

Techniques for preserving food

PRESERVATION TECHNIQUES

Food can be preserved while retaining most of its characteristics. Some preservation techniques are **physical processes**, such as refrigeration and cooking. Others are **biological processes**, like fermentation. In fact, most of these processes are traditional, having developed over time.

For example, **in the past**, the Indian method for preparing grains of rice was to steam them in hot water and then dry them so that they kept better. **Today**, there is a similar method known as 'parboiling'. This process allows the transfer of minerals and vitamins from the husk to the grain of rice. In order to retain the nutritional elements within the grain of rice, it is then hardened and dried.

TEMPERATURE, WATER, OXYGEN, ACIDITY

If you have seen the video on the role played by microorganisms in the natural spoiling of food, you will know that there are several ways of acting on the environment of germs to stop them from developing. These methods use temperature, water, oxygen and the acidity of the surroundings. Particular preservation techniques act on each of these parameters.

TEMPERATURE

Temperature needs to be lowered to stop the development of germs. Techniques using this method are **chilling** and **freezing**, for example. However, to destroy microorganisms, the temperature needs to be greatly increased. You know most of the techniques aiming to raise temperature, such as **boiling**, **grilling**, **baking** or even **pasteurising**. Pasteurisation uses a slightly different process, which involves rapidly heating without boiling, then rapidly chilling. This enables the majority of bacteria to be destroyed.

WATER

Other preservation techniques aim to remove the water contained in food. Methods such as **drying**, **filtering** or **squeezing** reduce the amount of water present, which prevents microorganisms from multiplying. **Concentrating by boiling** is another example. This technique brings about evaporation of water.

ACIDITY

It is hard to talk about preserving techniques without mentioning **fermentation**. The purpose of this technique is to increase acidity to stop germs from developing. There are other techniques such as adding citric acid or vinegar, but fermentation is a biological process involving microorganisms. The fermentation particles transform sugar and proteins into alcohol, acid and carbon dioxide. This transformation

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modifies the environment and prevents other microorganisms from multiplying. One last thing about fermentation – it is used both for preserving food and to change the taste of food.

PRESERVATIVES

Certain preservation techniques use substances that slow down germ development. These can be **chemical preservatives**, but there are also well-known techniques such as **salting** and **smoking**. When we add salt to something, the water is linked to other molecules, making it less available for microorganisms. Smoking is simply a method of exposing food to smoke. Smoke contains substances which inhibit the growth of moulds and yeasts on the surface of food. Finally, **sugar** is used to preserve food in syrups and jams.

ULTRA-HIGH PRESSURE AND IRRADIATION

There are two other processes to consider: ultra-high pressure and irradiation.

In **ultra-high pressure**, food is subjected to 3000 to 10 000 bars of pressure. This pressure enables cold pasteurisation and, avoids the loss of vitamins or changes in flavour.

In **irradiation**, food is subjected to low intensity beams. These beams block the multiplication of cells. If you are wondering whether these beams can make your food radioactive, the answer is no. The type of beam used and the energy emitted are too low.