

Slide 1

The slide features a green header bar at the top. The main title is "Keeping Food Safe" in a large, black, sans-serif font. Below it is the subtitle "Food Safety for 4-H Foods Projects" in a smaller, black, sans-serif font. On the right side, there is a cartoon bulldog mascot wearing a red t-shirt with "4-H" on it, gesturing with its right hand. At the bottom left, there are three logos: the UGA extension logo (a black circle with a white building icon), the 4-H logo (a green four-leaf clover with "4-H" on each leaf), and the Georgia 4-H logo (a green four-leaf clover with "4-H" on each leaf). To the right of these logos is the website address "georgia4h.org". On the far right, there is a grey rectangular box with the text "Foods & Nutrition" in white, with a speaker icon to its right.

Keeping food safe is important for you, your family and anyone who eats food that you prepare and serve! This module will help you learn about food safety for the 4-H Foods Projects and beyond!

Why Food Safety is Important

- Unsafe food can cause illness
 - Vomiting
 - Diarrhea
 - Stomach pain
 - Fever
- More serious complications
 - Kidney failure
 - Death

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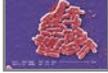
Do you know what can happen if food becomes unsafe? You can get really sick or you can make others sick. Unsafe food can cause illness. These illnesses have symptoms like vomiting, diarrhea (having to go to the bathroom A LOT), stomach pain and sometimes fever. Sometimes, more serious complications can occur – like kidney failure or even death. Food safety is really important.

Foodborne Illness

- Can be caused by bacterial cells



Salmonella



E. coli O157:H7

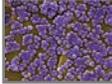


Campylobacter



Listeria

- Can be caused by toxins from certain bacteria



Staph



Clostridium botulinum



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Foodborne illness or as some people call it, “Food Poisoning,” is caused when harmful microorganisms (germs too small to be seen without a microscope) get into food. Some foodborne illnesses are caused by bacteria. With some bacteria like *Salmonella*, *E. coli* O157:H7, *Campylobacter* and *Listeria*, it is the bacterial cell itself that causes illness. With other types of bacteria like *Staph* and *Clostridium botulinum*, it is a toxin or “poison” produced by the cell that causes the illness. Bacteria like warm, moist surroundings with lots of nutrients – like foods! When these foods are held at the wrong temperature for a long enough time, bacteria can increase in number – one cell becomes two cells, two cells become four cells, four cells become eight cells, and so on very quickly, and some can produce toxins.

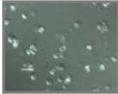
Foodborne Illness

- Can be caused by viruses

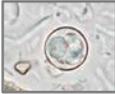


Norovirus

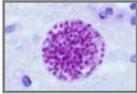
- Can be caused by parasites



Cryptosporidium



Cyclospora



Toxoplasma



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Foodborne illness can also be caused by viruses. Viruses are infectious particles that have to be inside a host cell to make copies of themselves. So viruses don't increase in number in foods. If you get a virus, it means there was enough of the particles contaminating the food to make you sick. So it is very important to keep foods from becoming contaminated. Norovirus is an example and causes many cases of foodborne illness. One good way to prevent it, is handwashing and good hygiene!

Foodborne illness can also be caused by parasites. Parasites can contaminate food and water and make us sick if we drink the water or if we eat foods that are contaminated. The ones we hear about most often are *Cryptosporidium*, *Cyclospora* and *Toxoplasma*. To avoid parasites, towns and cities treat and filter water supplies so they are safe, and people with wells should have their water tested to make sure it is safe. We should always wash our hands after handling pets or visiting petting zoos and always before we touch food, and use only water that is safe to drink to rinse fruits and vegetables before we use them in recipes or eat them.

Goals for Handling Food Safely



Don't let food get contaminated Control growth of bacteria that might be in food

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There are two big goals for keeping food safe:

- Don't let food get contaminated and
- Control the growth of bacteria that might be in food. In other words, handle the food so that we don't let bacteria multiply! Cooling the food is a good way to do this.



Let's look at some basic food safety rules to keep food from getting contaminated. Look closely at this 4-Her as he is preparing his food. What mistakes do you see? How could this 4-Her contaminate his food? Take a few seconds to find his mistakes. Then we will go over the answers.



Look closely at this 4-Her.

- He is wearing a dirty chef's jacket. When preparing food for contests and events, wear clean clothes with a clean apron or clean chef's jacket.
- He has long sleeves that can get in the food he is preparing and leave germs behind. Roll up sleeves so that they do not come in contact with the food you are preparing.
- He has an earring. If the earring gets into the food, it can leave germs behind AND it can also be a physical hazard – causing cuts or choking if gets eaten!
- He has a cut or sore on his finger that can be a source of germs. Anytime you have a cut or sore on your hand OR if you cut your finger while you are preparing food at the contest or event, always get it bandaged it and get a foodservice-type glove to wear over it.
- He is wearing a ring. Remove jewelry before the contest or event begins, and don't wear jewelry when preparing or serving foods in these situations.
- He has cookies and a drink at his work station. Don't eat or drink while preparing or serving food for others. When you eat or drink, your hand is going to your mouth – which can be a source of germs that then get in the food!
- He is chewing gum and blowing bubbles while preparing or serving food. Don't chew gum or blow bubbles when preparing or serving food.

Basic Food Safety Rules –
Don't let food get contaminated!

- Don't prepare food for others if you are sick

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And this rule is really important. If you are sick, then don't prepare food for other people. You can spread germs to the food and to others. Don't prepare food at contests or events if you have had vomiting or had diarrhea or had a fever within the last 24 hours.

Let's Review!



What are some ways that food can become contaminated?

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Let's review what you have learned so far by answering this question. Take a few seconds to come up with your answer, and then we will move on.

What are some ways that food can become contaminated?

Answer

Foods can become contaminated from:

- Dirty clothes
- Dirty hands
- Sores or cuts on hands
- Jewelry
- Handling foods when you are sick

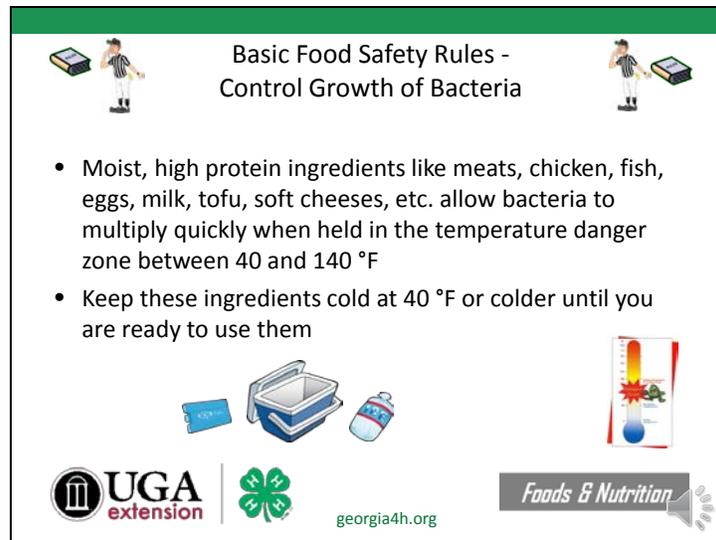


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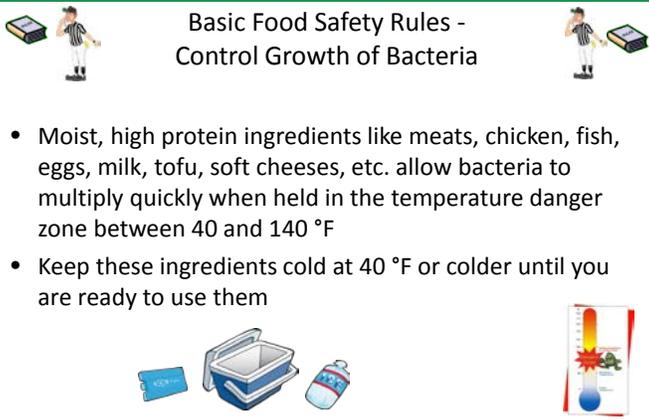
You are correct if you answered these ways:

- By wearing dirty clothes
- By having dirty hands and not washing your hands before handling foods
- By having sores or cuts on your hands and not bandaging and covering them
- By wearing jewelry that can get in the food
- By handling foods when you are sick



**Basic Food Safety Rules -
Control Growth of Bacteria**

- Moist, high protein ingredients like meats, chicken, fish, eggs, milk, tofu, soft cheeses, etc. allow bacteria to multiply quickly when held in the temperature danger zone between 40 and 140 °F
- Keep these ingredients cold at 40 °F or colder until you are ready to use them



  
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No matter how hard we try, sometimes food gets contaminated. One basic food safety rule is to control conditions that allow bacteria to multiply in the food. Moist, protein foods like meats, chicken, fish, eggs, tofu and soft cheeses allow bacteria to multiply quickly if they are held in what we call “the temperature danger zone.” The danger zone is a range of temperatures between 40 °F and 140 °F.

When moist, nutrient-rich foods stay at temperatures between 40 and 140 for too long, then they can become unsafe. Keep ingredients like these cold at 40 °F or colder until you are ready to use them.



Basic Food Safety Rules -
How to get your ingredients
safely to your project site

- Raw ingredients like meats, chicken, fish and eggs can contaminate other foods so keep them separate.
 - Transport these raw ingredients separate from other foods – especially foods that will be eaten without cooking
 - Package raw ingredients securely
 - Keep cold foods cold



  
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Keep raw ingredients like meats, chicken, fish and eggs separate from other foods that can be eaten raw without cooking. Package these food items securely in food storage bags or plastic food storage containers so that they do not touch other foods. Keep them cold. Bring them to your contest or event in a cooler with ice or a freezer gel pack. Dry ingredients and foods that can be eaten without cooking can be carried to the contest in other types of storage containers and do not have to be kept cold.



Basic Food Safety Rules -
And Speaking of Ingredients...

- Use only commercially prepared pasteurized milk, milk products and cheeses
- Use only meat that is USDA inspected
- Use only commercially produced eggs and egg products, including mayonnaise
- Use only commercially canned foods

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Preparing foods that will be served and tasted by attendees at contests and events or preparing foods for groups of people is different from preparing food for yourself and your family at home. Special food safety precautions should be taken in these situations. These precautions, like those used for restaurants and foodservice, are to:

- Use only commercially prepared pasteurized milk, milk products and cheeses
- Use only meat that is USDA inspected and
- Use only commercially produced eggs and egg products, including mayonnaise
- Use only commercially canned foods in your recipes for contests and events --- not foods that have been canned at home.

Let's Review!



What are some basic food safety rules to follow when bringing foods to contests or events?

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Let's review what you have learned by answering this question.

What are some basic food safety rules to follow when bringing foods to contests or events?

Answer

Basic rules include:

- Keep moist, nutrient-rich ingredients like meats, eggs, and cheeses out of the temperature danger zone
- Keep “cold” foods cold ... 40°F or colder
- Transport raw meats and eggs separate from other foods or ingredients that will not get cooked
- Use only commercially made products in recipes for contests and events

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If you answered any of these rules, then you are correct. Basic food safety rules to follow when bringing foods to contests or events include:

Keep moist, nutrient-rich ingredients like meats, eggs, and cheeses out of the temperature danger zone

Keep “cold” foods cold ... 40°F or colder

Transport raw meats and eggs separate from other foods or ingredients that will not get cooked and

Use only commercially made products in recipes for contests and events.



In addition to these basic rules, there are four steps to keep food safe that you should know when preparing foods for your family or for others. These are CLEAN, SEPARATE, COOK and CHILL. Now let's take a closer look at how each of these steps help you prepare and serve safe food.



CLEAN Wash hands and surfaces often

- Always wash your hands before handling food
- Always wash your hands after handling raw foods that must be cooked to be safe
 - Raw meats
 - Raw chicken
 - Raw fish, seafood and shellfish
 - Raw eggs

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One very important step to keeping food safe is to CLEAN.

Always wash your hands before handling food and after handling raw foods that must be cooked to be safe like...

Raw meats

Raw chicken

Raw fish, seafood and shellfish and

Raw eggs

CLEAN Wash hands and surfaces often

- CLEAN surfaces that come in contact with food
- Wash coolers, tables, countertops and cutting boards with hot water and dish detergent and rinse with clean water.
- Sanitizing kitchen wipes can be used to wipe already washed tables and countertops.
 - Wait about 1 minute
 - Rinse surfaces with clean water if they will actually touch food.

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It is also important to clean surfaces that come in contact with or touch food. This means washing coolers, tables, countertops, cutting boards and all your utensils with hot water and dish detergent and rinsing them with clean water. At contests and events, keep your workspace clean. After you have washed your tables and countertops, you can use sanitizing kitchen wipes to give them an extra margin of safety! Sanitizers reduce the number of harmful bacteria that might still be present. The surface should stay wet with the sanitizer for about 1 minute. Then rinse the surface with clean water if it is one that will actually touch food.

CLEAN Wash hands and surfaces often

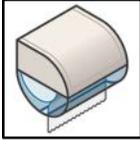
- 1 Tablespoon of plain, unscented chlorine bleach per gallon of water
 - Submerge items for at least 1 minute
 - Use in a spray bottle that is made fresh daily

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A good sanitizer can be made using **1 Tablespoon of plain, unscented chlorine bleach per gallon of water.** You can submerge washed and rinsed items like cutting boards and utensils in this solution for at least 1 minute. You can use this in a spray bottle to spray the item you want to sanitize, but chlorine does evaporate so to keep these the proper strength, they need to be made fresh every day. Remember that chlorine bleach will remove the color from clothes so you have to be very careful if you use it.

clean Wash hands and surfaces often

- Wash dishes, utensils, pots and pans thoroughly with hot water and dish detergent and rinse with clean water.
- Wash the tops of cans before opening.
- Dry with clean paper towels or clean cloth towels.



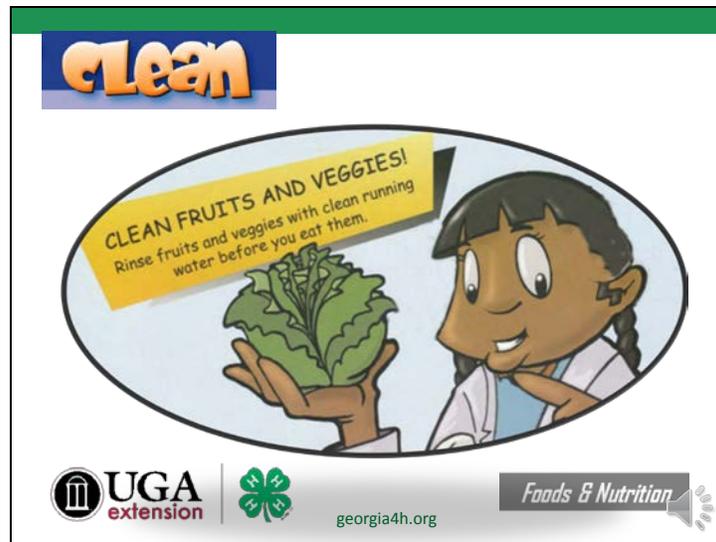
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Cleaning also means that you should:

Wash dishes, utensils, pots and pans thoroughly with hot water and dish detergent and rinse with clean water.

Wash the tops of cans before opening.

Dry with clean paper towels or clean cloth towels.



Always rinse fruits and vegetables with clean, running water before you use them in recipes or eat them.



CLEAN

Rinse fruits and vegetables under clean, running water

- For leafy vegetables like lettuce, wash one or two leaves at a time
- For firm products, use a clean vegetable brush to scrub the surface
- Dry fruits and vegetables with clean paper towels

Photos from U.S. Food and Drug Administration

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- For leafy vegetables like lettuce, wash one or two leaves at a time
- For firm products, use a clean vegetable brush to scrub the surface
- Drying fruits and vegetables with clean paper towels can also help to remove germs that might be present.

Separate Don't cross-contaminate

- Keep raw foods like meats away from ready-to-eat foods
- Use one cutting board for raw meats and a separate one for ready-to-eat foods
- Place cooked foods on clean plates – not on plates with raw juices
- Don't let raw meat juices get onto other foods



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Another important step to keeping food safe is to SEPARATE! When you SEPARATE, you prevent cross-contamination ---

the spread of germs from one food to another or from a surface to a food.

- Keep raw foods like meats away from ready-to-eat foods.
- Use one cutting board for raw meats and a separate one for ready-to-eat foods.
- Place cooked foods on clean plates – not on plates with raw juices.
- Don't let raw meat juices get onto other foods.

Separate Don't cross-contaminate

- Keep raw egg from coming in contact with ready-to-eat foods
 - By keeping them separate from other foods
 - By cleaning your workspace and utensils that come in contact with raw eggs
 - By washing your hands after working with raw eggs



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Also, keep raw eggs from coming in contact with food that is ready to eat.

- Keep raw eggs separate from other foods.
- Clean your workspace and utensils that come in contact with raw eggs.
- Wash your hands after working with raw eggs.

COOK Cook to proper temperatures

- Use a food thermometer to check when foods are cooked enough to be safe

Look for an indented point on the stem – shows how far it must be inserted in food

Dial Gauge

Digital

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Another step that can make food safe is the cooking step. Color is not always an accurate way to tell when foods are safely cooked. Foods must be cooked to a high enough temperature to destroy harmful microorganisms that might be present.

Using a food thermometer takes the guesswork out of cooking and lets you know when foods have reached a high enough temperature to be safely cooked.

There are several types of temperature measuring devices for food, but two types that are least expensive and are widely used are dial gauge food thermometers or digital food thermometers. Dial thermometers must penetrate about 2 to 3 inches into the food. Look for an indentation point on the thermometer stem. If one is present, then that is how far into the food the thermometer must be inserted to get an accurate reading. Most digital thermometers will read the temperature in a small area of the tip. However, always read the directions that come with the thermometer you are using.

Thin foods like burgers or chicken breasts - insert thermometer through side until tip reaches center with entire sensing area immersed

Casseroles, quiches, etc. - insert thermometer in thickest part with entire sensing area immersed and check in at least two places

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For thin foods like burgers or chicken breasts,

COOK

What to do when browning ground beef or ground chicken

Continue Cooking → Continue Cooking → Check for Clear Juice

Since a thermometer will not give an accurate reading in this situation:

- Use a spatula or spoon to break meat into tiny pieces
- Heat transfers more easily through tiny pieces than large pieces
- Continue cooking until there is no pink and juices are clear with no sign of blood
- See the 4-H factsheet: *Cooking Small Pieces of Chicken or Meat*

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Sometimes recipes call for ground meats that get cooked or “browned” like when you make tacos. In these cases, the meat is spread out thinly in a hot skillet. A thermometer will not give an accurate reading in this situation because you have a lot of air spaces and juices between the very small pieces of meat. In these cases:

- Use a spatula or spoon to break meat into tiny pieces.
- Heat transfers more easily through tiny pieces than large pieces.
- Continue cooking until there is no pink and juices are clear with no sign of blood.
- See the 4-H factsheet: *Cooking Small Pieces of Chicken or Meat* for more information about this.

USDA - Consumer Endpoint Cooking Temperatures

145°F	Beef, Lamb, Veal and Pork Steaks, Roasts and Chops <small>Allow meat to rest for 3 minutes before carving or serving</small>
160°F	Ground Beef, Pork, Veal and Lamb; Egg Dishes
165°F	Chicken and Turkey (Whole, Pieces, Ground)
165°F	Leftovers and Casseroles



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Two government agencies, the U. S. Dept. of Agriculture (USDA) and the U.S. Food and Drug Administration (FDA) both have roles in keeping our food supply safe. Both agencies have recommendations for the minimum or lowest temperature products can reach and still be safely cooked. USDA recommended temperatures are shown in this table. For beef, lamb, veal and pork – steaks, roasts and chops should reach at least 145 °F. Allow meats to rest or sit for at least 3 minutes before you carve or serve them. Ground beef, pork, veal and lamb and egg dishes should reach at least 160 °F. Chicken and turkey (whole, pieces or ground) should reach at least 165 °F. Leftovers and casseroles should reach at least 165 °F.

FDA – Foodservice Minimum Endpoint Cooking Temperatures

Pork, beef, veal and lamb
Steaks or chops 145°F for 15 seconds
Roasts 145°F for 4 minutes

Ground meat (including beef, pork and other meat)
155°F for 15 seconds

Poultry (including whole or ground)
165°F for 15 seconds

Seafood (including fish, shellfish, and crustaceans)
145°F for 15 seconds

Cooked Fruit, vegetables, beans, and grains (including rice and pasta)
that will be held for hot service
135°F

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FDA establishes a model food code that states can adopt for restaurants and other foodservice operations. You will notice that the lowest endpoint temperatures recommended by the FDA include a period of time that the food should stay at that temperature to be safe. For example, pork, beef, veal and lamb steaks or chops should reach at least 145 °F and stay at that temperature for 15 seconds. Roasts should reach 145, but stay at that temperature for 4 minutes before slicing or serving. Ground meats (including beef, pork and other meat) should reach 155 °F for 15 seconds. Poultry whether it is whole or ground should reach 165 °F for 15 seconds. Fish, shellfish and crustaceans should reach at least 145 °F for 15 seconds. Any cooked fruit, vegetables, beans or grains like rice and pasta, that will be held for periods of time for hot service, like on a steam table in a cafeteria or a buffet table at an event, should be heated quickly to at least 135 °F before they are held hot for serving.

**Differences in Rules
for Consumers and for Foodservice**

- You can use either for your project, but if judges ask you a question, be prepared to explain which you are using.
- Be sure you know the correct temperature for the food you are preparing.

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So....the recommendations are a little different for consumers at home and for foodservice situations like restaurants.

You can use either for your project, but be prepared to explain which recommendations you are using, and be sure you know the correct temperature for the food you are preparing.



COOK Cook to proper temperatures

- If you cook at home in a microwave oven, follow package directions
- Use a thermometer to check product temperature
- Observe the stand time called for in the directions
- No stand time listed?
 - Wait at least one minute before serving or eating



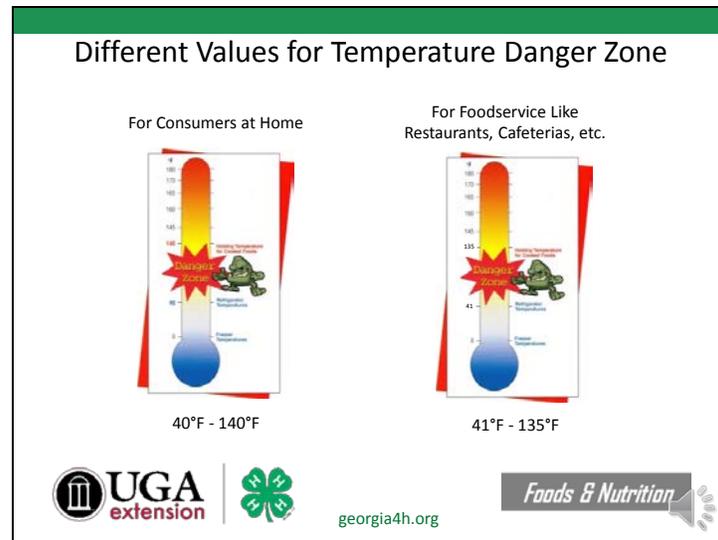
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If you cook at home in a microwave oven, follow package directions carefully.

Use a food thermometer to check product temperature.

Always observe the stand time called for in the directions on the package of food or in your microwave manual.

If there is no stand time listed, then wait at least one minute before serving or eating the food.



Just as there are different endpoint cooking temperatures for consumers at home and for foodservice facilities, there are also different values used for the temperature danger zone. For consumers, USDA uses 40 °F – 140 °F, so don't let moist, nutrient-rich foods stay between those temperatures --- anywhere between 40 and 140. For foodservice facilities, FDA uses 41 °F – 135 °F as the danger zone. In other words, at home, cold foods and leftover foods should be kept cold at 40 °F or colder, and foods that are being held hot for serving should be kept at 140 or above. Restaurants and other foodservice facilities would keep cold foods at 41 °F or colder and keep hot foods at 135 or above for serving.

**Differences in Rules
for Consumers and for Foodservice**

- You can use either range for your project, but be prepared to explain which you are using.
- Be sure you know the correct temperatures for the range you choose to use as the danger zone.

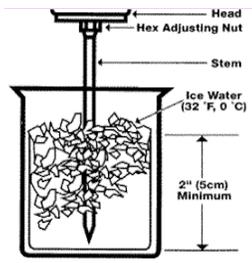
  

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Again, you can use either range for your project, but be prepared to explain which you are using.

Be sure you know the correct temperatures for the range you choose to use as the danger zone.

Thermometers Must Be Calibrated to Read Accurately



- Make a 50/50 mixture of water and ice and stir
- Hold the thermometer in the mixture without touching the sides or bottom of container
- Wait at least 30 seconds
- If temperature does not read 32°F, adjust the nut under the head and take a reading
- Repeat until accurate

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Thermometers must be tested periodically to make sure they are reading accurately. Many can be calibrated if they are not. If you are purchasing a food thermometer, look to see if it is one that you can calibrate. Read the instructions that come with it. To test the thermometer:

-

chill Refrigerate promptly

Refrigerate promptly

- * Use thermometers in your refrigerator and freezer
- * Keep refrigerators at 40°F or colder and freezers at 0°F or colder
- * Put foods back in the refrigerator as soon as you use them
- * Keep cold foods cold on the go in lunch boxes or coolers with ice or a freezer gel pack

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The fourth step in keeping food safe is CHILL!

Cold foods must be kept cold. To refrigerate foods correctly...

- Use thermometers in your refrigerator and freezer to make sure the temperature is correct.
- The temperature in your refrigerator should be 40°F or colder.
- Freezer temperature should be 0°F or colder.
- Always put cold foods back in the refrigerator as soon as you use them.
- Use ice or freezer gel packs to keep foods cold in lunch boxes or coolers.

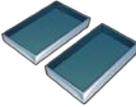
chill Refrigerate promptly

To cool large quantities of hot foods quickly:

- Divide them in shallow containers and refrigerate

OR

- Place a large pot of hot food in a sink with water and ice; stir food until cool before refrigerating



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To cool large quantities of hot foods quickly:

Divide them in shallow containers and refrigerate

OR

Place a large pot of hot food in a sink with water and ice; stir food until cool before refrigerating it.

Let's Review!



What are some ways to keep foods safe using the four food safety rules?

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Let's review what you have learned! I'll give you some time to think of your answer to this question.

What are some ways to keep foods safe using the four food safety rules?

Answer

To keep foods safe:

- Wash hands before handling food
- Wash hands after handling raw meats, poultry, fish and eggs
- Put a bandage on sores or cuts on hands and wear a glove
- Don't wear jewelry
- Don't prepare foods when you are sick

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We have talked about a lot of ways to keep food safe. You could have included these in your answers.

- Wash hands before handling food.
- Wash hands after handling raw meats, poultry, fish and eggs.
- Put a bandage on sores or cuts on hands and wear a glove.
- Don't wear jewelry when preparing or serving food AND
- Don't prepare foods when you are sick.

Answer

To keep foods safe:

- Keep raw foods separate from ready-to-eat foods or foods that do not have to be cooked
- Clean countertops, tables, dishes and utensils with hot water and dish detergent after coming in contact with raw meats or eggs
- Keep cold foods cold
- Cook foods to a safe internal temperature using a food thermometer

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More ways to keep food safe are to:

Keep raw foods separate from ready-to-eat foods or foods that do not have to be cooked.

Clean countertops, tables, dishes and utensils with hot water and dish detergent after coming in contact with raw meats or eggs.

Keep cold foods cold. AND...

Cook foods to a safe internal temperature using a food thermometer.

Serving Food Safely

- Avoid bare hand contact with ready-to-eat foods at contests and events
 - Wear disposable foodservice gloves
 - Use tongs
 - Use long-handled spoons
 - Use bakery tissue



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When you have your food item ready to serve or eat at a contest or event, it is important to avoid handling that food with your bare hands. You can either wear disposable foodservice gloves or you can use tongs, long-handled spoons or other utensils or bakery tissue to touch the food.



For more information on preventing foodborne illnesses and keeping food safe, see the recommended food safety resources on the GA 4-H website. Now that you know how to keep food safe, LET THE CONTESTS BEGIN!

Keeping Food Safe

Food Safety for 4-H Foods Projects

Developed by Dr. Judy Harrison, Professor and Extension Foods Specialist
Dept. of Foods and Nutrition
College of Family and Consumer Sciences

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This module on Food Safety for 4-H Foods Projects has been brought to you by Georgia 4-H and UGA Extension Family and Consumer Sciences, Foods and Nutrition.