



Freezing Fruits

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Frozen foods can add variety to your meals year-round. As with any method of food preservation, following specific guidelines will assure you of high quality, safe food. For additional information, refer to MU publications GH 1501, GH 1502, GH 1503, GH 1504, GH 1505 and GH 1506 in the Quality for Keeps freezer series.

Tips for successful freezing

- Select varieties suitable for freezing. Check a seed catalog or ask the grower.
- Work under sanitary conditions.
- Choose fresh, firm, ripe fruits of good quality. Freezing does not improve quality. Sort for size, ripeness and color.
- If fruit can't be frozen immediately, refrigerate it.
- Work with small quantities: enough for only a few containers at a time, to prevent loss of quality and nutrients.
- Wash and drain all fruits before removing hulls (caps), cores, pits, seeds, skins or shells. Wash small lots at a time through several changes of cold water. Lift produce out of the water so that the dirt washed off will not get back on the food. Do not let fruits soak.

Quality for Keeps



- When preparing fruit for freezing do not use galvanized, copper or iron equipment. Acid in the fruit could react with the metals forming harmful compounds or off-flavors.
- Remember that yields will vary depending on the condition of the produce as well as the preparation and packing methods used. See Table 1 for the approximate yield of frozen fruit from fresh.
- Prepare each fruit as directed below and refer to MU publication GH1501, *Freezing Basics*, for general freezing information.

How to prevent darkening

Fruits like peaches, apples, pears and apricots darken quickly when exposed to air and during freezing. They also may lose flavor when thawed. There are several ways to pre-

vent darkening and flavor loss in frozen fruit.

Crystalline (powdered) ascorbic acid, or vitamin C, is the most effective agent in preventing darkening of fruit. Not only does it preserve natural color and flavor of fruits, but it adds nutritive value as well. Ascorbic acid in crystalline or powdered form is available at some drugstores or where freezing supplies are sold. Check in advance as it may have to be special ordered.

Ascorbic acid tablets are more readily available and less expensive, but are more difficult to dissolve. Also, fillers in the tablets may make the syrup cloudy. Three thousand milligrams of ascorbic acid in tablet form equal one teaspoon of crystalline ascorbic acid. To use, dissolve ascorbic acid in a little cold water. If using tablets, crush them so they will dissolve more easily. Use the amount specified for each fruit.

How to use ascorbic acid with different freezing methods

- Syrup pack — Add dissolved ascorbic acid to cold syrup shortly before using. Stir it in gently so that you will not stir in air. Keep syrup refrigerated until used.
- Sugar pack — Sprinkle dissolved

Table 1. Approximate yield of frozen fruits from fresh

Fruit	Fresh, as purchased or picked	Frozen pints
Apples	1 bu. (48 lbs.) 1¼ to 1½ lbs.	32 to 40 1
Apricots	1 bu. (48 lbs.) ¾ to 1 lb.	60 to 72 1
Berries ¹	1 crate (24 qt.) 1½ to 1½ pt.	32 to 36 1
Cantaloupes	1 dozen (28 lbs.) 1 to 1¼ lbs.	22 1
Cherries, sweet or sour	1 bu. (56 lbs.) 1¼ to 1½ lbs.	36 to 44 1
Cranberries	1 box (25 lbs.) ½ lb.	50 1
Grapes	1 bu. (48 lbs.) 2 lbs.	20 to 24 1
Peaches	1 bu. (48 lbs.) 1 to 1½ lbs.	32 to 48 1
Pears	1 bu. (50 lbs.) 1 to 1¼ lbs.	40 to 50 1
Pineapple	5 lbs.	4
Plums	1 bu. (50 lbs. ²) 1 to 1½ lbs.	34 to 50 1
Raspberries	1 crate (24 pt.) 1 pt.	24 1
Rhubarb	15 lbs. ¾ to 1 lb.	15 to 22 1
Strawberries	1 crate (24 qt.) ¾ qt.	38 1

¹ Includes blackberries, blueberries, boysenberries, dewberries, elderberries, gooseberries, huckleberries, loganberries and youngberries.

² As defined by the Missouri Department of Agriculture.

ascorbic acid over fruit just before adding sugar.

- Unsweetened pack — Sprinkle dissolved ascorbic acid over fruit, and mix thoroughly just before packing. If fruit is packed in water or juice, dissolve the ascorbic acid in the water or juice.
- Fruit juices — Add ascorbic acid directly to the juice. Stir only enough to dissolve ascorbic acid.

- Crushed fruits and fruit purees — Add dissolved ascorbic acid to fruit preparation and mix. Commercial ascorbic acid mixtures are special anti-darkening preparations, usually made of ascorbic acid mixed with sugar or with sugar and citric acid. The important active ingredient in these mixtures usually is ascorbic acid. Follow manufacturer's directions for use. Do not confuse these mixtures with the

ascorbic acid specified in directions for individual fruits found in this publication.

Citric acid or lemon juice are sometimes used in place of ascorbic acid. Neither, however, is as effective as ascorbic acid.

When used in quantities high enough to prevent darkening, they often mask natural fruit flavors and make a tart-tasting product. To use,

dissolve ¼ teaspoon crystalline citric acid or 3 tablespoons of lemon juice in a quart of cold water. Place prepared fruit in the mixture for 1 to 2 minutes. Drain and pack the fruit.

Steaming works best for fruits that will be cooked before use. Steam the fruit in single layers over boiling water just until hot.

Sugar syrups work during preparation by excluding air from the fruit. Slice fruit directly into the syrup, and then use the same syrup for packing the fruit. To make this as effective as other methods, add ascorbic acid to the syrup.

Types of packs

There are several ways to pack fruits for freezing: syrup pack, sugar pack, unsweetened pack, tray pack and artificial sweetener pack. Whichever method you choose, be sure to leave the appropriate headspace (see Table 2).

How you plan to use the fruit determines the type of pack:

Intended use

- Uncooked desserts
- Cooking purposes (pies, crisps)
- Sweet spreads

Type of pack

- Syrup
- Dry sugar/dry unsweetened
- Unsweetened (so that correct amount of sweetening can be added at time of preparation)

Syrup pack

The sweetness of the fruit to be frozen depends upon the proportion of sugar to water used. A 40 percent syrup is recommended for most fruits. Lighter syrups are desirable for mild-flavored fruits to prevent masking the flavors. Heavier syrups may be needed for very sour fruits. See Table 3 for proportions of sugar and water to use for the different syrups. To make the syrup, dissolve sugar in lukewarm water, mix until the solution is clear. Chill syrup before using.

Use just enough cold syrup to cover the prepared fruit after it has been placed in the container (about ½ to ⅔ cup of syrup per pint). Leave appropri-

ate headspace (Table 2). To keep fruit under the syrup, place a small piece of crumpled, water-resistant paper, such as waxed paper, on top of the fruit and gently press fruit down into the syrup. Seal container tightly, label and freeze.

Sugar pack

Sprinkle sugar over fruit and mix gently until the juice is drawn out and the sugar dissolved. Soft-sliced fruits such as peaches, strawberries, grapes, plums and cherries will yield sufficient syrup for covering if the fruit is layered with sugar and allowed to stand 15 minutes. Pack into containers, leaving appropriate headspace (Table 2). To keep fruit under the syrup, place a small piece of crumpled, water-resistant paper, such as waxed paper, on top of the fruit and gently press fruit down into the syrup. Seal container tightly, label and freeze.

Unsweetened pack

Most fruits have a better texture, color and flavor if packed in sugar or syrup. However, sugar is not necessary

Table 2. Headspace for wide mouth rigid containers

Type of pack	Pint	Quart
• Liquid pack (Fruit packed in juice, sugar, syrup or water; crushed or pureed fruit and freezer jams)	½ inch	1 inch
• Dry pack (Fruits packed without added sugar or liquid) ¹	½ inch	½ inch
• Fruit juice	1½ inches	1½ inches

¹ Tray-packed fruits do not need any headspace.

Caution: Do not use narrow-mouth jars for freezing foods packed in liquid, as expansion of the liquid could cause the jars to break at the neck.

Table 3. Syrups for use in freezing fruits

Type of syrup	Sugar (cups) ¹	Water (cups)	Yield of syrup (cups)
20 percent (very light)	1¼	4	4⅔
30 percent (light)	2	4	5
40 percent (medium)	3	4	5½
50 percent (heavy)	4¾	4	6½
60 percent (very heavy)	7	4	7¾

¹ In general, up to one-fourth of the sugar may be replaced by corn syrup or a mild-flavored honey. A larger proportion of corn syrup may be used if a very bland, light-colored type is selected.

to safely preserve fruit. For those wishing to cut down on sugar, fruit can be packed dry without any sugar, or covered with water or unsweetened juice containing ascorbic acid. For a juice pack, use unsweetened, light-colored, complementary juices such as apple, pineapple, orange or white grape juice. For all unsweetened packs, leave appropriate headspace (Table 2). When fruit is packed in unsweetened water or juice, keep fruit submerged by placing a small piece of crumpled, water-resistant paper, such as waxed paper, on top of the fruit and gently press fruit down into the juice or water. Seal container tightly, label and freeze.

Raspberries, blueberries, blanched apples, gooseberries, cranberries and rhubarb can be frozen without sugar and still be a good quality product.

Tray pack

The tray pack is a dry unsweetened pack that is good for small, whole fruits such as blueberries, raspberries and cranberries that give a good quality product without sugar. Spread a single layer of prepared fruit on shallow trays and freeze. Leave in the freezer just long enough to freeze firm. Longer exposure to dry freezer air will result in moisture loss and a decrease in quality. When frozen, promptly package, leav-

ing no headspace, seal tightly, label and return to the freezer. The fruit pieces remain loose and can be poured from the container and the package reclosed.

Puree pack

Puree fruit and add ascorbic acid. Sweetening is optional. Pack, leaving appropriate headspace (Table 2), seal container tightly, label and freeze.

Artificial sweetener pack

Artificial sweeteners containing saccharin give a sweet flavor but do not function like sugar to thicken syrup, protect color and give a firm texture. In addition, they may become bitter after freezer storage. Fruits preserved with artificial sweeteners will freeze harder and thaw more slowly than those preserved with sugar. A better alternative is to freeze fruit using an unsweetened pack, adding the artificial sweetener at

Tips

- **Freeze a few big, red, ripe strawberries individually with the stem on for use as a garnish or in iced drinks.**
- **Freeze lemon juice in ice-cube trays for use in iced tea or lemonade.**
- **Freeze mixed fruit for serving as fruit cocktail.**
- **Freeze fruits, juices and puree in amounts needed for meals or favorite recipes.**
- **Fruit pie filling freezes well. It may be frozen in the pie shell baked or unbaked, see MU publication GH 1505, Freezing Home-Prepared Foods.**

servicing time.

Labels on artificial sweeteners give the equivalents to a standard amount of sugar. Use directions on the container to determine the amount of sweetener needed.

Preliminary research has shown that strawberries and peaches sweetened with aspartame (marketed as Equal™) are similar in quality to sugar-sweetened frozen fruit. To sweeten strawberries and peaches, use enough aspartame to equal ½ cup of sugar for every quart of fruit. Use the sugar pack method rather than a syrup pack.

For other fruits that haven't been researched yet, try replacing half the sugar you ordinarily use with aspartame. Equivalent amounts are given on the package. Since this procedure is still being researched, prepare and taste test a small amount before freezing large quantities of fruit with aspartame.

Thawing and using

Fruit is best served while it is still partially frozen with a few ice crystals still remaining. If thawed completely, frozen fruit will become mushy because of cell wall damage from ice crystals that form during the freezing process. Thaw fruit in the refrigerator, in the container you froze it in, about 12 hours per pint. For a shorter thawing time, run cold water over container until thawed. Thaw only enough fruit for one meal. Serve the juice from frozen fruit, too, as it is flavorful and contains nutrients.

Freezing instructions for specific fruits

Apples

When you plan to use apples in uncooked desserts or fruit cocktail, the syrup-pack method is preferred. A sugar or unsweetened pack is good for

pie making. Select full-flavored apples that are crisp and firm, not mealy in texture. Wash, peel and core. Slice medium apples into twelve sections, large ones into sixteen.

- Syrup pack — use 40 percent syrup. To prevent browning, add ½ teaspoon crystalline ascorbic acid to each quart of syrup. Slice apples directly into syrup in container starting with ½ cup syrup to a pint container. Press fruit down in containers and add enough syrup to cover, leave headspace, seal and freeze.
- Sugar pack — To prevent darkening of apples, treat each quart with ½ teaspoon of ascorbic acid dissolved in 3 tablespoons of cold water, or steam blanch for 1½ to 2 minutes. Mix ½ cup sugar with 1 quart (1¼ pounds) of fruit. Pack apples into containers and press fruit down, leave headspace, seal and freeze.

Applesauce

Select full-flavored apples. Wash apples, peel if desired, core and slice. To each quart of apple slices, add ½ cup water or apple juice; cook until tender. Cool and strain if desired. Sweetening can be added if needed: ¼ to ¾ cup sugar for each quart of sauce. Or, use your regular recipe for applesauce.

Pack into containers, leave headspace, seal and freeze.

Apricots

Select firm, ripe, uniformly yellow apricots. Sort, wash, halve and pit. Peel and slice if desired. If apricots are not peeled, heat them in boiling water 30 seconds to keep skins from toughening during freezing. Cool in cold water and drain.

- Syrup pack — Use 40 percent syrup. For a better quality frozen product, add ¾ teaspoon crystalline ascorbic acid to each quart of

syrup. Pack apricots directly into containers and cover with syrup, leave headspace, seal and freeze.

- Sugar pack — Before combining apricots with sugar, treat with the following mixture to prevent darkening: ¼ teaspoon crystalline ascorbic acid and ¼ cup cold water. Dissolve crystalline ascorbic acid in cold water and sprinkle over 1 quart (¾ pound) of fruit. Mix ½ cup sugar with each quart of fruit. Stir until sugar is dissolved. Pack apricots into containers and press down until fruit is covered with juice, leave headspace, seal and freeze.

Avocados

Select avocados that yield to gentle pressure with skins free from dark blemishes. Avocados are best frozen as puree.

Avocados are not satisfactory frozen whole or sliced.

- Puree — Peel fruit, cut in half and remove pit. For a better quality product, add ½ teaspoon crystalline ascorbic acid or 3 tablespoons lemon juice to each quart of puree. Pack into containers, leave headspace, seal and freeze.

Bananas

Select firm, ripe bananas. Peel; mash thoroughly. Add 1 tablespoon lemon juice or ½ teaspoon ascorbic acid per cup of mashed banana. Pack into containers, leave headspace, seal and freeze.

Blackberries, boysenberries, dewberries, loganberries, youngberries

Select fully ripe, firm berries. Wash carefully in cold water, discarding soft, underripe or defective fruit, leaves and stems.

Drain.

- Syrup pack — Pack whole berries

into containers and cover with 40 percent to 50 percent syrup, depending on sweetness of fruit, leave headspace, seal and freeze.

- Sugar pack — Gently mix $\frac{3}{4}$ cup sugar with 1 quart ($1\frac{1}{2}$ pounds) berries. Fill containers, leave headspace, seal and freeze.
- Unsweetened pack — Tray freeze; then pack berries into containers, leaving no headspace, seal and freeze.

Blueberries

Select full-flavored, ripe berries. Wash berries and remove leaves, stems and immature or defective berries. Preheating in steam tenderizes skin and improves the flavor of the product.

- Unsweetened pack — Tray freeze; then pack berries into containers, leaving no headspace, seal and freeze.

Cherries, sour

Select bright red, tree-ripened cherries. Wash, stem and pit.

- Syrup pack — Pack cherries into containers and cover with 60 percent syrup, leave headspace, seal and freeze.
- Sugar pack — To 1 quart ($1\frac{1}{2}$ pounds) cherries add $\frac{3}{4}$ cup sugar. Mix until sugar is dissolved. Pack into containers, leave headspace, seal and freeze.

Cherries, sweet

Select bright, fully ripened cherries of dark colored varieties. Wash, stem and pit.

- Syrup pack — Pack cherries into containers and cover with a 40 percent syrup. For a better quality product, add $\frac{1}{2}$ teaspoon crystalline ascorbic acid to each quart of syrup. Leave headspace, seal and freeze.

Gooseberries

Choose fully ripe berries if freezing for pie; choose berries a little underripe for jelly. Sort, remove stems and blossom ends and wash. The unsweetened pack is best for use in pies or preserves.

- Unsweetened pack — Tray freeze; then pack into containers, leaving no headspace, seal and freeze.
- Syrup pack — Pack into containers. Cover with 50 percent syrup, leave headspace, seal and freeze.

Grapes

Choose fully-ripe, firm, sweet grapes. Sort, stem and wash. Leave seedless grapes whole; cut table grapes with seeds in half and remove seeds.

- Syrup pack — Pack into containers, cover with 40 percent syrup, leave headspace, seal and freeze.
- Unsweetened pack — Tray freeze seedless only; then pack, leaving no headspace, seal and freeze.
- Puree — Wash, stem and crush the grapes. Heat to boiling. Drain off free juice and freeze it separately. Use a colander to remove seeds and hulls. To 1 quart (2 pounds) puree, add $\frac{1}{2}$ cup sugar. Pack into containers, seal and freeze.
- Juice — For beverages, select fully ripe, firm, sweet grapes. For jelly making, select as recommended in specific jelly recipe. Wash, stem and crush grapes. Add 1 cup water per gallon crushed grapes. Simmer for 10 minutes. Strain juice through a jelly bag. To remove tartrate crystals, let juice stand overnight in refrigerator. Pour off clear juice for freezing. Discard sediment that sinks to bottom. Pour juice into containers, leave headspace, seal and freeze. If tartrate crystals form in frozen juice, they may be removed by straining the juice after thawing.

Melons (cantaloupe, crenshaw, honeydew or watermelon)

Select firm-fleshed, well-colored, ripe melons. Cut in half, remove seeds and rind. Cut melons into slices, cubes or balls.

- Syrup pack — Pack into containers and cover with 30 percent syrup, leave headspace, seal and freeze.
- Unsweetened pack — Pack into containers, leaving no headspace, seal and freeze.

Peaches or nectarines

Select well-ripened fruit and handle carefully to avoid bruising. Sort, wash and peel. Note: peeling without a boiling water dip gives a better product. Slice or halve if desired.

- Syrup pack — Use 40 percent syrup. For a better quality product, add $\frac{1}{2}$ teaspoon crystalline ascorbic acid for each quart of syrup. Slice fruit directly into syrup in container — starting with $\frac{1}{2}$ cup syrup to a pint container. Press fruit down and add syrup to cover, leave headspace, seal and freeze.
- Sugar pack — Before combining peaches or nectarines with sugar treat with the following mixture to prevent darkening: $\frac{1}{4}$ teaspoon crystalline ascorbic acid and $\frac{1}{4}$ cup cold water. Dissolve crystalline ascorbic acid in cold water and sprinkle over 1 quart ($1\frac{1}{2}$ pounds) of fruit. Mix $\frac{2}{3}$ cup sugar with each quart of fruit. Stir until sugar is dissolved. Pack into containers, leave headspace, seal and freeze.
- Unsweetened pack — Pack peaches or nectarines into containers and cover with cold water or juice, containing 1 teaspoon crystalline ascorbic acid for each quart, leave headspace, seal and freeze.
- Puree — Coarsely crush peeled

and pitted peaches or nectarines. Press through a sieve or puree in a blender or food processor. (Heating pitted fruit for about 4 minutes in just enough water to prevent scorching makes them easier to puree.) Mix 1 cup sugar with each quart (2 pounds) of pureed fruit. For better quality, add ½ teaspoon crystalline ascorbic acid to each quart of fruit. Pack into containers, leave headspace, seal and freeze.

Pears

Select full-flavored pears that are crisp and firm, not mealy in texture. Wash, peel and core. Slice medium pears into twelve sections, large ones into sixteen.

- Syrup pack — Heat pears in boiling, 40 percent syrup for one to two minutes, depending on size of pieces. Drain and cool. Pack pears into containers and cover with 40 percent syrup. For a better product, add ¾ teaspoon crystalline ascorbic acid to each quart of syrup. Leave headspace, seal and freeze.

Persimmons

Select orange-colored, soft-ripe persimmons. Sort, wash, peel and cut into sections. Press fruit through a sieve to make a puree. For a better product, add ½ teaspoon crystalline ascorbic acid or 1½ teaspoons crystalline citric acid to each quart of puree. Puree made from native (Missouri) varieties needs no sugar. Puree made from cultivated varieties may be packed with or without sugar.

- Unsweetened pack — Pack unsweetened puree into containers, leave headspace, seal and freeze.
- Sugar pack — Mix 1 cup sugar with each quart (2 pounds) of puree and pack into containers, leave headspace, seal and freeze.

Pineapple

Select firm, ripe pineapple with full flavor and aroma. Pare and remove core and eyes. Slice, dice, crush or cut the pineapple into wedges or sticks.

- Unsweetened pack — Pack fruit tightly into containers without sugar, leave headspace, seal and freeze.
- Syrup pack — Pack fruit tightly into containers. Cover with plain, unsweetened pineapple juice or a 30 percent syrup made with pineapple juice, leave headspace, seal and freeze.

Note: If you plan to use frozen pineapple in gelatin desserts, bring it to a boil and simmer 2 to 3 minutes and cool before freezing. Raw pineapple, either fresh or frozen, contains an enzyme that prevents a gel from forming. Heating the pineapple before freezing will prevent this problem.

Plums

Select firm, ripe fruit soft enough to yield to slight pressure. Sort and wash. Leave whole or cut in halves or quarters and pit.

- Syrup pack — Pack fruit into containers and cover with 40 percent to 50 percent syrup, depending on tartness of fruit. For improved quality, add ½ teaspoon crystalline ascorbic acid to each quart of syrup. Leave headspace, seal and freeze.
- Puree — Select fully ripe fruit. Wash, cut in halves and remove pits. Puree may be prepared from unheated fruit if the plums are soft, or from heated fruit for firmer plums. To prepare puree from unheated fruit, press raw fruit through a sieve. For better quality, add either ¼ teaspoon crystalline ascorbic acid or ½ tablespoon crystalline citric acid to each quart (2 pounds) of puree.

To prepare puree from heated fruit, add 1 cup water for each 4 quarts (4 pounds) of fruit. Bring to a boil, cook two minutes, cool and press through a sieve. Mix ½ to 1 cup sugar, depending on tartness of fruit, to each quart (2 pounds) or puree.

Pack into containers, leave headspace, seal and freeze.

- Plum sauce — Cook unsweetened puree until thickened. Add 1 cup sugar (and spices if desired) for each 4 cups of puree. Simmer until sugar dissolves. Cool, pack into containers, leave headspace, seal and freeze.
- Juice — For juice to be served in beverages, select fully ripe plums. For juice to be used for jelly making, select as recommended in specific jelly recipe. Wash plums, cut in halves and remove pits. Simmer in enough water to barely cover until soft. Strain through a jelly bag. Cool. If desired, sweeten with 1 to 2 cups of sugar for each quart of juice depending on tartness of fruit. Pour into containers, leave headspace, seal and freeze.

Raspberries

Harvest fully ripe, firm, well-colored berries. Remove those that are immature or defective. Wash and drain.

- Sugar pack — To 1 quart (1½ pounds) berries add ¾ cup sugar and mix carefully to avoid crushing. Pack into containers, leave headspace, seal and freeze.
- Syrup pack — Pack berries into containers and cover with 40 percent syrup, leave headspace, seal and freeze.
- Unsweetened pack — Tray freeze; then pack berries into containers, leaving no headspace, seal and freeze.

Strawberries

Select fully ripe, firm berries with a deep red color. Discard immature and defective fruit. Wash, drain and remove caps.

Sugar and syrup packs produce a better quality product than unsweetened strawberries.

■ Whole berries, syrup pack — Put

berries into containers and cover with 50 percent syrup, leave headspace, seal and freeze.

■ Whole berries, sugar pack — Add $\frac{3}{4}$ cup sugar to 1 quart ($1\frac{1}{2}$ pounds) strawberries and mix thoroughly.

Put into containers, leave headspace, seal and freeze.

■ Sliced or crushed — Prepare as for

whole strawberries; then slice or crush partially or completely. To 1 quart ($1\frac{1}{2}$ pounds) sliced or crushed berries add $\frac{3}{4}$ cup sugar; mix thoroughly. Pack into containers, leave headspace, seal and freeze.

