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FREEZING FRUITS, VEGETABLES, AND MEATS

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FREEZING FRUITS, VEGETABLES\*, AND MEATS

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Food Industries Dept.  
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The proper preparation of fruits and vegetables is an important step in preservation by freezing. Care should be exercised to see that all material used is carefully washed to remove sand, dirt, and other foreign material. Proper sorting should remove decayed, badly bruised, or immature products that not only detract from the appearance, but also from the flavor of the commodity.

In general, fruits require no preliminary pretreatment except washing and sorting. The exceptions are apples, peaches, and apricots. Peaches are usually pitted and peeled and, therefore, require either a steam or a hot water blanch for a period of thirty seconds to a minute and a half. Heat treatment, for peeling purposes, likewise stops enzymatic changes on the surface which might cause browning of the tissue. In this case, cooling is essential to stop further heat effect which might cause softening. In handling peaches, attention should be directed especially to proper maturity. If the fruit is at the right stage for eating, the skins will loosen easily when the fruit is blanched. Green fruit is a greater problem in peeling and results in a poor quality finished product.

In freezing apples or peaches, slicing should be done because packing of the product is simplified if the pieces are smaller in size. In the case of stone fruits, such as apricots, prunes, or firm-fleshed plums, the pits should be removed. Large fruit is also protected from browning by sugar or sugar syrup which is used when packing into container.

Scalding or Blanching Vegetables

The scalding or blanching of vegetables is an essential step in the process of freezing these products. Vegetable material will spoil or change if not properly blanched. The period given for this operation is the minimum time to insure good keeping quality; therefore, follow closely the table in the back of this circular.

Blanching will stop most active processes of deterioration. It likewise preserves the color and softens the vegetables so that packing is simplified. In case this process is omitted, the product will change during storage even where temperatures are held at the recommended point. The usual change is one of flavor and odor, which in time makes the product unpalatable.

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\*Material on fruits and vegetables taken from Publication MC - 53 "Preservation of Fruits and Vegetables by Freezing in the Pacific Northwest" by Diehl, Wiegand, and Berry.

### Use of Sugar and Syrup for Fruit Packs

Fruit can be packed without sugar, with dry sugar, or with sugar syrup. Although it is possible to freeze fruit without sugar, the flavor is improved when either sugar or syrup is added.

Sugar is an important ingredient in the packing of the fruit. It assists in the retention of the natural color, flavor, and aroma of the fruit. It also acts to protect the fruit from oxidation by keeping it away from the air. When dry sugar is used, it gradually dissolves on the surface of the fruit and coats it completely. Thus, a protective covering is immediately formed which tends to check oxidation.

The recommended proportions of fruit with dry sugar may vary considerably. However, those most desired are four parts of fruit and one part of sugar (4 + 1) or three parts of fruit and one part of sugar (3 + 1). These proportions are based on weight. It must be remembered that fruit to be used for ice cream and other products, where dilution is not desired, is best packed in dry sugar (3 + 1).

Fruit syrups are often used for dessert. The best results are obtained with a syrup density of 50° Balling (half sugar and half water by weight) and this is best for most fruits. Some people prefer the use of lighter syrups on the milder fruits such as Royal Ann cherries. In this case the syrup density can be reduced to a concentration of 40 or 45 per cent by weight of sugar.

### Packing Vegetables

Most vegetables are suited to dry packing. In cases like this, the blanched and cooled vegetables can be packed immediately in proper containers. There are, however, some vegetables which respond better to liquid packing because of the peculiar conditions found in food lockers. Where temperatures never drop lower than zero degrees Fahrenheit (0°F) the freezing of such products as asparagus is best carried on in brine solutions. Brines made up with 2 per cent salt (1 level teaspoon of salt to 1 cup of water) are suited for such products. (Tables illustrate best packing method).

### Containers for Freezing Fruits and Vegetables

Containers suited to this type of processing are as follows: First, glass jars used in home canning operations may be used. Second, lacquered tin cans with slip tops are suitable. Third, waxed paper containers. All of these can be used with either the dry or liquid packs. Where liquid packs are used, care should be exercised not to fill jars too full. Allow at least 1 1/2 inches of head space in the large sizes.

### Cooking Frozen Vegetables

There is always some criticism regarding quality of frozen vegetables. When cooking these products, do not defrost; but place the frozen material in a vessel containing only a small quantity of boiling water. Bring the entire contents of the pan to a boil and continue boiling the required length of time.

Storage Temperatures for Meat and Fish

It has been demonstrated at this station, that the temperature at which meat and fish are stored has a decided effect upon the time at which the fat and oil become rancid. The higher the storage temperatures the quicker rancidity sets in. Objectionable flavors in meats and fish are traced to these changes. Therefore, it is imperative that low temperatures for storage be maintained. According to investigations carried on at the New York Agricultural Experiment Station, as reported in Bulletin No. 690, it was found that pork will show undesirable rancidity in two months when stored at a temperature of + 15° F and in four months at + 10° F. When stored at 0° F, however, pork showed no signs of rancidity even at the end of a year. Beef, lamb, veal, and chicken fat became unpleasantly rancid in three months when held at + 15° F and in five months at + 10° F. Use of 0° F, however, gave conditions which proved entirely successful even for a year's storage.

Storage of fish at temperatures above 0° F is not recommended. The work indicates best results are obtained when temperatures of 0° Fahrenheit or lower are maintained for all products.

FREEZING FRUIT

Freezing and Storage Temperature for All Varieties, 0° F

Variety	Pretreatment	Type of Pack	Container
Blackberries (Oregon)	Sort carefully. (Sizing not necessary) Wash in cold water. Remove excess moisture.	Dry sugar (3 + 1) or 40 to 50% syrup	Airtight preferred. Lacquered cans. Glass jars (be cautious of overfilling).
Blueberries (Rancocas)	Screen and sort well. Wash in cold water.	40 to 45% syrup	Airtight containers. Lacquered cans. Glass jars.
Cranberries (McFarlin)	Screen and sort with care. Wash thoroughly.	50% syrup	Non-airtight may be used. Lacquered cans.
Dewberries and Loganberries	Sort and wash. Watch for uniformity in color. Allow berries to drain.	Dry sugar (3 + 1) or 50% syrup	Airtight preferred. Lacquered cans.
Raspberries, Black (Cumberland)	Screen and sort with care. Wash thoroughly. Drain well before packing.	Dry sugar (3 + 1) or 40 to 50% syrup	Glass jars. Tin (fruit lacquer lining). Waxed paper-board.
Raspberries, Red (Cuthbert)	Sort and wash carefully. Reduce handling to minimum. Drain thoroughly.	Dry sugar (3 + 1) or 50% syrup	Airtight preferred. Lacquered cans.
Strawberries (Corvallis)	Sort and wash carefully. Drain thoroughly. Slice immediately (if desired) 1/8-inch in thickness.	Dry sugar (3 + 1) or 45 to 50% syrup	Airtight preferred. Lacquered cans.

## FREEZING FRUIT (Continued)

Variety	Pretreatment	Type of Pack	Container
Apples (Yellow Newton)	Peel, core and trim. Slice in eighths or twelfths. Handle quickly. (Drop in salt brine 2 to 3% to protect against browning before packing.)	Dry sugar (3 + 1)	Glass jars. Waxed paperboard (airtight).
Apricots (Tilton)	Sort, wash, halve and pit. Peeling not necessary.	40 to 50% syrup	Airtight containers only. Lacquered cans. Hermetic seal or tight friction seal.
Cantaloupes	Slice or cut into ball shape	40 to 50% syrup	Airtight or non-airtight. Plain tin cans. Glass jars (separate the layers by wax paper)
Cherries, Sour (Montmorency)	Sort carefully. Pit before packing.	Dry sugar (3 + 1)	Airtight containers only. Lacquered cans. Glass jars.
Cherries, Sweet (Bing)	Stem, sort and wash. Reduce handling to minimum. Pitting not necessary.	40 to 50% syrup	Airtight containers only.
Peaches (Hale)	Scald in boiling water or steam. Cool quickly and peel. Pit and slice. Handle quickly. (Drop in 1% citric acid solution to protect against browning before packing.)	50% syrup	Airtight containers necessary. Lacquered cans. Glass jars.
Prunes (Italian)	Sort, wash, halve and pit. Peeling not necessary	Dry sugar (3 + 1) or 50% syrup	Airtight containers preferred. Lacquered cans. Glass jars.

## FREEZING VEGETABLES

## Freezing and Storage Temperature for All Varieties, 0°F

Variety	Pretreatment	Type of Pack	Container
Asparagus	Sort and wash carefully. Scald or blanch with steam or boiling water 2 to 3 minutes at 212°F. Cool promptly.	Dry pack or 2% salt brine	Airtight containers. Glass jars. Lacquered tins.
Beans, Lima	Pod and segregate. Scald in boiling water or live steam 1 to 2-1/2 minutes. Cool promptly.	Dry pack	Either airtight or non-airtight. Glass jars. Plain tins.
Beans, Snap	Sort, screen and wash. Snip and slice. Scald in boiling water or live steam 2 to 3 minutes. Cool rapidly in cold water.	Dry pack or 2% salt brine	Non-airtight may be used. (Minimize dehydration). Lacquered tins preferred. Glass jars.
Broccoli, Italian or Sprouting	Careful examination of material. Thorough washing. Cut off woody stem ends. Scald in boiling water or live steam 3 to 4 minutes. Cool promptly.	Dry pack	Airtight preferred. Unlacquered cans. Glass jars.
Brussel Sprouts	Careful trimming and sorting. Thorough washing. Soak a short time in water to crisp. Scald in boiling water or live steam 3 to 4 minutes. Cool immediately.	Dry pack	Either airtight or non-airtight. Unlacquered cans. Glass jars.
Cabbage	Remove outside and defective leaves. Cut into convenient pieces. Scald in boiling water or live steam for 3 minutes. Cool promptly.	2% salt brine	Airtight or non-airtight. Plain tins.
Carrots	Top, scrub under cold running water and trim. Scald small whole carrots for 3 to 5 minutes. Sliced or diced carrots 2 to 3 minutes. Cool promptly.	Dry pack	Airtight or non-airtight. Plain tins. Plate cans. Glass jars.

## FREEZING VEGETABLES (Continued)

Variety	Pretreatment	Type of Pack	Container
Cauliflower	Sort, trim, cut and wash carefully. Break large curd parts. Arrange loosely in wire basket and scald in boiling water for 2-1/2 to 3-1/2 minutes. Cool promptly in cold water.	Dry pack	Airtight containers preferred. Unlacquered tins.
Corn, Sweet	Husk, silk and trim ends. Scald by steam and cool quickly in ice water for best results. Avoid soaking or immersing the corn in water as much as possible. If cut from cob blanch 2 to 3 minutes. If corn on cob: Small ears - 6 minutes Medium ears - 8 minutes Large ears - 10 minutes	Dry pack	Cut corn - airtight or non-airtight. Corn on cob - wrap carefully in moisture-proof paper.
Mushrooms	Sort, size and wash carefully. Scald in boiling water: Button size - 2 minutes Large size - 3 to 4 minutes	2% salt brine	Airtight preferred. Unlacquered cans.
Peas	Pod, sort and segregate. Scald in live steam or boiling water 60 to 90 seconds. Cool promptly in large volume of cold water.	Dry pack	Airtight or non-airtight. (Avoid dehydration) Unlacquered cans.
Peppers, Sweet	Wash, halve or slice. Scald for 2 minutes in boiling water or live steam. Prompt cooling.	2% salt brine	Any type - airtight or non-airtight. Unlacquered cans.
Rhubarb	Wash thoroughly. Trim leafy heads and white bases. Cut remainder of stalk into 1-inch pieces.	40 to 50% sugar syrup only	Glass jars. Lacquered tin cans. Waxed paperboard.
Spinach	Thorough washing. Destroy inferior leaves and tough stems. Scald in boiling water or live steam 1 to 2 minutes. Keep leaves moving during scalding. Cool thoroughly.	Dry pack	Airtight or non-airtight. Plain tins.

For instructions on preparing meat for freezing see Circular HELLOO, Oregon State College Extension Service.