

Chapter 2  
Keeping Food Safe

## 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.

## 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

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.

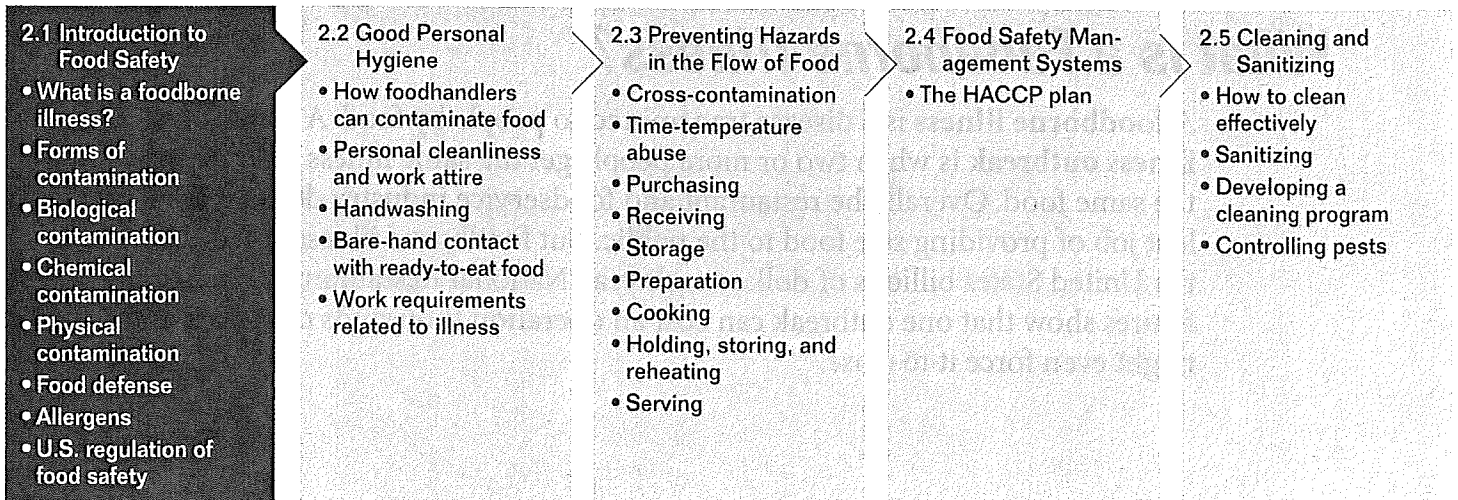
For those of you interested in entering this field, remember that understanding and getting involved in the many steps of the food-chain process will be very beneficial when developing and implementing food safety programs and procedures. There are so many key players, and they all have different roles 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.



## 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.

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### Study Questions

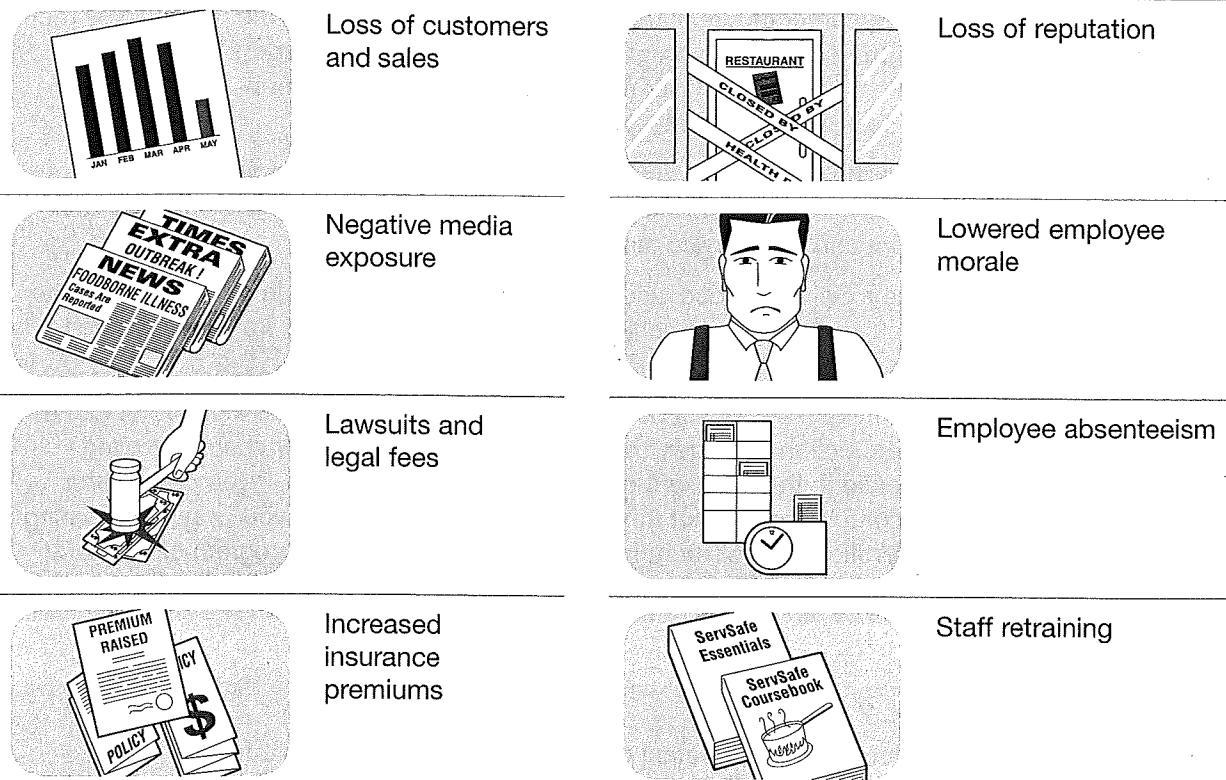
After studying Section 2.1, you should be able to answer the following questions:

- 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?
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### *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](http://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/Foodbornellness/](http://www.ers.usda.gov/Data/Foodbornellness/).

## 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.

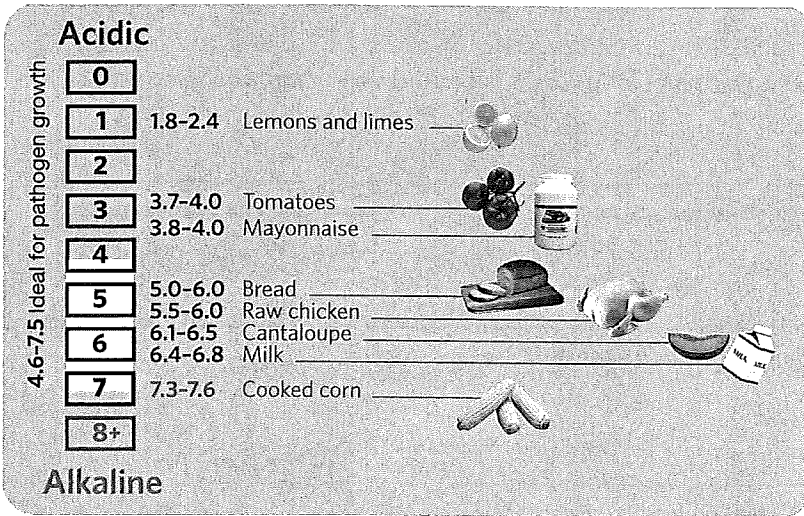


Figure 2.2: pH level of common foods.

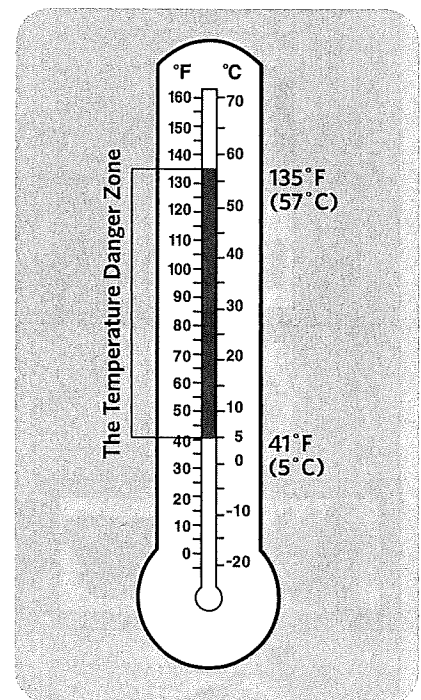


Figure 2.3: The temperature danger zone.