



Something's Fishy about Processing!

Middle School Food and Agricultural Literacy Curriculum

Precepts

- B. Relationships
- B2. Interact and work with others

National Standards

FPP.04.02.01.b. Discuss desirable qualities of processed meat, egg, poultry, fish, and dairy products.

FPP.04.03.02.a. Explain methods and materials for processing foods for sale as fresh-food products.

FPP.04.03.05.a. Explain materials and methods of food packaging and presentation.

NL-ENG.K-12.4 – Communication Skills

NL-ENG.K-12.12– Applying Language Skills

Student Learning Objectives

As a result of this **unit**, the student will be able to...

Examine processes involved in food science.

As a result of this **lesson**, the student will be able to...

Explain methods utilized to process aquaculture and seafood products.

Content Outline

I. Steps involved in processing aquaculture and seafood products

- A. **Cleaning**, filleting and gutting fish: Did you know that fish tissue is the most perishable food item we've talked about so far? Fresh fish must be cleaned, gutted, and placed on ice as soon as possible to remain as fresh as possible. This is the first step to fish processing. It can be completed on the fishing boat or off, depending on the use of the fish and the type captured.
- B. **Smoking** Atlantic salmon and other seafood. **Smoking** fish is similar throughout the world through this age-old process. Preservation can be accomplished by first cutting the fish into thin strips and then drying them slowly over a fire. When the fish is packed as a dried smoked product, it can travel great distances and remain edible for long periods of time.

Time

Instruction time for this lesson: 45 minutes.

Resources

National FFA Organization. (2009). LifeKnowledge Online. Retrieved September 1, 2009 from <http://agedlearning.org>.
—Hayes, K. Introduction to Food Science, Purdue University CopyMat, 2005. — Primary Skills Victoria (2009). Seafood Processing. Retrieved September 1, 2009. From The Victorian Primary Industries Training Board Web site. http://www.psv.com.au/seafood_processing.htm

Tools, Equipment, and Supplies

Overhead projector/transparencies
Red, yellow, and blue notecards
Plain index cards
Various colors of construction paper cut into fish shapes
Various items to be used as "ocean litter"
Nets or fishing poles with optional magnets
Writing surface
Writing utensil
MS.FS.2.6.ASSESS.A – one per student
MS.FS.2.6.TM.A – one per teacher
MS.FS.2.6.TM.B as a transparency or transferred onto index cards to be handed out to groups of students

Key Terms

The following terms are presented in this lesson and appear in **bold italics**:

Cleaning

Smoking

Marinating

Canning

Freezing

Grading

- C. ***Marinating*** seafood and preparing seafood mixes. ***Marinating*** seafood and preparing seafood mixes creates different, flavorful types of seafood for purchase. Quite often used to retain moisture and flavor, these processing techniques are combined with preservatives to last longer, creating seafood items that can be integrated with other types of foodstuff.
- D. Preparing fish, such as tuna, for ***canning***. Canned tuna is the number one consumed seafood product in the United States. Once tuna are cleaned and sorted by size, they are pre-cooked and then cooled overnight. All of the white and dark meat is separated by hand. The white meat receives a premium price.



Something's Fishy about Processing!

Afterwards, they are compacted into cans and vacuum-sealed for shipment to stores.

- E. **Freezing** fish and other seafood. This is the most common method of processing seafood. Upon completion of **cleaning** and filleting, glaze or flash **freezing** is used to lock in the freshness and flavor of the fish for long periods of time. This is the process used for most non-battered or breaded fish products found in the grocery store.
- F. Preparing shaped and breaded products such as fish fingers and nuggets. This is one of the most popular seafood processes among young people. The meat of fish that have been deemed unusable for other processes must be pressed into large blocks. These blocks are then cut to size for the food, covered with a thin layer or breading, then pre-cooked before being frozen.
- G. Opening oysters and other shellfish. Oysters can be eaten on the half shell, raw, smoked, boiled, baked, fried, roasted, stewed, canned, pickled, steamed, or broiled. They have the longest shelf-life of all seafood at 2.5 weeks. Fresh oysters must be alive just before consumption or cooking. There is a simple criterion: the oyster must be capable of tightly closing its shell, otherwise it is unsafe. Opening oysters requires skill, a sharp knife, and heavy gloves. The shell can also be sharp. Professional shuckers require less than three seconds to open an oyster.
- H. **Grading** and boiling prawns and other crustaceans. Since prawns, more commonly known as shrimp, are animals with hard shells, the first task is removing the outer shell. This is known as peeling. Once this is completed, they are chopped and washed, then sorted and placed in trays or other containers based upon size. Most of these tasks can be done by machine.

Interest Approach

The purpose of this interest approach is to start off with an interactive activity that involves students playing various roles in the fishing industry. Be prepared to talk in pirate-speak to set the scene of this interest approach. As students enter the room, randomly distribute color-coded cards. On one side of these cards, outline the tasks they must complete as their role on the fishing crew (see below). Prepare the "fishing" area beforehand by scattering different colored paper cutouts of fish and other items, such as old boots, tin cans, and trash, for the students to "catch." Magnets can be attached to the fish and fishing poles/nets for easier catching. Students can fish outside, in a gymnasium, or in the classroom.

Red – Deckhand – your job is to set the lines and the nets, unpack and repack all of the catches of the day. Hard labor is a must in this job!

Blue – Coxswain – you are in charge of all watch-keeping, as well as assisting both the deckhand and the skipper with sorting the fish, keeping them on task. Look out for obstacles on the horizon!

Yellow – Skipper – you are steering our million-dollar vessel! It is your job to assist in locating and navigating to areas where fish are present!

Ahoy Mates! Welcome aboard the USS Fishing Supreme! We each have an important role to fulfill in today's adventure, so clear the desks—I mean decks—and take out the cards that were handed out at the doorway. On each card, we will find our crew assignments for the day. In just a few moments, we will set sail, but first we have some important rules to establish.

Deckhands will travel to the front of the room to pick up nets and fishing poles. You can only use these nets and poles in the areas that the Skippers designate. You are in charge of catching the fish. Deckhands, what are you in charge of?

Solicit student response.

Coxswains will travel to the center of the room. Be sure to keep watch for any mishaps that may occur. Once the fish are caught and thrown, you will sort them. Coxswain, what is your task?

Solicit student response.

Skippers! You will travel to the back of the room, where you will guide the deckhands at sea! You must direct them toward the schools of fish to bring in our catch! Skippers, your job is?



Something's Fishy about Processing!

Solicit student response.

When I say ANCHORS AWAY! You will have three minutes to catch and sort all of your fish. What questions are there? ANCHORS AWAY!

Allow students to gather and sort as many fish as they can for three minutes. At the end of three minutes, capture students' attention with:

All Hands on Deck! Crew members, gather your fish – bring all catches and supplies to the front of the room! Wow! It seems like we had quite a successful morning out on the ocean today.

What were some of the hardest tasks in fishing today?

Solicit student responses.

When harvesting fish many decisions must be made. What type of fish, how big, how many and how we will capture them are quite a task!

Today, we are going from the ocean to the frozen foods department as we learn how processing works in the aquaculture industry. Get ready, because today is going to be one wild ship ride. Be prepared to take notes and work diligently throughout today's lesson. It's quite a catch!

Summary of Content and Teaching Strategies

Objective 1. Explain the steps utilized to process aquaculture and seafood products

I. Steps involved in processing aquaculture and seafood products

The Eyewitness News e-Moment® establishes students as experts on the information provided to the class. Students present the information in a news-eyewitness format. They retrieve the information and share it with the class while other students ask questions. This is particularly useful when there is a significant amount of information to be covered. Optional: It might be a good idea to take one of the cards and model this to the students.

Chunk the following information on index cards:

- A. **Cleaning**, filleting, and gutting fish: Did you know that fish tissue is the most perishable food item we've talked about so far? Fresh fish must be cleaned, gutted, and placed on ice as soon as possible to remain as fresh as possible. This is the first step to fish processing. It can be completed on the fishing boat or off, depending on the use of the fish and the type captured.
- B. **Smoking** Atlantic salmon and other seafood. **Smoking** fish is similar throughout the world through this age-old process. Preservation can be accomplished by first cutting the fish into thin strips and then drying them slowly over a fire. When the fish is packed as a dried smoked product, it can travel great distances and remain edible for long periods of time.
- C. **Marinating** seafood and preparing seafood mixes. **Marinating** seafood and preparing seafood mixes creates different, flavorful types of seafood for purchase. Quite often used to retain moisture and flavor, these processing techniques are combined with preservatives to last longer, creating seafood items that can be integrated with other types of foodstuff.
- D. Preparing fish, such as tuna, for **canning**. Canned tuna is the number one consumed seafood product in the United States. Once tuna are cleaned and sorted by size, they are pre-cooked and then cooled overnight. All of the white and dark meat are separated by hand. The white meat receives a premium price. Afterwards, they are compacted into cans and vacuum-sealed for shipment to stores.
- E. **Freezing** fish and other seafood. This is the most common method of processing seafood. Upon completion of **cleaning** and filleting, glaze or flash **freezing** is used to lock in the freshness and flavor of the fish for long periods of time. This is the process used for most non-battered or breaded fish products found in the grocery store.
- F. Preparing shaped and breaded products such as fish fingers and nuggets. This is one of the most popular seafood processes among young people. The meat of fish that has been deemed unusable for other processes must be pressed into large blocks. These blocks are then cut to size for the food, covered with a thin layer or breading, then pre-cooked before being frozen.



Something's Fishy about Processing!

G. Opening oysters and other shellfish. Oysters can be eaten on the half shell, raw, smoked, boiled, baked, fried, roasted, stewed, canned, pickled, steamed, or broiled. They have the longest shelf-life of all seafood at 2.5 weeks. Fresh oysters must be alive just before consumption or cooking. There is a simple criterion: the oyster must be capable of tightly closing its shell, otherwise it is unsafe. Opening oysters requires skill, a sharp knife, and heavy gloves. The shell can also be just as sharp. Professional shuckers require less than three seconds to open an oyster.

H. **Grading** and boiling prawns and other crustaceans. Since prawns (more commonly known as shrimp) are animals with hard shells, the first task is removing the outer shell. This is known as peeling. Once this is completed, they are chopped and washed, then sorted and placed in trays or other containers based upon size. Most of these tasks can be done by machine.

Seafood is prepared and processed for sale to consumers, retail and wholesale businesses. Seafood processing is a vital part of the seafood chain, making sure that our seafood harvest is safe and great to eat. In a few moments, we will have the opportunity to serve as eyewitnesses to the class about what has happened to our fish we caught earlier. But first, we must divide into eight equal groups. As we count off by eight, remember your number!

Count students off by eights, then direct each number to a corresponding classroom location.

As you travel to your corner think about your favorite newscaster and be prepared to share their traits. When seated, hold a pencil up in the air to signify you are ready to move to the next steps!

Wait for all students to be ready.

When you hear HOOK! select one member of the group to come forward and fish out a card. Read the information on the card to the group. HOOK!

Allow time for students to complete these tasks.

Next, determine – in five seconds – who will be the eyewitness newscaster. Do this now.

Pause for five seconds.

Great! The rest of the group will serve as the media.

When I say GO FISH!, you will have seven minutes to prepare your group's breaking news bulletin. The group's responsibility is to present all the information on the card that was read to you. Each member of the media will ask one question that the eyewitness newscaster must answer. This newscast will be presented to the class. Remember all information on the card must be covered. What questions are there?

You have seven minutes to prepare. GO FISH!

Allow for additional prep time as needed. Students may want to complete additional research with textbooks.

The (insert call letters of the local TV station) is ready to begin airing its exclusive broadcast on the importance of food in our diets. Who will be the first to share with us today?

Allow each group to present their information. This should take approximately 25 minutes.

We obviously have futures as news eyewitnesses! Let's give a round of applause to each other for that success!

Review/Summary

Use a Me-You-Us e-Moment to present a review of the lesson by having students first write down what they learned; second, share it with a neighbor or small group; and third, share pieces of the review with the entire class. Challenge students to truly dive deep into the material that was covered in the lesson. Students may need about two minutes to create their personal review and may want to work in small groups for another three minutes. Class review should take approximately five minutes.

Take the next two minutes to write down everything that you have learned today.

Provide two minutes, assisting students with writing information.

Pencils down! Now, when you hear CATCH, join up with three other classmates, and take two minutes to catch all the information you learned in a short synopsis. We will share our reviews with the class. What questions are there? CATCH!



Lesson Number: MS.FS.2.6

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Something's Fishy about Processing!

Upon completion of two minutes, have each group read the synopsis of the day.

Wow! What a catch today! Throughout these past few days, we have learned the many processes of meat, plants, dairy, and seafood. Today, we learned that there are eight ways to process seafood, and we heard riveting eyewitness reports on each of these processes. It's obvious that these processes are important to our experiencing the many different types of seafood available to us today! You all definitely experienced having the "Catch of the Day"! Come prepared tomorrow to learn about the differences between raw and finished products!

Application

Extended classroom Activity:

Watch an episode of Deadliest Catch from the Discovery Channel or utilize the computer lab and participate in an interactive game on crab fishing at <http://dsc.discovery.com/fansites/deadliestcatch/game/game.html>.

FFA Activity:

Students can conduct a water analysis test on a local pond or creek. This will serve as an introduction to the Environmental Sciences & Natural Resources CDE. Then discuss with students how the water pollutants may affect the fish industry in different bodies of water.

SAE Activity:

As middle school students, throughout SAE activities, students should be developing an SAE on an exploratory basis. If an aquaculture or aquaponics facility is available at the school system, allow students to participate in a daily feeding and maintenance of the project. Students can also research careers in the aquaculture industry and prepare a 2-5 minute presentation to the class on their discovery.

Evaluation:

MS.FS.2.6.ASSESS.A

Answers to Evaluation

1. A
2. B
3. B
4. D
5. B
6. Answers will vary



Name _____

Directions: Read each statement and write the letter of the correct answer in the blank.

1. _____ Tuna is the number one fish product consumed in the United States.

- A. True
- B. False

2. _____ Oysters are safe only when the shell remains open.

- A. True
- B. False

3. _____ Which process dries fish meat?

- A. Freezing
- B. Smoking
- C. Filleting
- D. Breeding

4. _____ Which of the following seafood are shelled animals?

- A. Tuna
- B. Fish
- C. Salmon
- D. Prawn

5. _____ Flash freezing destroys the flavor of the fish.

- A. True
- B. False

6. Explain one processing step that you are most familiar with or have the clearest understanding about below.

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Smoking Atlantic Salmon and other seafood:

Smoking fish is similar throughout the world through this age-old process. Preservation can be accomplished by first cutting the fish into thin strips and then drying them slowly over a fire. When the fish is packed as a dried smoked product, it can travel great distances and remain edible for long periods of time.

Marinating seafood and preparing seafood mixes:

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Preparing shaped and breaded products such as fish fingers and nuggets:

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