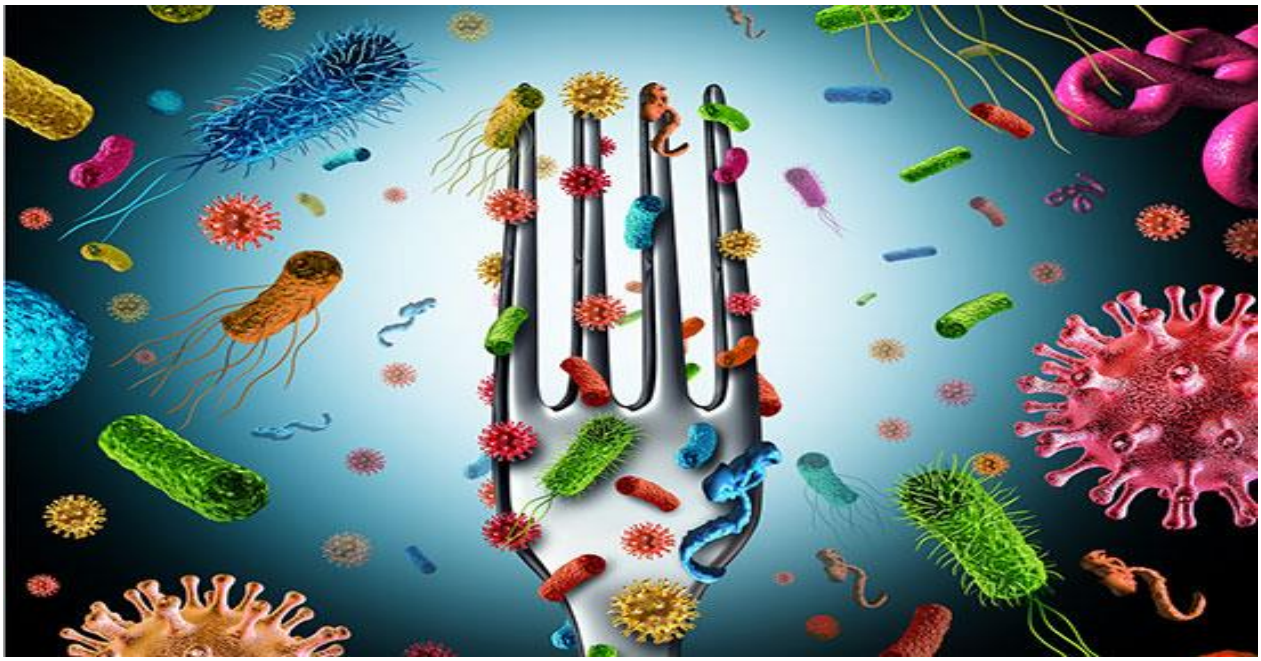
Chapter II

FOOD BORNE ILLNESS



- ***Chapter II Objectives***
- ***Generality***
- ***Classification of Food Borne Illness***
- ***Food borne infection***
- ***Food borne intoxication***
- ***Activities***

II-1 Chapter II objectives

At the end of the Chapter II , in relation to the subjects covered, the student must be able to:

- **Provide** students with the meaning of food borne illness;
- **Provide** students with a basics of food borne illness;
- **Understand** the differences between infection & intoxication;

II-2 Generality

Food poisoning is caused by consuming tainted, spoilt, or poisoned food; its most typical symptoms are nausea, vomiting, and diarrhea; 1 in 6 persons will have food poisoning year, according to the Centers for Disease Control and Prevention (CDC);

o In addition to chemical or herbal toxins, foodborne illness is caused by consuming contaminated food, pathogenic bacteria, viruses, or parasites that contaminated meals.

- **Activity 05 (Chap II) Give examples of bacteria and viruses known to be predominant responsible of FOOD BORNE ILLNESS ?**

  250 different foodborne diseases have been described and bacteria are the causative agents of 2/3rd of them.

- These include **E. Coli, Salmonella, Shigella, Bacillus cereus, Clostridium, Staphylococcus aureus, Vibrio, Listeria monocytogenes, Campylobacter, Yersenia, Brucella, Mycobacterium, and others.**

- These are some of the most common bacteria observed. The most common viruses are rotavirus, norovirus (like Norwalk viruses), hepatitis (A&E) virus, etc.

II-3 Classification of Food Borne Illness

II-3-1 Food Borne Infection

The body reacts to the presence of harmful microbes in food by allowing them to enter the body and causing food-borne Infection. These could be bacterial, viral, parasitic, fungal, or protozoal in nature. Fever is typically the hallmark of food-borne infection, which has lengthy incubation times.

II-3-1-1 Bacterial Foodborne Infections

Include Cholera, Vibrio parahemolyticus, salmonellosis, typhoid fever, Escherichia coli infection, … etc

- While almost any food or beverage can potentially harbor the bacterium that causes a Salmonella infection, the most prevalent sources are meat, cheese, and eggs.
- Gram negative Bacteria
- More than 2500 Serovars / Serotypes
- Many are zoonotic
- Species : S.Bongori & S. Enterica
- Outbreak in 255 people

Fig 8. Bacterial Food Borne Infection (Example : **Salmonellosis)**

❑ **How Salmonella progresses**

Bacteria enter the small intestine, stick to the lining, and start their life cycle. If left untreated, severe cases of germs that have penetrated the intestinal wall and entered the bloodstream can be fatal.

❑ **Symptoms**

- Within 12 to 72 hours (vomiting, cramping in the abdomen, fever, diarrhea, and nausea).
- 4–7 days (the majority of patients recover without treatment; illnesses range from mild to severe).
- Severe cases (more common in young children, the elderly, and those with weakened immune systems)

❑ **Treatment**

Oral or injected antibiotics: usually for 2 weeks

II-3-1-2 Mycotic Foodborne Infections

Include Candida spp., Sporothrix spp , Wangiella spp. etc)

- Phylum: Ascomycota;
- Family: Sachharomycetaceae;
- Approximately 200 species
- Approximately 20 linked to pathology in both people and animals
- Chief pathogenic species: Candida albicans, Candida glabrata, Candida krusei, and Candida

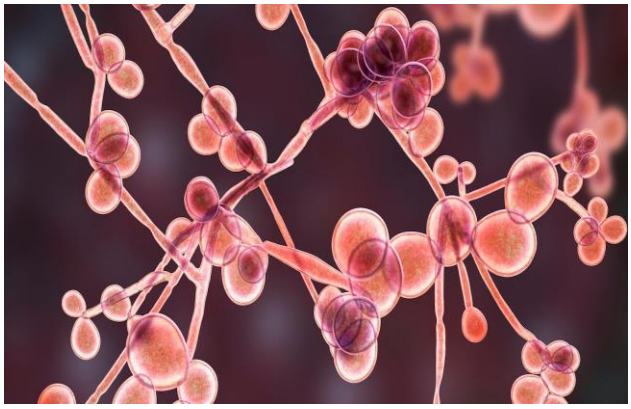


Fig 9. Mycotic Food Borne Infection (Example : **Candida SP)**

❑ **Types of Candidiacis**

- Invasive Candidiasis (Organs , Brain, Eyes ,
- Bones)
- Cutaneous Candidiasis (Skin)
- Thrush (Oropharyngeal Candidiasis)
- Penile Candidiasis (Penile yeast infection)
- Vaginal Candidiasis (Vagin yeast infection)
- Nail Candidiasis onychomycosis (Nails)

II-3-1-3 Viral Foodborne Infections

Include hepatitis A & E, Norwalk virus and poliomyelitis virus

The hepatitis A virus is the cause of hepatitis A. Contact with an infected person's stool can spread the infection. This may occur if you :

Fig 10. Viral Food Borne Infection (Example : **Hepatitis A)**

- Be in close physical proximity to a person who is hepatitis A positive.
- Consume food prepared by someone who has the virus and neglect to wash their hands adequately after using the restroom.
- Drink infected water or consume food that has been rinsed with contaminated water.

❑ **Symptoms**

- Nausea
- Abdominal pain on the right side
- Vomiting
- Fever
- Jaundice
- Feeling weak
- Digestion disorders
- Dark urine

II-3-1-4 Parasitic Foodborne Infections

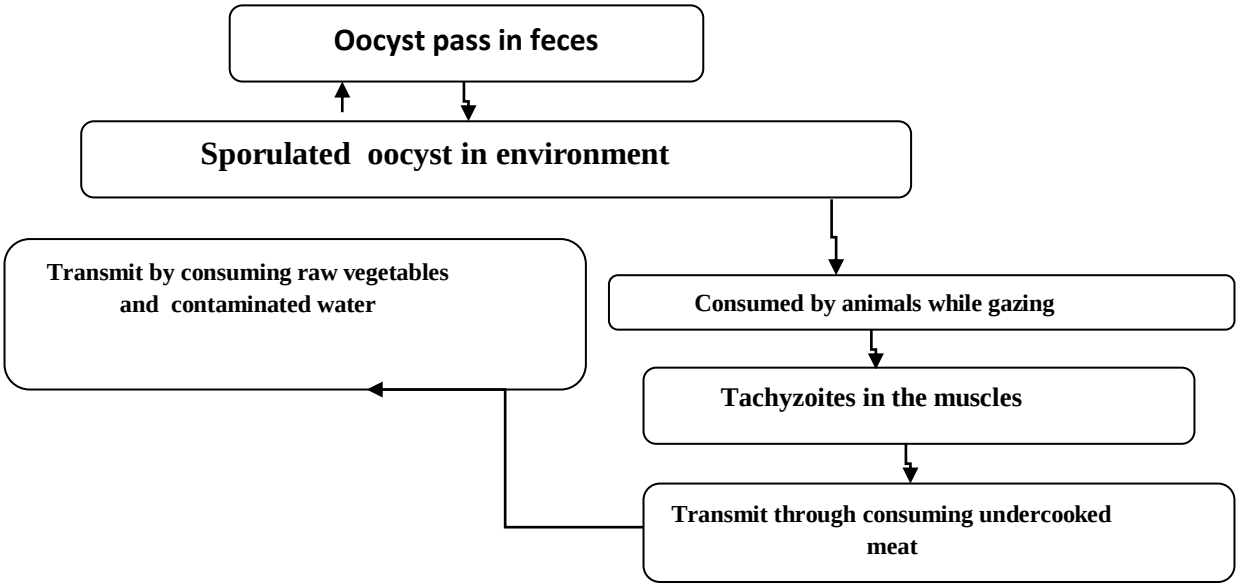
Include hydatidosis, Taeniasis, Anisakiasis, Trichinosis

- ✓ By consuming larvae from undercooked beef; *
- ✓ Through consuming egg-contaminated food, drink, or vegetables;
- ✓ Rarely, reinfection by egg transfer from the intestines to the stomach ;
- ✓ Incubation time: eight to fourteen weeks;

Fig 11. Parasitic Food Borne Infection (Example : **: Taeniasis)**

II-3-1-5 Protozoal Foodborne Infections

Include Cryptosporidiosis, toxoplasmosis, Sarcocystosis and cyclosporiasis.



Symptoms

- Fever
- Fatigue
- Body aches
- Headache
- Swollen lymph nodes

Fig 12. Protozoal Food Borne Infection (Example : **toxoplasmosis)**

II-3-2 Food Borne Intoxication

Ingestion of harmful substances released or generated by bacterial development in food.

- These toxins cause a range of illnesses in the consumers;
- The food's chemical qualities will be altered by these toxins, which are invisible to the unaided sight;
- Bacteria carried in food that can lead to intoxication
  - Clostridium Botulinum (Found in the ground and connected to meat and veggies)
  - Staphylococcus aureus (Found in human noise and throat and also skin)
  - Clostridium Perfringens (present in both birds and animals)
  - Bacillus cereus (found in cereals, spices, and soil vegetation)

- Chemicals that cause intoxication
  - Cleaning products
  - Sanitizers
  - Pesticides
  - Metals

Fig 13. Chemicals that cause Intoxication

- Seafood that cause intoxication
  - Ciguatera toxin
  - Shellfish toxins
  - Systemic fish toxins
  - Scombroid toxin

Fig 14. Seafood that cause Intoxication

- **Activity 06 (Chap II)**

What Are The Differences Between Food Borne Infection And Food Borne Intoxication?

- **Activity 07 (Chap II)**

- **MCQ 01 Which of the following is most likely to cause foodborne illness?**

a) A vegetable cutting board that was cleaned, but not sanitized

b) Cooks who did not wash their hands after going to the restroom

c) Fried chicken held at 150 F for 4 hours

d) Tuna salad held at 38 F for 4 hours

- **MCQ 02 Food contamination is caused by**

a) Stained receptacles

b) Unclean chopping board

c) Insufficient Personal Hygiene

d) Deficient refrigeration

- **MCQ 03 Bacteria that causes foodborne illness grow best in**

a) Protein foods

b) Acidic foods

c) High sugar foods

d) Water

- **MCQ 04 Trichinosis is a disease caused by**

a) Virus

b) Bacterium

c) Parasite

d) Fungus

- **MCQ 05 Which of the following is the most common pest found in food establishments?**

a) Termites

b) Flies

c) Mosquitos

d) Moths