FOOD POISONING

by

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Food poisoning

is ‘any disease of an infectious or toxic nature caused by or thought to be caused by the consumption of food or water. “World Health Organization”

Contamination of food can happen at any point during its production: growing, harvesting, processing, storing, shipping or preparing. Cross-contamination — the transfer of harmful organisms from one surface to another — is often the cause. This is especially troublesome for raw, ready-to-eat foods, such as salads or other produce. Because these foods aren't cooked, harmful organisms aren't destroyed before eating and can cause food poisoning.

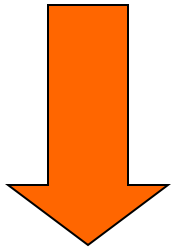
Types of food poisoning

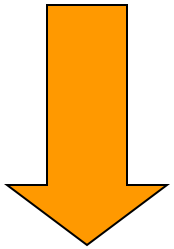
1- Bacterial, parasites and viral infections

2- Chemical contamination of food

3- Plant or animal toxins and food allergies

Bacterial Food poisoning





1. food infection

2. food intoxication

- **Food infection**

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

- **Food intoxication**

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

Bacteria and bacterial toxins

By chemicals:-

- Arsenic
- Cu sulphate
- Mercury
- Cadmium
- Pesticides
- Sea foods
- Certain plants
- fertilizers

Surveillance of food poisoning

1- Notifications of food poisoning.

2- Surveillance of laboratory-confirmed infections.

3- Investigation of outbreaks of food poisoning.

Source of human infection

Food-borne disease is not static and constantly changes and evolves.

1-Consumption of contaminated food or water

not only have animal sources but survive or even increase within the environment. This includes, for example, the *Clostridia* spp., *Listeria* spp. and *Bacillus* spp.

2- Direct or indirect contact with animals

Salmonella spp., *Campylobacter* spp. and *E. coli.*

3- Person-to-person spread.

Staphylococcal, *Shigella* spp and viruses

People at high risk

Elderly People

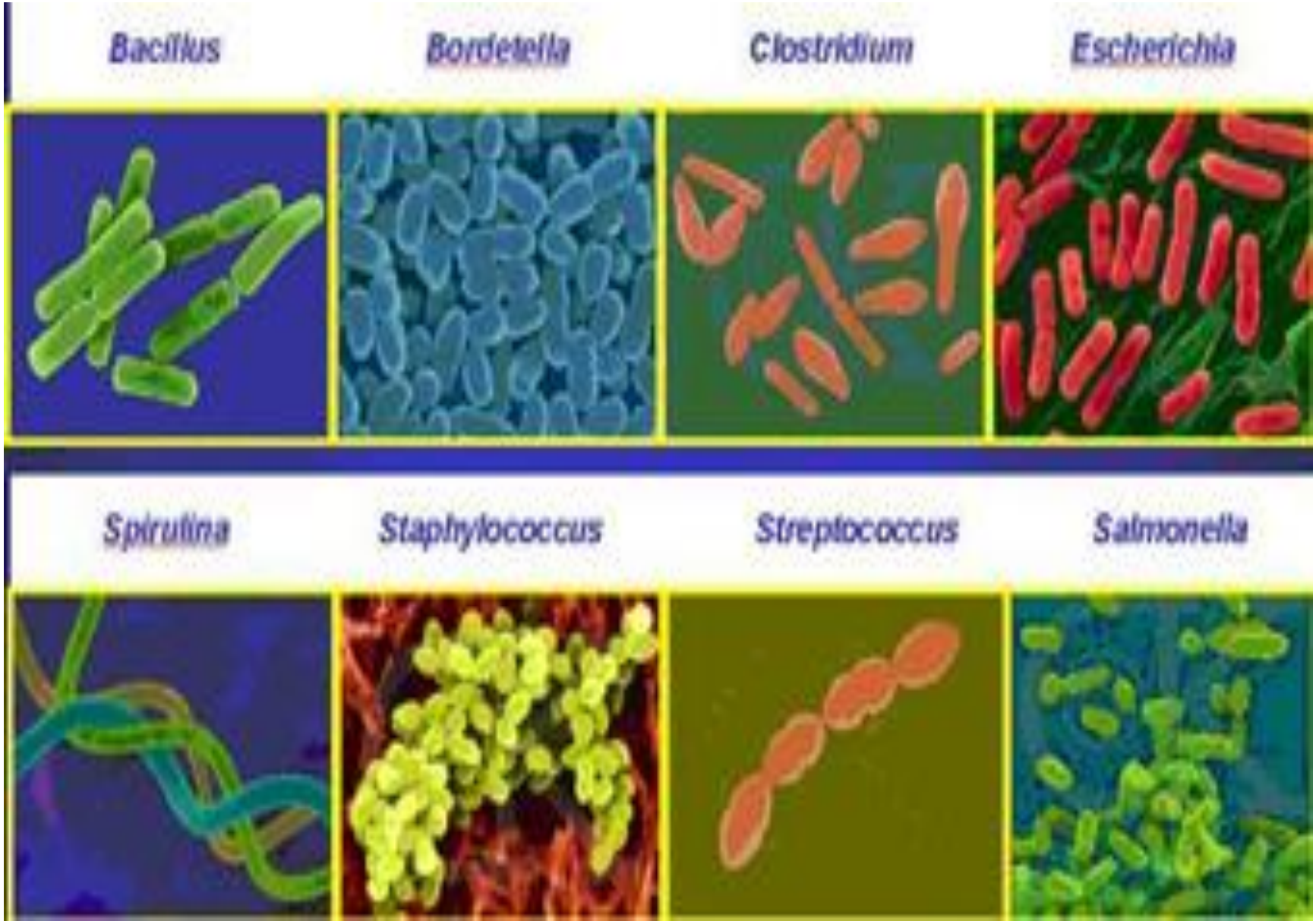
People with Chronic diseases

Babies

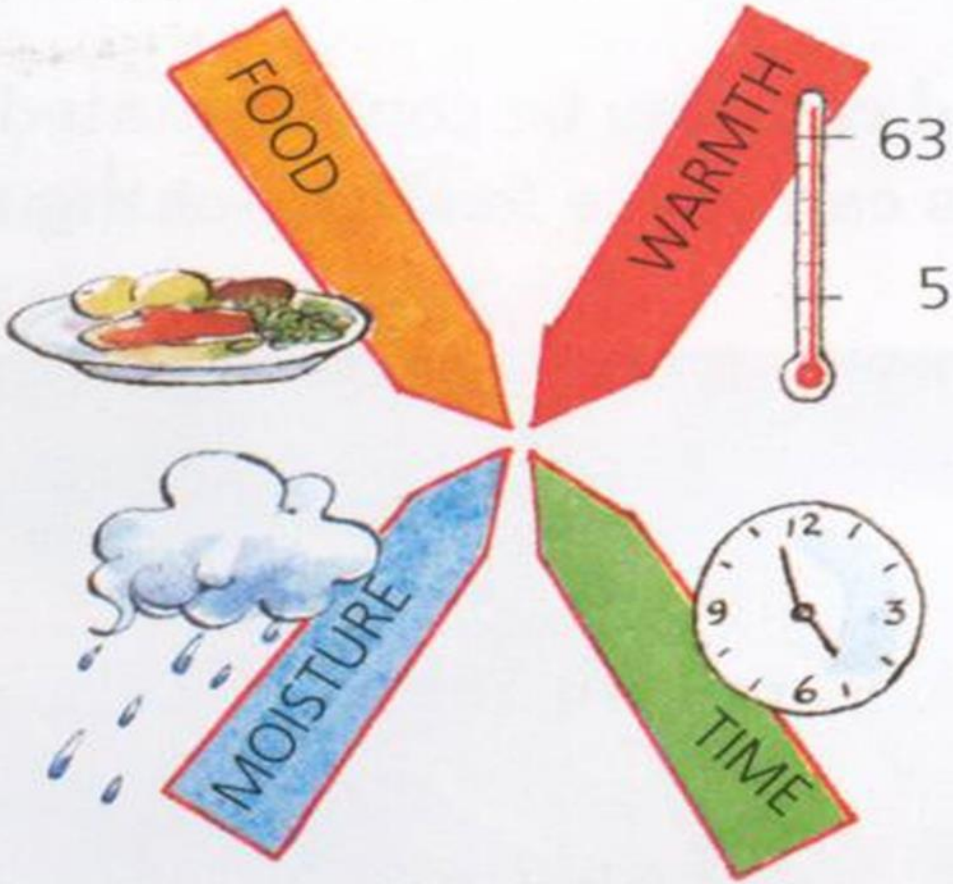
Pregnant Women

Food Poisoning Causes and Symptoms

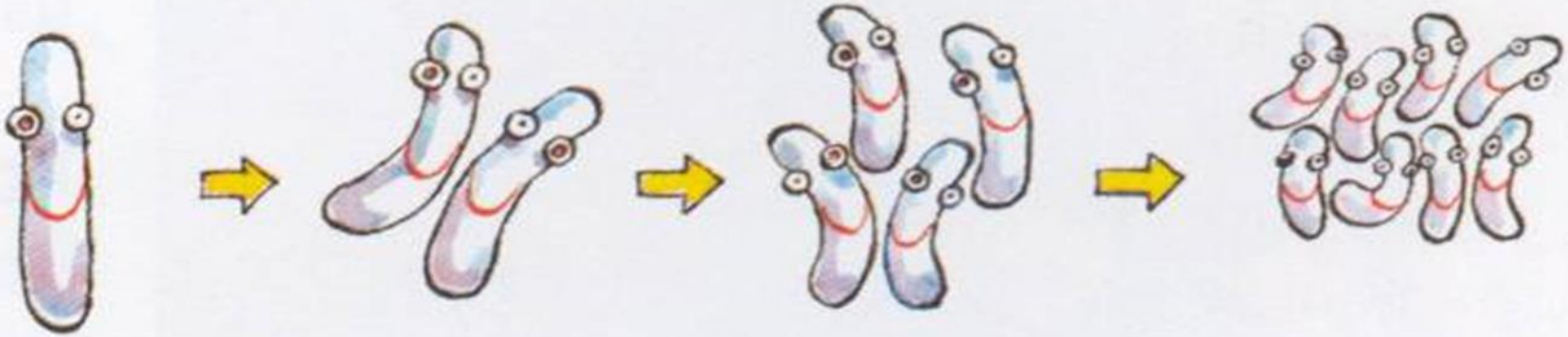
Common Food borne Bacteria



Bacteria need all four to multiply



Multiplication of bacteria



Salmonella spp

The salmonellae constitute a large group of over 2200 different serotypes. They are members of the Enterobacteriaceae, are gram-negative, and can readily grow on a wide range of media including foods.

They are temperature sensitive and readily destroyed by cooking.

Some salmonellae usually only affect a single animal species including, for example, S. typhi in humans, S. dublin in cattle and S. pullorum in poultry.

Most cases are thought to be the result of food-borne infection and highlight the importance of controlling hygiene in the food chain. Meat can become contaminated during the slaughter process either from intestinal contents or from faecal contamination on the hide.
Environmental contamination, especially untreated water, is also important.

Salmonellas poisoning

- Nature
  - Poultry
  - Farm Animals

Egg, Egg products, Meat (shami kebab, Biryani, chicken Tikka)

Campylobacter spp

Campylobacter, although long recognized by veterinarians as a cause of animal disease, were not associated with human enteric infection until 1975.

The traditional animal strains of **Campylobacter fetus fetus** and **C. fetus venerealis** rarely cause human infection and the most common types in the UK are **C. jejuni and C. coli.**

Escherichia coli 0157 :

E. coli are ubiquitous inhabitants of the intestinal tracts of animals and man.

A variety of serogroups cause infection, usually in a single animal species for example **Bowel oedema in pigs.**

In humans, a number of different disease syndromes are recognized including:
Enteropathogenic E. coli, Enteroinvasive E. coli

Enterotoxigenic E. coli, Enterohaemorrhagic E. coli.


E. coli
E. coli

Clostridium perfringens :

Gram positive spore former requiring, anaerobic conditions for growth. Five types (A to E), only type A has been implicated in food poisoning

food poisoning with *Cl. perfringens* is consumption of large numbers of bacteria which rapidly form enterotoxin in the small intestine.

The clostridia form part of the normal intestinal flora of animals and are widespread in the environment.

The clostridial spores survive normal cooking, and the heating process may in fact stimulate them to germinate.

As food cools, very rapid multiplication can take place, since optimal growth occurs at 43-47°C.

The heating process of cooking also drives off oxygen, creating the anaerobic conditions necessary for growth.

These conditions are most likely to be found when large volumes of food are cooked and cooled, particularly large joints of meat or stews and casseroles.


gangrenepictures.org

Clostridium botulinum :

Botulism is one of the most feared causes of food 'poisoning because, although it is exceptionally rare, it is a severe disease with a high mortality.

Cl. botulinum is a gram-positive spore-forming obligate anaerobe producing one or more of seven toxins (A to G).
Sources of human infection *Cl. botulinum* is ubiquitous and can be found on a wide range of foods.

Toxin production only takes place when growth occurs. This can happen during preservation process such as smoking or fermentation of fish and meat which result in a suitable anaerobic environment. Improperly bottled or canned foods can also allow growth to take place.

Bacteria

Foodborne botulism or botulism food poisoning

The bacteria that produce toxins and causes this disease survives in environments that have less oxygen like canned foods.

Staphylococcus aureus :

Illness caused by *Staph. aureus* is due to the consumption of preformed toxin and not the bacteria, which may be absent.

The toxin is heat-stable and may survive for 1.5 hours at boiling temperatures even though the staphylococci themselves are destroyed.

Five major enterotoxins are known to be produced (A to E) of which type A is the most common.

Staph. aureus gram-positive cocci can grow over a wide range of temperatures (10-45°C) with the optimum at 35-40°C. The **Source of human infection** result in contamination of food and subsequent multiplication and toxin production.

The foods usually implicated are cooked meats, poultry and dairy produce.

Staphylococcal poisoning

Everywhere in Nature

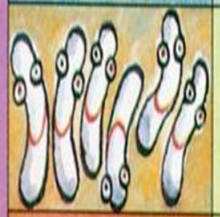
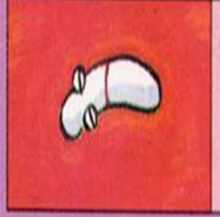
Men & Animals

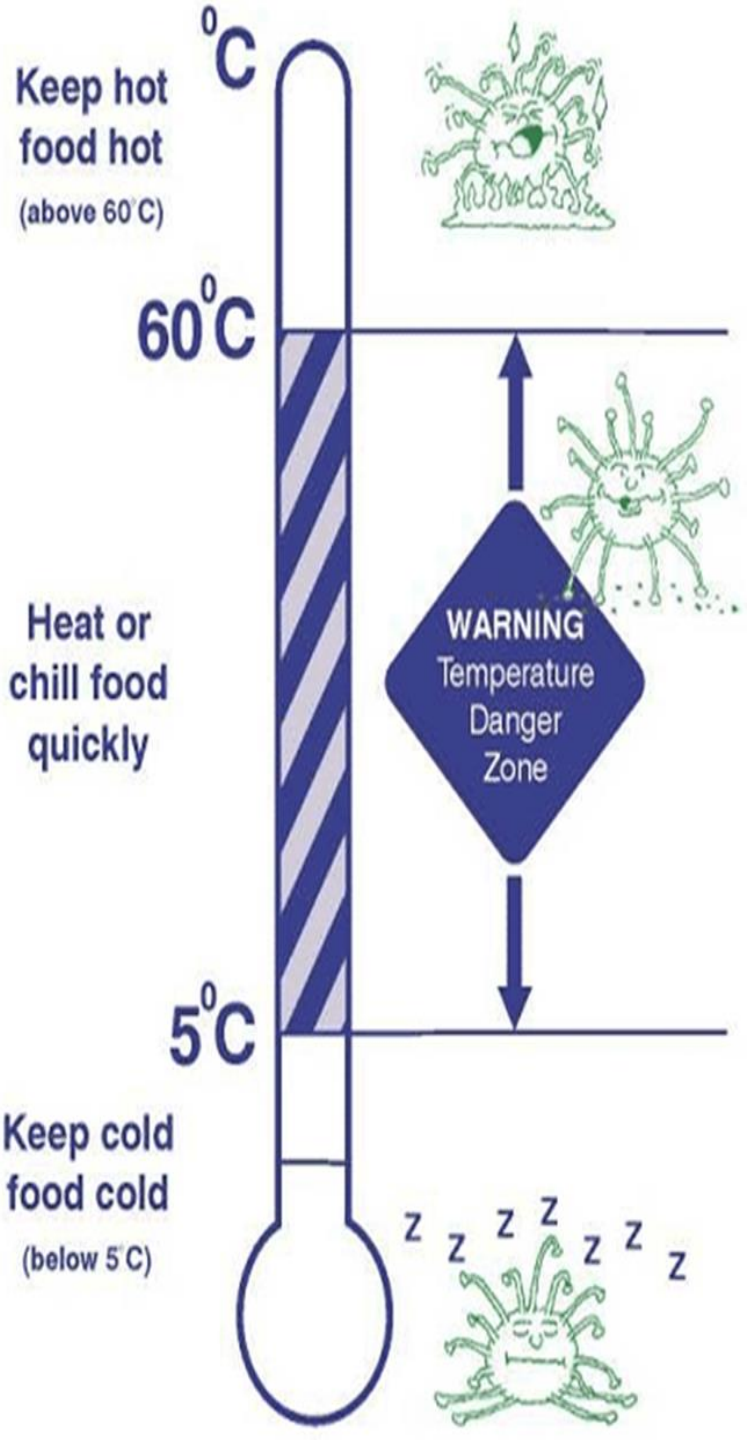
skin, Nose & throats

Common agent of Boil & pyogenic Infection

Cows (Mastitis) involving Milk & milk products

Type of food poisoning	Where the bacteria come from	Onset time	Symptoms
Salmonella	Raw meat, eggs, poultry, animals	6 - 72 hours	Abdominal pains, diarrhoea, fever, vomiting, dehydration
Clostridium perfringens	Raw meat, soil, excreta, insects	8 - 72 hours	Abdominal pain, diarrhoea
Staphylococcus aureus	Skin, nose, boils, cuts, raw milk	1 - 6 hours	Vomiting, abdominal pains, lower than normal temperature

	Temperature	Conditions	Bacterial action	Safety
	–18°C	Freezers	Dormant – not able to multiply	Safe
	1–4°C	Fridges and cold stores	Most bacteria unable to multiply	Safe
	5–63°C	Room temperature (10–36°C) Body temperature (37°C) Warm food (38–63°C)	Bacteria able to multiply	DANGER
	64–72°C	Keeping food hot	Most bacteria can't multiply	Safe
	73–100°C	Cooking temperature	Most bacteria die	Safe
	Above 100°C	Boiling food Pressure cookers	Most bacteria and bacterial spores killed	Safe



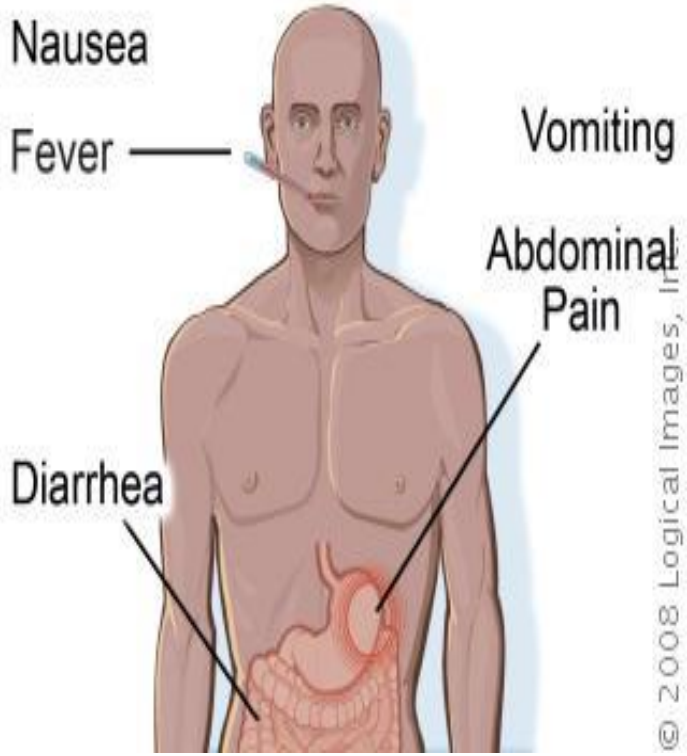
Symptoms of food poisoning

Food poisoning can be mild or severe.

The symptoms will be different depending on what type of bacteria is responsible.

Common symptoms include:

- **severe vomiting;**
- **diarrhoea;**
- **exhaustion or fatigue**
- **headache;**
- **fever;**
- **abdominal pain;**
- **tiredness.**



Control Measures:-

- Cook food thoroughly
- Handle food as little as possible
- Try not to prepare food in advance
- Keep food covered at all times
- Store food at safe temperatures below 5ºC or above 63ºC.
- Do not keep food in the temperature (5ºC to 63ºC danger zone)
- Keep raw and cooked foods separate.
- Avoid re-heating food.

Finally, Never Forget:

- **Good Food Handling Practices are the Most Important Aspect of Food Hygiene.**

- **Get the Practices Right, Keep them Right, and you should Achieve Food Safety.**


Eat well
Stay well
Thank you