues**. Design and conduct an original experiment to prove or disprove the hypothesis. Collect the appropriate data to evaluate claims, synthesizing and communicating results within the broader context of food science.

## Standards Alignment Notes

References to other standards include:

- SAE for All: [Evolving the Essentials](#): All Agriculture students are encouraged to participate in a Supervised Agricultural Experience (SAE) program to practice and demonstrate the knowledge and skills learned in their agriculture courses.
- AFNR: [National Agriculture, Food, & Natural Resources \(AFNR\) Career Cluster Content Standards](#): Students who are engaging in activities outlined above should be able to demonstrate fluency in Standards CR, FPP, and PS at the conclusion of the course.
- P21: Partnership for 21st Century Skills [Framework for 21st Century Learning](#)
  - Note: While not all standards are specifically aligned, teachers will find the framework helpful for setting expectations for student behavior in their classroom and practicing specific career readiness skills.