

Freezing Fruit

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MontGuide

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Safety is the top priority

The United States Department of Agriculture (USDA) food preservation guidelines used in the MontGuide are based on extensive research to prevent potential foodborne illnesses caused by bacteria and molds which can grow in improperly home-preserved foods. The guidelines presented here will also help prevent food spoilage in your home-preserved food caused by other bacteria, molds and yeast. Reduced spoilage is important to assure effective use of time, energy and resources.

This MontGuide is best suited for intermediate and advanced food preservers. A listing of resources for beginning food preservers is found on page 3.

Advantages of Freezing Fruit

Freezing is a convenient method for preserving foods at home. Frozen foods will maintain most of their nutritional value and fresh flavor if frozen properly. Only some fruits need pretreatment to prevent darkening.

Freezing acts to preserve food by almost completely stopping growth of bacteria and other microorganisms that cause foodborne illness or spoilage, at least while the food is completely frozen. Freezing causes texture changes when the water inside the fruit expands and ruptures the cells. This results in soft fruit after defrosting.

Selecting Containers

Select freezing containers that meet the following characteristics:

- Moisture/vapor resistant (waterproof)
- Designed for freezing so there is no cracking or brittleness at low temperatures
- Straight or flared sides to easily remove food
- Square or rectangular flat-sided for efficient use of freezer space

Examples include: freezer bags, plastic freezer containers, freezing/canning jars, or freezer wrapping. If using glass jars, choose wide-mouth jars tempered to withstand temperature extremes. If narrow mouth canning jars are used, leave extra head space. Plastic bags and wrappings (moisture/vapor resistant) work well for dry packed fruits.

Do not use: paper cartons, glass jars not designed for home freezing/canning, non-waterproof plastic bags, or any container with a capacity over one-half gallon.

Selecting and Preparing Fruit

- Select fruits that are firm, yet ripe.
- Wash and drain all fruits before removing hulls, pits, cores or skins. Discard parts that are green or of poor quality.
- Wash small amounts of fruit at a time, lifting them out of the dirty water. Do not let the fruit soak.
- Berries and cherries are best frozen immediately after harvest.
- Peaches, apples, apricots and plums may need to be held for a short time to fully ripen.
- Prepare enough fruit for only a few containers at a time, especially those that darken quickly.
- If fruit must be held before freezing, store it in the refrigerator to prevent spoilage.
- Avoid using the following equipment: galvanized, iron, copper, or chipped enamelware. Fruits may react with equipment causing off-flavors or contaminants.

TABLE 1. Syrups for use in freezing fruits

Types of Syrup	Percent Syrup*	Cups of Sugar**	Cups of Water	Yield of Syrup
Very Light	10%	½	4	4½ cups
Light	20%	1	4	4¾ cups
Medium	30%	1¾	4	5 cups
Heavy	40%	2¾	4	5⅓ cups
Very Heavy	50%	4	4	6 cups

* Approximate

** In general, up to one-fourth of the sugar may be replaced by corn syrup or mild-flavored honey. A larger proportion of corn syrup may be used if a very bland, light-colored fruit is selected.

Pretreatment to Prevent Darkening

Some fruits darken quickly when exposed to air and freezing, and may lose flavor when thawed. Carefully follow directions for selected fruits.

Types of Pretreatment:

- **Ascorbic acid**

Purpose: Ascorbic acid (Vitamin C) is effective in preventing discoloration.

Types: powdered or tablets.

The powdered form is easier to use, but may be more expensive. One-half teaspoon of ascorbic acid equals 1500 mg. Tablets of ascorbic acid are more economical, but harder to dissolve. To dissolve, they need to be finely crushed. Ascorbic acid may be purchased at a drug store or where freezing supplies are sold. Add 1 tablespoon ascorbic acid or 6 vitamin C tablets to 1 gallon water. Do not rinse fruit.

- **Ascorbic Acid Mixtures**

Special commercial anti-darkening preparations are usually made of ascorbic acid or citric acid and sugar. Follow the manufacturer's directions for use.

- **Citric acid and lemon juice:** Citric acid and lemon juice may sometimes be used but are not as effective as ascorbic acid or ascorbic acid mixtures. Lemon juice may also impart a tart flavor.

Types of Packs

Fruits can be frozen using any of the sweetened and unsweetened packs described following. Table 3 (insert) lists the recommended packs for the highest quality frozen product.

Headspace is required for all fruit packs except tray pack. This is the amount of empty space between food and the top of the container that should be left and is necessary for expansion of food as it freezes. See Table 2.

If using freezer bags, leave three inches of headspace for all packs but tray pack and push out air in the bag. Keep the zippered spaces and channels completely dry and free of moisture or frozen crystals can break the seal in storage.

Sweetened Packs (syrup, sugar, artificial sweeteners)

1. Syrup pack: The type of syrup depends on the sweetness of the fruit to be frozen. A 40 percent syrup is recommended for most fruits. Lighter syrups are desirable for mild-flavored fruits to prevent masking of flavors. Heavier syrups may be needed for very sour fruits. Dissolve sugar in lukewarm water until syrup is clear. Chill syrup before using. Determine headspace (see Table 2). Use just enough syrup to cover prepared fruit after it is in the container. To keep fruit fully submerged in syrup to prevent discoloration, place crumpled wax paper on top of the fruit, seal and freeze.

2. Sugar pack: Sprinkle the amount of sugar specified over fruit and mix gently until sugar is dissolved and juice is drawn out. Soft sliced fruits such as peaches and strawberries will yield sufficient syrup if layered with sugar and allowed to stand for 15 minutes. Determine headspace (see Table 2), fill containers, seal and freeze.

3. Artificial Sweeteners/Sugar Substitutes: Sugar substitutes work well in frozen fruit. They will not provide the benefits of color protection and thickness of syrup as well as regular sugar. Use directions on the container to determine the amount of sugar substitute needed.

Unsweetened Packs

1. Dry packs (including tray pack): Dry pack works best for small whole fruits that freeze well without sugar, such as berries. Loosely pack fruit into a container, determine head space (see Table 2), seal and freeze.

TABLE 2. Headspace for dry and liquid pack fruit

Types of Pack	Container with wide opening		Container with narrow top opening	
	Pint	Quart	Pint	Quart
Liquid Pack*	½ inch	1 inch	¾ inch***	1½ inches
Dry Pack**	½ inch	½ inch	½ inch	½ inch

* Fruit packed in juice, sugar, syrup or water, crushed or pureed fruit, or fruit juice.

** Fruit or vegetable packed without added sugar or liquid.

***Head space for juice should be 1½ inches.

Tray pack uses another method to freeze fruit and allows for easy removal of frozen fruit from the container. Simply spread a single layer of prepared fruit on shallow trays and freeze. Promptly pack when frozen without headspace. Fruit left on trays will develop freezer burn if not promptly packaged. Frozen fruit pieces will remain loose and can be poured from the container as needed and resealed.

2. Liquid Packs: Unsweetened fruit can also be packed in water or unsweetened juice. Fruits in unsweetened packs generally result in a lower quality product than sweetened packs. The fruits freeze harder and take longer to thaw. However, these fruits freeze well without sugar: raspberries, blueberries, huckleberries, steamed apples, gooseberries, currants, cranberries, rhubarb and figs. Determine head space (see Table 2). Use just enough liquid to cover prepared fruit after it is in the container. To keep fruit fully submerged in liquid, place crumbled wax paper on top of fruit, seal and freeze.

Labeling and Storing

- Label each package with the following information: fruit and form (sliced, whole, etc), added ingredients, date and amount. Label with tape, marker or gummed labels – specifically made for freezing.
- Freezer should be 0°F or lower. Lower freezer to -10°F 24 hours prior to freezing foods to facilitate quick freezing. Storing frozen foods above 0°F increases the deterioration of food.
- Keep fruits frozen for no more than 12 months for safety and best quality.
- Use freezer tape to seal the lids of loose fitting containers.
- If the freezer stops, fruits can be safely refrozen – usually with reduced quality – if they still have ice crystals or if they are thawed but still cold (40°F) for no longer than two days.

Thawing and Preparing Frozen Fruits

Partially thaw fruit in refrigerator or microwave so a few ice crystals remain. Do not thaw at room temperature due to safety and quality concerns. Frozen fruit may be used the same as fresh fruit in most recipes. If using in cooking, adjust for any sugar that was added in the freezing process.

Additional Resources

This MontGuide is best suited for intermediate and advanced home food preservers. The following resources provide a wide variety of tested recipes and information, based on USDA recommendations, especially important for the beginning food preserver.

National Center for Home Food Preservation (NCHFP),

USDA sponsored Web site is the most current source for publications, video clips, tutorials for the beginning home food preserver, frequently asked questions, and seasonal tips: <http://www.uga.edu/nchfp/>

USDA *Complete Guide to Home Canning, 2006*. Available on NCHFP Web site, above, click on 'publications'

So Easy to Preserve, 5th edition only. Earlier editions not recommended by MSU Extension. <http://www.soeasytopreserve.com>

The following publications are available at local stores or online at <http://www.kitchenkrafts.com>: *Ball Blue Book Guide to Preserving*, 2009 edition only; *Ball Complete Book of Home Preserving*, 2006 edition only; *Ball Blue Book of Preserving*, 2006 edition only.



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TABLE 3. Freezing Fruit Instructions.

While fruits can be frozen using any of the sweetened and unsweetened packs described on page 2, this table lists the recommended packs for the highest quality frozen product.

APPLE SLICES	
Recommended packs: syrup, sugar, dry (including tray pack). General directions on page 2, additional directions for specific fruit below.	
Select full-flavored apples that are crisp and firm. Wash, peel and core. Slice medium apples into twelfths, large ones into sixteenths. Syrup pack is best for uncooked desserts, sugar and dry pack for pie making.	
Syrup pack	Pack in 40 percent syrup. Add ½ teaspoon (1500 mg) ascorbic acid to each quart of syrup.
Sugar pack	Dissolve ½ teaspoon (1500mg) ascorbic acid in 3 tablespoons water. Sprinkle over fruit. Mix ½ cup sugar per quart of fruit.
Dry pack (including tray pack)	Follow directions for sugar pack, omitting sugar.
APPLESAUCE	
Make applesauce. Cool, strain and sweeten to taste.	
APRICOTS	
Recommended packs: syrup, sugar, dry (including tray pack). General directions on page 2, additional directions for specific fruit below.	
Wash, halve and pit. Peel and slice if desired. If apricots are not peeled, heat in boiling water for 30 seconds to keep skins from toughening during freezing. Cool in cold water, drain.	
Syrup pack	Pack in 40 percent syrup. Adding ¾ teaspoon (2250 mg) crystalline ascorbic acid per quart of syrup.
Sugar pack	Sprinkle with ascorbic acid solution – ¼ teaspoon (750 mg) ascorbic acid in 3 tablespoons water per quart of fruit. Mix ½ cup sugar per cup of fruit.
Dry pack (including tray pack)	Follow directions on page 2.
AVOCADOS	
Peel soft, ripe avocados. Cut in half, remove pit, and puree pulp. Add ¼ teaspoon (750 mg) crystalline ascorbic acid to each quart of puree, or 1 tablespoon lemon juice for 2 avocados. Package in recipe-size amounts.	
BERRIES (blackberries, boysenberries, dewberries, gooseberries, huckleberries, loganberries and raspberries)	
Recommended packs: syrup, sugar, dry (including tray pack), and unsweetened liquid. See general directions on page 2, additional directions for specific fruit below.	
Select firm, plump, fully ripe berries with glossy skins. Sort, wash and drain. Use one of the following packs.	
Syrup pack	Use whole berries. Pack in 40 or 50 percent syrup, depending on sweetness of berries.
Sugar pack	Sprinkle ¾ cup sugar over one quart whole berries. Mix well. Pack. Leave head space. Seal and freeze.
Dry pack	Loosely pack berries into containers and freeze.
Liquid pack	See directions on page 2.
CHERRIES (sweet and sour)	
Recommended packs: syrup, sugar, dry (including tray pack). General directions on page 2, additional directions for specific fruit below.	
Select well-colored, tree-ripened cherries. Stem, sort and wash thoroughly. Drain and pit.	
Syrup pack	For sweet cherries, pack in 40 percent syrup. Add ½ teaspoon (1500 mg) ascorbic acid per quart. For sour cherries, pack in 50 percent syrup without ascorbic acid.
Sugar pack	For sour cherries, pack using ¾ cup sugar per quart of fruit.
Dry pack (including tray pack)	See directions on page 2.
GRAPES	
Recommended packs: syrup, sugar, dry (including tray pack). General directions on page 2, additional directions for specific fruit below.	
Select firm, ripe grapes with tender skins and full flavor and color. Wash and remove stem. Leave seedless grapes whole. Cut and remove seeds from other grapes. Grapes are best frozen with syrup, but grapes to be used for jelly or juice can be frozen unsweetened.	
Syrup pack	Cover grapes with 40 percent syrup. Freeze.
Dry pack (including tray pack)	See directions on page 2.
Juice	Crush grapes. Make juice as for jelly or drinking. Let stand overnight in a cool place (so tartrate crystals will settle). Pour clear juice into containers.

JUICE (citrus)

Divide into sections, removing seeds and membrane. Squeeze juice from fruit using juicer that does not press oil from rind. Sweeten with 2 table-
spoons sugar per quart of juice or pack unsweetened. Add $\frac{3}{4}$ teaspoon ascorbic acid per gallon of juice. Leave $1\frac{1}{2}$ inch headspace.

JUICE (non-citrus)

Select fully ripe fruit. Crush and heat slightly until juice flows from pulp. Strain through cloth bag. Add sugar to taste - approximately $\frac{1}{4}$ cup per quart. Add
ascorbic acid to juices of light-colored fruits. Pour into containers and/or ice cube trays and freeze. Remove cubes from trays and store in freezer bags.

MELON (cantaloupe, honeydew, watermelon)

Recommended packs: syrup, sugar, dry (including tray pack). See general directions on page 2, additional directions for specific fruit below.

Select firm-fleshed, well-colored, ripe melons. Remove seed and rind. Cut melons into slices, cubes or balls. Can use unsweetened or tray pack
method.

Syrup pack	Pack into containers and cover with 30 percent syrup.
Dry pack (including tray pack)	See directions on page 2.

PEACHES OR NECTARINES

Recommended packs: syrup, sugar, dry (including tray pack), and unsweetened liquid. See general directions on page 2, additional directions for specific fruit below.

Select firm ripe peaches with no green color. Peaches in halves and slices have better quality when packed in syrup or with sugar. For a better prod-
uct, peel without boiling-water dip.

Syrup pack	Pack in 40 percent syrup.
Sugar pack	For each quart of prepared peaches, add $\frac{3}{4}$ cup sugar and mix well. To retard darkening, sprinkle $\frac{1}{4}$ teaspoon (750 mg) ascorbic acid dissolved in 3 tablespoons cold water per quart of peaches before adding sugar.
Unsweetened liquid pack	Pack peaches into containers. Cover unsweetened peaches with water containing ascorbic acid (1 teaspoon to each quart of water).
Crushed or pureed	Loosen skins by dipping fruit in boiling water for $\frac{1}{2}$ to 1 minute. Cool in cold water. Remove skins and pit. Crush or puree fruit. With each quart of crushed fruit, mix 1 cup sugar and $\frac{1}{8}$ teaspoon (375 mg) ascorbic acid.
Dry pack (including tray pack)	See directions on page 2.

PEARS

Recommended packs: syrup, sugar, dry (including tray pack). See general directions on page 2, additional directions for specific fruit below.

Select pears that are full-flavored, crisp, firm and not mealy. Wash, peel and core. Cut medium pears into twelfths, large pears into sixteenths.

Syrup pack	Boil 40 percent syrup, add pear and boil 1 to $1\frac{1}{2}$ minutes. Drain and cool. Cover packed pears with cold syrup to which ascorbic acid ($\frac{3}{4}$ teaspoon, or 2250 mg, per quart of syrup) is added.
Dry pack (including tray pack)	See directions on page 2.

PLUMS

Recommended packs: syrup, sugar, dry (including tray pack). See general directions on page 2, additional directions for specific fruit below.

Choose firm, ripe fruit soft enough to yield to slight pressure. Sort and wash. Leave whole, or cut into halves or quarters and pit. Can use unsweet-
ened or tray pack method.

Syrup pack	Cover packed plums with 40 to 50 percent syrup depending on tartness of fruit. Add $\frac{1}{2}$ teaspoon (1500 mg) ascorbic acid per quart of syrup, to improve the quality.
Dry pack (including tray pack)	See directions on page 2.

RHUBARB

Recommended packs: syrup, sugar, dry (including tray pack), and unsweetened liquid. See general directions on page 2, additional directions for specific fruit below.

Choose firm, tender, well-colored stalks with good flavor and few fibers. Wash and trim. Cut into 1 or 2 inch pieces. Preheat or pack raw. Pre-heating
in boiling water for 1 minute and cooling promptly helps retain color and flavor.

Syrup pack	Pack rhubarb tightly into containers. Cover with 40 percent syrup.
Dry pack	Pack tightly, freeze.
Unsweetened liquid	See diections on page 2.

STRAWBERRIES

Recommended packs: syrup, sugar, dry (including tray pack). See general directions on page 2, additional directions for specific fruit below.

Choose firm, ripe, deep-red berries. Wash and remove caps.

Syrup pack	Cover packed whole berries with 50 percent syrup. Leave head space. Seal and freeze.
Sugar pack	Leave berries whole, sliced or crushed. Add $\frac{3}{4}$ cup of sugar per quart of berries. Mix well until sugar is dissolved.
Dry pack	Loosely pack berries.