FOOD SPOILAGE

Our food comes from plants and animals. Once they have been harvested or killed, changes take place. In time, food spoils or goes "bad". If this food is eaten, it can cause food poisoning and illness.

Food spoilage is caused by micro-organisms which are too small to be seen with the naked eye, but which can be seen through a microscope. Micro-organisms are found everywhere – in water, dust, on food and on the hands. There are three types of micro-organism which cause food spoilage.

They are:

- Yeast
- Mould
- Bacteria

Yeasts
Need food, warmth and liquid to grow rapidly. They use the sugar in food to grow and produce carbon dioxide gas and alcohol. They are killed at high temperatures. Yeasts can be useful. They help bread to rise and make wines and beers by a process called fermentation. But yeasts may attach fruits and jams and spoil them.

Mould
You have probably seen mouldy bread. Mould spores are carried in the air and can settle and grow on food such as bread, cheese and meat. They grow fastest on moist food and will even grow in the fridge. Moulds are killed by heat. We deliberately eat some mouldy foods – such as blue cheese.

Bacteria
Bacteria are the most commonly found of the three types of micro-organism. Some bacteria are useful, some just spoil the food, but others cause an illness called food poisoning. Bacteria are killed by boiling, but food-poisoning bacteria can produce spores and poisons which can survive twenty minutes or longer in boiling liquid.

Changes in food can also be caused by enzymes. Enzymes are chemicals in food which cause chemical changes. When apples turn brown, this is a chemical change. Enzymes are destroyed by heat. If air and water are removed then most enzymes cannot work.

FOOD POISONING

Bacteria are everywhere, in the air, soil, water and dust. Some bacteria are useful, but others are dangerous because they cause disease. Food-poisoning bacteria can cause illness two hours or as long as forty-eight hours after poisoned food is eaten. Bacteria are so small that they can only be seen with a microscope. They cannot be seen on food and the food may not even taste bad, yet bacteria and their poisons could still be present in large numbers. The victim suffers from stomach pains, diarrhoea and sickness which can last one or two days, or even longer! One type of food poisoning can cause death.

There are three conditions which these bacteria need to live and breed: food, warmth and moisture. Every twenty or thirty minutes, a bacterium can divide in two.

Work out this puzzle:

If a piece of meat containing two bacteria is left in a warm room and the bacteria divide in two every twenty minutes, how many bacteria will there be at the end of four hours?

How food poisoning is carried by: Humans or Animals

1. Bacteria are found in the nose, throat and sores on the skin, as well as in the faeces. We can pass the bacteria from these places onto the food we prepare.

Hands must be washed after visiting the toilet.

2. Pests and pets pass bacteria on to the food we eat (droppings or saliva from rats, flies, mice or pets).

3. Food such as raw chicken or meat may contain food poisoning bacteria. After touching these foods, the hands can pass bacteria on to other foods.

4. Surfaces and equipment can harbour bacteria. A dirty meat-slicer could infect other meat.

Where bacteria live

Bacteria thrive on nutritious food which is not too salty, sweet or acid. They like warm, moist places and multiply rapidly if undisturbed. Bacteria are killed by boiling but some of their spores or poisons can multiply/survive twenty minutes boiling. In the cold of the fridge or freezer they are inactive or “dormant”.