

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.

Freezing

Move fresh produce to the freezer quickly for top-quality frozen vegetables. During hot weather, harvest early in the morning before vegetables absorb much heat. Select vegetables at optimum maturity for best flavor and texture.

Process 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.

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. If blanched, frozen vegetables can be stored for 9 to 12 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. 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. Keep the chilling water ice cold.
- 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. Steam blanching is the preferred method for broccoli, pumpkin, sweet potatoes, and winter squash.

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 containers or freezer bags to reduce the amount of air in the container. Press to squeeze excess air from the freezer bag. Alternate the heads and stems when packing broccoli.

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.

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).

Wash jars. For standard metal lids, preheating is optional. If desired, heat in simmering but not boiling water. If using reusable plastic lids with rubber rings, follow manufacturer's instructions.

Vegetables and other low-acid foods, must be processed in a pressure-canner. Pressure does not destroy microorganisms. Temperatures high enough to kill all microorganisms capable of growing in canned food must be obtained in pure steam, free of air, at sea level. At sea level, a canner operated at a gauge pressure of 10.5 pounds provides an internal temperature of 240°F.

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 24½ pounds is needed for a 7-quart canner load and 16 pounds for a 9-pint load. A crate weighs 31 pounds and yields 7 to 12 quarts — an average of 3½ pounds per quart. One crate of fresh asparagus (12, 2-pound bunches) yields 15 to 22 frozen pints. One to 1½ pounds yields 1 pint frozen.

Preparation

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

Freezing

Separate stalks into medium and large (½- to ¾-inch in diameter). Using instructions on page 1, blanch medium stalks for 3 minutes, large stalks for 4 minutes. Chill in ice water. Fill pint- or quart-size freezer containers leaving ½-inch headspace. Squeeze to remove excess air, label, and freeze.

Canning

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

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

Add 1 teaspoon of salt per quart or ½ teaspoon salt per pint if desired. Add boiling water, leaving 1 inch of headspace. Remove air bubbles and adjust 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, and store.

Asparagus, Pickled

Yield: 6 wide-mouth pints

10 pounds asparagus

6 large garlic cloves

4½ cups water

4½ cups white distilled vinegar (5%)

6 small hot peppers (optional)

½ cup canning salt

3 teaspoons dill seed

Wash asparagus gently under running water. Cut stems from the bottom. Leave spear tips cutting to a length that will fit the jar with a little less than a half-inch of headspace. Wash and peel garlic cloves. Place one clove at the bottom of each jar. Place asparagus into jars spear side 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 of 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, and store.

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. Typically, 1¼ to 1½ pounds yield 1 frozen pint.

Preparation

Trim to remove beet tops leaving an inch of the stems and roots to reduce bleeding of color. Scrub well.

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, and freeze.

Canning

Cover beets with boiling water. Boil until skins slip off easily, 15 to 25 minutes depending on size. Cool, 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, leaving 1 inch of headspace.

Remove air bubbles; 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, and store.

Beets, Pickled

Yield: about 8 pints

- 7 pounds of 2 to 2½-inch diameter beets
- 4 cups vinegar (5 percent)
- 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. Wash thoroughly. Sort by size. Place similar sizes together in boiling water and cook until tender (about 25 to 30 minutes).

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. 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, and store.

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 crate (25 pounds) yields 24 frozen pints. 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

Blanch 3 minutes in boiling water (see page 1). Cool promptly. Pack the heads and stalks alternately. Fill pint- or quart-size freezer containers leaving ½-inch headspace. Squeeze out the air, label and freeze.

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. Cool promptly, drain and package, leaving ½ inch of headspace. Seal and freeze.

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 wash, peel, and rewash carrots.

Freezing

Leave small carrots whole. Cut others into thin slices, ¼-inch cubes, or lengthwise strips. Blanch small whole carrots for 5 minutes or diced, sliced, and lengthwise strips for 2 minutes. (For blanching instructions, see page 1.) Cool promptly. Fill pint- or quart-size freezer bags within 3 to 4 inches of the top. Squeeze to remove air, label, and freeze.

Canning

Wash, peel, and rewash carrots. 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 of headspace. Add 1 teaspoon salt per quart or ½ teaspoon salt per pint, if desired. Add hot cooking liquid or water, leaving 1 inch of 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, and store.

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 to remove 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 ½ inch headspace. Squeeze to remove excess air, label, and freeze.

Eggplant — Freezing Only

Quality

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

Quantity

Two average eggplant yield 2 frozen pints.

Freezing

If eggplant is to be fried, cut it in ½ inch slices. For casseroles or mixed vegetables, dice or cut it in strips. Work quickly, preparing only enough eggplant for one blanching.

Blanch diced pieces or strips for 2 minutes in 1 gallon of boiling water with 4½ teaspoons of citric acid or ½ cup of lemon juice following instructions on page 1. Blanch ½ inch slices for 4 minutes. Cool and drain.

Note: Pack slices for frying between sheets of freezer wrap for easy removal.

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

Onions

Bulb onions store well in a cool, dry place.

Quality

Choose mature bulbs and clean as for eating.

Freezing

Water blanch (see page 1) for 3 to 7 minutes or until center is heated. Cool promptly, drain and package, leaving ½-inch headspace. Seal 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.

Onion Rings: Wash, peel and slice onions. Separate into rings. Water blanch 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.

Canning — Hot Pack Only

Use onions of 1-inch diameter or less. Wash and peel. 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 jars to 1 inch from top with boiling water.

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, and store.

Peas

Freeze sugar snap and Chinese edible pods for best quality. Green and English peas can be frozen or canned.

Quality

Green or English peas: Select filled pods containing young, tender, sweet seeds. Discard diseased pods.

Snow peas (also called Chinese peas): Harvest when peas are barely visible in the pods.

Sugar snap peas: Pick when pods are round and fully mature, 2 to 3 inches long.

Quantity

Green or English: 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.

Sugar snap and Chinese: One bushel (30 lbs.) yields 12 to 15 frozen pints. Two to 2½ pounds yield 1 frozen pint.

Preparation

Green or English: Shell and wash the peas.

Sugar snap and Chinese: Wash. Remove the stems, blossom ends and any strings. Leave whole.

Freezing

Green or English: Blanch (see page 1) for 2½ minutes. Cool and drain.

Sugar snap and Chinese: Blanch (see page 1) small pods for 2 minutes, large pods for 3 minutes. Cool and drain. Fill pint- or quart-size freezer containers leaving ½-inch headspace. Squeeze out air, label and freeze.

Canning

Green or English: Wash jars. For standard metal lids, preheating is optional. If desired, heat in hot simmering, not boiling, water. If using other types of lid systems with rubber rings, follow that manufacturer's advice about pretreating rubber rings. Add 1 teaspoon of salt per quart to the jar, if desired.

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 of headspace.

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 of headspace. Do not shake or compress the peas.

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, and store.

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 and wash.

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 of headspace.

Baked: Wash, 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 polyethylene bags and freeze. Finish baking in an oven at 350°F immediately before serving, leaving the potatoes wrapped in foil.

Canning

This method is not recommended for raw 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. *Do not mash or puree pieces.*

Fill jars, leaving 1 inch of headspace. Add ½ teaspoon salt per pint or 1 teaspoon of salt per quart, if desired. Cover with boiling water leaving 1 inch of 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, and store.

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.

Because fresh potatoes are available year-round, it may not be practical to freeze potatoes at home. If potatoes are to be frozen, cooked mashed potato patties, baked stuffed potatoes, french fries, or hashbrowns are best.

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: Wash; peel; remove eyes, bruises, and green surface color. Cut into ¼- to ½-inch cubes. Blanch 5 minutes in boiling water. Cool. Package in freezer containers. For grated hashbrowns, wash potatoes and 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.

Canning

Wash and peel potatoes. Place potatoes in an ascorbic acid solution to prevent darkening. Place 1 teaspoon (3,000 mg.) of ascorbic acid in 1 gallon of water and mix. If using tablets, crush and mix. If desired, cut potatoes into ½-inch cubes. Drain. Cook for 2 minutes in boiling water and drain again.

For whole potatoes, boil for 10 minutes and drain. Add ½ teaspoon salt per pint or 1 teaspoon of salt per quart, if desired. Fill hot jars with hot potatoes and fresh hot water, leaving 1 inch of 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, and store.

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) make better products. Spaghetti-squash pulp should not be mashed.

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

Wash, 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.

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 of headspace. Squeeze to remove excess air, label, and freeze.

Canning — Cubed Only

Wash, 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 the cubes and cooking liquid, leaving 1 inch of 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, and store.

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

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

Wash greens thoroughly and cut off woody stems. 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, and freeze.

Canning

Wash only 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 of 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, and store.

Summer Squash — Freezing Only

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

Quality

Choose young squash with tender skin.

Freezing

Slices: Wash and cut in ½ inch slices. Water blanch for 3 minutes. Cool promptly, drain and package, leaving ½ inch headspace. Seal and freeze.

Grated: Choose young tender zucchini. Wash and grate. Steam blanch 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.

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, wash, and prepare vegetables, meat and seafoods as described for the specific foods in their own canning instructions. *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. **Do not thicken.** Salt to taste, if desired. Fill jars halfway with solid mixture. Add remaining liquid, leaving 1 inch of 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, and store.

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 altitudes (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
		Quarts	75	11	12	10	15

Nutrition per ½ cup

	Calories (kcal)	Carbo. (g)	Fat (g)	Vitamin C (mg)	Dietary fiber (g)	Sodium without added salt (mg)	Sodium with added salt (mg)
Asparagus	22.0	3.8	0.3	9.7	1.5	9.9	276.0
Asparagus, Pickled	15.0	3.0	0.0	11.6	1.0	NA	720.0
Beets	37.0	8.5	0.2	3.0	2.0	65.5	332.0
Beets, Pickled	100.0	24.0	0.0	6.4	3.0	NA	190.0
Broccoli	22.0	3.9	0.3	58.0	2.0	20.0	287.0
Cabbage	11.0	2.58	0.04	16.3	1.1	8.0	(no salt)
Carrots	35.0	8.2	0.1	1.8	2.5	51.5	318.0
Cauliflower	17.0	3.4	0.2	28.2	1.8	16.2	283.0
Eggplant	14.0	3.2	0.1	0.6	1.5	1.4	268.0
Onions	21.0	4.5	0.10	4.8	1.3	3.0	416
Peas	67.0	12.5	0.2	11.4	3.8	2.4	269.0
Potatoes, Sweet	88.0	20.6	0.1	8.0	2.2	7.0	273.0
Potatoes, White	67.0	15.6	0.0	5.7	1.1	4.0	270.0
Pumpkin	24.5	6.0	0.1	5.8	2.1	1.2	(no salt)
Winter Squash	47.0	10.5	0.8	11.5	3.3	4.5	(no salt)
Spinach	21.0	3.4	0.2	8.8	2.0	63.0	196.0
Vegetable Soup	Nutrition will vary based on foods used. Omit salt to reduce sodium content.						

Problems and Solutions

1. How do I dry vegetables?

Most vegetables can be dried. To learn about drying foods, visit the K-State Rapid Response Center online: www.rrc.ksu.edu.

2. Is it safe to can vegetables without salt?

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

3. 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.

4. 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.

5. 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. Previous USDA recommendations included directions for canning mashed winter squash, but these were withdrawn. Recommendations published before *Complete Guide to Home Canning* (September 1994) are out of date. It is best to freeze pumpkin butters or mashed squash.

6. 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. 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.

7. 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.

8. 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.

9. 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.*

10. 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.

Revised by Karen Blakeslee, M.S., Extension Associate, Food Science

Adapted from original by Karen P. Penner, Ph.D., and Jeanne Dray, April 1995

Complete Guide to Home Canning, USDA AIB No. 539, 2009; and *So Easy to Preserve*, 6th ed., The University of Georgia Cooperative Extension Service.

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