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Curriculum for Foods of Animal Origin at Ellsworth Community College

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Developing a curriculum for
Foods of Animal Origin (AGS270)
For Ellsworth Community College

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Summer 2019

A creative component submitted to the graduate faculty in partial fulfillment of the requirements for
the degree of:
MASTER OF SCIENCE
Major: Agricultural Education

Program of study committee:

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Table of Contents

Chapter 1	Introduction	Page 2
	Background Information	Page 3
	Purpose & Objectives	Page 4
Chapter 2	Literature Review	Page 5
Chapter 3	Methods & Procedures	Page 6
Chapter 4	Foods of Animal Origin (ECC AGS270)	Page 8
Chapter 5	Reflection on the Project	Page 11
	Reflection on my Degree & Program	Page 12
References	Literature Review	Page 14
	Course Unit Content	Page 14

Chapter 1

Introduction

In 1998, I graduated from Iowa State University with a degree in Public Service Administration in Agriculture with an emphasis in Journalism. I worked in agricultural public relations and agricultural media sales where I shared information about or with clients. My third job in my post college career was directing the Iowa Sheep Industry Association (ISIA) for four years. In that job, I was able to work with consumers, producers, processors, regulators and legislators providing information about the sheep industry in Iowa. I recognize now all of those jobs involved informal educational programming.

The experiences with ISIA were amazing and challenging, but not functional for our family needs as we started to have children. I took a part-time job as a fundraiser for Ellsworth Community College's Department of Development and Alumni Affairs. While I had left ISIA, I had found a job where informal educational programming, through message development, audience evaluation, and delivery systems were still key processes to being successful. I was also able to stay somewhat active in production agriculture through our farm's locker beef and pork sales and four years of managing a small garden share in our community. I was also given the opportunity to work within my agricultural interests and teach as an adjunct instructor in the Agriculture department at Ellsworth.

My first course as an adjunct instructor was the Careers Seminar (AGC216). I enjoyed the classroom experience and developing content beyond the scant course materials that were on the course CD given to me by the department. My enjoyment of teaching was an absolute surprise to me. That experience motivated me to begin my Master's program in 2012. I was able to teach that course each spring term for five years, until the full-time teaching staff at Ellsworth expanded and my job with

the Foundation grew to a full-time job. I continued my Master's program and helped with the Computer Applications course as a TA, where I got to see a really well developed and implemented online course from the instructor side.

Background Information

In the Spring of 2018, the ECC Agriculture department again needed an adjunct instructor to offer the Foods of Animal Origin (AGS270) course that transfers to Iowa State University as ANS 270 and 270Lab. It had been longer than two years since it had been offered to students as an elective course because of required courses taking over the professional instructors' teaching load and not having a regular adjunct available or interested in teaching the course. The department approached me to teach the course because of my background with a commodity livestock organization, my willingness to teach, and my continued work in agriculture through our farming family's activities. I also had enough graduate credits to provide the educator credentials that were consistent with Iowa Department of Education and the North Central Region Higher Learning Commission accreditation standards for Community Colleges.

About a month before the class began, I was handed a binder with presentations and materials that dated back to 2003, and up to 2011. There were no labs, assignments or scoring rubrics to use. There were also no Agriculture, Food, Natural Resource Career Cluster Standards being identified as covered by the course. Career Cluster Standards can be helpful for students wanting to take college courses for dual enrollment that may need to advocate for their educational experience to high school ag instructors, guidance counselors and school administration that the course is able to advance their educational experience beyond programming currently available at the high school. Having AFNR standards clearly articulated provide proof that sound programming and learning opportunities not available at the high school through the program's offered courses are available through dual enrollment courses.

I was also concerned the potentially outdated content provided in the binder did not give students adequate content or experiences to successfully transfer to Iowa State University or be prepared to meaningfully consider careers in animal agriculture or food production systems. Ellsworth transfer courses have the opportunity to provide engaged students to be prepared to enter the subsequent Meat Science courses successfully. The course needed to be compared to what Iowa State University is currently teaching students, especially in the hands-on labs.

Purpose

This creative component was designed to serve as a guideline for instructing students enrolled in AGS270 (3cr.) at Ellsworth Community College. This is a condensed course of 11 weeks meeting every other spring term. The class is set up for two class meetings each week of. A field trip day of up to 4 hours, provides 48 contact hours for the students.

The focus for this curriculum project is to provide experiential learning opportunities to students with the goal of making them more aware of production, processing and consumption of foods originating from animal sources. The content has been compared to ISU's ANS 270L. This course also hopes to expose students to how animal-based foods fit in local, national and global food security and consumption patterns. This course is designed to encourage students to consider careers in meat and food science and to be better informed consumers and advocates of animal based food products in sustainable food production systems.

Objectives

The following objectives were addressed by this creative component:

1. Serve as the instructor manual for AGS270 at Ellsworth Community College.
2. Review content of AGS270 and Iowa State's ANS270L

3. Introduce students to concepts of:
 - a. HACCP
 - b. Food Safety from the farm gate to consumer plate
 - c. Live & Carcass Evaluation Concepts
 - d. Meat processing from carcass to consumer ready cuts for pork, beef and sheep
 - e. Dairy and Egg food processing and quality assessment
 - f. Basic food preparation methods for foods of animal origins (including dairy, eggs, pork, beef and poultry)
 - g. Awareness of careers in industries related to production, processing, sales and consumption of foods of animal origin.

Chapter 2

Literature Review

Food production is impacted by cultural, economic and legal frameworks that largely go unnoticed and unrecognized in America and Europe because of melting pot practices of culturally appropriating food based on taste preferences, social acceptance, abundance in product availability that meet the majority of consumers interest to purchase and relative low cost of food (Feunekes GIJ, et al., 1998). Globally, foods coming from animal sources have the potential for social, safety, religious, ethic, ethnic and financial barriers to consumption (Kearney, et al, 2000 & Bellisle, 2006). Animal based foods are also large competitors for plant produced and land-based resources to feed the global population that continues to grow. These issues lead to the need for skilled and educated food producers and processors to be mindful producers and consumers of natural resources.

Napoleon, Freedman, Seetharaman and Sharma (2006) identified four themes and skill clusters that food industry employers indicate as beneficial knowledge base and skill sets for their employees. These include: safety training, knowledge of food and production systems, learning and applying math skills and professional conduct. The challenge of approaching these themes, skill clusters and appropriate career content standards in a meaningful way can be difficult to measure, but can impact students and future production of livestock and consumer ready products in profound ways.

Schunk says that learning can be recognized by an awareness of information, accumulation of technical skill, a change in perception, a change in the action of the individual and his/her behavior that endures over time or becomes the basis of additional growth. Those characteristics of learning are also performance points of experiential learning which directly impact the ability to absorb, internalize and practice new skills from a novice to a more experienced participant. Experiential learning provided by lab work, consumption of and product development focuses on interactions with the academic and physical experience content, comparing those interactions with experiences the student may already have and then implementing those comparisons (Roberts, G. 2006 and Lee. 2015) to make the content valuable and applicable.

Chapter 3

Methods & Procedures

To begin this project I had to carefully look at the contents of the resource binder from the previous instructors and offered courses, the lab manual from the ISU ANS270 and the AFNR Career Cluster Content Standards. Lab space, available equipment, student enrollment caps and budgets all had to be evaluated as well.

Dr. Sherrlyn Olsen graciously visited with me about what she feels are key skills for students in her labs to be proficient in. After visiting with her, adjustments were made to content with

consideration to Iowa State University course content. Practical issues of lack of carcass hanging space and limited cooler and freezer space, were also taken into account as the course was developed. My student base has no academic achievement requirement to be allowed to enroll (unlike ISU's GPA, ACT and class rank admission policies) and over 75% of Ellsworth students qualify for PELL and other Federal Student Financial Aid programs targeted at low income and first generation students. I tried to provide guided learning opportunities that addressed the four themes and skill clusters needed by industry employers. Because of the cultural and socioeconomic perspectives on food coming from animal sources, I have tried to anticipate how to grade students who cannot/have not ever consumed products that we may be working with in lab. This evaluation of content and student populations in this classroom addressed Objective 2 of this project.

I began to divide content into units. In each unit, I pulled content into PowerPoints that introduced the knowledge base to build rational and physical skills from. The content in the animal units focus on:

- What meat, milk and eggs are physiologically
- Where those products are produced, processed and consumed.
- How does who is eating those products impact quality
- What is involved in getting products to the consumer (breaking, processing, and preparation for sale or consumption and basic laws and regulations that govern those steps)
- How to determine value and how does processing impact consumer cost and processor break evens.
- How are value and quality determined by USDA
- Food safety from farm to plate
- Retail cut identification and links to carcass structures

After knowledge base presentations were developed, I focused on developing lab activities and appropriate note and data collection instruments, reflection questions, and evaluation rubrics for each unit. Labs were practiced to gauge time needed to set up, model, execute and evaluate. Reflection questions were developed to encourage individual reflection and potential group discussion that highlighted industry themes and skill clusters that could be gleaned from the knowledge base presentations and how those themes and skill clusters presented themselves in the lab environment.

I worked with department leadership to acquire adequate lab equipment (white board, stainless steel tables, adequate knives and breaking tools, a stove, chest freezer, adequate scales and consumables in addition to a refrigerator) and develop a list of facility improvements to build additional opportunities for students in the course and with interests in food science.

Since this class will have an online component for students to submit their work and receive feedback, access content information, articles and course information, I have reviewed the Quality Matters "Specific Review Standards from the QM Higher Education Rubric, Sixth Edition" to ensure I was designing and provide students with an engaged and responsive online component to the lecture and lab work. Reviewing the QM evaluation matrix and the Blackboard portal provided by the college has allowed me to recognize this course will need additional changes and interactive processes (group chat topics and schedules clearly articulated and supplemental instruction materials and handouts to translate online content effectively to the students) to further improve the learning environment.

Chapter 4

Foods of Animal Origin (Ellsworth Community College AGS270)

This course has nine units that include informational content and exposure to concepts and information sources through PowerPoint presentations, lab activities that include instructional outlines, and student data gathering and reflection devices. Lab evaluation rubrics are also included for

assignments and lab activities. I have collected industry standard visuals and handouts that come from governmental regulation organizations, certification organizations, commodity and checkoff groups as well as research and extension publications to show how valid information is shared with the public and industry.

Unit 1 – Food Safety: This unit includes a PowerPoint covering procedural differences between cleaning and disinfection, role of HACCP in food safety and animal food production and contamination sources. The lab focuses on understanding contamination sources, how to minimize risk, understanding the process of developing a standard operating procedure, and implementing that procedure.

Unit 2 – Dairy Foods - Fluid and Processed Dairy: The dairy industry in Iowa is becoming a specialty production scenario with fewer dairy herds in the state each year. Few students come to class with any experience with dairy cattle but almost all consume the products from the industry. The module provides information about: the physiology of the dairy cow and how it differs from beef cow; what milk is comprised of and how the composition of milk impacts use; and consumption and value. Lab work allows students to understand defect judging of fluid milk and understanding how fluid milk can become a wide variety of cheeses and other consumable products. Consumer sensory panels are introduced to the students so they understand the process of product development, flavor profiling and marketability of processed dairy products.

Unit 3 – Slaughter & Yield: This unit strives to teach students about the regulatory side of slaughter as well as the common processes of killing livestock animals to be used for human food. Students are exposed to the concepts and progression from live animal to full carcass and the breakage into primal, sub primal and retail cuts. The lab takes students through a grapefruit slaughter that is intended to show students how cutting loss occurs as well as the math of carcass yields. This provides knife, math and breaking skills to students.

Unit 4 – Eggs: The physiology of production and product as well as the concept of quality assessments and grades assigned to eggs, help students to understand how eggs are evaluated for use, price and consumption. Students will explore vocational skills of candling and grading sets of grocery store and home raised eggs. Cooking skills and various preparations of eggs as consumable food happen in the lab.

Unit 5 – Poultry: The unit provides context for differences between poultry and other meat sources in invested time and resources, slaughter and breaking. This is the one complete carcass that students will have the ability to break and consume in lab. The chicken carcass is where muscles of movement and support are discovered and the understanding of structure impacting the quality of consumer product.

Unit 6 – Lamb: Due to cost, this unit focuses of awareness of lamb as a novelty meat and the industry's niche role and pressure from imported products. Live animal evaluation is covered.

Unit 7 – Beef: This unit covers carcass breaking and grading of carcasses. Content focuses on developing an understanding of the structure, arrangement and action of muscles and bone structure of the beef carcass as well as learning about cooking temperatures, palatability and shear testing of meats to determine quality and uses.

Unit 8 – Pork: This unit provides students the ability to take loin eye measurements from the loin and break Primal cuts of the loin, shoulder and side belly and work on further processing into roasts, ground product and treatments (brines, marinades and smoking). Students are able to see that how they handle the product impacts produced product.

Unit 9 – Field trip: The field trip is designed to take lab experiences and see how they can be applied in production, entrepreneurial and consumer marketing environments. Taking students to state and federally inspected custom slaughter plants allow them to see procedural and structural differences. The local meat counter tour shows how meat is marketed to consumers and what safety measures are in place at the point of sale and retail value of meat products. Providing exposure to a milking dairy farm

that is involved in processing and consumer sales allows students to see how farm production directly impacts product development and how risk can impact profit.

Chapter 5

Reflection On the Project

The project is ready to implement in the classroom. As I worked through labs and discovered mistakes and flaws in how I designed class time, I appreciated the opportunity to be thoughtful about content, sources, delivery, evaluations and desired outcomes for students in the class without looking like a complete idiot in front of the students. Many of the labs, made me so excited to teach the content with students, just so I could get my hands messy and watch students learn and experience just a little bit of the meat industry's potential.

That excitement and desire to be elbow deep in animal carcasses and ground meat, really reinforced how much I gravitate toward experiential learning as an instructor and that my own preferred learning style really impacts how I organize content and approach teaching others. By trying out the labs on my family, I also realized that not every student is comfortable or appreciates being thrown into skills or new environments. I was able to adjust how skills were presented to include situated and exploratory learning and some of the assignments allow for discovery based and rote learning to make the content more approachable to all types of learning styles.

By considering the QM matrix, I realize I still have work to do on the online course portal and clarification of the syllabus. I would like to add a follow up worksheets/quizzes to serve as additional practice for the math portions of carcass yield percentages, how to figure product breakeven and percent markup for product sales. I will take time to develop those further while I'm teaching the content, if I see students are struggling with those skills.

I wish that I had the opportunity to take the ISU version of Foods of Animal Origin to compare what I've accumulated into this course and what they are teaching on their campus. I really believe that animal physiology would be an ideal class to teach alongside this course if it were designed to cover concurrent skeletal and muscular structures.

My Degree

There is a lot to evaluate in achieving the completion of this project and ultimately my degree. I am not the same person who stepped in front of the first class of students as a community college adjunct or who started this process under academic probation seven years ago. I have had to change my degree goal (from getting a high school license or teaching at the community college level to just completing a Master's degree) because I could not quit my job to student teach.

I discovered an interest in qualitative and quantitative research that as a struggling undergraduate in Stat101, I never would have explored. I feel like a better and more discerning consumer of information because of the exercises and content I was exposed to. I also am better equipped to point out flaws in research and dissect research presented to substantiate news and public policy development.

My world view of how people succeed and recognizing systemic bias was turned on its head in CI506 (taught by Dr. Daniel Spikes). I was exceptionally uncomfortable talking about race, gender and socioeconomic issues. I can now see and identify how systems of privilege impact participant success. I hope that I am able to parent my children to be more tolerant, inclusive problem solvers who help others achieve their goals or are a part of changing how systems operate when they provide barriers to others. I was fortunate to have a supportive spouse, understanding employer and a wide resource net to help when the online videos were too robust for my available internet bandwidth at our acreage. When content posting for the unit's work on Thursdays and Mondays for Wednesday due dates didn't

give a weekend to do the work, I was fortunate to have vacation or late nights at the office computer available to me. Other students may not have access to those resources or support to get the work done. I am aware that I benefitted from my privileges. Before Dr. Spike's class, I wouldn't have recognized the privileges afforded to me, I might have thought other students just didn't work hard enough.

Special Ed 501 was a course that I think all managers should be required to take. Understanding that every individual is an exceptional learner, better prepared me to screen applicants and provided better training and retraining to employees I manage. I also had the uncomfortable realization that I have work habits, learning processes and coping mechanisms that would clearly identify me as a dyslexic to someone who knew what they were working with. By realizing that, I gained a better understanding of how labels can impact students and personal identity and that every student has unique skills and attributes that can lead to success.

I wish that CI505 had included more content on building hybrid and supportive learning environments as well as how to evaluate student and teacher technology. CI505 also taught me that being an adjunct isn't an excuse for lax instruction or cookie cutter content. I had hoped to gain video production experience from at least one of my class assignments. I was also disappointed that I didn't get to take the course that covered assessments. Because I didn't develop those skills through my course work, video production skill development and studying assessment design have become my post graduate school goals.

Even if I don't teach as a next career, I have gained knowledge and enjoyed opportunities to stretch and learn as a person. I hope these opportunities and knowledge developing experiences have made me a better spouse, parent, supervisor, citizen and teacher when the opportunity is available.

References

Literature Review

Kearney M, et al. (2000). Sociodemographic determinants of perceived influences on food choice in a nationally representative sample of Irish adults. *Public Health Nutrition* 3(2):219-226.

De Irala-Estevez J, et al. (2000). A systematic review of socioeconomic differences in food habits in Europe: consumption of fruit and vegetables. *European Journal of Clinical Nutrition* 54:706-714.

Feunekes GIJ, et al. (1998). Food choice and fat intake of adolescents and adults: associations of intakes within social networks. *Preventive Medicine* 27:645-656.

Bellisle, F. (June 6, 2006). The Factors that Influence Our Food Choices.

<https://www.eufic.org/en/healthy-living/article/the-determinants-of-food-choice>

Napoleon, L. , Freedman, D. , Seetharaman, K. and Sharma, P. (2006), An Educational Needs Assessment of Pennsylvania Workforce: Opportunities to Redefine Secondary Career and Technical Education to Meet Food Industry Needs. *Journal of Food Science Education*, 5: 19-23. doi:[10.1111/j.1541-4329.2006.tb00077.x](https://doi.org/10.1111/j.1541-4329.2006.tb00077.x)

Roberts, T. Grady. (2006). A Philosophical Examination of Experiential Learning theory for Agricultural Educators. *Journal of Agricultural Education* Vol 47 no 1, Pgs 17-29

Lee, Yee Ming. (2015). Project-Based Learning Involving Sensory Panelists Improves Student Learning Outcomes. *Journal of Food Science Education*. Vol 14, Issue 2, pgs 60-65

AGS270 Course Unit Content

Course Pre-Evaluation Survey: Created by Kaitlyn Bartling

Unit 1 Food Safety

- ✓ Power point: Slides 1-10 original work by Kaitlyn Bartling from sources cited in the document, Slides 11- 57 "Sanitation & Safety Procedures in Food Production," CEV – Food Safety & Sanitation Methods
- ✓ Hand Washing & Black Light Lab: Created by Kaitlyn Bartling
- ✓ SafeServe Hand Washing Poster: National Restaurant Association Solutions™
- ✓ Food Worker Handwashing & Food Preparation Poster: Centers for Disease Control
- ✓ 12 Most Unwanted Bacteria: Team Project, www.teachengineering.org
- ✓ Rubrics for 12 Most Unwanted Bacteria team project and Hand Washing & Black Light Lab: created by Kaitlyn Bartling

Unit 2 Dairy Foods

- ✓ Power Point: Created by Kaitlyn Bartling (sources cited)
- ✓ Modern Marvels Milk Student Notes: Adapted from Mollie Goldman's 10/17/2017 post in Ag Education Discussion Lab on Facebook shared files

- ✓ Modern Marvels Cheese Student Notes: Used through Creative Commons License questions created by [Movie Worksheet by Carmen](#) Worksheets are for classroom use under a [Creative Commons License](#). <https://moviesheets.com/site/save-as.php?uid=1050>
- ✓ Ice Cream Sensory Panel & Grading Rubric: Created by Kaitlyn Bartling
- ✓ Dairy Defect Judging Lab & Grading Rubric: Created by Kaitlyn Bartling, utilizing National FFA Dairy Judging score card
- ✓ Cheese Identification Lab & Grading Rubric: Created by Kaitlyn Bartling
- ✓ Mozzarella Cheese lab: From “30 Minutes Mozzarella Cheese” recipe from Ricki Carrol’s book “Home Cheese Making”. <http://www.cheesemaking.com/howtomakemozzarellacheese.html>
- ✓ Cheese Resource List : Adapted From: <https://www.realcaliforniamilk.com/cheese-types>
- ✓ Dairy Vocab List: Dairy Dictionary at Dairy Farming Today
- ✓ Let’s Make Cottage Cheese: Kansas Foundation for Agriculture in the Classroom, www.ksagclassroom.org
- ✓ Milk Flavor Defects: *Dairy Day 1993 pgs 57-60*, RAW MILK QUALITY - MILK FLAVOR by H.A. Roberts

Unit 3 Slaughter & Yield

- ✓ Livestock Harvest & Slaughter Powerpoint: Adapted from CEV70544 Harvesting of LivestockAMSA with additional resources cited
- ✓ Evaluation and Yield Powerpoint: Adapted from: “From the ground up...The basics of livestock judging Powerpoint by Jeff Thayne, Iowa State University Livestock Judging.” <http://duval.agrilife.org/files/2011/07/livestock-judging-jeff-thayne.pdf> With information added from “Did the Locker Steal some of my Meat” SDSU Meats and “The Butcher Stole my Meat” Penn State Dairy & Animal Science
- ✓ Carcass Value & Knife Skill Lab: Created by Kaitlyn Bartling
- ✓ Legislation Round Up Assignment: Created by Kaitlyn Bartling
- ✓ Meat Counter Value Assignment: Created by Kaitlyn Bartling
- ✓ Did the Locker Plant Steal Some of My Meat?: From <http://ars.sdstate.edu/MeatSci/May99-1.htm>, by Duane M. Wulf, Ph.D. Department of Animal and Range Sciences, South Dakota State University
- ✓ The Butcher Stole My Meat: Dr. Christopher R. Raines, Assistant Professor, Department of Dairy & Animal Science, The Pennsylvania State University

Unit 4 – Eggs

- ✓ Eggs Powerpoint: Created by Kaitlyn Bartling
- ✓ Egg Lab: adapted from <https://communities.naae.org/docs/DOC-2437>, Sarah Heideman, post author

Unit 5 – Poultry

- ✓ Poultry Processing Power Point: Created by Kaitlyn Bartling
- ✓ Chicken breaking Lab: Created by Kaitlyn Bartling
- ✓ Chicken Lab Breaking Sheet: Created by Kaitlyn Bartling
- ✓ Cutting_and_boning Chicken: National Chicken Council

Unit 6 – Lamb

- ✓ Lamb Primal Cuts: adapted from
<http://www.iss.k12.nc.us/cms/lib4/NC01000579/Centricity/Domain/5517/Retail%20Cuts.pptx>

Unit 7 – Beef

- ✓ Beef Primal Cuts: adapted from
<http://www.iss.k12.nc.us/cms/lib4/NC01000579/Centricity/Domain/5517/Retail%20Cuts.pptx>
- ✓ Ground Beef & Steak Lab & grading Rubric: Created by Kaitlyn Bartling
- ✓ USDA Grading Module and Simulation: Beef Checkoff
- ✓ NCBA Grading Learning Module: National Cattlemen Beef Association, Checkoff
- ✓ Beef Student Handout: National Cattlemen Beef Association, Checkoff
- ✓ AMS USDA CarcassBeefStandard: USDA.gov
- ✓ AMSA-grassfed: Jude L. Capper, PhD, *AMSA Webinar, March 22nd 2016*
- ✓ Heat and Its Effects on Muscle Fibers in Meat: blog.thermoworks.com/beef/coming-heat-effects-muscle-fibers-meat/
- ✓ The History of Instrument Assessment: Prepared for the National Cattlemen's Beef Association by Dale R. Woerner, Keith E. Belk Department of Animal Sciences, Colorado State University

Unit 8 – Pork

- ✓ Pork Primal Cuts and Carcass Info: adapted from
<http://www.iss.k12.nc.us/cms/lib4/NC01000579/Centricity/Domain/5517/Retail%20Cuts.pptx>
- ✓ Pork Shoulder and Boston Butt Breaking Lab: Created by Kaitlyn Bartling
- ✓ Loin Breaking Lab: Created by Kaitlyn Bartling
- ✓ AMS USDA Pork Standard: USDA.gov
- ✓ Pork Carcass Evaluation and Procedures: Oklahoma Cooperative Extension Service, ANSI-3725
- ✓ Sausage Formulations Spreadsheet: SmuckersMeats.com
- ✓ The Art & Practice of Sausage Making: NDSU Extension Service FN176(revised)

Unit 9 – Field Trip

- ✓ Itinerary: Created by Kaitlyn Bartling
- ✓ Location Checklist: Created by Kaitlyn Bartling

Final

- ✓ Product fabrication challenge: Created by Kaitlyn Bartling
- ✓ 8 Retail Cuts Identification Test: Created by Kaitlyn Bartling