Memorial Sloan Kettering Cancer Center

PATIENT & CAREGIVER EDUCATION

Food Safety During Cancer Treatment

This information explains what foodborne illness (food poisoning) is. It also explains how to handle food safely to help prevent foodborne illness.

What is foodborne illness?

Foodborne illness is caused by germs that get into the food you eat. Germs such as bacteria, viruses, or parasites can attach to food and grow. You cannot always see, smell, or taste these germs.

Who is at risk to get foodborne illness?

Foodborne illness can happen to anyone, but some people are more likely to get it than others. People are at higher risk if their immune system is weakened by cancer and cancer treatment.

Some people may need to take extra steps to avoid foodborne illness. This includes people who had a stem cell transplant. Your care team will tell you if this applies to you.

What are the symptoms of foodborne illness?

Symptoms of foodborne illness include:

- Vomiting (throwing up)
- Diarrhea (loose or watery poop)
- Pain in your abdomen (belly)
- Flu-like symptoms, such as:

- A fever above 101.3 °F (38.5 °C)
- A headache
- Body aches
- Chills

Symptoms often happen within 1 to 3 days after eating the contaminated food. They can also happen within 20 minutes or up to 6 weeks later.

Contact your healthcare provider right away if you have any symptoms of foodborne illness.

How can I prevent foodborne illness?

It's important to handle food safely to lower your risk. Foodborne illness can be serious or even deadly.

To help keep yourself safe, follow these 4 simple steps: **clean**, **separate**, **cook**, and **chill**.

Clean your hands and surfaces often

- Wash your hands with warm water and soap for at least 20 seconds:
  - Before and after handling food.
  - After using the bathroom, changing diapers, handling garbage, or touching pets.
- Wash cutting boards, dishes, forks, spoons, knives, and countertops with hot soapy water after preparing each food item.
- Use clean glass, plastic, or wooden cutting boards.
- Use paper towels to clean kitchen surfaces, if you can. Germs can grow on wet or dirty cloth towels and sponges.
  - If you use cloth towels, wash them often using hot water.

    - If you use a sponge, squeeze out all the water after each use. Replace it every 2 weeks.
- Use an antibacterial cleaning spray to clean surfaces. Look for sprays that have bleach or ammonia, such as Lysol® or Clorox®.
- Rinse all fruits, vegetables, and other produce under running water. This includes produce with skins and peels you don't eat, such as bananas and avocados. Scrub firm produce (such as melons, oranges, and lemons) to clean them. If you use a produce brush, clean it every 2 to 3 days. You can put it in your dishwasher or wash it with hot, soapy water.
- Avoid produce that has bruises or blemishes.
- Clean the lids of canned goods before you open them.



Separate raw meats from other foods

- Put raw meats, poultry, and seafood into individual bags in your shopping cart and grocery bags. This will keep any liquids that leak from getting onto other foods.
- Do not store raw meats, poultry, or seafood in your refrigerator above produce or other foods you do not cook before eating.
- Use one cutting board for produce. Use a different cutting board for raw meats, poultry, and seafood.
- Do not use any plate that held raw meat, poultry, seafood, or eggs without washing it first. Wash the plate with hot, soapy water before you use it again.
- Do not reuse marinades used on raw meats, poultry, or seafood unless you heat them to a boil first.



Cook foods to the right temperature

- The best way to tell if food is cooked enough to be safe is to check the internal temperature. That's the temperature of the middle of the food. Food color and texture are not always reliable ways to tell if foods are fully cooked.
- Use a food thermometer to check the internal temperature of meat, poultry, seafood, and egg products as they cook. You must cook these foods to a certain temperature to kill any harmful germs. This is called the safe minimum internal temperature (see Table 1).
- Cook eggs until the yolk and white are firm. Choose recipes that only use eggs that are cooked or heated thoroughly.
- When cooking in a microwave oven:
  - Cover, stir, and turn the food to make sure it's cooked evenly. If the microwave doesn't have a turntable, pause it and turn the food yourself once or twice while it's cooking.
  - Always wait about 10 minutes after the food is done before checking the food's internal temperature with a food thermometer. This lets the food finish cooking.
- When reheating sauces, soups, or gravy, heat them to a boil.
- Eat reheated leftovers within 1 hour.
- Do not reheat leftovers more than once. If you don't finish the food you reheated, throw it away. Do not put it back in the refrigerator.

How do I know when cooked food is safe to eat?

Measure the internal temperature of your food as it's cooking. Different foods must reach a certain internal temperature before they are safe to eat.

Use a food thermometer to measure the internal temperature of your food as it's cooking. Push the thermometer into the center of the food. The numbers on the thermometer will go up slowly. Hold the thermometer in place until the numbers stop going up.

The table below shows the minimum (lowest) internal temperatures for a food to be safe to eat. The temperature on the thermometer should be the same or higher than the temperature in the table. If the temperature is lower than the temperature in the table, keep cooking the food. Once the food reaches the temperature in the table, it's fully cooked and safe to eat.

Type of food	Safe minimum internal temperature
Beef, pork, veal, and lamb (steaks, roasts, and chops)	145 °F (63 °C) with a 3-minute rest time
Beef, pork, veal, and lamb (ground)	160 °F (71 °C)
Poultry, such as chicken, turkey, and duck	165 °F (74 °C)
Egg dishes and sauces	160 °F (71 °C) or until the yolk and white are firm
Fish and shellfish	145 °F (63 °C) and flesh is opaque (not see-through)
Leftovers and casseroles	165 °F (74 °C)

Table 1. Safe minimum internal temperature of foods

Chill foods right away

- Make sure the refrigerator is 40 °F (4 °C) or lower inside.
- Make sure the freezer is 0 °F (-18 °C) or lower inside.
- Refrigerate or freeze meat, poultry, eggs, seafood, and other perishables (foods that can go bad). Do this within 2 hours of cooking or buying them. If the temperature outside is above 90 °F (32 °C), refrigerate or freeze them within 1 hour.
- When it's hot out, keep perishables cold when you bring them home after shopping. Use an insulated bag or a cooler with ice or frozen gel packs.
- Defrost food in the refrigerator, cold water, or a microwave. If you use cold water or a microwave, cook the food right away once it's defrosted. Never defrost food at room temperature, such as on the countertop.
- When you marinate food, always marinate it in the refrigerator.
- Split up large amounts of leftovers into shallow containers before refrigerating them. This helps them cool more quickly.
- Eat leftovers within 2 days.

Common questions

How can I store my groceries safely?

- Keep perishable foods cold if you need to make a stop after grocery shopping. Use an insulated bag or cooler with ice or frozen gel packs to keep them cold.
- Put eggs and milk on a shelf inside the refrigerator. Do not store them in the refrigerator door. Food stays cooler inside the refrigerator than on the door.
- If you use a grocery delivery service:
  - Make sure all refrigerated and frozen items are at a safe temperature when they're delivered.
  - Put these items into the refrigerator or freezer right away.

How can I make safe choices while grocery shopping?

- Check containers for an expiration date. Do not buy the item if the date has passed.
- Do not buy canned, jarred, or boxed foods with dents, swelling, or a broken seal.
- Do not buy foods from self-service bulk containers or bins. This includes nuts, grains, or other items that you portion into containers yourself.
- Pick up cold and frozen foods, such as milk and frozen vegetables, at the end of your shopping trip. This helps limit the time they will be outside of a refrigerator or freezer.

Is it safe to eat at restaurants?

It's safe for most people to eat at restaurants. Follow these guidelines to lower your risk of foodborne illness:

- Choose the restaurant carefully. You can see a restaurant's recent health inspection score by visiting your local Department of Health (DOH) website.

- Order food that's properly cooked. Send back any meat, poultry, fish, or eggs that are undercooked. Food that's steaming hot is usually safer than room temperature and cold foods (such as sandwiches and salads).
- Refrigerate any leftovers within 2 hours of eating out. Reheat them until they're steaming hot (165 °F) and eat them within 2 days.
- Avoid foods that may have raw, unpasteurized eggs. This includes Caesar salad dressing, fresh mayonnaise or aioli, and hollandaise sauce.

Some restaurant foods are riskier than others. These include:

- Foods from buffets and salad bars.
- Food that isn't cooked to order, such as fast food and foods stored under heat lamps.
- Containers used by many people, such as condiments and milk at a cafe.
- Any food handled by employees without gloves or utensils.

Take-out food, delivery food, and food from food trucks can also be riskier. These foods may not be kept hot or cold enough during transit.

If you had a stem cell transplant, you may need to avoid eating at restaurants for about 3 months. Talk with your healthcare provider about when it's safe for you to eat at restaurants.

Is it safe for me to take dietary supplements?

How dietary products are made and stored is not regulated in the United States. This means they can be a health risk (infection or foodborne illness). Dietary supplements can also keep some medications from working as well as they should.

Talk with your MSK healthcare provider before taking any supplements, probiotics, homeopathic remedies, or herbal products. This includes as St. John's wort and traditional Chinese medicines, such as herbs, roots, or seeds.

How do I know if my drinking water is safe?

Tap water from most big cities (such as New York City) is safe to drink. If you're not sure if the tap water in your area is safe, check with your local health department.

Never drink water from lakes, rivers, streams, or springs.

If you use well water that's not tested for bacteria, boil it before you drink it. To do this:

- Bring the water to a rolling boil (large, fast-moving bubbles) for 15 to 20 minutes.
- Store the water in the refrigerator and use it within 48 hours (2 days).
- After 2 days, pour any leftover water down the drain. Do not drink it.

You can also use bottled water instead of well water.

Visit www.epa.gov/privatewells/potential-well-water-contaminants-and-their-impacts for more information about well water.

What foods I should avoid eating?

Some foods are more likely to cause a foodborne illness than others. It's best to avoid:

- Raw or undercooked meat, poultry, seafood (including sushi), eggs, and meat substitutes, such as tempeh and tofu.
- Unpasteurized (raw) milk, cheese, other dairy products, and honey.
- Unwashed fresh fruits and vegetables.
- Raw or uncooked sprouts, such as alfalfa and bean sprouts.
- Cold or uncooked deli meats (cold cuts) and hot dogs. Cooked meats on other foods, such as pepperoni on pizza, are safe to eat.

Infections can also happen when sickness spreads through foods. Visit www.cdc.gov/foodborne-outbreaks to find news about current cases in the

U.S.

A clinical dietitian nutritionist can help you make safe food choices by understanding risks of eating certain foods. Talk with them about the risks of eating the foods in listed in the table below.

Food group	Talk with a clinical dietitian nutritionist about the risks of eating these food items
Milk and dairy	• Milk, cheese, and other dairy products that are not in a refrigerator. • Cheese sliced at a deli counter. These cheeses may be sliced near deli meats. Choose sealed, pre-packaged cheese instead. • Unrefrigerated desserts or pastries with cream fillings or frosting. Choose packaged, shelf-stable products instead. • Soft-serve ice cream, soft-serve yogurt, and ice cream scooped at a restaurant.
Meat, poultry, seafood, and eggs	• Meat sliced at a deli counter. Choose sealed, pre-packaged deli meat instead. • Raw or partially cooked fish and shellfish. This includes caviar, sashimi, sushi, ceviche, and cold smoked seafood, such as lox. • Clams, mussels, and oysters in the shell. • Refrigerated pâtés and meat spreads.
Fruits and vegetables	• Produce that is bruised, dented, or has other markings on it. • Salads and produce from a deli or salad bar. • Pre-cut fruits and vegetables. • Vegetarian sushi, unless you make your own at home. Vegetarian sushi made at a store or restaurant may be prepared near raw fish.
Drinks	• Unpasteurized eggnog, apple cider, or other fruit or vegetable juices. • Fresh-squeezed fruit or vegetable juices, unless you make your own at home. • Unpasteurized beer and wine, such as microbrewery beers and those that aren't shelf-stable. Talk with your doctor before having any alcohol. • Fountain soda and other fountain drinks. • Water from a water fountain or other shared container.
Nuts and grains	• Unroasted nuts in the shell.

Other	• Herbal and nutritional supplements, including probiotic supplements to improve gut health. These usually come in capsule, gummy, powdered, or pill form. • Shared containers used by many people, such as condiments and milk at a coffee shop. • Any unpackaged, communal, or shared food items. This includes free samples or shared non-perishable pantry foods in your home.

If you have questions or concerns, contact your healthcare provider. A member of your care team will answer Monday through Friday from 9 a.m. to 5 p.m. Outside those hours, you can leave a message or talk with another MSK provider. There is always a doctor or nurse on call. If you're not sure how to reach your healthcare provider, call 212-639-2000.

For more resources, visit www.mskcc.org/pe to search our virtual library.

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