

# Various types of food preservation methods used in food and beverages industries

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## DESCRIPTION

Food preservation is one method of preventing the growth of undesirable germs on food. After the food is prepared, we use lids to store and protect the rice and curry, keeping flies and other insects out. By doing this, we are protecting it from any infection that they may introduce. This condition is temporary. However, food preservation is done to keep food fresher for a longer period of time. Important objectives for food preservation include the following: to prevent microbial contamination, eliminating pathogens, to lessen the chance of food poisoning and food spoilage. The following industrial pre-processing techniques are among the most common:

### Pasteurization

Liquid food preserved through the pasteurization process. At first, it was employed to keep fresh local wines from spoiling. Today, dairy products are predominantly used in the technique. In order to kill any germs present, milk must be quickly chilled to 10°C (50 °F) after being heated to roughly 70°C (158 °F) for 15 to 30 seconds. After processing, the milk is stored cold in sterile bottles or pouches. In 1862, French chemist Louis Pasteur invented this method.

### Vacuum Packing

Food is vacuum-packed and stored there for future use, typically in a bag or container that is airtight. Microorganisms are killed by the absence of oxygen in the vacuum atmosphere. Nuts are typically vacuum-packed to stop the oxidation of their flavor while being stored. Because vacuum packaging can deform contents and take flavor out of some foods, like cheese, it has a serious drawback for consumers.

### Freeze Drying

Freeze drying, often referred to as lyophilization or cryodesiccation, is a low-temperature dehydration technique

that entails freezing the product, reducing pressure, and sublimating the ice. This contrasts with dehydration caused by the majority of traditional methods, which use heat to evaporate water. The low processing temperature ensures that the rehydrated product keeps a large portion of its original properties. When solid products, like strawberries, are freeze dried, the product's original shape is preserved.

When drying a liquid product, as is frequently the case in pharmaceutical applications, the excipient mixture optimizes the finished product's qualities (i.e., inactive ingredients). Biological (such as bacteria and yeasts), biomedical (such as surgical transplants), food processing (such as coffee), and preservation are some of the main uses for freeze drying.

### Artificial Food Additives

Preservative food additives can be either antioxidants, such as oxygen absorbers, which prevent the oxidation of food components, or antimicrobials, which stop the growth of bacteria or fungi, including mould. Calcium propionate, sodium nitrate, sodium nitrite, sulfites (sulphur dioxide, sodium bisulfite, potassium hydrogen sulfite, etc.), and Ethylenediaminetetraacetic acid (EDTA) are typical antimicrobial preservatives. Butylated Hydroxyanisole (BHA) and Butylated Hydroxytoluene are examples of antioxidants. Other preservatives include ethanol, glutaraldehyde (an insecticide), formaldehyde (often in solution), and Methylchloroisothiazolinone (MCI). The use of antimicrobials and antioxidants such as butylated hydroxyanisole, butylated hydroxytoluene, tocopherols, hinokitiol, lysozyme, nisin, natamycin, chitosan, and polylysine to impregnate packing materials (plastic films or other) is another method.

### Irradiation

Food that has been irradiated has been exposed to ionising radiation. It is possible to employ a variety of

ionising radiation types, such as gamma rays and beta particles (high energy electrons) (emitted from radioactive sources such as cobalt or cesium). Irradiation has the power to eradicate germs, mould and insect pests, delay fruit ripening and spoilage, and, at higher levels, causes infertility. The process, also referred to as "cold pasteurization" because the product is not heated, might be compared to pasteurization. Foods of lesser quality or that have been tainted may be made marketable through irradiation. Food irradiation has been deemed "wholesome" by national and international expert bodies, and it is supported by United Nations (UN) agencies including the World Health Organization and the Food and Agriculture Organization.

The idea that irradiated food is radioactive may cause consumers to have an unfavorable opinion of it. However, irradiated food is not and cannot become radioactive. Activists have opposed food irradiation for a variety of additional reasons, such as the claim that

technology can be used to sterilize contaminated food without addressing the underlying problem. Over 40 countries throughout the world irradiate over 500,000 tonnes of food annually. The majority of these are spices and condiments, with a growing percentage of fresh fruit being radioactively sterilized to prevent fruit flies.

### **High-Pressure Food Preservation**

Pascalization, sometimes known as high-pressure food preservation, is a method of preserving food by applying high pressure. Food can be prepared such that it preserves its fresh appearance, flavour, texture, and nutrients while inhibiting unwanted microbes and reducing rotting, according to the article. Pressed inside a vessel exerting 70,000 pounds per square inch or more. The method was widely utilized and sold for a variety of goods, including deli meats, guacamole, and orange juice.