

# PRESERVE IT FRESH, PRESERVE IT SAFE VEGETABLES

When preserving fresh foods at home, follow proper procedures to prevent foodborne illness. These safety tested methods can be used for freezing and canning vegetables popular in Kansas. **Always wash your hands before preparing any recipe.**

## Freezing

Freeze fresh vegetables without delay. If vegetables must be stored for a short time after harvesting, spread them loosely in a cool well-ventilated place or in the refrigerator. Prompt cooling in ice water followed by refrigerator storage helps retain flavor, quality, and vitamin C in fresh vegetables such as asparagus and unshelled peas. Pack in crushed ice for longer storage.

Vegetables should not be stored after shelling or cutting. A delay between preparation and freezing, improper cooling after blanching, or stacking packages too closely when freezing may cause souring.

Freezer manuals offer guidelines for the maximum amount that can be frozen at one time to maintain quality — usually 2 to 3 pounds of food for each cubic foot of freezer space. Approximate freezer storage time is 8 to 12 months.

## Blanching

Blanching inactivates enzymes that cause frozen vegetables to develop off flavors and lose garden-fresh color, texture, and vitamins in a couple of months.

For best quality, blanch vegetables in boiling water or steam. This process requires 1 gallon of water for each pound of vegetable or 2 gallons per pound for leafy greens. To retain maximum nutritional value:

- Bring water to a boil quickly.
- Blanch for as little time as possible.
- Chill quickly and remove from water promptly.

*To blanch in boiling water:*

- Bring water to a rolling boil.
- Immerse the wire basket, blanching basket, or mesh bag containing the vegetables.
- Cover the kettle and boil at top heat for the

amount of time specified for a particular vegetable. See the chart at <https://nchfp.uga.edu/how/freeze/freeze-general-information/blanching-vegetables/>. Start timing as soon as water returns to a boil. Blanching water can be used two or three times if kept at the required level. Change water if it becomes cloudy.

- Cool vegetables immediately by placing in ice water for the same amount of time blanched. Replace ice as needed.
- Drain vegetables thoroughly to prevent too many ice crystals from forming.
- Pack using the dry- or tray-pack method.

*To blanch in steam:* Use a pot with a tight-fitting lid and basket to hold the food at least 3 inches above the bottom of the pot. Fill with an inch or two of water and bring to a boil. Place vegetables in the basket in a single layer for even steaming. Cover and start timing as soon as the lid is on, keeping heat high. See the timing chart at <https://nchfp.uga.edu/how/freeze/freeze-general-information/blanching-vegetables/>. Remove from heat and chill immediately in ice water. Drain well, pat dry, and freeze using one of the packing methods below.

*Microwave blanching:* Not recommended. Uneven heating may not inactivate all enzymes, and this method does not save time or energy.

## Packing Methods

Pack vegetables for freezing using one of the following methods:

*Dry pack:* Blanch, cool, and drain vegetables. Pack tightly into freezer containers or freezer bags to reduce the amount of air in the container. Press to squeeze excess air from the freezer bag.

*Tray pack:* Freeze individual pieces of blanched and drained vegetables on a tray or shallow pan before placing frozen pieces into a freezer bag or container. This produces a product similar to commercially frozen bagged vegetables and works well for peas,

corn, and beans. Pack vegetables into a bag or container as soon as they are frozen.

## Dehydrating

For information on dehydrating vegetables, see <https://www.rrc.k-state.edu/preservation/drying.html> for resources.

## Canning

To learn more about canning, see *How-to Guide to Water Bath Canning and Steam Canning* (MF3241) and *How-to Guide to Pressure Canning* (MF3242).

### Preparing Jars and Lids

For all canning recipes processed less than 10 minutes, wash and sterilize jars by placing them inside a boiling water canner and cover with water. Boil jars for at least 10 minutes and keep them hot. For recipes processed longer than 10 minutes, jars will get sterilized during the canning process. All jars must be warm prior to filling with food.

Preheating is not required for standard metal lids. Always wash lids in hot, soapy water before use. If using reusable plastic lid systems with rubber rings, follow the manufacturer's directions.

## Processing

Vegetables and other low-acid foods, must be processed in a pressure-canner. Pressure does not destroy microorganisms. But pressure does increase temperatures high enough to kill all microorganisms capable of growing in canned food. The pressure canner produces an environment of pure steam and free of air. At sea level, a canner operated at a gauge pressure of 10.5 pounds provides an internal temperature of 240°F. At higher elevations, the amount of pressure is increased to achieve this temperature and safely preserved low-acid foods.

For more about preserving snap and Italian beans, dry beans, sweet corn, peppers, and tomatoes, see other titles in this series.

*Preserve it Fresh, Preserve it Safe:*

*Beans*, MF1179

*Tomatoes*, MF1185

*Sweet Corn*, MF1183

*Peppers*, MF1186

## Asparagus — Spears or Pieces

### Quality

Use tender, tight-tipped spears, 4 to 6 inches long.

### Quantity

An average of 3½ pounds yields 1 quart canned. One to 1½ pounds yields 1 pint frozen.

### Preparation

Rinse asparagus and trim tough scales. Break off tough stems and rinse again. Leave asparagus whole or cut into 1-inch pieces.

### Freezing

Separate stalks into small, medium, and large. Using instructions on page 1, water blanch small stalks for 2 minutes, medium stalks for 3 minutes, large stalks for 4 minutes. Chill in ice water, drain. Fill pint- or quart-size freezer containers leaving no headspace. Squeeze to remove excess air, label, date, and freeze.

*Nutrition:* Frozen Asparagus

Serving size: about 6 spears — 35 calories, 0 g fat, 6 g carbohydrates, 5 g protein, 3 g fiber, 12 mg sodium, 0 g sugar

### Canning

Use tender, tight-tipped spears, about 4 to 6 inches long. Prepare spears as directed above.

*Hot pack:* Cover asparagus with boiling water. Boil 2 or 3 minutes. Fill jars loosely with hot asparagus, leaving 1-inch headspace.

*Raw pack:* Fill jars with raw asparagus, pack as tightly as possible without crushing, leaving 1-inch headspace.

Add 1 teaspoon of salt per quart or ½ teaspoon salt per pint if desired. Add boiling water, leaving 1-inch headspace. Remove air bubbles and adjust headspace if necessary. Wipe rims with a damp, clean paper towel. Apply lids and rings fingertip-tight. Process according to Table 1. Turn off heat and allow canner to depressurize before removing the lid. Cool jars for 5 minutes. Remove from canner. Do not retighten bands. Cool completely, check seals, label, date, and store.

*Nutrition:* Canned Asparagus, no salt added

Serving size: ½ cup — 18 calories, 0 g fat, 3 g carbohydrates, 2 g protein, 1 g fiber, 32 mg sodium, 1 g sugar

## Asparagus, Pickled

*Yield:* 6 wide-mouth pints

- 10 pounds asparagus
- 6 large garlic cloves
- 4½ cups water
- 4½ cups white distilled vinegar (5% acidity)
- 6 small hot peppers (optional)
- ½ cup canning salt
- 3 teaspoons dill seed

Rinse asparagus gently under running water. Cut stems from the bottom. Leave spear tips intact, cutting to a length to fit the jar with a little less than a ½-inch of headspace. Peel and rinse garlic cloves. Place one clove at the bottom of each jar. Place asparagus into jars with tips of spears up.

In an 8-quart Dutch oven or saucepot, combine water, vinegar, hot peppers (optional), salt and dill seed. Bring to a boil. Place one hot pepper (if used) in each jar over asparagus spears. Pour boiling hot pickling brine over spears, leaving ½-inch headspace.

Remove air bubbles and adjust headspace. Wipe jar rims with a damp, clean paper towel. Apply lid and ring fingertip-tight. Process in a boiling water canner or steam canner 10 minutes at an altitude of 0 to 1,000 feet; 15 minutes at 1,001 to 6,000 feet. Turn off heat. Remove canner lid. Let jars cool 5 minutes. Remove jars from canner; do not retighten bands. Cool completely, check seals, label, date, and store.

*Nutrition:* Pickled Asparagus

Serving size: about 3 spears — 5 calories, 0 g fat, 1 g carbohydrate, 0 g protein, 0 g fiber, 240 mg sodium, 0 g sugar

## Beets — Whole, Cubed, or Sliced

### Quality

Beets with a diameter of 1 to 2 inches are best for whole packs. Larger beets may be fibrous.

### Quantity

An average of 21 pounds (without tops) is needed for a 7-quart canner load and 13½ pounds for a 9-pint load. A bushel (without tops) weighs 52 pounds and yields 15 to 20 quarts — an average of 3 pounds per quart. One bushel (30 pounds) of beets without tops yields 30 to 45 frozen pints.

### Preparation

Trim to remove beet tops leaving an inch of the stems

and roots to reduce bleeding of color. Scrub well with water.

### Freezing

Sort beets according to size. Cook in boiling water until tender: small beets for 25 to 30 minutes, medium beets for 45 to 50 minutes. Cool promptly in cold water. Peel, remove stem and tap root, and cut into slices, julienne strips, or cubes. Fill pint- or quart-size freezer containers leaving ½-inch headspace. Squeeze out air, label, date, and freeze.

*Nutrition:* Frozen Beets, no salt added

Serving size: ½ cup — 45 calories, 0 g fat, 10 g carbohydrate, 1 g protein, 2 g fiber, 130 mg sodium, 5 g sugar

### Canning

Cover beets with boiling water. Boil until skins slip off easily, 15 to 25 minutes depending on size. Cool enough to handle, then remove skins and trim stems and roots. Leave baby beets whole. Cut medium or large beets into ½-inch cubes or slices. Halve or quarter very large slices. Add 1 teaspoon of salt per quart or ½ teaspoon salt per pint, if desired. Fill jars with hot beets and fresh hot water (not the cooking water), leaving 1-inch headspace.

Remove air bubbles and adjust headspace if necessary. Wipe jar rims with a clean, damp paper towel. Apply lids and rings fingertip-tight. Process according to instructions in Table 1. Turn off heat and allow canner to depressurize before removing the lid. Cool jars for 5 minutes. Remove from canner. Do not retighten bands. Cool completely, check seals, label, date, and store.

*Nutrition:* Canned Beets, no salt added

Serving size: ½ cup — 35 calories, 0 g fat, 8 g carbohydrate, 1 g protein, 2 g fiber, 26 mg sodium, 7 g sugar

## Beets, Pickled

*Yield:* about 8 pints

- 7 pounds of 2 to 2½-inch diameter beets
- 4 cups vinegar (5% acidity)
- 1½ teaspoons canning or pickling salt
- 2 cups sugar
- 2 cups water
- 2 cinnamon sticks
- 12 whole cloves
- 4 to 6 onions (2 to 2½-inch diameter) if desired

Trim off beet tops, leaving 1 inch of stem and roots to keep color from bleeding. Rinse thoroughly. Sort by size. Place similar sizes together in boiling water and

cook until tender (about 25 to 30 minutes).

**Caution: Drain and discard liquid.** Cool beets. Trim roots and stems and slip off skins. Slice into ¼-inch slices. Peel and thinly slice onions. Combine vinegar, salt, sugar, and fresh water. Put spices in cheesecloth bag and add to vinegar mixture. Bring to a boil. Add beets and onions. Simmer 5 minutes. Remove spice bag.

Fill jars with beets and onions. Add hot vinegar solution, leaving ½-inch headspace. Remove air bubbles and adjust headspace. Wipe jar rims with a damp, clean paper towel. Apply lids and rings fingertip-tight. Process in a water-bath or steam canner for 30 minutes at 0 to 1,000 feet; 35 minutes at 1,001 to 3,000 feet; or 40 minutes at 3,001 to 6,000 feet. Turn off heat. Remove canner lid. Let jars cool 5 minutes. Remove jars from canner; do not retighten bands. Cool completely, check seals, label, date, and store.

**Variation:** Pickled whole baby beets. Follow the directions above. Use beets that are 1- to 1½ inches in diameter. Pack whole; do not slice. Onions may be omitted.

*Nutrition:* Pickled Beets, with onions

Serving size: about 4 slices — 15 calories, 0 g fat, 4 g carbohydrate, 0 g protein, 1 g fiber, 35 mg sodium, 3 g sugar

## Broccoli — Freezing Only

Canning results in an undesirable product and is not recommended.

### Quality

Select firm, young, tender stalks with bright-green compact heads. Discard off-color heads or those that have begun to blossom.

### Quantity

One pound yields 1 pint frozen.

### Preparation

Remove leaves and woody portions. Separate heads into convenient-size sections and immerse in brine (4 teaspoons of salt to 1 gallon of water) for 30 minutes to remove insects. Drain and split lengthwise so florets are no more than 1½ inches across. Broccoli may be cut into chunks or chopped.

### Freezing

Water blanch 3 minutes in boiling water or steam blanch for 5 minutes (see page 1). Cool promptly and

drain. Pack the heads and stalks alternately. Fill pint- or quart-size freezer containers leaving no headspace. Squeeze out the air, label, date, and freeze.

*Nutrition:* Frozen Broccoli

Serving size: ½ cup — 20 calories, 0 g fat, 4 g carbohydrate, 2 g protein, 3 g fiber, 19 mg sodium, 1 g sugar

## Cabbage — Freezing Only

Frozen cabbage or Chinese cabbage are suitable for use only as a cooked vegetable.

### Quality

Select freshly picked, solid heads.

### Preparation

Trim coarse outer leaves from head. Cut into medium to coarse shreds or thin wedges, or separate head into leaves. Water blanch 1½ minutes (see page 1). Cool promptly, drain and package, leaving ½-inch headspace. Remove air, seal, and freeze.

*Nutrition:* Frozen Cabbage

Serving size: 1 cup — 23 calories, 0 g fat, 5 g carbohydrate, 1 g protein, 2 g fiber, 16 mg sodium, 3 g sugar

## Carrots — Sliced or Diced

### Quality

Select small carrots, preferably 1 to 1¼ inches in diameter. Larger carrots are usually too fibrous.

### Quantity

An average of 17½ pounds (without tops) is needed per canner load of 7 quarts; an average of 11 pounds is needed per canner load of 9 pints. A bushel (without tops) weighs 50 pounds and yields 17 to 25 quarts — an average of 2½ pounds per quart. One bushel (50 pounds) yields 32 to 40 frozen pints. One and one-fourth to 1½ pounds yields 1 pint frozen.

### Preparation

Remove tops, and rinse, peel, and rinse again.

### Freezing

Leave small carrots whole. Cut others into thin slices, ¼-inch cubes, or lengthwise strips. Water blanch (see page 1) small whole carrots for 5 minutes or diced, sliced, and lengthwise strips for 2 minutes. Cool promptly and drain. Fill pint- or quart-size freezer bags leaving ½-inch headspace. Squeeze to remove air, label, date, and freeze.

*Nutrition:* Frozen Carrots

Serving size: ½ cup — 23 calories, 0 g fat, 5 g carbohydrate, 0 g protein, 2 g fiber, 44 mg sodium, 3 g sugar

## Canning

Rinse, peel, and rinse carrots again. Slice or dice.

*Hot pack:* Cover with boiling water; bring to a boil and simmer for 5 minutes. Add 1 teaspoon of salt per quart or ½ teaspoon salt per pint, if desired. Fill jars, leaving 1-inch headspace.

*Raw pack:* Fill jars tightly with raw carrots, leaving 1-inch headspace. Add 1 teaspoon salt per quart or ½ teaspoon salt per pint, if desired. Add hot cooking liquid or water, leaving 1-inch headspace.

Remove air bubbles; adjust headspace if necessary. Wipe jar rims with a clean, damp paper towel. Apply lids and rings fingertip-tight. Process according to instructions in Table 1. Turn off heat and allow canner to depressurize before removing the lid. Cool jars for 5 minutes. Remove from canner. Do not retighten bands. Cool completely, check seals, label, date, and store.

*Nutrition:* Canned Carrots, no salt added  
Serving size: ½ cup — 20 calories, 0 g fat, 5 g carbohydrate, 0 g protein, 2 g fiber, 29 mg sodium, 2 g sugar

## Cauliflower — Freezing Only

Canning is not recommended because the product will not be desirable.

### Quality

Choose compact, snow-white heads with fresh leaves.

### Quantity

Two medium heads yield 3 frozen pints. One and one-third pounds of cauliflower yield 1 frozen pint.

### Preparation

Trim off leaves and cut head into 1-inch pieces. Immerse in brine (4 teaspoons salt to 1 gallon of water) for 30 minutes to remove insects. Drain.

### Freezing

Freeze only up to 2 pounds of food per cubic foot of freezer capacity per day. Blanch (see page 1) for 3 minutes in water containing 4 teaspoons of salt per 1 gallon of water. To prevent darkening, add 2 to 3 tablespoons of lemon juice per gallon of blanching water. Cool promptly. Fill pint- or quart-size freezer containers leaving no headspace. Squeeze to remove excess air, label, date, and freeze.

*Nutrition:* Frozen Cauliflower  
Serving size: ¾ cup — 20 calories, 0 g fat, 4 g carbohydrate, 2 g protein, 2 g fiber, 20 mg sodium, 2 g sugar

## Eggplant — Freezing Only

### Quality

Use garden varieties with immature seeds and of good color and quality. Canning is not recommended.

### Quantity

Two average eggplant yield 2 frozen pints.

### Freezing

Rinse, peel, and slice to ⅓-inch thick. For casseroles or mixed vegetables, dice or cut it in strips. Work quickly, preparing only enough eggplant for one blanching.

Water blanch (see page 1) ⅓-inch slices for 4 minutes with ½ cup lemon juice in 1 gallon of water. Cool and drain.

Pack slices between sheets of parchment or wax paper for easy removal.

Fill pint- or quart-size freezer containers leaving ½-inch headspace. Squeeze to remove excess air, label, date, and freeze.

*Nutrition:* Frozen Eggplant  
Serving size: About 1 cup — 35 calories, 0 g fat, 9 g carbohydrate, 1 g protein, 3 g fiber, 1 mg sodium, 3 g sugar

## Onions

Bulb onions store well in a cool, dry place.

### Quality

Choose mature bulbs and clean as for eating.

### Freezing

*Whole onions:* Water blanch whole onions (see page 1) from 3 minutes (for small onions) to 7 minutes (for larger onions) or until center is heated. Cool promptly, drain, and package, leaving ½-inch headspace. Seal, label, date, and freeze. These are suitable for cooking only.

*Green Onions:* Young green onions may be chopped for salads and sandwiches and frozen without blanching, but they will not be crisp. They will be highly flavored but may be slightly tough. Trim and clean thoroughly. Dice into about ¼-inch pieces. Tray freeze in a single layer, then pack into freezer packages. Squeeze to remove air, seal, label, date and freeze.

*Diced Onions:* Peel, trim and clean thoroughly. Dice into about ¼-inch pieces. Dry pack into freezer containers or tray freeze first, then pack into freezer

containers leaving ½-inch headspace. Remove air, seal, label, date, and freeze.

*Onion Rings:* Peel, rinse, and slice onions. Separate into rings. Water blanch (see page 1) for 10 to 15 seconds. Cool promptly, drain and coat with flour. Dip in milk. Coat with a mixture of equal parts cornmeal and pancake mix. Arrange in a single layer on a tray. Freeze. Pack into containers using wax paper to separate the layers. Seal and freeze. To prepare, fry frozen rings in 375°F oil until golden brown.

*Nutrition:* Frozen Onions, chopped  
Serving size: ⅔ cup — 25 calories, 0 g fat, 6 g carbohydrate, 1 g protein, 2 g fiber, 10 mg sodium, 0 g sugar

### **Canning — Hot Pack Only**

Use onions of 1-inch diameter or less. Peel and rinse. Cover with boiling water; bring to a boil. Boil 5 minutes. Pack onions into hot jars, leaving 1 inch of headspace. Add ½ teaspoon salt to pints; 1 teaspoon salt to quarts, if desired. Fill with boiling water, leaving 1-inch headspace.

Remove air bubbles; adjust headspace if necessary. Wipe jar rims with a clean, damp paper towel. Apply lids and rings fingertip-tight. Process according to instructions in Table 1. Turn off heat and allow canner to depressurize before removing the lid. Cool jars for 5 minutes. Remove from canner. Do not retighten bands. Cool completely, check seals, label, date, and store.

*Nutrition:* Canned Onions  
Serving size: ⅔ cup — 25 calories, 0 g fat, 6 g carbohydrate, 1 g protein, 2 g fiber, 10 mg sodium, 0 g sugar

### **Green or English Peas**

Green and English peas can be frozen or canned. It is recommended that edible pea pods be frozen for best quality.

#### **Quality**

Select filled pods containing young, tender, sweet seeds. Discard diseased pods.

#### **Quantity**

An average of 31½ pounds (in pods) is needed per canner load of 7 quarts or an average of 20 pounds per 9-pint load. A bushel weighs 30 pounds and yields 5 to 10 quarts or 4½ pounds per quart average. Two to 2½ pounds yield 1 frozen pint.

#### **Preparation**

Shell and rinse the peas.

### **Freezing**

*Green or English Peas:* Water blanch (see page 1) for 1½ minutes. Cool and drain. Tray freeze then package in freezer containers leaving ½-inch headspace. Squeeze out air, label, date, and freeze.

*Edible Pea Pods:* Select bright green, flat, tender pods. Wash. Remove stems, blossom ends, and any strings. Leave whole. Water blanch (see page 1) 1½ minutes for small pods; 2 minutes for large pods. (NOTE: If the peas have started to develop, follow the directions for green beans. If the peas are already developed, shell and follow the directions for green peas.) Cool, drain and package, leaving ½-inch headspace. Package, seal and freeze.

*Nutrition:* Frozen Peas  
Serving size: ⅔ cup — 70 calories, 0 g fat, 12 g carbohydrate, 5 g protein, 4 g fiber, 0 mg sodium, 4 g sugar

### **Canning**

Shell and rinse peas.

*Hot pack:* Cover with boiling water. Bring to a boil in a saucepan, and boil for 2 minutes. Add 1 teaspoon of salt per quart or ½ teaspoon salt per pint, if desired. Fill jars loosely with hot peas and add cooking liquid, leaving 1-inch headspace. Do not shake or compress the peas.

*Raw pack:* Fill jars with raw peas. Add 1 teaspoon of salt per quart or ½ teaspoon salt per pint, if desired. Add boiling water, leaving 1-inch headspace. Do not shake or compress the peas.

Remove air bubbles; adjust headspace if necessary. Wipe jar rims with a clean, damp paper towel. Apply lids and rings fingertip-tight. Process according to instructions in Table 1. Turn off heat and allow canner to depressurize before removing the lid. Cool jars for 5 minutes. Remove from canner. Do not retighten bands. Cool completely, check seals, label, date, and store.

*Nutrition:* Canned Peas, no salt added  
Serving size: ½ cup — 66 calories, 0 g fat, 12 g carbohydrate, 4 g protein, 4 g fiber, 11 mg sodium, 4 g sugar

### **Potatoes, Sweet — Pieces or Whole**

#### **Quality**

Choose small- to medium-sized potatoes that are mature, but not too fibrous. Preserve them within 2 months after harvest.

#### **Quantity**

An average of 17½ pounds is needed for a 7-quart

canner load and 11 pounds for a 9-pint load. A bushel weighs 50 pounds and yields 17 to 25 quarts — an average of 2½ pounds per quart. Two-thirds pound of sweet potatoes yields 1 frozen pint.

### Freezing

*Preparation:* Choose medium to large sweet potatoes that have been cured for at least a week. Sort by size, rinse with water, and scrub with a brush.

Cook potatoes until almost tender, in water, steam, pressure-cooker, or oven. Let them stand at room temperature until cool. Peel sweet potatoes; cut in halves, slice, or mash. Dip whole sweet potatoes or slices in a solution of ½ cup of lemon juice to 1 quart of water for 5 seconds to keep them from darkening. For mashed sweet potatoes, add 2 tablespoons of orange or lemon juice per quart. Fill pint- or quart-size freezer containers leaving ½-inch headspace.

*Baked:* Rinse, scrub, trim, (don't peel) and heat the potatoes in the oven at 350°F until they are slightly soft. Cool, remove peel and wrap them individually in aluminum foil. Place them in freezer bags and freeze. Finish baking in an oven at 350°F immediately before serving, leaving the potatoes wrapped in foil.

*Nutrition:* Frozen Sweet Potatoes  
Serving size: ½ cup — 82 calories, 0 g fat, 19 g carbohydrate, 1 g protein, 1 g fiber, 5 mg sodium, 0 g sugar

### Canning

It is not recommended to dry or raw pack sweet potatoes. Wash potatoes and boil or steam until partially soft (15 to 20 minutes). Remove skins. If necessary, cut medium potatoes so they are about the same size. **Caution:** *Do not mash or puree pieces.*

Fill jars, leaving 1-inch headspace. Add ½ teaspoon salt per pint or 1 teaspoon of salt per quart, if desired. Cover with boiling water, leaving 1-inch headspace. Or use syrup, prepared with water and sugar in the following proportions:

#### Measures of water and sugar for medium syrup

For a 9-pint load		For a 7-quart load	
Cups of water	Cups of sugar	Cups of water	Cups of sugar
5¼	2¼	8¼	3¾

Heat water and sugar together. Bring to a boil and pour over the sweet potatoes in the jars.

Remove air bubbles and adjust headspace. Wipe jar rims with a damp, clean paper towel. Apply

lids and rings fingertip-tight. Process according to recommendations in Table 1. Turn off heat and let the canner depressurize naturally. Remove canner lid. Let jars cool 5 minutes. Remove jars from canner; do not retighten bands. Cool completely, check seals, label, date, and store.

*Nutrition:* Canned Sweet Potatoes, in medium syrup  
Serving size: ½ cup — 116 calories, 0 g fat, 27 g carbohydrate, 4 g protein, 1 g fiber, 38 mg sodium, 20 g sugar

### Potatoes, White

#### Quality

Select small to medium-size potatoes of ideal quality for cooking. Tubers stored below 45°F may discolor when canned. Choose potatoes 1 to 2 inches in diameter if they are to be packed whole.

#### Quantity

An average of 35 pounds is needed per canner load of 7 quarts; an average of 22½ pounds is needed per canner load of 9 pints. A bag weighs 50 pounds and yields 8 to 12 quarts — an average of 5 pounds per quart. Two-thirds of a pound yields 1 frozen pint.

#### Freezing

Freeze only up to 2 pounds of food per cubic foot of freezer capacity per day.

*New Irish Potatoes:* Select smooth new potatoes directly from the garden. Peel or scrape and rinse. Water blanch for 3 to 5 minutes, depending on the size. Cool, drain, and package whole or sectioned, leaving ½-inch headspace. Seal and freeze.

*Baked stuffed potatoes or mashed potato patties:* Prepare using your favorite recipe and cool quickly in the refrigerator. Wrap in moisture-proof packaging, seal, and freeze. Recommended storage time is one month at 0°F. Reheat in a 350°F oven before serving.

*French-fried potatoes:* Pare and cut potatoes lengthwise into strips about ¼-inch thick. Rinse quickly in cold water and dry on paper towels.

Oven method — Arrange the potato strips in a shallow baking pan, brush with melted butter or margarine, and bake at 450°F just until they begin to brown, turning occasionally. Cool them quickly in the refrigerator.

Oil method — Blanch the potato strips in vegetable oil heated to 370°F until tender but not brown. Drain and cool them quickly in refrigerator.

Place prepared strips in moisture-proof containers or bags. Seal and freeze. Maximum recommended storage time is 2 months at 0°F.

To serve, place frozen potatoes on baking sheet. Bake at 450°F until golden brown, turning occasionally. Or deep-fat fry frozen potatoes at 390°F until golden and crisp.

*Hashbrown potatoes:* Rinse; peel; remove eyes, bruises, and green surface color. Cut into ¼- to ½-inch cubes. Blanch 5 minutes (see page 1) in boiling water. Cool. Package in freezer containers. For grated hashbrowns, rinse and scrub potatoes, then cook with skins on until almost done. Cool, peel, and grate. Cooked potatoes also can be made into patties and frozen on a cookie sheet. When frozen, wrap individually. Recommended storage time at 0°F is 1 to 3 months.

To serve, place frozen hashbrowns in a hot skillet with 2 to 4 tablespoons butter, margarine, or oil. Cook until brown and crisp.

*Nutrition:* Frozen Hash Browns, unprepared  
Serving size: ½ cup — 86 calories, 1 g fat, 19 g carbohydrate, 2 g protein, 1 g fiber, 23 mg sodium, 0 g sugar

## Canning

Choose potatoes 1 to 2 inches in diameter if they are packed whole. Rinse and peel potatoes. If desired, cut potatoes into ½-inch cubes. Place potatoes in an ascorbic acid solution to prevent darkening. Place 1 teaspoon of ascorbic acid (3,000 mg or six 500 mg crushed vitamin C tablets) in 1 gallon of water and mix. Drain. Cook cubes for 2 minutes; or whole potatoes for 10 minutes in fresh boiling water and drain again.

Pack hot potatoes in hot jars. Add ½ teaspoon salt per pint or 1 teaspoon of salt per quart, if desired. Fill hot jars with fresh boiling water, leaving 1-inch headspace.

Remove air bubbles and adjust headspace if needed. Wipe jar rims with a clean, damp paper towel. Apply lids and rings fingertip-tight. Process according to instructions in Table 1. Turn off heat and allow canner to depressurize before removing the lid. Cool jars for 5 minutes. Remove from canner. Do not retighten bands. Cool completely, check seals, label, date, and store.

*Nutrition:* Canned Potatoes  
Serving size: ½ cup — 57 calories, 0 g fat, 13 g carbohydrate, 2 g protein, 2 g fiber, 282 mg sodium, 0 g sugar

## Pumpkin and Winter Squash

### Quality

Pumpkins and squash should have a hard rind and stringless mature pulp of ideal quality for cooking fresh. Small-size pumpkins (sugar or pie varieties) are recommended for best quality. Spaghetti squash pulp is frozen only, not canned.

### Quantity

An average of 16 pounds is needed for a 7-quart canner load and an average of 10 pounds for a 9-pint load — an average of 2¼ pounds per quart. Three pounds yield 2 pints frozen.

### Freezing

Rinse, remove seeds, slice 1-inch wide, and peel. Cook until soft in boiling water or steam, or in a pressure cooker, oven, or microwave. To cool, place the pan containing the pumpkin in cold water and stir occasionally. Remove pulp from the rind and mash. Do not mash spaghetti squash pulp so it retains its spaghetti-like texture.

*Note:* Small pumpkins can be baked whole in the oven or a microwave. Pierce skin and cook until soft. Cool and peel. Remove strings and seeds, and mash.

Fill pint- or quart-size freezer containers leaving ½-inch headspace. Squeeze to remove excess air, label, date, and freeze.

*Nutrition:* Frozen Butternut Squash, no salt added  
Serving size: ½ cup — 48 calories, 0 g fat, 12 g carbohydrate, 1 g protein, 1 g fiber, 1 mg sodium, 2 g sugar

### Canning — Cubed Only

Rinse, remove seeds, cut into slices 1-inch wide, and peel. Cut flesh into 1-inch cubes. Boil 2 minutes in water. **Caution:** *Do not mash or puree.*

Fill jars with hot cubes and cooking liquid, leaving 1-inch headspace. Remove air bubbles and adjust if necessary. Wipe jar rims with a clean, damp paper towel. Apply lids and rings fingertip-tight. Process according to instructions in Table 1. Turn off heat and allow canner to depressurize before removing the lid. Cool jars for 5 minutes. Remove from canner. Do not retighten bands. Cool completely, check seals, label, date, and store.

When ready to use, drain the jars and mash or puree the cubes for pies.

*Nutrition:* Canned Butternut Squash, no salt added  
Serving size: ½ cup — 48 calories, 0 g fat, 12 g carbohydrate, 1 g protein, 1 g fiber, 1 mg sodium, 2 g sugar

## Spinach and Other Greens

### Quality

Preserve only fresh harvested greens. Discard wilted, discolored, diseased, or insect-damaged leaves. Choose tender, dark-green leaves.

### Quantity

An average of 28 pounds is needed for a 7-quart canner load and 18 pounds for a 9-pint load. A bushel weighs 18 pounds and yields 3 to 9 quarts — an average of 4 pounds per quart. One to 1½ pounds of fresh greens yield 1 frozen pint.

### Freezing

Rinse greens thoroughly and cut off woody stems. Water blanch (see page 1) collards for 3 minutes and all other greens for 2 minutes. Chill and drain.

Fill pint- or quart-size freezer containers leaving ½-inch headspace. Squeeze out air, label, date, and freeze.

*Nutrition:* Frozen Spinach, no salt added

Serving size: ½ cup — 25 calories, 0 g fat, 4 g carbohydrate, 3 g protein, 3 g fiber, 63 mg sodium, 0 g sugar

### Canning

Rinse small amounts of greens at one time. Drain water and continue rinsing until water is clear and free of grit. Cut out tough stems and midribs. Place 1 pound of greens at a time in a cheesecloth bag or blancher basket and steam for 3 to 5 minutes or until they are well wilted. Add ½ teaspoon of salt to each quart jar, if desired.

Fill jars loosely with greens and add fresh boiling water, leaving 1-inch headspace.

Remove air bubbles and adjust headspace. Wipe jar rims with a clean, damp paper towel. Apply lids and rings fingertip-tight. Process according to instructions in Table 1. Turn off heat and allow canner to depressurize before removing the lid. Cool jars for 5 minutes. Remove from canner. Do not retighten bands. Cool completely, check seals, label, date, and store.

*Nutrition:* Canned Spinach, no salt added

Serving size: ½ cup — 25 calories, 0 g fat, 4 g carbohydrate, 3 g protein, 3 g fiber, 98 mg sodium, 0 g sugar

## Summer Squash — Freezing Only

(Cocozelle, Crookneck, Pattypan, Straightneck, White Scallop, Yellow Squash, Zucchini)

### Quality

Choose young squash with tender skin.

### Freezing

*Slices:* Rinse and cut in ½-inch slices. Water blanch for 3 minutes (see page 1). Cool promptly, drain and package, leaving ½-inch headspace. Seal and freeze.

*Grated Zucchini (for baking):* Choose young tender zucchini. Rinse and grate. Steam blanch (see page 1) in small quantities 1 to 2 minutes until translucent. Pack in measured amounts into containers, leaving ½-inch headspace. Cool by placing containers in cold water. Seal and freeze. If watery when thawed, discard the liquid before using.

*Nutrition:* Frozen Zucchini, no salt added

Serving size: ½ cup — 15 calories, 0 g fat, 3 g carbohydrate, 1 g protein, 1 g fiber, 1 mg sodium, 1 g sugar

## Vegetable Soup

Vegetable, dried bean or pea, meat, poultry, or seafood soups can be canned. **These directions are intended for use with ingredients that already have separate canning recommendations.**

**Caution:** Do not add noodles or other pasta, rice, flour, cream, milk or other thickening agents to home canned soups. If dried beans or peas are used, they must be fully rehydrated first.

### Procedure

Select, rinse, and prepare vegetables, meat and seafoods as described for the specific foods in their own canning instructions. *Caution: If there is not a canning recommendation for a vegetable, do not include it.* Cover meat with water and cook until tender. Cool meat and remove bones. Cook vegetables as described for a hot pack. For each cup of dried beans or peas, add 3 cups of water, boil 2 minutes, remove from heat, soak 1 hour, and heat to boil; drain.

Combine solid ingredients with meat broth, tomatoes, or water to cover. Boil 5 minutes. **Caution: Do not thicken.** Salt to taste, if desired. Fill jars halfway with solid mixture. Add remaining liquid, leaving 1-inch headspace.

Remove air bubbles and adjust headspace. Wipe jar rims with a clean, damp paper towel. Apply lids and rings fingertip-tight. Process according to instructions in Table 1. Turn off heat and allow canner to depressurize before removing the lid. Cool jars for 5 minutes. Remove from canner. Do not retighten bands.

Cool completely, check seals, label, date, and store.

*Nutrition:* Varies based on ingredients used.

## Problems and Solutions

### 1. Is it safe to can vegetables without salt?

Yes. Salt is used for flavor only and is not necessary to prevent spoilage.

### 2. Should all vegetables be precooked before canning?

For best quality, yes. However, some vegetables can be packed raw into jars before being processed in the pressure canner.

### 3. What vegetables expand instead of shrink during processing?

Corn, peas and lima beans are starchy, absorb water and expand during processing. They should be packed loosely.

### 4. Can I can mashed or pureed pumpkin?

Home canning is not recommended for pumpkin butter or any mashed or pureed pumpkin or winter squash. There are not sufficient data available to safely process these types of products at home. It is best to freeze pumpkin butters or mashed squash.

### 5. Which canners are recommended for vegetables?

Pressure canners for home use have been redesigned in recent years. Models made before the 1970s were heavy-walled kettles with clamp-on or turn-on lids. They were fitted with a dial gauge, a vent port in the form of a petcock or counterweight, and a safety fuse. Modern pressure canners are lightweight, thin-walled kettles. Most have turn-on lids. They have a jar rack, gasket, dial or weighted gauge, an automatic vent/cover lock, a vent port (steam vent) to be closed with a counterweight or weighted gauge, and a safety fuse. See more information in *How-to Guide to Pressure Canning*, MF3242, <https://bookstore.ksre.ksu.edu/pubs/MF3242.pdf>.

Pressure does not destroy microorganisms, but rather, high temperatures applied for an adequate period of time. The success of destroying all microorganisms capable of growing in canned food is based on the temperature obtained in pure steam, free of air, at sea level. At sea level, a canner operated at a gauge pressure of 10.5 lbs provides an internal temperature of 240°F.

Always read and follow your stove manufacturer

recommendations for canning. Some smooth-top stoves cannot support the weight or high heat of canning. Also, follow the canner manufacturer recommendations for using their canners on smooth-top stoves. Learn more at <https://nchfp.uga.edu/blog/do-you-have-a-smooth-cooktop-and-still-want-to-can-at-home>.

The Presto Precise® Digital Pressure Canner is an alternative to stovetop pressure canners. This canner senses and responds to temperature to achieve safely pressure canned foods.

### 6. How long can home canned foods be stored?

If lids are tightly vacuum sealed on cooled jars, remove screw bands, wash the lid and jar to remove food residue; then rinse and dry jars. Label and date the jars and store them in a clean, cool, dark, dry place. For best quality, store between 50 and 70 °F. Can no more food than you will use within one year.

Do not store jars above 95° F or near hot pipes, a range, a furnace, in an uninsulated attic, or in direct sunlight. Under these conditions, food will lose quality in a few weeks or months and may spoil. Dampness may corrode metal lids, break seals, and allow recontamination and spoilage.

### 7. What causes the food to float inside a jar of canned food?

Food naturally contains trapped air. When using a raw pack method to fill jars, floating can occur. Use a hot pack to preheat the food and begin removing air from the food. When using the raw pack method, pack food as close as possible without crushing it. Be sure to release trapped air bubbles before applying the lid and ring. Add more food or liquid if necessary. Liquid should cover food pieces completely.

### 8. What causes white sediment to form in the bottom of a jar?

Sediment may come from several sources. It could be natural starch released in the food, which cannot be prevented. Or it may be caused by hard water minerals settling out of the water. Use soft water to prevent this. Another possible cause is table salt, which contains fillers to keep it from caking. Always use canning and pickling salt for home canned foods. Murky liquid and soft food may indicate spoilage, which may be the result of not processing for the recommended length of time. ***In this case, do not use.***

## 9. What are the white crystals in canned spinach?

Spinach contains calcium and oxalic acid, which combine to form harmless calcium oxalate. The spinach is safe to consume.

**Table 1. Recommended processing times for vegetables in a pressure canner**

Product	Style of pack	Jar size	Process time	Canner gauge pressure needed at different elevations (in feet)			
				Dial gauge (lbs.)		Weighted gauge (lbs.)	
				0- 2,000	2,001-4,000	0-1,000	Above 1,000
Asparagus	Hot or raw	Pints	30	11	12	10	15
		Quarts	40	11	12	10	15
Beets	Hot	Pints	30	11	12	10	15
		Quarts	35	11	12	10	15
Carrots	Hot or raw	Pints	25	11	12	10	15
		Quarts	30	11	12	10	15
Onions	Hot	Pints or Quarts	40	11	12	10	15
Peas	Hot or raw	Pints or Quarts	40	11	12	10	15
Potatoes, sweet	Hot	Pints	65	11	12	10	15
		Quarts	90	11	12	10	15
Potatoes, white	Hot	Pints	35	11	12	10	15
		Quarts	40	11	12	10	15
Pumpkin and winter squash	Hot	Pints	55	11	12	10	15
		Quarts	90	11	12	10	15
Spinach and other greens	Hot	Pints	70	11	12	10	15
		Quarts	90	11	12	10	15
Vegetable Soup	Hot	Pints	60*	11	12	10	15
* Caution: Process 100 minutes if soup contains seafoods.		Quarts	75*	11	12	10	15

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*Complete Guide to Home Canning*, USDA AIB No. 539, 2015; and *So Easy to Preserve*, 6th ed., The University of Georgia Cooperative Extension Service ;and National Center for Home Food Preservation, <https://nchfp.uga.edu/>.

*Weights and Processed Yields of Fruits and Vegetables*, Circular 780, University of Georgia Cooperative Extension, <https://fieldreport.caes.uga.edu/publications/C780/weights-and-processed-yields-of-fruits-and-vegetables/>

*Freezing Convenience Foods That You've Prepared at Home*, Pacific Northwest Extension No. 296, [https://verso.uidaho.edu/view/pdfCoverPage?instCode=01ALLIANCE\\_UID&filePid=13325544480001851&download=true](https://verso.uidaho.edu/view/pdfCoverPage?instCode=01ALLIANCE_UID&filePid=13325544480001851&download=true)

*Pressure Can It Right! Tips for Safely Using a Stovetop or Electric Pressure Canner*, North Central Food Safety Extension Network, [https://www.ncrfsma.org/files/page/files/fn2064\\_pressure\\_can\\_it\\_right\\_fillable\\_22.pdf](https://www.ncrfsma.org/files/page/files/fn2064_pressure_can_it_right_fillable_22.pdf)

Nutrition data provided by USDA FoodData Central, <https://fdc.nal.usda.gov/index.html> and ESHA Genesis R&D Food Formulation & Labeling Software, version 11.13

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