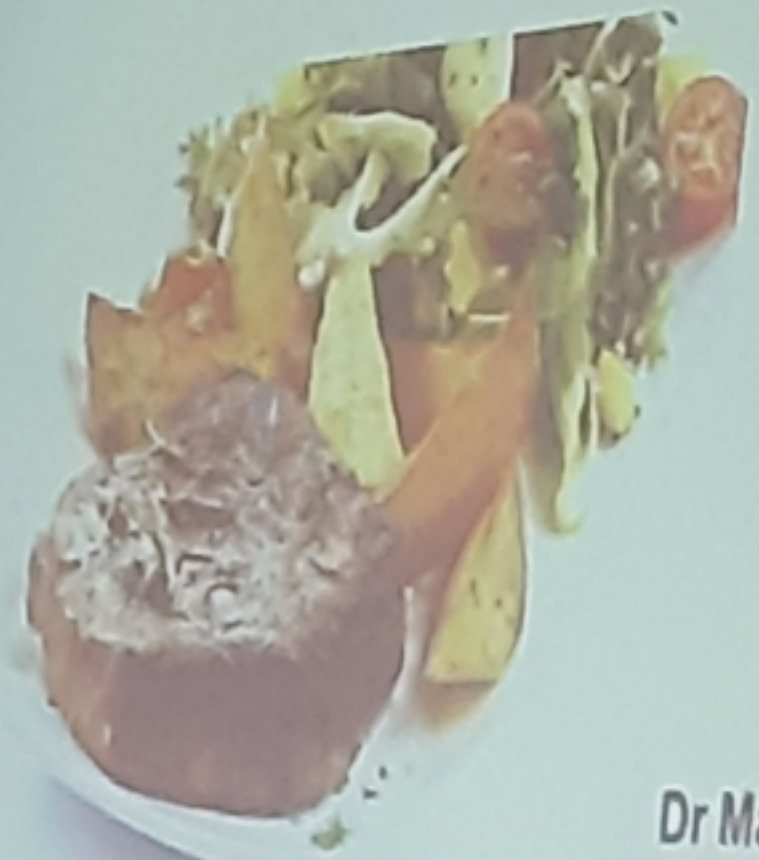
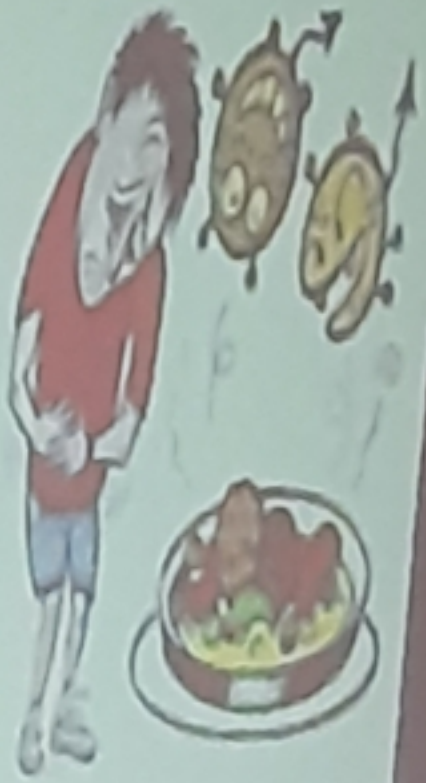
Food and food poisoning





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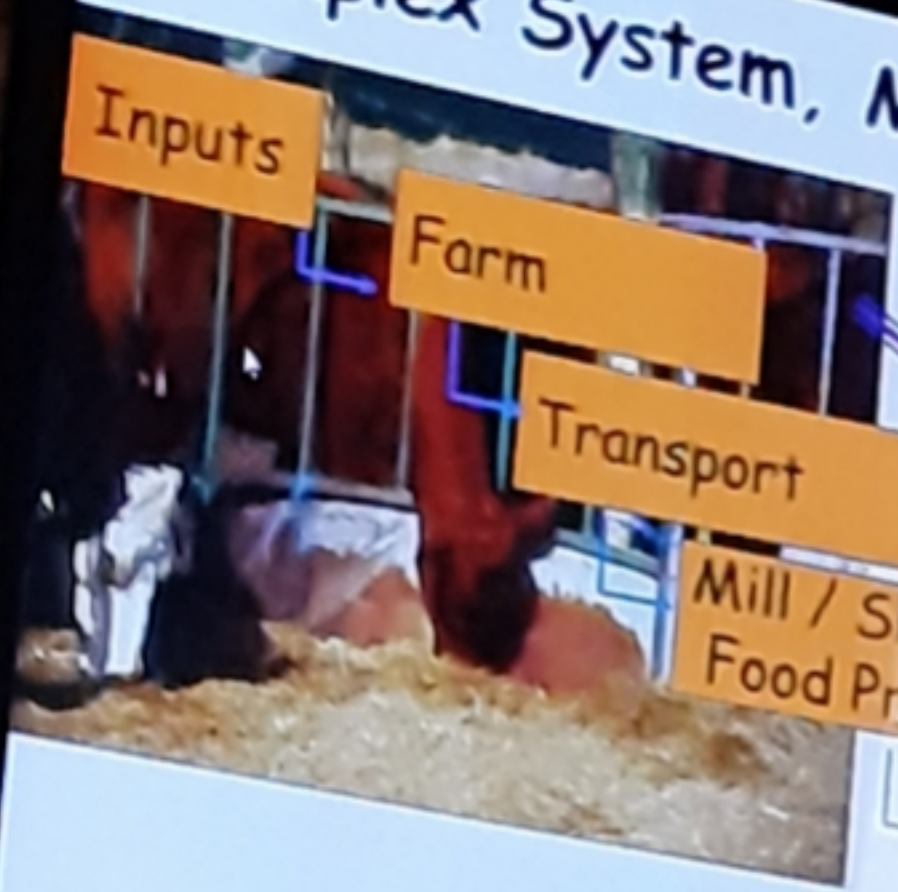
Learning Objectives

- Describe the general concepts of food infections
- Describe the general concepts of food poisoning
- Discuss different food poisoning causative agents
- Describe the different laboratory diagnosis, treatment and prevention

Complex System, Many Food Interests



Inputs

Farm

Transport

Mill / Slaughter / Food Processor

Transport/Imports

Restaurant/Retail

Consumer

Food can be contaminated at any point, from farm to fork.

A. Bacterial Food poisoning

1. food infection

- Food infection

refers to the presence of bacteria or other microbes which infect the body after consumption.

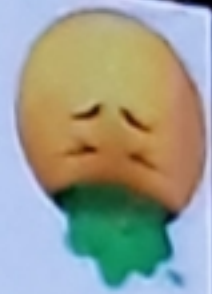
2. food intoxication

- Food intoxication

refers to the ingestion of toxins contained within the food, including bacterially produced exotoxins

Food borne infections

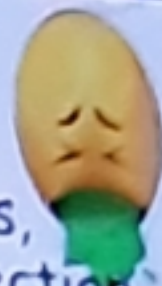
- Food borne infections are caused by the entrance of pathogenic microorganisms contaminating food into the body, and the reaction of the body tissues to their presence.



- These can either be fungal, bacterial, viral or parasitic
- Food borne infections tend to have long incubation periods and are usually characterized by fever

Food Borne Infections cont..

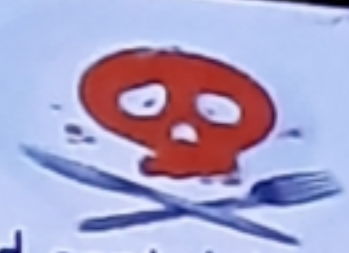
Bacterial food borne infections include Cholera, salmonellosis, typhoid fever, shigellosis, Yersiniosis Escherichia coli infection Campylobacteriosis, Vibrio parahemolyticus and Listeriosis



Mycotic food borne infections include Candida spp., Sporothrix spp., Wangiella spp. etc),

Viral food borne infections include hepatitis A , Norwalk virus and poliomyelitis virus

FOOD BORNE INTOXICATIONS



These are diseases caused by consumption of food containing:

- **Biotoxicants** which are found in tissues of certain plants and animals

- **Metabolic products (toxins)** formed and excreted by microorganisms (such as bacteria, fungi and algae), while they multiply in food, or in gastrointestinal tract of man.

- **Poisonous substances**, which may be intentionally or unintentionally added to food during production, processing, transportation or storage.

Food borne intoxications.....

Food borne intoxications have **short incubation** periods (minutes to hours) and are characterized by **lack of fever**.

BACTERIAL FOOD BORNE INTOXICATIONS

1. *Staphylococcus aureus* intoxication
2. *Bacillus cereus* food borne intoxication
3. *Clostridium perfringens* food borne intoxication
4. *Clostridium botulinum* food borne intoxication

Fungal intoxications

- These are caused by consumption of metabolites produced by fungi, when growing in food.
- These metabolites are called **mycotoxins**.
- Poor dry storage practices of grains and other foods leads to mould growth and production of mycotoxins.
- Of significance to public health is aflatoxicosis.

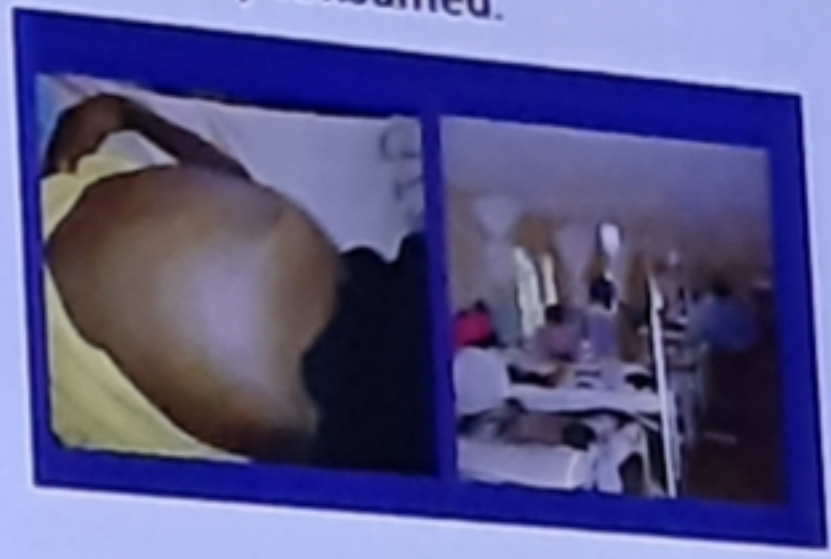
Aflatoxicosis is caused by aflatoxins produced by the fungi, e.g. *Aspergillus flavus*.

Acute effects of aflatoxin..

Acute aflatoxicosis can be **fatal depending on quantity consumed.**

Clinical symptoms in humans include:

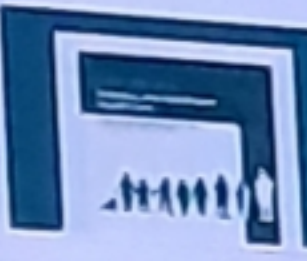
- Abdominal pain
- Vomiting
- Pulmonary edema
- Liver necrosis



- Long term consumption of small doses cause liver tumors as these are potent carcinogens

Ongoing studies:

Prevalence of chronic Aflatoxin exposure and the resultant clinical and immunological effects in children in Makueni County, Kenya.



Current Problems in Pediatric and Adolescent Health Care

Supports open access

The effects of aflatoxin exposure on Hepatitis B-vaccine induced immunity in Kenyan children

D. Githang'a [a,b,*], B.N. Wangia [c], M.W. Mureithi [a,b], S.O. Wandiga [d], C. Mutegi [e], B. Ogutu [f], A. Agweyu [g], J-S Wang [c], O. Anzala [a,b]

- Exposure to aflatoxin was high and weakly associated with low anti-HBs antibodies.

General symptoms

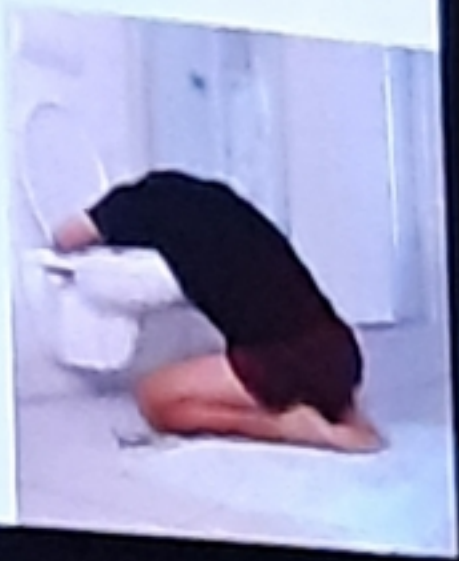
Fever, chills, malaise , aches, swollen lymph node

- **Salmonella** typhi,

Upper GIT signs

Nausea, vomiting, abdominal pain, diarrhea

- *S. aureus* and its toxins
- *B. cereus* and its toxin



Lower GIT signs

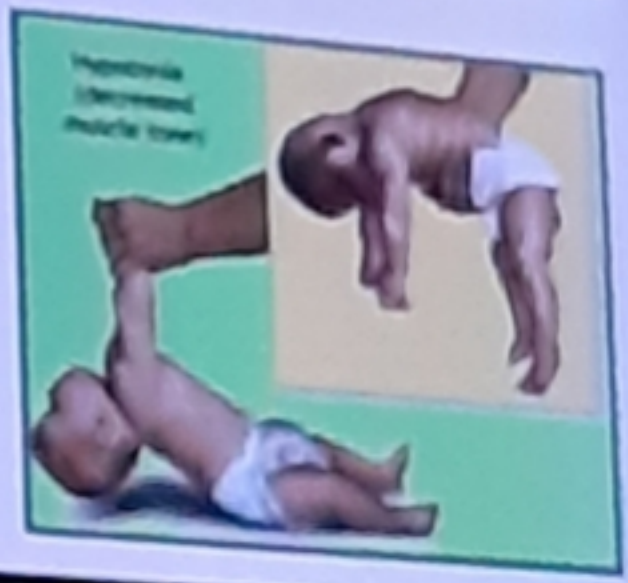
Lower abdominal cramps & diarrhea :

- Clostridium perfringens,
- Bacillus cereus
- Salmonella, Shigella,

Neurological signs

Visual disturbances, vertigo & paralysis

Clostridium botulinum



Treatment

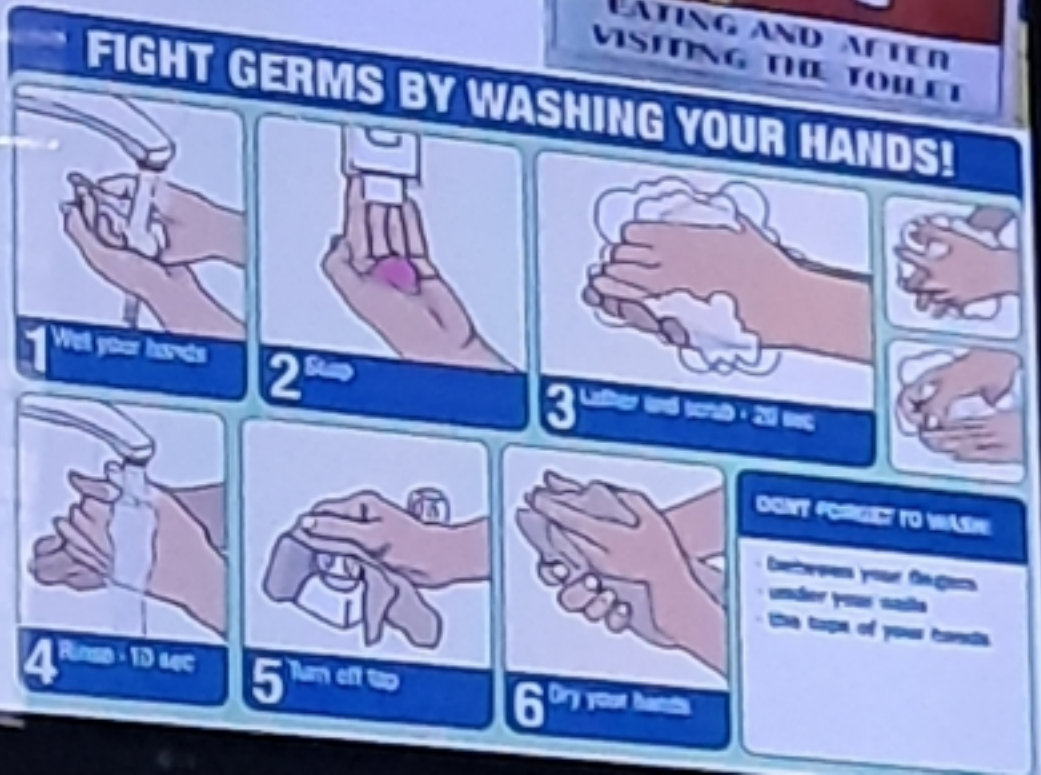
- The main treatment for food poisoning is putting fluids back in the body (rehydration) through an IV and by drinking.
- Do not eat solid food while nauseous or vomiting but drink plenty of fluids.
- Anti-vomiting and diarrhea medications
  Antibiotics

Strategies to prevent food poisoning

1. Keep hands and nails clean

We need to:

- dry hands thoroughly
- cover cuts and infections on hands



Public health ACT- food

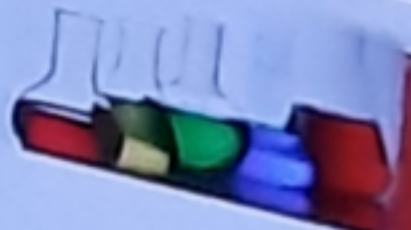
LAWS OF KENYA

PUBLIC HEALTH ACT

CHAPTER 242

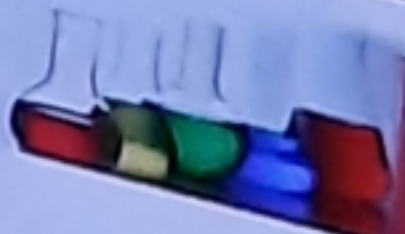
OUTLINE OF INVESTIGATION of FOOD POISONING

- Stool/Urine
  - Collection and Transport of specimen
  - Macroscopic appearance
  - Microscopy
  - Culture
  - Biochemical Tests and Serological tests
- Others investigations



. Examine and Report the cultures.

REFER TO NOTES ON INDIVIDUAL PATHOGENS IN BACTERIOLOGY LECTURES AND LABORATORY SESSIONS.



Points to Remember/Conclusion

- General characteristics of the causative agents
- Infections produced by pathogenic species
- Microscopic and colony morphology
- Tests used to identify these species
- Emergence of resistant strains
- Vaccines