2.7: Microorganisms and their applications

The safe use of basic aseptic techniques involved in inoculating, plating and incubating microorganisms

- Bacteria and fungi can be grown on nutrient agar in a Petri dish, to produce an agar plate.
- Petri dishes and nutrient agar should be sterilised before the agar is poured.
- An inoculating loop is used to transfer bacteria and is sterilised before and after use by heating it to red heat in a Bunsen flame.
- The Petri dish lid prevents microorganisms from the air contaminating the culture and vice versa.
- After inoculation the lid of the Petri dish should be secured in place by strips of adhesive tape for safety reasons.
- Inoculated agar plates are incubated at 25°C in school laboratories, which encourages growth of the culture without growing pathogens.
- For safety reasons, plates and equipment should be sterilised after use.

The link between the number of bacterial colonies on the agar and the number of bacteria in the original sample

- One bacterium will give rise to one colony.
- However, the clumping of bacteria can cause inaccuracies in counting.

The effect of temperature on the growth of bacteria

- Refrigeration slows bacterial growth.
- Freezing stops bacterial growth.

The production of penicillin

- A starter culture of the fungus *Penicillium* is added to a liquid nutrient culture medium in a fermenter.
- In a fermenter, the supply of air, the temperature and pH can be controlled to enable maximum growth to take place.
- The organism grows and secretes the antibiotic into the surrounding medium.
- After incubation, the culture medium is filtered and the penicillin.