



Food Poisoning

By

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The background features several large, stylized, overlapping swirls in shades of purple, green, and blue. Scattered throughout are numerous small, yellow, triangular shapes that resemble confetti or starbursts.

Food Poisoning → food borne illnesses

➤ **Microbial Food Poisoning**

➤ **Chemical Food Poisoning**




What is food borne illnesses ?

*microbial food borne illnesses are caused by eating food or drinking beverages contaminated with bacteria, parasites, or viruses.

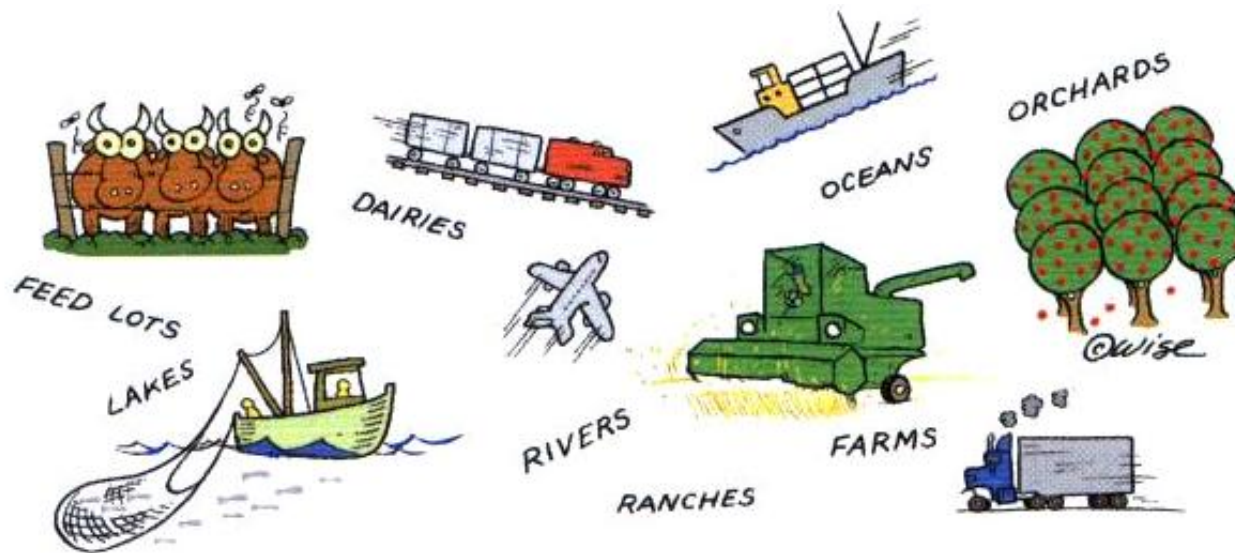
*Harmful chemicals can also cause microbial food borne illnesses if they have contaminated food during harvesting or processing.

*microbial food borne illnesses can cause symptoms that range from an upset stomach to more serious symptoms, including diarrhea, fever, vomiting, abdominal cramps, and dehydration. Most microbial food borne infections are undiagnosed and unreported, though the Centers for Disease Control and Prevention estimates that every year about 76 million people in the United States become ill from pathogens, or disease-causing substances, in food. Of these people, about 5,000 die



What are the causes of microbial food borne illnesses?

- *Harmful bacteria are the most common cause of microbial food borne illnesses.
- *Some bacteria may be present on foods when you purchase them.
- *Raw foods are the most common source of microbial food borne illnesses because they are not sterile; examples include raw meat and poultry that may have become contaminated during slaughter.



Foods can become contaminated at several points between the farm and the table.



Ingredients



Water



Soil



Air



Animals, Rodents, and Insects



Food Handlers



Food-Contact Surfaces




Packaging Materials



Sources of contamination






* Contamination may occur during food preparation in a restaurant or a home kitchen. The most common form of contamination from handled foods is the calcivirus, also called the Norwalk-like virus.



*When food is cooked and left out for more than 2 hours at room temperature, bacteria can multiply quickly.

*Most bacteria grow undetected because they don't produce a bad odor or change the color or texture of the food. Freezing food slows or stops bacteria's growth but does not destroy the bacteria.

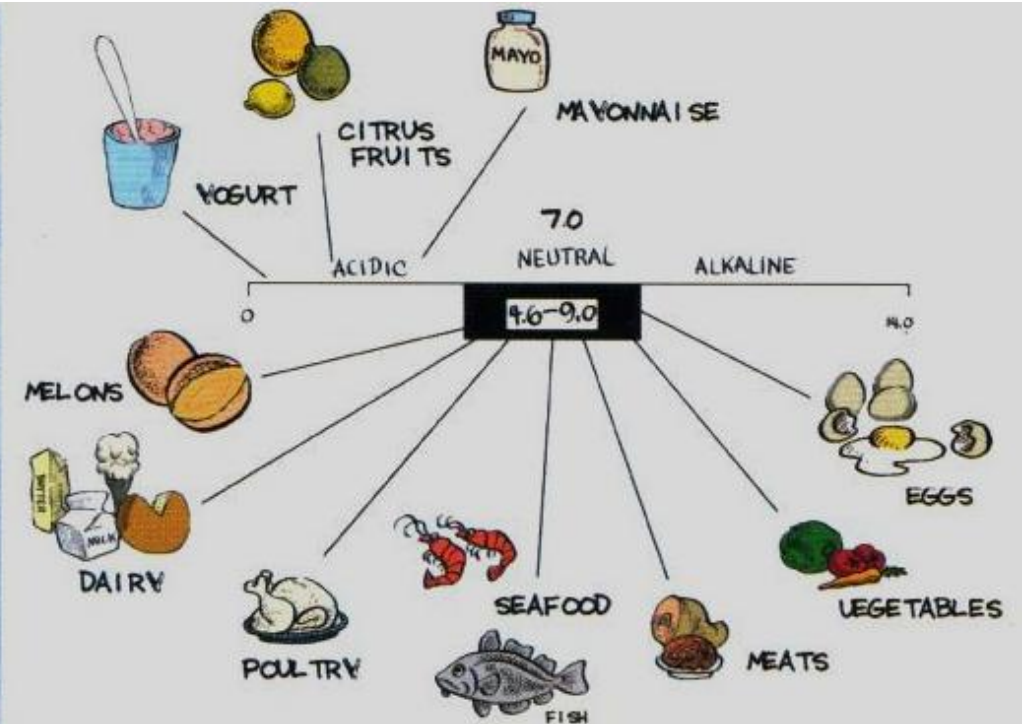


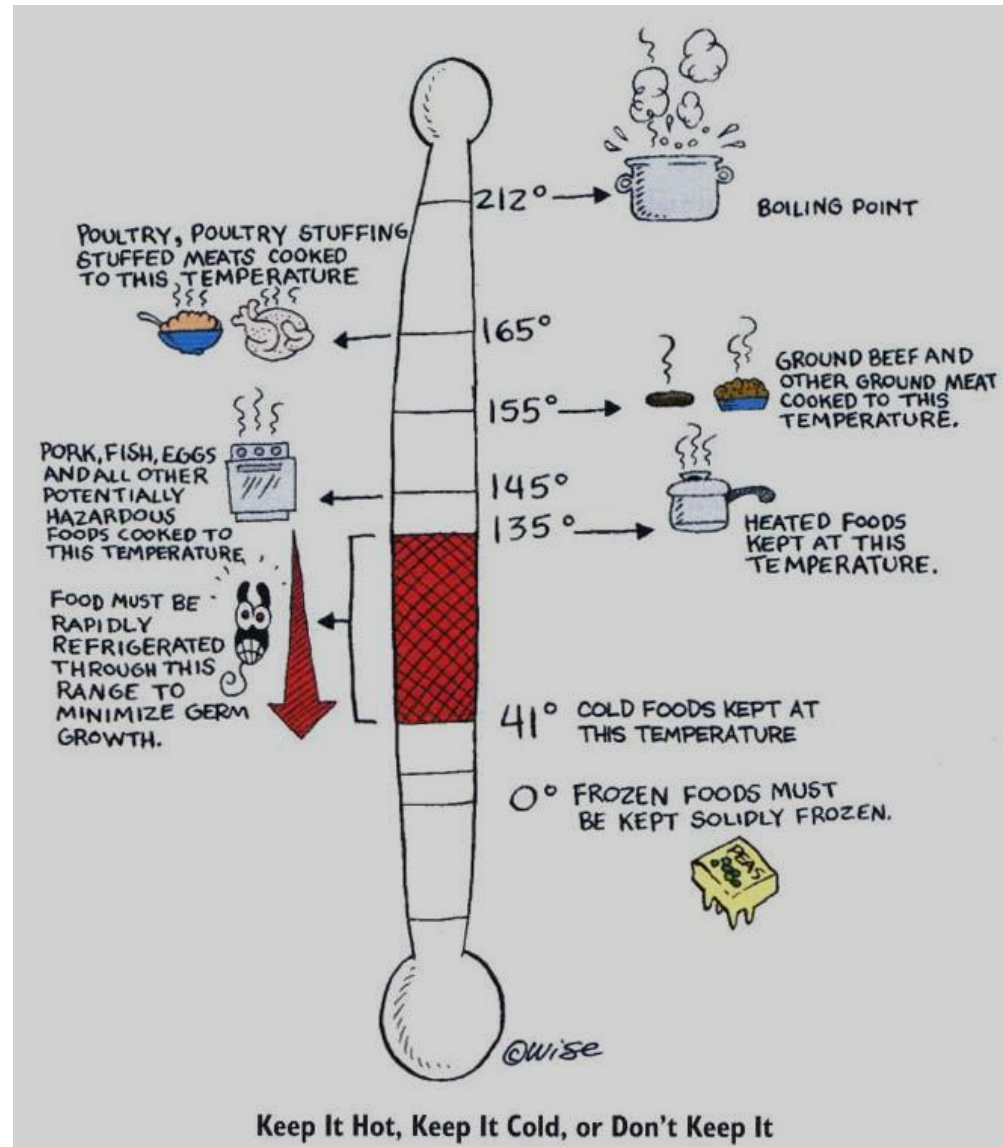
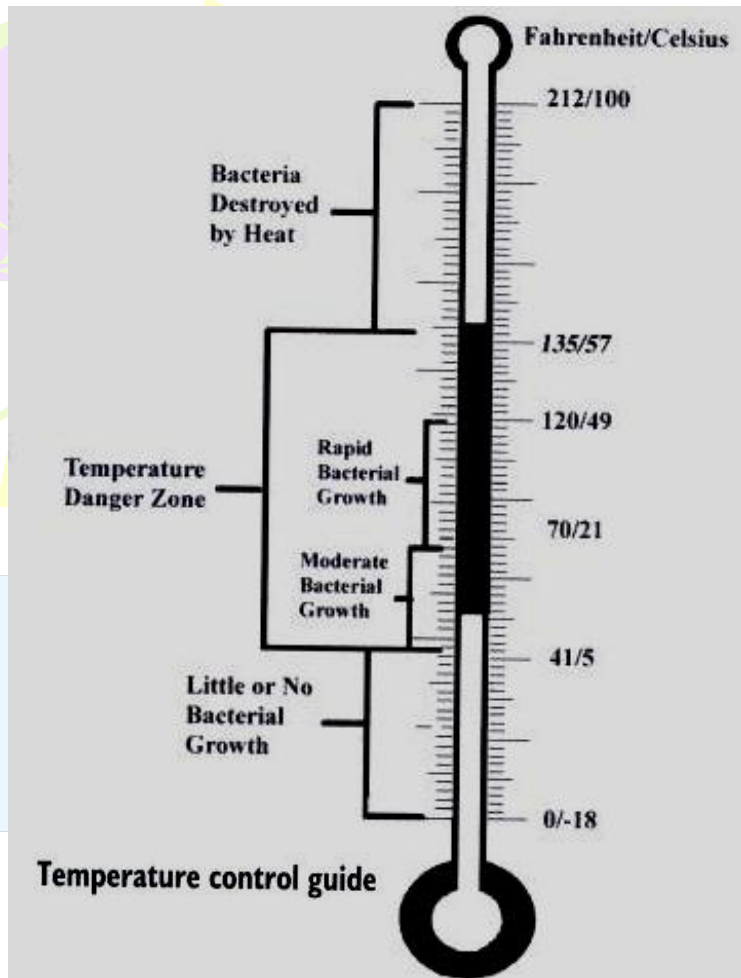
*The microbes can become reactivated when the food is thawed. Refrigeration also can slow the growth of some bacteria. Thorough cooking is needed to destroy the bacteria.



Microbes eat the same foods we do.

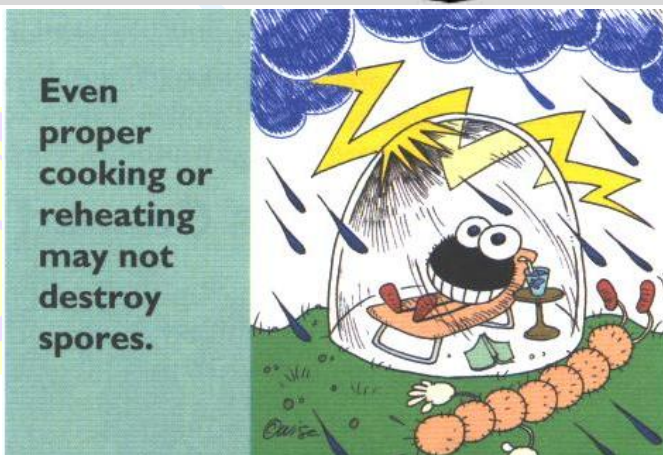
Disease-causing bacteria grow best when the foods they live in and on have a pH of 4.6 to 7.0.





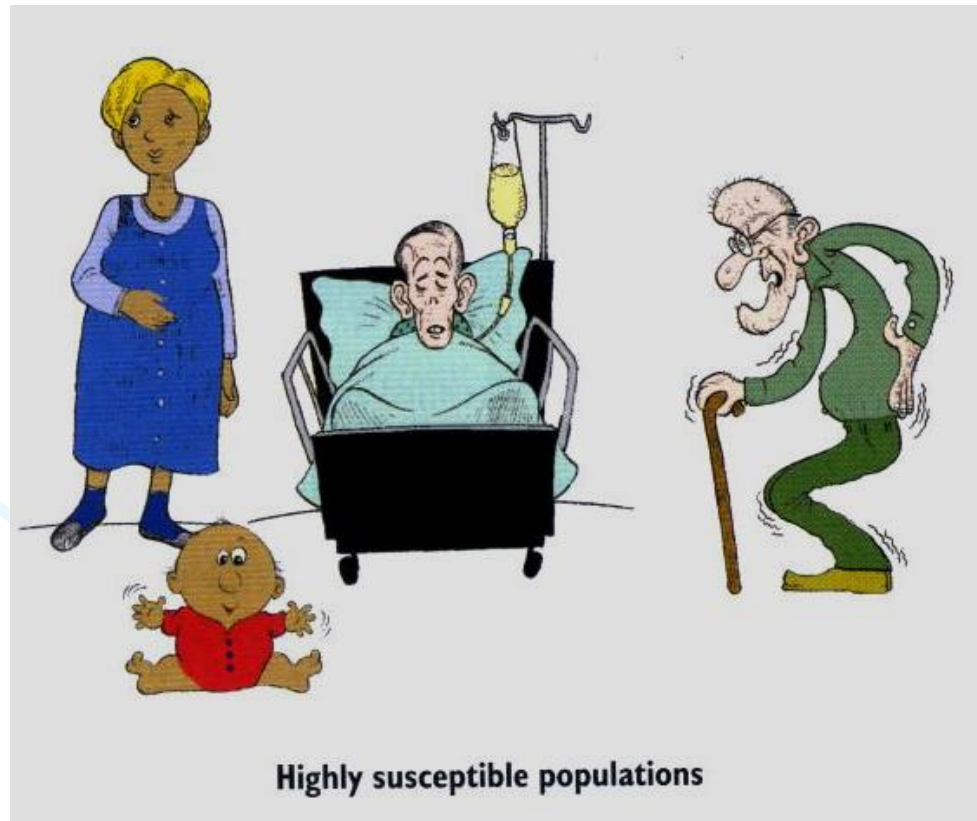
It is critical hot food temperatures be maintained at 135°F (57°C) or above and cold foods should be held at 41°F (5°C) or below.

Always cook and cool foods as rapidly as possible (within 4 hours) to limit bacterial growth.



What are the risk groups of microbial food borne illnesses?


Some people are at greater risk for bacterial infections because of their age or an unhealthy immune system. Young children, pregnant women and their fetuses, and older adults are at greatest risk.





What are the symptoms of microbial food borne illnesses?

In most cases of microbial food borne illnesses, symptoms resemble intestinal flu and may last a few hours or even several days. Symptoms can range from mild to serious and include:

- * abdominal cramps
 - * nausea
 - * vomiting
 - * diarrhea, which is sometimes bloody
 - * fever
 - * dehydration
- 



What are the serious types of microbial food borne illnesses?

- * Some micro-organisms, such as *Listeria monocytogenes* and *Clostridium botulinum* cause far more serious symptoms than vomiting and diarrhea.
- * They can cause spontaneous abortion or death.
- * In some people, especially children, *E. coli* can lead to kidney failure and death.
- * HUS is a rare disorder that affects primarily children between the ages of 1 and 10 years and is the leading cause of acute renal failure in previously healthy children. A child may become infected after consuming contaminated food or beverages, such as meat, especially undercooked ground beef; unpasteurized juices; contaminated water; or through contact with an infected person..



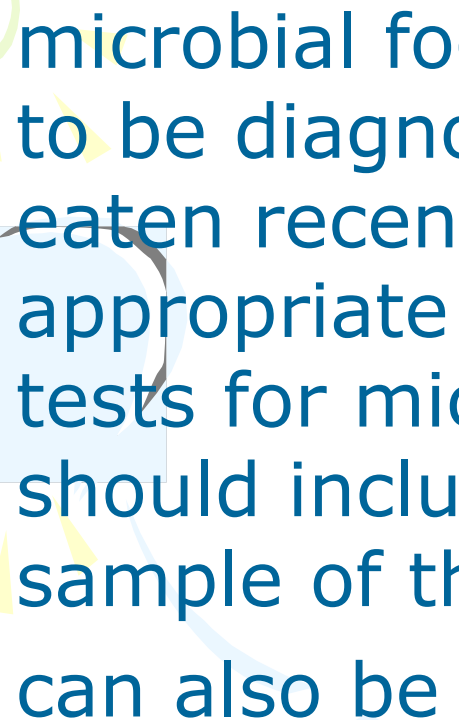
Important!

See a doctor right away if you or your child has any of the following symptoms with diarrhea:


- * High fever—temperature over 38.5°, measured orally
 - * Blood in the stools
 - * Diarrhea that lasts more than 3 days
 - * Prolonged vomiting that prevents keeping liquid down and can lead to dehydration
 - * Signs of severe dehydration, such as dry mouth, sticky saliva, decreased urination, dizziness, fatigue, sunken eyes, low blood pressure, or increased heart rate and breathing rate.
 - * Signs of shock, such as weak or rapid pulse or shallow breathing.
 - * Confusion or difficulty reasoning.
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How are microbial food borne illnesses diagnosed?

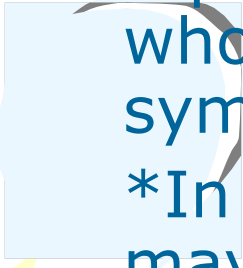


microbial food borne illnesses may be able to be diagnosed from a list of what you've eaten recently and from results of appropriate laboratory tests. Diagnostic tests for microbial food borne illnesses should include examination of the feces. A sample of the suspected food, if available, can also be tested for bacterial toxins.





How are microbial food borne illnesses treated?



*Most cases of microbial food borne illnesses are mild and can be treated by increasing fluid intake, either orally or intravenously, to replace lost fluids and electrolytes. People who experience gastrointestinal or neurologic symptoms should seek medical attention.

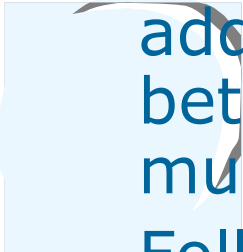
*In the most severe situations, hospitalization may be needed to receive supportive nutritional and medical therapy. Maintaining adequate fluid and electrolyte balance and controlling blood pressure are important.




Dialysis may be needed until the kidneys can function normally. Blood transfusions also may be needed.



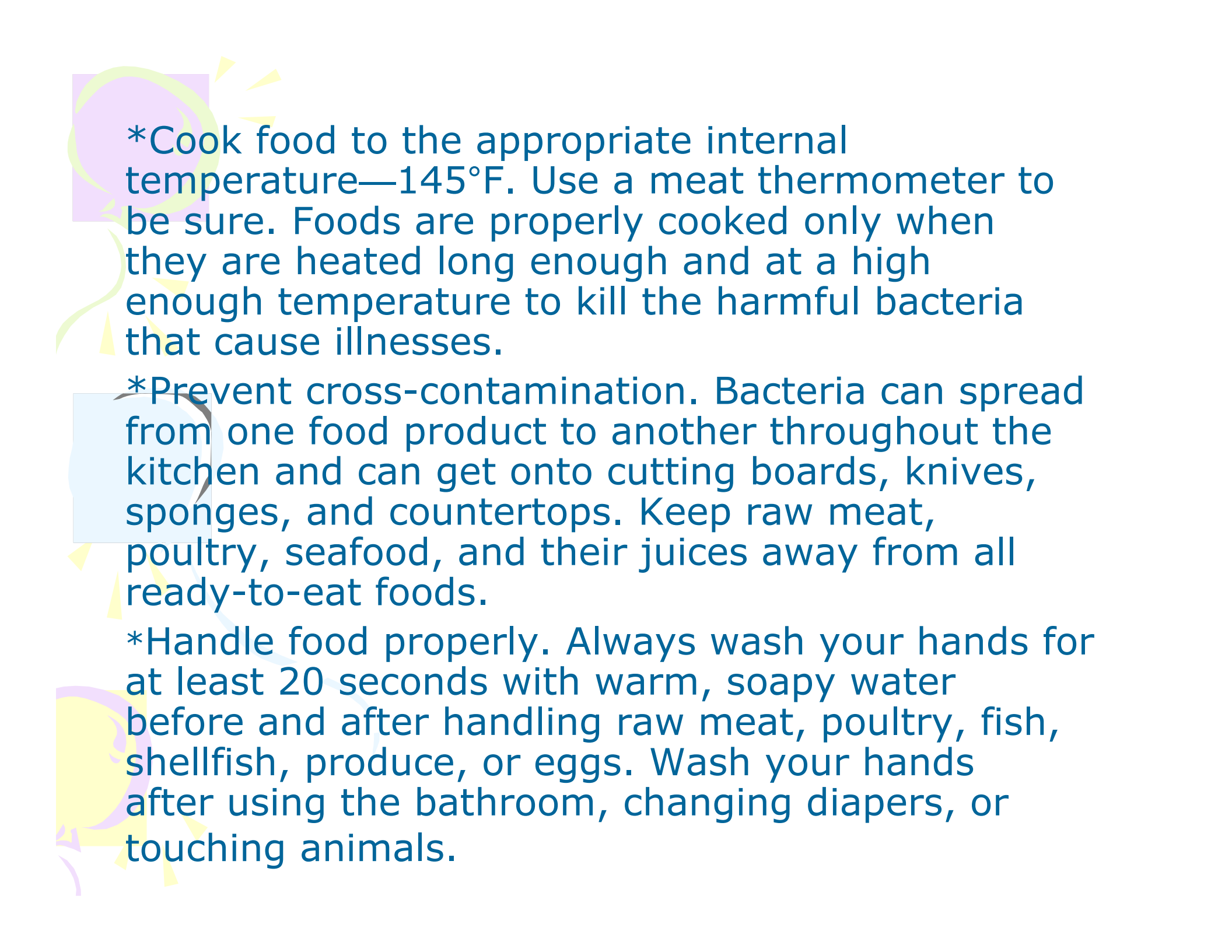
How are microbial food borne illnesses prevented?



*Most cases of microbial food borne illnesses can be prevented through proper cooking or processing of food, which kills bacteria. In addition, because bacteria multiply rapidly between 40°F(4.5°) and 140°F(60°), food must be kept out of this temperature range. Follow these tips to prevent harmful bacteria from growing in food:




*Refrigerate foods promptly. If prepared food stands at room temperature for more than 2 hours, it may not be safe to eat. Set your refrigerator at 40°F or lower and your freezer at 0°F (-17°).



*Cook food to the appropriate internal temperature—145°F. Use a meat thermometer to be sure. Foods are properly cooked only when they are heated long enough and at a high enough temperature to kill the harmful bacteria that cause illnesses.

*Prevent cross-contamination. Bacteria can spread from one food product to another throughout the kitchen and can get onto cutting boards, knives, sponges, and countertops. Keep raw meat, poultry, seafood, and their juices away from all ready-to-eat foods.

*Handle food properly. Always wash your hands for at least 20 seconds with warm, soapy water before and after handling raw meat, poultry, fish, shellfish, produce, or eggs. Wash your hands after using the bathroom, changing diapers, or touching animals.



*Wash utensils and surfaces before and after use with hot, soapy water. Better still, sanitize them with diluted bleach—1 teaspoon of bleach to 1 quart of hot water.

*Wash sponges and dish towels weekly in hot water in the washing machine.



*Keep cold food cold and hot food hot.

*Maintain hot cooked food at 140°F or higher.

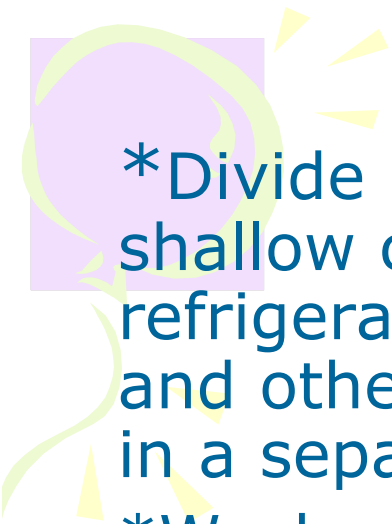
*Reheat cooked food to at least 165°F.

*Refrigerate or freeze perishables, produce, prepared food, and leftovers within 2 hours.

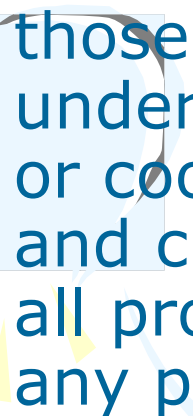
*Never defrost food on the kitchen counter. Use the refrigerator, cold running water, or the microwave oven.



*Never let food marinate at room temperature—refrigerate it.



*Divide large amounts of leftovers into small, shallow containers for quick cooling in the refrigerator.*Remove the stuffing from poultry and other meats immediately and refrigerate it in a separate container.




*Wash all unpackaged fruits and vegetables, and those packaged and not marked “pre-washed,” under running water just before eating, cutting, or cooking. Scrub firm produce such as melons and cucumbers with a clean produce brush. Dry all produce with a paper towel to further reduce any possible bacteria.




*Do not pack the refrigerator. Cool air must circulate to keep food safe.



The most common bacteria cause microbial food borne illness



microbial food borne illness can strike at any time and be caused by any number of different pathogens. Here is a rundown of the most common bacterial offenders, and what you can do to protect yourself:





Sporeforming Bacteria

Bacillus cereus

Causative Agent

- *Bacillus cereus*

Type of Illness

- Bacterial intoxication or toxin-mediated infection

Symptoms

- Diarrhea type: abdominal
- Vomiting type: vomiting, diarrhea, abdominal cramps

Onset

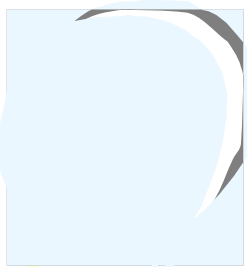
- Diarrhea type: 8 to 16 hours; usually lasts 12 to 14 hours
- Vomiting type: 30 minutes to 6 hours; usually lasts 30 minutes to 6 hours

Common Foods

- Diarrhea type: meats, milk, vegetables, fish
- Vomiting type: rice, starchy foods, grains, cereals

Prevention

- Properly cook and hold at 135°F (57°C), cool rapidly to below 41°F (5°C), and reheat foods.



Clostridium perfringens

Causative Agent	● <i>Clostridium perfringens</i>
Type of Illness	● Bacterial toxin-mediated infection
Symptoms	● Intense abdominal pains and severe diarrhea
Onset	● 8 to 22 hrs
Common Foods	● Spices, gravy, improperly cooled foods (especially meats and gravy dishes)
Prevention	● Properly cook, cool, and reheat foods.

Clostridium botulinum

Causative Agent	● <i>Clostridium botulinum</i>
Type of Illness	● Bacterial intoxication
Symptoms	● Dizziness, double vision, difficulty in breathing and swallowing, headache
Onset	● 12 to 36 hours; usually lasts several days to a year
Common Foods	● Low-acid foods (pH above 4.6), which are inadequately heat-processed and then packaged anaerobically (metal can or vacuum pouch), and held in the food temperature danger zone. Examples: home-canned green beans, meats, fish, and garlic or onions stored in oil and butter respectively.
Prevention	● Properly heat-process and cool vacuum-packaged and other reduced-oxygen packaged foods, DO NOT use home-canned foods.

Non-Sporeforming Bacteria

Campylobacter jejuni

Causative Agent	● <i>Campylobacter jejuni</i>
Type of Illness	● Bacterial infection
Symptoms	● Watery, bloody diarrhea
Onset	● 2 to 5 days; usually lasts 2 to 7 days
Common Foods	● Raw poultry, raw milk, raw meat
Prevention	● Properly handle and cook raw meats and poultry, properly clean and sanitize food-contact surfaces and properly wash hands.



Campylobacter jejuni is commonly found in raw chicken.



Enterohemorrhagic *Escherichia coli* (EHEC 0157:H7)

Causative Agent	<ul style="list-style-type: none">● Toxin-producing <i>Escherichia coli</i>
Type of Illness	<ul style="list-style-type: none">● Bacterial infection or toxin-mediated infection; at special risk are children up to 16 years old and the elderly
Symptoms	<ul style="list-style-type: none">● Bloody diarrhea followed by kidney failure and hemolytic uremic syndrome (HUS) in severe cases
Onset	<ul style="list-style-type: none">● 12 to 72 hours; usually lasts from 1 to 3 days
Common Foods	<ul style="list-style-type: none">● Raw and undercooked beef and other red meats, raw finfish, improperly pasteurized milk, unpasteurized apple cider, lettuce
Prevention	<ul style="list-style-type: none">● Practice good food sanitation, handwashing; properly handle and cook ground meats to an internal temperature of at least 155°F (68°C) for 15 seconds; prevent cross contamination and keep hot foods above 135°F (57°C) and cold foods below 41°F (5°C). Wash lettuce in sinks used only for food preparation. Use only pasteurized apple cider or fruit juice and milk products.

Listeria monocytogenes

Causative Agent ● *Listeria monocytogenes*

Type of Illness ● Bacterial infection

Symptoms

- 1) Healthy adult: flu-like symptoms.
- 2) Highly susceptible: septicemia, meningitis, encephalitis, birth defects.
- 3) Stillbirth.

Onset ● 1 day to 3 weeks; indefinite duration depending on when treatment is administered

Common Foods ● Raw meats, raw poultry, dairy products, cooked luncheon meats and hot dogs, raw vegetables, and seafood

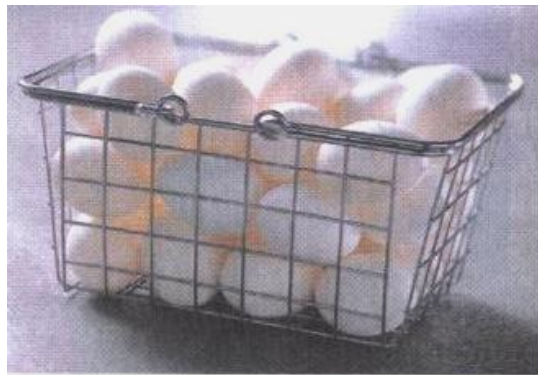
Prevention ● Properly store and cook foods, avoid cross contamination, rotate processed refrigerated foods using FIFO to ensure timely use.



Listeria monocytogenes can grow at refrigerated temperatures.

Salmonella spp.

Causative Agent	● <i>Salmonella spp.</i>
Type of Illness	● Bacterial infection
Symptoms	● Nausea, fever, vomiting, abdominal cramps, diarrhea
Onset	● 6 to 48 hours; usually lasts 2 to 3 days
Common Foods	● Raw meats, raw poultry, eggs, milk, dairy products, pork
Prevention	● Properly cook foods; example: <i>Salmonella</i> bacteria will be destroyed when poultry is cooked to an internal temperature of 165°F (74°C) for 15 seconds and when eggs are cooked to 145°F (63°C) for 15 seconds. Clean and sanitize raw food-contact surfaces after use; make sure food employees wash their hands adequately before working with food, avoid cross contamination.



Eggs are a common source for *Salmonella spp.*

***Shigella* spp.**

Causative Agent	● <i>Shigella</i> spp.
Type of Illness	● Bacterial infection
Symptoms	● Bacillary dysentery, diarrhea, fever, abdominal cramps, dehydration
Onset	● 1 to 7 days; duration depends on when treatment is administered
Common Foods	● Foods prepared with human contact: ready-to-eat salads (i.e., potato, chicken), raw vegetables, milk, dairy products, raw poultry, non-potable water, ready-to-eat meat
Prevention	● Wash hands and practice good personal hygiene, properly cook foods, avoid cross contamination, wash produce and other foods with potable water (water that is safe to drink). Do not allow individuals who have been diagnosed with shigellosis to handle food.

***Shigella* spp. is most often attributed to foods prepared with human contact.**





Staphylococcus aureus

Causative Agent	<ul style="list-style-type: none">● <i>Staphylococcus aureus</i>
Type of Illness	<ul style="list-style-type: none">● Bacterial intoxication
Symptoms	<ul style="list-style-type: none">● Nausea, vomiting, abdominal cramps, headaches
Onset	<ul style="list-style-type: none">● 1 to 6 hours, usually 2 to 4 hours; usually lasts 1 to 2 days
Common Foods	<ul style="list-style-type: none">● Foods prepared with human contact; cooked ready-to-eat foods such as luncheon meats, ready-to-eat meat, deli salads (such as taco, potato, egg, and tuna salads), meat, poultry, custards, high-salt foods such as ham, and milk and dairy products, processed foods
Prevention	<ul style="list-style-type: none">● Wash hands and practice good personal hygiene, avoid coughing and sneezing near food, do not reuse tasting spoons and ladles, properly clean and bandage cuts, burns or wounds on hands and wear plastic gloves. Cooking WILL NOT inactivate the toxin.




Chemical Food Poisoning

Types of Chemical Hazards in a Food Establishment

Naturally Occurring:

- Allergens
- Ciguatoxin
- Mycotoxins
- Scombrototoxin
- Shellfish toxins.

Man-Made Chemicals:

- Cleaning solutions
 - Food additives
 - Pesticides
 - Heavy metals.
- 



Common Food Allergens The Big Eight

Milk

Soy

Eggs


Tree nuts

Wheat proteins

Fish

Peanuts

Shellfish.



**Foods containing
potential
contaminants
must be properly
labeled.**

A close-up of a yellow and orange food package. The text "Manufactured on shared equipment with peanuts & tree nuts." is printed in black on the yellow background. Below this, there is a red section of the package with some illegible text.

Manufactured on shared equipment with peanuts & tree nuts.

Ciguatoxin

Causative Agent

- Ciguatoxin

Type of Illness

- Fish toxin originating from toxic algae of tropical waters

Symptoms

- Vertigo, nausea, hot/cold flashes, diarrhea, vomiting, shortness of breath

Onset

- 30 minutes to 6 hours; usually lasts a few days but death can occur from concentrated dose of toxin

Common Foods

- Marine finfish including grouper, barracuda, snapper, jack, mackerel, triggerfish, reef fish

Prevention

- Purchase fish from a reputable supplier; cooking **WILL NOT** inactivate the toxin.

Ciguatoxin can be found in marine finfish such as red snapper.





Scombrotxin

Causative Agent

- **Scombrotxin**

Type of Illness

- Seafood toxin originating from histamine-producing bacteria

Symptoms

- Dizziness; burning feeling in the mouth; facial rash or hives; shortness of breath; peppery taste in mouth; headache; itching, teary eyes; runny nose

Onset

- Few minutes to half-hour; recovery usually occurs in 8 to 12 hours

Common Foods

- Tuna, mahi mahi, bluefish, sardines, mackerel, anchovies, amberjack, abalone, Swiss cheese

Prevention

- Purchase fish from a reputable supplier; store fish between 32°F (0°C) and 39°F (4°C) to prevent growth of histamine-producing bacteria; toxin IS NOT inactivated by cooking.



THANKS

