Utah Department of
Health & Human Services
Population Health

Environmental Epidemiology Program
Utah Department of Health and Human Services
288 North 1460 West
Salt Lake City, Utah 84116
https://epht.health.utah.gov/

Utah Environmental Epidemiology Program

Food safety for the home

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Food Safety for the Home is a guide produced by the Utah Environmental Epidemiology Program that can help all Utahn's avoid foodborne illness. This report provides an excellent overview of the ways to prevent food poisoning; ranging from information about how to clean your kitchen to how to cook and store your food. The basic actions outlined here can help everyone in their kitchen and home.

In addition to what is provided in this report, you can find more information through Utah's Indicator-Based Information System for Public Health (IBIS-PH) at https://ibis.health.utah.gov and the Utah Environmental Public Health Tracking Network (UEPHTN) at http://epht.health.utah.gov. These free, online resources provide important information about the public health of Utah. If you have any questions related to this report, please do not hesitate to contact us at the Utah Department of Health and Human Services at foodhandler@utah.gov.

I would like to thank all agencies within Utah who share data, maintain public information sources, and promote public and environmental health. Protecting the public health of Utah is a collaborative effort that requires the input of many to achieve a common goal. I hope that you will read this report and use it to promote health in your home and community.

Sincerely,

Dr. Leisha Nolen

Utah State Epidemiologist

Cannon Bldg.: 288 North 1460 West, Salt Lake City, Utah 84116 telephone:
(801) 538-4001 | email: dhhs@utah.gov | web: dhhs.utah.gov

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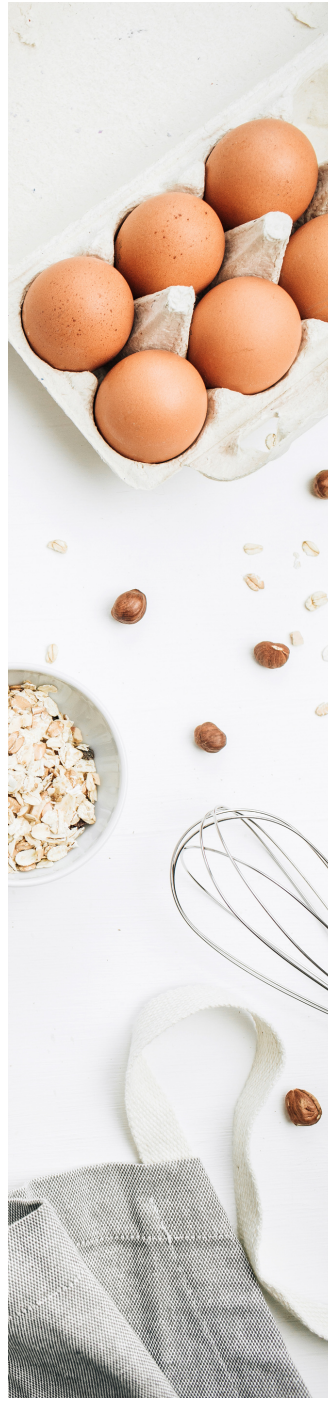
Forward

The objective of this booklet is to inform the reader on important food safety measures to help reduce the risk of foodborne illness when cooking at home. This booklet is meant to be used as a reference in the kitchen to help answer important food safety questions.

This booklet was written by environmental health professionals within the Utah Department of Health and Human Service (DHHS) Environmental Epidemiology Program (EEP).

The DHHS EEP Environmental Public Health Tracking Network helps track data on indicators about foodborne illnesses. You can explore this information and data at: https://epht.health.utah.gov/.

Authors:
The Utah Department of Health and Human Services
Environmental Epidemiology Program
Environmental Public Health Tracking Network



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Why food safety?

"Foodborne illness (sometimes called foodborne disease, foodborne infection, or food poisoning) is a common and expensive public health problem. The Centers for Disease Control and Prevention (CDC) estimates that each year **1 in 6 people get sick** by consuming contaminated foods or beverages, **128,000 are hospitalized**, and **3,000 die** of foodborne diseases in the United States. **More than 250 different foodborne diseases have been described.**"[1] Most of these diseases are infections, caused by a variety of bacteria, viruses, and parasites that can be in food.

Other diseases are poisonings caused by harmful toxins or chemicals that have contaminated the food. An example of this could be poisonous mushrooms or potato salad left unrefrigerated for a long time. These different diseases have many different symptoms, so there is no 1 syndrome that is foodborne illness. However, the microbe or toxin enters the body through the gastrointestinal tract and often causes the first symptoms there.

The most common symptoms of food poisoning include upset stomach, abdominal cramps, nausea and vomiting, diarrhea, fever, and dehydration. Symptoms may range from mild to severe and may differ depending on the germ that is making you sick. Severe cases of food poisoning can cause long-term health problems or death. The Food and Drug Administration's (FDA) Bad Bug Book is an updated list of the major known agents that cause foodborne[2] illness.

There are many different kinds of foodborne diseases and all may require different treatments, depending on the symptoms. Illnesses that are primarily diarrhea or vomiting can lead to dehydration if the person loses more body fluids and salts (electrolytes) than they take in.

Report foodborne illness

Think you got sick from something you ate? Let us know by answering a few questions about your symptoms, places you visited, and what you ate.

Foodborne illnesses can be reported at: **igotsick.health.utah.gov**

Or scan the QR code

"A healthcare provider should be consulted for a diarrheal illness if any of the following symptoms are present: high fever (temperature more than 101.5°F, measured orally), blood in stool, prolonged vomiting that prevents keeping liquids down (which can lead to dehydration), signs of dehydration, including a decrease in urination, a dry mouth and throat, feeling dizzy when standing up, or diarrheal illness that lasts more than three days."[1]

Seek medical advice

Certain individuals are at higher risk of becoming sick or developing serious medical problems if exposed to pathogens in contaminated food. These individuals include:[3]

- Pregnant women
- Adults age 65 and older
- People who have weakened immune systems
- Young children and infants

If you are ill and are at high risk, seek medical attention. You should also seek medical attention if you have severe symptoms such as bloody diarrhea, severe nausea and vomiting, or a high fever.

Adults age 65 and older

"Older adults have a higher risk because as people age, their immune systems and organs don't recognize and get rid of harmful germs as well as they once did. Nearly half of people age 65 and older who have a lab-confirmed foodborne illness from Salmonella, Campylobacter, Listeria, or E. coli need to be hospitalized."[3]

Pregnant women

Pregnant women are more likely than other people to get sick from certain germs. When a pregnant woman gets sick, it also puts the fetus at risk. For example, pregnant women are 10 times more likely to get a Listeria infection.[3]

Children younger than 5 years

"Young children's immune systems are still developing, so their body's ability to fight germs and sickness isn't as strong. Food poisoning can be particularly dangerous for them because illness can lead to diarrhea and dehydration. Children younger than 5 are 3 times more likely to be hospitalized if they get a salmonella infection. Kidney failure occurs in 1 out of 7 children younger than age 5 who are diagnosed with E. coli O157 infection."[3]

People with weakened immune systems

People who have weakened immune systems cannot fight germs and sickness as effectively as those who don't have health complications. This may include those who have diabetes, liver, or kidney disease, alcoholism, and HIV/AIDS; or who receive chemotherapy or radiation therapy. For example, people on dialysis are 50 times more likely to get a listeria infection.[3]

References

1. Utah Department of Health and Human Services (n.d.). *Food Related Diseases and Conditions*. DHHS Population Health. https://epi.health.utah.gov/food-related-disease-conditions/

2. Food and Drug Administration (2012). *Bad Bug Book, Foodborne Pathogenic Microorganisms and Natural Toxins* (2nd ed.). Center for Food Safety and Applied Nutrition. https://www.fda.gov/media/83271/download

3. Centers for Disease Control and Prevention (2019, January 24). *People with a Higher Risk of Food Poisoning.* Food Safety. https://www.cdc.gov/foodsafety/people-at-risk-food-poisoning.html

Clean

Clean means being absent of debris and residue to sight and touch.

Why clean?

Some people are more at risk for illness than others, and an unclean kitchen provides a place where diseases can hide and grow.

At-risk groups include:

- Pregnant women
- Young children
- Older adults
- Anyone who has a weakened immune system

A clean kitchen helps provide uncontaminated food for everyone.

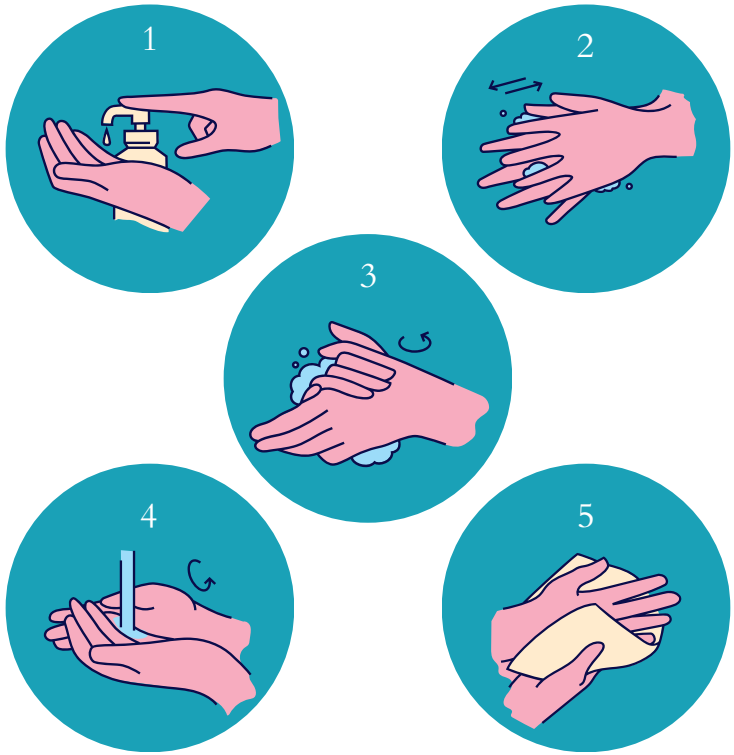
Wash your hands

Handwashing is the most important step to provide uncontaminated food, but 99% of people do not wash their hands correctly.[1] One in 3 individuals use personal electronic devices while cooking and do not wash their hands after touching the device.[1]

Hands should be washed after you handle raw meats or other foods that need to be cooked to be made safe. Hands should also be washed after you use the bathroom, change a diaper, handle pets, after you tend to a sick person, and after you blow your nose, cough, or sneeze. Wash your hands before you handle any foods barehanded.[1]

How to wash hands[2]

1. Wet your hands with warm or cold running water and apply soap.
2. Rub your hands together to make a lather and scrub them well. Be sure to scrub the backs of your hands, between your fingers, and under your nails. Bacteria can hide out here too!
3. Continue scrubbing hands for at least 20 seconds.
4. Rinse your hands well under running water.
5. Dry your hands using a clean towel, paper towel, or air dry.



Wash surfaces and utensils

Use paper towels or clean cloths to wipe kitchen surfaces or spills. Wash wiping cloths often in the hot cycle of your washing machine. Wash cutting boards, dishes, utensils, and countertops with hot, soapy water after you prepare each food item and before you go on to the next item.

Clean before sanitizing[3]

Clean means free from debris and residue to sight and touch. The next step after cleaning is sanitizing; a process that uses chemicals or high temperature to further eliminate harmful germs. Any items that will be sanitized need to be cleaned first. Cleaning removes surface debris, like grease and grime. If the items aren't cleaned first, you'll just sanitize the debris on top of the surface, which allows any dangerous pathogens to survive. Even though cleaning can remove a large number of germs when you remove debris and grease from surfaces, it can still leave enough pathogens to cause someone to get sick.

Sanitizing a surface after cleaning kills the leftover pathogens. For dishes, washing with soap and water, or running through a dishwasher, should be sufficient. For countertops and other places that won't fit in a dishwasher, or need to be cleaned by hand, unscented disinfecting wipes work well. It's especially important to clean and sanitize countertops used to prepare raw meats, or that may have been contaminated with raw meat. Follow the manufacturer's instruction label on cleaning products to ensure surfaces are sanitized correctly and in a way that won't contaminate food.

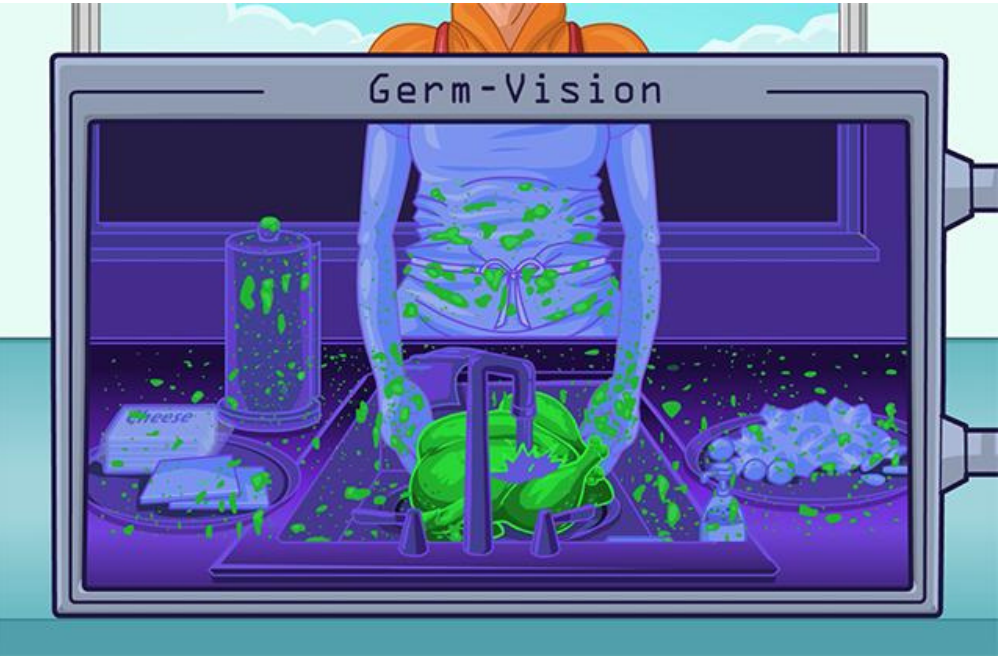
What's different at home than at a restaurant?

Many of the requirements in state and FDA food codes are meant to be applied to operations that serve tens or hundreds of people in a day. With a high volume of people being served, slight mistakes can lead to large consequences, so the standards for sanitation are much more strict. The recommendations in this booklet are based on common restaurant standards, but are modified for a home kitchen serving a much smaller number of people per day.

Do NOT wash meat, poultry, or eggs

Washing raw meat and poultry can help bacteria spread because juices may splash onto (and contaminate) your sink and countertops.

All commercial eggs are washed before sale. Any extra handling of the eggs, such as washing, may actually increase the risk of cross-contamination, especially if the shell is cracked.



Source of image: New Mexico State University, *Don't Wash Your Chicken*

Sponges and rags

The sponge's porous design provides places for germs to hide. When you use sponges to wash dishes, they should only be used to remove food and debris. They should not be used to clean or sanitize dishes, utensils, or kitchen surfaces. It is better to use rags or wiping cloths that are changed frequently. If the rag is stiff, crusty, or smells, change it out! [3]

Pets

Keep pets out of food storage areas and off of kitchen countertops and kitchen tables where food is prepared and served. Clean and sanitize surfaces where pets may have been before you prepare food on them.

References

1. U.S. Department of Agriculture (n.d.). *Food Safety*. Food Safety and Inspection Service. https://www.fsis.usda.gov/food-safety

2. Centers for Disease Control and Prevention (2022, March 14). *When and How to Wash Your Hands*. Handwashing in Community Settings. https://www.cdc.gov/handwashing/when-how-handwashing.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Ffeatures%2Fhandwashing%2Findex.html

3. U.S. Food and Drug Association (2022, March 7). *Food Code 2013*. U.S. FDA. https://www.fda.gov/food/fda-food-code/food-code-2013

Separate

Avoid contamination

Cross-contamination happens when harmful germs (i.e., pathogens) are transferred from surface to surface, food to food, or surface to food. Keep raw foods to themselves, including raw meats, poultry, seafood, and eggs. An example of cross-contamination would be when you prepare raw chicken to be cooked, then you prepare a salad on the same surface or use the same knife.

Why separate?

Even after you've cleaned your hands and surfaces thoroughly, raw meat, poultry, seafood, and eggs can still spread illness-causing bacteria to ready-to-eat foods—unless you keep them separate.

This image shows the meat in the wrong place. It should be on the bottom shelf below the vegetables.

How to separate

Keep raw meat, poultry, seafood, and eggs separate from other foods. Do this in your shopping cart, bags, and refrigerator. In your refrigerator, keep raw meat on the lowest shelf. This prevents juices from the raw meat from dripping onto other foods and contaminating them.

- At the grocery store, place meat products into plastic bags to keep potential leaks from dripping onto other foods.[1]
- When you store food, freeze any raw meats you won't use within the next few days. Keep eggs in the original carton and do not store them in the door.[1]
- When you prepare food, do not reuse marinades used on raw foods unless you bring the marinade to a boil first or intend for it to be fully cooked before service. Don't use any marinade that is not shelf stable and older than 7 days.[1]
- Use a separate cutting board to cut meat and a different cutting board to cut vegetables.[1]

Other concerns

Food should never be handled barehanded when cooking in a restaurant. If you cook at home, avoid touching ready-to-eat foods with your bare hands. If you plan to do so, wash your hands beforehand and between preparing different food items. For example, if you handle raw meats or eggs, wash your hands before you prepare the next food item or handle foods that do not need to be cooked.

References

1. U.S. Department of Agriculture (2008). *Kitchen Companion: Your Safe Food Handbook* (pp. 8-9). Food Safety and Inspection Service. https://www.fsis.usda.gov/sites/default/files/media_file/2020-12/Kitchen-Companion.pdf

Cook to the right temperature

Why cook?

Cooking raw foods reduces the number of harmful pathogens to a safe level. Cooked foods are not considered sterile, which is why any food not commercially packaged should be thrown away after 7 days.[1]

Do all foods need to be cooked?

No. You only need to cook foods considered to have high amounts of harmful pathogens or commonly associated with a foodborne disease, including raw meats, poultry, seafood, and eggs. Most other foods are cooked for quality, not necessarily for safety.

The 3 basic temperatures*

In a restaurant, some requirements can be relaxed if an advisory is posted on the menu (for raw or undercooked meat or fish). In general, food can be considered safe if cooked to these temperatures for 15 seconds. These are based on the current food code adopted in Utah, but may change when a new code is adopted.[2]

- **145°F for raw eggs, fish, and meat***
- **155°F for ground and mixed meats**
- **165°F for poultry, stuffing, and leftovers**

*Please refer to the purple box titled Quality vs. safety to learn more about safe cooking temperatures for meat.

Use a food thermometer

If you don't already have one, consider buying a food thermometer. A digital thermometer with a stem that tapers at the end, and is thin enough for most foods, is usually preferred for general use in a kitchen. Thermometers that are not digital need constant calibration to remain accurate.

When you think your food is done:

- Place the food thermometer in the thickest part of the food. Make sure not to touch bone, fat, or gristle.
- Wait the amount of recommended time for your type of thermometer.
- Compare your thermometer reading to the required minimum temperature for the type of meat to be sure it has reached a safe temperature.
    - Some foods need 3 minutes of rest time after cooking to make sure harmful germs are killed.
- Clean your food thermometer with hot, soapy water after each use.

Keep hot foods hot

Bacteria can still multiply in food as it cools after cooking because the drop in temperature allows bacteria to thrive. To keep your food above the safe temperature of 135°F, use a heat source like a chafing dish, warming tray, or slow cooker.

Microwave cooking

Follow these tips to safely cook food in the microwave:

- Pause the microwave in the middle of the cooking time and stir the food.
- Be sure to let foods rest when stated on the instruction label. When you let microwaved food sit for a few minutes the food cooks more completely because it allows cool spots to absorb heat from hotter areas.
- Any microwaved food cooked for safety should be checked with a thermometer for a minimum temperature of 165°F.

Quality vs. safety

Many raw foods, especially beef products, can benefit from a low and slow style of cooking. Appendix A of the USDA/FSIS Compliance Guidelines provides guidance for safe cooking temperatures of poultry, like turkeys, and other meats when normal temperatures may affect quality. These temperatures are tied to a required time; food can be considered safe if cooked for a certain amount of time at the associated temperature.

Whole muscle meats, like pork and beef, that have not been injected or tenderized, can be cooked to a lower internal temperature as long as there is a visible color change on the outside. Injecting or tenderizing meats can introduce harmful pathogens to the interior of the muscle, which requires higher internal cook temperatures.

Scan the QR code to explore Appendix A of the USDA/FSIS Compliance Guidelines

References

1. U.S. Food and Drug Association (2022, March 7). *Food Code 2013*. U.S. FDA. https://www.fda.gov/food/fda-food-code/food-code-2013

2. Utah Food Service Sanitation. 2016, May 15. *Rule R392-100: Food Service Sanitation Rule (Based on the U.S. Food and Drug Administration's Food Code 2013 with Utah Amendments)*. http://epi.health.utah.gov/wp-content/uploads/2019/08/fda_foodcode.pdf

Keep it cold

Cold temperatures slow the growth of illness-causing bacteria. It's Important to chill food promptly and properly.

What temperature?

Your fridge should be between 41°F and 33°F. Appliance thermometers help you know if your fridge is cold enough.[1] To be sure a fridge works properly, make sure the fridge is not too packed with food. Airflow should be unrestricted. The flow of air is what cools, and keeps cold, items in the fridge. If airflow is restricted, items in the fridge will not be able to stay at the appropriate temperatures. In contrast, when you have a full freezer items will freeze faster and stay frozen longer if power ever goes out.

Time

Make sure perishable foods are put into the fridge or freezer within 2 hours. In the summer months, cut this time down to 1 hour. Perishable foods left out for more than 4 hours (total time out of refrigerator) need to be thrown away.

Keep cold foods cold

Foods that need to be refrigerated should be served quickly or kept cold. Foods prepared using previously cooked warm or hot foods need to be cooled as quickly as possible down to 41°F or below, especially if it is being prepared for later.[2] An example would be preparing potato or macaroni salad to take to a family picnic many hours away.

Get it chilled as quickly as possible

The temperature danger zone is between 41°F and 135°F. Food that is between these measurements in temperature will experience pathogen growth which, if not checked, may pose a health threat. This is especially true for cooked foods. Cooking destroys most of the commonly known foodborne pathogens, but this also provides an opportunity for less competitive pathogens to take root.

- Use smaller, shallow containers to allow food to chill faster.
- Use a lid on hot foods to trap heat and steam so it takes longer for the food to chill down.
- Keep lids or covers on only loosely to allow vapor and heat to escape.
- Remember to store leftovers within 2 hours.
- Marinate foods in the fridge, not on the counter.

Freeze food

- You can freeze almost any food. However, that doesn't guarantee the food will be good to eat later on, or safe to eat.
- Freezing does not destroy harmful bacteria, but it does stop the growth of harmful microorganisms until you can cook it.
- Foods that seem to have been thawed and refrozen repeatedly (look for many ice crystals) can be a sign of temperature abuse while in transit or at the store.
- Freezer burn does not make food unsafe, just dry in spots. It appears as grayish-brown leathery spots and is caused by air coming in contact with the surface of the food. Cut freezer-burned portions away either before or after cooking the food. Heavily freezer-burned foods may have to be thrown away for quality reasons.

Thaw

Thawing food gives pathogens a chance to grow if not done correctly. Never thaw food by letting it sit at room temperature. The food will thaw too unevenly and too slowly; the surface temperature will allow for pathogen growth, but the inside remains frozen.[2]

Methods to thaw food

- **In the fridge.**[3] This is the safest method; it allows for an even thaw that restricts pathogen growth. Small items may defrost in the refrigerator overnight; most foods require a day or 2. Large items like turkeys may take longer, approximately 1 day for each 5 pounds of weight.

- **Under cold water.**[3] Keeps the surface cold to reduce pathogen growth. For faster thawing, place food in a leak proof plastic bag and immerse it in cold water. Check the water frequently to be sure it stays cold (not higher than 70°F). Change the water every 30 minutes, or keep a cold water trickle running continuously. Cook immediately after thawing.

- **In the microwave** (if cooked immediately after).[3] When you defrost food in the microwave, plan to cook it immediately after thawing because some areas of the food may become warm and begin to cook during the microwave process. Uneven thawing provides optimal conditions for pathogen growth.

Pantry

Keep foods off of the floor to reduce the temptation and access to pests and prevent spoilage in case of flooding (when mopping, for example).

This image shows the food stored on shelves and in closed containers. This can help prevent spoilage and reduce access from pests.

Dented cans

Dents can be ignored if minor and not on a seam. Any cans with major damage, or dents on a seam should be avoided and can be returned.

Date labels and expirations

"Most date labels are not based on exact science. Manufacturers generally apply date labels at their own discretion and for a variety of reasons. The most common is to inform consumers and retailers of the date up to which they can expect the food to retain its desired quality and flavor. The key exception to this general rule is for infant formula products. These products are required to bear a use by date, up to which the manufacturer has confirmed the product contains no less than a minimum amount of each nutrient identified on the product label, and that the product will be of an acceptable quality." [4]

Sell by: The date set by the manufacturer to inform the store how long to display the product for sale. It should be purchased before the date expires.[3]

Use before: The date set by the manufacturer to recommend when the food product should be thrown away by the consumer. Recommended for best flavor or quality. It is not a purchase or safety date.[3]

Best if used by: The date by which a food product should be consumed for the best quality according to the manufacturer.[3]

Use by: The date set by the manufacturer to recommend the food product be used by this date or discarded. In other words, the last recommended date to use the product while at peak quality.[3]

Restaurants keep commercially packaged foods until the date listed on the container. Foods made up of many ingredients should be discarded at the earliest listed date or 7 days after preparation, whichever is soonest.

Recalls

Your grocery store should be aware of any recalls. If you happen to have a product that has been recalled, bring it to your grocery store. See the appendix for more information on recalled products.

References

1. U.S. Department of Health and Human Services (2022, January 26). *4 Steps to Food Safety.* Food Safety. https://www.foodsafety.gov/keep-food-safe/4-steps-to-food-safety

2. U.S. Food and Drug Association (2022, March 7). *Food Code 2013*. U.S. FDA. https://www.fda.gov/food/fda-food-code/food-code-2013

3. U.S. Department of Agriculture (2008). *Kitchen Companion: Your Safe Food Handbook* (pp. 10, 16). Food Safety and Inspection Service. https://www.fsis.usda.gov/sites/default/files/media_file/2020-12/Kitchen-Companion.pdf

4. U.S. Food and Drug Association (2019, May 23). *Confused by Date Labels on Packaged Foods*. U.S. FDA. https://www.fda.gov/consumers/consumer-updates/confused-date-labels-packaged-foods

Conclusion

Healthy food habits start at home, and that includes preparing food in a manner that won't make others sick. The recommendations in this booklet will allow you to prepare food for family and friends with confidence.

Glossary

Bacteria: Living single-celled organisms. They can be carried by water, wind, insects, plants, animals, and people. Bacteria survive well on skin and clothes and in human hair. They also thrive in scabs, scars, the mouth, nose, throat, intestines, and room-temperature foods.[1]

Best if used by: The date by which a food product should be consumed for the best quality according to the manufacturer.

Clean: The condition of a surface being visibly free from dirt, soil, stain, leftover food particles, or other materials not intended to be a part of the object in question.

Cross-contamination: The transfer of harmful substances or disease-causing microorganisms to ready-to-eat foods. This can occur from unclean hands, food-contact surfaces (such as a cutting board), sponges, cloth towels, and utensils that touch raw foods and then touch ready-to-eat foods). Cross-contamination can also occur when raw meat touches or drips onto cooked or ready-to-eat foods.[1]

Disinfect: The use of a chemical to kill viruses and bacteria on surfaces. This may include disinfectant wipes or products advertised to kill 99.99% of pathogens.[2]

Foodborne illness: A disease carried or transmitted to humans by food containing harmful substances.[1]

Food poisoning: A term commonly used by the media and the public to mean either actual poisoning, or intoxication, or an infection of a foodborne pathogen.

Immunocompromised: A weakened immune system.

Microorganisms: A small life form, seen only through a microscope, that may cause disease. Examples: bacteria, fungi, parasites, or viruses.[1]

Parasite: A microorganism that needs a host to survive such as Cryptosporidium and Toxoplasma.[1]

Pathogen: A microorganism that is infectious and causes disease.[1]

Ready-to-eat foods: Food that does not need additional preparation to be safe to eat.

Sanitize: The application of cumulative heat or chemicals on cleaned food-contact surfaces that will provide a 99.999% reduction of representative disease microorganisms of public health importance. Not meant to kill viruses.[2]

Sell by: The date set by the manufacturer to inform the store how long to display the product for sale. Should be purchased before the date passes.

Sterilize: A process that destroys or eliminates all forms of microbial life and is carried out by physical or chemical methods. Normally carried out in healthcare facilities and not food facilities. Some sterilizing methods include steam under pressure, dry heat, EtO gas, hydrogen peroxide gas plasma, and liquid chemicals.

Time/temperature control for safety (TCS) foods: Foods that are not safe for consumption without additional preparation. This includes raw meat, eggs, and poultry.

Use before: The date set by the manufacturer which recommends when the food product should be discarded by the consumer. Recommended for best flavor or quality. It is not a purchase or safety date.

Use by: The date set by the manufacturer to recommend the food product be used by this date or discarded. The last recommended date for the use of the product while at peak quality.

Virus: A protein-wrapped genetic material which is the smallest and simplest life-form known such as norovirus and hepatitis A.[1]

Glossary references

1. Partnership for Food Safety Education (n.d). *Food Safety Glossary*. Partnership for Food Safety Education. https://www.fightbac.org/food-poisoning/food-safety-glossary/

2. U.S. Environmental Protection Agency (2022, July 5). *What's the difference between products that disinfect, sanitize, and clean surfaces?*. Coronavirus. https://www.epa.gov/coronavirus/whats-difference-between-products-disinfect-sanitize-and-clean-surfaces

Appendix A

Additional information

Alternate cooking time and temperatures

USDA/FSIS Appendix A

This guideline provides information on the USDA's regulatory requirements associated with safe production of ready-to-eat (RTE) products with respect to the destruction of Salmonella and other pathogens. It applies to small and very small meat and poultry official establishments although all meat and poultry establishments may apply the recommendations in this guideline.

This guide may be used when you need to use a combination of time and temperature instead of the typically recommended cooking temperatures (for low and slow cooking).

Scan the QR code to explore Appendix A of the USDA/FSIS Compliance Guidelines

Recalls

If you have questions about a recalled food product, contact your local grocery store or where your food item was purchased.

Information on government agency product recalls

FDA U.S. FOOD & DRUG ADMINISTRATION

The U.S. Food and Drug Administration (FDA) website lists product recalls, alerts, and warnings.

Scan the QR code for more information

USDA

The U.S. Department of Agriculture (USDA) Food Safety and Inspection Service website lists recalls on meat and poultry products.

Scan the QR code for more information

Food safety by events and seasons

Whether you plan a small summer cookout or a big holiday celebration, a camping trip or a potluck dinner, make sure your plans include food safety.

- Parties and large groups
- Back to school
- Spring holidays
- Summer vacation
- Super bowl
- Thanksgiving
- Weddings
- Winter holidays
- Food safety in a disaster or emergency

Scan the QR code to learn how to safely prep food for events

Resources

FoodSafety.gov

4 steps to food safety (US DHHS)
Learn how you can help keep your family safe from food poisoning at home by following these 4 simple steps: clean, separate, cook, and chill.

FDA U.S. FOOD & DRUG ADMINISTRATION

Barbecue basics
Tips to prevent foodborne illness. Bacteria in food multiply faster at temperatures between 40°F and 140°F, so summer heat makes the basics of food safety especially important.

USDA

Food safety (USDA)
Take steps to ensure your food is safe by learning how to buy, prepare, and store food safely. Stay informed about recalls and report any food poisoning to the appropriate authorities.

Resources continued

USDA

Kitchen Companion handbook (PDF)

This food safety handbook was written by the U.S. Department of Agriculture and contains all the basic information you need to know about food safety: some old, some new, and all in one place.

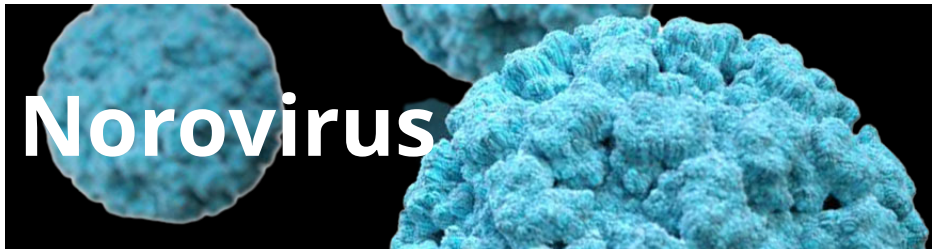
FDA U.S. FOOD & DRUG ADMINISTRATION

Date labels

Confused by date labels on packaged foods? Here's how to know if your food is still good to eat while also reducing waste in your home.

Appendix B

Overview of major foodborne pathogens



Source of image: Centers for Disease Control and Prevention, 2021, *About Norovirus*

Classification	Norovirus is a very contagious virus.
Transmission	You can get norovirus from: • Direct contact with an infected person • Consuming contaminated food or water • Touching contaminated surfaces and then putting your unwashed hands in your mouth
Symptoms	The most common symptoms are: • Diarrhea • Vomiting • Nausea • Stomach pain
Treatment	There is no specific medication to treat norovirus. The biggest concern with norovirus is dehydration. Drink plenty of fluids to prevent dehydration from vomiting and diarrhea. Severe dehydration may require hospitalization.
Prevention	Protect yourself and others from norovirus: • Wash your hands often • Rinse fruits and vegetables • Cook shellfish thoroughly • Stay home when you're sick and for 2 days after symptoms stop • Avoid preparing food for others when sick and for 2 days after symptoms stop
Learn more	**Scan the QR code to learn more** DHHS—norovirus CDC—norovirus

"Norovirus can be especially challenging to control on cruise ships because of the close living quarters, shared dining areas, and rapid turnover of passengers."

CDC, 2021, Common settings of Norovirus Outbreaks

Salmonella

Classification	Salmonella are a diverse group of **bacteria** that make people sick.
Transmission	Salmonella lives in the intestines of people and animals. People can get Salmonella infection from a variety of sources, including: • Eating contaminated food or drinking contaminated water • Touching infected animals, their feces, or their environment
Symptoms	Symptoms usually start sometime between 6 hours and 6 days after infection and last 4 to 7 days. Most people with a Salmonella infection experience: • Diarrhea (that can be bloody) • Fever • Stomach cramps Some people may also have nausea, vomiting, or a headache.
Treatment	Most people recover from Salmonella infection within 4 to 7 days without antibiotics. People who are sick with a Salmonella infection should drink extra fluids as long as diarrhea lasts.
Treatment continued	Antibiotic treatment is recommended for: • People with severe illness • People who have a weakened immune system, such as from HIV infection or chemotherapy treatment • Adults older than 50 who have medical problems, such as heart disease • Infants (children younger than 12 months) • Adults age 65 or older
Prevention	Salmonella can be found in many foods and can spread from animals to people. Always wash your hands after contact with animals and after you use the toilet, change diapers, or after you help someone who has diarrhea. The most effective prevention is to refrigerate or freeze all perishable foods, prepared foods, and leftovers within 2 hours. This lowers to 1 hour if the temperature outside is 90 degrees or hotter, since salmonella grows more quickly in these conditions
Learn more	**Scan the QR code to learn more** DHHS—Salmonella CDC—Salmonella

Clostridium Perfringens

Source of image: Centers for Disease Control and Prevention, 2021, *Prevent Illness from C. Perfringens*

Classification	Clostridium perfringens **bacteria** are one of the most common causes of foodborne illness (food poisoning).
Transmission	C. perfringens cannot be passed from one person to another. Foods more likely to become infected with C. perfringens are those cooked then cooled improperly, such as pasta or grains, beef, poultry, gravies, and dried or pre-cooked foods. C. perfringens can survive at high temperatures as a spore then grows once food begins to cool. When foods are kept warm (54°F–140°F) for long periods of time, C. perfringens colonies can grow. If food has been temperature abused, live bacteria may be consumed. Although this is more common in cafeterias and restaurant buffet settings, large at-home potlucks or catered meals for holidays or parties might result in food being warmed and left out for long periods of time.
Symptoms	Sudden onset of diarrhea and abdominal cramps occur within 8-12 hours of infection. Symptoms usually resolve within 24 hours. Fever or vomiting are uncommon.
Treatment	Most people recover from C. perfringens infection without antibiotic treatment. Patients should drink extra fluids as long as diarrhea lasts.

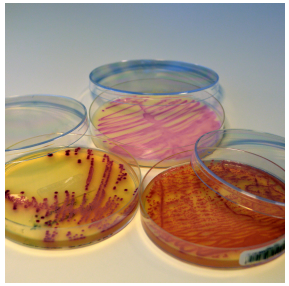
Prevention	• Cook food to a safe temperature, especially beef roasts and whole poultry.
	• After food is cooked, keep it at 140°F or warmer or 40°F or colder if it will not be served and eaten soon.
	• Refrigerate leftovers at 40°F or colder within 2 hours after cooking the food or within 2 hours after removing it from an appliance that keeps it at a safe temperature. Refrigerate within 1 hour if the outside temperature is above 90°F.
	  ◦ It is okay to put hot foods directly into the refrigerator if you don't cover it until steam stops coming off and you stir the food occasionally.
	  ◦ Divide large pots of food, such as soups and stews, and large cuts of meats, such as roasts, into small quantities for refrigeration. This helps food cool quickly enough to prevent bacteria from growing.
	• Reheat leftovers to at least 165°F before serving.

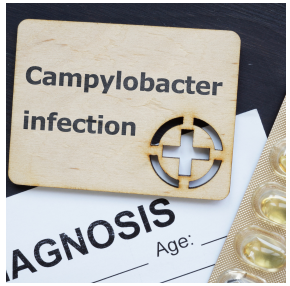
Learn more	**Scan the QR code to learn more**

Source of image: Centers for Disease Control and Prevention, 2021, *Campylobacter (Campylobacteriosis)*

Classification	Campylobacteriosis is an infectious disease caused by the **bacteria** Campylobacter.
Transmission	Campylobacter does not usually spread from one person to another. Most Campylobacter infections are probably acquired by eating raw or undercooked poultry or eating something that touched it. Campylobacter is also transmitted by other foods, including seafood, meat, and produce; by contact with animals; and by drinking untreated water. People can get infected when a cutting board that has been used to cut and prepare raw chicken isn't washed before it is used to prepare foods that are served raw or lightly cooked, such as salad or fruit. People can also get infected through contact with dog or cat feces. Very rarely, people have become infected through a transfusion of contaminated blood.
Symptoms	Diarrhea (often bloody), fever, and stomach cramps are the most common symptoms. Symptoms usually start within 2-5 days of exposure and resolve within a week.
Symptoms continued	More serious illness can result in complications such as irritable bowel syndrome, temporary paralysis, and arthritis. In people who have weakened immune systems, such as those with HIV or receiving chemotherapy, Campylobacter occasionally spreads to the bloodstream and causes a life-threatening infection.
Treatment	Most people recover from Campylobacter infection without antibiotic treatment. Patients should drink extra fluids as long as diarrhea lasts. Some people with, or at risk for, severe illness might need antibiotic treatment. These people include those who are 65 years or older, pregnant women, and people who have weakened immune systems, such as those with a blood disorder, AIDS, or who receive chemotherapy.
Prevention	Eating raw or undercooked poultry, or something that has been in contact with raw or undercooked poultry increases the risk for Campylobacter infection. Contaminated seafood, meat, and produce can also transmit Campylobacter. Campylobacter is also a common raw milk contaminant. People can also be infected through contact with infected livestock.
Learn more	**Scan the QR codes to learn more** DHHS—Campylobacter CDC—Campylobacter

Antibiotic-resistant Campylobacter





Antibiotic resistance is when germs (such as bacteria or fungi) develop the ability to defeat the antibiotics designed to kill them. It does not mean your body is resistant to antibiotics.

Antibiotic-resistant strains of Campylobacter are an increasing concern in the US. Most people with Campylobacter infection don't need antibiotics. They should drink plenty of fluids to remain hydrated while diarrhea lasts and their illness will resolve naturally. Reducing the use of unnecessary antibiotics is the most effective way to stop the increase in antibiotic-resistant bacteria.

If someone becomes sick enough to require antibiotics, there are 2 types of antibiotics that can be taken to treat Campylobacter infections: ciprofloxacin and azithromycin. Unfortunately, the percentage of Campylobacter with decreased susceptibility to ciprofloxacin has almost doubled in 20 years, which limits treatment options for patients.

There are 2 primary reasons for the increase in antibiotic resistance

Reason 1

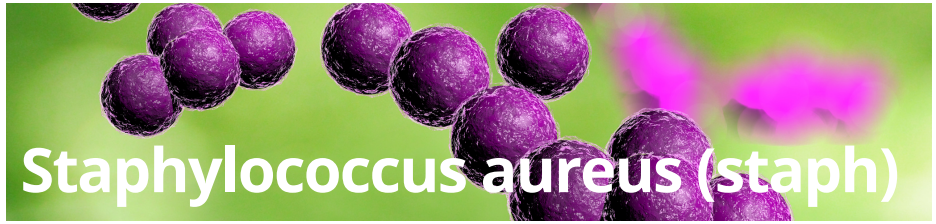
Taking antibiotics when they are not necessary increases the prevalence of antibiotic resistant bacteria by shifting survival pressures in favor of antibiotic resistant strains.
As a result, azithromycin is now the antibiotic of choice for treating campylobacter, but if azithromycin resistant strains develop there is not currently an alternative treatment.

Reason 2

Many industrial farm operations also add antibiotics like ciprofloxacin to their animal feed. This prevents many infections, but increases the likelihood that the ones that do occur are of the antibiotic resistant strain.

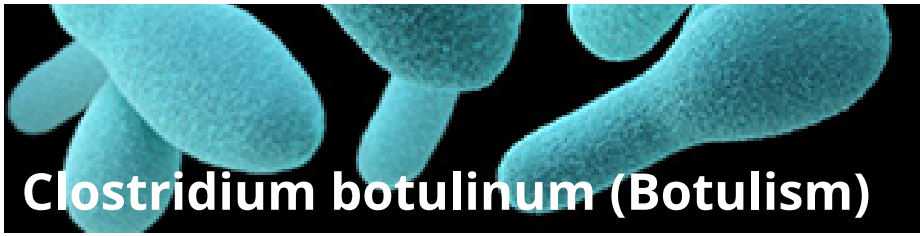
The FDA has now withdrawn its approval for using fluoroquinolones, the class of antibiotic that includes ciprofloxacin, for poultry.

Scan the QR code to read more about antibiotic-resistant Campylobacter



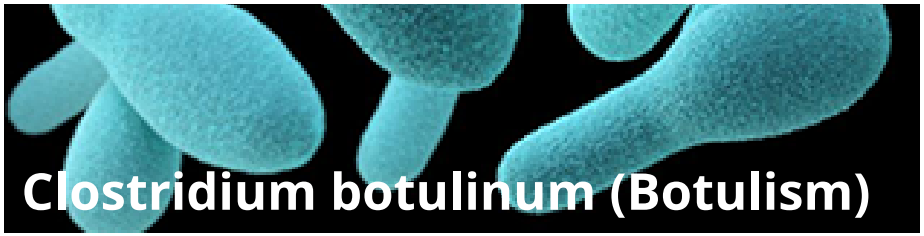
Staphylococcus aureus (staph)

Classification	Staph food poisoning is a gastrointestinal illness caused by eating foods contaminated with toxins produced by the bacterium Staphylococcus aureus (staph) **bacteria**.
Transmission	The illness cannot be passed from one person to another. People who carry staph can contaminate food if they don't wash their hands before touching it. If food is contaminated with staph, the bacteria can multiply in the food and produce toxins that can make people ill. Staph bacteria are killed by cooking, but the toxins are not destroyed and will still be able to cause illness. Foods that are not cooked after handling, such as sliced meats, puddings, pastries, and sandwiches, are especially risky if contaminated with staph. Food contaminated with staph toxin may not smell bad or look spoiled.
Symptoms	Symptoms usually develop within 30 minutes to 8 hours after eating or drinking an item containing staph toxin, and last no longer than 1 day. Severe illness is rare. Staph food poisoning is characterized by a sudden start of nausea, vomiting, and stomach cramps. Most people also have diarrhea.
Treatment	The most important treatment is to drink plenty of fluids. Your healthcare provider may give you medicine to decrease vomiting and nausea. People with severe illness may require intravenous fluids. Antibiotics are not useful in treating this illness because the toxin is not affected by antibiotics.
Prevention	• Use a food thermometer and cook foods to their safe minimum internal temperature. • Keep hot foods hot (140°F or hotter) and cold foods cold (40°F or colder). • Store cooked food in wide, shallow containers and refrigerate within 2 hours (or 1 hour if it's warmer than 90° F outside). • Wash your hands for 20 seconds with soap and water before, during, and after preparing food, and before eating. • Do not prepare food if you are ill with diarrhea or vomiting. • Wear gloves while preparing food if you have wounds or infections on your hands or wrists.
Learn more	**Scan the QR code to learn more**



Source of image: Centers for Disease Control and Prevention, 2021, *About Botulism*

Classification	Botulism is a rare but serious illness caused by a toxin made by the Clostridium botulinum bacteria. The toxin can sometimes be caused by the Clostridium butyricum and Clostridium baratii bacteria.
Transmission	Foodborne botulism is a food poisoning caused by a toxin produced by the bacteria, Clostridium botulinum. It occurs naturally in soil. It is not spread person-to-person. A person must eat contaminated food that has not been properly cooked or reheated after the toxin has been produced by the bacteria. This toxin does not have a bad odor or taste to food. Botulism is most commonly associated with low-oxygen food environments that have been poorly prepared or temperature abused. Many cases of foodborne botulism happen after people eat home-canned, preserved, or fermented foods that were contaminated with toxin. The foods might have become contaminated if they were not canned (processed) correctly.
Symptoms	Symptoms usually begin 18 to 36 hours after consuming the toxin. Symptoms are a result of muscle paralysis, which can progress into full paralysis of some muscles when left untreated. • Difficulty swallowing • Muscle weakness • Double vision • Drooping eyelids • Blurry vision • Slurred speech • Difficulty breathing • Difficulty moving the eyes
Treatment	Doctors treat botulism with a drug called an antitoxin, which prevents the toxin from causing any more harm. Antitoxin does not heal the damage the toxin has already done. Depending on how severe your symptoms are, you may need to stay in the hospital for weeks or even months before you are well enough to go home. If your disease is severe, you may have breathing problems. You may even have respiratory (breathing) failure if the toxin paralyzes the muscles involved in breathing. If that happens, your doctor may put you on a breathing machine (ventilator) until you can breathe on your own. The paralysis caused by the toxin usually improves slowly. The medical and nursing care you receive in the hospital is to help you recover. People with wound botulism sometimes need surgery to remove the source of the bacteria and may need to take antibiotics.



Source of image: Centers for Disease Control and Prevention, 2021, *About Botulism*

Prevention	If you preserve, can, or ferment your own foods, you can reduce the chance of these foods giving you, your family, or friends botulism. • Follow safe home canning instructions as recommended by the U.S. Department of Agriculture in the USDA Complete Guide to Home Canning • Follow all instructions for washing, cleaning, and sterilizing items used in canning • Use pressure canners for low-acid foods like potatoes, most other vegetables, and meats Everyone can reduce their chances of getting botulism. • Refrigerate homemade oils infused with garlic or herbs and throw away any unused oils after 4 days. • Keep potatoes that have been baked while wrapped in aluminum foil hot (at temperatures above 140°F) until they are served, or refrigerate them with the foil loosened. • Refrigerate any canned or pickled foods after you open them.
Prevention continued	Most infant botulism cases cannot be prevented because the bacteria that causes the disease is in soil and dust. The bacteria can be found inside homes on floors, carpet, and countertops—even after cleaning. **Honey can contain the bacteria that causes infant botulism, so do not feed honey to children younger than 12 months.** Honey is safe for people 1 year of age and older.
Learn more	**Scan the QR code to learn more** DHHS—Botulism CDC—Botulism

Honey can contain the bacteria that causes infant botulism, so do not feed honey to children younger than 12 months.

Source of image: Centers for Disease Control and Prevention, 2022, *Listeria (Listeriosis)*

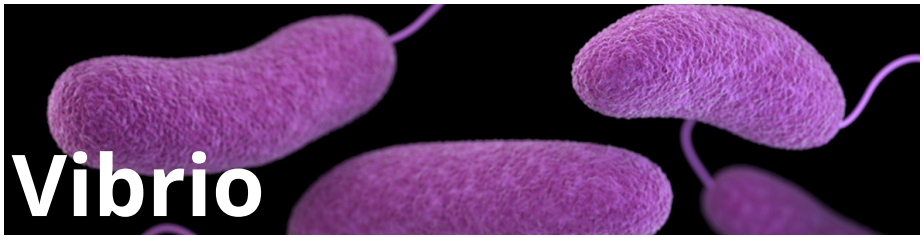
Classification	Listeriosis is a serious infection usually caused by eating food contaminated with the Listeria monocytogenes bacteria.
Transmission	Listeriosis is usually caused by eating food contaminated with listeria monocytogenes. If infection occurs during pregnancy, listeria bacteria can spread to the baby through the placenta. Infection during pregnancy usually leads to miscarriage, stillbirth, premature delivery, or life-threatening infection of the newborn.
Symptoms	**An infection of Listeria can be in the intestines, or be invasive, meaning it has spread beyond the intestines.** Signs and symptoms of Listeria infection vary depending on the person infected and the part of the body affected. • Intestinal infection: Symptoms of intestinal illness are diarrhea and vomiting. Symptoms usually start within 24 hours after eating food contaminated with Listeria and usually last 1–3 days. This kind of illness is rarely diagnosed because laboratories do not regularly test patient stool (poop) samples for Listeria.
Symptoms continued	• Invasive infection: Symptoms of invasive infection are fever and flu-like symptoms, such as muscle aches and fatigue. Symptoms usually start within 2 weeks after eating food contaminated with Listeria.
Treatment	**An infection of Listeria can be in the intestines, or be invasive, meaning it has spread beyond the intestines.** Intestinal infection: Most people recover from intestinal illness without antibiotic treatment. Antibiotics are needed only for patients who are very ill or at risk of becoming very ill. People who have an intestinal illness should drink extra fluids while they have diarrhea. Invasive infection: People with an invasive illness are treated with antibiotics.
Prevention	• Know which foods are risky and avoid these foods. • Avoid drinking raw (unpasteurized) milk or eating soft cheeses made from it. • Be aware that soft cheeses made from unpasteurized milk, such as queso fresco, have caused Listeria infections. This is likely because they were contaminated when the cheese was made. • Heat deli meats and hot dogs until steaming hot before eating. • Refrigerate leftovers within 2 hours in shallow, covered containers and use within 3 to 4 days. • Avoid cross-contamination in the refrigerator or other places in the kitchen. • Use a thermometer to make sure your refrigerator is 40°F or lower and your freezer is 0°F or lower.

Listeria (Listeriosis)

Pregnant individuals	Not Pregnant individuals
Symptoms: Fever, flu-like symptoms including muscle aches and fatigue	**Symptoms:** Fever, flu-like symptoms including muscle aches and fatigue, headache, stiff neck, confusion, loss of balance, seizures
Severity: Symptoms in pregnant people are usually mild. Some pregnant people never have symptoms. However, infection during pregnancy usually leads to miscarriage, stillbirth, premature delivery, or life-threatening infection of the newborn.	**Severity:** Symptoms in non-pregnant people can be severe. Almost 1 in 20 non-pregnant people with invasive listeriosis die.

Learn more	Scan the QR code to learn more
	DHHS—Listeriosis CDC—Listeriosis

Infection during pregnancy usually leads to miscarriage, stillbirth, premature delivery, or life-threatening infection of the newborn.



Source of image: Centers for Disease Control and Prevention, 2019, *Vibrio Species Causing Vibriosis*

Classification	Vibriosis is an illness caused by the vibrio bacteria.
Transmission	Most people become infected by eating raw or undercooked shellfish, particularly oysters. Certain vibrio species can also cause a skin infection when an open wound is exposed to saltwater or brackish water. Brackish water is a mixture of fresh and saltwater. It is often found where rivers meet the sea.
Symptoms	When ingested, vibrio bacteria can cause: • Watery diarrhea • Nausea • Chills • Vomiting • Fever • Abdominal cramping Usually these symptoms occur within 24 hours of ingestion and last about 3 days. Severe illness is rare and typically occurs in people who have a weakened immune system. Vibrio bacteria can also cause a skin infection when an open wound is exposed to saltwater or brackish water. Brackish water is a mixture of fresh and saltwater. It is often found where rivers meet the sea.
Treatment	Treatment is not necessary in mild cases, but patients should drink plenty of liquids to replace fluids lost through diarrhea. Although there is no evidence that antibiotics decrease the severity or duration of illness, they are sometimes used in severe or prolonged illnesses.
Prevention	You can reduce your risk of vibriosis by following these tips: • Don't eat raw or undercooked oysters or other shellfish. Cook them before eating. • Always wash your hands with soap and water after you handle raw shellfish. • Avoid contaminating cooked shellfish with raw shellfish and its juices. • Stay out of saltwater or brackish water if you have a wound (including from a recent surgery, piercing, or tattoo), or cover your wound with a waterproof bandage if there's a possibility it could come into contact with saltwater or brackish water, raw seafood, or raw seafood juices. Brackish water is a mixture of fresh and saltwater. It is often found where rivers meet the sea. • Wash wounds and cuts thoroughly with soap and water if they have been exposed to seawater or raw seafood or its juices. • If you develop a skin infection, tell your medical provider if your skin has come into contact with saltwater or brackish water, raw seafood, or raw seafood juices.
Learn more	Scan the QR code to learn more about Vibrio →

Escherichia coli

Classification	The term E. coli covers a wide range of similar bacteria. For food safety there is special emphasis on Shiga-toxin producing E. coli (STEC).
Transmission	Infections start when you swallow STEC—in other words, when you get tiny (usually invisible) amounts of human or animal feces in your mouth. Unfortunately, this happens more often than we care to think about. Exposures that result in illness include consumption of contaminated food, consumption of unpasteurized (raw) milk, consumption of water that has not been disinfected, contact with cattle, or contact with the feces of infected people. People have gotten infected by swallowing lake water while swimming, touching the environment in petting zoos and other animal exhibits, and by eating food prepared by people who did not wash their hands well after using the toilet. Almost everyone has some risk of infection.
Symptoms	Most people with a STEC infection start feeling sick 3 to 4 days after eating or drinking something that contains the bacteria. However, illnesses can start anywhere from 1 to 10 days after exposure. Most people get better within 5 to 7 days. Some infections are very mild, but others are severe or even life-threatening. Symptoms of Shiga toxin-producing E. coli (STEC) infection vary for each person, but often include: • Severe stomach cramps • Diarrhea (often bloody) • Vomiting • Fever (usually less than 101°F/38.5°F) Contact your healthcare provider if you have diarrhea that lasts for more than 3 days or diarrhea accompanied by a fever higher than 102°F, bloody diarrhea, or so much vomiting that you cannot keep liquids down and you pass very little urine. **Hemolytic uremic syndrome (HUS)** About 5 to 10% of people who are diagnosed with STEC infection develop a potentially life-threatening complication known as hemolytic uremic syndrome (HUS). HUS develops about 7 days after symptoms first appear, when diarrhea is improving. Clues that someone is developing HUS include decreased frequency of urination, feeling very tired, and losing pink color in cheeks and inside the lower eyelids. People with HUS should be hospitalized because their kidneys may stop working and they may develop other serious problems. Most people with HUS recover within a few weeks, but some suffer permanent damage or die.

Escherichia coli

Treatment	Non-specific supportive therapy, including hydration, is important. Antibiotics should not be used to treat this infection. There is no evidence that treatment with antibiotics is helpful and taking antibiotics may increase the risk of HUS. Antidiarrheal agents like Imodium may also increase that risk.
Prevention	• Wash your hands thoroughly after you use the bathroom, change diapers, before you prepare or eat food, and after contact with animals or their environments (farms, petting zoos, fairs, even your own backyard). • Cook meats thoroughly. Ground beef and meat that has been needle-tenderized should be cooked to a temperature of at least 160°F/70°C. It's best to use a thermometer, as color is not a very reliable indicator of doneness. • Avoid raw milk, unpasteurized dairy products, and unpasteurized juices (like fresh apple cider). • Avoid swallowing water when swimming or playing in lakes, ponds, streams, swimming pools, and backyard kiddie pools.
Prevention continued	• Prevent cross-contamination in food preparation areas by thoroughly washing hands, counters, cutting boards, and utensils after they touch raw meat.
Learn more	**Scan the QR code to learn more** DHHS—E. coli CDC—E. coli E. coli and food safety