EXTENSION

ANIMAL SCIENCE

STEAK SCIENCE

UNIVERSITY OF NEBRASKA

YOUTH MEAT SCIENCE CURRICULUM

UNIVERSITY OF NEBRASKA-LINCOLN

Youth Meat Science Curriculum

EXTENSION

Contaminated Cooking

Quick Overview:

In this lesson, students will learn about the importance of washing their hands when cooking. The bread will act as the 'petri dish' for bacteria to grow. One slice of bread that has not been touched will act as the control, while others will be exposed to unwashed, washed, and hand sanitized hands. Through this activity, students will learn about cross contamination and the importance of keeping the workspace clean while cooking.

In the second activity, students will learn the importance of using a meat thermometer, how to use it correctly and how to make sure it is accurately calibrated.

Materials Needed:

- Loaf of bread
- Resealable plastic bags
- Hand sanitizer
- Soap
- Meat Thermometers
- Glass of ice water

PRIOR TO:

Delivery Type: Demonstration/Hands-On.

Prep Work: Purchase bread, resealable plastic bags, and hand sanitizer. Label the bags with the planned treatments. Adjust a meat thermometer so the temperature does not read correctly.

Directions:

Activity 1:

- Without touching the slice of bread with your bare hands, place one slice in a plastic bag to act as the control.
- Have the students pass a slice of bread around prior to washing their hands. Place this slice in a bag.
- Have half the students use hand sanitizer and pass a slice of bread around. Place this slice in a bag.
- Have the other half of students wash their hands and pass a slice of bread around. Place this slice in a bag.
- Monitor the slices of bread daily for mold growth. Depending on the type of bread used, the preservatives may slow this process. It may take a few days to see growth.

Expose additional samples to common "touch" points in the classroom: shared electronic screens, computer keyboards, door handles, etc. This will reinforce the importance of hand washing and avoiding contamination. Remember to label each sample.

Helpful Resources:

https://www.cdc.gov/foodsafety/cdc-and-food-safety.html
https://www.cdc.gov/foodsafety/communication/food-safety-in-the-kitchen.html
https://www.cdc.gov/foodsafety/ten-dangerous-mistakes.html
https://www.cdc.gov/foodsafety/food-poisoning.htm

Contaminated Cooking

Directions Continued:

Activity 2:

- Place the meat thermometer in the glass of ice water for 1 minute. What does the temperature read? If it is calibrated correctly, it should read approximately 32° F. If it is incorrect, use a pliers or adjustment tool provided with the thermometer to calibrate the temperature.
- Stack 2 slices of bread on top of each other and explain to the students that when using a meat thermometer, it is important for the probe to be in the geometric center of the steak, roast or patty (in this case, the bread stack will serve as the cut of meat.)
- Have students take turns inserting the meat thermometer between the slices of bread trying to accurately place it in the geometric center of the stack.
- Remove the top slice and see how close the student was to the center.

The Science:

Every year, approximately 48 million people in America (or 1 in 6) get sick, 128,000 are hospitalized and 3,000 die of foodborne diseases (CDC, 2020). Taking steps at home to practice food safety can help lower the risk of contamination and contraction of foodborne illnesses.

1. Clean: Washing your hands, surfaces, and cooking equipment is necessary to minimize the risk of contamination. When you touch food with your bare hands, all the germs your hands have been in contact with can now be in contact with that food. Washing your hands and surfaces is the most basic step in food safety. Once you wash your hands, prepare the food without recontamination. If you wash your hands and then touch your cellphone, you are now recontaminating your hands.

2. Separate: To avoid cross contamination, keep raw foods (specifically meat) away from cooked/ready-to-eat foods. Store raw meat on the bottom shelf of the fridge to avoid any drips or cross contamination. Use separate cutting boards and utensils for raw meat and cooked product/raw vegetables.

3. Cook: It is important to cook meat to the correct internal temperature to eliminate any bacteria that may be present. A meat thermometer is an important tool to ensure adequate doneness. Whole muscle cuts can be cooked to a lower temperature as the center of the cut as not had the chance to be exposed to contamination. Ground products must be cooked to a higher temperature.

    a. 145°F for whole cuts of beef, pork, veal, and lamb

    b. 160°F for ground meats, such as beef and pork

    c. 165°F for all poultry, including ground chicken and turkey

    d. 165°F for leftovers and casseroles

Meat thermometers not only help make sure the meat is cooked to a safe temperature, but they also help protect against overcooking. Overcooking can lead to product that is tough and dry.

Contaminated Cooking

The Science Continued:

4. Chill: Refrigerators should be kept between 32-40°F. The danger zone that allows bacteria to grow and cause spoilage is 40-140°F. Thaw and marinate meat in the refrigerator and refrigerate leftovers promptly (within 2 hours of cooking or within 1 hour if the food is exposed to temperatures above 90° F). Leftovers should be cooled in shallow containers to allow for prompt cooling. Most leftovers last in the fridge for 3-4 days but can be frozen if not able to be consumed in that time frame.

Taking simple steps at home can minimize the stress of food safety and help ensure a great eating experience for everyone.

4-H ADAPTATION

Presentations/Poster: Students could prepare an oral presentation or poster about the topic promoting agricultural literacy.

LEARNING OUTCOMES

Students will see microorganism growth and be able to identify cause and effect relationships by identifying factors impacting the rate of growth. Additionally, students will strengthen their understanding of food safety and relate it to other topics.

ADDITIONAL INFORMATION

This lesson would be best to do if you will be having multiple contacts with the students over a couple week period to "check in" on the project. If you use fresh (bakery) bread, the lesson will speed up as it likely contains less preservatives than other brands.

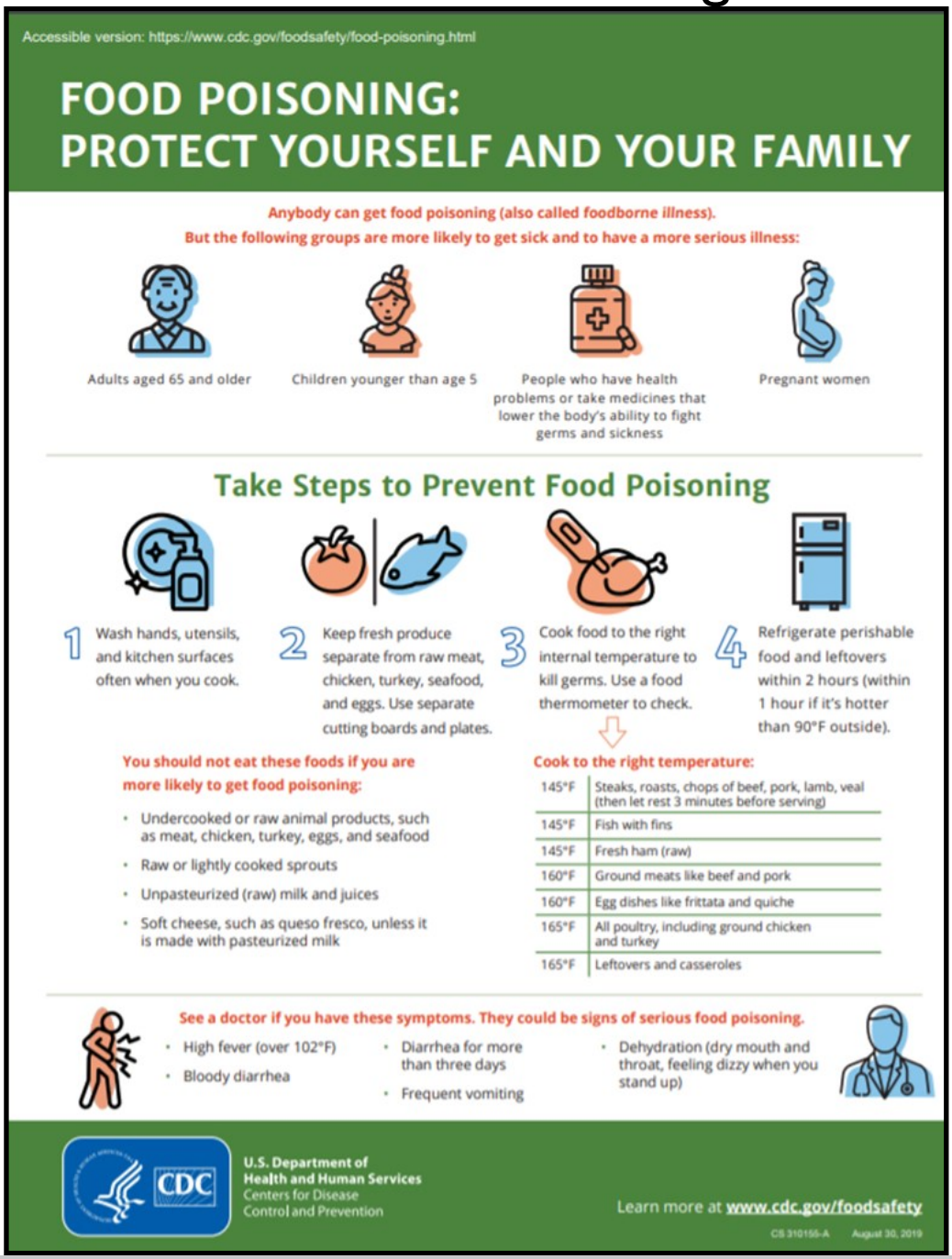
To hasten the growth of the mold on the bread, place the baggies in a single layer in a warm spot in the classroom. Make sure to label the bags so you can identify how each slice was treated. Taking photos of the samples each day would allow you to see the progression of growth over time and easily compare the samples to one another.

UNIVERSITY OF NEBRASKA-LINCOLN

EXTENSION

Youth Meat Science Curriculum

Contaminated Cooking



Accessible version: https://www.cdc.gov/foodsafety/food-poisoning.html

FOOD POISONING: PROTECT YOURSELF AND YOUR FAMILY

Anybody can get food poisoning (also called foodborne illness).
But the following groups are more likely to get sick and to have a more serious illness:

- Adults aged 65 and older
- Children younger than age 5
- People who have health problems or take medicines that lower the body's ability to fight germs and sickness
- Pregnant women

Take Steps to Prevent Food Poisoning

1. Wash hands, utensils, and kitchen surfaces often when you cook.
2. Keep fresh produce separate from raw meat, chicken, turkey, seafood, and eggs. Use separate cutting boards and plates.
3. Cook food to the right internal temperature to kill germs. Use a food thermometer to check.
4. Refrigerate perishable food and leftovers within 2 hours (within 1 hour if it's hotter than 90°F outside).

You should not eat these foods if you are more likely to get food poisoning:

- Undercooked or raw animal products, such as meat, chicken, turkey, eggs, and seafood
- Raw or lightly cooked sprouts
- Unpasteurized (raw) milk and juices
- Soft cheese, such as queso fresco, unless it is made with pasteurized milk

Cook to the right temperature:

145°F	Steaks, roasts, chops of beef, pork, lamb, veal (then let rest 3 minutes before serving)
145°F	Fish with fins
145°F	Fresh ham (raw)
160°F	Ground meats like beef and pork
160°F	Egg dishes like frittata and quiche
165°F	All poultry, including ground chicken and turkey
165°F	Leftovers and casseroles

See a doctor if you have these symptoms. They could be signs of serious food poisoning.

- High fever (over 102°F)
- Bloody diarrhea
- Diarrhea for more than three days
- Frequent vomiting
- Dehydration (dry mouth and throat, feeling dizzy when you stand up)

CDC U.S. Department of Health and Human Services Centers for Disease Control and Prevention

Learn more at www.cdc.gov/foodsafety

CS 310155-A August 30, 2019

ANIMAL SCIENCE

Contact:
Brianna Buseman
Youth Meat Extension Educator
Brianna.buseman@unl.edu