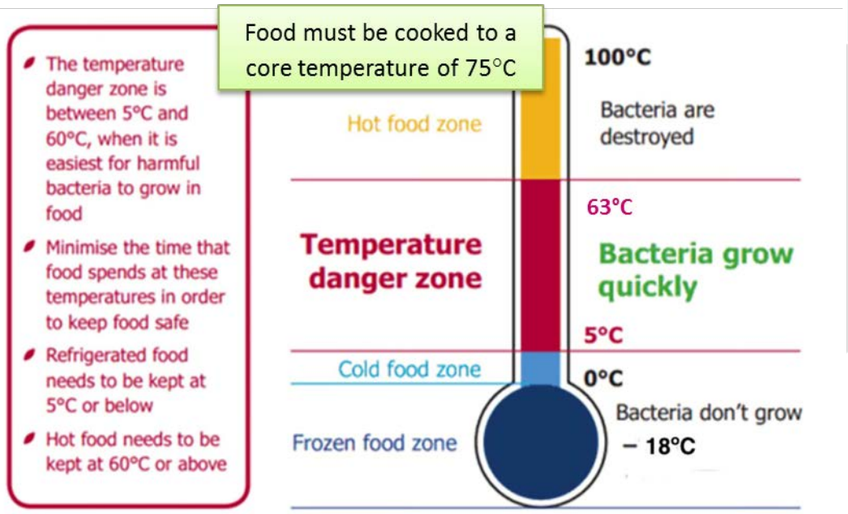
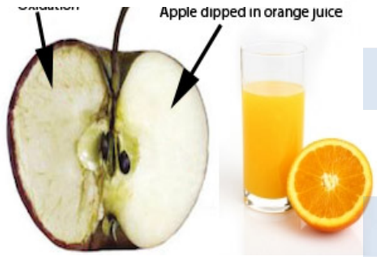
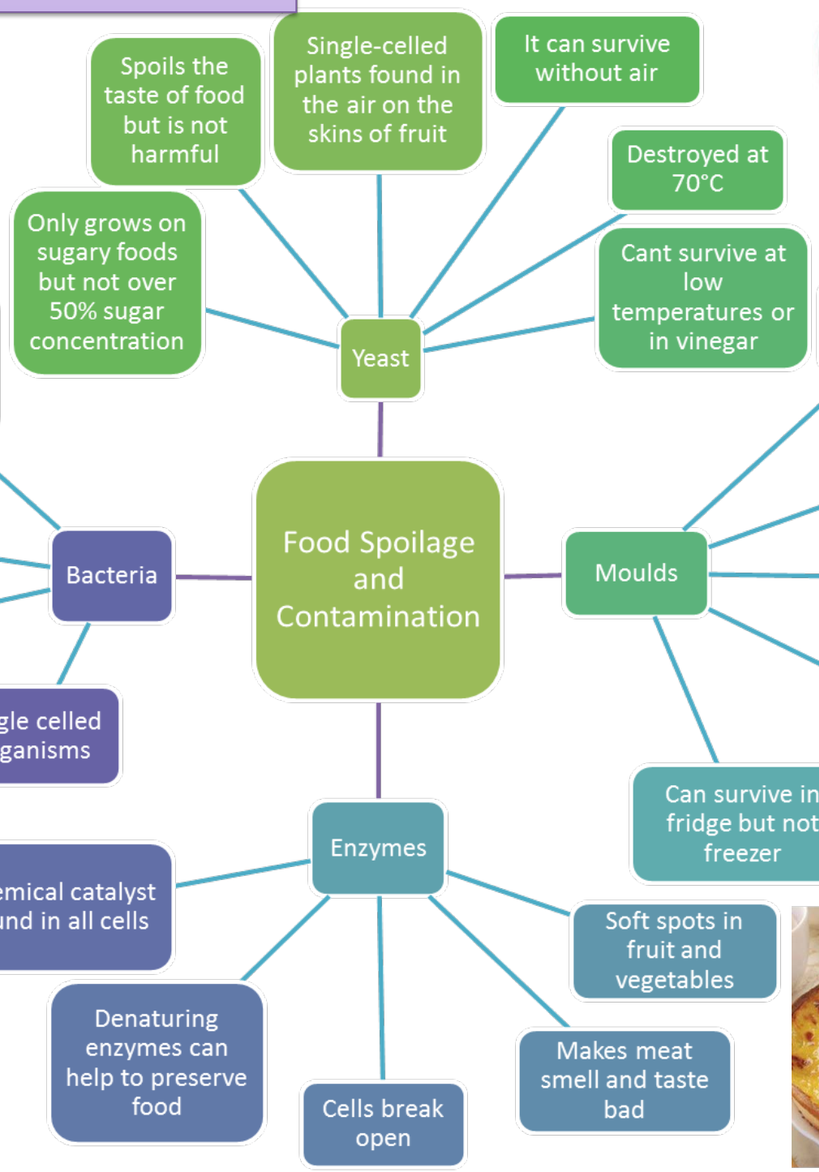
Microorganisms in Food Production

- Dairy Industry:
  - Cheese
    - Converts sugar lactose into lactic acid
    - Essential to choose the right amount of culture for high quality cheese
    - Some cheese production relies on mould e.g. blue cheese, soft cheese and rind-washed cheese
  - Yoghurt
    - The culture is responsible for taste and texture
    - Probiotic cultures have become more popular in recent years
    - Probiotic cultures are classified as afunctional food
- Meat Industry:
  - Meat cultures are used to make dried, fermented products e.g:
    - Salami
    - Peperoni
    - Chorizo
    - Dried ham
  - Lactic bacteria develop the flavour and colour of the products



Food Safety





1. Turn on the probe, make sure it is calibrated (follow user Manuel)
2. Take food out of the oven or off the heat
3. Put the probe into the middle at a slight angle
4. Hold the probe in the food until the temperature stabilises
5. If it is not at a core temperature of 75°C it needs to go back in the oven or into the heat and then re-test shortly

Bacteria: Conditions For Growth

Temperature	Moisture	Time	Nutrients	pH level
• Multiplies between 5°C and 63°C • Ideal temperature for rapid multiplication is 37°C (body	• Needs moisture to live and multiply	• Under optimum conditions bacteria will multiply every 10-20 minutes • Cool down food within 90 minutes to store in fridge/freezer to prevent bacteria multiplication	• Can multiply to large numbers on high-risk foods like meat, poultry, fish, eggs, milk	• Grows best at neutral pH between 6.6 and 7.5 • Unable to survive below pH 4.5

Pathogenic Bacteria	Food Affected	Symptoms	Onset
Salmonella	Raw meat, eggs, seafood, dairy products	Diarrhoea, Vomiting, Fever	12-36 hours (Can be fatal to elderly and babies)
Staphylococcus Aureus	Cooked slices meat, dairy products, anything touched by hand	Diarrhoea, Vomiting, Abdominal pain	1-6 hours (Associated with bad personal hygiene)
Clostridium Perfingens	Raw and cooked meat and meat products	Diarrhoea, Nausea, Abdominal pain	8-22 hours
Clostridium Botulinum	Incorrectly canned meat, fish or vegetables	Nausea, Vomiting, Paralysis, Difficulty breathing, Double vision	12-48 hours (Rare)
Bacillus cereus	Cooked rice, pasta and cereal foods	Diarrhoea, Nausea, Vomiting	1-6 hours

Food-borne Disease Pathogenic Microbe	Food Affected	Symptoms	Onset
Escherichia-Coli (E-Coli)	Raw meat, untreated milk and water	Blood in Diarrhoea, Vomiting, Kidney damage or failure	12-24 hours (Causes gastro-enteritis in humans)
Listeria Monocytogenes	Soft cheese, Pate, Unpasteurised milk, undercooked met, incorrectly heated cook-chill meals	Mild Flu-like symptoms, Septicaemia, Meningitis and Pneumonia	No specific time (Can also cause miscarriage or premature labour/birth)
Campylobacter	Meat, Shellfish, Untreated water, Washing raw poultry	Diarrhoea, Headache, Fever, Abdominal pain	1-11 days (Easily transmitted between humans)
Norovirus	Shellfish, Raw vegetables, Salads	Nausea, Vomiting, Fever, Abdominal pain, Diarrhoea	1-2 days (Can survive for several days if not cleaned up properly)