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The Flow of Food: An Introduction

Chapter Overview

Chapter 5 introduces students to hazards encountered in the flow of food.

Learning Objectives

- 5-1** Identify types of contaminants and methods of prevention
- 5-2** Explain ways to prevent time-temperature abuse
- 5-3** Describe how to use and maintain thermometers
- 5-4** Describe how to calibrate a thermometer

Opening Case Study

1. What could have been done to prevent this situation from occurring?

Here is what could have been done to prevent this situation from occurring:

- The operation should have supplied food handlers with color-coded cutting boards to keep things separate when prepping different types of food. For example, it could have supplied yellow cutting boards for prepping raw chicken and green cutting boards for prepping produce, like the lettuce. Of course, it would be critical to train food handlers on the correct use of each color.
- The food handler should have cleaned and sanitized all work surfaces, equipment, and utensils, including the knife and cutting board, after each task.
- The operation could have chosen to purchase prepared lettuce to eliminate the necessity of chopping it for their chicken Caesar salads.

Chapter Breakdown

Pages 98 to 101**5.1 Hazards in the Flow of Food**

Resources

PowerPoint Slides 3 to 5

Reinforce and Review:

- The flow of food is the path food takes in your operation from purchasing to serving. Many things can happen to food in its flow through the operation. Two major concerns are cross-contamination and time-temperature abuse.
- To prevent cross-contamination, keep ready-to-eat and raw food separated. When possible, use separate equipment for each type of food. Clean and sanitize all work surfaces, equipment, and utensils before and after each task. When separate equipment cannot be used, prep ready-to-eat food and raw meat, poultry, and fish at different times. Prepping ready-to-eat food first minimizes the chances of contamination. Similarly, you can buy food items that do not require much preparation or handling.
- Time-temperature abuse happens any time food remains between 41°F and 135°F (5°C and 57°C). This range is called the temperature danger zone. You must try to keep food out of this range.

Key Terms

- **Flow of Food:** Path that food takes through an operation, from purchasing and receiving through storing, preparing, cooking, holding, cooling, reheating, and serving.

Knowledge Check Answers

1. The guidelines for preventing cross-contamination of food include:
 - Using separate equipment for raw and ready-to-eat food
 - Cleaning and sanitizing all work surfaces, equipment, and utensils before and after tasks
 - Prepping raw meat, fish, and poultry at different times from ready-to-eat food when using the same prep table
 - Separating raw meat, poultry, and seafood from unwashed and ready-to-eat fruits and vegetables during storage, preparation, holding, and display
 - Purchasing ingredients that require minimal preparation, such as buying prepared food

2. The steps in the flow of food include:

- Purchasing
- Receiving
- Storing
- Preparation
- Cooking
- Holding
- Cooling
- Reheating
- Serving

CLASSROOM ACTIVITY: Follow the Food Flow

LO: 5-1 Identify types of contaminants and methods of prevention

Materials: Blank paper, different colored writing utensils

1. Divide students into small groups.
2. Assign each group a food and location (Ex: fresh-pressed green juice at a health spa or scrambled eggs in a hotel banquet room) and give them a blank sheet of paper.
3. Ask groups to brainstorm the flow of their food in their operation and create a Food Flow Map.
4. Direct students to exchange their Food Flow Map with another group.
5. Ask groups to use a different colored writing utensil to mark areas where hazards could occur in the flow of food.
6. Each group should then return the Food Flow Map to its original group.
7. Instruct groups to examine the hazards marked on their return maps and brainstorm solutions to prevent each of those hazards from occurring during the flow of food.
8. Debrief as a whole class.

Chapter Breakdown

Pages 102 to 108**5.2 Monitoring Time and Temperature****Resources**

PowerPoint Slides 6 to 11

Reinforce and Review:

- Have policies and procedures to avoid time-temperature abuse. They should include monitoring food and recording temperatures and times. Also make sure the correct types of thermometers are available. Use timers to check how long food is in the temperature danger zone. Make sure food handlers know what to do if time and temperature standards are not met.
- A thermometer is the most important tool you can use to prevent time-temperature abuse. Different types of thermometers are suited to different tasks. Use the correct type for the food or equipment being checked. Clean and sanitize thermometers before and after each use.
- When checking food temperatures, put the thermometer stem or probe into the thickest part of the food. Then take another reading in a different spot. Before you record the temperature, wait for the thermometer reading to steady. If using a bimetallic stemmed thermometer, put it into the food from the tip to the end of the sensing area. Never use glass thermometers with food items unless they are enclosed in a shatterproof casing.
- Thermometers should be calibrated regularly to keep them accurate. Two methods for calibrating are the ice-point method and the boiling-point method. Follow the manufacturer's directions for calibration.

Key Terms

- **Bimetallic stemmed thermometer:** The most common and versatile type of thermometer, which measures temperature through a metal stem with a sensor on the end.
- **Thermocouples:** Thermometers that check food temperature through a sensor on the tip of a metal probe.
- **Thermistors:** Thermometers that check food temperature through a sensor on the tip of a metal probe.
- **Time-temperature indicator:** Time and temperature monitoring device attached to a food shipment to determine if the product's temperature has exceeded safe limits during shipment or storage.
- **Calibration:** Process of adjusting a thermometer to a known standard, such as the freezing point or boiling point of water, to ensure that the thermometer gives accurate readings.
- **Ice-point method:** Method of calibrating thermometers based on the freezing point of water.
- **Boiling-point method:** Method of calibrating a thermometer based on the boiling point of water.

Knowledge Check Answers

1. The two thermometer calibration methods are the boiling-point method and the ice-point method. When using the boiling point method, thermometers should be calibrated to a temperature of 212°F (100°C), adjusted for altitude as necessary. When using the ice-point method, thermometers should be calibrated to 32°F (0°C).
2. Thermometers must be washed, rinsed, sanitized, and air-dried before and after use. Always have plenty of cleaned and sanitized thermometers on hand.

End of Chapter

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Discussion Questions

1. What are some ways food can be time-temperature abused?

Food is being time-temperature abused whenever it is handled in the following ways:

- It is cooked to the wrong minimum internal temperature.
- It is held at the wrong temperature.
- It is cooled or reheated incorrectly.

2. What are some ways to help food handlers keep regular temperature logs?

Have food handlers record temperatures regularly. Make sure they write down when the temperatures were taken. Print sample forms for recording this information. Post them on clipboards outside of coolers and freezers, near prep areas, and next to cooking and holding equipment.

3. How is a thermometer calibrated using the ice-point method?

These are the steps for calibrating a thermometer using the ice-point method:

1. Fill a large container with ice. Use crushed ice if you have it. Add tap water until the container is full. Stir the mixture well.
2. Put the thermometer stem or probe into the ice water. Make sure the sensing area is completely submerged. Wait 30 seconds or until the indicator stops moving. Do not let the stem or probe touch the sides or bottom of the container.
3. Adjust the thermometer so it reads 32°F (0°C). To calibrate a bimetallic stemmed thermometer, adjust it by holding the calibration nut with a wrench or other tool. To calibrate a thermocouple or thermistor, follow the manufacturer's directions.

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Apply Your Knowledge

Cross-contamination Stops Truck in Its Tracks

1. What should the operator of the food truck done differently?

The food truck operator should have used separate equipment for preparing different kinds of food. Also, he could have prevented cross-contamination by prepping raw and ready-to-eat food at different times. Finally, the food truck operator should have washed, rinsed, and sanitized his utensils and equipment after each task.

Tour Canceled by Outbreak

1. What caused the illnesses?

The food in the box lunches was time-temperature abused. Because the box lunches were stored in the warm luggage compartment of the bus, pathogens on the food grew and made the food unsafe.

2. What could have been done to prevent the illnesses?

The box lunches should have been stored in a way that would have kept the food out of the temperature danger zone. The food needed to be held at 41°F (5°C) or lower.

Pages 100 to 111

Study Questions

1. C. It must be washed, rinsed, and sanitized.
2. C. Up to the dimple in the thermometer stem
3. C. In the thickest part of the food
4. C. Immersion probe
5. C. Time-temperature indicator
6. C. Between 70°F and 125°F (21°C and 52°C)
7. B. Infrared thermometer
8. D. $\pm 2^\circ\text{F}$ or $\pm 1^\circ\text{C}$
9. A. Calibrate the thermometer.
10. B. Pathogens have time to grow