

# Preservation

## Food preservation has always been important...

Food preservation has always been important to survival; from earliest times the sun and wind were used to dry foods and in very cold climates food could be frozen on the ice. Storing food in clay jars protected it from pests and slowed spoiling by keeping it away from air and moisture.

Many different methods of preserving foods have been used since then. Salt was the first chemical preservative and was used a lot in the Middle Ages - salt preserves food by drawing out the moisture.

Some preservation methods actually change the taste or texture of foods and are actually used today more because we like the different taste or texture rather than there being any real need to use the same techniques.

The main methods of preserving foods today are:

### Canning and bottling

Canning means cooking food, sealing it in sterile cans or jars and boiling the containers to kill any bacteria that are still there.

As soon as the can or bottle has been opened the food is again put at risk of spoilage.

### Drying

Drying is one of the oldest techniques for preserving food. Drying food means exposing it to a temperature high enough to remove the moisture but low enough that it doesn't cook the food! Moisture is one of the essential elements bacteria need to multiply. So removing moisture reduces the chances of bacteria surviving and multiplying.

An electric dehydrator can be used to dry or dehydrate food.

### Food Additives

A variety of different food additives are used to preserve foods. They inhibit the growth of any bacteria.

### Freezing

Freezing is one of the most commonly used methods of preserving food.

Freezing food stops bacteria from growing.

### Irradiation

No heat is used in irradiation. Irradiating food means exposing it to high-energy electrons or x-rays from accelerators or by gamma rays. Irradiation kills bacteria, moulds, insect pests and reduces the ripening and spoiling of fruits.

### Pasteurisation

Pasteurisation is a method of preserving liquid, particularly milk. The milk is heated to 72°C for 15 seconds (or 63°C for 30 minutes) to kill the bacteria and then cooled quickly to less than 3°C to prevent the bacteria growing again.

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## Pickling

There are two types of pickling – chemical pickling and fermentation pickling. Chemical pickling means putting a food into a liquid which kills or inhibits bacteria, such as brine, vinegar, alcohol, vegetable oil or olive oil. To saturate the food with the pickling agent some chemical pickling processes also involve heating or boiling.

Common foods which are often chemically pickled are onions and eggs.

In fermentation pickling the food produces its own preservation agent.

Sauerkraut is pickled using fermentation pickling.

## Refrigeration

Refrigeration is one of the most common methods of preserving foods. Keeping foods in a fridge at a temperature below 5°C slows down the growth of bacteria. It doesn't kill it. As soon as the food goes above 5°C any bacteria will start to multiply again. For example a bacteria such as Listeria grows nearly twice as fast at 8°C as it does at 5°C.

One food that should not be kept in a fridge is a potato. When potatoes are stored in the fridge the starch in the potato is converted into sugar and then when the potato is cooked a chemical called acrylamide is produced which is thought to be harmful.

## Salting and Curing

As with drying, salt reduces the amount of moisture in a food – it effectively draws the moisture out of the food. By taking out the moisture it takes out one of the essential elements bacteria need to multiply, and so reduces their ability to do so.

## Smoking

Smoking is one of the oldest techniques used for preserving foods. In smoking the food is exposed to smoke from burning plant materials, such as wood. Meat and fish are the most commonly smoked foods.

## Sugar

Sugar is often used to preserve fruits. It works in a similar way to salt – by drawing out the moisture. The more sugar there is in any solution the more water it tries to draw from its surroundings. The sugar concentration needs to be quite high.

## Ultra Heat Treatment (UHT)

Ultra heat treatment is used to preserve liquid. The liquid is heated for around 2 seconds at a temperature over 135°C. UHT is commonly used for milk and fruit juices, cream, yogourt, wine and soup. UHT milk has a typical shelf life of six to nine months until it is opened. Once opened it should be used within 3 to 5 days.