

Topic: Food Safety



Bacteria

Single celled organisms.
Sometimes harmless – cheese making, bread, yoghurt.
Sometimes harmful – pathogenic and cause food poisoning, sometimes death.

Conditions for Growth

Remember this acronym - **TO Many Flies Waiting**.



Time	Can multiple every 10-20 minutes – BINARY FISSION .
Moisture	Need moisture to live.
Food	NUTRIENTS – protein rich foods.
Warmth	TEMPERATURE - Danger zone (bacteria most active) = 5-63c
pH - extra	Best grow in low pH – 6.6 – 7.5 . Cannot survive below 4.5 . Vinegar has a pH of 3.5 .

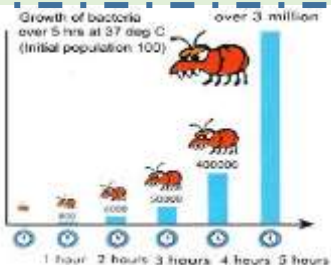
Ways to PREVENT OXIDATION

(Enzymic Browning)

Adding lemon juice to fruit.
Blanching prevents discolouration.
Removing air – immersing in water (potato).
Chilling / freezing slows

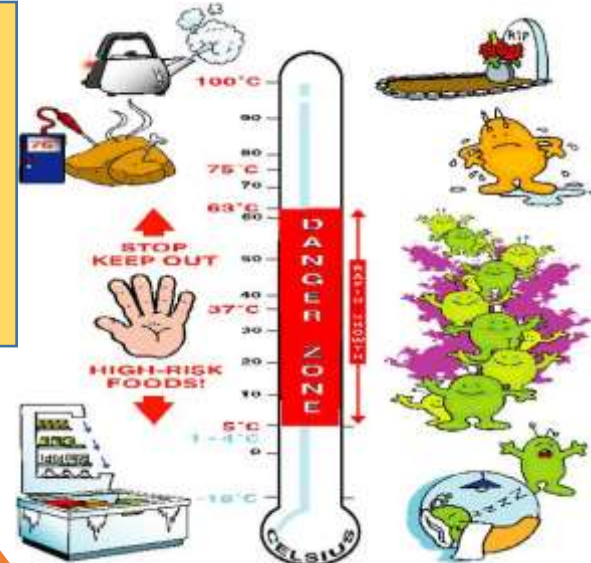
Microorganisms in the Food Industry

Meat Industry – meat starter cultures are used to make dried, fermented foods – salami, pepperoni, chorizo, dried ham.
Lactic bacteria develops flavours and colours.



The **DANGER ZONE** – bacteria multiply best between **5-63c**. Over **70** most bacteria are destroyed, below **5c** bacteria grow slowly.

- 100c** – water boils
- 70c+** - bacteria is destroyed.
- 68c** – minimum temperature food should be reheated to and held for 2 minutes.
- 37c** – body temperature.
- 1-5c** – temperature of the fridge.
- 18c** – temperature of the freezer.



Yeast

Bread making, beer making and wine.
Yeast is a microorganisms.

- Requires sugar to grow.
- Leavens bread dough by producing CO2
 - Through fermentation, enzyme action and gluten, creates a stretchy dough.
 - Contributes to flavour and taste.

The Dairy Industry

Cheese –**starter culture** is required.
As the culture grows, it converts the sugar lactose into lactic acid, this gives the required level of acidity and moisture.
As the cheese ripens it gives a balanced aroma, taste, texture.
Blue cheese – treated with mould, matures, creates a blue vein. – Stilton.
Soft ripened – camembert, mould grows on the outside.
YOGHURT - the culture is responsible for the taste and texture, probiotic cultures have health benefits, improve digestion, and safeguard the immune system,

Food Poisoning Bacteria

Salmonella - raw meat, eggs, dairy, seafood. Diarrhoea, vomiting, fever, onset – 12-36 hours. May be fatal.
Staphylococcus Aureus – cooked meat, dairy, anything touched by hand. Vomiting, diarrhoea, abdominal pain. Onset 1-6 hours. Nose, throat, skin, dirty food handlers.

Food-borne Disease.

Escherichia-Coli (E Coli) – raw meat, untreated milk & water. Vomiting, blood in diarrhoea, kidney damage. Onset – 12-24hours. Can cause gastro-enteritis in humans.
Listeria Monocytogenes – soft cheese, undercooked meat, unpasteurised dairy. Mild flue like symptom, septicaemia, meningitis. No specific onset time. Can cause miscarriage.

Yeasts



Not harmful but spoils the taste, grows on sugary foods, can survive without air, can't grow in the cold or in vinegar, destroyed above 70c.
Helpful organisms – bread making, wine making.

Moulds



Type of fungus, grow on many foods like bread, cheese, meat. Like slightly acid conditions, need moisture and warmth, can survive in the fridge, do not eat mould!

Enzymes



Soft spots appearing on fruits / vegetables, makes meat taste and smell bad. Denaturing the enzyme helps with preservation – heat, acid, salt.
Enzymes break down plant and animal tissues, causes fruit to ripen, meat to tenderise, enzymic browning – **OXIDATION**.

High Risk / Low Risk

High risk - defined as a food that contains protein and moisture. Higher risk of food poisoning if not handled correctly - meat, fish, eggs, cooked rice, gravies, meaty soups, unpasteurised foods.

Low Risk – lower risk of food poisoning – fats, oils, foods with a high sugar content, high acid foods - chutneys, dried foods – cereals.

Key words – hygiene, high-risk, danger zone, reheating, core temperature, use-by-date, best-before-date, frozen food, chilled food, bacteria, enzymes, microorganisms, moulds, pathogens, food poisoning, oxidation, onset and contamination