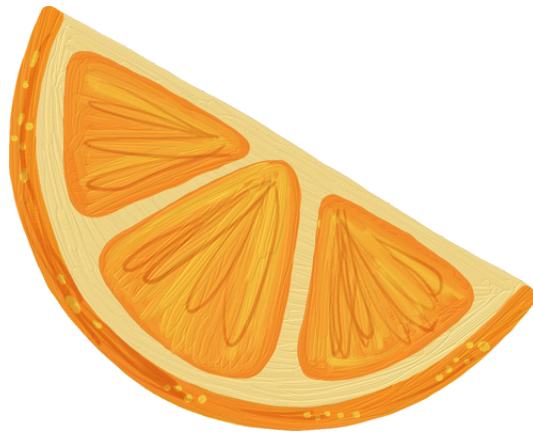


UNIT 10

FOOD SAFETY AND HYGIENE



UNIT SUMMARY

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SECTION 1

FOODBORNE ILLNESS

SECTION 2

CROSS-CONTAMINATION

SECTION 3

PREVENTING FOODBORNE ILLNESS

SECTION 4

FOOD ALLERGIES AND INTOLERANCES



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10.1 – Foodborne Illness

What are Foodborne Illnesses?

Foodborne: when something is carried through food.

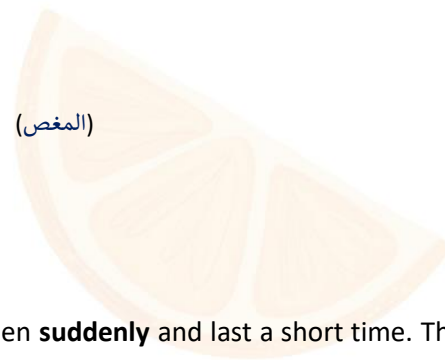
(منقول بالغذاء)

A foodborne illness is an illness that happens because of eating foods that contain disease-causing microorganisms. Foodborne illness is also known as **food poisoning**. The most common disease-causing microorganisms found in food are **bacteria**, but can also include

- viruses,
- fungi, (فطريات)
- parasites, (طفيليات)
- or chemicals.

The signs and symptoms of foodborne illnesses are different depending on the cause and type of infection. They may include

- nausea,
- vomiting,
- abdominal cramps, (المغص)
- and diarrhoea.



Most foodborne illnesses happen **suddenly** and last a short time. They can happen from **6–72 hours** after eating contaminated food. Most people recover on their own without treatment. Sometimes, foodborne illnesses may cause more dangerous complications.

Contaminated: when food becomes dangerous because a harmful or unwanted substance, such as bacteria, gets into it.

(مؤبوء/ملوث)

One in ten people become ill after eating contaminated food. Each year 420,000 people in the world die from foodborne illness. From this number, 125,000 are children younger than five years of age.

Bacteria

Harmful bacteria may already be in foods when you buy them. Raw (*not cooked*) foods may be contaminated with bacteria that cause foodborne illness.

10.1 – Foodborne Illness

Contamination can happen very easily. It can happen during:

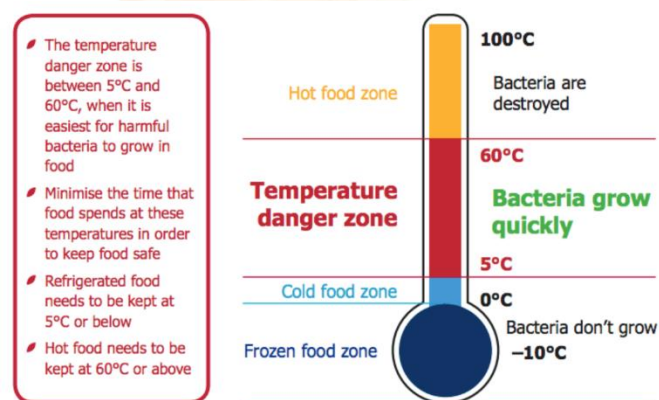
- growth
- harvesting (الحصاد)
- slaughter (الذبح) (when animals are killed to be eaten)
- processing
- storage
- transportation
- preparation in a kitchen.

Bacterial Growth

Bacteria grow by multiplying and they can do this very quickly. They need certain conditions to grow. These conditions are:

#1 Time: Bacteria double every 15 minutes. This means that within six hours, one bacterium can multiply to over 16 million.

#2 Warmth: Bacteria need warmth to multiply. The ideal temperature is **37°C**. They can multiply in temperatures between **5°C** and **60°C**.



Keeping food in the fridge can reduce the growth of bacteria. Freezing food can further slow, or even stop this growth.

Bacteria in refrigerated or frozen foods will become **active** again when brought to room temperature. These foods must be properly cooked to kill any harmful bacteria.

#3 Food: Bacteria need nutrients to grow. Meat, seafood, cooked rice, cooked pasta, milk, cheese and eggs are all foods that provide very good growing conditions for bacteria.

#4 Water: Bacteria need moisture to grow.

10.1 – Foodborne Illness

Some of the illness-causing bacteria that are commonly found in foods are:

- Campylobacter (عطيفة قولونية)
- Escherichia coli (E. coli) (الإشريكية القولونية)
- Salmonella (السالمونيلا)
- Listeria (ليستيريا)

Food containing harmful bacteria and other harmful substances such as viruses, parasites or chemicals can cause more than **200 diseases** ranging from diarrhoeal disease to cancer.

High-Risk Foods

Some foods are more likely to make you sick than others. This is because these foods are more at risk of bacterial growth. If they are not cooked to a safe temperature, or stored or handled properly, there is a higher chance they will make you sick.

Most foodborne illnesses develop quickly. However, some can take days to develop, so it can be difficult to find the exact cause of the illness. Knowing which foods to be extra careful with when storing, handling and cooking is helpful.

Poultry

(الدواجن)

Raw and undercooked poultry can be dangerous. Small amounts of bacteria can make people very sick. Cooking to a safe temperature normally kills dangerous bacteria.

Avoid washing raw chicken as this will spread the bacteria around the kitchen. Wash and sanitise anything that raw poultry has touched.

Eggs

Raw and undercooked eggs are also high-risk. Bacteria can live in the yolk (yellow part), the white part of the egg and on the eggshell. Normally the egg will not look, smell or taste any different.

Seafood

From the moment a fish is caught until it is eaten, it must be stored correctly. There are many different bacteria and toxins that can cause foodborne illness from fish.

Fish can become contaminated through **sewage** (مياه المجاري) in the water where they live. Even cooking to at high temperatures cannot kill some of the toxins found in seafood.

10.1 – Foodborne Illness

Rice

Sometimes bacteria can live in uncooked rice. Cooked rice provides heat, moisture and food which are perfect conditions for bacteria to multiply.

Vegetables

Vegetables are a common source of foodborne illness, especially when eaten raw. They can become contaminated at many stages from growth to storage to preparation.

Leafy green vegetables are especially dangerous as they are usually eaten raw. It is important to wash vegetables before eating them.



10.2 – Cross-Contamination

What is Cross-Contamination?

Cross-contamination is how bacteria can spread in food. It happens when raw food touches cooked food. Cross-contamination can result in food poisoning.

Cross-contamination can also refer to when allergy-containing food comes into contact with other foods, as this food is no longer safe for someone who has an allergy.

Types of Cross-contamination

There are three main types of cross-contamination:

- Food-to-food
- Equipment-to-food
- People-to-food

Food-to-Food

This is when contaminated food comes into contact with “**clean**” food.

Raw, undercooked or unclean food can contain large amounts of bacteria which can spread to other food that comes into contact with it. This can happen if you let raw food touch clean food, or if the juices (*liquid*) from raw food **drips** onto other food, either in the fridge, shopping trolley or while preparing food.

High-risk foods that could cause contamination include

- leafy green vegetables,
- leftover rice,
- raw eggs,
- poultry
- and seafood.

Equipment to Food

Bacteria can live for a long time on surfaces like **countertops, cutting boards, utensils** (*knives and forks*), **storage containers** and **factory equipment**. Therefore, it is very important to wash all surfaces and equipment properly using soap and hot water.

Using the same cutting board and knife to cut raw meat and cooked meat can be very harmful.

10.2 – Cross-Contamination

There are globally recognised **colour codes** which are used to identify which chopping board to use depending on the food that is being prepared.

Prevent cross-contamination Use the correct colour coded chopping boards and knives		
Raw meats and poultry only	Raw fish and shellfish only	Raw unwashed vegetables, salads and fruits only
Ready to eat and cooked foods only	Washed vegetables, salads and fruits only	Bakery and dairy products only

Food Hygiene Act 1995

People-to-Food

Not washing hands regularly when handling food can cause contamination. If a person coughs into their hand or touches raw chicken then touches 'clean' food without washing their hands it can cause contamination.



10.3 – Preventing Foodborne Illness

Five Keys to Safer Food

The five keys to safer food is a global health message that everyone all over the world should know. They help prevent foodborne illnesses and improve health. The five steps are:

1. Keep clean
2. Separate raw and cooked food
3. Cook thoroughly
4. Keep food at safe temperatures
5. Use safe water and raw materials

#1 – Keep Clean

Just because something looks clean it does not mean that it is. It takes over 2.5 billion bacteria to make 250ml of water look cloudy. However, in some cases, it only takes twenty harmful bacteria to make a person sick.

Why is it important?

Dangerous germs are widely found in **soil**, **water**, **animals** and **people**. These germs are carried by hands, clothes and kitchen equipment. The slightest contact can transfer germs to food and cause foodborne diseases.

Handwashing

Hands transfer germs from one place to another, so handwashing is very important. You should wash your hands:

- before, during and after handling food.
- before eating.
- after going to the toilet.
- after blowing your nose.
- after handling rubbish.
- after handling cleaning products.
- after touching animals or playing with pets.



By now, you should be very familiar with how to properly wash your hands.



10.3 – Preventing Foodborne Illness

Cleaning Plates and Kitchen Equipment

Some general advice from the WHO includes the following:

- Clean **while** preparing food so bacteria do not have a chance to grow.
- Give a lot of attention to equipment that may touch both **raw** food and **cooked** foods and anything that will touch someone's mouth.
- **Sanitise** cutting boards and equipment after they have been in contact with raw meat or seafood.
- Don't forget to **clean** and **dry** the cleaning equipment as bacteria grow fast in damp (slightly wet) places.

Cleaning – is the process of physically removing dirt and crumbs of food.

Sanitising – is the process of killing germs or disinfecting.

Protect Food from Pests

Pests include **cockroaches**, **mice**, **rats**, **flies** and **insects**. They can pass harmful germs onto food and kitchen surfaces. Pets carry pests in their fur or their feet.

Do the following things to keep food safe from pests:

- Food should be **covered** or in closed containers.
- Rubbish bins should be **covered** and rubbish should be removed regularly.
- Food preparation areas should be in good condition (**repair** cracks or holes).
- Keep house pets **away** from food preparation areas.

#2 – Separate Raw and Cooked food

Separating raw and prepared foods will prevent cross-contamination.

Why is it important?

Raw food, especially meat, poultry and seafood (and their juices) contain dangerous bacteria which can move onto other foods during food preparation and storage.



10.3 – Preventing Foodborne Illness

How to Keep Raw Food and Prepared Foods Separate

- While shopping, keep raw meat, poultry and seafood **separate** from other foods.
- In the fridge, store raw meat, seafood and poultry on shelves or sections **below** cooked foods.
- Store food in **containers** with lids to stop raw and cooked foods from touching.
- **Wash** plates that have been in contact with raw foods, and always use a clean plate for cooked foods.

#3 – Cook Thoroughly

Thoroughly – being careful about doing something in the correct way.

Why is it important?

Proper cooking can kill almost all dangerous bacteria. Cooking food to **70°C** can ensure it is safe to eat. A temperature of 70°C can kill large groups of bacteria within thirty seconds.

How to Cook Food Thoroughly

Use a **thermometer** to check that foods reach **70°C**. Make sure the thermometer is cleaned and sanitised after each use. This will avoid cross-contamination between raw and cooked foods.



Sometimes a thermometer will not be available. There are other ways to check that food is properly cooked. This includes:

- Cook meat and poultry until the juices are **clear** and the inside is **not pink**.
- Cook eggs and seafood until **pipng** hot the whole way through.
- **Boil** liquid-based foods like soups and stews. Allow them to remain boiling for at least one minute.

Using a Microwave Oven

Microwave ovens can cook and reheat foods **unevenly**. They sometimes can **leave** cold spots where dangerous bacteria can survive. It is very important to **check** that food cooked or reheated in a microwave is at least **70°C** the whole way through to the centre.

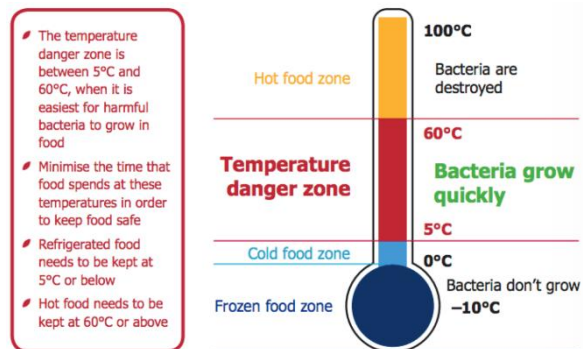
10.3 – Preventing Foodborne Illness

#4 – Keep Food at Safe Temperatures

What are the Safe Temperatures for Food?

The **danger zone** is the temperature range between **5°C-60°C**. This is where bacteria multiply very quickly.

Bacteria cannot grow if it is **too hot** or **too cold**. Therefore, storing food at a temperature below five degrees is advised.



How to Keep Food at Safe Temperatures

- Cool and store all leftover food **quickly**. **Slice** large pieces of meat into smaller pieces and place food in a clean, cool container.
- Leftover food should not be stored in the fridge for more than **three** days and should not be reheated more than **once**. This is because food enters the danger zone once it is reheated, and bacteria can grow quickly.
- Thaw (أذِثِّ) frozen food in the fridge.
- **Cool** hot food until the steam no longer rises from it. You should not leave hot food to cool for more than **two** hours.

#5 – Use Safe Water and Raw Materials

Why is it important?

Raw materials (including water) may be **contaminated** with dangerous bacteria and chemicals. You should be careful when buying raw materials and take precautions. For example, you should wash and peel (يقشر) fruit and vegetables to reduce the risk of eating dangerous bacteria.

Safe water is needed to:

- Wash fruit and vegetables.
- Add to food and drinks.
- Make ice.
- Clean cooking equipment.
- Wash hands.

Selecting Safe Raw Materials

- Select fresh foods.
- Avoid rotten food.
- Choose dairy products that have been pasteurised.
- If you are buying ready-to-eat cooked foods, make sure they are stored correctly.

10.3 – Preventing Foodborne Illness

Five keys to safer food



Keep clean

- ✓ Wash your hands before handling food and often during food preparation.
- ✓ Wash your hands after going to the toilet.
- ✓ Wash and sanitise all surfaces and equipment used for food preparation.
- ✓ Protect kitchen areas and food from insects, pests and other animals.

Why?

While most microorganisms do not cause disease, dangerous microorganisms are widely found in soil, water, animals and people. These microorganisms are carried on hands, wiping cloths and utensils, especially cutting boards and the slightest contact can transfer them to food and cause foodborne diseases.



Separate raw and cooked

- ✓ Separate raw meat, poultry and seafood from other foods.
- ✓ Use separate equipment and utensils such as knives and cutting boards for handling raw foods.
- ✓ Store food in containers to avoid contact between raw and prepared foods.

Why?

Raw food, especially meat, poultry and seafood, and their juices, can contain dangerous microorganisms which may be transferred onto other foods during food preparation and storage.

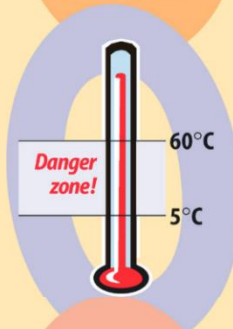


Cook thoroughly

- ✓ Cook food thoroughly, especially meat, poultry, eggs and seafood.
- ✓ Bring foods like soups and stews to boiling to make sure that they have reached 70°C. For meat and poultry, make sure that juices are clear, not pink. Ideally, use a thermometer.
- ✓ Reheat cooked food thoroughly.

Why?

Proper cooking kills almost all dangerous microorganisms. Studies have shown that cooking food to a temperature of 70°C can help ensure it is safe for consumption. Foods that require special attention include minced meats, rolled roasts, large joints of meat and whole poultry.



Keep food at safe temperatures

- ✓ Do not leave cooked food at room temperature for more than 2 hours.
- ✓ Refrigerate promptly all cooked and perishable food (preferably below 5°C).
- ✓ Keep cooked food piping hot (more than 60°C) prior to serving.
- ✓ Do not store food too long even in the refrigerator.
- ✓ Do not thaw frozen food at room temperature.

Why?

Microorganisms can multiply very quickly if food is stored at room temperature. By holding at temperatures below 5°C or above 60°C, the growth of microorganisms is slowed down or stopped. Some dangerous microorganisms still grow below 5°C.



Use safe water and raw materials

- ✓ Use safe water or treat it to make it safe.
- ✓ Select fresh and wholesome foods.
- ✓ Choose foods processed for safety, such as pasteurized milk.
- ✓ Wash fruits and vegetables, especially if eaten raw.
- ✓ Do not use food beyond its expiry date.

Why?

Raw materials, including water and ice, may be contaminated with dangerous microorganisms and chemicals. Toxic chemicals may be formed in damaged and mouldy foods. Care in selection of raw materials and simple measures such as washing and peeling may reduce the risk.

10.4 – Food Allergies and Intolerances

Food Allergies

A **food allergy** is when the body's immune system responds unusually to certain foods. When you have a food allergy, your body reacts to the food and tries to fight against it.

It might handle harmless substances in the food you eat and see them as a threat. This tells the body to release chemicals which cause an **allergic reaction**. Food allergies can be so severe that they cause a reaction called **anaphylaxis**. They can even be life-threatening.

Allergies can develop at any stage in life. For example, **shellfish** allergies are more likely to develop in adulthood.

Common Causes of Allergy

Foods that commonly cause allergies are called **allergens**. Some examples of allergens include:

- Peanuts (and other nuts)
- Shellfish (المحار)
- Eggs
- Fish
- Gluten (a protein naturally found in certain cereal grains)
- Milk and dairy foods
- Mustard (خردل)
- Sesame seeds

More than 170 foods have been reported to cause allergic reactions.

The Rise in Food Allergy Cases

The number of people with food allergies has risen a lot over the past few decades. The reason for this is unclear but there are a couple of theories that suggest why.

One theory is that the typical child's **diet** has changed a lot over the last thirty to forty years.

Another theory is that children are growing up in '**germ-free**' environments. Their immune systems might not develop properly because they are not exposed to germs. When they eat certain foods, their bodies mistake harmless substances for bacteria, and they think they are being attacked, causing an allergic reaction.

10.4 – Food Allergies and Intolerances

Food Intolerances

(الحساسية المفرطة/عدم تحمل الطعام)

Food intolerance happens when the body cannot properly digest the food that is eaten. It can also happen when a particular food irritates the digestive system.

It can be difficult to know if a person has a food intolerance as the symptoms are similar to other conditions. Reactions due to food intolerances are **not life-threatening**.

Types of Intolerances

Some common types of food intolerance include:

- **Lactose**
- **Caffeine**
- **Gluten**
- **Histamine** (in mushrooms and pickles (مخللات))
- **Additives** (e.g. artificial sweeteners, colouring or flavours)

Lactose Intolerance

This is one of the most common intolerances. It happens when a person has **digestive problems** after eating **dairy products**. Their body cannot digest lactose which is a **natural sugar** found in milk, yoghurt and soft cheeses.

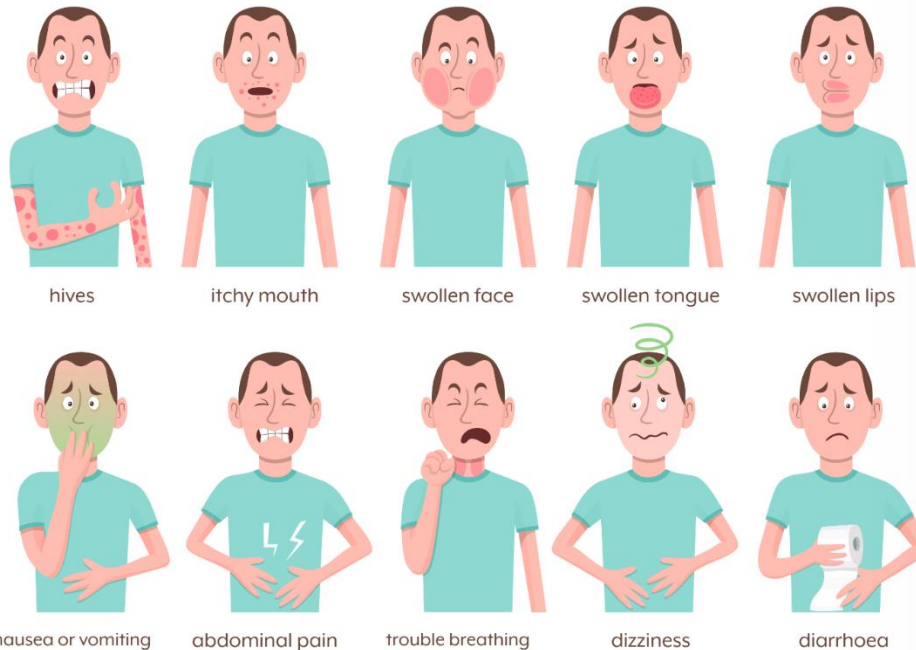
Gluten Intolerance

Many people experience digestive problems caused by gluten, but not all of these people are gluten intolerant. Gluten is a **protein** in **wheat** (قمح), **barley** (شعير) and **rye** (الذرة). It is used in foods like **bread**, **pasta**, **cereal**, **pastries**, **cookies** and **doughnuts**.

Signs and Symptoms of Food Allergies

The signs and symptoms of allergies and intolerances are very similar. They can range from person to person depending on how mild or severe their reaction is. If a person suffers a mild reaction on one occasion, it does not mean that their reaction will be mild the next time. By now, you should be very familiar with how to properly wash your hands.

10.4 – Food Allergies and Intolerances



Food Allergy

- It usually comes on **suddenly**.
- **Small amounts** of food can trigger a reaction.
- A reaction happens **every** time the food is eaten.
- It can be **life-threatening**.

Food Intolerance

- It usually comes on **gradually**.
- A reaction may only happen when **a lot** of the food is eaten.
- A reaction may only happen if the food is eaten **often**.
- It is **not** life-threatening.

Symptoms of Allergic Reactions

- Rashes or hives
- Itchy mouth
- Swelling of face, tongue and lips
- Trouble breathing

Symptoms of Food Intolerance

- Gas
- Stomach cramps/bloating
- Heartburn
- Headaches

حرقة في المعدة

Symptoms of Both

- Nausea
- Abdominal pain
- Diarrhoea
- Vomiting

10.4 – Food Allergies and Intolerances

Food intolerances can be **hard** to diagnose. This is because the symptoms that people experience are similar to those of many other conditions, such as **irritable bowel syndrome** and **irritable bowel disease**.

The best way to diagnose food intolerance is to monitor symptoms alongside the foods that are eaten. Removing suspected foods from the diet and seeing if any changes are noticed is a good method.

Anaphylaxis

Anaphylaxis is a severe allergic reaction to certain foods and it can lead to death. A person who has an anaphylaxis reaction needs immediate emergency medical care.

Symptoms of anaphylaxis include:

- Difficulty breathing
- Rash on the skin
- Rapid heart rate
- Nausea

If someone has a severe reaction, they may go into a state known as **anaphylactic shock**. The sufferer should be treated with an injection of **adrenaline** that comes in the form of an **auto-injector** and an ambulance should be called immediately.

Most people with severe allergies carry an **adrenaline auto-injector** with them.



UNIT 10

FOOD SAFETY AND HYGIENE

UNIT SUMMARY

Resources

- G12 – Term 3 – Unit 10: Food Safety and Hygiene

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