

Case Study *It's All Wrong*

Linda recently left her position at the By Land and By Sea Resort. She had been looking for an opportunity to be a manager at an independent restaurant where she would have more control, so she has accepted the position of manager at the Uptown Grille.

This position involves handling a lot of public relations and meetings with local groups in addition to her restaurant responsibilities. Today, she and Chef Jean have a meeting scheduled with the local Chamber of Commerce.

While Linda and Chef Jean are at their meeting, FoodCorp International makes its weekly delivery. The delivery includes cases of canned vegetables, fresh lettuce, fresh tomatoes, sour cream, frozen shrimp, and fresh chicken. Brian, the line cook, is responsible for receiving, inspecting, and storing deliveries.

Brian is in the middle of prepping raw chicken and carrots for a stew when the delivery arrives. He pushes them over, inadvertently leaving them on the same cutting surface. Then, he wipes his hands on his apron, and attends to the delivery.

Brian proceeds to check the order. He puts the frozen shrimp in the freezer and the fresh chicken in the refrigerator. He puts the fresh tomatoes, lettuce, and canned vegetables in dry storage. Then he loads a case of sour cream into the tightly packed refrigerator. When he is finished, he goes back to his work area to prep the remaining vegetables. It takes Brian about 45 minutes to receive, inspect, and store the delivery.

At the time of receiving, the shrimp are frozen solid and the packages are sealed, but they contain a large amount of ice crystals. The boxes with the fresh tomatoes and lettuce have some holes and wet marks.

Linda and Chef Jean return from their meeting and find that they are behind schedule for tonight's dinner service. Michael, a line cook who had an upset stomach earlier today, is feeling better, so he grabs the same uniform he wore yesterday when prepping turkey. As soon as Michael arrives at work, Linda puts him to work on prepping the vegetables for dinner service. During prep, Michael's stomach starts to bother him, but since they are behind schedule, Linda asks him to stick it out as long as possible. Michael agrees to stay, but within a few

Case Study *It's All Wrong (continued)*

minutes he heads to the restroom in the hopes of relieving his symptoms. He quickly rinses his hands, wipes his hands on his apron, and heads back to prep work.

Brian cooks the chicken he prepped earlier. He checks the temperature of the chicken with an infrared thermometer for five seconds and finds that it is 165°F. Brian removes the chicken from the oven and holds the chicken for dinner service, which is starting shortly. After an hour, Brian checks the held chicken, and the internal temperature is 130°F. Brian serves the held chicken as orders come in.

As you read this chapter, think about the following questions:

1. What role do managers play in ensuring safe food?
2. How can you balance the need to move quickly with the need to keep food safe?
3. What techniques can you use to remind yourself to put food safety first?
4. What could managers do to help employees focus on handling food safely?

Professional profile

Melisa Bouchard

Quality Assurance Coordinator

Brinker International (parent company of Chili's, Maggiano's, and On the Border)

“I began working in the restaurant industry when I was in college at Sam Houston State, from which I received a bachelor of science degree. At the time, I thought it was just going to be a job to pay bills. However, 12 years later, it's become much more than that. I can honestly say that a big factor in choosing this career path is the dedication and loyalty I have for Brinker.”



I wanted to stay and grow with them, so I continued on with Brinker as a server and then bartender, which led to a restaurant management position. I remember that, as a restaurant manager, I spent much of my time in the dining room visiting with our guests. As I would walk through the room, I saw families visiting with each other as they enjoyed the food prepared by our team members. These were people's mothers and grandmothers, fathers and grandfathers, parents' precious children. I felt honored they chose to dine with us... knowing they were in good hands where the service would be great and the food would be excellent and most importantly, safe.

Eventually, I made my way to our corporate office as a member of our food safety team. In this position, I have been able to learn more about the “behind-the-scenes” planning of the programs that are in place in our restaurants to keep our guests safe while maintaining our high quality standards.

Foodservice operators impact a large population on a daily basis, so it is very important they have all the tools necessary to serve safe food. And cooking is the last step in the foodservice process, so it is very important that the staff is properly trained in all areas of food safety. Cooking to proper temperatures, avoiding cross-contamination, and holding product at the proper temperature are all major components. Discussing these topics on a daily basis, as well as establishing habits that build food safety into what you do every day, helps to ensure safe food is being served to our guests.

For those of you interested in entering this field, remember that understanding and getting involved in the many steps of the food-chain process will be very beneficial when developing and implementing food safety programs and procedures. There are so many key players, and they all have different roles that play a huge part in serving safe food. As an operator, you do not always see all the work that goes on away from the restaurant, and from a corporate standpoint, you do not always see what goes on in operations. Therefore, understanding both worlds helps establish a “big picture” of food safety.

Remember, “There is no sincerer love than the love of food.” —George Bernard Shaw

About Food Safety

And when it comes to food safety, knowledge, communication, and a passion for serving safe food are most important.

Illness caused by eating unsafe food can cost money, jobs, and even lives. The reputation of a restaurant or foodservice operation can be destroyed by a single case of food-related illness. All operations, from four-star restaurants to school cafeterias, must keep food safe. Every person in the operation must work toward this goal—managers and employees both share this responsibility.

2.1 Introduction to Food Safety

- What is a foodborne illness?
- Forms of contamination
- Biological contamination
- Chemical contamination
- Physical contamination
- Food defense
- Allergens
- U.S. regulation of food safety

2.2 Good Personal Hygiene

- How foodhandlers can contaminate food
- Personal cleanliness and work attire
- Handwashing
- Bare-hand contact with ready-to-eat food
- Work requirements related to illness

2.3 Preventing Hazards in the Flow of Food

- Cross-contamination
- Time-temperature abuse
- Purchasing
- Receiving
- Storage
- Preparation
- Cooking
- Holding, storing, and reheating
- Serving

2.4 Food Safety Management Systems

- The HACCP plan

2.5 Cleaning and Sanitizing

- How to clean effectively
- Sanitizing
- Developing a cleaning program
- Controlling pests

SECTION 2.1 INTRODUCTION TO FOOD SAFETY

Dining out is an experience that most people enjoy. Restaurants offer more than good food. They can be the perfect place for talking to friends, celebrating, conducting business, or relaxing. When people dine out, they expect to have a good time. But even more importantly, they expect to eat tasty, wholesome, safe food in a clean environment, served by a pleasant staff.

Study Questions

After studying Section 2.1, you should be able to answer the following questions:

- What is a foodborne-illness outbreak?
- What are the costs associated with a foodborne-illness outbreak?
- Who is at high risk for contracting foodborne illness?
- What is FAT TOM?
- What are the characteristics of TCS food?
- What methods can prevent biological contamination?
- What are the guidelines for storing chemicals safely?
- Why is a food defense system needed?
- What are the most common allergens, and what are the methods for preventing allergic reactions?
- What government agencies regulate the restaurant and foodservice industry?

What Is a Foodborne Illness?

A **foodborne illness** is a disease transmitted to people by food. A **foodborne-illness outbreak** is when two or more people get the same illness after eating the same food. Overall, the restaurant and foodservice industry does an excellent job of providing safe food to the public. But foodborne illness still costs the United States billions of dollars each year. National Restaurant Association figures show that one outbreak can cost an operation thousands of dollars and might even force it to close.

Costs of a Foodborne Illness to an Establishment

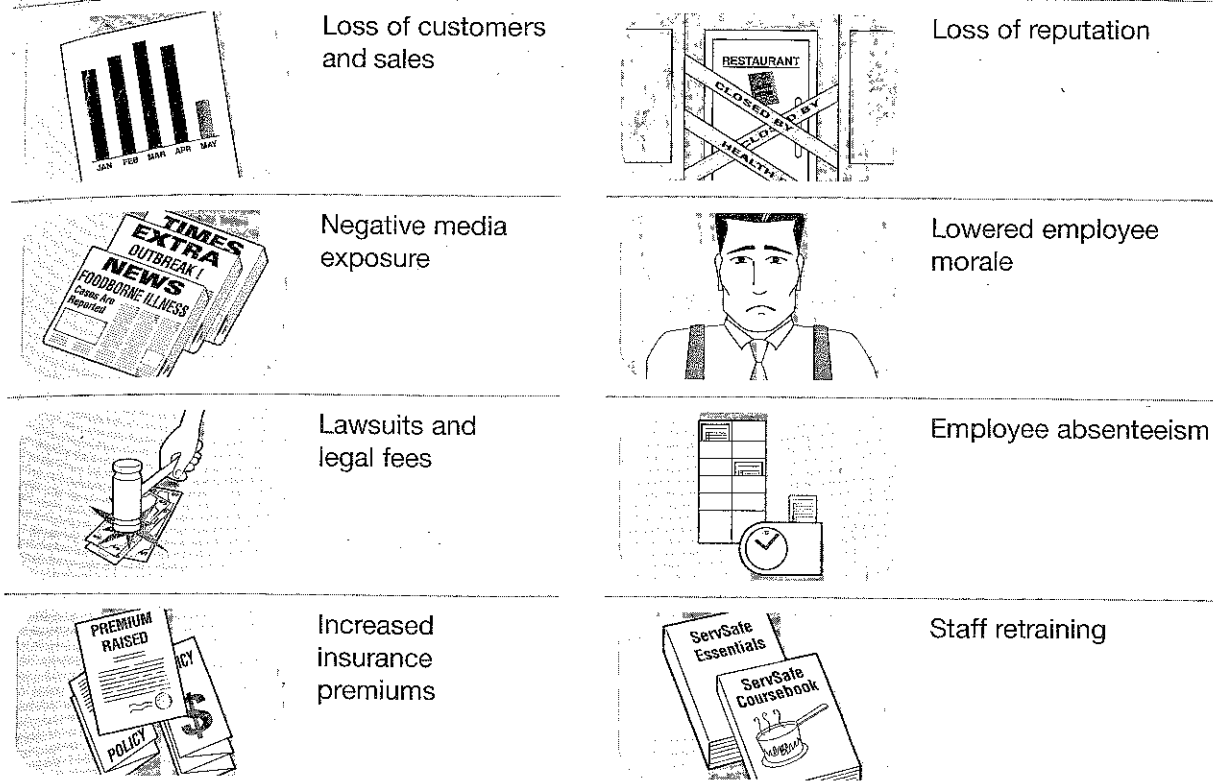


Figure 2.1: Foodborne illnesses can seriously affect any restaurant or foodservice operation.

Consider the following cases:

- At an East Coast school, over 400 children became ill after they were served lunch. Later, it was discovered that the source of the illness was contaminated egg salad sandwiches that the students ate.
- A nationwide *Salmonella* spp. outbreak traced to peanut butter sickened more than 400 people in 43 states, and three elderly people died from the outbreak. The peanut butter was distributed to schools, hospitals, and long-term care facilities.
- An elderly woman died and several hundred other people became sick after eating food served at a state fair. Most of the people who became sick were tourists. Health departments across the country received reports of illness, and many people were hospitalized.

The Centers for Disease Control and Prevention (CDC) estimates that there will be 76 million cases of foodborne illness in the United States each year. Of these, approximately 325,000 require hospitalization and 5,000 end in death. Figure 2.1 shows the many ways in which foodborne illness can impact an operation.

[ServSafe Connection]

The ServSafe® Food Safety Training and Certification Program

Help advance your career in food safety! The ServSafe® program is the most widely recognized training and certification program for food protection managers in the industry and is approved in all 50 states. Over the last 30 years, this program has awarded more than 3.5 million ServSafe Food Protection Manager Certifications.

Although many of the people who achieve the certification are managers in their operations, the ServSafe certification examination is open to anyone, including students and aspiring restaurant and foodservice managers.

Most people take a ServSafe food safety training class or a ServSafe online course. The second step is taking the exam to achieve the certification, which is known as a Food Protection Manager Certification.

The information in this chapter is a portion of what you would need to know to become a certified food protection manager. You'll also see sidebars in other chapters called "ServSafe Connection" that highlight critical food safety guidelines. If you can master the food safety content throughout this book, then you are well on your way to preparing for a ServSafe certification. For more information on the ServSafe program or to find a class in your area, visit www.ServSafe.com.

[fast fact]

Did You Know...?

A restaurant or foodservice operation can be held legally responsible for the food it serves. A court might order an operation to pay money to the person(s) who suffered illness caused by its food. Depending upon the laws in the state where the incident happened, the state might require an operation to prove that it has done everything that could be reasonably expected to prevent foodborne illness by ensuring that it serves safe food.

Most important are the human costs. Victims of foodborne illnesses may experience loss of time at work, medical costs, long-term disability, and possibly death.

As you can see, you will play an important role in keeping food safe. If you know and understand the basics of food safety, then you can do your share in preventing food-related problems.

[fast fact]

Did You Know...?

The U.S. Department of Agriculture Economic Research Services has developed a foodborne illness cost calculator as a way to estimate the annual cost of foodborne illness. The cost calculator allows you to estimate medical costs, costs associated with time lost from work, and costs of premature death for most foodborne pathogens.

Try this at www.ers.usda.gov/Data/FoodborneIllness/.

High-Risk Populations for Foodborne Illnesses

Certain groups of people have a higher risk of getting a foodborne illness than others. These groups are known as **high-risk populations**. Operations that serve these groups must sometimes follow special rules.

The **immune system** is the body's defense against illness. When the system is weak, it cannot fight off illness as easily as a healthy system. There are a variety of reasons why someone's immune system might be weakened:

- Elderly people's immune systems weaken with age.
- Infants and preschool-age children have not yet built strong immune systems.
- Pregnant women's immune systems are weaker during pregnancy.
- People with cancer or on chemotherapy, people with HIV/AIDS, and transplant recipients all have immune systems weakened by illness or treatment.

These people are all considered high-risk populations for foodborne illness.

Forms of Contamination

To prevent foodborne illness, it is important to recognize the hazards that can make food unsafe. A **hazard** is something with the potential to cause harm. In the preparation of food, hazards are divided into three categories: biological, chemical, and physical.

Many hazards contaminate food because someone has handled the food incorrectly. **Contamination** means that harmful things are present in food, making it unsafe to eat. Food can become unsafe through any of the following practices:

- Poor personal hygiene transfers **pathogens**, the microorganisms that cause illness, from your body to food.
- Time-temperature abuse allows food to stay too long at temperatures that are good for pathogen growth.
- Cross-contamination transfers pathogens from one surface or food to another.
- Poor cleaning and sanitizing allows contaminated surfaces to touch food.
- Purchasing from unapproved suppliers brings food from companies that aren't following food safety practices into the operation.

Biological Contamination

Microorganisms are small, living organisms that can be seen only through a microscope. Most living things, including humans, carry microorganisms on, or in, their bodies. Microorganisms that cause illness are called **pathogens**. They can be transferred from surfaces and hands to food and other surfaces. Pathogens are the greatest threat to food safety in a restaurant or foodservice operation.

There are four types of pathogens that can contaminate food, causing food-borne illness:

- Viruses
- Bacteria
- Parasites
- Fungi

Biological toxins can also be present in food. These toxins may be produced by pathogens contaminating the food, or they may occur naturally in certain plants and animals. Biological toxins can also cause foodborne illness.







Many viruses, bacteria, and parasites cause illness, but cannot be seen, smelled, or tasted. On the other hand, some fungi, like mold, change the appearance, taste, or smell of food—but they might not cause illness.

Pathogens need six conditions to grow. An easy way to remember these conditions is by remembering the phrase **FAT TOM**. Table 2.1 shows what **FAT TOM** stands for: food, acidity, temperature, time, oxygen, and moisture.

Any type of food can be contaminated, but some types actually encourage the growth of pathogens. Table 2.2 lists the foods that are most likely to become unsafe.

All these types of food have the **FAT TOM** conditions needed for pathogen growth. Not surprisingly, they are also commonly involved in foodborne-illness outbreaks.

Foodhandlers can help to keep food safe by controlling **FAT TOM**. Most of the time, however, a restaurant or foodservice operation is only going to be able to control time and temperature. Food that is most vulnerable for pathogen growth is also referred to as food that needs time and temperature control for safety—**TCS food** for short.

Table 2.1: FAT TOM		
	Food	To grow, pathogens need an energy source. Carbohydrates, such as baked potatoes, and proteins, such as beef, are some examples.
	Acidity	Pathogens grow best in food that contains little or no acid. An example of food with a lot of acid is lemons. Food items with little acid include chicken and cooked corn. Figure 2.2 shows the acidity of common food types.
	Temperature	Pathogens grow well in food that has a temperature between 41°F and 135°F. This range is known as the temperature danger zone. Figure 2.3 shows the temperature danger zone.
	Time	Pathogens need time to grow. When food is in the temperature danger zone, pathogens grow. After four hours, they will grow to levels high enough to make someone sick.
	Oxygen	Some pathogens need oxygen to grow. Others grow when oxygen isn't there. For example, some pathogens that grow without oxygen would grow quickly in cooked rice.
	Moisture	Pathogens need moisture in food to grow. For example, tomatoes and melons have a large amount of water in them, which means they can easily support the growth of pathogens.

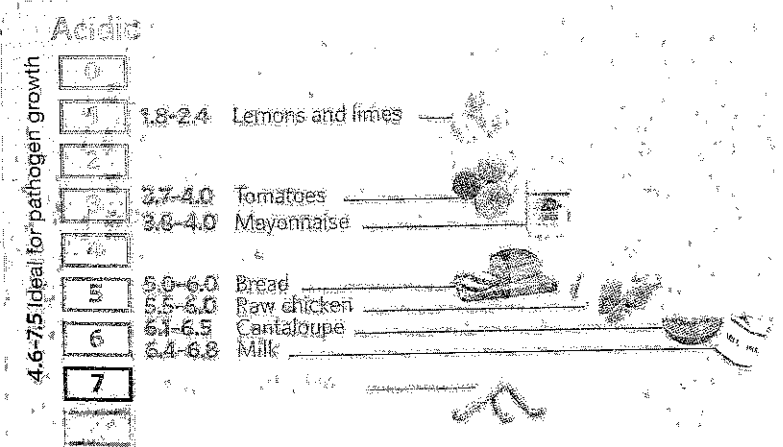


Figure 2.2: pH level of common foods.

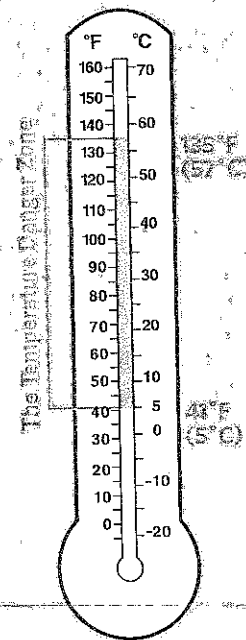




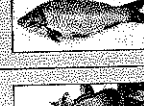









Figure 2.3: The temperature danger zone.

Table 2.2: Food Most Likely to Become Unsafe

	Milk and dairy products
	Meat: beef, pork, and lamb
	Eggs (except those treated to eliminate <i>Salmonella</i> spp.)
	Poultry
	Fish
	Shellfish and crustaceans
	Baked potatoes
	Heat-treated plant food, such as cooked rice, beans, and vegetables
	Tofu or other soy protein; synthetic ingredients, such as textured soy protein in meat alternatives
	Sprouts and sprout seeds
	Sliced melons and cut tomatoes
	Untreated garlic-and-oil mixtures

To control temperature, foodhandlers must keep TCS food out of the temperature danger zone. But the reality is that TCS food is most likely going to spend some time in this range. Restaurant and foodservice workers must limit how long the TCS food actually spends in the temperature danger zone.

Like TCS food, ready-to-eat food also needs careful handling to prevent contamination. **Ready-to-eat food** is exactly what it sounds like: food that can be eaten without further preparation, washing, or cooking. Some examples of ready-to-eat foods include washed fruit and vegetables both whole and cut, deli meat, bakery items, sugar, spices, seasonings, and cooked food.

Viruses

Viruses are the leading cause of foodborne illness. Restaurant and foodservice managers must understand what viruses are and how they can make people sick. Most importantly, managers must know how to prevent viruses from making customers sick.

Viruses can survive refrigerator and freezer temperatures. They can't grow in food, but once they are eaten, they grow inside a person's intestines. Viruses can be transferred from person to person, from people to food, and from people to food-contact surfaces. Examples of viruses that can cause foodborne illness include hepatitis A and Norovirus.

People carry viruses in their feces and can transfer them to their hands after using the restroom. Food can become contaminated if hands are not washed the right way. The best ways to prevent the spread of viruses are to stay home if you've been vomiting or have diarrhea or jaundice (yellowing of skin and eyes), to wash your hands at the right times and in the right way, and to avoid using bare hands to handle ready-to-eat food.

Bacteria

Bacteria also cause many foodborne illnesses. Figure 2.4 depicts a microscopic view of bacteria.

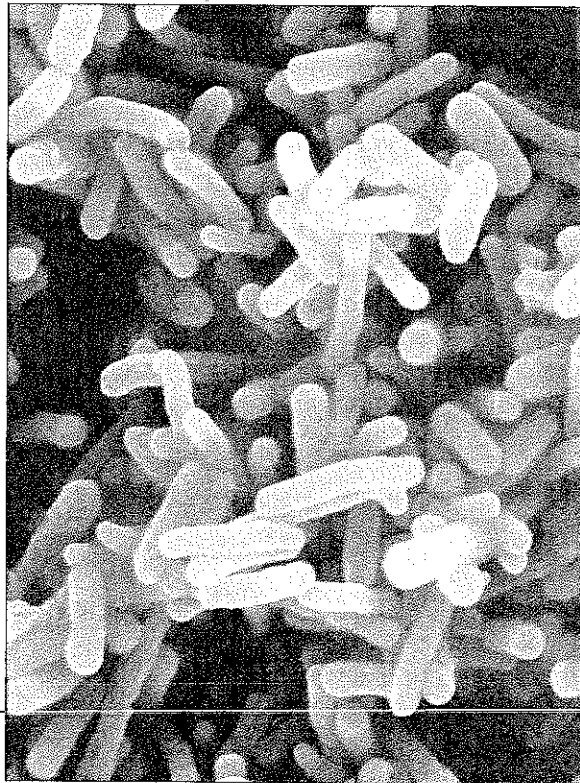


Figure 2.4: Bacteria cause many foodborne illnesses.

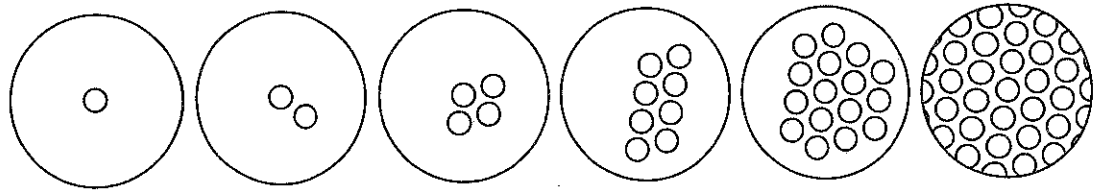


Figure 2.5: Bacteria growth at 20-minute intervals.

Knowing what bacteria are and how they grow can help you to control them. If FAT TOM conditions are right, bacteria will grow rapidly, doubling their number as often as every 20 minutes, as shown in Figure 2.5. Some bacteria, as they grow and die, create toxins (poisons) in food. Cooking may not destroy these toxins, and people who eat them can become sick. Examples of foodborne bacteria include *Salmonella* spp., shiga toxin-producing *E. coli*, and *Clostridium botulinum*.

You can control most bacteria by keeping food out of the temperature danger zone.

Parasites

In the United States, illnesses from **parasites** are not as common as those from viruses and bacteria. However, it is still important to understand what parasites are and how to prevent contamination. Figure 2.6 shows images of parasites, bacteria, and viruses.

Parasites cannot grow in food. They need to live in a host organism to grow. A **host** is a person, animal, or plant on which another organism lives and feeds. Parasites can live in cows, chickens, pigs, and fish—many types of food that humans like to eat. They also can contaminate water. Examples of parasites that can cause illness include *Cryptosporidium parvum* and *Giardia duodenalis*.

The most important measure that restaurant and foodservice managers can take to prevent parasites is to purchase food from approved, reputable suppliers.

Fungi

Fungi can cause illness, but most commonly they are responsible for spoiling food. Fungi are found in air, soil, plants, water, and some food. Mold and yeast are two examples of fungi.

Mold that is visible to the human eye is actually a tangled mass of thousands of tiny mold plants. Molds share some basic characteristics. They grow under

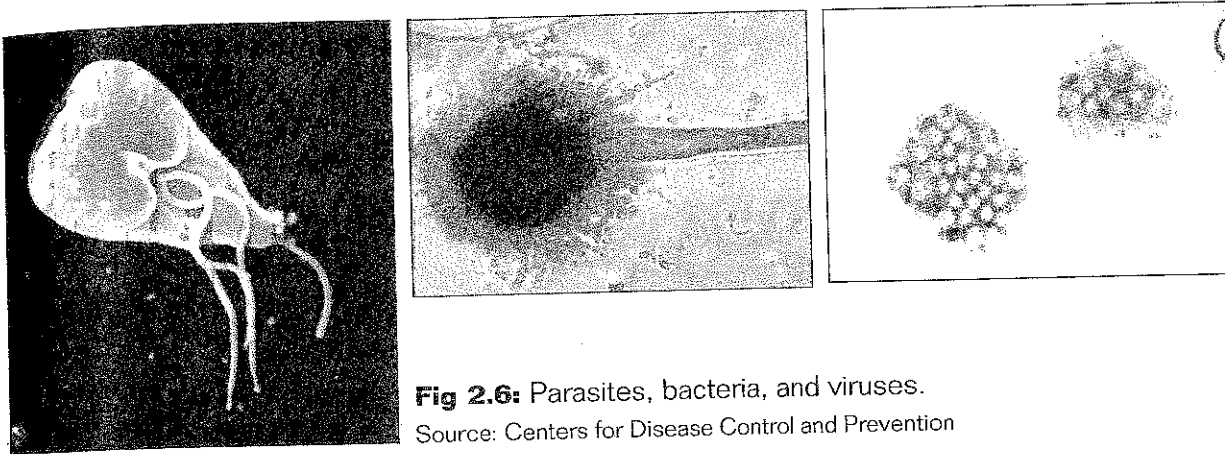


Fig 2.6: Parasites, bacteria, and viruses.
Source: Centers for Disease Control and Prevention

almost any condition, but especially well in acidic food with little moisture. Examples are jams, jellies, and cured, salty meat such as bacon. Molds often spoil food and sometimes produce toxins that can make people sick. Refrigerator and freezer temperatures may slow the growth of molds, but cold doesn't kill them. Figure 2.7 shows mold on cheese. Sometimes mold is intentionally used to affect the flavor or characteristics of a product, especially in some cheeses, such as Brie, Camembert, and Gorgonzola. Unless the mold is a natural part of the product, throw out all moldy food.

Yeast can spoil food quickly. The signs of spoilage include the smell or taste of alcohol, white or pink discoloration, slime, and bubbles. Figure 2.8 shows what yeast looks like on jam.

Like molds, yeasts grow well in acidic food with little moisture. Examples include jellies, jams, syrup, honey, and fruit or fruit juice. Throw out any food that has been spoiled by yeast.

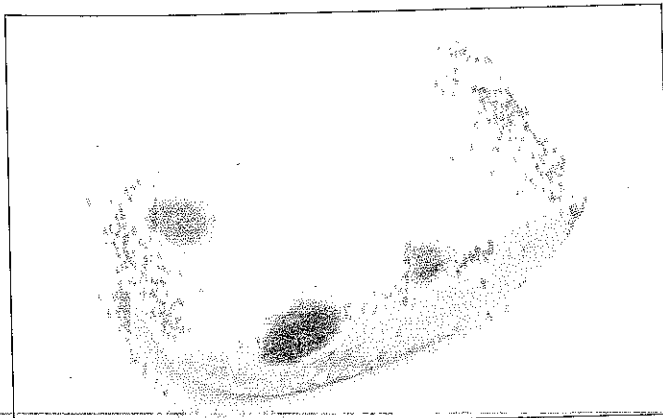


Figure 2.7: Mold is a type of fungus found on spoiled food.



Figure 2.8: Yeast can cause discoloration, slime, bubbles, and odors on refrigerated foods such as jams and jellies.

Did You Know...?

Ever heard of the five-second rule? It implies that if food drops on the floor and is picked up within five seconds, it won't get contaminated with bacteria. Next time you drop food on the floor, remember that a clean-looking floor isn't necessarily clean. Any food that makes contact with the floor can pick up pathogens.

Biological Toxins

Pathogens make biological toxins, or poisons. Sometimes certain kinds of plants or animals contain toxins naturally or because that plant or animal has been contaminated itself somewhere in the food chain. Toxins can make people sick, so restaurant and foodservice managers must be aware of them.

Seafood toxins, which can contaminate fish or shellfish, make seafood unsafe. Seafood toxins may be a natural part of the food, made by pathogens on the seafood, or form when toxic algae are eaten by the fish or shellfish. When people eat contaminated seafood, they cannot taste or smell these toxins. Foodhandlers cannot destroy toxins by freezing or cooking, either, once they form in food. The best way to prevent illness from this source is to purchase seafood from approved, reputable suppliers.

Most people who get sick from mushroom toxins have eaten poisonous wild mushrooms collected by amateur hunters. Many types of mushrooms look alike, and it is easy to mistake toxic varieties for edible ones. Mushroom toxins can't be destroyed by cooking or freezing. Buying mushrooms from approved, reputable suppliers is the best way to prevent illness from this source.

Illnesses from plant toxins usually happen because products were purchased from an unapproved supplier or because items weren't cooked correctly. For example, undercooking kidney beans may cause toxins to form in the beans. Purchasing from approved, reputable suppliers and then cooking and holding dishes correctly are the best prevention methods.

Chemical Contamination

Chemicals have caused many cases of foodborne illnesses. These contaminants come from everyday items that may be found in many restaurant and foodservice operations.

Restaurant and foodservice chemicals can contaminate food if they are used or stored in the wrong ways. This includes cleaners, sanitizers, polishes, and machine lubricants. Store chemicals in a separate area away from food, utensils, and equipment used for food. Always follow the manufacturers' directions when

using chemicals, and be careful when using them while food is being prepared. Figure 2.9 shows an example of inappropriate chemical storage.



Figure 2.9: These chemicals are not stored properly, which can cause contamination of food.

Some utensils and equipment contain toxic metals that can contaminate acidic food. A person who then eats this food gets toxic-metal poisoning. This illness is frequently caused by using equipment with lead, copper, or zinc. When an acidic food, such as tomato sauce, comes in contact with the metal, the acid may dissolve some of the metal into the food. To prevent toxic-metal poisoning, you should only use utensils and equipment, including kettles, pots, serving ware and pans, that are made for handling food.

Physical Contamination

Physical contamination happens when objects get into food. These objects can be naturally occurring, such as the bones in fish. Others result from accidents and mistakes. Figure 2.10 shows examples of physical contaminants. Physical contaminants include the following:

- Metal shavings from cans
- Glass from broken lightbulbs
- Fingernails, hair, and bandages
- Jewelry
- Fruit pits

Most physical contamination can be prevented by inspecting food closely, practicing good personal hygiene, and following preparation procedures.

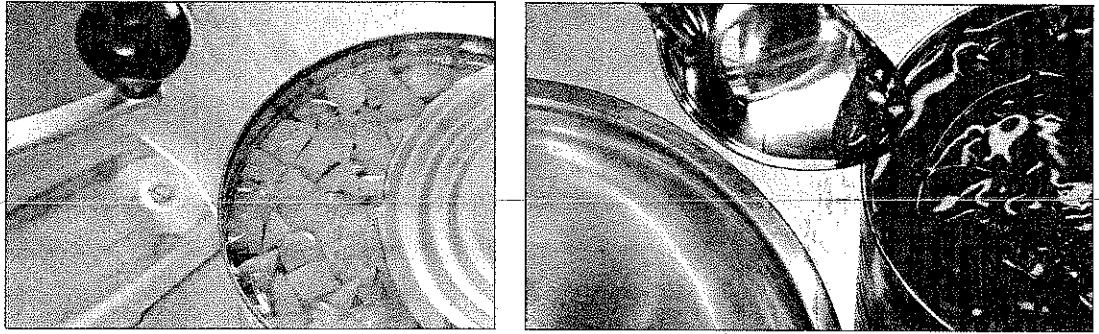


Figure 2.10: Foodservice employees must be careful to avoid physical contamination of food from metal can shavings and fruit pits.

Food Defense

The prevention measures discussed throughout this section will help prevent accidental contamination of food. But restaurant and foodservice employees also must take steps to prevent people from purposely contaminating food. Competitors, vendors, former employees, or terrorists may try to tamper with the food in your operation. Attacks might occur anywhere from the farm to the restaurant. They are usually focused on a specific food item, a manufacturing process, or a business. For example, someone might choose to target the manufacturing of a common food product, like peanut butter, because so many people would be affected.

One important way to prevent tampering is to control access to the operation's food storage and preparation areas. Uniforms and nametags help identify staff and vendors. Security badges also help ensure that only the people who belong there are in the specific food area. All employees in an operation, from busser to executive chef, should report anything that seems suspicious. As the saying goes, "If you see something, say something."

Allergens

The number of people in the United States with food allergies is increasing. A **food allergy** is the body's negative reaction to a food protein. People with food allergies can become sick or even die from eating even the smallest amount of a triggering allergen. In a restaurant or foodservice operation, managers, servers, and kitchen staff must each do their part to keep customers with food allergies safe.

The following is a list of the major allergens in the United States. They account for 90 percent of all food-allergic reactions:

- Milk and dairy products
- Eggs and egg products
- Fish

- Shellfish (crab, shrimp, lobster)
- Wheat
- Soy and soy products
- Peanuts
- Tree nuts, such as pecans and walnuts (see Figure 2.11)

Employees should be aware of these food items and the menu items that contain them.

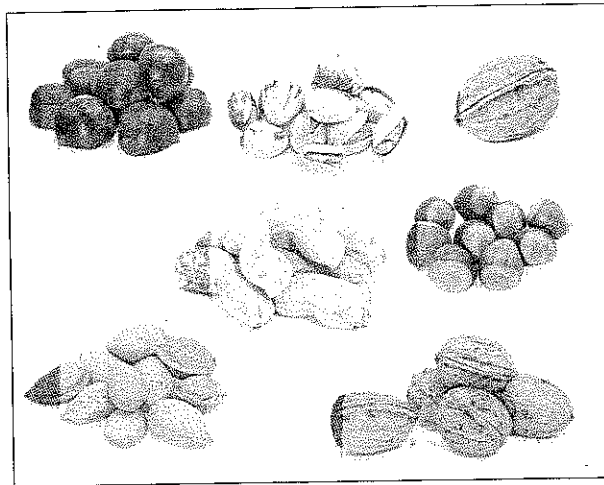


Figure 2.11: Tree nuts and peanuts are a common allergen.

When serving customers with food allergies, servers must be ready to answer customers' questions about any menu item. Specifically, they should be able to do the following:

- Tell the customer how each dish is made.
- Tell the customer about any "secret" ingredients that may contain allergens. While you might not want to share these recipes with the public, you still must be able to tell the "secret" items when asked.
- Suggest alternative menu items that don't have the food allergen.

Servers should never take a guess about what a menu item contains. If they don't know, they should ask someone who does, such as the manager or kitchen staff.

When preparing food for customers with food allergies, kitchen employees must make sure that allergens are not transferred from food containing an allergen to the food served to the customer. This is called **cross-contact**. Figure 2.12 illustrates the steps that kitchen staff must take to avoid cross-contact.

Did You Know...?

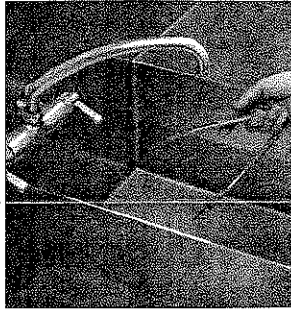
Food allergies vary from irritating to life threatening. Each year in the United States, approximately 30,000 people go to the emergency room to get treated for severe allergies. It is estimated that 150–200 Americans die because of allergic reactions to food each year.

Allergies affect 2 percent of adults and 4–8 percent of people in the United States. While there are treatments for the reactions caused by allergies, there is no cure for food allergies themselves. Signs of a food allergy reaction include hives, itching in and around the mouth, swelling of body parts, fainting, and difficulty breathing.

A severe reaction, known as anaphylaxis, is life threatening and requires immediate attention. Signs of a severe reaction include swelling of the throat, extreme difficulty breathing, shock with a drop in blood pressure, and loss of consciousness.



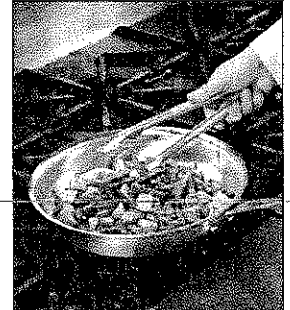
1. Make sure the allergen doesn't touch anything that is going to be served to or used by these customers, including food, beverages, and utensils, or anything that is used in preparing food for them, such as equipment and gloves.



2. Wash, rinse, and sanitize cookware, utensils, and equipment before preparing their food.



3. Wash your hands and change gloves before preparing their food.



4. Use equipment assigned only for preparing their food.

Figure 2.12: Kitchen staff must follow specific steps to avoid cross-contact.

[on the job]

Peanut Allergy and Kitchen Equipment

Food often makes a long journey before it arrives on a customer's table, from the farm or ocean to the fork. For a person with a peanut allergy, a long process presents many opportunities for food or equipment to come into contact with peanuts. More children and adults are allergic to peanuts now than at any previous time in recorded history. It is important for restaurant and foodservice operations to be aware of any peanuts in recipes and of equipment contact with peanuts. If a customer has an allergy and asks about peanuts in a menu item, the server must give accurate information. If a peanut-allergic person is exposed and has an anaphylactic response, it will be immediate and life-threatening.

In the event of a peanut or other allergy problem, call 911 immediately, and get help from the people in the area. The victim should be given an injection of epinephrine (EpiPen is a very common brand of auto-injector) and an antihistamine (Benadryl) as soon as possible to help keep airways open. Some individuals carry their own and can self-administer. Do not wait or delay. Do not try to drive the person to the ER, but have an ambulance come to you. The paramedics have epinephrine in case more is needed.

Prevention of food-allergy problems is especially critical in dormitories or schools where young people eat meals daily in a foodservice facility away from home.

U.S. Regulation of Food Safety

Today, many government departments monitor food safety. In the United States, most regulations that affect restaurant and foodservice operations are written at the state level. However, federal, state, and local governments are all involved.

The Food and Drug Administration (FDA) writes the *FDA Food Code*, which recommends specific food safety regulations for the restaurant and foodservice industry. But the code is not actual law. Each state decides whether to adopt the *FDA Food Code* or some form of it as law. The laws passed at the state level are then enforced by state or local (city or county) health departments. Health inspectors from city, county, or state health departments conduct inspections in most states.

Fast fact!

Did You Know...?

According to Gallup, 71 percent of Americans have a fair amount or great deal of confidence in the federal government to ensure the safety of the food supply in the United States.

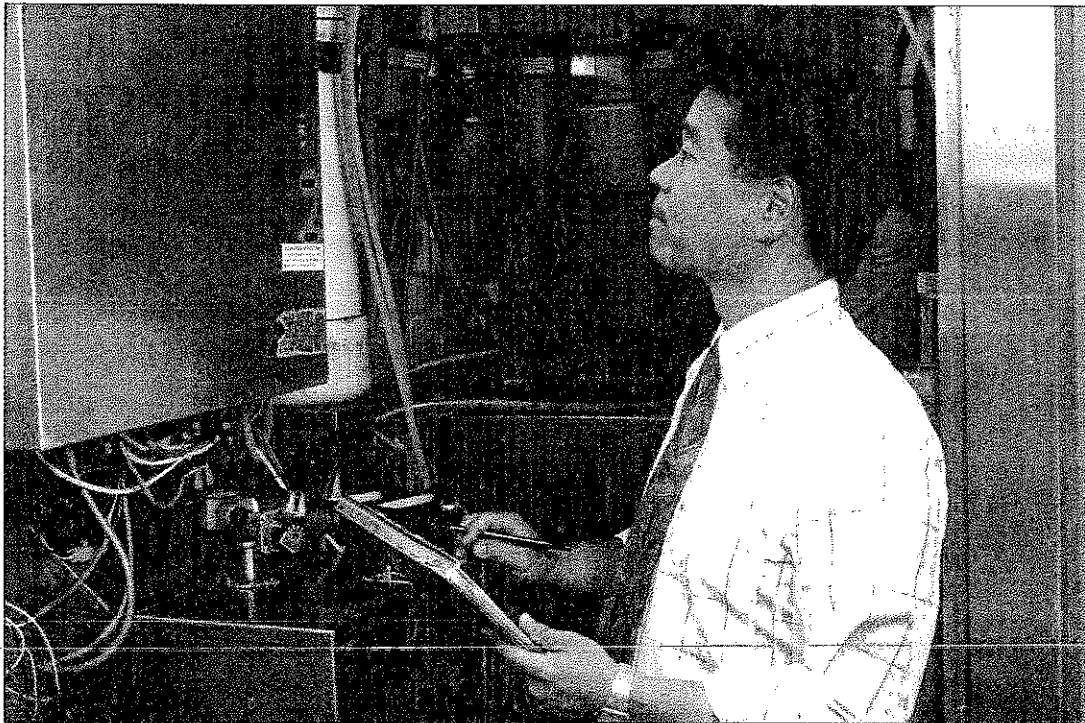


Figure 2.13: Health inspectors ensure that an operation is following all food safety laws.

An **inspection** is a formal review or examination conducted to see if an operation is following food safety laws. All operations serving food to the public, from quick-service restaurants to hospitals, nursing homes, and schools, are inspected. The most important reason for inspections is that failing to keep food safe can put the health of customers at risk. Failing an inspection could also result in an operation going out of business. Figure 2.13 on the previous page shows an inspector during an inspection.

[on the job]

Public Health Inspector

Public health inspectors play different roles, but their goal is always the same: to improve public safety. Some inspectors investigate restaurants and other foodservice facilities to make sure that all health and safety rules within the jurisdiction are being observed. Most facilities inspected fare well; the inspector identifies any concerns and educates management and employees. However, occasionally kitchens don't do well on the inspection, and the inspector finds major errors in day-to-day operations. In these instances, the health inspector has the authority to fine the business or even, if the problems are severe, close the facility. After the inspection, the inspector will write a report so that both management and the local government know the results.

Some health inspectors investigate wells and septic systems to prevent threats to the public water supply. Others may focus on environmental concerns, like air or soil pollution. And still others may investigate processing plants, such as slaughterhouses.

To become a public health inspector, a four-year degree in public health, food science, or a related field is usually required, as are a strong interest in science and good communication skills. Local governments often require prospective inspectors to pass additional examinations before they can be hired.

Successful restaurant and foodservice managers understand local food safety requirements and design policies that address them. They also conduct their own self-inspections. A self-inspection should check for the same things that a health inspector would, so that an operation is always prepared and functioning appropriately.

Summary

In this section, you learned the following:

- A foodborne illness is a disease transmitted to people by food. A foodborne-illness outbreak is when two or more people get the same illness after eating the same food.
- The costs of a foodborne-illness outbreak include financial costs to the restaurant or foodservice operation and human costs: loss of time at work, medical expenses, long-term disability, and possibly death.
- High-risk populations include people with weakened immune systems: the elderly, infants, preschool-age children, pregnant women, and people with HIV/AIDS or cancer, as well as people on chemotherapy and transplant recipients. They have a higher risk of getting a foodborne illness.
- Pathogens need six conditions to grow. These conditions can be remembered by FAT TOM: food, acidity, temperature, time, oxygen, and moisture.
- Those foods that need time and temperature control for safety, such as milk or fish, are called TCS foods. Ready-to-eat food also needs careful handling to prevent contamination.
- Contamination from biological toxins can be prevented by purchasing from approved, reputable suppliers and then cooking and holding dishes correctly.
- To store chemicals properly, you must keep them in a separate area away from food, utensils, and equipment used for food. Then follow safe storage rules.
- A food defense system helps to prevent people from purposely contaminating food. One important way to prevent tampering is to make sure access to an operation's food is controlled through use of uniforms and name tags.
- The most common allergens include milk and dairy products, eggs and egg products, fish, shellfish, wheat, soy, peanuts, and tree nuts. To prevent allergic reactions, servers must be able to answer questions about any ingredients in menu items. In addition, kitchen employees must be sure that allergens are not transferred by cross-contact.
- The restaurant and foodservice industry is monitored by many agencies. The FDA writes the *FDA Food Code*, and each state adopts the code as it sees fit. State and local health departments then enforce these laws.

Section 2.1 Review Questions

- ① Describe the four types of pathogens that can contaminate food and cause foodborne illness.
- ② Which populations have a higher risk of getting a foodborne illness and why?
- ③ List the three types of hazards that make food unsafe.
- ④ How can servers prepare to address the needs of customers with food allergies?
- ⑤ Melisa Bouchard indicates that guests expect their food to be safe. Is this something that you think about when you go out to eat? Why or why not?
- ⑥ Linda and Chef Jean are setting up a self-inspection for Uptown Grille. Given the situation that they faced today, where should they focus their attention?
- ⑦ How are the federal, state, and local governments each involved in food safety? Do you think this system works well? If not, what would you change?
- ⑧ A diner was eating at a restaurant. In a plate of noodles was a rather large shard of broken, off-white ceramic. Upon finding this physical hazard, the diner showed the problem to the server and requested a replacement plate of noodles. What should the manager of the restaurant do for the customer? What should the manager do to make sure this situation doesn't happen again?

Section 2 | Activities

1. Study Skills/Group Activity: How to Work Safely

Brainstorm as a group about the various ways in which viruses cause foodborne illness. How can you prevent viruses from making customers sick? Create a poster called Personal Hygiene Rules for the Uptown Grille.

2. Activity: How to Handle an Outbreak

In recent years, there have been numerous incidents of foodborne illness making national and international headlines. Select one episode, and write two paragraphs on it, describing the source of the problem, the identity of the pathogen, the number of people affected, and the steps taken to rectify the situation.

3. Critical Thinking: Keeping Food Safe

Most restaurants go to great lengths to ensure that they serve safe food. However, this activity usually stays behind the scenes. How can foodservice establishments highlight all this effort for customers? Is keeping food safe a marketing opportunity? If you were designing a marketing campaign based on food safety, what would your focus be?

Figure 2.14: Hairnets or covered hair is required by most restaurant and foodservice operations.



[on the job]

Making a Personal Statement

Many people like making a personal statement at school, at work, or out with friends. This often means favoring a particular hairstyle, wearing intricate jewelry, or applying detailed makeup. For people desiring a more permanent change, there are also facial piercings and tattoos.

These choices might not translate well into a professional environment, though, especially one in which there is the potential to contaminate food. Moreover, the ambiance of a particular restaurant, hotel, or other hospitality business might not mesh well with a less traditional "look."

A basic rule for foodhandlers is that they should never wear anything that could harm food. Jewelry could carry pathogens; it's even possible that a small bit of jewelry, such as an earring back, could fall into the food and be lost. Facial piercings, including earrings, should be removed. Hair restraints should always be worn, especially for long hair. Wearing too much makeup can be a problem, too. When the kitchen becomes hot, sweat can cause particles of makeup to contaminate food, so be moderate when considering cosmetic choices.

The rules are somewhat different for front-of-house employees, who primarily interact with customers. It is often acceptable for such employees to wear more jewelry than their coworkers in the kitchen; the same goes for makeup, and there is sometimes more flexibility with hairstyles as well. On the other hand, tattoos that might go unnoticed in kitchens might raise eyebrows in the dining room and must often be covered; in fact, some organizations do not hire employees with tattoos in particular places, such as necks and hands. Facial piercings, depending on their size and placement, might also be forbidden. Much depends on the style of the particular operation.

Handwashing

Handwashing is the most important part of personal hygiene. It may seem like an obvious thing to do, but many foodhandlers do not wash their hands correctly or as often as they should.

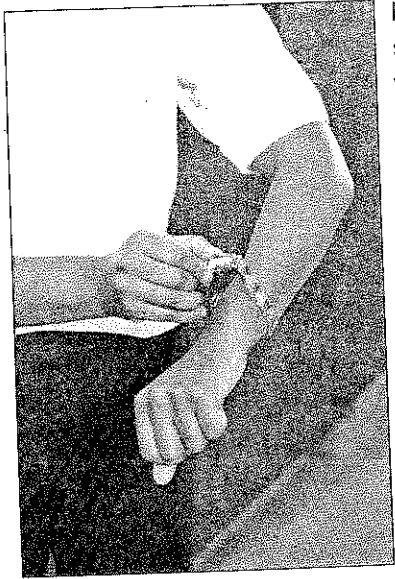


Figure 2.15: Foodservice workers should take off any jewelry before working with food.

Foodhandlers must wash their hands before they start work. They must also do it after the following activities:

- Using the restroom
- Handling raw meat, poultry, or seafood
- Touching the hair, face, or body
- Sneezing, coughing, or using a tissue
- Eating, drinking, smoking, or chewing gum or tobacco
- Handling chemicals that might affect food safety
- Taking out garbage
- Clearing tables or busing dirty dishes
- Touching clothing or aprons
- Handling money
- Touching anything else that may contaminate hands, such as dirty equipment, work surfaces, or towels

Figure 2.16 shows the steps for proper handwashing. The whole process should take about 20 seconds. Foodhandlers should wash their hands only in a designated handwashing sink. If they are not careful, they can contaminate their hands again after washing them. Using a paper towel to turn off the faucet and to open the door when leaving the restroom can prevent this.






	1. Wet hands and arms with running water as hot as you can comfortably stand (at least 100°F).
	2. Apply soap. Apply enough to build up a good lather.
	3. Scrub hands and arms vigorously for 10 to 15 seconds. Clean under fingernails and between fingers.
	4. Rinse hands and arms thoroughly under running water.
	5. Dry hands and arms with a single-use paper towel or warm-air hand dryer.

Figure 2.16: Steps for proper handwashing.

[trends]

Hand Sanitizers: You Can Even Carry It in Your Pocket

Hand sanitizers are now commonplace. They were a bright new idea not that long ago. Isopropyl alcohol is a good skin sanitizer, but it is a very thin and runny liquid, so product-development chemists mixed alcohol with some glycerin to thicken it.

Now you can pump it into your hands through a dispenser and easily rub it onto your skin. Brilliant! A new foam version is now available, that comes in an upside-down dispenser that does not require you to touch a pump with a freshly washed hand. Even more brilliant!

The most important thing to keep in mind with sanitizers is that they do not clean away dirt or anything else. They should never take the place of handwashing in a restaurant or foodservice operation. They kill most germs, but not all. Nothing replaces the need for you to completely wash your hands before applying a hand sanitizer. If you choose to use sanitizers after washing your hands, wait until the sanitizer is completely dry before handling food or equipment.

[fast fact]

Did You Know...?

Handwashing is very important to good hygiene. Everyone knows how to wash his or her hands, right? WRONG. Most people do not wash long enough or carefully enough. Experts say you should scrub your hands long enough to sing "Happy Birthday" twice.

Hand Maintenance

Besides handwashing, hands need additional care to prevent spreading pathogens. Figure 2.17 illustrates hand care guidelines for foodhandlers.





	Keep fingernails short and clean. Long fingernails can be difficult to keep clean.
	Do not wear false nails. They can break off into food and are difficult to keep clean.
	Do not wear nail polish. It can disguise dirt under nails and flake off into food.
	Wear a bandage over wounds on hands and arms. Make sure it keeps the wound from leaking. Also wear a single-use glove or a finger cot (a finger cover) over bandages on hands or fingers. These will protect the bandage and keep it from falling off into food.

Figure 2.17: Hand care for foodhandlers.

Fast fact!

Did You Know...?

80 percent of infectious diseases are transmitted by touching surfaces that have germs on them.

Source: WebMD

Bare-Hand Contact with Ready-to-Eat Food

Using bare hands to handle ready-to-eat food can increase the risk of contaminating it. Gloves, tongs, and deli tissue can help keep food safe by creating a barrier between hands and food. Figure 2.18 shows how to use gloves correctly.

Work Requirements Related to Illness

Restaurants and foodservice operations have a responsibility to ensure that their employees do not spread foodborne illnesses. Foodhandlers who are sick can spread pathogens to food. Depending on the illness, they might not be able to work with food until they recover.

Table 2.3 explains how managers should handle employees with illnesses.

Figure 2.18: How to use gloves correctly.

- Never use gloves in place of handwashing.
- Wash hands before putting on gloves and when changing to a new pair. Otherwise, dirty hands might contaminate the clean gloves.
- Make sure the gloves fit. They shouldn't be too loose or too tight.
- Never rinse, wash, or reuse gloves.
- Gloves should be changed as soon as they become dirty or torn. They should also be changed before beginning a different task; at least every four hours during continual use; and after handling raw meat, seafood, or poultry, and before handling ready-to-eat food.



Table 2.3: Handling Employee Illnesses

Situation	Procedure
The foodhandler has a sore throat with a fever.	The foodhandler cannot work with or around food. If the operation serves mostly high-risk customers (such as a nursing home), then the foodhandler shouldn't be in the operation.
The foodhandler has at least one of these symptoms: Vomiting Diarrhea Jaundice	The foodhandler shouldn't be in the operation.
The foodhandler has been diagnosed with a foodborne illness.	The foodhandler shouldn't be in the operation.

Summary

In this section, you learned the following:

- The following personal behaviors of foodhandlers can contaminate food:
 - Having a foodborne illness
 - Having wounds that contain a pathogen
 - Having contact with a person who is ill
 - Touching the hair, face, or body and then not washing their hands
 - Touching anything that may contaminate their hands and not washing them

- Having symptoms such as diarrhea, vomiting, or jaundice
- Eating, drinking, smoking, or chewing gum or tobacco while preparing or serving food
- The steps to proper handwashing are as follows:
 1. Wet hands and arms with running water as hot as you can comfortably stand (at least 100°F).
 2. Apply enough soap to build up a good lather.
 3. Scrub hands and arms vigorously for 10 to 15 seconds. Clean under fingernails and between fingers.
 4. Rinse hands and arms thoroughly under running water.
 5. Dry hands and arms completely with a single-use paper towel or warm-air hand dryer.
- Hands should be washed before starting work. They also must be washed after these activities: using the restroom; handling raw meat, poultry, or seafood; touching the hair, face, or body; sneezing, coughing, or using a tissue; eating, drinking, smoking, or chewing gum or tobacco; handling chemicals that might affect food safety; taking out garbage; clearing tables or busing dirty dishes; touching clothing or aprons; handling money; and touching anything else that may contaminate hands.
- Personal cleanliness practices include bathing or showering before work, keeping hair clean, wearing clean clothes, removing jewelry from hands and arms, and keeping nails clean.
- Proper work attire includes always covering hair, wearing clean clothes, removing aprons and storing them in the right place after leaving the prep area, and removing jewelry from hands and arms.
- Using bare hands to handle ready-to-eat food can increase the risk of contaminating it. Use gloves, tongs, or deli tissue when handling ready-to-eat food.
- Employees shouldn't work with or around food when they have a sore throat with a fever. They should be prevented from being in the operation when they are vomiting, have diarrhea or jaundice, or have a foodborne illness.

Section 2.2 Review Questions

- 1 What personal behaviors can contaminate food?
- 2 What should a foodhandler do if he or she cuts a finger while preparing food?
- 3 Identify the proper handwashing procedure.
- 4 List all the instances in which foodhandlers should wash their hands.
- 5 Melisa Bouchard believes that knowledge and communication help to ensure food safety. Create a scenario that shows how this would apply in a restaurant or foodservice operation.
- 6 Michael vomited early this morning, but he has come into work because he is feeling better. Then he starts to feel worse. Obviously, he came back to work too soon. What should happen?
- 7 What kind of personal habits do you have that might cause problems when handling food? What could you do to remind yourself not to do these things while handling food and equipment that comes into contact with food?
- 8 We all want to be seen as dedicated employees. When should you stay at home from work? Why?

Section 2.2 Activities

1. Study Skills/Group Activity: What's Your Style?

Brainstorm as a group about the balance between personal choice and professional appearance. Assuming you are investing in a restaurant, what type of "look" do you want your employees to portray? Do you foresee any food safety problems with this look? Create an ad for the positions of manager, server, and line cook for your restaurant. Include information on the ambience and environment that you wish to portray.

2. Activity: Hygiene Policy

What are the personal hygiene requirements for foodhandlers in your community? Contact your local health department or other authority to learn more. Develop a poster to share this information with the rest of the class, including the name of the local authority. Based on this information, create a hygiene policy for your restaurant employees.

3. Critical Thinking: What Should I Do?

You are the manager of a local restaurant. One of your employees arrives at work complaining of a stomachache. Today will be a busy day; another staff member is on vacation, and there are already many dinner reservations. What do you do? Write two paragraphs describing your response and why.