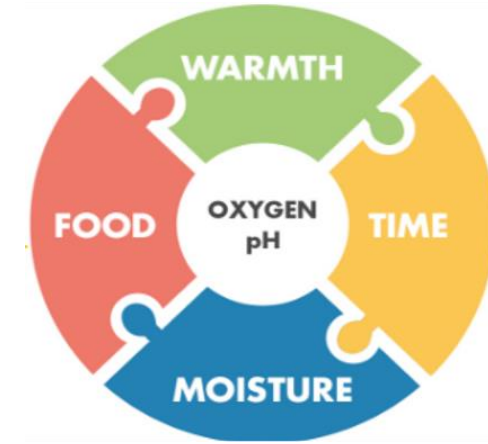


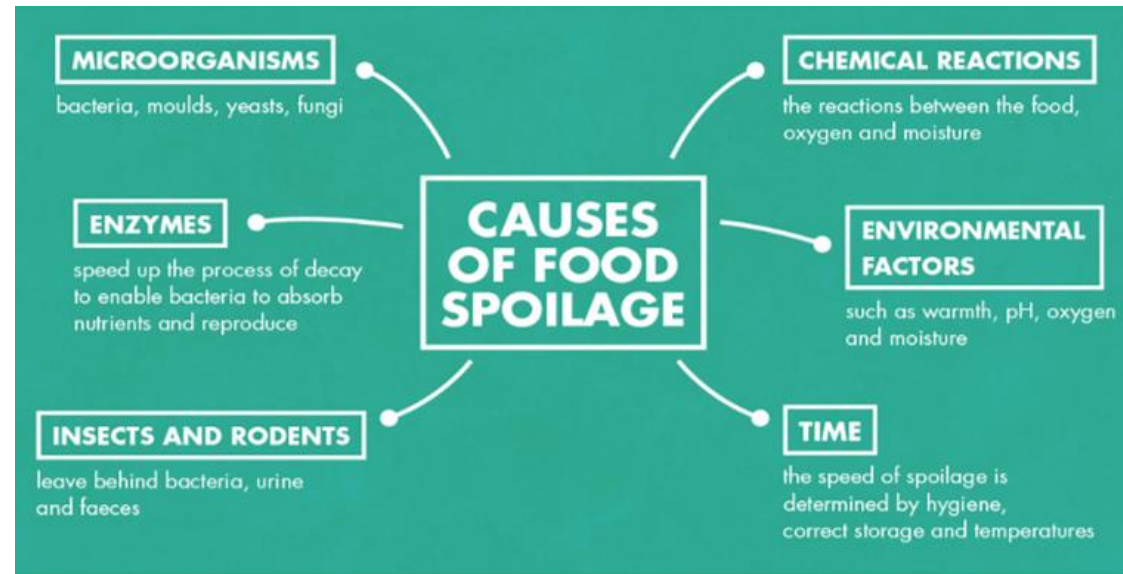
Food Spoilage

- Food spoilage is mainly **caused by microorganisms including moulds, yeasts, bacteria and fungi.**
- **These microorganisms need: oxygen, time, a food source, warmth and moisture to grow.** Removing any of these slows, sometimes prevents their growth.
- **Food preservation is the extending of a foods natural life by removing any of the factors needed by microorganisms to grow** e.g., removing oxygen when canning.



Signs of Food Spoilage







- **Discoloration** - Mould on bread, peppers going black.
- **Changes in texture** - Wrinkly, slimy, lumpy, hard, sloppy (mushy strawberries and hard cheese).
- **Visible mould** - Mould on cheese and bread.
- **Unpleasant odour** - Often sour, bitter, sharp
- **Changes in flavour** – Sour, rancid, acidic, unpleasant (old milk).
- **Blown cans or jars** (due to the release of gas from microorganisms).



Food Preservation

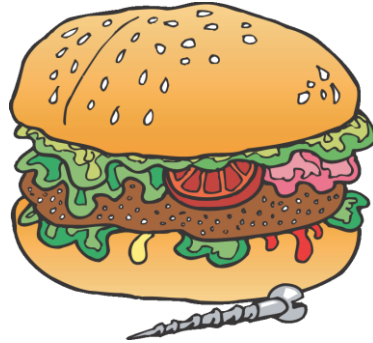
If we store food correctly and safely then we can slow down and reduce food spoilage. This is important as it saves waste and loss of money for manufacturers retailers and consumers.

We can do this by minimising the activity of bacteria, yeasts and enzymes. Most of the time this can be done by removing moisture and/or oxygen, reducing temperature or changing pH levels. **This is known as food preservation.**

METHOD OF PRESERVATION	SIMPLE EXPLANATION	EXAMPLES	METHOD OF PRESERVATION	SIMPLE EXPLANATION	EXAMPLES
HEAT 	Heat kills most microorganisms and it stops any enzyme activity. All foods should be cooked above 75°C	Pasteurisation of milk, all cooked foods, canned foods	REMOVING AIR (O₂) 	Most microorganisms need oxygen to reproduce. Food items are sealed in cans, jars, MAP, vacuum packaging.	Foods in cans and jars, meat, cheese, fish, sandwiches, crisps
FREEZING 	The microorganisms become inactive at very cold temperatures but will start reproducing during defrosting. Frozen food should be stored in a freezer on at -18°C. It should be sealed to prevent freezer burn.	Frozen meat, fish, readymade meals, desserts	CHEMICALS - SALT, SUGAR, VINEGAR, SMOKE 	The pH levels needed for bacterial growth and enzymic action are changed.	Salted meat and fish, pickles, chutneys, jams, smoked fish
DRYING 	Microorganisms need moisture to reproduce.	Pot noodles, coffee, milk, soups, gravy granules, pulses	IRRADIATION 	Food is exposed to low doses of radiation which kills all microorganisms.	Herbs, spices, some vegetables and fruit

Ambient foods (room temperature) which are stored on shelves or cupboards must be sealed or in air-tight contains. They should not be next to radiators or direct sunlight. And should be off the floor.

Physical



Examples:

Hair, jewellery, buttons, plasters, packaging.

Chemical



Examples:

Cleaning chemicals, oil, pesticides.

Microbial



Examples:

Bacteria, viruses, moulds, yeasts and parasites.

Food poisoning is an acute illness caused by consumption of contaminated or poisonous food.

Food which is contaminated with food poisoning bacteria SMELLS, LOOKS and TASTES normal

- Food poisoning bacteria are pathogens (micro-organisms/bacteria that cause infections) that release toxins in food to poison you. These micro-organisms multiply in the intestine.

ORGANISM	COMMON NAME OF ILLNESS	ONSET TIME AFTER INGESTING	SIGNS & SYMPTOMS	DURATION	FOOD SOURCES
<i>Bacillus cereus</i>	<i>B. cereus</i> food poisoning	10-16 hrs	Abdominal cramps, watery diarrhea, nausea	24-48 hours	Meats, stews, gravies, vanilla sauce
<i>Campylobacter jejuni</i>	Campylobacteriosis	2-5 days	Diarrhea, cramps, fever, and vomiting; diarrhea may be bloody	2-10 days	Raw and undercooked poultry, unpasteurized milk, contaminated water
<i>Clostridium botulinum</i>	Botulism	12-72 hours	Vomiting, diarrhea, blurred vision, double vision, difficulty in swallowing, muscle weakness. Can result in respiratory failure and death	Variable	Improperly canned foods, especially home-canned vegetables, fermented fish, baked potatoes in aluminum foil
<i>Clostridium perfringens</i>	Perfringens food poisoning	8-16 hours	Intense abdominal cramps, watery diarrhea	Usually 24 hours	Meats, poultry, gravy, dried or precooked foods, time and/or temperature-abused foods
<i>Cryptosporidium</i>	Intestinal cryptosporidiosis	2-10 days	Diarrhea (usually watery), stomach cramps, upset stomach, slight fever	May be remitting and relapsing over weeks to months	Uncooked food or food contaminated by an ill food handler after cooking, contaminated drinking water
<i>Cyclospora cayentanensis</i>	Cyclosporiasis	1-14 days, usually at least 1 week	Diarrhea (usually watery), loss of appetite, substantial loss of weight, stomach cramps, nausea, vomiting, fatigue	May be remitting and relapsing over weeks to months	Various types of fresh produce (imported berries, lettuce, basil)
<i>E. coli (Escherichia coli) producing toxin</i>	<i>E. coli</i> infection (common cause of "travelers' diarrhea")	1-3 days	Watery diarrhea, abdominal cramps, some vomiting	3-7 or more days	Water or food contaminated with human feces
<i>E. coli O157:H7</i>	Hemorrhagic colitis or <i>E. coli</i> O157:H7 infection	1-8 days	Severe (often bloody) diarrhea, abdominal pain and vomiting. Usually, little or no fever is present. More common in children 4 years or younger. Can lead to kidney failure	5-10 days	Undercooked beef (especially hamburger), unpasteurized milk and juice, raw fruits and vegetables (e.g. sprouts), and contaminated water