

# 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**.



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

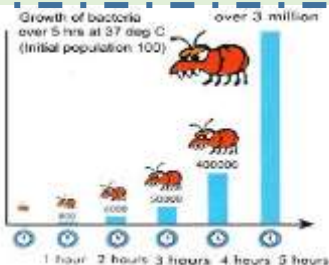
## Ways to PREVENT OXIDATION

### (Enzymic Browning)

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

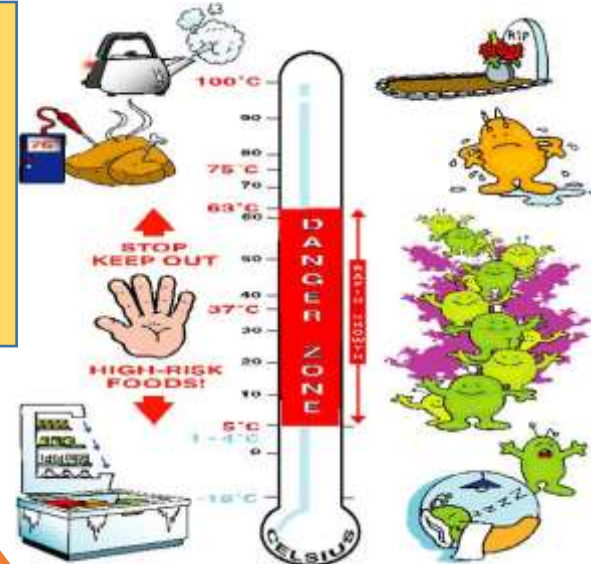
## Microorganisms in the Food Industry

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