

Freezing for the Future: Fruits and Vegetables

Quick and Convenient Preservation

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Why Freeze?

Freezing is one of the oldest methods of food preservation practiced by humans. It is a quick and convenient method that, in most cases, preserves the color and flavor as well as the nutritive quality of the food product. The method of freezing involves lowering the temperature of food below its freezing point. When performed correctly, it preserves the food by slowing down enzymes and other chemical reactions that compromise the quality of the food product. It also helps to enhance the safety of the food product by slowing the growth of microorganisms such as bacteria. However, one thing to keep in mind is that freezing does not kill microorganisms but only temporarily stops their growth. Frozen fruits and vegetables are good to consume with minimum loss of flavor, color, and nutrients for up to a year.

Freezing Supplies

The supplies essential for freezing at home are mostly the items you use to prepare your everyday meals. The most basic items needed are a freezer, pots and pans, and freezing containers (bags).

Packaging Materials: There are two types of packaging materials used for home freezing, rigid containers (glass/plastic) and flexible plastic bags. It is essential to select proper packaging materials and containers to ensure that moisture is not lost during the storage period. Select bags or containers specifically labelled for freezing foods. When choosing containers, select the ones with tapered sides for easy removal of food when needed. Ideal containers for freezing help prevent moisture loss and freezer burn in the long run.

The selected packaging material must have the following characteristics:

- Made of food-grade materials
- Moisture and vapor resistant
- Leak-proof
- Non-absorbent to flavors and odors
- Resistant to oil, grease, and water
- Resistant to cracking and brittleness at low temperatures
- Easy to seal
- Easy to label
- Economical



Preparation

The first step is to ensure that you are following good hygienic practices, and the preparation area and utensils are clean. Wash your hands frequently and ensure that the preparation area has been sanitized, and the utensils have been washed with soap and warm water before starting. Gather all the supplies that you will need.

When ready, start by washing the produce by rinsing, gently rubbing, or scrubbing with a food-grade brush under cold running water. After washing, slice or portion the produce into desired sizes. Before packaging, an additional preparation step is needed to stop naturally occurring chemical reactions that can cause loss of color, nutrients, and flavor.

Vegetables

For vegetables, the chemical reactions can be stopped by a process called blanching(scalding). Blanching also helps by destroying microorganisms on the surface of the vegetables. For blanching, the vegetables are placed in boiling water for a brief period, followed by rapid cooling of the vegetables in ice water for the same amount of time. You can also use steam in place of boiling water; however, it is more time-consuming. Make sure to follow the recommended time for blanching, as over-blanching will result in cooked products with reduced nutrients and lost flavor and color. To lift food from the boiling water, use a colander, sieve, or basket if you do not have a blancher.

Fruits

Like vegetables, fruits also contain chemicals that can affect color and flavor. The main effect of these chemicals is browning (darkening) and loss of Vitamin C. As fruits are generally served raw, most fruits are not blanched but treated with chemical compounds such as Ascorbic Acid or Vitamin C. Ascorbic acid may be used in its pure form or commercial ascorbic acid mixtures. Ascorbic acid is added to the holding water at the rate of 1 teaspoon to 1 gallon of water. The fruits are then drained before moving to the next step. Sometimes lemon juice or other citrus fruit solutions are used to control browning, but they are not as effective as treatment with ascorbic acid.

Fruits are sometimes packed with sugar and sugar syrup. The addition of sugar also helps to prevent browning, but does not prevent it entirely. For this, after the fruit is prepared for the freezer, sugar is then added to the fruit as dry sugar or as a syrup and packaged for freezer storage. The amount of sugar or syrup added will depend on the sweetness of the fruit, personal preference, and intended use. For sugar packing, use about 1 cup of sugar for every 2 to 3 pounds of fruit. For syrup packing, dissolve sugar in hot or cold water and add it to the fruit after cooling. Allow $\frac{1}{2}$ to $\frac{2}{3}$ cup syrup for each pint of fruit, or $1\frac{1}{3}$ cups for each quart of fruit so that it covers the fruit.

Packaging and Freezing

- After preparing the produce, quickly cool all foods and syrups before packaging.
- Work with small quantities and pack the food in quantities that will be used for a single meal. Follow directions for individual produce to determine if it can be packed dry or needs added liquid.
- Keep adequate headspaces for all types of containers to allow expansion during freezing.
- When packaging using bags, press the air out of the bag.
- Label packages with the name of the produce; added ingredients, the date packaged, and the date to use by; number of servings or quantity; and the type of pack, such as whole, sliced, or diced.
- Freeze the produce products as soon as they are packaged and sealed.
- Place packages in contact with refrigerated surfaces in the coldest part of the freezer.
- Do not overload the freezer with unfrozen produce; instead, spread packages among already frozen foods.
- Spread unfrozen produce out in the freezer so that it freezes more rapidly. After they are frozen, packages can be stacked.





Individual Quick Freezing or Tray Freezing

Some fruits and vegetables can be frozen quickly before packaging. Some of the produce that can utilize this method are strawberries, cranberries, blueberries, cherries, cut green beans, peas, whole-kernel corn, and small mixed vegetables. Simply spread a single layer of prepared produce on shallow trays and freeze. When frozen, promptly package and return to the freezer. This prevents the sticking of the produce and allows the removal of the desired portion when needed.

Packaging Tips

- Plastic freezer and vacuum packaging designed for freezing are suitable for dry packs.
- Rigid plastic containers, Glass freezing jars with wide mouths and straight sides are suitable for all packs, especially liquid packs.
- Paper cartons, cottage cheese tubs, cardboard ice cream and milk cartons, thin plastic (deli plastics), or any rigid carton with cracks or a poorly fitting lid are not suitable for long-term storage, nor do they adequately prevent moisture loss and freezer burn from exposure to air.

Blanching Guide

Vegetable	Blanching Time* (minutes)
Asparagus Small Stalk Medium Stalk Large Stalk	2 3 4
Beans-Snap, Green, or Wax	3
Beans - Lima, Butter, or Pinto Small Medium Large	2 3 4
Broccoli (florets 1.5" across)	3
Brussel Sprouts Small Heads Medium Heads Large Heads	3 4 5
Cabbage (shredded)	1.5
Carrots Small Diced, Sliced, or Strips	5 2
Cauliflower (florets 1" across)	3
Celery	3
Corn On The Cob Small Ears Medium Ears Large ears Whole Kernel or Cream Style Corn (ears blanched before cutting corn from cob)	7 9 11 4
Eggplant	4
Collard Greens	3
Okra Small Pods Large Pods	3 4

Blanching Guide Continued

Vegetable	Blanching Time* (minutes)
Peas - Edible Pod	1.5-3
Peas - Field (black eyed)	2
Peas - Green	1.5
Peppers - Sweet Halves	3
Strips or Rings	2
Soybeans - Green	5
Squash - Chayote	2
Squash - Summer	3



Preparation and Packaging of Fruits

Fruit	Dry Pack	Suggest Syrup Pack	Sugar Pack	Ascorbic Acid in Pack
Apples	Yes	Yes	Yes	Yes
Applesauce	N/A	N/A	N/A	Optional
Apricot	Now	Yes	Yes	Yes
Avocados	No	No	No	Yes
Bananas	N/A	N/A	N/A	Yes
Blackberries	Yes	Yes	Yes	No
Blueberries (Whole)	Yes	No	No	No
Blueberries (Crushed or Pureed)	Yes	N/A	Yes	No
Cantaloupe (and Other Melons)	Yes	Yes	No	No
Cherries (Sour)	Yes	Yes	Yes	No
Cherries (Sweet)	Yes	Yes	Yes	Yes
Cranberries	Yes	Yes	No	No
Citrus Fruits	No	Yes	No	No
Figs	Yes	Yes	No	No
Grapes (Whole)	Yes	Yes	No	No
Grapes (Pureed)	No	N/A	Yes	No
Peaches and Nectarines (Crushed or Pureed)	No	N/A	Yes	Yes
Pears	No	Yes	No	Yes
Pineapple	Yes	No	No	No
Plums	Yes	Yes	No	Yes
Raspberries	Yes	Yes	Yes	No
Rhubarb	Yes	Yes	No	No
Strawberries (Whole)	Yes	Yes	Yes	No
Strawberries (Sliced or Crushed)	N/A	N/A	Yes	No

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