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## Food Science Unit for Combined Agricultural Leadership and Introduction to Foods Class

Elizabeth Naviaux

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**Food Science Unit for Combined Agricultural Leadership and Introduction to Foods Class**

by

**Elizabeth Naviaux**

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:

Dr. Scott Smalley, Major Professor

Dr. Mark Hainline, Committee Member

Dr. Jeanne Dyches-Bissonnette, Committee Member

Iowa State University

Ames, IA

2019

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## **Chapter 1**

### 1.1 Introduction

As classrooms become more student-driven, it is important for schools to provide numerous electives that allow students to explore and develop both personal and career-related interests in an academic setting. Middle school and high school agricultural and family consumer science classes are two important subject areas that meet those needs. The classes are electives students can take which provide hands-on experiences and prepare students for careers in their perspective areas as well as other career fields. The Smith-Hughes Act of 1917 created the foundation for career and technical education (CTE) programs found in schools today. “The Smith-Hughes Act funded and promoted vocational education programs to train for occupations available directly after high school” (“Celebrate the Future of CTE,” n.d.). Since then, career and technical education classes in school have grown to “address the academic, technical, and employability skills that students need in today’s workplace and civic society” (“Celebrate the Future of CTE”, n.d.). Agriculture, family and consumer sciences, health sciences, industrial technology, and business education are examples of categories that fall under career and technical education. Two categories of CTE taught at Clay Central-Everyly High School in Everyly, Iowa, include agricultural education and family consumer science. Clay Central-Everyly High School has 76 students in grades 9-12. According to the 2018-2019 certified enrollment by district spreadsheet found on the Iowa Department of Education website, as of January 2019 the Clay Central-Everyly Community School District serves 204 kids district wide. The low enrollment means teachers teach only one period of each class and some teachers teach a variety of subject areas. This can create scheduling conflicts for students.

For the 2019 spring semester, three students were concurrently enrolled in agricultural leadership and introduction to foods during the same class period. It was decided the students would attend introduction to foods class four days a week and agricultural leadership one day a week, and agricultural leadership would be like an independent study. However, this agreement was subject to change according to the teachers' lesson plans. To assist the students concurrently enrolled, it was determined the agricultural education and the family consumer science teacher would co-teach one unit and combine the two classes for a two-week period. This created an opportunity for all agricultural leadership students to learn about basic food science as well as host a Chopped cooking competition for the introduction to foods students. The teachers that taught this unit at Clay Central-Everly were Liz Naviaux, the half agriculture and half Spanish teacher, referenced as the agriculture teacher, and Betsy Schoelerman, the half family consumer science and half agriculture teacher, referenced as the family consumer science teacher.

### 1.2 Purpose and Objectives

The purpose of this project was to develop a two-week unit for a combined agricultural leadership and introduction to foods course. The following objectives were developed to provide direction to the project:

1. Create a two-week unit for a combined agricultural leadership and introduction to foods course.
2. Utilize food science curriculum as the basis for student instruction.
3. Provide at least three kitchen lab experiences for students.

### 1.3 Need

Schools with low enrollment may have instructors teaching different subject areas or only one period of a subject which creates schedule conflicts for students. Although there are a few exceptions to this rule, a student must be enrolled in at least one semester of an agricultural course each year in order to be an FFA member. This can create an issue when a student wants to be in FFA but cannot fit an agriculture course into their schedule and independent study is not available. One option is for students to enroll in two classes during the same class period if the school and teachers allow. When students are enrolled in two classes at the same time, one suggestion for the two teachers would be to combine the two classes for a unit.

## Chapter 2

### 2.1 Literature Review

According to the United States Census Bureau (2018), the United States population will be about 404 million people in the year 2060. The United Nations is predicting by the year 2050 the world population will be 9.8 billion people (Graham, 2017). The rising population increases the need for greater food production and more skilled workers. By the year 2050, agriculture production must increase by about 60-70 percent to meet the needs of food demand (Silva, 2018). As the need for workers continues to increase, the amount of agriculture job openings increases. “According to the USDA, there are nearly 60,000 high skilled agriculture job openings expected annually in the United States with only 35,000 graduates to fill them” (“Job Outlook Bright for Ag Students,” n.d)

Jobs in agriculture are categorized by career clusters. The agriculture career clusters are agribusiness, animals, environmental services, food products and processing, natural resources, plants, and power, structural, and technical systems (“Agriculture, Food, and Natural Resources,” n.d.). This unit provides the agricultural leadership students the opportunity to explore the food products and processing career cluster.

Career and technical education classes provide opportunities for students to learn soft skills needed for any career. “Soft skills are the personal attributes you need to succeed in the workplace. Hard skills are directly relevant to the job you are applying for” (Doyle, 2019). Some broad categories of soft skills included in CTE classes are communication, critical thinking, leadership, teamwork, and a strong work ethic. Regardless if students are going to pursue a career in a CTE related field, students can apply skills learned in CTE classes to their future careers. CTE classes help prepare students for their future; whether their plans are to go directly

into the workforce or to further their education. According to Brian Jacob (2017), a professor at the University of Michigan,

CTE can provide hands-on training that translates directly to attractive careers upon graduation. Work-related or internship-like experiences that are often a part of CTE can teach students the “soft skills” necessary in the labor market. Finally, by integrating into a “real world” context, advocates claim that CTE can motivate students to attend school more frequently and be more engaged.

With the increasing population and need for food production, and decreasing number of filled agriculture jobs, high school students are encouraged to take agriculture and other CTE classes to be prepared for an agriculture career if that is the path they choose to follow.

When career and technical education teachers lesson plan, they are often thoughtful to include soft skills within the lesson plans. First, many CTE classes include lab activities, and the lab activities may be completed in groups. Beyond teamwork, group activities provide the opportunity for students to “develop stronger communication skills, develop their own voice and share perspectives, delegate roles and responsibilities, and give and receive feedback on performance” (Carnegie Mellon University, n.d.). Second, communication is included within CTE classes through different activities such as presentations in front of the class, small group conversations, partner discussions, and other daily activities. Third, real life topics included in lessons create opportunities for students to develop their problem-solving skills. For example, in this unit students will be given three ingredients they have to use in a recipe. An example of how this could relate to their own life that was given in class would be if they were at home during a blizzard and were hungry and had to cook with the food found within their home.

## Chapter 3

### 3.1 Methods and Procedures

The planning process started with evaluating what units were already planned for the spring semester of introduction to foods. The class is a full year class that has been taught at Clay Central-Everyly for many years. The agricultural leadership class was a new class offered during the spring of 2019. After evaluating what units were already planned, it was then narrowed down to a unit that would last a couple weeks, so the two classes would still have time to complete their own content and standards. The teachers decided on a food science unit about dairy foods and eggs as it is valuable information for any consumer.

The textbook *Food for Today* by Kowtaluk and Kopan, 2000, was used as a guide for instructional notes. The curriculum was designed to include notes and lab activities. Some days the students have different tasks based on if they are enrolled in agricultural leadership or introduction to foods. The students enrolled in both classes are counted as introduction to foods students. After the curriculum was developed, the curriculum was shared with a few individuals to provide feedback. First, a high school agriculture teacher and a high school family consumer science teacher from the same school in Minnesota provided feedback.

The feedback from Kelsey Mckim, the family consumer science teacher, included adding photos to the note slides and adding clipart pictures to the lab sheets. Then, pictures and clip art were added to some of the note slides and lab sheets. The feedback from Rachel Moe, the agriculture teacher, included clarifying how the teacher will assess the students are understanding the notes. It was then added into the lesson plans for the teacher to ask questions as the teacher presents notes to the students. She also suggested adding a column to the cheese

lab note sheet for students to write in their type of cheese guess instead of students just writing it on the side. The column was then added to the lab sheet.

Then, Kim Harken, the Clay Central-Everly curriculum director, reviewed the curriculum and provided feedback. She suggested creating a rubric for the assignment where students create a small poster about parts of an egg. A rubric was then created. She also provided suggestions on how to improve some of the objectives. The objectives were then updated.

The first week of the curriculum is designed to provide background knowledge for all students. Students from both classes need the same background information on dairy foods and eggs to help them prepare for the Chopped challenge in week two. Although the first week of the curriculum is more closely related to family consumer science, the agricultural leadership students need the same background information on dairy foods and eggs in order to decide what ingredients they will choose for the Chopped challenge. By completing the first week of the curriculum, students in both introduction to foods and agricultural leadership will have a basic understanding about choosing dairy foods, preparing dairy foods, the structure of an egg, and using eggs in recipes.

## **Chapter 4**

### 4.1 Product

The curriculum includes a block plan, detailed lesson plans, and any necessary supporting documents including notes and lab sheets. The lesson plans were written so another teacher or school could replicate this unit.

The documents are included below.

Classes: Ag Leadership/ Intro to Foods	<b>Monday Day 1</b>	<b>Tuesday Day 2</b>	<b>Wednesday Day 3</b>	<b>Thursday Day 4</b>	<b>Friday Day 5</b>
Standards (See lesson plans for full standard)	Ag: FPP.03 FCS: Food Production and Services: 8.5	Ag: FPP.03 FCS: Food Production and Services: 8.5	Ag: FPP.03 FCS: Food Production and Services: 8.5	Ag: FPP.03 FCS: Food Production and Services: 8.5	Ag: FPP.03 FCS: Food Production and Services: 8.5
Objective	Students will describe the benefits of having dairy foods in their diet.	Students will identify different types of cheese.	Students will investigate why there is extra cheese in storage.	Students will create an egg poster.	Students will analyze egg recipes.
Bell Ringer	Write down a list of 6 dairy foods. What one is your favorite? Least favorite?	How could you add more dairy foods to your diet? (3 examples)	With a partner, find a recipe that uses cheese in a non-traditional way	If you eat eggs, how do you like them cooked?	Draw an egg and label the albumen, yolk, and chalazae
General Class Outline	<p>Discuss Bell Ringer. Who has the longest list? Common favorite and least favorite foods?</p> <p>Notes over 18.1 Dairy Foods- Choosing dairy foods. Topics include: milk basics, types of milk, other dairy foods. Teacher presents notes. Students take notes in notebook.</p> <p>2 Reinforcement questions (Think, pair, share)</p> <p>18.1/18.2 Notes <a href="https://docs.google.com/presentation/d/1ZwmTdPcDTMsqBAW1IEWKDsJYIcZF19INuBpAqOIJw5l/edit?usp=sharing">https://docs.google.com/presentation/d/1ZwmTdPcDTMsqBAW1IEWKDsJYIcZF19INuBpAqOIJw5l/edit?usp=sharing</a></p>	<p>Cheese lab -Students try cheese labeled (A-E) -Use lab sheet to describe color, smell, texture, taste, try to guess the type of cheese -After completion of lab teacher shares the type of cheese <a href="https://docs.google.com/document/d/14!0fYrj9LRAPXUoQ11QvO2kXX81G0H3mzcosqISrGY/edit?usp=sharing">https://docs.google.com/document/d/14!0fYrj9LRAPXUoQ11QvO2kXX81G0H3mzcosqISrGY/edit?usp=sharing</a></p> <p>Notes over 18.2 Preparing Dairy Foods Teacher presents notes, students take notes in notebook.</p> <p>2 Reinforcement questions (think, pair, share)</p>	<p>Share/Discuss recipes with the class Ever tried any before? Knew you could use cheese in a recipe like that?</p> <p>Read and discuss the Newsela article about cheese and current agricultural events <a href="https://newsela.com/read/american-cheese-surplus/id/48679/">https://newsela.com/read/american-cheese-surplus/id/48679/</a></p> <p>Assign: 18.1/18.2 Study Guide</p>	<p>Notes over 18.3 Egg Basics 18.3 Notes Link <a href="https://docs.google.com/presentation/d/1KcuK4HJpiXaE4I7-uAtESD3B4pfLzso5ChpoHBlBxos/edit?usp=sharing">https://docs.google.com/presentation/d/1KcuK4HJpiXaE4I7-uAtESD3B4pfLzso5ChpoHBlBxos/edit?usp=sharing</a></p> <p>Students create a poster. Draw/label/describe parts of an egg.</p> <p>Egg rubric</p> <p>If time, students present their poster to a partner and explain the parts of an egg.</p>	<p>Notes 18.4 Using eggs in recipes <a href="https://docs.google.com/presentation/d/1K96xqZILhxoWUn1y3GpEtTr8tlfiaFShKs0AzsedQ/edit?usp=sharing">https://docs.google.com/presentation/d/1K96xqZILhxoWUn1y3GpEtTr8tlfiaFShKs0AzsedQ/edit?usp=sharing</a></p> <p>To prepare for the egg lab on Monday, read through the egg lab</p> <p>Exit Ticket (use sticky notes or other small piece of paper) from 18.4: Describe difference between soft and hard meringue besides "soft and hard"</p>
Assessment	Reinforcement questions	Reinforcement questions	Study Guide	Discussion	Exit Ticket

Classes: Ag Leadership/ Intro to Foods	<b>Monday Day 6</b>	<b>Tuesday Day 7</b>	<b>Wednesday Day 8</b>	<b>Thursday Day 9</b>	<b>Friday Day 10</b>
Standards (See lesson plan for full standard)	Ag: FPP.03 FCS: Food Production and Services: 8.5	Ag: FPP.03 FCS: Food Production and Services: 8.5	Ag: FPP.03 FCS: Food Production and Services: 8.5	Ag: FPP.03 FCS: Food Production and Services: 8.5	Ag: FPP.03 FCS: Food Production and Services: 8.5
Objective	Students will compare different methods of cooking eggs.	Students will create recipes for the Chopped challenge.	Students will prepare for the Chopped challenge.	Students will cook their Chopped recipes.	Students will compare two different types of hot chocolate.
Bell Ringer	None- Lab Day	What is the last thing you cooked? List 3 ingredients you used.	None- food prep day	None- Lab day	What went well with your lab yesterday? Did anything go wrong? Explain
General Class Outline	Egg Lab  <a href="https://docs.google.com/document/d/10ueKCNdGXPdmEPVxZtm6204KbsV560BatSJhbfYQoIA/edit?usp=sharing">https://docs.google.com/document/d/10ueKCNdGXPdmEPVxZtm6204KbsV560BatSJhbfYQoIA/edit?usp=sharing</a>	Ag lead kids will pick 3 ingredients that will be used for the chopped lab. 3 ingredients must be from dairy foods/egg unit now students in lead/foods have the same background knowledge.  **Students in both classes will be counted as food class students  Food students will decide on their recipes. They may look online for inspiration but may have to create their own recipe in order to include the 3 ingredients  An episode of Chopped will be playing for students to watch after they are done with their other task.	Chopped cook off prep day  Food class students will prepare food.  Ag lead students will create a judging score sheet (focusing on what priorities are when judging food as priorities was a topic covered in ag lead), review qualities of a leader and from there select a panel of judges from teachers/staff, and create a certificate to give the winning team.	Food class students will cook their recipe  Ag lead students will be the emcees and check in on the groups. At the end they will each write 2 paragraphs (about 12-15 sentences) describing how the group use their time management skills, how their teamwork was, how the group prioritized, did they procrastinate, etc. (All topics covered already in ag lead).  *panel of judges will judge after this class period	All students will start the lab. Once the lab is prepared the ag lead students will meet to write their short speech.  Ag lead students will meet to evaluate score sheets and write a short speech. They will decide on a few comments to share with each group which will lead up to them announcing what team is the winner. (Speech/communication was covered in ag lead). At the end of class, the ag lead students will give their short speech and announce the winner.  Hot chocolate lab instructions. Ties back to dairy foods. Easy and fun way to end the unit. <a href="https://docs.google.com/document/d/1eFiMNYAOiGaBsF-NGHgmfxQ79HrXZmqWi7myFUcEn_U/edit?usp=sharing">https://docs.google.com/document/d/1eFiMNYAOiGaBsF-NGHgmfxQ79HrXZmqWi7myFUcEn_U/edit?usp=sharing</a>
Assessment	Lab	Participation	Participation/Lab	Participation/Lab	Participation/Lab

### Day 1

**Unit:** Combined Agricultural Leadership/Introduction to Foods

**Standards:** Ag: FPP.03: Select and process food products for storage, distribution, and consumption.

FCS: Food Production and Services 8.5: Demonstrate professional food preparation methods and techniques for all menu categories to produce a variety of food products that meet customer needs.

**Objectives:** Students will describe the benefits of including dairy foods in their diets.

**Instructional Method:** Direct instruction

**Modification/Accommodation Ideas:** Provide a copy of the notes to students

**Materials:** PowerPoint with 18.1 Notes

Segment/Phase	Time	Teacher Task	Student Learning Task
Warm-up/Introduction	10 min	Teacher will explain that the next two weeks the ag leadership class and foods class will be combined. The teachers will co-teach this unit. Most of the class periods will start with a bell ringer written on the board. The focus of the two-week unit includes some basic food science information and teamwork through lab activities.	<p><u>Bell Ringer Question:</u> Write down a list of at least 6 dairy foods. What one is your favorite? Least favorite?</p> <p>*Students will need a notebook piece of paper to use as bell ringer sheet for the next two weeks.</p> <p>Share bell ringer answers/discuss. Who has the longest list? Common favorite and least favorite foods? Any foods that you can think of that no one has already said? What dairy foods are currently in your fridge?</p>
Input/Instruction	25 Min	<p>Teacher will go over PowerPoint notes from 18.1 from the Foods textbook. Topics include: milk basics, types of milk, and other dairy foods. Teacher will lecture the notes.</p> <p>Teacher walk around the room, observe if students are taking notes. Teacher asks questions throughout lecture to check for understanding.</p>	Students will take notes in their notebook over the PowerPoint.

Guided practice	5 min	Think pair share the following questions: -Mrs. Murray decided to add chocolate to milk as a good way to entice her 5-year-old daughter to drink milk. Do you feel this is a sensible idea? Why or why not? -Your 13-year-old cousin doesn't drink milk. How can your cousin meet dairy recommendations without drinking milk?	Students will think pair share the two questions -Think about an answer by themselves. Could write down an answer on their notes. -Share with their neighbor -Discuss answers with the entire class
Closure	0 min	Closure will be discussing the think pair share questions with the entire class	Class discussion
Assessment			Think pair share activity

Resources:

PowerPoint Notes

<https://docs.google.com/presentation/d/1ZwmTdPcDTMMsgBAW1IEwKDsJYIcZFI9INuBpAoOIJw5I/edit?usp=sharing>

18.1 Notes Document Link

<https://docs.google.com/document/d/1fLipxohJM4GSf-BHpbfdr8kTTLI5gHsq0BK4tqU55Y/edit?usp=sharing>

## Choosing Dairy Foods 18.1 Notes

### Legal definition of milk

Milk is. . .

“The lacteal secretion, practically free from colostrum, obtained by the complete milking of one or more healthy cows.”

### Nutrients in Milk

-High in protein, vitamin A, riboflavin, vitamin B12, calcium, phosphorus, magnesium, and zinc

-2-3 Servings/day of milk (or other dairy products) should be consumed

### Types of Milk

-Whole Milk

-Reduced Fat Milk

-Low Fat Milk

-Fat Free Milk

### Processing of Fluid Milk

-Pasteurization= Heating a liquid to a given temperature for a given period to kill enzymes and harmful bacteria

-Ultra Pasteurization (UHT)= Heating to a higher temperature for a shorter time to eliminate all pathogens

-Homogenization= Process where the fat in milk is broken down and evenly distributed in milk. This prevents the milk fat from separating from the rest of the milk and rising to the top.

### Other Types of Milk

-Fat free dry milk= Powdered form of fat-free milk, needs to be refrigerated once liquid is added

Evaporated milk = Canned whole or fat-free milk that contains only half the amount of water as regular milk; Used as a cream substitute in beverages

Sweetened condensed milk= Concentrated, sweetened form of milk, used to make candy and desserts

Lactose-free/Reduced-lactose milk= Available for people with lactose intolerance

## Choosing Dairy Foods 18.1 Notes Continued

### Other Dairy Foods- Yogurt

- Made by adding a harmless bacteria culture to milk
  - Streptococcus thermophilus
  - Lactobacillus delbrueckii ssp. bulgaricus
- Higher in calcium than liquid milk
- May have less fat than fluid milk
- Two major categories: Cup yogurt, drinkable yogurt
- Styles of yogurt: Fruit on the bottom, Swiss style (blended)

### Other Dairy Foods- Sour Cream

- Types: Full fat sour cream, reduced/low fat sour cream, nonfat sour cream
- Manufactured for different target markets
- Increased popularity over the past forty years

### Other Dairy Foods- Cheese

- Over 400 varieties of cheese
- Ripened (aged)
  - Made from curds to which ripening agents (bacteria, mold, yeast) are added
  - Cheese can be stored for a relatively long time
  - Texture ranges from soft to very hard (based on amount of moisture)
- Unripaened
  - Made from curds that have not been aged
  - Will only keep a few days in the refrigerator

### Other Dairy Foods- Butter

- Made from milk, cream, or a combo of the two
- High in saturated fat
- With or without salt
- Tubs or sticks

### Reinforcement Questions

Mrs. Murray decided to add chocolate to milk as a good way to entice her 5-year-old daughter to drink milk. Do you feel this is a sensible idea? Why or why not?

Your 13-year-old cousin doesn't drink milk. How can your cousin meet dairy recommendations without drinking milk?

### Day 2

**Unit:** Combined Agricultural Leadership/Introduction to Foods

**Standards:** Ag: FPP.03: Select and process food products for storage, distribution, and consumption.

FCS: Food Production and Services 8.5: Demonstrate professional food preparation methods and techniques for all menu categories to produce a variety of food products that meet customer needs.

**Objectives:** Students will identify different types of cheese.

**Instructional Method:** Lab and direct instruction

**Modification/Accommodation Ideas:** Provide a copy of the notes to students

**Materials:** PowerPoint with 18.2 Notes, Cheese lab note sheet, 5 different types of cheese pre-cut into small bites and placed onto labeled plates before class

Segment/Phase	Time	Teacher Task	Student Learning Task
Warm-up/Introduction	5 min	Write bell ringer on board before class starts  Discuss bell ringer answers as a class	<u>Bell Ringer Question:</u> How could you add more dairy foods to your diet? (at least 3 examples)
Lab	20 min	Cheese Lab Teacher needs to pre-cut 5 types of cheese into small bites and placed onto separate plates. Label each container either A,B,C,D,E. Make sure a key is made to remember which type of cheese is on each plate  After students have completed the lab, have students discuss what they wrote for A, then share what type of cheese it was really was. Continue for B-E.	Cheese Lab Instructions -Students will try each type of cheese -Use the lab sheet to describe color, smell, texture, taste, and try to guess the type of cheese  Possible discussion questions teacher could ask students: -Favorite type of cheese of the 5? Least favorite? -Have you tried these cheeses before? Heard of all the cheeses before? -Were your guesses right? Far off?
Input/Instruction	10 min	Teacher will go over a PowerPoint notes from 18.2 from the Foods textbook. Topics include: cooking with milk, using yogurt in recipes, and preparing cheese  Teacher walk around the room, observe if students are taking notes. Teacher asks questions	Students will take notes in their notebook over the PowerPoint.

		throughout lecture to check for understanding.	
Closure	5 min	Think pair share Questions: -What advice would you give to someone cooking with milk? -What advice would you give to someone cooking with cheese?	Students will think pair share the two questions -Think about an answer by themselves. Could write down an answer on their notes. -Share with their neighbor -Discuss answers with the entire class
Assessment			Lab Think pair share activity

## Resources:

## PowerPoint Notes

<https://docs.google.com/presentation/d/1ZwmTdPcDTMsqBAW1IEwKDsJYIcZFI9INuBpAoOIJw5l/edit?usp=sharing>

## Cheese Lab Sheet

<https://docs.google.com/document/d/14I0fYrj9LRApXUoQl1IQvO2kXX81G0H3mzcosqISrGY/edit?usp=sharing>

## 18.2 Notes Document

[https://docs.google.com/document/d/1USki\\_B425MVhwG79pK53FusyCrb24PEmElq2NiKg\\_kw/edit?usp=sharing](https://docs.google.com/document/d/1USki_B425MVhwG79pK53FusyCrb24PEmElq2NiKg_kw/edit?usp=sharing)

## Preparing Dairy Foods 18.2 Notes

### Focus Question

Have you ever encountered anything unusual or any problems when cooking with milk, yogurt, or cheese?

### Cooking with Milk

*Several problems can occur when cooking with milk:*

#### *Forming a skin*

*As milk cooks, protein solids clump together, forming a skin on the surface*

*The skin can make the milk bubble up or boil over*

*Cover the pan or stir regularly to keep skin from forming*

*Do not remove the skin as that removes nutrients*

#### *Scorching*

*Occurs when milk solids fall to the bottom of a pan and stick and burn*

*Use low heat and stir regularly to keep solids circulating*

*Cooking milk in a double broiler can help prevent scorching*

### Curdling

When milk curdles it has separated into curds and whey

Can occur when milk is heated with acidic foods, such as vegetables and fruits

Use low temperatures, stir, and combine milk with acidic foods gradually to prevent curdling

### Scalded Milk

Milk heated just below the boiling point

Use low heat and cook until bubbles appear around the sides of the pan

### Using Yogurt in Recipes

-A healthy substitute for sour cream, cream cheese, milk, mayonnaise

-Can be cooked, baked, or frozen

-Whey may separate from the curd in yogurt when it is stored

-Will curdle if overcooked

-Can be used as a salad dressing, dip, sauce, or dessert topping

## **Preparing Dairy Foods 18.2 Notes Continued**

### **Preparing Cheese**

- Serve unripened cheeses (cottage cheese, cream cheese) chilled
- Ripened cheese tastes best at room temperature
- When cooking cheese:
  - Heat cheese just long enough to melt it. If overcooked, it will get stringy and tough
  - To speed up cooking time, shred, grate, or cut cheese into small pieces
  - To lower the fat in recipes with cheese, choose sharp flavored varieties

### **Reinforcement Questions**

- What advice would you give to someone cooking with milk?
- What advice would you give to someone cooking with cheese?

**2019 CHEESE LAB**

<b>Cheese Sample Letter-Cheese Name</b>	<b>Color</b>	<b>Smell</b>	<b>Texture</b>	<b>Taste</b>	<b>Did you like it? Why or why not?</b>	<b>Guess the type of cheese</b>
<b>A</b>						
<b>B</b>						
<b>C</b>						
<b>D</b>						
<b>E</b>						

### Day 3

**Unit:** Combined Agricultural Leadership/Introduction to Foods

**Standards:** Ag: FPP.03: Select and process food products for storage, distribution, and consumption.

FCS: Food Production and Services 8.5: Demonstrate professional food preparation methods and techniques for all menu categories to produce a variety of food products that meet customer needs.

**Objectives:** Students will investigate why there is extra cheese in storage.

**Instructional Method:** Guided reading

**Modification/Accommodation Ideas:** See Newsela information below

**Materials:** Either print off news article for each student or every student have an electronic version

Segment/Phase	Time	Teacher Task	Student Learning Task
Warm-up/Introduction	5 min	Write bell ringer on board before class starts  Discuss bell ringer answers as a class	<u>Bell Ringer Question:</u> With a partner, find a recipe that uses cheese in a non-traditional way.
Input/Instruction	5 min	Newsela Article -Either hand out hard copy or have students access article electronically. Students/teachers can create an account for free. With this website, students can change the Lexile reading level to match their level. This article can also be translated into Spanish. The suggested level for this article for this class would be MAX.	While students read the article, have them highlight 3 sentences that stood out to them and have them write their thoughts in the margin or the annotation feature online. They should be prepared to share their thoughts.
Guided Practice	25 min	Walk around as students read the article Once students are done, read first few paragraphs, ask if students highlighted anything, students share if they did, and so on to finish article. See list of possible discussion questions.	Students read the article, highlight/write their thoughts
Closure	5 min	Handout 18.1/18.2 Study Guide, Explain assignment, due tomorrow, work time	Assignment: 18.1/18.2 Study Guide (students answer questions, use notes as reference if needed)
Assessment			Study Guide

Resources:

<https://newsela.com/read/american-cheese-surplus/id/48679/>

Study Guide

[https://docs.google.com/document/d/1\\_2eSKZCjveV7AMZ8eojQSfaAgnmVIMSoluRJEUniuYA/edit?usp=sharing](https://docs.google.com/document/d/1_2eSKZCjveV7AMZ8eojQSfaAgnmVIMSoluRJEUniuYA/edit?usp=sharing)

**Possible Discussion Questions for the Newsela article *The big cheese mountain: America's stockpile nears record high:***

-“Almost 37 pounds per person, per year” do you think you eat more than that? Less? Was this statistic surprising?

-“Growing popularity of veganism” do you know someone who is a vegan? What does it mean to be vegan?

-Have you tried almond milk or any other plant-based milk? Favorite? Least favorite?

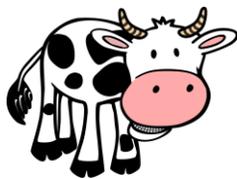
-What cheese would be found in your fridge right now?

-When you go to Subway, what cheese do you order on your sub?

-Would you be more apt to buy a breakfast sandwich from McDonald's because it now has two slices of cheese? Why or why not?

-What are some other ways we as consumers can use cheese? (could tie this question back to the bell ringer)

-What are other ways dairy farmers can offload their cheese supplies?



## 18.1/18.2 Study Guide

### 18.1

1. Name 4 nutrients found in milk.
2. What occurs when milk is homogenized? Why is this done?
3. How does yogurt compare nutritionally with milk?
4. What is the difference between ripened and unripened cheese?
5. Identify 2 ways that butter may be stored and tell how long the butter can be stored each way.

### 18.2

1. When cooking with milk, how can you keep it from scorching?
2. Explain how to scald milk.
3. How can you reduce the fat in recipes with cheese?

### Day 4

**Unit:** Combined Agricultural Leadership/Introduction to Foods

**Standards:** Ag: FPP.03: Select and process food products for storage, distribution, and consumption.

FCS: Food Production and Services 8.5: Demonstrate professional food preparation methods and techniques for all menu categories to produce a variety of food products that meet customer needs.

**Objectives:** Students will create an egg poster.

**Instructional Method:** Direct instruction

**Modification/Accommodation Ideas:** Provide a copy of the notes to students

**Materials:** PowerPoint with 18.3 notes, blank pieces of paper, markers

Segment/Phase	Time	Teacher Task	Student Learning Task
Warm-up/Introduction	5 min	Write bell ringer on board before class starts. Discuss bell ringer answers as a class.	<u>Bell Ringer Question:</u> If you eat eggs, how do you like them cooked?
Input Instruction	20 min	-Teacher will go over PowerPoint notes from 18.3 from the Foods textbook. Topics include: structure of an egg, nutrients in eggs, buying/storing/preparing eggs, and types of cooked eggs. -Teacher walk around the room, observe if students are taking notes. Teacher asks questions throughout lecture to check for understanding.	Students will take notes in their notebook over the PowerPoint.
Guided Practice	10 min	Teacher explains the assignment then walks around while students work on their mini posters	Every student will create a poster on a blank 8.5X11 piece of paper. Students will draw an egg and label parts of an egg.
Closure	5 min	Teacher explains task and walk around as students present to a partner.	Students will present their poster to a partner and explain the parts of an egg.
Assessment			Poster and sharing poster

Resources:

18.3 PowerPoint Notes

<https://docs.google.com/presentation/d/1KcuK4HJpiXaE4I7-uAtESD3B4pfLzso5ChpohBIBXos/edit?usp=sharing>

18.3 Egg Basic Notes Document

[https://docs.google.com/document/d/1raloMqGrqw\\_3pwt1loTzvBUyLvxJuVZfYixE4G\\_PvxU/edit?usp=sharing](https://docs.google.com/document/d/1raloMqGrqw_3pwt1loTzvBUyLvxJuVZfYixE4G_PvxU/edit?usp=sharing)

## 18.3 Egg Basic Notes

### Structure of an Egg

The eggshell is lined with several membranes.

A pocket of air is between these membranes. As the egg ages, the air pocket grows.

Albumen (inside the egg) - thick, clear fluid commonly known as the egg white

Yolk - round, yellow portion - floats within the albumen

Chalazae - twisted, cordlike strands of albumen

### Nutrients in Eggs

-Protein, riboflavin, and iodine

-Good sources of Vitamin A, Vitamin D, iron, and trace minerals

-1 egg= 1 ounce of meat

-Whole eggs are high in cholesterol so you should eat no more than 4 egg yolks per week

-No limit on egg whites because they are cholesterol free

### Buying Eggs

-Eggs are sold according to grade and size standards set by the USDA.

#### Grade

-Eggs have been federally inspected for wholesomeness

-Determined by the inner and outer quality of the egg at the time of packaging

-Has nothing to do with freshness of the egg or size

-AA, A, and B - differ in appearance when cooked

-AA and A are used when appearance is important (fried or poached eggs)

#### Size

-Determined by the minimum weight for a dozen

-Common sizes are large and extra large

-Recipes assume that large eggs will be used

### Storing Eggs

-Refrigerate in original carton

-Do not put them in the egg tray commonly found in the refrigerator door

-Egg shells are porous and pick up aromas from other foods if stored uncovered

-Do not wash before storing (washing destroys the eggs natural protective covering)

### Preparing Eggs

-Cook at moderate temp for a short time

-When overcooked, egg whites shrink and become tough and rubbery

-When overcooked, egg yolks toughen and turn gray-green on the surface

-Eggs can be cooked on the stovetop, in the oven, or in the microwave

-Preparation methods: (shell, fried, baked, poached or scrambled)

## 18.3 Egg Basic Notes Continued

### Eggs cooked in the shell

- Place a single layer of them in the saucepan
- Add water 1 inch above the eggs
- Boil
- Turn off the heat and let eggs stand in the hot water, covered.
- For hard cooked eggs, let them stand for about 15 minutes. For soft cooked eggs, 4-5 minutes.
- After cooking, run cold water over the eggs to stop the cooking process.

### Fried Eggs

- Fry in a small amount of unsaturated fat or in a nonstick skillet that has been coated with vegetable spray.
- Heat skillet until hot enough to sizzle a drop of water
- break one egg at a time into a small bowl. Slip egg from bowl into the heated pan
- Reduce heat to low. Cover and cook eggs slowly until done.
- Turn over to cook the other side.

### Baked Eggs

- Break eggs into a small bowl and add to baking dish.
- Top with a small amount of milk, if desired.
- Place in preheated oven (325). Bake until done - about 12 min for 2 eggs.
- To microwave, pierce yolks with the tip of a knife so that steam can escape.

### Poached Eggs

- Poaching is a method of cooking eggs, out of the shell, in simmering water.
- Bring water to a boil in a saucepan then reduce heat to a gentle simmer.
- Break one egg at a time into a small dish. Hold the dish close to the surface and slip in the egg.
- Simmer about 5 minutes.

### Scrambled Eggs

- Beat eggs together with water or milk. Use 1 Tablespoon liquid for each egg.
- Pour egg mixture into hot skillet.
- As the mixture thickens, draw a spatula across the bottom and sides of the pan.
- Continue until eggs are thickened and no visible liquid remains.
- Don't stir the eggs constantly as they will get mushy.

### Basic Omelet

- Made with beaten eggs
- Cook in skillet without stirring the eggs
- Lift edges of the omelet to allow uncooked egg to flow to the bottom.
- When the omelet is almost done you can add a filling, such as sautéed vegetables.

## RUBRIC FOR PARTS OF AN EGG POSTER

	<b>5-4 points</b>	<b>3-2 Points</b>	<b>1-0 Points</b>
Includes the following labels of an egg: Shell Shell membrane Albumen Yolk Chalazae	Includes all 5 parts of an egg	Missing 2-3 labels	Missing 4-5 labels
Defines the 5 parts of an egg listed above	Defines all 5 parts of an egg	Missing 2-3 definitions	Missing 4-5 definitions
Picture of the 5 parts of an egg	Includes a picture of all 5 parts of an egg	Missing 2-3 pictures	Missing 4-5 pictures
Color Neatness Title Name is on poster	Uses color Poster is neat Can read the words Includes a title Name is on poster	Missing 2 or more requirements	Missing 4 or more requirements

Name: \_\_\_\_\_

Score: \_\_\_\_\_ / 20

### Enrichment Activity Option for +5 Points:

**\*Pick another country. Investigate how eggs differ in another country. Write five differences between eggs found in the United States and eggs found in the country you chose.**

### Day 5

**Unit:** Combined Agricultural Leadership/Introduction to Foods

**Standards:** Ag: FPP.03: Select and process food products for storage, distribution, and consumption.

FCS: Food Production and Services 8.5: Demonstrate professional food preparation methods and techniques for all menu categories to produce a variety of food products that meet customer needs.

**Objectives:** Students will analyze egg recipes.

**Instructional Method:** Direct instruction

**Modification/Accommodation Ideas:** Provide a copy of the notes to students

**Materials:** PowerPoint with 18.4 notes, sticky notes

Segment/Phase	Time	Teacher Task	Student Learning Task
Warm-up/Introduction	5 min	Write bell ringer on board before class starts  Discuss bell ringer answers as a class	<u>Bell Ringer Question:</u> Draw an egg and label the albumen, yolk, and chalazae.
Input Instruction	25 min	Teacher will go over PowerPoint notes from 18.4 from the Foods textbook. Topics include: custard, separating eggs, beating egg whites, omelets, and meringue.	Students will take notes in their notebook over the PowerPoint.
Guided Practice	5 min	Teacher hand out the egg observation lab sheet to preview next day's lab	Read over egg observation lab sheet
Closure	5 min	Exit ticket- hand out sticky note to each student to answer the exit ticket question	Describe difference between soft and hard meringue besides "soft and hard"
Assessment			Exit ticket

Resources:

18.4 Notes

[https://docs.google.com/presentation/d/1K96xqZILhxoWUn1y3GpEtTr8tlfiaF\\_ShKs0AzsedQ/edit?usp=sharing](https://docs.google.com/presentation/d/1K96xqZILhxoWUn1y3GpEtTr8tlfiaF_ShKs0AzsedQ/edit?usp=sharing)

18.4 Notes Document

[https://docs.google.com/document/d/1izdKepAHGkYyBjeLiHjy69c\\_r6wWH7JhEHtsdJ2ZLUc/edit?usp=sharing](https://docs.google.com/document/d/1izdKepAHGkYyBjeLiHjy69c_r6wWH7JhEHtsdJ2ZLUc/edit?usp=sharing)

Egg Lab

<https://docs.google.com/document/d/10ueKCNdGXPdEPVxZtm6204KbsV560BatSJhbfYQolA/edit?usp=sharing>

## 18.4 Using Eggs in Recipe Notes

### Custards

- Blend of milk thickened with eggs
- Base for main dishes, such as quiche
- 2 types
- Stirred
- \*Cooked on stovetop and stirred constantly until it thickens enough to coat a spoon.
- \*Can serve as a pudding or as a sauce over cake or fruit
- Baked
- \*Baked in the oven
- \*Firm, delicate consistency
- \*Bake until a knife inserted in or near the center comes out clean

### Separating Eggs

- Eggs separate more easily when they are cold
- Use egg separator

### Beating Egg Whites

- When egg whites are beaten, air is incorporated into them.
- Beaten egg whites can be used to add volume and lightness to baked products.
- Used to prepare souffles (made by folding stiffly beaten whites into a sauce or batter, then baking)
- Guidelines for beating egg whites:
- Be careful to no yolk mixes with the whites
- Let egg whites stand at room temp for 20 minutes
- Use beaters and bowls that are clean and completely free of fat
- Use only glass or metal bowls as plastic bowls tend to absorb fat

### Forming Peaks

- As you beat egg whites they'll turn white and foamy.
- 2 stages of peaks that eggs can reach:
- Soft peak
- \*Peaks bend over slightly when the beaters are lifted out of the whites
- Stiff peak
- \*Peaks are glossy and hold their shape when the beaters are lifted out of the mixture
- \*Never try to beat past the stiff peak stage

### Puffy Omelet

- Can be made with beaten egg whites
- Made by separating the eggs and beating the whites and yolks separately.
- Cook on stovetop until it is puffed and lightly browned on the bottom
- Then bake for 10-12 minutes

## 18.4 Using Eggs in Recipe Notes Continued

### Meringue

- A foam made of beaten egg white and sugar
- Used for desserts
- 2 types
- Soft
- \*Used to top pre-cooked pies and puddings
- Hard
- \*Used in baked meringue shells that can be filled like a pie

### Soft Meringue

- Made by beating egg whites to the soft peak stage
- Spread soft meringue over hot, pre-cooked pie filling or pudding
- In a pie, meringue should touch the crust all around the edge, otherwise it may shrink during baking.
- Bake until peaks are lightly browned.

### Hard Meringue

- Made by beating egg whites to the stiff=peak stage
- Can be baked on a baking sheet
- Shape meringue into individual or large shells using a spoon, spatula, or pastry tube.
- Will be crispy
- Bake according to the time and temp on the directions and then turn off oven and leave the meringue in it for at least another hour to dry out.

### Day 6

**Unit:** Combined Agricultural Leadership/Introduction to Foods

**Standards:** Ag: FPP.03: Select and process food products for storage, distribution, and consumption.

FCS: Food Production and Services 8.5: Demonstrate professional food preparation methods and techniques for all menu categories to produce a variety of food products that meet customer needs.

**Objectives:** Students will compare different methods of cooking eggs.

**Instructional Method:** Lab

**Modification/Accommodation Ideas:** Lab is a group activity

**Materials:** Eggs, tongs, saucepan, paper plate, butter (amount depends on number of students)

Segment/Phase	Time	Teacher Task	Student Learning Task
Warm-up/Introduction	5 min	No bell ringer today to ensure there is enough time for the lab  Explain that today the class will be cooking the egg lab from Friday.	
Lab	30 min	Lab day Teacher walks around and observe the groups, help as needed, ask questions of the group about their recipes and what they're doing	Lab day- students will complete the egg observation lab
Closure	5 min	Go over questions from lab	Students will discuss the egg lab
Assessment			Lab

Resources:

Egg Lab

<https://docs.google.com/document/d/10ueKCNdGXPdmEPVxZtm6204KbsV560BatSJhbfYQoIA/edit?usp=sharing>

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Egg Observation Lab

### Part 1: Raw or Cooked?

1. Take a look at the eggs on your table. Pick them up at the same time. Do they feel the same?
2. After everyone has a chance to hold the eggs, carefully spin one egg at a time. What do you notice?
3. Why do you think the egg that spins faster would be the cooked egg?
4. When you are finished spinning the eggs, give the COOKED egg to the teacher.

### Part 2: Egg Observation

1. Hold the raw egg in the palm of your hand. Gently close your fingers around the egg. Begin to squeeze the egg slowly, increasing the pressure until you are squeezing quite firmly. **DO NOT punch your finger through the shell.**
2. Gently shake the egg back and forth in your hand. Note whether you feel anything moving inside the egg.
3. Place the egg in a small saucepan. Add enough water to barely cover the egg. Heat the water slowly, just enough to make the water warm but still comfortable to the touch. What do you notice coming out of the egg when the water starts to heat up?
4. Use tongs to gently remove the egg from the saucepan.
5. Gently crack open the shell over the paper plate. Carefully pour the contents of the egg onto the plate. What do you notice?
6. Examine the structure and texture of the shell. Look in the blunt end of the shell. Locate the membrane and the air space.
7. Examine the contents of the egg on the plate. Refer to the above picture as you work. The germinal disc is a small white spot on the top of the yolk. This is the spot where fertilization and the development of the embryo occur.

8. Find the whitish strands attached to both sides of the yolk. These are the chalaza. When the egg is intact, the chalaza twist when the egg rolls, keeping the germinal disc and the embryo at the top of the egg.
9. The clear fluid on the plate is the albumin protein. This protein will be used by the developing embryo for growth. In an intact egg, the albumin completely fills the space between the yolk and the membrane beneath the shell.
10. The yolk is the yellow material. The yolk is rich in carbohydrates and is used by the embryo for energy. Note how the yolk appears to form a slightly flattened sphere. The yolk is surrounded by a membrane that helps it maintain its shape. Puncture the membrane surrounding the yolk with a toothpick. Observe what happens. Write your observations here:

## Experimental Egg Cookery

**Directions:** Follow the recipe assigned to your group as carefully as possible. Place the egg on a plate and take it to the designated place for analysis by the rest of the class. Record the results in the chart.

### Group 1

#### **Fried Eggs: With Lid at High Heat**

Use 1 egg. Melt 1 Tbsp. butter in skillet. Break egg into skillet. Cover with a tight lid and cook with the heat turned to HIGH. After 1 minute, add 1/2 tsp. water. Cook until yolk is set, about 3 to 4 minutes.

### Group 2

#### **Fried Eggs: Without Lid at Low Heat**

Use 1 egg. Melt 1 Tbsp. butter in skillet. Break egg into skillet. Cover with a tight lid and cook with the heat turned LOW (Simmer). After 1 minute, add 1 tsp. water. Cook covered about 3 to 4 minutes or until yolk is set.

### Group 3

#### **Fried Eggs: Without Lid at High Heat**

Use 1 egg. Melt 1 Tbsp. butter in skillet. Break egg into skillet. Cook uncovered with the heat turned HIGH until the white sets. Turn egg over with a turner and cook until yolk is set.

### Group 4

#### **Fried Eggs: Without Lid at Low Heat**

Use 1 egg. Melt 1 Tbsp. butter in skillet. Break egg into skillet. Cook uncovered with heat turned LOW (Simmer) until the white sets. Turn egg over with turner and cook until yolk sets.

**Group 5****Hard-Cooked Eggs: At Heavy Boil**

Use 2 eggs. Cover eggs with cold water at least 1/4 inch above eggs. Bring rapidly to a boil and continue boiling rapidly for 10 minutes. Remove from heat and drain off water. Remove 1 egg and place in a small dish and set aside to cool. Label. Cool second egg thoroughly under cold running water from faucet. When cool, shell both eggs and cut in half.

**Group 6****Hard-Cooked: At Simmer or Low Heat**

Use 2 eggs. Cover eggs with cold water at least 1/4 inch above eggs. Bring rapidly to a boil. Turn off heat and cover. Let stand 15 minutes. Drain off water. Remove one egg and place in a small dish and set aside to cool. Label. Cool second egg thoroughly under cold running water from faucet. When cool, shell both eggs and cut in half.

<b><i>Circle Which One Applies</i></b>	<b><i>Tenderness of White</i></b>	<b><i>Tenderness of Egg</i></b>
Fried Egg with Lid High Heat:	Tender or Tough	Crisp or Firm or Soft
Fried Egg with Lid Low heat:	Tender or Tough	Crisp or Firm or Soft
Fried Egg without Lid High Heat:	Tender or Tough	Crisp or Firm or Soft
Fried Egg Without Lid Low Heat:	Tender or Tough	Crisp or Firm or Soft
Hard Cooked Egg Heavy (Heavy boil, Fast cool, High heat)	Tender or Tough	Crisp or Firm or Soft
Hard Cooked Egg Heavy (Heavy boil, Slow cool, High heat)	Tender or Tough	Crisp or Firm or Soft
Hard Cooked Egg Heavy Soft (Slimmer, Fast cool, Low heat)	Tender or Tough	Crisp or Firm or Soft
Hard Cooked Egg Heavy (Slimmer, Slow cool, Low heat)	Tender or Tough	Crisp or Firm or Soft

**Questions:**

1. How should an egg be cooked to get the best results?
2. What do the high temperatures do to eggs when cooking them?
3. What does a lid do for the egg while it is cooking?

### Day 7

**Unit:** Combined Agricultural Leadership/Introduction to Foods

**Standards:** Ag: FPP.03: Select and process food products for storage, distribution, and consumption.

FCS: Food Production and Services 8.5: Demonstrate professional food preparation methods and techniques for all menu categories to produce a variety of food products that meet customer needs.

**Objectives:** Students will create recipes for the Chopped challenge.

**Instructional Method:** Lab

**Modification/Accommodation Ideas:** Lab is a group activity

**Materials:** Chopped TV episode

Segment/Phase	Time	Teacher Task	Student Learning Task
Warm-up/Introduction	5 min	Write bell ringer on board before class starts  Discuss bell ringer answers as a class	<u>Bell Ringer Question:</u> What is the last thing you cooked? List 3 ingredients you used.
Lab Prep Day 1	30 min	An episode of Chopped will be playing on the screen.  Teacher must okay the recipes. As groups are discussing, listen to their conversation, add advice as needed to their discussion.  **Example ingredients: cottage cheese, yogurt, and either goat cheese/gouda cheese/blue cheese	While Chopped is playing, students will be in their chopped groups deciding on a recipe to make for the Chopped challenge. Students will make a grocery list based from their recipe. Groups of 3-4 students that are in the foods class. Students can look online for inspiration but will probably need to create their own recipe due to the combination of ingredients.  The ag lead students will decide on 3 ingredients that the students must use in their recipes.
Closure	5 min	Make sure groups have their recipe approved and their roles assigned.	Students will decide upon roles within their group.
Assessment			Group participation

Resources:

Hulu (or YouTube) to play an episode of Chopped

### Day 8

**Unit:** Combined Agricultural Leadership/Introduction to Foods

**Standards:** Ag: FPP.03: Select and process food products for storage, distribution, and consumption.

FCS: Food Production and Services 8.5: Demonstrate professional food preparation methods and techniques for all menu categories to produce a variety of food products that meet customer needs.

**Objectives:** Students will prepare for the Chopped challenge.

**Instructional Method:** Lab

**Modification/Accommodation Ideas:** Lab is a group activity

**Materials:** Food needed for the groups to cook their recipes

Segment/Phase	Time	Teacher Task	Student Learning Task
Warm-up/Introduction	5 min	<p>No bell ringer today- need the time to prep for lab</p> <p>Explain that today the students will be preparing to cook their food tomorrow. Anything they can do today to prepare for tomorrow and/or cook part of their recipe today and the rest tomorrow. (Depends on the recipe). Explain what the ag lead students will be doing (see below).</p>	<p>No bell ringer</p> <p>Students plan what they will do today and what they will do tomorrow.</p>
Lab Prep Day 2	30 min	<p>Walk around and check on the lab groups</p> <p>Help the ag lead students as needed. Provide feedback on their first draft of score sheet. Approve their panel of judges. (Be sure the kids keep the judges a secret).</p>	<p>Food class students will be preparing their recipe.</p> <p>Ag lead students will create a judging score sheet, select a panel of judges (teachers/faculty), and create a certificate to give the winning team.</p>
Closure	5 min	<p>Make sure groups have their kitchens cleaned up and food is sealed and stored for tomorrow.</p> <p>Print the judging score sheets.</p>	Students will clean up their kitchens.
Assessment			Lab prep

### Day 9

**Unit:** Combined Agricultural Leadership/Introduction to Foods

**Standards:** Ag: FPP.03: Select and process food products for storage, distribution, and consumption.

FCS: Food Production and Services 8.5: Demonstrate professional food preparation methods and techniques for all menu categories to produce a variety of food products that meet customer needs.

**Objectives:** Students will cook their Chopped challenge recipes.

**Instructional Method:** Lab

**Modification/Accommodation Ideas:** Lab is a group activity

**Materials:** Food needed for the groups to cook their recipes

Segment/Phase	Time	Teacher Task	Student Learning Task
Warm-up/Introduction	5 min	No bell ringer today- need the time to prep for lab  Explain that today the students will be finishing their recipes. Judging will take place after class is over.	No bell ringer
Lab Prep Day 2	30 min	Walk around and check on the lab groups	-Food class students will be preparing their recipe. -Ag lead students will be the "emcees" and check in on the groups. At the end they will each write 2 paragraphs (About 12-15 sentences) describing how the group worked together, what if anything went wrong, what went well, etc. Other ideas to include: time management, prioritizing, procrastinating. (each ag lead student will focus on 1 kitchen group)
Closure	5 min	Make sure groups have their kitchens cleaned up and food is plated for the judges.	Students will have their food plated and ready to go for the judges.  Students will clean up their kitchens.  Ag lead kids make sure score sheets are ready for judges. Ag lead students will set up a table with each groups plate on the table labeled with a number.
Assessment			Lab participation

### Day 10

**Unit:** Combined Agricultural Leadership/Introduction to Foods

**Standards:** Ag: FPP.03: Select and process food products for storage, distribution, and consumption.

FCS: Food Production and Services 8.5: Demonstrate professional food preparation methods and techniques for all menu categories to produce a variety of food products that meet customer needs.

**Objectives:** Students will compare two different types of hot chocolate.

**Instructional Method:** Lab

**Modification/Accommodation Ideas:** Lab is a group activity

**Materials:** Food needed for the hot chocolate lab

Segment/Phase	Time	Teacher Task	Student Learning Task
Warm-up/Introduction	5 min	Write bell ringer on board before class starts  Discuss bell ringer answers as a class	What went well with your lab yesterday? Did anything go wrong? Explain
Lab	25 min	Help with lab as needed  Look over the speech and provide feedback.	Hot chocolate lab  After hot chocolate is warming up, ag lead will prepare a short speech. Ag lead students will meet to evaluate score sheets. They will decide on a few comments to share with each group that will lead up to them announcing what team is the winner.
Closure	10 min	Announce the ag lead students prepared a speech and will announce the winner.  Wrap up unit- hand out a survey for students to complete about the two-week unit	Ag lead students will share their speech and award the certificate they made to the winning team.
Assessment			Lab

Resources:

Hot chocolate lab:

[https://docs.google.com/document/d/1eFiMNYAOiGaBsF-NGHgmfxQ79HrXZmqWi7myFUcEn\\_U/edit?usp=sharing](https://docs.google.com/document/d/1eFiMNYAOiGaBsF-NGHgmfxQ79HrXZmqWi7myFUcEn_U/edit?usp=sharing)

## Hot Cocoa Surprise

- 1 cup Nonfat dry milk
- 3 T. sugar
- 2 T. unsweetened cocoa
- 3 1.4 c. water
- 1 tsp vanilla extract
- ½ c. low fat chocolate ice cream



### Conventional Directions

1. Combine nonfat dry milk, sugar, and cocoa in a 1-quart saucepan. Stir in water and vanilla.
2. Cook over low heat until hot. (Do not boil)
3. Pour hot cocoa into 4 mugs.
4. Top each serving with 2 tablespoons ice cream and sprinkle with cinnamon.

### Microwave Directions:

1. Combine nonfat dry milk, sugar, and cocoa in 1-quart glass measuring cup. Stir in water and vanilla.
2. Microwave, uncovered, at 100% power for 3 minutes or until heated.
3. Pour hot cocoa into 4 mugs.
4. Top each serving with 2 tablespoons ice cream and sprinkle with cinnamon.

### Questions:

1. What causes milk to scorch when it is cooked?
2. How can lumps be prevented when mixing the dry milk and cocoa with the water?
3. Following the lab, how did the food look and taste?
4. How would you change or improve the recipe?
5. List any difficulties you had in preparing the recipe.
6. How would you solve the problem(s) next time?

**UNIT SURVEY**

Put a checkmark in the column that applies to you

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
The unit provided an appropriate balance between instruction/practice/lab.					
The unit work helped me understand concepts more clearly.					
The labs complemented my understanding of the lectures.					
The unit developed my ability to interact with others.					
The unit helped me develop my communication skills.					
The unit helped me develop my problem-solving skills.					
The unit provided me an opportunity to explore the food products and processing career cluster.					
The unit provided me an opportunity for kitchen lab experiences.					

1. What did you like best about this unit?
  
2. What would you like to change about this unit?

## Chapter 5

### 5.1 Reflection

Due to the amount of snow days and other weather related late starts and early outs, Betsy and I completed about four days of the curriculum instead of the entire unit. We completed the 18.1 and 18.2 notes, the cheese lab, and a modified version of the Chopped competition. Originally, there was a lab to make homemade yogurt. We completed the yogurt lab; however, the lab was unsuccessful for a variety of reasons. The recipe instructions did not correlate to the instant pots the students brought from home. The recipes said to “press the yogurt button” and none of them had yogurt buttons. Some students were also unfamiliar with how to use instant pots in general. The result was burnt milk. Based on the feedback from Betsy and the students, I deleted the yogurt lesson plan and inserted the Newsela lesson plan. Last year when I taught agricultural classes I taught a lesson like the Newsela lesson plan included within this curriculum. If teachers want to include a homemade yogurt lesson plan, they could create their own lab and add it to the curriculum.

I had students complete a survey to wrap up the unit. There were eight statements and students had to check a box marking if they strongly agree, agree, neutral, disagree, or strongly disagree. Out of the eight statements on the survey, there was one statement where most of the students marked the same box. Nine out of thirteen students checked agreed for the statement, “the unit provided an appropriate balance between instruction/practice/lab.” Overall the agreed box was the box most chosen, but I feel like the survey would have provided more accurate data had we completed the entire unit. There was an open-ended question asking, “what did you like best about this unit?” Most of the responses included the Chopped competition and getting to

work in groups. One student did answer with the collaboration between classes. Another student wrote on the survey that the notes and lab activities from the first few days were necessary to choose the best ingredients for the Chopped challenge. The other open-ended question was, “What would you change about this unit?” The consensus was to eliminate the yogurt lab. Other answers included more cooking labs and different judges. The agriculture leadership kids chose three teachers as judges. One suggestion would be to have judges that work in a variety of positions. Overall, the students enjoyed the unit because they got to work with other students, competed against each other, and had the opportunity to complete kitchen labs.

As I reflect on what I have learned from the graduate program, my beliefs of agricultural education have broadened beyond just classes being taught in middle school and high school classrooms. My undergraduate program focused on agricultural education at the middle school and high school levels. Classes at the graduate level expanded my thinking about agricultural education to include settings such as adult education and extension. While I was enrolled in graduate classes during the summer of 2017, I worked at the local extension office as a summer assistant. The AGEDS classes covered information about extension offices, and I was able to supplement the material with my work experience. The elective credits provided me the opportunity to take classes related to my interests. For example, one of my elective courses was food safety. I chose the food safety course because I was managing my dad’s restaurant at that time. I previously had no formal food safety training. I knew the food safety course would be relevant to my job.

Betsy has ten years of teaching experience and is highly respected within the agricultural education community. I knew I wanted to learn as much as I could from her while I was

employed at Clay Central-Everly. The creative component and concurrent enrollment of students provided an opportunity for us to collaborate on a unit and for me to observe her teaching. I enjoyed observing how Betsy presents notes and interacts with students. I could tell students respect Betsy and how connections have been made between Betsy and the students through other classes and FFA activities.

Overall, the graduate program expanded on what I learned throughout my undergraduate program. The classes gave me new ideas for the classroom, such as E-moments, and expanded my ideas on agricultural education to include adult education and extension. The creative component gave me an opportunity to collaborate, co-teach, and learn from an experienced agricultural teacher.

## 5.2 Recommendations

There are a few considerations I have for teachers to consider when using this curriculum. The first would be the length of time for each class period. At Clay Central-Everly the class periods are 40 minutes long. On Wednesdays the class periods are only 30 minutes long. Some lesson plans could be combined if the class periods are 50-60 minutes long or for block scheduling. The second consideration would be the students' background knowledge. Teachers may feel the need to cover kitchen lab safety as the agricultural leadership students might be new to the kitchen. The students in our unit had all previously been in one of Betsy's classes so they had prior kitchen safety experience. The third consideration would be a get to you know activity. If this unit was used in a larger school or a workshop, the students might not know each other. A get to know you activity will help the students learn more about each other and

also help the teachers get to know students in the opposite class. The teachers might want to add a get to know you activity on the first day.

This curriculum is two weeks long because two weeks is what fit my schedule and the family consumer science teacher's schedule. We did not want to take away too much class time to be sure we can complete our individual standards. One recommendation would be to add additional lab activities if time allows. With the topic being food science, specifically dairy foods, some other lab activity examples include milk tasting like the cheese lab, making homemade ice cream, making homemade butter, or completing a milk lab to explore the fat content in different types of milk. Teachers could add in any additional labs related to dairy foods.

A final recommendation for teachers would be to add more information about eggs to make the unit more agricultural based. The first example would be to include a lesson on candling eggs. Teachers could demonstrate how to candle eggs or could show a video. A second example of how to make the egg section more agricultural based is to provide further information about how to grade eggs. Teachers could lecture or show a video on how to grade eggs and then have students practice grading eggs.

### 5.3 Extensions

This curriculum was developed for high school classes, but the curriculum could be modified for a workshop. The Chopped challenge could be utilized with students as an activity for a high school organization. The Chopped challenge could be modified for middle schoolers at a workshop if basic ingredients are used and a microwave is the only required equipment.

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