

1990

## EC90-435 Let's Preserve: Vegetables and Vegetable Products

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# Let's Preserve: Vegetables and Vegetable Products

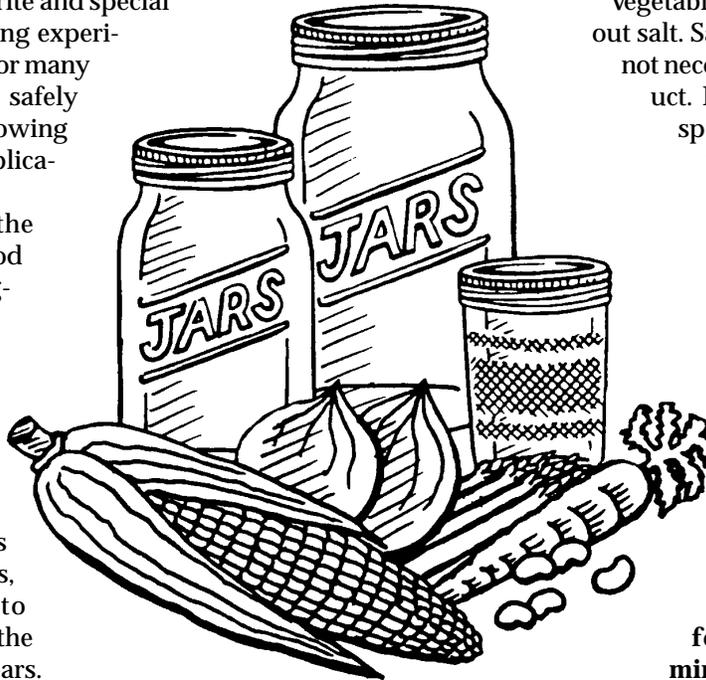
Julie A. Albrecht, Extension Food and Nutrition Specialist

High quality home canned vegetables can add nutrients and variety to your meals throughout the year. Canning favorite and special products can be a rewarding experience and a source of pride for many people. Vegetables can be safely preserved at home by following the procedures in this publication.

Pressure canning is the only recommended method for canning low-acid vegetables. The bacterium *Clostridium botulinum* is destroyed in low-acid foods when they are processed at the correct time and pressure in a pressure canner. These bacteria exist either as spores or as vegetative cells. The spores, which are comparable to plant seed, can survive in the soil and water for many years. When ideal conditions exist for growth, the spores produce vegetative cells which multiply and may produce a deadly toxin within three to four days. Refer to the Extension publication *Let's Preserve: Canning Basics (EC90-434)* for procedures for using a pressure canner, and jar selection, preparation and filling.

If *Clostridium botulinum* bacteria survive and grow inside a sealed jar of food, they can produce a poisonous toxin. Even a taste of food containing this toxin can be fatal. Boiling food 10 minutes at altitudes below 1,000 feet will destroy this toxin. For every additional 1,000 feet of elevation, add one minute to the boiling time.

The processing times for low-acid vegetables in this guide ensure the destruction of *Clostridium botulinum*. Properly sterilized canned food will be free of spoilage if lids seal and jars are stored below 95°F. Canned foods stored at 50°F to 70°F will retain quality.



## Canning Vegetables With or Without Salt

Vegetables can be canned with or without salt. Salt seasons the vegetable but is not necessary for a safely canned product. If salt is desired, add 1/2 teaspoon canning salt to pints or 1 teaspoon canning salt to quarts before you put on the lid. Salt substitutes should only be added at the table.

## Canning Vegetables for Baby Food

Can and store vegetables using the procedures in this publication, omitting the salt. **Do not attempt to can pureed vegetables because proper processing times for pureed foods have not been determined for home use.**

Puree or blend the vegetable immediately before serving. Heat one serving of the blended vegetable to boiling, simmer for 10 minutes, cool and serve. Store unheated, blended portions in the refrigerator and use within two days for best quality. Discard any heated, blended vegetables which were not eaten.

## Vegetable Selection and Preparation

Can fresh vegetables picked from your garden or ones bought from nearby producers when the vegetables are at their peak of quality. For most vegetables, this is within 6 to 12 hours of harvest. Harvest or buy only the amount of vegetables you can preserve in one day. The chart on page 4, *Recommended Process Times for Low Acid Vegetables*, gives approximate amounts of vegetables to fill a standard pressure canner with nine pints or seven



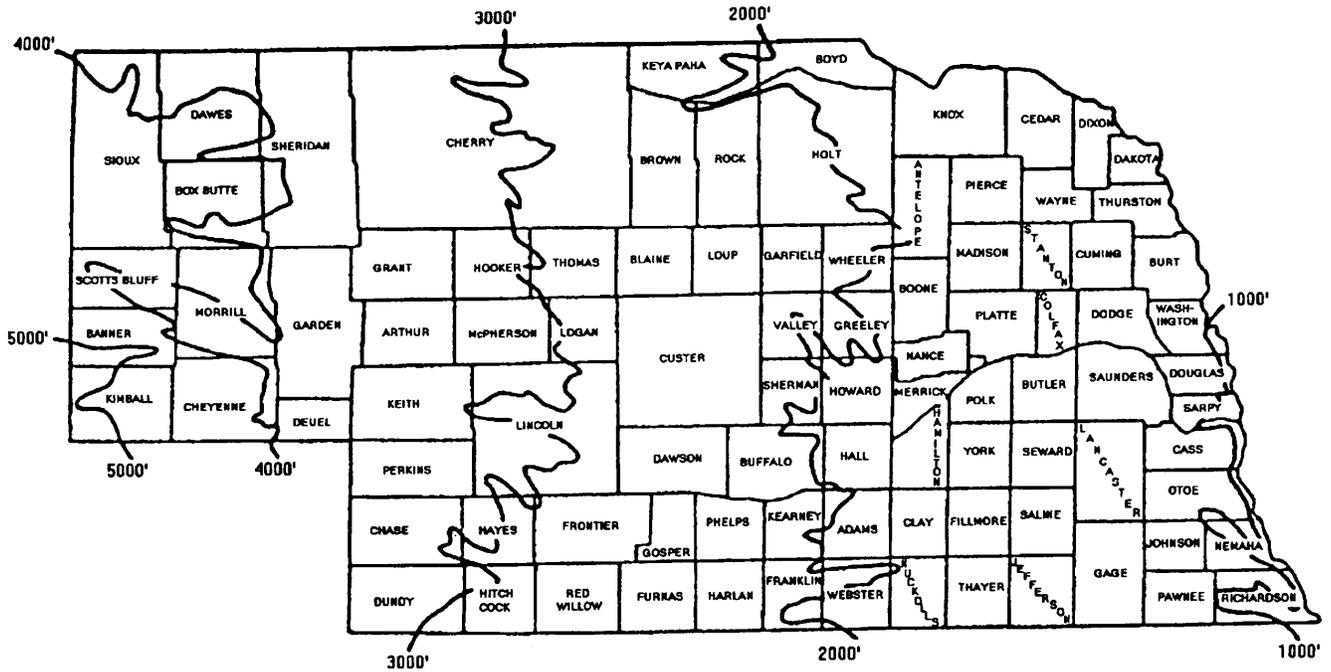


Figure 1. Altitude ranges in Nebraska.

Map was prepared by Les Howard, cartographer, UNL Geography Department

quarts. Specific quality factors and preparation techniques are listed below to help you obtain high quality canned vegetables.

**Determine Your Altitude**

At sea level, water boils at 212°F. With 10 pounds of pressure, water will boil at 240°F, and with 15 pounds of pressure, water will boil at 250°F. The temperature of boiling water is lower at higher elevations than it is at

sea level and foods take longer to cook. Increasing the pressure will raise the boiling temperature of water. To insure safely canned foods at altitudes above sea level, add more pressure as the altitude increases. The map indicates the altitudes for Nebraska in 1,000-foot increments.

Processing times in this publication are based on canner pressure for dial and weighted gauge pressure canners for Nebraska altitudes. Choose the proper pressure for your canner from the chart below.

**Recommended Pressures for Dial and Weighted-Gauge Canners**

Dial Gauge		Weighted-Gauge	
For Altitudes	Use Canner	For Altitudes	Use Canner
		Pressure of:	Pressure of:
Up to 2,000 ft	11 lbs	Up to 1,000 ft	10 lbs
2,001-4,000 ft	12 lbs	Above 1,000 ft	15 lbs
4,001-6,000 ft	13 lbs		

## Recommended Process Times for Low Acid Vegetables\*

Vegetable	Amount needed for:		Quality	Preparation	Hot Pack	Raw Pack	Style of Pack	Jar Size	Process Time
	9 Pints	7 Quarts							
Asparagus	16 lbs	24-114 lbs	Use tender; tight-tipped spears, 4-6" long.	Wash asparagus and trim off scales. Break off tough stems and wash again. Cut into 1" pieces, or can whole.	Cover asparagus with boiling water; boil 3 minutes. Fill jars with asparagus and liquid; leave 1" headspace.	Fill jars with raw asparagus, pack tightly. Add boiling water; leave 1" headspace.	Hot and Raw	Pints Quarts	30 min 40 min
Beans or Peas (shelled, dried)	3-1/4 lbs	5 lbs	Select mature, dry seeds. Sort out and discard discolored seeds.	Place dried beans or peas in a large pot and cover with water. Soak 12 to 18 hours in a cool place. Drain water. To quickly hydrate beans, cover sorted and washed beans with boiling water in a saucepan. Boil 2 minutes, remove from heat, soak 1 hour and drain. Cover beans soaked by either method with fresh water and boil 30 minutes.	Fill jars with beans and liquid; leave 1" headspace.		Hot	Pints	75 min
Dry Beans in Tomato or Molasses Sauce	3-1/4 lbs	5 lbs							
Baked Beans	3-1/4 lbs	5 lbs							
Beans, Lima	18 lb	28 lbs	Select well-filled pods with green seeds. Discard insect-damaged diseased seeds.	Shell beans and wash thoroughly.	Cover lima beans with boiling water. Heat to boiling. Fill jars with lima beans and liquid; leaves 1" headspace.	Fill jars with raw lima beans. Do not pack or shake down. Add boiling water; leave 1" headspace for pints, 1 1/2" headspace for quarts.	Hot and Raw	Pints Quarts	40 min 50 min

\*Pressure canning is the only method recommended for low-acid vegetables.

Vegetable	Amount needed for:		Quality	Preparation	Hot Pack	Raw Pack	Style of Pack	Jar Size	Process Time
	9 Pints	7 Quarts							
Beans, snap, wax or yellow	9 lbs	14 lbs	Select filled but tender, crisp pads. Remove and discard diseased and rusty pads.	Wash beans and trim ends. Leave whole or cut or snap into 1" pieces.	Cover beans with boiling water; boil 5 minutes. Fill jars with beans and liquid; leave 1" headspace.	Tightly fill jars with raw beans. Add boiling water; leave 1" headspace.	Hot and Raw	Pints Quarts	20 min 25 min
Beets (whole, cubed, sliced)	13-1/2 lbs	21 lbs	Beets with a diameter of 1-2" are preferred for whole packs. Beets larger than 3" are often fibrous.	Trim off beet tops, leaving 1" of stem and roots to reduce bleeding color. Scrub well. Cover with boiling water. Boil until skins slip off easily; about 15 to 25 minutes depending on size. Cool, remove skins, and trim off stems and roots. Leave baby beets whole. Cut medium or large beets into 1/2" cubes or slices. Halve or quarter very large slices.	Fill jars with beets. Add fresh boiling water; leave 1" headspace.	Hot Quarts	Pints	30 min 35 min	
Carrots (sliced or diced)	11 lbs	17-1/2 lbs	Select small carrots, preferably 1" to 1-1/4" in diameter. Large carrots are often too fibrous.	Wash, peel, and rewash carrots. Slice or dice.	Cover carrots with boiling water; boil 5 minutes. Fill jars with carrots and liquid; leave 1" headspace.	Tightly fill jars with raw carrots. Add boiling water; leave 1" headspace.	Hot and Raw	Pints Quarts	25 min 30 min

Vegetable	Amount needed for:		Preparation	Hot Pack	Raw Pack	Style of Pack	Jar Size	Process Time
	9 Pints	7 Quarts						
Corn	20 lbs		<p>Husk corn, remove silk, and wash ears. Blanch ears 4 minutes in boiling water.</p> <p>For <b>cream style</b> corn, cut corn from cob at about the center of kernel. Scrape remaining corn from cobs with a table knife</p> <p>For <b>whole kernel</b>, black 3 minutes in boiling water. Cut corn from cob at about two-thirds the depth of kernel.</p>	<p><b>Cream Style</b></p> <p>For each quart of corn, add 2 cups boiling water. Heat to boiling. Fill pints with corn and liquid; leave 1" headspace.</p>		Hot	Pints	85 min
				<p><b>Whole Kernel</b></p> <p>For each quart of corn, add 1 cup boiling water. Boil 5 minutes. Fill jars with corn and liquid; leave 1" headspace.</p>		Hot	and Pints	55 min
Mixed Vegetables	For seven quarts, use 6 cups sliced carrots; 6 cups cut, whole kernel sweet corn 6 cups cut green beans; 6 cups shelled lima beans; 6 cups whole or crushed tomatoes; 4 cups diced zucchini.		<p>Wash and prepare vegetables as described for each vegetable. Combine all vegetables in a large pot or kettle, and add enough water to cover pieces. Boil 5 minutes.</p>	<p>Fill jars with hot pieces and liquid; leave 1" headspace.</p>		Hot	Pints	75 min
				<p>Optional Mix: You may change proportions or substitute other vegetables except leafy greens, dried beans, cream style corn, squash, and sweet potatoes.</p>		Hot	Quarts	90 min
Okra	7 lbs	11 lbs	<p>Select young, tender pods. Remove and discard diseased and rust-spotted pods.</p>	<p>Cover okra with boiling water; boil 2 minutes. Fill jars with okra and liquid; leave 1" headspace.</p>	Hot	Pints	25 min	

<b>Vegetable</b>	<b>Amount needed for:</b>		<b>Quality</b>	<b>Preparation</b>	<b>Hot Pack</b>	<b>Raw Pack</b>	<b>Style of Pack</b>	<b>Jar Size</b>	<b>Process Time</b>
	<b>9 Pints</b>	<b>7 Quarts</b>							
Green Peas (shelled)	20 lbs	31-1/2 lbs	Select filled pads containing young, tender, sweet seeds. Discard diseased pods.	Shell and wash peas.	Cover peas w/ boiling water; boil 2 minutes. Fill jars with peas and liquid; leave 1" headspace.	Fill jars with raw peas. Do not pack or shake down. Add boiling water; leave 1" headspace.	Not Raw	Pints or Quarts	40 min
Peppers	9 lbs		Select firm yellow, green, or red peppers. Do not use soft or diseased peppers. If you choose hot peppers, wear plastic gloves while handling them or wash hands thoroughly with soap and water before touching your face.	Select your favorite pepper(s). Small peppers may be left whole. Large peppers may be quartered. Remove cores and seeds. Slash two or four slits in each pepper, and blanch in boiling water until skins blister. Cool. Place in a pan and cover with damp cloth. After several minutes, peel. Flatten whole peppers.	Fill jars loosely with peppers. Add fresh boiling water; leave 1" headspace.		Hot	Half-Pints or Pints	35 min
Sweet Potatoes (pieces or whole)	11 lbs	17-1/2 lbs	Choose small to medium-potatoes. They should be mature and not too fibrous. Can within 1 to 2 months.	Wash potatoes and boil or steam until partially soft (15 to 20 minutes). Remove skins. Cut medium potatoes, if needed, so that pieces are uniform in size. Do not mash or puree pieces.	Fill jars with sweet potatoes. Add fresh boiling water; leave 1" headspace.		Hot	Pints or Quarts	65 min 90 min

Vegetable	Amount needed for: 9 Pints	7 Quarts	Quality	Preparation	Hot Pack	Raw Pack	Style of Pack	Jar Size	Process Time
White Potatoes	22-1/2 lbs	35 lbs	Select small to medium-sized mature potatoes of ideal quality for cooking. Tubers stored below 45°F may discolor when canned. Choose potatoes 1-2 in diameter if they are to be packed whole.	Wash and peel potatoes. To prevent browning during preparation, put peeled, whole or cubed potatoes into cold water containing ascorbic acid. Purchase -milligram vitamin C tablets, crush and dissolve 6 tablets per gallon of water. If desired, cut potatoes into 1/2" tubes. Drain.	Fill jars with potatoes. Add fresh boiling water; leave 1" headspace.		Hot	Pints	35 min
								Quarts	40 min
Pumpkins and Winter Squash (cubed)	10 lbs	16 lbs	Pumpkins and squash have a hard rind and stringless, mature pulp of ideal quality for cooking fresh. Small size pumpkins make better products.	Wash, remove seeds, cut into 1" wide slices, and peel. Cut flesh into 1" tubes. <b>Do not mash or puree.</b>	Cover tubes with boiling water; boil 2 minutes. Fill jars with cubes and liquid; leave 1" headspace.		Hot	Pints	55 min
				Cook 2 minutes in boiling water and drain again. For whole potatoes, boil 10 minutes and drain				Quarts	90 min
Soups (Veg. dried bean/pea, meat, poultry, seafood)	Procedure: Select, wash, and prepare vegetables, meat, and seafoods as described for each specific food. Cover meat with water and cook until tender. Cool meat and remove bones. Cook vegetables. 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 and combine with meat broth, tomatoes, or water to cover. Boil 5 minutes. <b>DO NOT THICKEN.</b>				Fill jars halfway with solid mixture. Add remaining liquid; leave 1" headspace.		Hot	Pints	60* min
								Quarts	75* min
Squash (Zucchini)	Summer squash have soft rind. Choose young squash with tender skin for high quality products.	Summer squash have soft rind. Choose young squash with tender skin for high quality products.		Wash, trim ends, <b>do not peel.</b> Cut into 1/2" slices, halve or quarter.	Cover squash with hot water; boil 3 minutes. Fill jars loosely with squash and liquid; leave 1" head space.	Tightly fill jars with squash pieces. Add boiling water; leave 1" headspace.	Hot and Raw	Pints	30 min
								Quarts	40 min

## Dry Beans, With Tomato or Molasses Sauce

**Procedure:** Sort and wash dry beans. Add 3 cups of water for each cup of dried beans or peas. Boil 2 minutes, remove from heat and soak 1 hour and drain. Add fresh water, heat to boiling and save this liquid for making the sauce. Make one of the following sauces:

### **Tomato Sauce** (Option 1)

**Mix:** 1 quart tomato juice  
3 tablespoons sugar  
2 teaspoons salt  
1 tablespoon chopped onion  
1/4 teaspoon ground cloves  
1/4 teaspoon allspice  
1/4 teaspoon mace  
1/4 teaspoon cayenne pepper

Heat to boiling. Add 3 cups cooking liquid from beans and bring back to boiling.

### **Tomato Sauce** (Option 2)

**Mix:** 1 cup ketchup  
with 3 cups cooking liquid  
Heat to boiling.

### **Molasses Sauce**

**Mix:** 4 cups water or cooking liquid from beans  
3 tablespoons dark molasses  
1 tablespoon vinegar  
2 teaspoons salt  
3/4 teaspoon powdered dry mustard

Heat to boiling.

**Procedure:** Fill jars three-fourths full with hot beans. Add a 3/4-inch cube of lean pork, ham, or bacon to each jar, if desired. Fill jars with heated sauce; leave 1-inch headspace. (Refer to chart on page 3 for *Recommended Process Times for Low Acid Vegetables* for processing times.)

## Baked Beans

**Procedure:** Prepare beans according to directions under Dry Beans, With Tomato or Molasses Sauce. Place seven 3/4-inch pieces of lean pork, ham, or bacon in an earthenware crock, a large casserole, or a pan. Add beans and enough molasses sauce (see previous recipe) to cover beans. Cover and bake 4 to 5 hours at 350°F. Add water as needed - about every hour. Fill jars; leave 1-inch headspace. (Refer to chart on page 3 for recommended process times for low acid vegetables.)

## References

Complete Guide to Home Canning. Agriculture Information Bulletin 539, U.S. Government Printing Office. 1988.

“So Easy To Preserve” Georgia Cooperative Extension Service, 1988.



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