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Food Preservation

BY FREEZING

By E. H. Wiegand • Thomas Onsdorff
A. W. Oliver • Lucy A. Case

CALENDAR

For Freezing Foods

Winter—Meat, poultry, winter vegetables, apples.

Spring—Asparagus, peas, spinach, and other greens. Fish, berries, poultry, eggs, rhubarb.

Summer—Beans, peas, corn, apricots, berries, cantaloupe, cherries, fish, meat, poultry.

Fall—Beans, broccoli, brussels sprouts, cauliflower, corn, peppers, grape juice, peaches, plums, prunes, fish, game, meat, poultry.

DISCARD

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Food Preservation BY **FREEZING***

By E. H. WIEGAND, THOMAS ONSDORFF, A. W. OLIVER,
and LUCY A. CASE

Freezing of foods has many advantages compared with other methods of preservation. A greater quantity of essential vitamins can be preserved; less labor and time are required for preparation; and the finished product more closely resembles fresh food in palatability and appearance.

Very rapid freezing retains quality. Arrange packages so the centers can freeze fast. Never overload freezer; temperature must not rise above recommended freezing temperature. Carefully follow manufacturer's directions.

PREPARATION OF MEAT AND POULTRY FOR FREEZING

FRESH MEAT

1. **Selection.** Use animals that have been recently fattened and are gaining in weight at time of slaughter.

2. **Slaughtering.** Slaughter in cool weather or late in afternoon. Keep carcass clean. Cool rapidly, at 32° to 34° F., if possible.

3. **Aging.** Hang beef, lamb, and mutton in a chill room at 32° to 34° F., 7 to 10 days before freezing. Prepare and freeze pork and veal as soon as animal heat has left carcass, which will take 36 to 48 hours in a chill room.

4. **Cutting and preparing.** Cut into family-size pieces. Place waxed paper between slices of steaks and chops before wrapping. The waxed paper aids in separating them when using. Grind some of less tender cuts into hamburger and sausage; do not season until time to cook. Boning saves locker space.

5. **Wrapping and labeling.** Wrap each piece separately and tightly twice in special waxed paper. Tie firmly. Label with name of cut and date. Use only special paper made for frozen food lockers. Wrap package with waxed side of paper next to meat or on the inside. This makes it possible to write on the outside. Ordinary butcher paper and lightweight waxed papers allow the moisture to

* This circular is a compilation of information from Federal Cooperative Extension Service and the Departments of Food Industries, Foods and Nutrition, Animal Husbandry, and Poultry Husbandry.

evaporate from the meat. This dehydration causes the fat to become rancid and affects the flavor of the meat.

When wrapping, if a bone punctures the paper the meat should be rewrapped to avoid dehydration. The meat should be completely covered twice by the lockerwrap paper. Leave steaks flat. Do not roll unless a package is all to be used at one meal.

6. **Freezing.** Freeze and store at 0° F. or lower. Or quick freeze at -15° F. and store at 0° F. Check thermometer in storage room. Request that temperature of 0° F. or lower be provided. Freeze as soon as possible after cutting, but be certain to freeze within 12 hours. If no quick-freezing room is available, spread packages in an open or loose pile to aid in freezing quickly. Stack packages after freezing.

7. **Time in storage.** Use pork within 4 to 6 months; beef and lamb, 10 and 12 months after storing.

CURED MEATS

Cut into family-size pieces. Wrap in locker storage paper and tie securely. Pork may be given a mild cure and then frozen.

BIG GAME ANIMALS

Handle big game animals such as venison and elk the same as beef. Bleed and dress immediately after killing. Cool overnight. Transport in coolest part of car, away from engine and exhaust fumes. All game placed in storage and kept during the closed season must be tagged with metal game tags.

POULTRY

1. Choose fat birds for quality products. Bleed well. Dry pick; or semiscald 20 to 40 seconds in water at 125° to 130° F., and pick.
2. Singe. Draw. Wash. Remove oil sack, head, feet, and shanks. Cool thoroughly and quickly.
3. Leave whole for roasting. Disjoint for frying and fricaseeing. Cut broilers in half. Cutting saves locker space.
4. Pack not more than two chickens in one package.
5. Wrap tightly twice in locker storage paper and tie firmly; or pack in glass, tin, or waxed locker cardboard containers with tight covers. Some people, when using locker cardboard or tin containers, like to cover the pieces of poultry with cold water and freeze. It is necessary to leave headspace to allow for expansion in freezing. This should be 1½ inches for quart and two-quart jars. If this prac-

tice is followed, the water should be drained off as quickly as it thaws to avoid having the meat in water, which will remove some of the nutrients.

Giblets should be washed, wrapped in locker paper, and placed in body cavity. In case poultry is cut, wrap giblets and place at top of container.

6. Use within 8 to 10 months if stored at 0° F. temperature.

GAME BIRDS

Handle game birds as you do poultry. Bleed well. Prepare and freeze promptly after killing. At present, by federal law, possession of migratory game birds is possible for not more than 45 days following close of open season in state where taken. For further storage limitation information consult state officials.

PREPARATION OF FISH AND SEA FOOD FOR FREEZING*

FISH

1. Use only strictly fresh fish. Never allow fish to become warm after catching. Pack immediately after catching, if possible, or provide refrigeration in case of delay in packing.

2. Prepare as for cooking. Remove fins, head, tail, entrails, scales. Wash. Cut large fish into family-size pieces or fillet. Rinse or dip in salt water, about 1 cup salt to 1 gallon of water.

3. Pack preferably in airtight containers, i.e., glass, tin, waxed cartons or cups. These will prevent an exchange of odors with other packed products during storage. To such containers water or a 2½ per cent brine (3 ounces or 4 tablespoons salt for each gallon of water) may be added to cover the flesh well, leaving ample headspace for expansion. This should be ½ inch for short pints, 1 inch for tall pints, and 1½ inches for quarts. This method of brine covering is particularly adaptable to the freezing preservation of fatty or oily species of fish, since it greatly retards changes during storage.

Sheet cellophane, moisture proof parchment paper, or suitable waxed locker storage paper is used in wrapping the various pieces of fish. Small pieces of the wrapping material between slices and fillets or individual wrapping will aid the retention of the original quality and facilitate handling when thawing. It is expedient to put another wrapping over all. If a wax-coated locker paper is used,

* The information on fish and sea foods was prepared by Dr. E. W. Harvey of the Sea Foods Laboratory at Astoria. This laboratory is a branch of the Food Industries Department. More detailed information is available in *Preservation of Sea Foods*, Oregon Agricultural Experiment Station Circular 164, and *Freezing Razor Clams*, Oregon Station Circular of Information No. 301.

wrap in such a way that the wax coating will be inside the package, and seal the ends of the package well. Freeze at -15° F. and store at 0° F.; or freeze at 0° F. with packages separated for air circulation and store at 0° F.

RAZOR CLAMS

Razor clams are of the best quality if dug between September and April, although they may be taken the year round. Dead clams should not be used; and care in cleaning clams for freezing should be exercised.

1. Rinse off external sand by hosing or washing under water tap.
2. Place clams in cold tap water or cold water to which salt has been added in the proportion of 3 ounces (about 4 tablespoons) to each gallon of water. Allow to stand for about an hour so that the clams will clean themselves of most of the sand held within the body.
3. Open or shuck as follows in order of preference:
 - a. Shuck raw, saving liquor.
 - b. Steam open; subject to live steam until majority of shells open.
 - c. Immerse in boiling water for 2 to 3 minutes to open shells.
4. Wash clams well under running water, having slit the neck and digger lengthwise to remove any dirt, sand, or foreign material and stomach contents. Drain off excess water.
5. If desired the necks may be cut off, ground, and packed separately for use in chowder preparation.
6. Pack meats, whole or minced, in glass, waxed cups or cartons, cellophane lined cartons, tins, or other suitable containers. Cover with clam liquor. A salt solution (1 level tablespoon to a quart of water) may be substituted for the clam liquor. The meats should be thoroughly covered with the liquor or brine to prevent dessication or locker-burn, and off flavor development during storage. Leave head-space for expansion. (Refer to paragraph 3 under Fish.) Seal well.
7. Freeze at 0° F. Store at 0° F.

NOTE: If there is any question about "mussel poisoning" or "clam poisoning" during the late spring or summer months, consult the nearest city or county health officer. For more detailed information regarding clam freezing see Oregon Agricultural Experiment Station Circular of Information No. 301, Freezing Razor Clams.

OYSTER FREEZING

Oysters are more susceptible to various types of spoilage than are some of the other marine foods. They must be handled with

care and as rapidly as possible. It is suggested that the operator have well in mind the following steps in handling and the equipment and supplies needed before starting to shuck oysters preparatory to freezing them.

1. Use only live oysters.
2. Hose off to remove external debris from shell.
3. Shuck or open raw in usual manner, saving oyster liquor.
4. Wash thoroughly in salt brine (1 level tablespoon salt to a quart of water). Do not leave oysters in brine longer than necessary.
5. Drain off excess water or brine.
6. Package:
 - Cellophane lined box or carton
 - Waxed cups
 - Cans
 - Glass jars
7. Cover surface with oyster liquor to prevent exposure to air. For headspace refer to paragraph 3 under Fish.
8. Seal or close container.
9. Freeze as soon and as fast as possible.
10. Store at 0° F.

CRAB FREEZING

1. Use only live crabs.
2. Remove back shell by pulling from one side. The operator holds the crab mouth down by grasping the crab by its left legs and holding it on a table. Then with the right hand on the left edge of the back shell the operator pulls the back off with a quick pull up and to the right. Iced or chilled crabs will be less active than those fresh out of the water.
3. Eviscerate and wash. The body contents are easily shaken out or washed out with a small fast stream of water. The gills are removed by hand. Newly forming shell, which is jellylike and contains some pigment, is best removed. Otherwise this pigment may discolor the body meat. The crab is now broken in half ready for the precook.
4. Place crabs in a pressure cooker, a steamer, or a large kettle containing an inch of vigorously boiling water. Use of a pressure cooker is preferable. When using a pressure cooker, exhaust steam from petcock 7 to 10 minutes, then tighten the petcock and raise the pressure to 2 pounds. Cook from 12 to 15 minutes. When using a steamer or large kettle, count time from when steam flutters the lid or escapes rapidly. Steam the crabs 20 to 22 minutes.
5. After cooking, remove from the cooker, and as soon as the pickers can handle the crabs, start the picking. A small amount of

cold water may be used to cool a few to start the picking but it is better if the meat does not come in contact with water at this point.

6. The halves are grasped by the legs. The body sections (thin white cartilaginous structures) are cracked and slightly crushed by hand so as to free the body muscle attachments. The halves are then shaken, shaking the meat into a pan. The picker often strikes the rim of the pan with the body to remove some of the meat that may remain within these sections. The legs are cracked along the outer curved edges only enough to allow shell removal. The segments are removed from the legs by starting with those farthest from the body, thus pulling out the cartilaginous sheath to which the muscle of the next segment is attached. Usually the smaller segments do not contain enough meat to justify their being cracked and opened. Keep leg and body meat separate to facilitate packing.

7. Pack meat in suitable container for freezing. Glass, waxed cups, cellophane lined cups or other adaptable containers may be used. Fill, leaving headspace for expansion.

8. Cover meat with a salt brine (1 level tablespoon of salt for each quart of water) leaving headspace for expansion. (Refer to paragraph 3 under Fish.) Cover tightly, heat seal, or otherwise seal the container.

9. Freeze at -10° to -20° F., if available. If freezing is to be done at 0° F. allow ample spacing of containers for circulation of air until packages are frozen. Store at 0° F. or below.

Optional method for killing and cooking. Live crabs may be killed and cooked by dropping into a large amount of vigorously boiling salted water and boiling 20-25 minutes. The method outlined above, however, (killing and cleaning before cooking) is preferred since it produces a more desirable meat.

PREPARATION OF EGGS FOR FREEZING

1. Eggs should be frozen as quickly as possible after preparation.
2. Use only clean, fresh eggs.
3. Break each egg separately into a clean dish. Be sure eggs have firm yolks and whites, not weak or watery. Eggs must be free from odor.

4. Pack whole eggs or pack whites and yolks separately. *To pack whole eggs:* Mix whites and yolks thoroughly without beating air into them. To each pint of stirred egg, add 1 teaspoon of salt or 1 tablespoon of sugar, corn sirup, or honey, and mix thoroughly again. *To pack eggs with whites and yolks separated:* Whites need no treatment. Stir yolks thoroughly and treat the same as whole eggs.

5. *Containers* should be airtight and of suitable size. As frozen

eggs should be used immediately after thawing and should never be refrozen, freezing in half pint and other small containers is recommended. Allow $\frac{1}{2}$ -inch vacant space at top of half pint container and 1-inch vacant space for pint container. Indicate on label whether contents contain salt or sugar.

Use frozen eggs in practically the same way as fresh eggs. In using frozen eggs, the added salt or sweetening must be deducted from the recipe. Equivalentents: 5 medium whole eggs equal 1 cup; 8 medium egg whites equal 1 cup; 14 medium egg yolks equal 1 cup.

FREEZING DAIRY PRODUCTS

BUTTER

Butter may be packed in any of the following ways:

- (a) Wrapped in parchment paper and again in locker paper;
- (b) In waxed butter cartons lined with parchment paper and wrapped again in locker paper;
- (c) In airtight glass containers;
- (d) In paraffined parchment lined spruce butter boxes.

Two pound lots are suggested for (a) and (b); not more than 10 pounds for (d). Pack containers tight with as small air space as possible. Tie packages securely with string.

Butter for freezing should be made from fresh pasteurized cream. It should be well salted and thoroughly worked.*

COTTAGE CHEESE

Cottage cheese if of good quality, preferably made from pasteurized skimmed milk, the curd washed and salted but not creamed, may be kept in glass jars or paraffined containers, tightly covered, for 2 or 3 months. A temperature of from 0° to 10° F. is satisfactory. Thaw cottage cheese slowly.

MILK AND CREAM

Heat the milk or cream quickly to 180° F. Cool rapidly by placing the vessel in cold running water. Pour into locker cartons, waxed, or with vapor proof liners, allowing $\frac{1}{6}$ of height for expansion. Freeze at 20° F.; store at 0° F. The product will keep satisfactorily for several months.

PREPARATION OF FRUITS AND VEGETABLES FOR FREEZING

GENERAL RULES FOR BOTH FRUITS AND VEGETABLES

1. Variety is important. See tables, pages 12-15.

* Note: Directions for making butter and cottage cheese of quality suitable for freezing can be obtained from county extension offices.

2. Freeze only fresh products of good quality and proper maturity. Fruits and vegetables lose certain vitamins rapidly after harvesting.
3. Gather products in cool of the morning, handle quickly, and rush to freezer locker as soon as possible. Four hours or less from garden to locker is a good rule.
4. Keep in cool place while under preparation.
5. Prepare as for cooking. Wash, and remove foreign material, decayed, badly bruised, or immature products.
6. Pack in glass jars with tight covers, lacquered tin cans with friction top or slip covers, or locker storage waxed paperboard containers with tight covers. Best flavor and longer keeping quality are obtained in airtight containers. Avoid containers larger than 1 or 2 quarts in size. Square or rectangular containers use locker space most efficiently.
7. In case of dry pack, which is not solid, fill containers to top and close tightly before freezing.
8. In case of liquid pack, allow $\frac{1}{2}$ inch for short pints, 1 inch vacant space at top of tall pint containers, and $1\frac{1}{2}$ inches vacant space at top of quart containers. Close tin cans and paper containers immediately after packing. In case of glass jars, put lids in place before freezing and fasten down after freezing.
9. Rubber rings on glass jars improve pack by keeping out air.
10. Label containers with name of product, date, and method.
11. When transporting products to and from locker in excessive heat, insulate with paper and cardboard cartons.
12. At locker plant, quick freeze if possible or separate packages in locker to facilitate freezing.
13. Fruits and vegetables retain best quality when stored at 0° F.
14. Use frozen fruits and vegetables preferably within 1 year.

ADDITIONAL DIRECTIONS FOR FREEZING FRUITS

(See also General Rules, pages 8-9)

Sugar or sirup preserves color and flavor and improves the texture of the frozen fruit. Fruit may be packed in two ways, either in dry sugar or in sirup.

Dry sugar pack

Use dry sugar pack for purposes that require a less juicy product.

RATIONED ALLOTMENT, 1945. One-half cup of sugar is allowed to 1 quart of packed fruit, and $\frac{1}{4}$ cup of sugar to 1 pint of packed fruit. See tables, pages 12-13.

SUGAR USAGE. Use either the proportion of 4 pounds of fruit to 1 pound of sugar (four to one) or the proportion of 3 pounds of fruit to 1 pound of sugar (three to one).

Distribute sugar evenly over fruit. Combine fruit with sugar either in a bowl or directly in the container for freezing. Fill containers to top if there is air space between fruit pieces; otherwise leave vacant space as for sirup pack ($\frac{1}{2}$ inch for short pints, 1 inch for tall pints, and $1\frac{1}{2}$ inches for quarts). Seal immediately.

The proportion of 4 to 1 by weight is commonly used in peacetime with most fruits. A simple method of measuring sugar for berries is as follows: Remember that one standard hallock or retail box of berries weighs 12 ounces net. When packing berries in the proportion of 4 to 1 by weight, use slightly more than $\frac{1}{3}$ cup of sugar to one hallock of berries. When packing berries in the proportion of 3 to 1, use $\frac{1}{2}$ cup of sugar to one hallock of berries.

Sirup pack

Sirup pack has the advantages of preserving color, is easy to pack, and the berries or fruit pieces retain near-fresh size and shape.

RATIONED ALLOTMENT, 1945. This allows $\frac{1}{2}$ cup of sugar per quart of packed fruit and $\frac{1}{4}$ cup of sugar per pint of packed fruit. One quart of fruit requires approximately 1 cup of sirup and 1 pint of fruit requires approximately $\frac{1}{2}$ cup of sirup. To make wartime sirup, allow 1 cup of water and $\frac{1}{2}$ cup of sugar for each quart of fruit to be packed. Any remaining sirup can be held in the refrigerator or used in canning. One hallock or 12-ounce box of berries will usually fill a pint jar.

Use strength of sirup to your taste. Forty per cent and fifty per cent sirups are commonly used. Forty per cent sirup means that the sirup is forty per cent sugar by weight and sixty per cent water. This is equivalent to 4 pounds of sugar and 6 pounds of water or 4 cups of sugar and 6 cups of water. Fifty per cent sirup is equivalent to an equal number of cups of sugar and water.

To make sirup, add sugar to water, stir until dissolved, and bring to a boil. Cool thoroughly. Place prepared fruit in container. Add cold sirup to within $\frac{1}{2}$ to $1\frac{1}{2}$ inches from top. Be sure to cover fruit with sirup. Fruits that discolor quickly, such as peaches, apricots, and apples, should be sliced directly into sirup in the packing containers. (See other methods, table, page 13.) Discoloration of top layer of fruit may be prevented by holding fruit under the surface of the sirup. To do this, place a wad of waxed paper under the lid and freeze. Close tin cans and paper containers immediately after packing. In case of glass jars, partly seal before freezing and fasten lids down tightly after freezing.

ADDITIONAL DIRECTIONS FOR FREEZING VEGETABLES

(See General Rules, pages 8-9)

1. Blanch all vegetables thoroughly. This is necessary to insure retention of flavor and vitamin content. Blanching may be done either by steam or by boiling water, preferably by steam except as noted in table.

(a) *Blanching by steaming.* Use very hot fire. Place 1 to 2 inches of water in large kettle and bring to a vigorous boil. Place prepared vegetables in thin layer in wire basket or colander and lower into steam. Two wire baskets may well be used, one over the other for good steam distribution. Cover kettle closely and rapidly bring water to a boil again. Begin to count time when steam flutters the lid or escapes rapidly. Use blanching periods given in table, pages 14-15.

(b) *Blanching by means of boiling water.* Have hot fire. Have vigorously boiling 3 gallons of water in preserving kettle or hot water bath canner. Place prepared vegetable in wire basket or colander, small amounts at a time. Immerse basket in boiling water. Agitate vegetables occasionally during blanching, but keep below surface of water at all times. Start counting blanching time when water boils again. The quantity of vegetables should be so small that the water resumes boiling in $\frac{1}{2}$ minute. Blanch about 1 quart of vegetables at a time in 3 gallons of water. Bring water to a boil between lots. Blanch vegetables according to table, pages 14-15.

At the end of scheduled time, remove basket of vegetables immediately from boiling water and immerse in a large panful of cold running water until thoroughly chilled. If you have no running water, change water several times.

2. Drain well.

3. Pack by either dry pack or brine pack method. See table, pages 14-15, for individual vegetables. Dry pack is preferred.

a. *Dry pack.* Place cooled, drained vegetables in container, fill to top, and seal.

b. *Brine pack (2 per cent salt solution).* Prepare brine by dissolving salt in pure cold water. Use 1 level teaspoon salt for each cup of water. Place cooled, drained vegetable in container and fill with brine to within $\frac{1}{2}$ to $1\frac{1}{2}$ inches from top. Allow about $\frac{1}{2}$ cup of brine for each pint container

FREEZING FRUITS

These products should be frozen and stored at temperatures of 0° F. or lower. If quick frozen, use -15° F. or lower and store at 0° F.

| Name and varieties | Preparation | Sirup* | Sugar* | Containers |
|--|--|--|--|---|
| Apples Firm winter varieties | Refer to pages 8-9 Peel, core, and trim; cut in eights or twelfths Drop into light brine to prevent browning. (1 tablespoon salt per quart of water) Drain and pack | | *Dry sugar pack $\frac{1}{2}$ cup sugar per quart, well mixed | Glass jars or plain or enameled tin cans Locker cartons, waxed, or with vapor proof liners Waxed paper cups |
| Apricots Tilton, Royal Blenheim, Wenatchee, Moorpark | Refer to pages 8-9 Wash thoroughly and pit Dip into boiling water $\frac{1}{2}$ minute to stop discoloration Chill and pack | Refer to pages 9-10 Pack in 40 per cent sugar sirup | | Glass jars or plain or enameled tin cans Airtight containers preferable Locker cartons, waxed, or with vapor proof liners Waxed paper cups |
| Blackberries Pacific Northwest Native Wild, Cascade, Pacific, Brainard, Himalaya, Evergreen | Refer to pages 8-9 Sort carefully, wash, drain, and pack | Refer to pages 9-10 Pack in 40 per cent sugar sirup | *Dry sugar pack $\frac{1}{2}$ cup sugar per quart, well mixed | Glass jars or enameled tin cans Locker cartons, waxed, or with vapor proof liners Waxed paper cups |
| Blueberries Rancocas, June Concord, Katherine, Jersey, Rubel, Adams, Harding, Cabot, Grover Sam, Alaska Wild | Refer to pages 8-9 Screen, sort, and wash well to remove all foreign matter | Refer to pages 9-10 40 per cent sugar sirup preferred | | Glass jars or enameled tin cans Locker cartons, waxed, or with vapor proof liners Waxed paper cups |
| Boysenberries | Refer to pages 8-9 Sort and wash carefully. Drain. | Refer to pages 9-10 Pack in 40 per cent sugar sirup | *Dry sugar pack, $\frac{1}{2}$ cup sugar per quart, well mixed | Glass jars or enameled tin cans Locker cartons, waxed, or with vapor proof liners Waxed paper cups |
| Cantaloupe Any good firm variety | Refer to pages 8-9 Dice or slice from portion of fruit that is firm, ripe | Refer to pages 9-10 Pack in light sugar sirup | | Glass jars or plain or enameled tin cans Locker cartons, waxed, or with vapor proof liners Waxed paper cups |
| Cherries—Sour Montmorency, Early Richmond, Late Duke, English Morello | Refer to pages 8-9 Soaking fruit in cold water for 2 hours aids pitting Pit and pack into containers | Refer to pages 9-10 Pack in 40 per cent sugar sirup | *Dry sugar pack $\frac{1}{2}$ cup sugar per quart, very well mixed | Glass jars or enameled tin cans Locker cartons, waxed, or with vapor proof liners Waxed paper cups |
| Cherries—Sweet Lambert, Bing, Deacon, Royal Ann, Republican | Refer to pages 8-9 Pitting not necessary Stem, wash, and pack in containers | Refer to pages 9-10 Pack in 40 per cent sugar sirup | | Glass or enameled tin cans preferable Airtight containers necessary |

* Amounts of sugar and strength of sirups are subject to federal rationing regulations. Recommended ratio of fruit to unrationed sugar is 3 or 4 parts of fruit to 1 part sugar by weight. (See pages 9-10.)

FREEZING FRUITS—Continued

These products should be frozen and stored at temperatures of 0° F. or lower. If quick frozen, use -15° F. or lower and store at 0° F.

| Name and varieties | Preparation | Sirup* | Sugar* | Containers |
|---|--|--|---|--|
| Loganberries | Refer to pages 8-9 Use firm, ripe fruit Sort and wash well | Refer to pages 9-10 Pack in 40 per cent sugar sirup | *Dry sugar pack $\frac{1}{2}$ cup sugar per quart, well mixed | Glass jars or enameled tin cans Locker cartons, waxed or with vapor proof liners Waxed paper cups |
| Peaches Elberta, J. H. Hale, Candoka, Gold Medal, Crawford, Sal- wey, Rochester, Slappy, Carman | Refer to pages 8-9 Blanch and peel. Choice of methods: (a) Slice. Dip in boiling water $\frac{1}{2}$ minute to pre- vent discoloration, cool promptly. (b) Cut in half, dip in boiling water 1 to 2 minutes. Cool promptly. (c) Slice directly into sugar sirup. | Refer to pages 9-10 Use 40 per cent sugar sirup | Thoroughly mix 4 cups sliced blanched cooled peaches with $\frac{1}{2}$ cup sugar. | Glass jars or plain or enameled tin cans Airtight containers only Use locker cartons only if glass or tin containers not available |
| Prunes Italian, Agen | Refer to pages 8-9 Sort, wash and pit fruit Pack quickly before browning occurs | Refer to pages 9-10 Pack in 40 per cent sugar sirup | *Dry sugar pack $\frac{1}{2}$ cup sugar per quart, well mixed | Glass jars or enameled tin cans Locker cartons, waxed, or with vapor proof liners Waxed paper cups |
| Rhubarb Deep red color, standard varieties | Refer to pages 8-9 Select as for fresh use, tender with absence of fibers Wash, trim, cut into $\frac{1}{2}$ inch pieces | Refer to pages 9-10 Pack in 40 per cent sugar sirup | Dry sugar not recommended | Glass or plain or enameled tin cans Locker cartons, waxed, or with vapor proof liners Waxed paper cups |
| Raspberries Cuthbert, Tahoma, Washing- ton, Lloyd George, Viking, Cayuga, Latham, Chief, New- burgh, Antwerp, Marlboro | Refer to pages 8-9 Use only very fresh berries Sort carefully, wash, and drain Pack loosely in suitable con- tainers | Refer to pages 9-10 40 per cent sugar sirup preferable | *Dry sugar pack $\frac{1}{2}$ cup sugar per quart, well mixed | Glass jars or enameled tin cans Locker cartons, waxed, or with vapor proof liners Waxed paper cups |
| Strawberries Corvallis, Marshall, Clark Seedling, Redheart, Narcissa | Refer to pages 8-9 Select late season mature berries Sort, cap, wash, and drain care- fully | Refer to pages 9-10 Pack in 40 per cent sugar sirup | *Dry sugar pack $\frac{1}{2}$ cup sugar per quart, well mixed | Glass jars or enameled tin cans Locker cartons, waxed, or with vapor proof liners Waxed paper cups |
| Fruit Juices Grape and berries | Refer to pages 8-9 Use only mature fruit Sort and wash Place in preserving kettle with small amount of water Simmer 10 minutes Do not boil Drain in jelly bag | | *Add sugar in pro- portion of 4 to 5 cups of juice to 1 cup of sugar. (May dilute $\frac{1}{2}$ to $\frac{1}{2}$ for beverage) | Glass jars or enameled tin cans Bottles and jugs not over $\frac{3}{4}$ full |

NOTE: When storing food in refrigerated lockers, check the room temperature by observing the thermometer provided by the plant manager. To retain quality products request temperature of 0° F. or lower in storage room.

* Amounts of sugar and strength of sirups are subject to federal rationing regulations. Recommended ratio of fruit to unrationed sugar is 3 or 4 parts fruit to 1 part sugar by weight. (See pages 9-10.)

FREEZING VEGETABLES

These products should be frozen and stored at temperatures of 0° F. or lower. If quick frozen, use -15° F. or lower and store at 0° F.

| Name and varieties | Harvesting, handling† | Preparation | Blanching time and cooling | Type of pack | Container |
|---|--|--|--|--|---|
| *Asparagus Martha Washington, Mary Washington, Palmetto, Paradise | Harvest in early morning Keep fresh by placing stalks in water or in wet moss, in upright position | Sort, wash carefully and trim Cut stalks in 1-inch pieces or leave whole | Steam, 4 to 5 minutes Boiling water, 2 to 3 minutes Cool quickly and drain | Dry pack preferred or 2 per cent brine may be used | Glass or plain or enameled tin cans Locker cartons, waxed, or with vapor proof liners Wrap small bundles twice tightly in locker paper Waxed paper cups tightly packed |
| Beans—Green or Wax Kentucky Wonder, Tendergreen, Full Measure, Stringless, Valetine, Blue Lake | Select full flavored beans, not too young Handle quickly to avoid wilting | Sort, snip, wash carefully and cut Remove all bruised or discolored beans | Steam, 10 to 12 minutes Boiling water, 5 to 8 minutes Cool quickly and drain | Dry pack or 2 per cent brine | Glass or plain or enameled tin cans Locker cartons, waxed, or with vapor proof liners Waxed paper cups |
| Beans—Lima Baby Fordhook, Fordhook, Carpenteria, Holmes' Green Prolific, Seiberts' Early | Beans in pod will keep longer than shelled After shelling handle quickly | Sort overmature beans that have turned white Pack white and green beans separately | Boiling water, 3 to 4 minutes Cool quickly and drain | Dry pack or 2 per cent brine | Glass or plain or enameled tin cans Locker cartons, waxed, or with vapor proof liners Waxed paper cups |
| Broccoli—Italian Brussels Sprouts | Harvest only the bright green succulent stalks Pack loosely to prevent breaking heads | Remove woody stem ends, leaving tender portion Separate stalks to facilitate scalding and packing | Steam, 8 to 10 minutes Boiling water, 4 to 5 minutes Cool quickly and drain | Dry pack or 2 per cent brine | Glass, or plain or enameled tin cans Locker cartons, waxed, or with vapor proof liners Waxed paper cups |
| Cauliflower Any variety | Harvest as for fresh market Discolored heads should be discarded Handle rapidly to prevent discoloration | Sort, trim, split stalks to $\frac{1}{2}$ inch thickness Split stems to keep flowerets not larger than 1 inch Soak in light brine to assist cleaning | Steam 8 to 10 minutes Boiling water, 4 to 5 minutes Cool quickly and drain | Dry pack or 2 per cent brine | Glass or plain or enameled tin cans Locker cartons, waxed, or with vapor proof liners Waxed paper cups |
| Corn—Cut Golden Cross Bantam, Golden Bantam, Top Cross, other suitable varieties | Select corn when kernels are full, rounded, highly colored with rich, milky, sweet juice Harvest early in morning | Husk, silk and wash | Boil ears 8 to 10 minutes Cool quickly, drain and cut | Dry pack or 2 per cent brine | Glass or plain or enameled tin cans Locker cartons, waxed, or with vapor proof liners Waxed paper cups |

* Asparagus eating quality is improved more by quick freezing than that of any other vegetable.

† See pages 8-9 and 10-11.

FREEZING VEGETABLES—Continued

These products should be frozen and stored at temperatures of 0° F. or lower. If quick frozen, use -15° F. or lower and store at 0° F.

| Name and varieties | Harvesting, handling† | Preparation | Blanching time and cooling | Type of pack | Container |
|--|---|---|---|--|--|
| Corn on Cob Bantam, Top Cross, Improved Golden Bantam, Golden Cross Bantam, Burbank Top Cross, Pure Gold, Seneca Golden, Tendergold, White: Pearlcross | Same as for cut corn | Husk, silk, trim off rough ends, and wash (Requires much more locker space than cut corn) | Boiling water, 1½ inch ears, 8 minutes; 1¾ inch ears, 10 minutes; larger ears, 12 minutes Cool quickly and drain | Dry pack only | Large plain or enameled tin cans, or wrap ears tightly twice in locker wrap paper |
| *Peas World's Record, Improved Gradus, Thomas Laxton, Asgrow 40, Onward, Rogers' 95, Stratagem, Tall Alderman (Telephone) | Pick when peas fully developed Avoid over or under maturity After shelling handle rapidly | Shell and handle before peas become warm Heating reduces vitamin content Sort out overmature, starchy, or woody peas | Boiling water, 2 to 3 minutes Cool quickly and drain | Dry pack or 2 per cent brine | Glass or plain or enameled tin cans Locker cartons, waxed, or with vapor proof liners Waxed paper cups |
| Peppers, Sweet Any variety at proper stage of maturity | Customary practice of harvesting for fresh use is satisfactory This vegetable handles easily with minimum of deterioration | Wash, slice, or halve the product before packing | Steam, 5 to 8 minutes Boiling water, 3 to 5 minutes Cool quickly and drain | Dry pack or 2 per cent brine Brine is preferred | Glass or plain or enameled tin cans Locker cartons, waxed, or with vapor proof liners Waxed paper cups |
| Spinach and Other Greens Any variety at proper stage of maturity | Harvest when green and succulent, without fibrous midrib Spinach should be cut before flowering | Very thorough washing and trimming is necessary Remove all infested or decayed leaves and discard all large or tough stems | Steam 2 to 3 minutes Boiling water, 2 minutes Cool quickly and drain | Dry pack | Glass or plain or enameled tin cans Locker cartons, waxed, or with vapor proof liners Waxed paper cups |
| Squash or Pumpkin Only firm fleshed fall varieties | Select when matured | Cut open, remove seeds Cut into 4-inch square pieces | Steam until tender and sieve Cool quickly | Solid pack | Glass or plain or enameled tin cans Locker cartons, waxed, or with vapor proof liners Waxed paper cups |
| Zucchini | Select when matured | Wash and cut to ½ inch or thinner slices | Steam, 3 to 4 minutes Boiling water, 2 minutes Cool quickly and drain | Very light brine (1 teaspoon salt to quart) | Glass or plain or enameled tin cans Locker cartons, waxed, or with vapor proof liners Waxed paper cups |

NOTE: When storing food in refrigerated lockers, check the room temperature by observing the thermometer provided by the plant manager. To retain quality products, request temperature of 0° F. or lower in storage room.

* Varieties of peas high in B₁ content: World's Record, Dwarf Alderman, Rogers' 95, Stratagem. Varieties of medium B₁ content: Asgrow 40, Improved Gradus. Smaller differences in ascorbic acid (Vitamin C) occur: Highest, Dwarf and Tall Alderman, Improved Gradus.

† See pages 8-9 and 10-11.

of vegetable. Close tin cans and paper containers tightly at once. In case of glass jars, close tightly after freezing.

HOW TO PRESERVE FOOD VALUES

1. Select fruits and vegetables that are not overmature.
2. Freeze fruits and vegetables promptly after gathering.
3. Be sure to blanch thoroughly all vegetables for the full recommended time to insure against changes in flavor and food values. Precautions should be taken to prevent overblanching, which results in losses of essential nutrients.
4. Do not refreeze fruits or vegetables.
5. When cooking, place most frozen vegetables directly into a small amount of boiling water. Do not overcook. (Follow directions in circular HE 1663—The Cookery and Uses of Frozen Foods, available at Oregon State College or county Extension offices.)

SUGGESTIONS FOR COOKING AND SERVING FROZEN FOODS

Fruits. Serve very cold while they still have a few icy crystals in them. This insures a firmer texture, a more natural color, and more appetizing quality than does completely thawed, lukewarm fruit.

Vegetables. Corn on cob and solid masses of greens are thawed before cooking. Other vegetables are cooked while still frozen in small amounts of boiling water or by steaming. Cook all vegetables shortest time that yields the texture that your family will accept. This is about one half to two thirds the time for fresh vegetables. Flavor, food value, and good texture decrease with long cooking.

Meats. Cook frozen or thawed, preferably thawed. If frozen, allow extra time in cooking for thawing. Use low cooking temperature for a long period. Slow, long cooking produces more uniform doneness, greater tenderness and juiciness, and less shrinkage loss. Use dry heat for tender cuts and moist heat for less tender cuts.

Cooperative Extension Work in Agriculture and Home Economics

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