

## CAUTION

Because vegetables are naturally low in acid, canning them requires special precautions that differ from those followed when canning high-acid fruits. Growth of micro-organisms particularly must be avoided. Some bacteria cause food spoilage, while others produce toxins that cause illness or death. For example, *Clostridium botulinum* is a harmless bacteria in air. However, in little or no acid, an air-free canning jar, and temperatures between 40 and 120°F, this bacteria grows and produces a deadly toxin that can cause serious damage to the central nervous system or death when eaten in even minute amounts.

Pressure processing is the only safe way to can vegetables and other non-acid foods. Boiling water produces steam. Steam under pressure raises the temperature much higher than it normally would be without pressure. To prevent botulism, the internal temperature of canned vegetables and other non-acid foods must reach 240°F. This guide provides the correct processing times and canner pressures for canning vegetables safely in New Mexico.

To prevent the risk of botulism, low-acid and tomato foods not canned according to the 1994 USDA recommendations in this guide should be boiled even if no signs of spoilage are detected. Boil food for a full 10 minutes at altitudes below 1,000 feet. Add an additional minute of boiling time for each 1,000 of feet elevation. Boiling destroys botulism toxin. If in doubt, always boil foods before tasting.

At altitude (ft)	Boil foods (minutes)
2,000–2,999	12
3,000–3,999	13
4,000–4,999	14
5,000–5,999	15
6,000–6,999	16
7,000–7,999	17
8,000–8,999	18
9,000–9,999	19

## SELECTING VEGETABLES

Select freshly harvested, tender vegetables that are free of bruises, blemishes, or signs of disease or decay. To avoid waste, prepare only the quantity of vegetables that will fill the number of jars that can fit into the canner. See the chart below for recommended quantities of food.

## SALT

If desired, add 1/2 teaspoon of salt per pint or 1 teaspoon salt per quart. Salt may be omitted, as it is used only for flavor. For best results, do not use salt substitutes for canning, as heat causes some substitutes to become bitter or develop a metallic taste. Instead, add salt substitutes just before serving.

### Estimated amounts (in pounds) of vegetables necessary for a pressure-canner load

Vegetable	Canner load	
	9 pints	7 quarts
Asparagus	16	24-1/2
Beans or peas (shelled or dried)	3-1/4	5
Fresh lima beans	18	28
Beans (green)	9	14
Beets (without tops)	13-1/2	21
Carrots	11	17-1/2
Corn (cream style)	20	*
Corn (whole kernel)	20	31-1/2
Mushrooms	7-1/2 <sup>1</sup>	14-1/2 <sup>2</sup>
Okra	7	11
Peas (green, English, shelled)	20	31-1/2
Peppers (hot or sweet)	9	*
Potatoes	22-1/2	35
Pumpkin	10	16
Spinach and other greens	18	28
Sweet potatoes	11	17-1/2

<sup>1</sup>Makes 9 half-pints

<sup>2</sup>Makes 9 pints

\*Not recommended

## GENERAL CANNING PROCEDURES

Use regular and wide-mouth Mason jars with self-sealing lids held in place by screw-on metal bands. The bands hold the lids in place during the processing and cooling periods.

Mason jars are made from tempered glass to resist high temperatures. Jars are available in 1/2 pint, pint, 1-1/2 pint, and quart sizes. Larger jars are not recommended for home canning.

Inspect jars carefully for cracks or chips and discard faulty ones. Wash jars in hot, soapy water and rinse thoroughly or in the dishwasher. Keep jars hot in the dishwasher, a sink of hot water, or in a warm oven until they are filled.

Check metal screw bands for signs of rust or dents. Discard badly corroded or dented bands. Use only new lids and follow manufacturer's directions for preparing lids for canning.

Vegetables may be hot or cold packed. However, blanching for 3–5 minutes forces air from vegetables, resulting in better color and more space for food in the jar. Pack food loosely and add hot liquid, usually water. Leave a 1-inch headspace. Using a rubber or plastic spatula, slice between the food and the jar to ease out trapped air bubbles.

Use a clean, damp cloth or paper towel to wipe the rim and threads of each jar. Put on a new lid with a screw-on metal band to hold it in place; tighten comfortably. Process using a pressure canner.

### Follow These Steps for Successful Pressure Canning

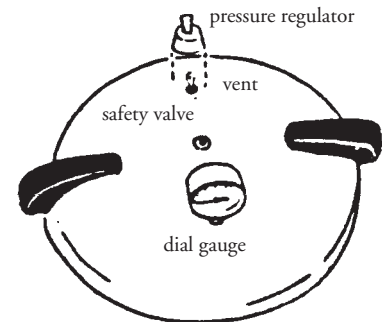
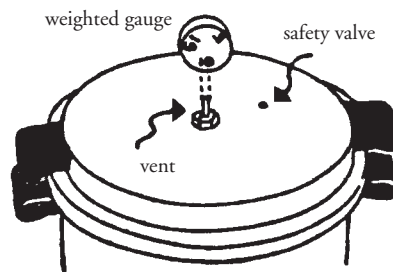
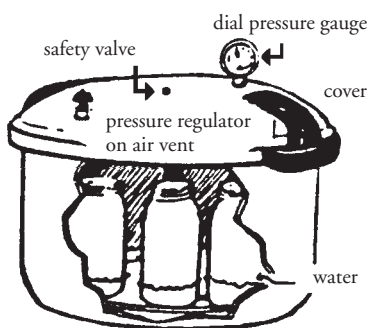
1. Put 2–3 inches of hot water in the canner. Place filled jars on the rack using a jar lifter. Fasten canner lid securely.
2. Leave weight off vent port or open petcock. Heat at the highest setting until steam flows from the petcock or vent port.
3. Maintain high heat setting, exhaust steam 10 minutes, and then place weight on vent port or close pet-

cock. The canner will pressurize during the next 3–5 minutes.

4. Start timing the process when the pressure reading on the dial gauge indicates that the recommended pressure has been reached, or when the weighted gauge begins to jiggle or rock.
5. Regulate heat under the canner to maintain a steady pressure at or slightly above the correct gauge pressure. Quick and large pressure variations during processing may cause unnecessary liquid losses from jars. Weighted gauges on Mirro canners should jiggle about 2 or 3 times per minute. Gauges on Presto canners should rock slowly throughout the process.
6. When the timed process is completed, turn off the heat, remove the canner from heat if possible, and let the canner depressurize. Do not force-cool the canner. Force cooling may result in food spoilage. Cooling the canner with cold running water or opening the vent port before the canner is fully depressurized will cause loss of liquid from jars and seal failures. Force-cooling also may warp the canner lid of older model canners, causing steam leaks. Depressurization of older models should be timed. Standard-size heavy-walled canners require about 30 minutes when loaded with pints and 45 minutes with quarts. Newer thin-walled canners cool more rapidly and are equipped with vent locks. These canners are depressurized when their vent lock piston drops to a normal position.
7. After the canner is depressurized, remove the weight from the vent port or open the petcock. Wait 2 minutes, unfasten the lid, and remove it carefully. Lift the lid away from you so that the steam does not burn your face.
8. Remove jars with a lifter, straight up without tipping and place on towel or cooling rack, if desired.

Do not touch lid or ring until completely cooled.

Dial gauges on pressure canners should be checked annually to make sure they are accurate.



## **Test for Jar Seals**

Remove screw bands when jars have cooled (12–24 hours) and test for vacuum seals by these methods:

- Press the lid center with finger. If the lid springs up when released, it is not sealed.
- Tap the lid with a teaspoon. A sealed jar lid will make a ringing sound.
- Hold the jar at eye level and look across the lid. A sealed jar lid curves down slightly in the center.

## **Reprocessing Unsealed Jars**

Remove lids from unsealed jars and discard. Check sealing surface of jar for tiny nicks or cracks. If the jar has defects, discard it and replace with another jar. If not, add a new lid and process for the same amount of time within 24 hours. Unsealed jars can be kept in the refrigerator and the food used within 3–4 days, or remove about an inch of the contents and freeze.

## **Storing Canned Food**

Clean the outsides of sealed, cooled jars. Label with date and contents and store in a cool (50–70°F), dark, dry place away from sun, light, or dampness. Vegetable products are best if eaten within one year.

## **Accidental Freezing**

Freezing may cause food in jars to spoil if jars become unsealed. Freezing and thawing cause food to soften and lose eating quality. Protect jars from freezing by wrapping with layers of newspapers.

## **If Canned Food Spoils**

Examine jars carefully before tasting vegetables. Check lids for a vacuum seal. NEVER taste food from an unsealed jar.

Signs of food spoilage are streaks and dried food at the top of the jar, swollen lids, broken jar seals, rising air bubbles, and any unnatural color. Other indicators include bad or unnatural odor; spurting liquid; white, blue, green, or black mold; or foaming.

Dispose of any food you suspect of being spoiled. For safety, spoiled canned food and containers may need to be detoxified before disposal. Contact your county Extension office for detoxification instructions.

## **Altitude Adjustments**

All communities in New Mexico are above sea level, varying from 3,000 to 10,000 feet with differences even within a county.

Use the chart on page 7 of this guide to determine the elevation of your community and then select safe processing times for canning your vegetables. The boiling temperature of liquids is lower at higher elevations, therefore food must be processed longer or at a higher pressure at high altitudes.

## Home Canning of Vegetables

**Note: The following instructions are for dial gauge pressure canners. When using a pressure canner with a weighted gauge in New Mexico, use the 15-pound weight and the time periods given.**

Vegetable	Pack	Directions	Jar size	Processing time	Pounds of pressure for altitude of			
					2,001–4,000 ft	4,001–6,000 ft	6,001–8,000 ft	8,001–10,000 ft
					-----pounds-----			
Asparagus	Hot	Wash, trim off scales. Snap off tough stems. Wash again. Can whole or in 1-inch pieces. Cover asparagus with boiling water. Boil 2 or 3 minutes. Fill jar loosely with hot asparagus, leaving a 1-inch headspace. Add boiling water leaving a 1-inch headspace. Add 1 teaspoon salt if desired. Adjust lids as previously stated and process.	Pint	30	12	13	14	15
			Quart	40				
	Raw	Fill jar with raw asparagus. Pack tightly without crushing. Add boiling water. Leave a 1-inch headspace. Add salt if desired.	Same					
Beans: Dry	Hot	Sort dried beans or peas. Wash, place in a large pot, and cover with water. Boil 2 minutes, remove from heat, soak for 1 hour. Drain. Cover soaked beans with fresh water and boil 30 minutes. Fill jars with beans or peas. Add cooking water, leaving a 1-inch headspace. Add 1/2 teaspoon salt per pint or 1 teaspoon per quart, if desired. Adjust lids and process.	Pint	75	12	13	14	15
			Quart	90				
Beans: Fresh Lima	Hot	Shell beans, wash thoroughly. Cover beans with boiling water and heat to boil. Fill jars loosely. Add boiling water and leave 1-inch headspace. Add 1/2 teaspoon salt per pint or 1 teaspoon per quart if desired. Adjust lids and process.	Pint	40	12	13	14	15
			Quart	50				
Beans: Fresh Green, Italian, snap, wax	Hot	Cover with boiling water. Boil 5 minutes. Fill jars loosely. Add cooking water. Leave a 1-inch headspace. Add 1 teaspoon salt per quart if desired. Adjust lids and process.	Pint	20	12	13	14	15
			Quart	25				
	Raw	Fill jars tightly with raw beans, leaving a 1-inch headspace. Add boiling water leaving a 1-inch headspace. Add salt if desired. Adjust lids and process.	Same					
Beets: Whole, cubed, sliced	Hot	Trim off tops, leaving 1 inch of stems and roots to reduce bleeding. Scrub well. Cover with boiling water and boil until skins slip off—15 to 25 minutes, depending on size. Cool. Remove skins, trim off stems and roots. Leave baby beets whole. Cut medium or large beets into 1/2-inch cubes or slices. Fill jars with hot beets and fresh hot water. Leave a 1-inch headspace. Add 1 teaspoon canning salt if desired. Adjust lids.	Pint	30	12	13	14	15
			Quart	35				
Carrots: Sliced or diced	Hot	Wash, peel, rewash carrots. Slice or dice. Cover with boiling water. Bring to boil and simmer 5 minutes. Fill jars of carrots leaving a 1-inch headspace. Add boiling water or cooking liquid leaving a 1-inch headspace. Add salt if desired. Adjust lids.	Pint	25	12	13	14	15
			Quart	30				

Vegetable	Pack	Directions	Jar size	Processing time	Pounds of pressure for altitude of			
					2,001-4,000 ft	4,001-6,000 ft	6,001-8,000 ft	8,001-10,000 ft
				minutes	-----pounds-----			
Carrots (cont'd)	Raw	Fill jars tightly with raw carrots, leaving a 1-inch headspace. Add hot water leaving a 1-inch headspace and add salt if desired. Adjust lids and process.	Same					
Corn: Cream style	Hot	Select ears of slightly immature corn. Shuck corn, remove silk, wash ears. Blanch ears 4 minutes in boiling water. Cut corn from cob at about the center of kernel. Scrape ears with knife. Add 2 cups of boiling water to each quart of corn and corn scrapings and heat to boiling. <i>Fill pints only.</i> Leave a 1-inch headspace. Add salt if desired. Adjust lids and process.	Pint*	85	12	13	14	15
Corn: Whole kernel	Hot	Select slightly immature ears of sweet corn. Too immature corn tends to become brown. Shuck, remove silk, and wash ears. Blanch 3 minutes in boiling water. Cut about three-fourths of kernel depth. To each 4 cups of kernels, add 1 cup of water and heat to boiling. Simmer 5 minutes Add 1 teaspoon salt if desired. Fill jars with corn and cooking liquid. Leave a 1-inch headspace.	Pint Quart	55 85	12	13	14	15
Mushrooms  CAUTION: Do <i>not</i> can wild mushrooms.	Hot	Select domestic small- to medium-sized mushrooms with bright color, short stems, and unopened caps. Trim stems. Soak in cold water 10 minutes to remove dirt. Wash in clean water. Leave small mushrooms whole, but cut large ones. Cover with water in a saucepan and boil 5 minutes Fill jars with hot mushrooms and add fresh hot water. Add 1/8 teaspoon ascorbic acid powder for better color. Leave a 1-inch headspace. Adjust lids and process.	1/2-pint* Pint*	45 45	12	13	14	15
Okra	Hot	Select young, tender pods. Discard any pods with rust spots. Wash and trim pods. Cut into 1-inch pieces or leave whole. Cover with hot water, boil 2 minutes, and drain. Fill jars loosely with hot okra and cooking liquid. Leave a 1-inch headspace. Add 1 teaspoon of salt if desired. Adjust lids and process.	Pint Quart	25 40	12	13	14	15
Peas: Shelled, green, English  Note: Snow, sugar, and snap peas are not recommended because they can poorly.	Hot  Raw	Select pods filled with young, tender, sweet seeds. Shell and wash peas. Cover with boiling water. Bring to boil and boil 2 minutes Fill jars loosely with hot peas. Add cooking liquid. Leave a 1-inch headspace. Add salt if desired. Fill jars loosely with raw peas and add boiling water. Leave a 1-inch headspace. Do not pack, shake, or press down. Add salt if desired. Adjust lids.	Same  Pint Quart	  40 40	  12	  13	  14	  15

cont'd...

Vegetable	Pack	Directions	Jar size	Processing time	Pounds of pressure for altitude of			
					2,001–4,000 ft	4,001–6,000 ft	6,001–8,000 ft	8,001–10,000 ft
				minutes	-----pounds-----			
Peppers: Hot or sweet (including green chiles)	Hot	Select firm peppers. Wash, dry, and pierce each pepper. Peppers must be blanched in boiling water or blistered in an oven or broiler. Allow peppers to cool. Peel. Remove stems, cores, and seeds. Quarter large peppers. Small peppers can be flattened and left whole. Fill jars loosely with peppers. Add boiling water. Add salt if desired. Leave a 1-inch headspace. Adjust lids and process.  <b>CAUTION:</b> Hot peppers may irritate hands. Use plastic gloves or avoid flesh of peppers. Keep hands away from eyes, face, and small children.	1/2-pint* Pint*	35	12	13	14	15
Potatoes: White	Hot	Select potatoes 1–2 inches in diameter. (May become discolored if stored below 45°F.) Wash, peel, cube if desired. Place in ascorbic acid solution. Drain. Boil 2 minutes if cubed, 10 minutes if whole. Discard water. Fill jars with hot potatoes and fresh water. Leave a 1-inch headspace. Add salt if desired. Adjust lids and process.	Pint Quart	35 40	12	13	14	15
Pumpkin or winter squash	Hot	Select hard-rind pumpkins or squash. Stringless and small are better. Wash, remove seeds, slice, peel and cut into 1-inch cubes. Boil in water to cover 2 minutes. Fill jars with cubes and cooking liquid. Leave a 1-inch headspace. Add salt if desired. Adjust lids and process.  <b>CAUTION: Do not puree or mash.</b>	Pint Quart	55 90	12	13	14	15
Spinach or other greens	Hot	Can only freshly harvested, tender, evenly colored greens that are free of disease or insect damage. Cut away tough stems and midribs and wash small amounts at a time. Lift from water and repeat until water is clear and free of grit. Steam about 1 pound of spinach in blancher basket or cheesecloth bag for 3–5 minutes or until wilted. Loosely fill jars with hot spinach and cover with fresh boiling water, leaving a 1-inch headspace. Add 1/4 teaspoon salt to pints and 1/2 teaspoon to quarts. Wipe jar rims, adjust jar lids, and process.	Pint Quart	70 90	12	13	14	15
Sweet potatoes: Cubed or whole	Hot	Select small- or medium-sized sweet potatoes that are mature but not fibrous. Can them within 2 months of harvest. Wash and boil (15–20 minutes). Remove skins. Cut into uniform pieces. Fill jars loosely with potatoes. Add boiling water, leaving a 1-inch headspace. Adjust lids and process.  <b>CAUTION: Do not dry pack, mash, or puree.</b>	Pint quart	65 90	12	13	14	15
Vegetables: Mixed	Hot	Combine 6 cups each of the following vegetables: sliced carrots, whole kernel corn, cut green beans, shelled lima beans; 4 cups chopped tomatoes, cubed or sliced zucchini. Wash and prepare vegetables as described in this publication. Combine all vegetables in a large pot. Add water to cover and boil 5 minutes. If desired, add 1 teaspoon salt to each quart or 1/2 teaspoon per pint and fill jars with hot vegetables and liquid. Leave a 1-inch headspace. Adjust lids and process.	Pint Quart	75 90	12	13	14	15

## Elevations of Cities and Towns in New Mexico

City/Town	Elevation (ft)	City/Town	Elevation (ft)
Alamogordo	4,350	Las Vegas	6,450
Albuquerque	5,000	Logan	3,830
Artesia	3,350	Lordsburg	4,250
Aztec	5,650	Los Alamos	7,400
Bayard	5,800	Los Ranchos de Albuquerque	4,950
Belen	4,800	Lovington	3,900
Bernalillo	5,050	Magdalena	6,556
Bosque Farms	4,864	Melrose	4,599
Carlsbad	3,100	Mora	7,200
Carrizozo	5,450	Mosquero	5,550
Chama	7,900	Mountainair	6,500
Cimarron	6,450	Portales	4,010
Clayton	5,050	Raton	6,650
Cloudcroft	8,650	Reserve	5,749
Clovis	4,300	Rio Rancho	5,290
Columbus	4,020	Roswell	3,600
Corona	6,664	Roy	5,900
Corrales	5,005	Ruidoso	7,000
Cuba	7,000	San Jon	4,200
Deming	4,300	Santa Fe	7,000
Dexter	3,500	Santa Rita	6,300
Eagle Nest	8,250	Santa Rosa	4,600
Elida	4,345	Silver City	5,900
Española	5,600	Socorro	4,600
Estancia	6,100	Springer	5,800
Farmington	5,400	Taos	7,000
Fort Sumner	4,050	Texico	4,150
Gallup	6,500	Tierra Amarilla	7,460
Grants	6,450	Truth or Consequences	4,250
Hobbs	3,650	Tucumcari	4,100
Hurley	5,700	Tularosa	4,500
Jemez Springs	6,200	Vaughn	5,950
Las Cruces	3,900	Wagon Mound	6,200

This publication is intended for use by individuals with a basic understanding of canning procedures. For more detailed information consult the *USDA Complete Guide to Home Canning*, which is available through your local county Extension office.

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