

Canning Low-Acid Foods: Vegetables

By Julie Cascio

Selecting Vegetables

Vegetables for canning should be young, tender and freshly gathered. Any delay in using produce gives nutrients time to dissipate and the bacteria in food an opportunity to multiply. Tough, overmature vegetables will result in a finished product that is poor in quality and flavor.

Frostbitten vegetables may be canned. For best quality, process as soon as possible after frost occurs. Generally, the texture of vegetables that freeze will be poor. Tomatoes may not be canned, because freezing changes their pH. Refer to FNH-00024 Green Tomatoes and FNH-00171 Canning Tomatoes for processing tomatoes.

Equipment

Have all the equipment needed to produce a safe, good-tasting canned product.

A pressure canner is required for processing vegetables. The high temperature reached under pressure is necessary to ensure a safe low-acid product. With pH values above 4.6, vegetables are low-acid foods. Canning at the appropriate pressure and correct amount of time is necessary to prevent the toxin that causes botulism.

Read and follow directions for your canner. If you no longer have an instruction manual, look online or write the manufacturer for a new copy.



Your pressure canner must be in good condition. Replace the gasket and safety plug if necessary. Be certain the vent or petcock is clear.

If you have a dial pressure gauge on your canner, have it checked for accuracy before the canning season begins. Dial pressure gauges may be checked at your local Cooperative Extension Service office.

Jars should be washed in hot, soapy water and rinsed before you use them. Check the rims of jars and discard any that have nicks.

Lids and screw bands (rings) form two-piece, self-sealing lids. Flat lids should be purchased each year. Rings may be reused if not bent or rusty. Prepare the jar rings and flat lids by rinsing and setting aside until needed.

Cutting boards, sharp knives and counters should be clean and sanitized to reduce bacterial contamination.

Vegetable Preparation

To begin, choose mature, healthy vegetables. Discard insect damaged, or diseased vegetables. Wash and rinse vegetables thoroughly. Soil clinging to the vegetable may carry bacteria that will not be destroyed during processing and may cause spoilage of the food or an infection from foodborne pathogens.

Work quickly while preparing the vegetables. Delays result in loss of flavor and nutritive value. Sort vegetables by size and degree of maturity.

Use the instructions in the following pages for the vegetable you are preparing. There are two methods:

Hot pack: preheat cut vegetables, fill hot jar to 1-inch headspace, then cover with boiling liquid to 1-inch headspace.

Raw pack: put raw cut vegetables in hot jar to 1-inch headspace, then cover with boiling water leaving a 1-inch headspace.

Most vegetables are hot packed; some may have the option to pack raw. When both are given, choose which you prefer.

Salt is optional; it is for flavor and is not needed to prevent spoilage. If desired, add ½ teaspoon salt to hot pint jar; 1 teaspoon to hot quart jar.

Release air pockets by inserting a flat, thin plastic or rubber spatula between the food and the jar. Slowly turn the jar and move the spatula up and down to allow air bubbles to escape. Adjust the headspace, then clean the rim of the jar with a damp cloth or paper towel.

Place the lid, gasket down, onto the clean jar rim. Add the metal screw band ring. Screw the band down gently with fingertips until you feel it catch. Then do a quarter turn more. If too tight, the lid will buckle during processing or form cuts in the sealing compound that prevent sealing.

Pack only enough jars at one time to fill the canner.

To ensure the safety of canned vegetables, process in a pressure canner. Use researched process time for the vegetable you are canning, shown in the following instructions. This is needed to kill all bacteria that cause spoilage or food poisoning.

Adjust for Elevation

Canning instructions are for sea level. Higher elevations need more pounds of pressure to reach the 240°F necessary for killing pathogenic spores. When a **dial gauge pressure canner** is used, add 1 pound per square inch (psi) pressure for each 2,000 feet above sea level.

- Use 11 pounds pressure at 0 to 2,000 feet altitude.
- Use 12 pounds pressure at 2,001 to 4,000 feet altitude.
- Use 13 pounds pressure at 4,001 to 6,000 feet altitude.
- Use 14 pounds pressure at 6,001 to 8,000 feet altitude.

When using a **weighted gauge pressure canner** use 10 pounds pressure in altitude 0 to 1,000 feet. If above 1,000 feet use 15 pounds pressure.

Processing in a Pressure Canner

1. Add 2–3 inches (about 3 quarts) of hot water to the pressure canner. Put the rack in the bottom of canner. Place the closed, filled jars on the rack, apart from each other. Fasten the canner cover securely. Leave the lid vent open. Turn the heat setting to high.
2. Heat the canner until steam comes through the open vent in a steady stream. Allow the steam to escape for 10 minutes. This step removes air from inside the canner. This is done so the temperature is the same throughout the canner.
3. Close the vent (use a hot pad or mitt) by shutting the petcock or by placing the weighted

It is a good idea to complete a trial run with your canner before using it the first time or at the beginning of each canning season.

Use 2–3 inches (about 3 quarts) of water in the canner. Put the canner through a short canning cycle to be certain it will reach and maintain the necessary pressure.

Practicing also helps you become familiar with the sound of the weighted gauge or with reading the dial gauge.

gauge or pressure regulator (also called a deadweight) on the vent.

4. Turn the heat to high. When the pressure reads 11 pounds per square inch (psi) on the dial gauge or the 10-pound weighted gauge begins to jiggle, begin the timing process and adjust the heat to maintain a steady pressure.
Write down the time at the beginning of the process and the time when the process will be finished.
5. If the pressure drops below 10 or 11 psi, the timing must begin again from zero minutes. If the pressure rises above 10 or 11 psi, lower the heat on the stove but do not begin timing again.
6. Regulate heat to maintain a uniform pressure.
7. When processing is complete, remove canner from the heat and allow the canner to air-cool until it is fully depressurized. This takes from 30 to 45 minutes to occur. Then slowly remove the weighted gauge or open the petcock. After waiting for an additional 10 minutes, unfasten and remove the canner lid.
8. Remove jars from the canner with a jar lifter and place on a towel or rack. Do not retighten screw bands. Let the jars set for 12 to 24 hours to cool.

9. Remove screw bands and check lid seals. If the center of the lid is indented, wash, dry, label, and store jars in a clean, cool location. Do not replace screw bands. If a lid is unsealed, the product can be refrigerated or reprocessed as before (check jar for defects and use a new lid).
10. Canned vegetables are best if consumed within a year. Do not consume any product that has lost its vacuum seal during storage.

Low-Acid Vegetables Instructions

Asparagus

Choose tender, tight-tipped spears, 4 to 6 inches long. Wash thoroughly, trim off scales and tough ends; wash again. Cut into 1-inch pieces or leave whole.

Hot Pack: cover with boiling water; boil 2–3 minutes. Pack hot vegetable pieces into hot jars, leaving 1-inch headspace. Fill jar to 1-inch from top with boiling hot cooking liquid or water. Remove air pockets. Wipe jar rims. Adjust lids and process as directed.

Raw Pack: Pack raw vegetable pieces into hot jars, leaving 1-inch headspace. Fill jar to 1-inch from top with boiling water.

Remove air pockets. Wipe jar rims. Adjust lids.

- Process asparagus in pint jars 30 minutes.
- Process asparagus in quart jars 40 minutes.



Beans and Peas, Dry

Select mature, dry seeds. Sort out and discard discolored seeds. Prior to canning, dry beans and peas must be fully rehydrated. Use slow or quick method to hydrate:

Slow Method: Place dried beans or peas in a large pot and cover with fresh water. Soak 8 to 12 hours in a cool place. Drain.

Quick Method: Place dried beans or peas in a saucepan. Cover with boiling water. Boil 2 minutes, remove from heat, soak 1 hour, then drain.

Cover beans soaked by either method with fresh water. Bring to boil, simmer 30 minutes. Fill jars with beans or peas, then add boiling water, leaving 1-inch headspace. Remove air pockets. Wipe jar rims. Adjust lids.

- Process beans in pint jars 75 minutes
- Process beans in quart jars 90 minutes

Refer to publication FNH-00720 Canning Low Acid Food: Legumes for various canning legume recipes.

Beans, Green (Snap, Wax or Italian)

Select tender, crisp pods. Remove and discard diseased and rusty pods. Trim ends. Break or cut into 1-inch pieces or leave whole.

Hot pack: Place beans in large pot. Cover beans with boiling water: boil 5 minutes. Pack into hot jars. Add cooking liquid to 1-inch headspace.

Raw pack: Pack tightly into hot jars. Add boiling water, leaving 1-inch headspace.

Remove air pockets. Wipe jar rims. Adjust lids.

- Process green beans in pint jars 20 minutes.
- Process green beans in quart jars 25 minutes.

Beets

Beets with diameter of 1 to 2 inches may be packed whole. Beets larger than 3 inches in diameter are often fibrous.

Hot pack: Cut off beet tops, leaving an inch of stem and root to reduce color loss. Scrub well. Place in large pot, cover with boiling water. Boil 15 to 25 minutes until skins slide off easily. Cool, remove skins and trim off root and stem. Leave baby beets whole. Cut medium to large beets into ½-inch cubes or slices. Halve or quarter very large slices. Pack into hot jars leaving 1-inch headspace. Add boiling water to 1-inch headspace.

Remove air pockets. Wipe jar rims. Adjust lids.

- Process beets in pint jars 30 minutes.
- Process beets in quart jars 35 minutes.

Carrots

Select small carrots, preferably 1 to 1¼ inch diameter. Large carrots are often very fibrous. Slice or dice.

Hot Pack: Cover carrots with water and bring to boil. Simmer 5 minutes. Pack hot carrots into hot jars to 1-inch headspace, cover with boiling liquid to 1-inch headspace.

Raw Pack: Fill jar tightly with raw carrots. Add boiling water, leaving 1-inch headspace.

Remove air pockets. Wipe jar rims. Adjust lids.

- Process carrots in pint jars 25 minutes.
- Process carrots in quart jars 30 minutes.

Corn, Cream Style

Use ears with slightly immature kernels, ideal for eating. Remove corn husks and silk; wash ears. Blanch ears 4 minutes in boiling water. Cut corn from cob at center of kernel. Scrape remaining corn from cobs with a table knife.

Hot pack: Add 1 cup boiling water for every 2 cups of corn. Bring to boil. Pack hot corn into hot jars leaving 1-inch headspace.

Remove air pockets. Wipe jar rims. Adjust lids.

- Process cream style corn in pint jars 85 minutes.

Corn, Whole Kernel

Use ears with slightly immature kernels, ideal for eating. Remove corn husks and silk; wash ears. Blanch ears 3 minutes in boiling water. Cut corn from cob three fourths the depth of the kernel. Do not scrape the cob.

Hot Pack: Add 1 cup boiling water for every 4 cups of blanched corn kernels; bring to boil. Simmer 5 minutes. Pack hot corn into hot jars to 1-inch headspace. Add boiling hot cooking liquid leaving 1-inch headspace.

Raw pack: Pack blanched kernels into hot jars to 1-inch headspace. Add boiling water leaving 1-inch headspace.

Remove air pockets. Wipe jar rims. Adjust lids.

- Process corn in pint jars 55 minutes.
- Process corn in quart jars 85 minutes.

Greens, including Spinach

Choose freshly harvested greens. Discard wilted, discolored, diseased or insect-damaged leaves. Leaves should be tender and good color.

Hot pack: Wash thoroughly in several changes of water. Cut out tough stems and midribs. Blanch 1 pound greens at a time, until well wilted, about 3

to 5 minutes. Pack hot greens loosely into hot jars. Add boiling water leaving 1-inch headspace.

Remove air pockets. Wipe jar rims. Adjust lids.

- Process greens in pint jars 70 minutes.
- Process greens in quart jars 90 minutes.

Mixed Vegetables

Hot pack: Select a mixture of vegetables (not greens, dried beans, cream-style corn, winter squash or sweet potatoes). Equal portions of carrots, whole kernel sweet corn, cut green beans, lima beans, whole or crushed tomatoes and cubed zucchini are a nice mix. Prepare each vegetable shown in these instructions to prepare each for canning. To include zucchini, wash, trim and dice.

Mix all vegetables together, add boiling water to cover pieces and bring back to boil. Boil 5 minutes. Fill hot vegetables into hot jars, leaving 1-inch headspace. Remove air pockets. Wipe jar rims. Adjust lids.

- Process mixed vegetables in pint jars 75 minutes.
- Process mixed vegetables in quart jars 90 minutes.

Mushrooms

Select brightly colored, small to medium domestic mushrooms with short stems, tight veils (unopened caps) and no discoloration. Do NOT can wild mushrooms.

Hot pack: Trim stems. Soak in cold water 10 minutes to remove dirt. Wash in clean water. Leave small ones whole; slice or quarter larger mushrooms. Cover with water in a saucepan; boil 5 minutes. Pack hot into hot half pint or pint jars to 1-inch headspace. For better color, add ½ teaspoon ascorbic acid per pint. Add boiling water leaving 1-inch headspace. Remove air pockets. Wipe jar rims. Adjust lids.

- Process mushrooms in half-pint or pint jars 45 minutes.

Okra

Select young, tender pods. Discard diseased and rust-spotted pods.

Hot pack: wash and trim ends. Leave whole or cut into 1-inch pieces. Cover with hot water in a saucepan. Boil 2 minutes; drain. Pack hot okra into hot jars to 1-inch headspace. Add boiling water leaving 1-inch headspace. Remove air pockets. Wipe jar rims. Adjust lids.

- Process okra in pint jars 25 minutes.
- Process okra in quart jars 40 minutes.

Onions

Use onions 1-inch diameter or smaller. Wash, peel. Cover with boiling water and bring to boil. Boil 5 minutes. Pack onions into hot jars to 1-inch headspace. Add boiling water leaving 1-inch headspace. Remove air pockets. Wipe jar rims. Adjust lids.

- Process onions in pint or quart jars 40 minutes.

Peas, Green or English

Select well-filled pods with young, tender, sweet peas. Discard diseased pods. Shell and wash.

Hot pack: In a saucepan, cover peas with water. Bring to rolling boil; boil 2 minutes. Pack hot peas loosely into hot jars to 1-inch headspace. Cover with boiling cooking liquid to 1-inch headspace.

Raw pack: Pack peas into hot jars; do not shake or press down. Fill with boiling water leaving 1-inch headspace.

Remove air pockets. Wipe jar rims. Adjust lids.

- Process green peas in pint or quart jars 40 minutes.

Peppers, Hot or Sweet

Bell: Select firm yellow, red and green peppers. Do not use soft or diseased peppers. Wash, drain.

Chile, Jalapeno, other tough-skinned peppers: DO wear rubber gloves while handling chiles. Wash hands thoroughly with soap and water before touching your face. Wash and dry chiles. Slit each pepper on its side to allow steam to escape. Then heat pepper skins using a method below to prepare to peel:

Oven or broiler method: Place peppers in oven 400°F or broiler for 6 to 8 minutes until skins blister.

Range-top method: cover hot burner, either gas or electric, with heavy wire mesh. Place chiles on burner for several minutes until skins blister.

Allow peppers to cool. Place in a pan; cover with damp cloth. After several minutes, peel each pepper. Remove stem and seeds from peppers.

Pimiento: Scald peppers in boiling water, about 10 to 20 minutes, or roast in 400°F oven about 6 to 8 minutes until skins can be rubbed off. Remove skins, stems, blossom ends and seeds. Flatten pimientos.

Other peppers: Remove stems and seeds, blanch 3 minutes.

Hot pack: Leave small peppers whole, quarter large peppers. Pack loosely in hot jars; add boiling water, leaving 1-inch headspace.

Remove air pockets. Wipe jar rims. Adjust lids.

- Process peppers in half-pint or pint jars 35 minutes.

Potatoes, White

Select small to medium-size mature potatoes good to eat. Tubers stored below 45°F may discolor when canned.

Hot pack: Wash, peel, rinse. For packing whole, choose potatoes 1 to 2 inches in diameter. Or, cut

into ½ inch cubes. To prevent darkening, place in solution of 1 teaspoon (3,000 mg) ascorbic acid and 1 gallon water. Drain. Place potatoes in pot of hot water, bring to boil. For whole potatoes, boil 10 minutes; for potato cubes, boil 2 minutes. Drain. Place hot potatoes in hot jars, leaving 1-inch headspace. Add fresh boiling water to 1-inch headspace. Remove air pockets. Wipe jar rims. Adjust lids.

- Process potatoes in pint jars 35 minutes.
- Process potatoes in quart jars 40 minutes.

Sweet Potatoes

Choose small to medium-sized mature potatoes, not too fibrous. Can within 1 to 2 months after harvest.

Hot pack: wash; boil or steam until partially soft, 15 to 20 minutes. Drain. Cool, then remove skins. Cut if needed so pieces are uniform in size. Do NOT mash or puree pieces. Place hot potatoes in hot jars; add fresh boiling water or boiling syrup (refer to FNH-0071-Canning Acidic Foods: Fruits for this recipe) leaving 1-inch headspace. Remove air pockets. Wipe jar rims. Adjust lids.

- Process sweet potatoes in pint jars 65 minutes.
- Process sweet potatoes in quart jars 90 minutes.

Pumpkin

Pumpkins should have a hard rind and stringless, mature pulp, great for cooking fresh. Small sugar or pie pumpkins make better products.

Hot pack: Wash pumpkin and remove seeds. Cut into 1-inch slices, peel. Cut flesh into 1-inch cubes. Add to a pot of boiling water, boil 2 minutes. *Caution: Do NOT mash or puree as density interferes with adequate heat penetration.*

Pack hot cubes into hot jars; add boiling cooking liquid, leaving 1-inch headspace.

Remove air pockets. Wipe jar rims. Adjust lids.

- Process pumpkin in pint jars 55 minutes.
- Process pumpkin in quart jars 90 minutes.

Winter Squash: Acorn, Banana, Buttercup, Butternut, Golden Delicious, Hubbard

A hard rind and stringless, mature pulp is good to can.

Hot pack: Wash squash and remove seeds. Cut into 1-inch slices and peel. Cut flesh into 1-inch cubes. Add to a pot with boiling water. Blanch 2 minutes. Do NOT mash or puree.

Pack hot cubes into hot jars; add boiling cooking liquid leaving 1-inch headspace.

Remove air pockets. Wipe jar rims. Adjust lids.

- Process winter squash in pint jars 55 minutes.
- Process winter squash in quart jars 90 minutes.

Turnips, Rutabagas, Parsnips

Discoloration and strong flavor may occur when canned.

Hot pack: Wash, scrubbing well. Peel, then slice or dice. Place in a pot, cover with boiling water and boil 5 minutes. Pack hot pieces into hot jars to 1-inch headspace; add boiling cooking liquid leaving 1-inch headspace.

Remove air pockets. Wipe jar rims. Adjust lids.

- Process in pint jars 30 minutes.
- Process in quart jars 35 minutes.

Zucchini, Broccoli

The United States Department of Agriculture no longer recommends home canning *plain* zucchini or broccoli. During processing, these vegetables condense at the bottom of the jar making it difficult to determine a safe processing time.

Recipes based on the Complete Guide to Home Canning, Agriculture Information Bulletin No. 539, USDA, revised 2015.

So Easy to Preserve University of Georgia Cooperative Extension: www.uga.edu/setp

Ball Blue Book. Ball Corporation, Consumer Products Division, Consumer Affairs, 345 S. High, Muncie, IN 47305-2326.

References

USDA Complete Guide to Home Canning. Online version: http://www.uga.edu/nchfp/publications/publications_usda.html. Print version: https://mdc.itap.purdue.edu/item.asp?item_number=AIG-539#.VWTLiZRdWrY

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