



National Center for Home Food Preservation



Using Boiling Water Canners

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Most boiling water canners are made of aluminum or porcelain-covered steel; at least one stainless steel model is also available. Boiling water canners have fitted lids and removable racks that are either perforated or shaped wire racks. The canner must be deep enough so that at least one inch of briskly boiling water will be over the tops of jars during processing. Some boiling water canners do not have completely flat bottoms; these will not work well on smooth top ranges. The canner bottom should also be fairly flat for use on electric burners. Either a flat or ridged bottom may be used on a gas burner. To ensure uniform processing of all jars with an electric range, the canner should be no more than 4 inches wider in diameter than the element on which it is heated. (When centered on the burner or element, the canner should not extend over the edge of the burner or element by more than 2 inches on any side.) Before canning on a smooth top range, check the range manufacturer's advice on suitability for canning and recommended maximum canner size for specific burners.

Follow these steps for successful boiling water canning:

(Read through all the instructions before beginning.)

1. Before you start preparing your food, place canner rack in the bottom of a boiling water canner. Fill the canner half full with clean warm water for a canner load of pint jars. For other sizes and numbers of jars, you will need to adjust the amount of water so it will be 1 to 2 inches over the top of the filled jars.
2. Center the canner over the burner and preheat the water to 140 degrees F. for raw-packed foods and to 180 degrees F. for hot-packed foods. You can begin preparing food for your jars while this water is preheating.
3. Load filled jars, fitted with lids and ring bands, into the canner one at a time, using a jar lifter. When moving jars with a jar lifter, make sure the jar lifter is securely positioned below the neck of the jar (below the ring band of the lid). Keep the jar upright at all times. Tilting the jar could cause food to spill into the sealing area of the lid.

If you have a shaped wire rack that has handles to hold it on the canner sides, above the water in the canner, you can load jars onto the rack in the raised position and then use the handles to lower the rack with jars into the water.

4. Add more boiling water, if needed, so the water level is at least one inch above the jar tops. Pour the water around the jars and not directly onto them. For process times over 30 minutes, the water level should be 2 inches above the jars.
5. Turn the heat setting to its highest position, cover the canner with its lid and heat until the water boils vigorously.
6. Set a timer (after the water is boiling) for the total minutes required for processing the food.
7. Keep the canner covered for the process time. The heat setting may be lowered as long as a gentle but complete boil is maintained for the entire process time.
8. Add more *boiling* water during the process, if needed, to keep the water level above the jar tops. Pour the water around the jars and not directly onto them.
9. If the water stops boiling at any time during the process, turn the heat on its highest setting, bring the water back to a vigorous boil, and begin the timing of the process over, from the beginning (using the total original process time).
10. When the jars have been processed in boiling water for the recommended time, turn off the heat and remove the canner lid. Wait 5 minutes before removing jars to allow the canner contents to settle. This waiting period is not required for safety of the food when using USDA or University of Georgia processing times, however.
11. Using a jar lifter, remove the jars one at a time, being careful not to tilt the jars. Carefully place them directly onto a towel or cake cooling rack, leaving at least one inch of space between the jars during cooling. Avoid placing the jars on a cold surface or in a cold draft.
12. Let the jars sit undisturbed while they cool, from 12 to 24 hours. Do *not* tighten ring bands on the lids or push down on the center of the flat metal lid until the jar is completely cooled.
13. Remove ring bands from sealed jars. Put any unsealed jars in the refrigerator and use first.
14. Wash jars and lids to remove all residues.
15. Label jars and store in a cool, dry place out of direct light.

Making Pickles

Fact Sheet No. 9.304

Food and Nutrition Series | Preservation

by P. Kendall and C. Schultz*

The many varieties of pickled and fermented foods are classified by types of ingredients and method of preparation. Regular dill pickles and sauerkraut are fermented and cured for about three weeks, refrigerator dills for about one week. During curing, colors and flavors change and acidity increases. Fresh-pack or quick-process pickles are not fermented; they are brined several hours to overnight, then drained and covered with vinegar and seasonings. Fruit pickles usually are prepared by heating fruit in a seasoned syrup acidified with either lemon juice or vinegar. Relishes are made from chopped fruits and vegetables that are cooked with seasonings and vinegar.

Ingredients

Cucumbers. Cucumbers grown for pickling will yield the best product. Seed catalogs are a good source of information about suitable varieties. Select firm cucumbers of the appropriate size: about 1 1/2 inches for gherkins and 4 inches for dills. Use odd-shaped and more mature cucumbers for relishes and bread-and-butter style pickles. Pick cucumbers early in the day to help prevent a bitter flavor. Do not purchase commercially waxed cucumbers for pickling – acid or salt will not penetrate them properly.

Other fruits and vegetables. Select fresh, tender vegetables and fresh, firm fruits that are free of blemishes. Use as soon as possible after picking. If the fruits or vegetables cannot be used within one or two hours after harvesting, refrigerate without washing or spread in a cool, well-ventilated place. Thoroughly wash all fruits and vegetables just before

pickling. Remove and discard a 1/16-inch slice from the blossom end of fresh cucumbers. Blossoms may contain an enzyme that causes excessive softening.

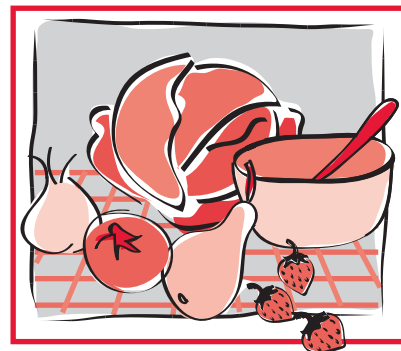
Salt. Use noniodized canning or pickling salt. Noncaking materials added to other salts may make the brine cloudy. Because flake salt varies in density, it is not recommended for making pickled and fermented foods. For information on reduced-sodium pickles, see fact sheet [9.302, *Food Preservation Without Sugar or Salt*](#).

Vinegar. Use a high-grade cider or white distilled vinegar of 5 percent acidity (50 grain). Use white distilled vinegar with light-colored fruits and vegetables to retain their light color. Do not use homemade vinegars or vinegars of unknown acidity.

Spices. Spices lose their flavor quickly. For best results, always use fresh spices in canning or pickling.

Caution

The level of acidity in a pickled product is as important to its safety as it is to taste and texture. There must be a minimum, uniform level of acid throughout the mixed product to prevent the growth of botulinum bacteria. Use only recipes with tested proportions of ingredients. Do not alter vinegar, food or water proportions in the recipe or use a vinegar with unknown acidity.



Quick Facts

- Use only fresh, blemish-free fruits and vegetables and up-to-date, research-based recipes.
- Use pure, granulated, noniodized canning or pickling salt, high-grade vinegar of 5 percent acidity, and fresh spices.
- Process pickled products in a boiling water bath for the altitude-adjusted length of time stated in the recipe.
- Store processed pickles in a dark, cool, dry place.
- Pickles may spoil if untested recipes, poor quality ingredients, or poor canning methods and equipment are used.

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Processing

Pickling means increasing the acidity of a product so that food poisoning organisms, such as *Clostridium botulinum*, do not grow and produce toxin. This may be done through a fermentation process and/or by the direct addition of an acid ingredient, such as vinegar or lemon juice. With either method, follow a reliable recipe to ensure proper acidification.

Once the produce has been properly acidified, take steps to prevent spoilage from microorganisms that thrive in an acid environment and to inactivate enzymes that may affect flavor, color and texture. Refrigeration is an acceptable short-term (up to six months) storage method for fully fermented products such as sauerkraut and long-brined dills. Canning is a better way to store fully fermented pickles and sauerkraut and is the **only** recommended procedure for fresh-pack pickle products. Processing times and procedures vary according to food acidity and the size of food pieces.

Boiling Water Bath

To process in a boiling water bath, pack the fruit or vegetables into clean, hot glass canning jars according to recipe directions. Pickles processed less than 10 minutes at sea level need to be packed into hot, sterilized jars; see below. Release air bubbles by inserting a flat plastic (not metal) spatula between the food and jar. Slowly turn jar and move spatula up and down to release air bubbles. Adjust headspace, then

Table 1. Processing time adjustments for altitude.

Altitude (feet)	Increase in sea level processing time	
	20 mins. or less (minutes)	More than 20 mins. (minutes)
1,000	1	2
2,000	2	4
3,000	3	6
4,000	4	8
5,000	5	10
6,000	6	12
7,000	7	14
8,000	8	16
9,000	9	18
10,000	10	20

clean jar rim with a dampened paper towel.

Place lid, gasket side down, on jar sealing surface and add screw band. Follow the lid manufacturer's directions for preparing and tightening the jar lids properly. Place jars on rack of canner or deep kettle half filled with hot (140 degrees F) water for raw-packed foods or very hot (180 degrees) for hot-packed foods. Add more boiling water, if needed, so the water level is at least 1 inch above jar tops. Turn heat to its highest position until water boils vigorously.

Cover canner, set timer for processing time required, and adjust heat setting to maintain a gentle boil throughout the process schedule, including the necessary adjustment for altitude (Table 1). The recipes in this fact sheet have been adjusted for use at altitudes of 1,001 to 10,000 feet. When only sea level processing time is given, use Table 1 to make the necessary increase in processing time.

To sterilize empty jars, place right side up on rack in boiling water bath canner. Fill canner and jars with hot water to 1 inch above jar tops. Boil 10 minutes plus 1 minute per 1,000 feet above sea level. Remove jars, drain and fill with product. Save hot water for processing filled jars.

Storage

When processing time is complete, remove jars and place upright about 2 inches apart on wire racks or towels. Let cool, undisturbed, for 12 to 24 hours.

Before storing, remove the screw bands of two-piece lids, recheck the seals and wipe the jars clean. Then label the jars with the name of the product, processing method used and date.

Store pickled products in a cool, dark, dry place where there is no danger of freezing.

Spoilage

Soft, slippery or slimy pickles are spoiled and should be destroyed so spoiled contents cannot be eaten by people or animals. Problems such as insufficient heat treatment and poor

Equipment

A 1-gallon container that does not react with acid is needed for each 5 pounds of fresh vegetables to be brined. A 5-gallon glazed stone crock is ideal for fermenting about 25 pounds of fresh cabbage or cucumbers. Food-grade plastic and glass containers are excellent substitutes for stone crocks.

Caution: Do not use garbage bags or trash liners as brining containers. Fermenting sauerkraut in quart and half-gallon mason jars is an acceptable practice, but may result in more spoilage. Wash, rinse and scald containers prior to use.

The kettle used to heat the pickling solution or product may be made of aluminum, stainless steel or unchipped enamel. Do not use iron, copper, brass or galvanized utensils.

A long-handled, stainless-steel spoon, wide-mouth funnel, jar lifter and bubble freer are necessary tools. A plastic or rubber knife-like utensil may serve as the bubble freer.

To store pickles, use standard canning jars that are free from cracks and chips. Mayonnaise jars or other jars and lids from commercially canned foods are not recommended because a proper seal is difficult to achieve. Screw bands can be reused if in good shape, but lids must be new.

jar seals lead to spoilage. Processing pickles in a boiling water bath and using standard canning jars with new lids will help prevent these problems. Other factors that lead to spoilage include failure to remove blossom ends, failure to thoroughly wash products to be pickled, not removing the scum that accumulates on curing brines, using a weak brine or vinegar solution, not keeping the pickles covered with brine throughout the curing process, using

Other Problems

Shriveling happens most often in very sweet or sour pickles and in large whole cucumber pickles. It is caused by using a salt, sugar or vinegar solution that is too strong at the beginning of the pickling process. Overcooking, overprocessing or not starting with fresh produce also may cause shriveling.

Hollow pickles are the result of faulty growth or curing. Because hollow cucumbers usually float, they can be picked out easily when the cucumbers are washed. Cucumbers that stand for more than 24 hours before processing may become hollow. For best results, use these for relishes rather than whole pickles.

Discolored pickles may be caused by iron from hard water or an iron cooking utensil. Iodized salt, ground spices, too much spice, or packing the spice bag in jars will darken pickles. Pickles prepared in a copper utensil will turn an abnormal green. Those made in a zinc pan will lose their color. Overmature dill may cause pickle liquid to turn pink shortly after canning. Sunburned or overmature cucumbers may produce dull or faded pickles. Pickles with small brown spots have been held too long before pickling.

A white sediment at the bottom of the jar may be caused by anticaking agents in the salt or by the fermenting bacteria. Neither cause is harmful.

Blue, purple or blue-green garlic may result from immature garlic or garlic that is not fully dry, from copper pans, or from a high amount of copper in the water. Garlic contains anthocyanin, a water-soluble pigment that under acid conditions may turn blue or purple. A blue-green color also may develop in pickles made with stored red-skinned garlic. Except for blue-green color resulting from an abnormally high copper-sulfate concentration, such color changes do not indicate the presence of harmful substances.

deteriorated ingredients such as moldy garlic or decayed spices, or storing the pickles at too warm a temperature.

Quick Fresh-Pack Whole Dill Pickles

- 8 pounds of 3- to 5-inch pickling cucumbers
- 1 1/4 cups canning or pickling salt (divided)
- 2 gallons cold water
- 1 1/2 quarts vinegar (5% acidity)
- 1/4 cup sugar
- 2 quarts water
- 2 tablespoons whole mixed pickling spices
- 3 (about) tablespoons whole mustard seed (1 teaspoon per pint jar)
- 14 heads of fresh dill or 4 1/2 tablespoons dill seed

Yield: 7 to 9 pints or 4 quarts

Procedure: Wash cucumbers. Cut 1/16-inch slice from blossom end and discard. Leave 1/4 inch of stem attached. Dissolve 3/4 cup salt in 2 gallons water. Pour over cucumbers and let stand 12 hours. Drain.

Combine vinegar, 1/2 cup salt, sugar and 2 quarts water. Add mixed pickling spices tied in a clean white cloth. Heat to boiling.

Fill jars with cucumbers. Add 1 teaspoon mustard seed and 1 1/2 heads fresh dill (or 1 1/2 teaspoon dill seed) to each pint. Use twice the amount for quarts.

Cover with boiling pickling solution, leaving 1/2-inch headspace. Remove air bubbles. Wipe jar rims. Adjust lids.

Process in a boiling water bath:

Pints:

- 15 minutes at 6,000 feet or less
- 20 minutes above 6,000 feet

Quarts:

- 20 minutes at 6,000 feet or less
- 25 minutes above 6,000 feet

Quick Sweet Pickles

- 8 pounds of 3- to 4-inch pickling cucumbers
- 1/3 cup canning or pickling salt
- Crushed or cubed ice
- 4 1/2 cups sugar
- 3 1/2 cups vinegar (5 % acidity)
- 2 teaspoons celery seed
- 1 tablespoon whole allspice
- 2 tablespoons mustard seed

Yield: 7 to 9 pints

Procedure: Wash cucumbers. Cut 1/16 inch off blossom end and discard. Cut cucumbers into slices or strips. Place in large bowl and sprinkle with 1/3 cup salt. Cover with 2 inches of crushed or cubed ice. Refrigerate 3 to 4 hours. Add more ice as needed. Drain well.

Combine sugar, vinegar, celery seed, allspice and mustard seed in 6-quart saucepot. Heat to boiling.

Drain cucumbers and pack without heating into clean jars, leaving 1/2-inch head space.

Fill jars to 1/2 inch from top with hot pickling liquid. Remove any air bubbles with a plastic spatula. Wipe jar rims. Adjust lids.

Process in a boiling water bath:

Pints:

- 15 minutes at 6,000 feet or below
- 20 minutes above 6,000 feet

Quarts:

- 20 minutes at 6,000 feet or below
- 25 minutes above 6,000 feet

After processing and cooling, store jars four to five weeks to allow flavor to develop before enjoying.

Pickled Bread-And-Butter Zucchini

16 cups fresh zucchini, sliced (3/16-inch thick)
4 cups onion, thinly sliced
1/2 cup canning or pickling salt
4 cups white vinegar (5% acidity)
2 cups sugar
4 tablespoons mustard seed
2 tablespoons celery seed
2 teaspoons ground turmeric

Yield: About 8 to 9 pints

Procedure: Cover zucchini and onion with 1 inch ice water and salt. Let stand 2 hours; drain thoroughly.

Combine vinegar, sugar, mustard seed, celery seed and turmeric. Bring to a boil; add zucchini and onions. Simmer 5 minutes.

Fill jars with mixture and pickling solution, leaving 1/2-inch headspace. Remove air bubbles. Wipe jar rims. Adjust lids.

Process pints or quarts in a boiling water bath canner for 15 minutes at 6,000 feet or less; 20 minutes above 6,000 feet.

Pickle Relish

3 quarts finely chopped cucumbers
3 cups finely chopped green peppers
3 cups finely chopped red peppers
1 cup finely chopped onions
3/4 cup canning or pickling salt
4 cups ice
8 cups water
4 teaspoons each mustard seed, turmeric, whole allspice and whole cloves
2 cups sugar
6 cups white vinegar (5% acidity)

Yield: about 9 pints or 18 half-pints

Procedure: Add cucumbers, peppers, onions, salt and ice to water and let stand four hours. Drain and re-cover vegetables with fresh ice water for another hour. Drain again.

Combine spices in a spice or cheesecloth bag. Add spices to sugar and vinegar. Heat to boiling and pour mixture over vegetables. Cover and refrigerate 24 hours.

Heat pickle mixture to boiling and fill hot into clean jars, leaving 1/2-inch

headspace. Remove air bubbles. Wipe jar rims. Adjust lids.

Process pints or half-pints in a boiling water bath canner for 15 minutes at 6,000 feet or less; 20 minutes above 6,000 feet.

Pickled Sweet Green Tomatoes

10 to 11 pounds of green tomatoes (16 cups sliced 1/4-inch thick)
2 cups thinly sliced onions
1/4 cup canning or pickling salt
3 cups brown sugar
4 cups vinegar (5% acidity)
1 tablespoon each mustard seed, allspice, celery seed and whole cloves

Yield: about 9 pints or 4 1/2 quarts

Procedure: Wash and slice tomatoes and onions. Place in bowl, sprinkle with 1/4 cup salt, and let stand 4 to 6 hours. Drain.

Heat and stir sugar in vinegar until dissolved. Tie mustard seed, allspice, celery seed and cloves in a spice bag. Add to vinegar with tomatoes and onions. If needed, add minimum water to cover pieces.

Bring to boil and simmer 30 minutes, stirring as needed to prevent burning. Tomatoes should be tender and transparent when properly cooked. Remove spice bag.

Fill jars and cover with hot pickling solution, leaving 1/2-inch headspace. Remove air bubbles. Wipe jar rims. Adjust lids.

Process in a boiling water bath:

Pints:

15 minutes at 6,000 feet or below
20 minutes above 6,000 feet

Quarts:

20 minutes at 6,000 feet or below
25 minutes above 6,000 feet

Sweet Pepper Relish

5 cups ground green bell peppers (about 7-8 peppers)
5 cups ground red bell peppers (about 7-8 peppers)
1-1/2 cups ground onion (about 3 medium yellow onions)

2-1/2 cups cider or white distilled vinegar (5% acidity)

2 cups sugar
4 teaspoons pickling salt
4 teaspoons mustard seed

Yield: About 6 pints or 12 half-pints

Procedure: Wash peppers well; trim to remove stems and seeds. Peel, core and wash onions. Cut peppers and onions into large pieces. Coarsely grind peppers and onions separately. Measure 5 cups of each type of ground bell peppers with their juice, and 1-1/2 cups of the ground onion, including juice.

Combine the measured peppers and onions with the vinegar, sugar, pickling salt and mustard seed in a large stockpot. Bring the mixture to a boil over high heat. Reduce heat and cook at a low boil for 30 minutes, stirring often to prevent scorching.

Fill the hot relish into prepared hot pint or half-pint jars, leaving 1/2-inch headspace. Remove air bubbles and re-adjust headspace to 1/2 inch. Wipe rims of jars with a dampened clean paper towel. Adjust lids and bands as directed on package instructions.

Process pints or half-pints in a boiling water canner for 15 minutes at 6,000 feet or less; 20 minutes above 6,000 feet.

References

USDA *Complete Guide to Home Canning*, AIG 539, U.S. Dept. of Agriculture, 2009.
Reynolds, S., Williams, P., and Harrison, J. *So Easy to Preserve*, Cooperative Extension Service, The University of Georgia, 5th ed., 2006.

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Making Pickled Peppers

Fact Sheet No. 9.314

Food and Nutrition Series | Preparation

by M. Hill and P. Kendall*

Pickled peppers and mixed vegetable-pepper home-canned products are commonly prepared by many Colorado households. These products also have been implicated in botulism deaths due to the use of untested recipes, under-acidified products, addition of too much oil, or lack of processing.

Ingredients

Peppers. A variety of peppers can be used to make home canned pickled peppers. Common varieties are Cubanelle, Hungarian, yellow wax, sweet cherry, sweet banana and sweet bells. Thick-fleshed peppers with firm waxy skins and bright, glossy color, free from defects, give the best pickled products. Avoid peppers that are soft, shriveled or pliable, and dull or faded in color. As with all pickled products, the shortest time from pick to pack offers the highest quality pickled product.

Cut large peppers (Cubanelle or bells) into jar-size pieces. Remove seeds and white inner core. Smaller varieties may be packed whole but must be slit to allow the vinegar solution to enter the hollow portion of the pepper. Make two small slits through the flesh of each whole pepper.

Caution: Wear plastic or rubber gloves when handling hot peppers. Hot pepper juice can be caustic to eyes or skin.

Other vegetables. For vegetable-pepper blends, follow a recipe with tested proportions. Select fresh, tender but firm vegetables. If the vegetables and peppers cannot be canned within one or

two hours after harvesting, refrigerate without washing. Thoroughly wash all vegetables in cold water before pickling.

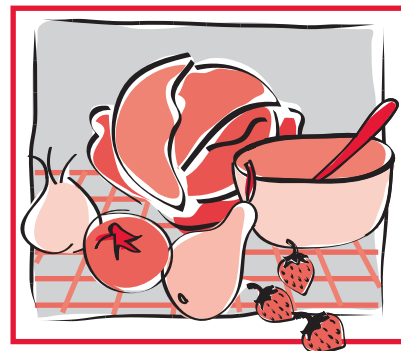
Salt. Use noniodized canning or pickling salt. Noncaking materials added to table salt may make the solution cloudy.

Vinegar. Use a high grade cider or white distilled vinegar of 5 percent acidity (50 grain). White vinegar may be preferred with light-colored peppers or vegetables to retain color or if clear liquid is desired. Do not use vinegars of unknown acidity. For a less acidic flavor, add a small amount of sugar. This offsets the sharp acid flavor without affecting the pH or acidity of a product.

Caution: The acidity in a pickled product is as important to its safety as it is for taste and texture. There must be a minimum, uniform amount of acid throughout the mixed product to prevent growth of botulinum bacteria. Use only recipes with tested proportions of ingredients. **Do not alter vinegar/water proportions** in the recipe.

Garlic. If desired for flavor, use mature, fully-dried, white-skinned garlic, free of blemishes. Garlic contains a water-soluble pigment that may turn blue or purple during pickling. Immature garlic, garlic that is not fully dry, or red-skinned varieties are most prone to turning blue, purple or blue-green. Except in the case of a bright blue-green color resulting from abnormally high concentrations of copper-sulfate, such color changes do not indicate the presence of harmful substances.

Oil. Specific problems exist when canning pickled peppers in oil. Use the recommended amount of oil (2 tablespoons per pint) and allow proper headspace. Peppers in oil need additional processing time over recipes not



Quick Facts

- Use only fresh, blemish-free vegetables and up-to-date, research-based recipes when pickling peppers and pepper blends.
- Use pure, granulated, non-iodized canning or pickling salt, high grade vinegar of 5 percent acidity, and fresh spices.
- Process pickled peppers in a boiling water bath for the altitude-adjusted length of time specified in a tested recipe.
- For pickled peppers marinated in oil, use only fresh vegetable oil in the amounts specified in tested recipes.

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containing oil. If peppers to be home-canned contain oil, take care that no ingredients touch the jar rim or flat lid. The oil tends to soften the natural rubber-based lining found in some brands of home-canning lids and may result in loosening of the seal over time.

Spices. Spices lose their flavor quickly. For best results, always use fresh spices in home canning.

Colorado Mix (Pickled Pepper Vegetable Blend)

- 2 1/2 pounds peppers, mild or hot as desired
- 1 pound cucumbers, cut into 1/2-inch chunks
- 2 to 4 carrots, cut into 1/2-inch chunks
- 1/2 pound cauliflower, cut into 1-inch flowerettes
- 1 cup peeled pickling onions
- 7 to 14 garlic cloves, as desired
- 6 cups vinegar
- 3 cups water
- 2 tablespoons pickling salt
- 2 tablespoons sugar, if desired

Yield: Makes 7 to 8 pints

Procedure: Wash and prepare vegetables. Slit small peppers. Core large peppers and cut into strips. Remove blossom end of cucumbers and cut into chunks. Peel and chunk carrots. Break cauliflower into flowerettes. Pack vegetable medley into hot, **sterilized** jars, leaving 1/2-inch headspace.

In 3-quart saucepan, bring vinegar, water, salt and sugar to a boil. Pour hot solution over mix in jars, leaving 1/4-inch headspace.

Remove air bubbles. Add liquid to bring headspace to 1/4 inch. Wipe jar rims. Add pretreated lids and process in boiling water bath for the time specified below for your altitude and jar size. For best flavor, store jars five to six weeks before opening.

Jar size	Boiling water bath processing time Altitudes of:	
	6,000 ft. or less	Above 6,000 ft.
Half-pints or pints	10 min	15 min
Quarts	15 min	20 min

Pickled Peppers

- 2 pounds Hungarian or banana peppers*
- 2 pounds sweet peppers (in strips)*
- 1 pound cherry peppers*
- 1 Jalapeno per jar (if desired for hotness)
- 1 clove garlic per jar
- 6 cups vinegar
- 2 cups water
- 1 tablespoon plus 1 teaspoon pickling salt
- 1 tablespoon sugar, if desired

***Note:** May use a variety of peppers to equal 5 pounds (4 quarts).

Yield: Makes 7 to 8 pints

Procedure: Wash peppers. Small peppers may be left whole with two small slits in each pepper. Core and cut large peppers into strips. Pack one clove garlic and a variety of peppers tightly into clean, hot, **sterilized** jars, leaving 1/2-inch headspace.

Combine vinegar, water, salt and sugar. Bring to boil and reduce to simmer. Pour hot pickling solution over peppers, leaving 1/4-inch headspace.

Remove air bubbles. Readjust headspace to 1/4 inch. Wipe jar rims. Add pre-treated lids and process in boiling water for the time specified for your altitude and jar size. For best flavor, store jars five to six weeks before opening.

Jar size	Boiling water bath processing time Altitudes of:	
	6,000 ft. or less	Above 6,000 ft.
Half-pints or pints	10 min	15 min
Quarts	15 min	20 min

To review the steps of packing, sealing and processing pickled products, see fact sheet 9.304, *Making Pickles at Home*. For information on canning chili, pimentos or other pepper products see 9.348, *Canning Vegetables*.

Hot Peppers Marinated in Oil

- 3 pounds hot peppers (Jalapenos or other varieties)
- 7 to 14 cloves garlic
- 7 tablespoons dried oregano
- 5 cups vinegar
- 1 cup water
- 1 tablespoon plus 1 teaspoon pickling salt
- 3/4 cup vegetable or olive oil

Yield: Makes 7 to 8 pints

Note: Improper procedures when canning vegetables in oil can result in **risk of botulism**. Read the section on oil and follow **exactly** the recommended procedures and tested recipe below.

Procedure: Wear rubber gloves when handling hot chilies. Do not touch the eyes or face. Wash peppers. Make two small slits in each whole pepper. Pack one or two garlic cloves and one tablespoon oregano into each clean, hot, **sterilized** pint jar. Pack peppers tightly into jars, leaving 1-inch headspace.

Combine vinegar, water, salt and oil and bring to a boil. Simmer 5 minutes. Pour hot solution over peppers, leaving 1-inch headspace. Make sure oil is equally distributed across jars. There should be no more than two tablespoons of oil per pint. Carefully wipe the jar lip so it is free of all oil. Add pretreated lids. Process in boiling water bath for the time specified below for your altitude and jar size. For best flavor, store jars five to six weeks before opening.

Jar size	Boiling water bath processing time Altitudes of:	
	6,000 ft. or less	Above 6,000 ft.
Half-pints or pints	15 min	20 min
Quarts	20 min	25 min

Marinated Refrigerated Peppers

Remember, all pickled pepper products stored at room temperature must be processed, to avoid the risk of botulism toxin development during storage. The boiling water-bath processing step can be omitted **if pickles are stored in the refrigerator**. Use the following procedure.

Wash peppers. Small peppers may be left whole with two small slits in each pepper. Core and cut large peppers into strips.

Sterilize jars, lids and screwbands. Pack peppers tightly into sterilized jars, leaving 1/2-inch headspace.

For each 6 cups of brine, combine 5 cups vinegar, 1 cup water and 1 tablespoon pickling salt. Bring to a boil, reduce heat and simmer five minutes.

Pour vinegar solution over peppers, leaving 1/8-inch headspace. Remove air bubbles. Adjust headspace so that brine covers all peppers. Wipe rims.

Place sterilized flats on jars. Do not put on screwbands. Allow jars to cool. Put on screwbands and wipe jars. Refrigerate six to eight weeks for the pickled flavor to fully develop. Keep refrigerated and use within six months. This pepper product allows the peppers to marinate in a high acid solution, at a cold temperature, and in the presence of air. These conditions are not favorable for botulism toxin formation. It **does not** ensure against other types of spoilage.

Home Canned Salsa Recipes

Most salsa recipes are a mixture of low-acid foods, such as onions and peppers, and acid foods, such as tomatoes. Use tested recipes to ensure proper acidification.

Use the amounts of each vegetable listed in the recipe. If desired, green tomatoes or tomatillos may be substituted for part or all of the tomatoes. Add the amount of vinegar listed. If desired, you may safely substitute an equal amount of lemon juice for vinegar in a recipe using

vinegar. **However, do not substitute vinegar for lemon juice.** This substitution will result in a less acid and potentially unsafe salsa.

Spices do not affect acidity or safety and may be adjusted as desired. Do not thicken salsas with flour or cornstarch before canning. After you open a jar to use, you may pour off some of the liquid or thicken with cornstarch.

Chili Salsa

- 12 cups peeled, cored, chopped tomatoes (choose a meaty variety or squeeze out extra juice)
- 6 cups seeded, chopped chili peppers*
- 1 1/2 cups finely chopped onions
- 1/4 cup finely chopped garlic
- 1 cup vinegar
- 1 tablespoon salt
- 1/2 teaspoon pepper

*Use mixture of hot and mild peppers to suit taste.

Yield: Makes 6 to 8 pints

Procedure: Combine ingredients in large saucepan. Heat to a boil and simmer 10 minutes. Ladle hot into clean pint jars, leaving 1/2-inch headspace. Remove air bubbles, wipe jar rims. Adjust lids and process in a boiling water bath for the time specified below for your altitude.

Jar size	Boiling water bath processing time	
	Altitudes of:	
	6,000 ft. or less	Above 6,000 ft.
Half-pints or pints	20 min	25 min

Tomato Salsa (Using Paste Tomatoes)

Note: Paste tomatoes, such as Roma, are recommended for salsa because they have firmer flesh and produce thicker products. Slicing tomatoes will require a much longer cooking time to achieve a desirable consistency.

- 7 quarts peeled, cored, chopped tomatoes
- 5 cups seeded, chopped long green chilies
- 4 cups finely chopped onion
- 1/4 cup seeded, finely chopped Jalapeno peppers

- 6-12 cloves garlic, finely chopped
 - 2 cups bottled lemon juice
 - 2 tablespoons salt
 - 1 tablespoon black pepper
 - 2 tablespoons ground cumin*
 - 3 tablespoons oregano leaves*
 - 2 tablespoons fresh cilantro*
- *Optional; use only for desired flavor

Yield: Makes 13 pints

Procedure: Combine all ingredients except cumin, oregano and cilantro in a large pot and bring to a boil, stirring frequently. Reduce heat and simmer 10 minutes. Add spices, if desired, and simmer for another 20 minutes, stirring occasionally. Ladle hot into clean pint jars, leaving 1/2-inch headspace. Remove air bubbles. Add pretreated lids and process in a boiling water-bath canner for the time specified for your altitude.

Jar size	Boiling water bath processing time	
	Altitudes of:	
	6,000 ft. or less	Above 6,000 ft.
Half-pints or pints	20 min	25 min

Source: *Salsa Recipes for Canning*; PNW395, a Pacific Northwest Extension Publication. Washington, Oregon, Idaho.

Credits

Recipes included in this publication were developed and tested by Colorado State University Extension, with the assistance of Master Food Preservers from Pueblo, El Paso, Elbert and Boulder counties.

The recipes were tested at altitudes below and above 5,000 feet, with pH samples conducted in the food science laboratory at Colorado State University. Recipes also were tested for flavor, texture and overall quality to offer a high quality and safe product.

Colorado State University, U.S. Department of Agriculture and Colorado counties cooperating. CSU Extension programs are available to all without discrimination. No endorsement of products mentioned is intended nor is criticism implied of products not mentioned.



Causes and Possible Solutions for Problems with Pickled Foods

Problem	Cause	Prevention
Soft or slippery pickles (If spoilage is evident, do not eat.)	1. Vinegar too weak.	1. Use vinegar of at least 5% acidity.
	2. Insufficient amount of brine.	2. Keep cucumbers immersed in the brine.
	3. Pickles not processed properly (to destroy microorganisms).	3. Process pickles in canner after filling jars.
	4. Moldy garlic or spices.	4. Always use fresh spices.
	5. Blossom ends not removed from cucumbers.	5. Slice at least 1/16th inch off blossom end of cucumbers and discard.
Strong, bitter taste	1. Spices cooked too long in vinegar, or too many spices used.	1. Follow directions for amount of spices to use and the boiling time.
	2. Vinegar too strong.	2. Use vinegar of the proper strength (5% acidity).
	3. Dry weather.	3. No prevention. Bitter taste is usually in the peel or skin of fruits and vegetables.
	4. Using salt substitutes.	4. Potassium chloride, the ingredient in most of these, causes bitterness.
Problem	Cause	Prevention
Shriveled Pickles	1. Placing cucumbers in too strong brine, too heavy syrup, or too strong vinegar.	1. Follow a reliable recipe. Use amounts of salt and sugar called for in a recipe, and vinegar that is 5% acidity.
	2. Overcooking or overprocessing.	2. Follow a reliable recipe exactly.
	3. Dry weather.	3. No prevention. Bitter taste is usually in the peel or skin of fruits and vegetables.
Dark or discolored pickles (If brass, copper or zinc utensils and brining equipment were used, do not use pickles.)	1. Minerals in hard water.	1. Use soft water.

	2. Ground spices used.	2. Use whole spices.
	3. Spices left in jars of pickles.	3. Place spices loosely in cheesecloth bag so they can be removed before canning.
	4. Brass, iron, copper or zinc utensils used.	4. Use food-grade unchipped enamelware, glass, stainless steel, or stoneware utensils.
	5. Iodized salt used.	5. Use canning or pickling salt.
Spotted, dull, or faded color	1. Excessive exposure to light.	1. Store processed jars in a dark, dry cool place.
	2. Cucumber of poor quality.	2. Use produce of optimum quality, and grown under proper conditions (weather, soil, etc.)
White sediment in jar.	1. Salt contains an anti-caking agent or other additives.	1. Use canning or pickling salt.

For problems with jar seals, and other general canned food problems, see [Causes and Possible Solutions for Problems with Canned Foods](#).

This document was adapted from "So Easy to Preserve", 5th ed. 2006. Bulletin 989, Cooperative Extension Service, The University of Georgia, Athens. Revised by Elizabeth L. Address, Ph.D. and Judy A. Harrison, Ph.D., Extension Foods Specialists.

[top ^](#)

How do I? [Can](#) · [Freeze](#) · [Dry](#) · [Cure & Smoke](#) · [Ferment](#) · [Pickle](#) · [Make Jam & Jelly](#) · [Store](#)
[Home](#) · [Publications](#) · [Search](#) · [Seasonal Tips](#) · [Info Request](#) · [Multimedia](#) · [FAQs](#) · [Contact](#) · [Links](#)



Preparing and Canning Pickled Vegetables Pickled Dilled Beans

- 4 lbs fresh tender green or yellow beans (5 to 6 inches long)
- 8 to 16 heads fresh dill or 4 Tablespoons of dill seed
- 8 cloves garlic (optional)
- 1/2 cup canning or pickling salt
- 4 cups white vinegar (5 percent)
- 4 cups water
- 1 tsp hot red pepper flakes (optional)

Yield: About 8 pints

Please read [Using Boiling Water Canners](#) before beginning. If this is your first time canning, it is recommended that you read [Principles of Home Canning](#) (https://nchfp.uga.edu/publications/usda/GUIDE01_HomeCan_rev0715.pdf)

Procedure: Wash and trim ends from beans and cut to 4-inch lengths. In each sterile pint jar, place 1 to 2 dill heads and, if desired, 1 clove of garlic. Place whole beans upright in jars, leaving 1/2-inch headspace. Trim beans to ensure proper fit, if necessary. Combine salt, vinegar water, and pepper flakes (if desired). Bring to a boil. Add hot solution to beans, leaving 1/2-inch headspace.

Adjust lids and process according to the recommendations in [Table 1](#).

Table 1. Recommended process time for **Pickled Dilled Beans** in a boiling-water canner.

		Process Time at Altitudes of		
Style of Pack	Jar Size	0 - 1,000 ft	1,001 - 6,000 ft	Above 6,000 ft
Raw	Pints	5 min	10	15

This document was adapted from the "Complete Guide to Home Canning," Agriculture Information Bulletin No. 539, USDA, revised 2015.

Reviewed February 2018.



Preparing and Canning Pickled Vegetables

Pickled Dilled Okra

- 7 lbs small okra pods
- 6 small hot peppers
- 4 tsp dill seed
- 8 to 9 garlic cloves
- 2/3 cup canning or pickling salt
- 6 cups water
- 6 cups vinegar (5 percent)

Yield: 8 to 9 pints

Please read [Using Boiling Water Canners](#) before beginning. If this is your first time canning, it is recommended that you read [Principles of Home Canning](#).

Procedure: Wash and trim okra. Fill jars firmly with whole okra, leaving 1/2-inch headspace. Place 1 garlic clove in each jar. Combine salt, hot peppers, dill seed, water, and vinegar in large saucepan and bring to a boil. Pour hot pickling solution over okra, leaving 1/2-inch headspace.

Adjust lids and process according to the recommendations in [Table 1](#).

Table 1. Recommended process time for **Pickled Dilled Okra** in a boiling-water canner.

		Process Time at Altitudes of		
Style of Pack	Jar Size	0 - 1,000 ft	1,001 - 6,000 ft	Above 6,000 ft
Raw	Pints	10 min	15	20

This document was adapted from the "Complete Guide to Home Canning," Agriculture Information Bulletin No. 539, USDA, revised 2015.

Reviewed February 2018.



Fruit Pickles

Spiced Apple Rings

- 12 lbs firm tart apples (maximum diameter 2-1/2 inches)
- 12 cups sugar
- 6 cups water
- 1-1/4 cups white vinegar (5%)
- 3 tbsp whole cloves
- 3/4 cup red hot cinnamon candies or 8 cinnamon sticks
- 1 tsp red food coloring (optional)

Yield: About 8 to 9 pints

Please read [Using Boiling Water Canners](#) before beginning. If this is your first time canning, it is recommended that you read [Principles of Home Canning](#).

Procedure: Wash apples. To prevent discoloration, peel and slice one apple at a time. Immediately cut crosswise into 1/2-inch slices, remove core area with a melon baller and immerse in [ascorbic acid solution](#). To make flavored syrup, combine sugar water, vinegar, cloves, cinnamon candies, or cinnamon sticks and food coloring in a 6-qt saucepan. Stir, heat to boil, and simmer 3 minutes. Drain apples, add to hot syrup, and cook 5 minutes. Fill jars (preferably wide-mouth) with apple rings and hot flavored syrup, leaving 1/2-inch headspace. Adjust lids and process according to the recommendations in [Table 1](#).

Table 1. Recommended process time for **Spiced Apple Rings** in a boiling-water canner.

		Process Time at Altitudes of		
Style of Pack	Jar Size	0 - 1,000 ft	1,001 - 6,000 ft	Above 6,000 ft
Hot	Half-pints or Pints	10 min	15	20