UNIT-5 Food Poisoning

Learning Outcomes
By the end of this unit the learner will be able to:
• Differentiate between bacterial food poisoning and chemical food poisoning • Discuss the control measures that can be implements to prevent food poisoning • Understand the potential consequences of falling ill after consuming contaminated foods

Unit 5
Food Poisoning

Foods that are spoiled look, smell and taste 'off'. These are detectable signs to warn the consumer not to eat them. Eating spoiled foods however is unlikely to cause illness. On the other hand, foods that are contaminated with harmful micro-organisms or toxins look, smell and taste okay. Toxins in foods can be from a number of sources. Some foods are naturally poisonous or are subject to natural contaminants.

Examples:

- Poisonous mushrooms.
- 'green' potatoes - poison 'solanine'.
- Comfrey - contains a poisonous alkaloid.
- Rhubarb leaves - high levels of oxalic acid.
- Apricot kernels - contain cyanide.
- Apple seeds - contain cyanide.
- Peanuts - may be contaminated with high levels of Aspergillus flavus mould.

Chemical Food Poisoning

Harmful chemicals may end up in the food supply as a result of agricultural practices or industrial pollution. Pesticides/herbicides are widely used in the control of undesirable plants and insects. The surface of fruits and vegetables may have spray residues. It is good practice to wash fruit and vegetables before use.

Sometimes cleaning chemicals can accidentally contaminate food eg. Sodium hypochlorite inadequately rinsed from drink containers. Always store chemicals away from food. Make sure chemicals are correctly labelled. Always follow manufacturer's instructions for use.

Bacterial Food Poisoning

The term food poisoning is used to describe the illness that results from the consumption of food containing pathogenic bacteria. Symptoms of food poisoning vary but usually involve vomiting, diarrhoea and abdominal pain.

The bacteria responsible for food poisoning may be derived from:

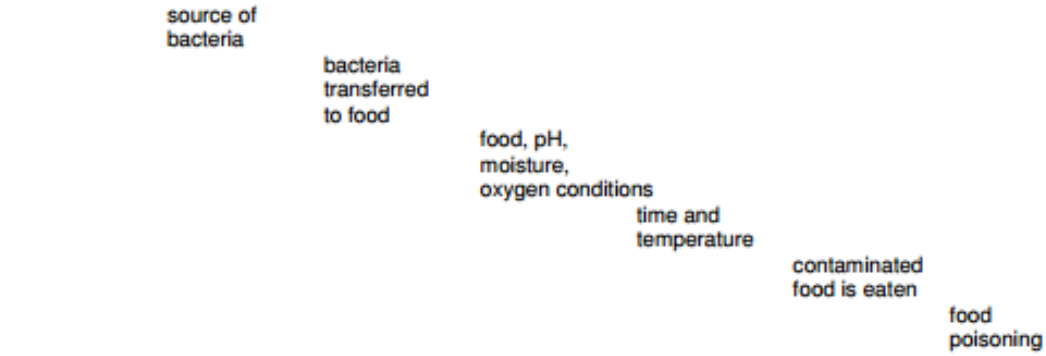
- Contaminated raw ingredients.
- Infected food handlers.
- Pests contaminating raw or processed foods.
- The equipment, surfaces and utensils in the food preparation area.

The growth of these bacteria can be accelerated by:

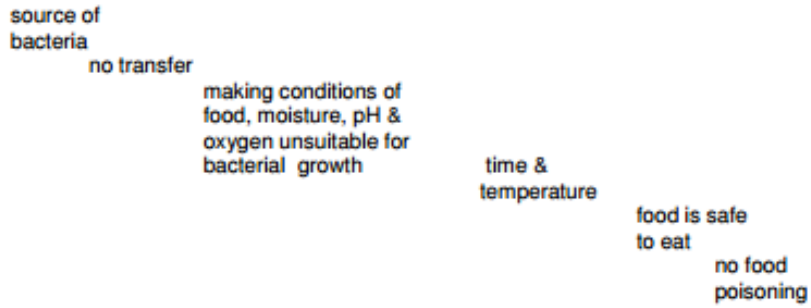
- Preparing food too far in advance.
- Inadequate cooking.

- Inadequate reheating.
- Improper thawing.
- Improper hot holding of cooked foods.

Most food poisoning is the result of unhygienic practices. The causes of food poisoning are sometimes summarised as the Food Poisoning Chain. There are six links.



Breaking any link in the chain will prevent food poisoning.



Food service workers should organise their work so that the links in the food poisoning chain are broken. They should be especially careful when handling potentially hazardous foods. These foods are high in protein and moisture and will readily support bacterial growth eg. Meats, poultry, fish, milk and eggs. The most important types of food illnesses are caused by the following:

These bacteria cause infection	Illness is due to toxins produced by the bacteria
Salmonella	Staphylococcus Aureus
Listeria monocytogens	Campylobacter jejuni
Clostridium botulinum	Bacillus Cere
Vibrio parahaemolyticus	

Salmonella

Incubation time: 8-48 hours.
Symptoms: Diarrhoea, vomiting, abdominal pain, fever.

Lasts: 1-7 days.

Environmental and Food Source

- Present in the intestines of animals.
- Spread by flies, cockroaches, mice and rats.
- Meats, poultry and eggs contaminated with excreta during processing.
- Shellfish and fish from sewerage polluted waters.
- Vegetables grown using animal manure.
- Transferred from raw foods to cooked foods by hands, equipment and surfaces in the kitchen.
- Food handlers can be carriers of Salmonella.

Controls

- Thorough cooking of foods. Temperatures above 65°C will destroy Salmonella.
- Wash hands and equipment between handling raw and cooked foods.
- Wash vegetables, especially those to be eaten raw.
- Enforce strict personal hygiene.
- Avoid cross contamination after cooking by keeping raw and cooked meat apart.

Clostridium Perfringens

It is anaerobic and forms spores.

Illness

Incubation time: 8-20 hours.
Symptoms: Diarrhoea and abdominal pain. Vomiting is rare.
Lasts: 12-48 hours.

Occurs particularly in situations of large scale catering.

Environmental and Food Sources

- Present in the intestines of animals, commonly found on meat and poultry.
- Spores occur widely in soil, dust, air and water.
- Vegetables contaminated with animal manure, soil or dust may harbour spores.
- Large quantity meat dishes that involve long slow cooking and roasts that are cooked ahead, then reheated.

Spores may survive the cooking process. If cooling is slow and not under refrigeration, spores may germinate and Clostridium Perfringens bacteria grow to dangerous numbers.

Controls

- Keep soil carrying vegetables out of preparation area?
- Avoid partial cooking of foods, then reheating.
- Cool cooked meat dishes quickly (within 1½hours) and refrigerate.
- If foods must be reheated, do it quickly and thoroughly.
- Enforce strict personal hygiene.

Listeria Monocytogenes

The organism responsible for listeriosis has caused several major food-borne outbreaks affecting particular at-risk groups in the community. The bacteria can be found in a variety of ready-to-eat foods such as deli-meat, cooked diced chicken, smoked mussels, smoked fish, pre-prepared salads and soft serve ice-cream. It has also been found in unpasteurised milk, soft cheese, coleslaw and pate.

Who is at Risk from Listeria Infection?

Listeria infection can affect people differently. Healthy people may develop few or no symptoms. However, for some people, the infection can be serious enough to require hospitilisation and be a threat to life.

People who are at particular risk of infection include:

- Pregnant women and their unborn babies.
- Newborn babies.
- The elderly.
- Anyone whose immune system has been weakened by disease or illness eg cancer, leukemia, diabetes, liver or kidney disease.
- Anyone on prednisone or cortisone as this can also suppress the immune system.

Symptoms

Healthy people may not be affected at all. In persons at risk, symptoms may include fever, headache, tiredness, aches and pains. These symptoms may progress to more serious forms of the illness, such as meningitis and septicaemia. Less common symptoms are diarrhoea, nausea and abdominal cramps.
In pregnant women the illness may vary from a mild form to resulting in miscarriage, still birth, premature birth or a very ill baby.

How common is Listeria Infection?

It is relatively uncommon but the fatality rate among at-risk people is very high. Between 8-24 cases are reported each year.

Can Listeria Infection be Treated?

Yes, with antibiotics if treatment is started early.

How can you Avoid Listeria Infections?

As Listeria bacteria are commonly found in the environment, they are impossible to eradicate. Some exposure to the bacteria is unavoidable; most people are, however, at low risk of Listeria infection.

High Risk Foods

- Ready to eat seafood such as smoked fish and smoked mussels.
- Pre-mixed raw vegetable salads, such as coleslaw.
- Pre-cooked meat products which are eaten without further cooking or heating, such as pate, sliced deli-meat, and cooked diced chicken.
- Any unpasteurised milk or foods made from unpasteurised milk.
- Soft serve ice-cream.
- Soft cheeses such as brie, camembert, ricotta.

Safe Foods

- All freshly cooked foods.
- Hard cheeses, cheese spreads, processed cheeses.
- Milk, freshly pasteurised and UHT.
- Yoghurt.
- Tinned and pickled foods.

BACILLUS CEREUS

Bacillus organisms are aerobic and spore forming. In the vegetative state they produce toxins. Infective dose is large; 100 million bacteria.

Illness

Incubation time:	1-12 hours.
Symptoms:	Vomiting, some diarrhoea and abdominal pain.
Lasts:	6-24 hours.

Environmental and Food Sources

- Found in soil, dust and water.
- Frequently present in rice, cornflour, dried peas and beans.
- Mostly associated with spore germination in cooked foods incorrectly stored and reheated.

Controls

- Hold food out of the temperature danger zone.
- Discard water used for soaking dried peas and beans.
- Refrigerate leftovers quickly.
- Thoroughly reheat leftovers.

Sathylococcus Aureus

Staphyle is from the Greek, meaning 'bunch of grapes'. Under the microscope this bacteria looks like a bunch of grapes. Staphylococcus is a facultative micro-organism and able to survive without oxygen. It does not form spores, but does release heat resistant toxin. The bacteria themselves are easily destroyed by heating. The toxin, however may survive boiling temperatures for thirty minutes. Staphylococcus is tolerant of salt.

Approximately 50% of the human population permanently or intermittently carry Staphylococcus

Aureus in the nose, throat and on the skin. It is the micro-organism which infects pimples, cuts and burns.

Illness

Incubation time:	2-6 hours.
Symptoms:	Acute vomiting, abdominal cramps and sometimes diarrhoea.
Lasts:	2-24 hours.

Environmental and Food Sources

- Food handled with contaminated hands.
- Food handler coughing or sneezing over food.
- Ham, cold meats, sausages.
- Bakery items eg. Cream filled cakes, trifles, custards.
- Salads eg. Pasta, potato.
- Unpasteurised milk from cows with infected udders.

Controls

- Enforce strict personal hygiene.
- Food handlers with colds should not work with food.
- Use gloves, tongs, spoons to minimise contacting food with bare hands when mixing, slicing, and serving. Store food items under refrigeration.
- Guard against cross contamination.

Clostridium Botulinium

The word 'Botulinium' is a Latin derivative of sausage.
Through the ages, sausages have need associated with the most deadly form of bacterial food poisoning.
A 0.2mg dose of the toxin produced by the bacteria is thought to be lethal to an adult. Fortunately, botulism is rare and an anti-toxin is available. Clostridium botulinium is anaerobic and forms spores.

Illness

Incubation time:	12-36 hours
Symptoms.	Toxins act on the central nervous system. Vision and speech are impaired. Respiratory muscles are paralysed. In the worst cases breathing stops

Environmental and Food Sources

- Found in soil, sea water.
- Low acid canned foods that have been inadequately heat processed eg. Beetroot, corn, beans, mushrooms, fish.
- Vacuum packed fish eaten raw.

Controls

- Do not use defective 'blown' canned foods.
- Ensure sufficient time/temperature combinations in cookery.
- Add acid (vinegar, lemon juice, wine) to low acid foods bottled on the premises.

Further Reading: