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UNIT 10

Food safety and hygiene

- 10.1** Foodborne illness
- 10.2** Prevention of foodborne illness
- 10.3** Food allergies and cross contamination

Introduction

Foodborne illnesses, also known as food poisoning, are caused by eating food that are contaminated with bacteria, viruses or other harmful substances. Food can become contaminated at any point during slaughter, processing, transport, storage, or preparation. There are many different bacteria that cause more than 200 foodborne illnesses. For every ten people who eat contaminated food, one person will become ill. Foodborne illness can cause death, particularly in young children and older adults.

In this unit, you will look at four common types of bacteria that lead to foodborne illness. You will understand how to prevent causing foodborne illnesses, and five key steps which should be taken in order to prevent the spread of dangerous bacteria to humans ranging from hand washing to food storage. You will explore the many causes of allergies, how they are treated, and how to avoid cross-contamination.



Learning outcome

Learning outcome 10: Explore the importance of food safety and hygiene in avoiding foodborne illness and cross-contamination.

Performance indicators:

- 11.10.1 Explore the concept of foodborne illness
- 11.10.2 Identify the importance of proper hygiene practices when handling food.
- 11.10.3 Explain how to avoid foodborne illness through proper food storage practices.
- 11.10.4 Understand safe food handling procedures when preparing meals.
- 11.10.5 Describe the causes of food related allergy and the strategies to avoid cross contamination.

Keywords

Word	Form	Definition
allergy	noun	a medical condition that causes someone to become sick after eat-ing or touching something that is harmless to most people
anaphylaxis	noun	a serious allergic reaction that can cause death
bacteria	noun	a group of very small living things that cause disease
contaminated	verb	when something becomes danger-ous, for example food, when a harmful or undesirable substance is added, like bacteria
diarrhoea	noun	An illness that causes waste to be passed from the body frequently in liquid rather than solid form
disease	noun	a condition that prevents the body or mind from working normally
faeces	noun	solid waste that is released from the body
foodborne	noun	when something is carried through food, such as a disease
symptom	noun	a change in the body or mind that suggests a disease is present
transmission	noun	the process by which something is spread or passed from one person or thing, to another

10.1 Explore the concept of foodborne illness



Discussion: Foodborne illness

Have you ever had a foodborne illness? What signs and symptoms did you have? Do you know anything about the different kinds of foodborne illnesses? Discuss with your class.

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Activity 1

Causes of foodborne illness



Name three things that cause foodborne illness.

1.
2.
3.



Discussion: Contamination

Discuss with your class why you think bacteria can grow and spread during the processing and storage of food.

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Activity 2

Bacteria



Below is an image of a kitchen. Circle the places you think you would find bacteria in this kitchen.



10.1

shutterstock

IMAGE ID: 1100253859
www.shutterstock.com

Answer the following questions about the picture above.

In which part of the kitchen do you think you would find the most bacteria?

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Why does it contain the most bacteria?

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Suggest what you could do to control the level of bacteria in this area.

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Activity 3

Bacterial growth



Using the growth rate of bacteria in your textbook, calculate the number of bacteria you would expect to be present after the following time periods.

Example:

1 bacterium after 15 minutes

$1 \times 2 = 2$ bacteria

1 bacterium after 45 minutes

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1 bacterium after 120 minutes

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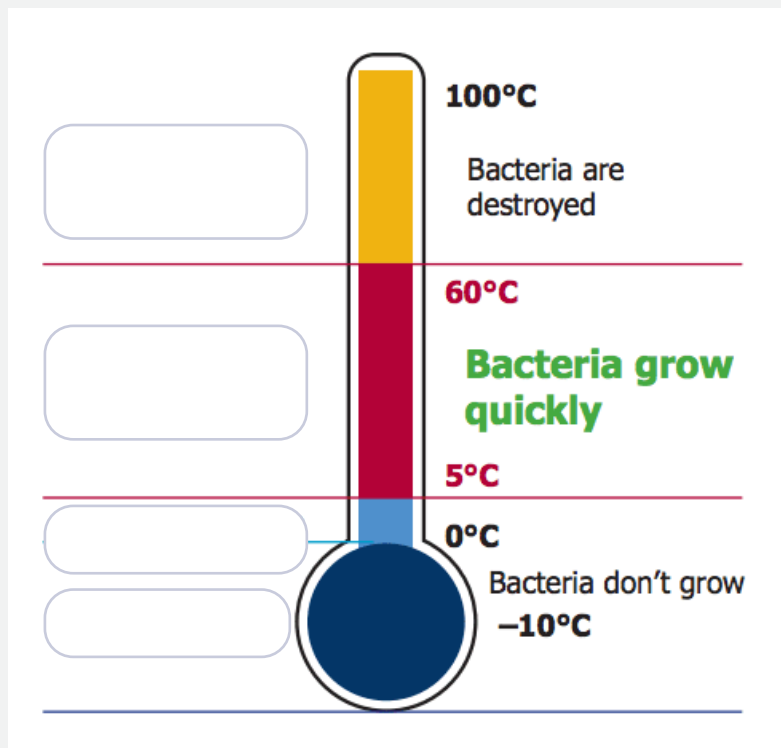


Activity 4

Temperature zones



Label each of the temperature zones correctly.



10.2



Activity 5

Growth conditions



Draw or write foods below that provide ideal growth conditions for bacteria.



Activity 6

Bacteria leading to illness



Name the four types of bacteria that lead to foodborne illness.



Answer the following questions about each type of bacteria.

Campylobacter	
Where can it be found?	
How is it passed to humans?	
Name a disease caused by the bacteria.	
What symptoms does it cause?	
How long does the illness caused by it last?	
Who is most at risk of death by it?	

Salmonella	
Where can it be found?	
How is it passed to humans?	
Name a disease caused by the bacteria.	
What symptoms does it cause?	
How long does the illness caused by it last?	
Who is most at risk of death by it?	

Listeria monocytogenes

Where can it be found?

How is it passed to humans?

Name a disease caused by the bacteria.

What symptoms does it cause?

How long does the illness caused by it last?

Who is most at risk of death by it?

E. coli

Where can it be found?

How is it passed to humans?

Name a disease caused by the bacteria.

What symptoms does it cause?

How long does the illness caused by it last?

Who is most at risk of death by it?



The newspaper article below has been taken from a UAE newspaper in September 2019. Read the information carefully and answer the questions on the next page.

The Daily News

10.3

Dubai restaurant closed after 15 people became ill in food poisoning outbreak

The Dubai Municipality has shut down a restaurant after 15 people fell ill following a food poisoning outbreak recently.

The outlet in Jumeirah has been forced to shut after the municipality received a report of 15 people falling sick after eating at the restaurant. The patients were hospitalised with symptoms such as diarrhoea, fever and vomiting.

Samples of food were collected and tested. The infection was traced to Salmonella bacteria from raw eggs which were used by the chef to make hollandaise sauce. There is a ban on Dubai restaurants using unpasteurised eggs in ready-to-eat products.

Once the restaurant reopens, it will be watched very closely for six months.



10.4

Source: The National Newspaper.

Now, answer the following questions.

1. What is the location of the restaurant?

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2. How many people became ill?

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3. What symptoms did the people have?

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4. What bacteria caused the food poisoning and where did it come from?

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5. Name some other symptoms these bacteria can cause.

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6. What disease is caused by these bacteria?

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Notes:

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10.2 Prevention of foodborne illness

STARTER 

Attitude to food safety

Read the following statements. Decide if you agree, disagree or are not sure of the statement.

Statement	Agree	Disagree
Regular handwashing during food preparation is worth spending extra time on.		
Keeping kitchen surfaces clean reduces the risk of illness.		
Keeping raw and cooked food separate will help to prevent illness.		
Using different knives and cutting boards for raw and cooked foods is important.		
Meat thermometers are useful in making sure food is cooked properly.		
Soups and stews should be boiled to make sure they are safe.		
You should thaw food in a cool place like a fridge.		
It is unsafe to leave chilled food out of the fridge for more than two hours.		
Checking foods are fresh before buying them is important.		

At the end of the lesson, have another look at these statements and see if you would change any of your answers.



Discussion: Prevention or cure

What is the difference in preventing an illness and curing an illness? Discuss and make notes below.

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Activity 9

Video: Five keys to safer food



Watch the video created by the World Health Organization. It shows the five steps to safer food handling and storage.

What are the five keys to safer food?

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Use the space below to make any other notes you have on the video.

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Activity 10

Keeping clean



Number the steps for handwashing from 1-4.

Dry hands with a clean dry towel.

Wet hands under running water.

Rub hands together for at least forty seconds with soap.

Rinse hands under running water.



Activity 11

Cleaning and sanitising



Explain the difference between cleaning and sanitizing.

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Notes:

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Activity 12

Storage of foods



Look at the following pictures. Identify if the pictures are good or bad examples of how to store food in a fridge. Give a reason for each answer.

Image	Is this a good or bad example? Explain why.
 <p>10.5</p>	
 <p>10.6</p>	
 <p>10.7</p>	
 <p>10.8</p>	



Discussion: Remember

Can you remember the name of the bacteria you learned about that can grow in cold temperatures?

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Activity

True or false



Answer true or false to the following questions about cooking food to safe temperatures.

To cook food thoroughly means that it is cooked correctly and properly.	
Cooking food to 50°C will kill large groups of bacteria within twenty seconds.	
One way to check that food is cooked is to use a stethoscope.	
Microwave ovens can cause toxic chemicals to be released from plastic.	



Activity

Quiz on food safety



Scan the QR code below to complete the WHO quiz on food safety. How many marks did you get in the quiz?

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10.9



Activity 15

Improving food safety



In groups, think about how you could promote or improve food safety at the following points of food production. Think about the five keys to safer food that you have learned. Make notes in the space below and discuss your suggestions with the rest of the class.

Production

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Transport

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Preparation

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Research: Your restaurant

Imagine you have decided to open a restaurant in your local area. Be creative and think of a unique concept. What type of restaurant would you like to see in the area that doesn't already exist?

Name of the restaurant

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Location of the restaurant

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Type of cuisine

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What makes your restaurant better than other similar restaurants?

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Research a food safety course your staff should complete that is held in the UAE.

Name of the course

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Location of the course

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Length of the course

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Cost of the course

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10.3 Food allergies and cross-contamination



Discussion: Allergies

Have you or does anybody you know have a food allergy? If so, what are they allergic to? What would happen if you (or the person you know) ate this food?

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Activity 17

Causes of allergy



Label each image below with the correct allergen.

 10.10	 10.11	 10.12
 10.13	 10.14	 10.15
 10.16	 10.17	 10.18



Research: Other causes

Research some other causes of food allergies. List the allergens you find below.

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Research: The rise in allergy cases

Do some research to find out which allergens have risen the most in recent years.

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Activity 18

Signs and symptoms



Name five signs and symptoms of food allergies.

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Activity 19

Anaphylaxis



Read the scenario below and answer the following questions.

Mohammed has a severe egg allergy. He went to a restaurant and ordered a burger. In this restaurant, eggs and burgers are cooked using the same grill. When Mohammed bit into his burger, he suffered anaphylaxis.

Is anaphylaxis a mild, medium or severe allergic reaction?

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What symptoms would you expect Mohammed to have?

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What should be used to treat Mohammed's anaphylaxis?

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What should Mohammed do when he orders food from a restaurant in the future?

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Activity 20

Have a go



Get into pairs. Follow the steps in your textbook to administer a practice adrenaline auto-injector on your partner.

How did it feel to administer an adrenaline auto-injector?

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Activity 21

Cross-contamination



The following activity is a practical way to show you how easily cross-contamination can occur.

Materials you will need:

- Sand
- Water

Steps:

- ⦿ Put a light dusting of sand on the table. This will act as the particles of an allergen-causing food such as nuts.
- ⦿ Wet the surface of your hand. Your hand is a piece of food that is safe to eat such as chicken.
- ⦿ Place the wet surface of your hand on top of the sand. After 5 seconds, remove your hand.

What has happened to your hand?

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Can the sand be removed easily? What does this show you about when particles of an allergen touch a safe food?

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What have you learned from this demonstration?

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Can you remember what food items are used with each colour of chopping board?
Label each of the colours below with the correct food items.

Prevent cross contamination

Use the correct colour coded chopping boards and knives

The image shows six horizontal rectangular boxes stacked vertically, each with a different colored border. From top to bottom, the colors are red, blue, maroon, yellow, green, and white. These boxes are intended for labeling the corresponding food items associated with each color of chopping board.

Notes:

A series of horizontal dotted lines for taking notes.

End of unit quiz

1. What are foodborne illnesses?

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2. Name the bacteria that is being described.

Bacteria that can pass the whole way through the food chain. Normally found in eggs, meat and poultry. It is one of the four key causes of diarrhoeal disease in the world.

Eating undercooked ground meat is one way which these bacteria can pass to humans. It is commonly found in the gut of cattle.

These bacteria survive and multiply at low temperatures. The disease caused by the bacteria is very serious and the death rate of infected people is high.

Undercooked poultry is one of the main transporters of these bacteria. Poultry becomes contaminated by coming into contact with faeces during slaughtering.

3. Match each of the five keys to safer food with their correct description.

Keep clean	Store food in containers to avoid contact between raw and cooked foods.
Separate raw and cooked food	Use clean water to cook and clean with.
Cook thoroughly	Thaw food in the fridge.
Keep food at safe temperatures	Wash your hands before handling food and during preparation.
Use safe water and raw materials	For meat and poultry, make sure the juices are clear and not pink.

4. List five common signs and symptoms of food allergies

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Notes:

A series of horizontal dotted lines for taking notes.

Notes:

A series of horizontal dotted lines for writing notes.