7 Microbes make food

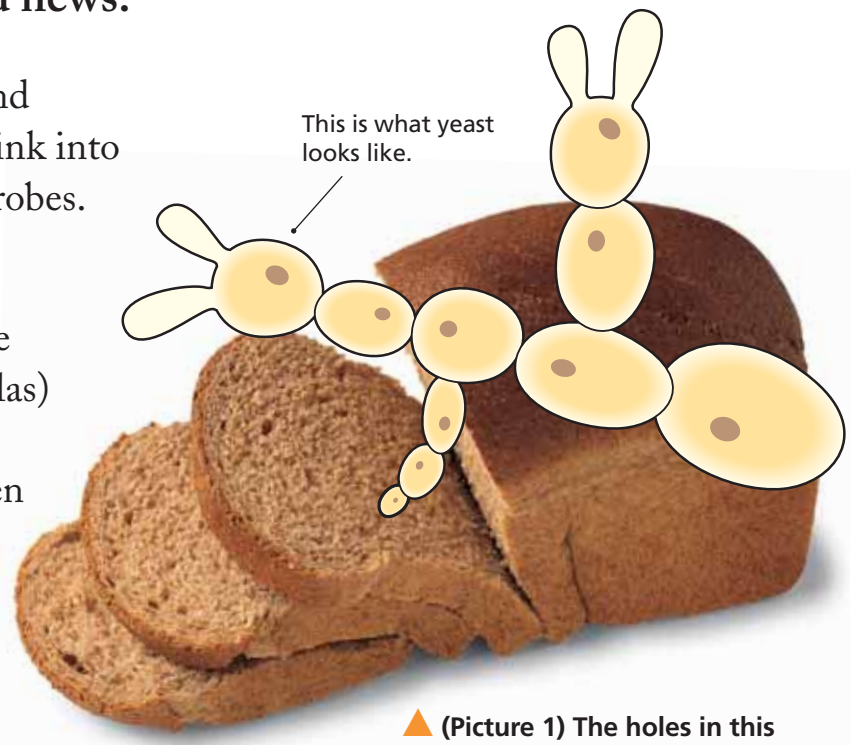
Microbes need to eat, and they eat the same food as us. This can be good news.

We get our nourishment by eating and drinking. But as we take food and drink into our bodies, we are also taking in microbes.

Bread

There are many kinds of bread. Some breads (such as naan bread and tortillas) are flat and dense, whereas loaves of bread and dinner rolls are light. When you look at a loaf of bread you can see the reason for the lightness: it is full of tiny holes (Picture 1). These were made by bubbles of gas that formed during baking.

Bread that rises and makes bubbles is called leavened bread. The bubbles are made by a microbe called yeast, which is a type of fungus.



▲ **(Picture 1) The holes in this bread are bubbles of carbon dioxide gas made as the yeast 'eats' part of the bread. The bubbles make the bread swell up. This is what we call 'rising'.**

Baker's yeast is made of dried-out clumps of this fungus. When yeasts are added to a dough, they eat sugars in the dough and release a gas (carbon dioxide). This happens when you leave dough to rise before baking it. When you bake the bread, you kill the yeast – but the gas makes the bread fluffy. Yeast is also used in making beer and wine (Picture 2).

◀ **(Picture 2) This is a picture of a winery. The wine is made by allowing grape juice to be eaten by yeast while it is in large wooden casks. The cloudiness in the jar in the middle of the picture is produced by dead yeast. It will be filtered off to give clear wine.**

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Cheese

Cheese is a curdled form of milk. Curdling separates the curd – cheese – from watery liquids called whey. This is done by bacteria when they release chemicals called enzymes.

The microbes used in cheese-making give cheeses their distinctive flavour. At the same time, the rapid growth of the cheese-making microbes stops the growth of any harmful microbes and preserves the cheese.

Later, salt is added to the curd to bring out the flavour and to preserve the cheese. Microbes cannot grow in salt.

Surface-mould ripened cheeses, such as Brie, and blue-veined cheeses, such as Roquefort, rely on a penicillin fungus (Picture 3).

▼ (Picture 3) All cheese is a result of change by fungus. We call it ripening.

The holes in some cheeses, such as Gruyere, are made by warming the ripening cheeses for a while, so that bacteria grow and release carbon dioxide gas which forms bubbles in the cheese. The cheese is then moved back to a cold room.

Milk

Milk is an important part of your diet. But in the past it was a source of danger.

Milk is a rich source of nourishment, not just for you, but also for a wide range of bacteria and other microbes. At room temperature, bacteria grow very quickly in milk. They grow more slowly in a refrigerator, but they are not killed by the cold. They are not even killed by freezing.

Microbes can be destroyed by boiling milk for about five minutes, but this also changes the milk completely and destroys some nutrients. Louis Pasteur was one of the great scientists to study microbes. He discovered that the way to kill microbes without altering the milk was to heat milk to about 70°C for a short time and then cool it very quickly. This process is called pasteurisation.

Summary

- **Microbes are responsible for adding textures and flavours to our food.**
- **Foods that are likely to contain bacteria can be pasteurised easily.**