

FRUIT AND VEGETABLE PROCESSING

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What is preservation?

- 1) The activity or process of keeping something valued alive, intact, or free from damage or decay.
- 2) The preparation of food for future use (as by canning, pickling, or freezing) to prevent spoilage.
- 3) The act of keeping something in its original state or in good condition.
- 4) The act of keeping something safe from harm or loss.
- 5) The act of using a particular treatment on a food so that it can be eaten in the future.

Methods of preservation for fruits and vegetables-

1) Storing

Storing is the easiest method for keeping your harvest, but most vegetables don't have a long shelf life. Root vegetables and vegetables that can be cured, like onions and winter squash, will last the longest.

Basic Storing Tips:

- Only store fully mature, healthy vegetables. Any bruised or immature vegetables should be eaten fresh or preserved by other means.
- Clean of soil and allow the outside of vegetables to dry before freezing.
- Keep a few inches of the stem on winter squash and also cut the green tops of root crops to an inch or so.

2) Freezing

Many vegetables keep well in the freezer. When blanched and frozen soon after harvesting, this can be the best method for retaining nutrients, as well as color, texture and flavor. Most vegetables can last 8 to 12 weeks in the freezer.

Basic Freezing Tips:

- Freeze food immediately after packaging.
- Keep freezer temperature at 0 degrees F or lower. You can set your freezer control to -10 degrees F, the day before freezing to speed the process.
- Don't try to pack your freezer with unfrozen produce. This will only lower the temperature in the freezer and lengthen the time needed for the produce to chill.

3) Canning

Canning is a great method for preserving fruits and vegetables with a high water content, like tomatoes, mushrooms, beans and peaches.

Basic Canning Tips:

- Use clean jars and new seal lids.
- Process in boiling water or a pressure canner for the specified amount of time.

4) Drying

Drying dehydrates the fruit or vegetables, removing all the water along with the bacteria, yeasts and mold that live in the moisture. Besides altering the texture of the food, drying also modifies the taste, typically concentrating it. Dried food has the added benefit of being safe to store as is on your pantry shelf – you don't need special packaging to keep it in or to keep it in the refrigerator. In some countries solar drying of food is a part of life, and if you live in an area that receives high levels of consistent sunshine, you may be able to dry food that way. More likely however, is drying in an oven. The technique requires low temperature and good air circulation so use the lowest setting and prop the oven door open – this allows the air that the moisture has evaporated into to escape. Drying fruits, vegetables, and herbs is also a very easy process and can be done without any special equipment or sped up by using the oven or a dehydrator. Dried fruits, seeds, jerky, leather and even popcorn can be done by these methods.

Basic Drying Tips:

- Provide good air circulation while drying, to prevent spoilage.
- Be sure the fruits and vegetables are fully mature and disease free.

5) Pickling

Cucumbers come to mind when we think of pickling, but many vegetables and fruits can be preserved in this manner, including peppers, cauliflower, apples, and pears. Relishes are also prepared by pickling.

Basic Pickling Tips:

- Always follow a tested recipe. Even in vinegar, spoilage can happen. Canning pickled products by the boiling water methods further stop spoilage.
- Choose only disease-free fruits or vegetables and wash them well before processing.

6) Jams & Jellies

No method of preserving food smells as wonderful as making jams and jellies.

Basic Tips for Making Jams & Jellies:

- The freshest, sweetest fruit makes the best jelly.
- The acidity level has to be right for the fruits to gel. Lemon juice is added to low acid fruits.
- Don't alter sugar amounts in recipes. Sugar helps to preserve and gel the fruits.

7) Salting

One of the oldest methods of preserving food, salting can be used for meat and fish, as well as for sliced vegetables. There are two methods. The first uses a low salt to vegetable ratio (between two and five percent salt per weight of vegetables). This level of salting promotes the growth of the lactic acid bacteria, which in turn inhibits the growth of other bacterial forms that could spoil the food. It also serves to slightly pickle the vegetables. The second method uses a higher percentage of salt (between twenty and twenty-five percent), preserving the freshness of the produce but adding a salty flavour when used, even after the salt has been washed off. Whichever method of salting you use, you need to store the produce in the refrigerator.

8) Fermenting

The fermentation process involves converting carbohydrates to alcohol or organic acids. To get the process going, you need to introduce salt, whey or a dedicated starter culture to water – creating the brine solution in which the food will ferment.

Fermenting summer fruits and vegetables is relatively easy, but it's important to ensure that they're cut into small and even chunks or slices. The food is put into an airtight container, and the brine is poured on top. It's important to ensure that all of the food remains submerged in the brine until the fermentation process has finished. If you're fermenting fruit, the process should take around 48 hours. However, because of their lower sugar content, vegetables tend to take a little longer.

9) Oil Packing

The use of vegetable oils to preserve summer fruits and vegetables makes it harder for bacteria to develop — but it also adds a completely different dimension to the flavor. Ideal for preserving tomatoes, eggplants, herbs, onions and olives, oil packing creates anaerobic conditions (basically no air) with the addition of acid, usually vinegar. Most people use airtight mason jars to preserve fruits and vegetables these days, but sealable food bags can work just as well.

10) Cooling

Cooling preserves food by slowing down the growth and reproduction of microorganisms and the action of enzymes that causes the food to rot. The introduction of commercial and domestic refrigerators drastically improved the diets of many in the Western world by allowing food such as fresh fruit, salads and dairy products to be stored safely for longer periods, particularly during warm weather.

Before the era of mechanical refrigeration, cooling for food storage occurred in the forms of root cellars and iceboxes. Rural people often did their own ice cutting, whereas town and city dwellers often relied on the ice trade. Today, root cellaring remains popular among people who value various goals, including local food, heirloom crops, traditional home cooking techniques, family farming, frugality, self-sufficiency, organic farming, and others.

11) **Boiling**

Boiling liquid food items can kill any existing microbes. Milk and water are often boiled to kill any harmful microbes that may be present in them.

12) **Heating**

Heating to temperatures which are sufficient to kill microorganisms inside the food is a method used with perpetual stews. Milk is also boiled before storing to kill many microorganisms.

13) **Sugaring**

The earliest cultures have used sugar as a preservative, and it was commonplace to store fruit in honey. Similar to pickled foods, sugar cane was brought to Europe through the trade routes. In northern climates without sufficient sun to dry foods, preserves are made by heating the fruit with sugar. "Sugar tends to draw water from the microbes (plasmolysis). This process leaves the microbial cells dehydrated, thus killing them. In this way, the food will remain safe from microbial spoilage."^[5] Sugar is used to preserve fruits, either in an antimicrobial syrup with fruit such as apples, pears, peaches, apricots, and plums, or in crystallized form where the preserved material is cooked in sugar to the point of crystallization and the resultant product is then stored dry. This method is used for the skins of citrus fruit (candied peel), angelica, and ginger. Also, sugaring can be used in the production of jam and jelly.

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