

How to Can Pickled Products

Pickling fruits and vegetables can add variety to your pantry. However, pickled products, if not processed correctly, can spoil easily. Microorganisms — particularly yeasts, molds and enzymes — may affect flavor, color and texture. Process pickles in a boiling-water or steam canner to prevent these problems and to ensure that your products are safe.

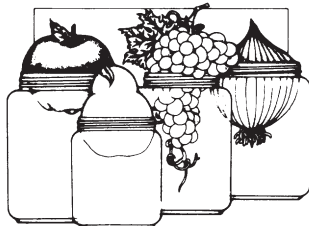
Processing times and procedures will vary according to food acidity and the size of food pieces.

Please refer to MU Extension publications GH1451, *Safe Home Canning Basics*, and GH1452, *Steps for Successful Home Canning*, for information on correct canning procedures and step by step guidance.

There are four types of pickled products:

1. **Brined pickles or fermented pickles** go through a curing process in a brine (salt and water) solution for one or more weeks. Curing changes the color, flavor and texture of the product. If the product is fermented, the lactic acid produced during fermentation helps preserve the product. In brined products that are cured but not fermented, acid in the form of vinegar is added later to preserve the food.
2. **Fresh pack or quick process pickles** are covered with boiling hot vinegar, spices and seasonings. Some recipes may call for brining the product for several hours and then drained before being covered with pickling liquid. These tart pickles are easy to prepare. Fresh pack or quick pickles taste better if allowed to stand for several weeks after they are sealed in jars.
3. **Fruit pickles** are prepared with whole or sliced fruits and simmered in a spicy, sweet-sour syrup made with vinegar or lemon juice.
4. **Relishes** are made from chopped fruits and vegetables cooked to desired consistency in a spicy vinegar solution.

Quality for Keeps



Start with quality ingredients

Select cucumbers of the appropriate size, about 1½ inches for gherkins and 5 inches for dills. Use odd-shaped and more mature cucumbers for relishes and bread-and-butter style pickles. All vegetables should be fresh, firm and free of spoilage.

Use canning or pickling salt. The noncaking material added to other salts will make the brine cloudy. Flake salt varies in density, so don't use it to make pickled and fermented foods, as the salt ration will be incorrect.

The salt used in making fermented sauerkraut and brined pickles not only provides characteristic flavor but also is vital to safety and texture. In fermented foods, salt favors the growth of desirable bacteria while inhibiting the growth of others. Do not cut back on the salt when making sauerkraut or fermented pickles.

White granulated and brown sugars are the sweeteners most often used in pickling. Corn syrup and honey, unless called for in research-based tested recipes, may produce undesirable flavors.

Use white distilled and cider vinegars of 5 percent. White vinegar is usually preferred when light color is desirable. Never use homemade vinegar when making pickles. The level of acidity in a pickled product is important not only to its taste and texture, but also for food safety. Acid prevents the growth of *Clostridium botulinum*. If the product does not have enough acid, there may be a risk of botulism. Use only tested recipes. **Never alter the proportions of vinegar, food or water in a recipe.**

Use fresh, whole spices for the best quality and flavor. Powdered spices may darken and cloud the produce.

Pickles are best if eaten within one year of processing.

Containers, weights and covers for fermenting

A 1-gallon container holds approximately 5 pounds of fresh produce; a 5-gallon container holds approximately 25 pounds. Glass, unchipped enamel-lined pans and food-grade plastic containers are excellent substitutes for the traditional stone crock. Before use, wash all containers, plates and jars in hot, sudsy water and rinse well with very hot water.

You may use other non-food-grade containers as long as you line each with a clean food-grade plastic bag. Do not

use garbage bags or trash liners because they may leach chemicals into your food.

Because produce will float, you must weight it down to keep covered with brine. Use a large, sealed food-grade plastic bag containing 4½ tablespoons of salt and 3 quarts of water as a weight to hold cucumbers under the surface of brine. Or use a plate and jar of water as a weight. Select a pie or dinner plate small enough to just fit inside the container. Place a heavy, clean bath towel over the weight and container to reduce mold growth on the brine surface.

Table 1. Recommended processing times in a boiling-water canner or steam canner.

Pickles	Recommend- ed Style of pack	Jar size	Minutes of process time at different elevations	
			0-1,000 feet	1,001-6,000 feet
Sauerkraut	Hot	Pints	10	15 ^a
		Quarts	15	20 ^a
	Raw	Pints	20	25 ^a
		Quarts	25	30 ^a
Dilled beans	Raw	Pints	5	10
Beets	Hot	Pints or quarts	30	35
Cauliflower or Brussels sprouts	Hot	Half pints or pints	10	15
Corn relish	Hot	Half pints or pints	10	20
Dilled okra	Hot	Pints	10	15
Bell peppers	Hot	Half pints or pints	5	10
Hot peppers	Raw	Half pints or pints	10	15
Reduced-sodium, sliced dill pickles	Raw	Pints	15	20
Green tomato relish	Hot	Pints	5	10
Bread-and-butter zucchini	Hot	Pints or quarts	10	15
Piccalilli	Hot	Half pints or pints	5	10
Pickled carrots	Hot	Pints	15	20
Quick, fresh-pack dills	Raw	Pints	10	15
		Quarts	15	20
Quick, sweet	Raw	Pints	10	15
		Quarts	15	20
	Hot	Pints or quarts	5	10
Sweet gherkin	Raw	Pints	5	10
Bread-and-butter	Raw	Pints or quarts	10	15
Pickle relish	Hot	Half pints or quarts	10	15
Dill, fermented	Raw	Pints	10	15
		Quarts	15	20

^a Safe processing time for elevations *only up to 3,000 feet*.

Getting crisp pickles

If high quality ingredients are used and up-to-date methods are followed, firming agents may not be needed for crisp pickles. If you desire a crisper pickle, use one of the following methods:

1. Soaking cucumbers in ice water for 4 to 5 hours prior to pickling.
2. Commercial calcium chloride products can be found where canning supplies are sold. Add to filled jars before applying lids according to the manufacturer's directions.
3. Food-grade lime may be used in a lime-water solution for soaking fresh cucumbers 12 to 24 hours before pickling them. However, **EXCESS LIME ABSORBED BY THE CUCUMBERS MUST BE REMOVED TO MAKE SAFE PICKLES.** To remove excess lime, drain the lime-water solution, rinse and then resoak the cucumbers in fresh water for 1 hour. Repeat the rinsing and soaking steps two more times. Failure to remove lime adequately may increase the risk of botulism. **Do not use agricultural or burnt lime as these products are not for human consumption.**
4. Alum may be used to firm fermented cucumbers. It does not work with quick process pickles.
5. Low-temperature pasteurization treatment produces a firmer product, but you must carefully follow these steps to avoid spoilage.

Place jars in a canner filled halfway with warm (120–140° F) water. Add hot water until it is 1 inch above jars.

Heat the water and maintain a 180° F water temperature for 30 minutes. Use a candy or jelly thermometer to be certain that the water temperature does not fall below 180° F during the entire 30 minutes.

Temperatures higher than 185° F may cause unnecessary softening of pickles.

Sauerkraut

- 25 pounds cabbage
- ¾ cup canning or pickling salt

Yield: About 9 quarts

Quality: Firm heads of fresh cabbage make the best sauerkraut. Shred cabbage and start kraut between 24 and 48 hours after harvest.

Procedure: Work with about 5 pounds of cabbage at a time. Discard outer leaves. Rinse heads under cold running water, and drain. Cut heads in quarters, and remove cores.

Shred or slice to the thickness of a quarter.

Put cabbage in a suitable fermentation container, and add 3 tablespoons of salt. Mix thoroughly with clean hands.

Pack cabbage down firmly until salt draws out juices. Repeat shredding, salting and packing until all cabbage is in the container.

Be sure the container is deep enough so the packed, shredded cabbage is at least 4 or 5 inches below the rim. If juice does not cover cabbage, add boiled and cooled brine (1½ tablespoons of salt per quart of water).

Add plate and weight; cover container with a clean bath towel. Store sauerkraut at 70–75 degrees F while it is fermenting. Kraut will be fully fermented in 3 to 4 weeks at temperatures between 70 and 75 degrees F.

At 60–65 degrees F, fermentation may take 5 to 6 weeks. Kraut may not ferment at temperatures lower than 60 degrees F. Above 75 degrees F, kraut may become soft.

If you weight the cabbage down with a brine-filled bag, don't disturb the crock until normal fermentation is completed (when bubbling stops). If you use a jar as a weight, check the kraut two to three times each week and skim off scum if it forms.

Fully fermented kraut will keep tightly covered in the refrigerator for several months. Additionally, you can preserve kraut for longer using either of these methods:

Hot pack: Bring kraut and liquid slowly to a boil in a large kettle; stir frequently. Remove from heat and fill jars rather firmly with kraut and juices. Leave ½ inch of headspace. Adjust lids, and process as directed in Table 1.

Raw pack: Fill jars firmly with kraut and cover with juices. Leave ½ inch of headspace. Adjust lids, and process as directed in Table 1.

Pickled dilled beans

- 4 pounds fresh tender green or yellow beans (5 to 6 inches long)
- 8–16 heads fresh dill or 8 teaspoons dill seed
- 8 cloves garlic (optional)
- ½ cup canning or pickling salt
- 4 cups white vinegar (5 percent)
- 4 cups water
- 1 teaspoon hot red pepper flakes or cayenne pepper (optional)

Yield: About 8 pints

Procedure: Wash and trim ends from beans, and cut beans into 4-inch lengths. Put 1 to 2 dill heads (or 1 teaspoon dill seed) and 1 clove of garlic in each sterilized jar. Stand beans upright in jars. Leave ½ inch of headspace.

Trim beans to fit the jar if necessary.

Mix salt, vinegar, water and pepper flakes or cayenne pepper. Bring to a boil and pour over beans. Leave ½ inch of headspace. Adjust lids, and process as directed in Table 1.

Pickled beets

- 7 pounds beets, 2 to 2½ inches around
- 4 cups vinegar (5 percent)
- 1½ teaspoons canning or pickling salt
- 2 cups sugar
- 2 cups water
- 2 cinnamon sticks
- 12 whole cloves
- 4–6 onions, 2 to 2½ inches around (optional)

Yield: About 8 pints

Caution: Drain and discard liquid. Cool beets. Trim off roots and stems, and slip off skins. Slice in ¼-inch slices.

Peel and thinly slice onions.

Procedure: Trim off beet tops. Leave 1 inch of stem and roots to prevent color from bleeding. Wash beets thoroughly and sort them for size. Cook similar sizes together by covering them with boiling water and cooking until tender, about 25 to 30 minutes.

Mix vinegar, salt, sugar and fresh water. Put spices in cheesecloth bag and add to vinegar mixture. Bring to a boil and add beets and onions. Simmer 5 minutes. Remove spice bag. Fill jars with beets and onions. Leave ½ inch of headspace. Add hot vinegar mixture, leaving ½ inch of headspace. Adjust lids, and process as directed in Table 1.

Variation: Pickle whole baby beets that are 1 to 1½ inches around using the above directions. Pack whole. Onions can be left out.

Pickled cauliflower or Brussels sprouts

- 12 cups of 1- to 2-inch cauliflower florets or small Brussels sprouts
- 4 cups white vinegar (5 percent)
- 2 cups sugar
- 2 cups thinly sliced onions
- 1 cup diced sweet red peppers
- 2 tablespoons mustard seed
- 1 tablespoon celery seed
- 1 teaspoon turmeric
- 1 teaspoon hot red pepper flakes

Yield: About 9 half pints

Procedure: Wash cauliflower and cut into flowerets. Wash Brussels sprouts and remove stems and damaged outer leaves. Boil in salt water (4 teaspoons canning salt per gallon of water). Boil cauliflower 3 minutes, and boil Brussels sprouts 4 minutes. Drain and cool.

Mix vinegar, sugar, onion, diced red pepper and spices in large saucepan. Bring to a boil, and simmer 5 minutes.

Divide onion and diced pepper among jars. Fill jars with drained cauliflower or Brussels sprouts and hot pickling mixture. Leave ½ inch of headspace. Adjust lids, and process as directed in Table 1.

Pickled corn relish

- 10 cups fresh whole kernel corn (16 to 20 medium-size ears), or six 10-ounce packages of frozen corn
- 2½ cups diced sweet red peppers
- 2½ cups diced sweet green peppers
- 2½ cups chopped celery
- 1½ cups diced onions
- 1½ cups sugar
- 5 cups vinegar (5 percent)
- 2½ tablespoons canning or pickling salt
- 2½ teaspoons celery seed
- 2½ tablespoons dry mustard
- 1½ teaspoons turmeric

Yield: About 9 pints

Procedure: Boil ears of corn 5 minutes. Dip in cold water and cut whole kernels from cob (do not scrape the cob) or use six 10-ounce packages of frozen corn (defrost in the refrigerator or in the microwave). Mix peppers, celery, onions, sugar, vinegar, salt and celery seed in a saucepan. Bring to a boil and simmer 5 minutes. Stir occasionally.

Mix mustard and turmeric with a small amount of the simmered mixture, and add back to the hot mixture along with the com. Simmer another 5 minutes. If desired, thicken mixture with flour paste (¼ cup flour blended in ¼ cup water) and stir frequently. Fill jars with hot mixture. Leave ½ inch of headspace. Adjust lids, and process as directed in Table 1.

Pickled dilled okra

- 7 pounds small okra pods
- 6 small hot peppers
- 4 teaspoons dill seed
- 8–9 garlic cloves
- ⅓ cup canning or pickling salt
- 6 cups water
- 6 cups vinegar (5 percent)

Yield: 8 to 9 pints

Procedure: Wash and trim okra. Pack jars firmly with whole okra. Leave ½ inch of headspace. Put 1 garlic clove in each jar.

Mix salt, hot peppers, dill seed, water and vinegar in large saucepan and bring to a boil. Pour hot pickling mixture over okra. Leave ½ inch of headspace. Adjust lids, and process as directed in Table 1.

Pickled bell peppers

- 7 pounds firm bell peppers, free of blemishes
- 3½ cups sugar
- 3 cups vinegar (5 percent)
- 3 cups water
- 9 cloves garlic
- 4½ teaspoons canning or pickling salt

Yield: About 9 pints

Procedure: Wash peppers, cut into quarters and remove cores and seeds. Slice peppers in strips. Boil sugar, vinegar and water for 1 minute. Add peppers and bring to a boil. Put ½ clove of garlic and ¼ teaspoon salt in each sterilized half-pint jar. Double the amounts for pint jars. Add pepper strips and cover with hot pickling mixture. Leave ½ inch of headspace. Adjust lids, and process as directed in Table 1.

Pickled hot peppers

(Hungarian, banana, chile, jalapeño)

- 4 pounds hot, long peppers (red, green or yellow)
- 3 pounds sweet peppers (red and green mixed)
- 5 cups vinegar (5 percent)
- 1 cup water
- 4 teaspoons canning or pickling salt
- 2 tablespoons sugar
- 2 cloves garlic

Yield: About 9 pints

Caution: To avoid severe burns, wear rubber gloves when handling hot peppers. After handling peppers, wash hands thoroughly with soap and water before touching your face.

Procedure: Wash peppers. If small peppers are left whole, slash 2 to 4 slits in each. Quarter large peppers. To peel peppers, blanch in boiling water or blister as follows:

- **Oven or broiler method:** Put peppers in a hot oven (400 degrees F), or place under the broiler for 6 to 8 minutes or until skins blister.
- **Range-top method:** Cover hot burner, either gas or electric, with heavy wire mesh. Put peppers on burner for several minutes until skins blister.

Cool peppers in a pan covered with a damp cloth. This step makes it easier to peel the peppers.

Peel skin off cooled peppers. Flatten small peppers.

Fill jars, leaving ½ inch of headspace. Mix and heat other ingredients to boiling, and simmer 10 minutes. Remove garlic, and pour hot pickling mixture over peppers. Leave ½ inch of headspace. Adjust lids, and process as directed in Table 1.

Reduced-sodium, sliced dill pickles

- 4 pounds pickling cucumbers (3 to 5 inches long)
- 6 cups vinegar (5 percent)
- 6 cups sugar
- 2 tablespoons canning or pickling salt
- 1½ teaspoons celery seed
- 1½ teaspoons mustard seed 2 large onions, thinly sliced
- 8 heads fresh dill

Yield: About 8 pints

Procedure: Wash cucumbers. Cut ⅛-inch slice off blossom end and discard. Cut cucumbers into ¼-inch slices. Mix vinegar, sugar, salt, celery and mustard seeds in large saucepan and bring to a boil.

Put 2 slices of onion and ½ dill head on bottom of each pint jar.

Fill jars with cucumber slices. Leave ½ inch of headspace. Add 1 slice of onion and ½ dill head on top. Pour hot pickling mixture over cucumbers. Leave ¼ inch of headspace. Adjust lids, and process as directed in Table 1.

Pickled green tomato relish

- 10 pounds small, hard green tomatoes
- 1½ pounds red bell peppers
- 1½ pounds green bell peppers 2 pounds onions
- ½ cup canning or pickling salt
- 1 quart water
- 4 cups sugar
- 1 quart vinegar (5 percent)
- ⅓ cup prepared yellow mustard
- 2 tablespoons cornstarch

Yield: 7 to 9 pints

Procedure: Wash and coarsely grate or finely chop tomatoes, peppers and onions. Dissolve salt in water, and pour water over vegetables in large kettle. Heat to boiling and simmer 5 minutes. Drain vegetables in a colander.

Return vegetables to kettle and add sugar, vinegar, mustard and cornstarch. Stir to mix. Heat to a boil and simmer 5 minutes. Fill sterilized pint jars with hot relish. Leave ½ inch of headspace. Adjust lids, and process as directed in Table 1.

Pickled horseradish sauce

- 2 cups (¾ pound) freshly grated horseradish
- 1 cup white vinegar (5 percent)
- ½ teaspoon canning or pickling salt ¼ teaspoon powdered ascorbic acid

Yield: About 2 half pints

Note: Make only small quantities of horseradish at a time — its biting taste fades within 1 to 2 months, even when refrigerated. Combine ingredients, and fill sterilized jars.

Seal jars tightly. Store in a refrigerator.

Pickled bread-and-butter zucchini

- 16 cups fresh zucchini, sliced
- 4 cups onions, thinly sliced
- ½ cup canning or pickling salt
- 4 cups white vinegar (5 percent)
- 2 cups sugar
- 4 tablespoons mustard seed
- 2 tablespoons celery seed
- 2 teaspoons ground turmeric

Yield: About 8–9 pints

Procedure: Cover zucchini and onion slices with 1 inch water and salt. Let stand 2 hours and drain thoroughly. Combine vinegar, sugar and spices. Bring to a boil and add zucchini and onions. Simmer 5 minutes. Fill jars with zucchini mixture and pickling mixture. Leave ½ inch of headspace.

Adjust lids, and process as directed in Table 1. Or use the low-temperature pasteurization treatment described in the *Getting crisp pickles* section.

Piccalilli

- 6 cups chopped green tomatoes
- 1½ cups chopped sweet red peppers
- 1½ cups chopped green peppers
- 2¼ cups chopped onions
- 7½ cups chopped cabbage
- ½ cup canning or pickling salt
- 3 tablespoons whole mixed pickling spice
- 4½ cups vinegar (5 percent)
- 3 cups brown sugar

Yield: 9 half pints

Procedure: Wash, chop and combine vegetables with the ½ cup salt. Cover with hot water and let stand 12 hours. Drain and place in a clean white cloth. Squeeze gently to remove all liquid.

Mix vinegar and brown sugar in a saucepan. Tie spices loosely in a spice bag; add to vinegar and brown sugar mixture. Heat to boil. Add vegetables and continue boiling gently 30 minutes, or until the volume of the mixture is reduced by one-half. Remove spice bag.

Fill hot, sterilized jars with hot mixture. Leave ½ inch of headspace. Adjust lids, and process as directed in Table 1.

Pickled carrots

- 2¾ pounds peeled carrots (about 3½ pounds as purchased)
- 5½ cups white vinegar (5 percent)
- 1 cup water
- 2 cups sugar
- 2 teaspoons canning salt
- 8 teaspoons mustard seed
- 4 teaspoons celery seed

Yield: About 4 pints

Procedure: Wash and peel carrots. Cut into rounds that are about ½ inch thick. Combine vinegar, water, sugar and canning salt in an 8-quart Dutch oven or stockpot. Bring to a boil, and boil 3 minutes. Add carrots and bring back to a boil. Reduce heat to a simmer and heat until half-cooked, about 10 minutes. Meanwhile, place 2 teaspoons mustard seed and 1 teaspoon celery seed into each empty hot pint jar. Fill jars with hot carrots, leaving 1 inch of headspace. Fill with hot pickling liquid, leaving ½ inch of headspace. Remove air bubbles, and adjust headspace, if needed. Wipe rims of jars with a damp, clean paper towel.

Adjust lids and process.

Pickled baby carrots

Procedure: Follow directions for pickled carrots, using 8½ cups peeled baby carrots, leaving them whole, and use the same process time.

Quick, fresh-pack dill pickles

- 8 pounds of 3- to 5-inch pickling cucumbers
- 2 gallons water
- ¼ cup canning or pickling salt
- 1½ quarts vinegar (5 percent)
- ¼ cup sugar
- 2 quarts water
- 2 tablespoons whole mixed pickling spice
- 3 tablespoons whole mustard seed (1 teaspoon per pint jar)
- 14 heads fresh dill (2 heads per pint jar) or 4½ tablespoons dill seed (1½ teaspoons per pint jar)

Yield: 9 pints or 4 quarts

Procedure: Cut a ¼-inch slice off blossom ends and discard, but leave ¼ inch of cucumber stem ends attached. Dissolve ¼ cup salt in 2 gallons of water. Pour brine water over cucumbers and let stand 12 hours. Drain.

Combine vinegar, ½ cup salt, sugar and 2 quarts water. Add mixed pickling spices tied in a spice bag or cheesecloth bag. Heat to boiling.

Fill jars with pickles. Add 1 teaspoon mustard seed and 1½ heads fresh dill (or 1½ teaspoons of dill seed) per pint. Cover with boiling liquid; leave ½ inch of headspace. Adjust lids, and process jars as described in Table 1. Or use the low-temperature pasteurization treatment described under *Getting crisp pickles*.

Sweet gherkins

- 7 pounds cucumbers (1½ inches or less)
- ½ cup canning salt or pickling salt
- 8 cups sugar
- 1½ quarts vinegar (5 percent)
- ¾ teaspoon turmeric
- 2 teaspoons celery seed
- 2 teaspoons whole, mixed pickling spice
- 2 cinnamon sticks
- ½ teaspoon fennel (optional)
- 2 teaspoons vanilla (optional)

Yield: 6 to 7 pints

Procedure: Leave ¼ inch of cucumber stem ends attached. Place cucumbers in large container and cover with fresh boiling water.

Six hours to eight hours later, and again on the second day, drain and cover with a mixture of 6 quarts of boiling water and ¼ cup salt.

On the third day, drain and prick cucumbers with table fork.

Combine 3 cups sugar, turmeric and spices with 3 cups vinegar. Boil and pour over cucumbers.

Six to eight hours later, drain and save syrup. Add another 2 cups each of sugar and vinegar, and reheat syrup to boil.

Pour over pickles.

On the fourth day, drain and save syrup. Add another 2 cups sugar and 1 cup vinegar, and reheat syrup to boil. Pour over pickles.

Six to eight hours later, drain and save syrup. Add 1 cup sugar and 2 teaspoons vanilla, and heat to boiling.

Fill sterilized pint jars with pickles and cover with hot syrup; leave ½ inch of headspace. Adjust lids, and process jars as described in Table 1. Or use the low-temperature pasteurization treatment described under *Getting crisp pickles*.

Quick sweet pickles

- 8 pounds of 3- to 4-inch pickling cucumbers
- ½ cup canning or pickling salt
- 1 cup pickling lime (for optional liming procedure, see *Getting crisp pickles* section)
- 4½ cups sugar
- 3½ cups vinegar (5 percent)
- 2 teaspoons celery seed
- 1 tablespoon whole allspice
- 2 tablespoons mustard seed

Yield: 7 to 9 pints

Procedure: Cut a ¼-inch slice off blossom ends and discard, but leave ¼ inch of cucumber stem ends attached. Slice or cut in strips, if desired. Place in bowl and sprinkle with ½ cup salt. Cover with 2 inches of crushed or cubed ice. Refrigerate 3 to 4 hours. Add more ice as needed. Drain well.

Optional step: For firmer pickles, use the pickling lime treatment described in the *Getting crisp pickles* section.

Combine sugar, vinegar, celery seed, allspice and mustard seed in a 6-quart pot. Heat to boil.

For a hot pack, add cucumbers and heat slowly until vinegar mixture returns to boil. Stir occasionally to make sure vinegar mixture heats evenly. Fill sterilized jars with cucumbers and add hot pickling syrup; leave ½ inch of headspace.

For a raw pack, fill jars with cucumbers and add hot pickling syrup; leave ½ inch of headspace.

Adjust lids, and process jars as described in Table 1. Or use the low-temperature pasteurization treatment described under *Getting crisp pickles*.

Variation: Add two slices of raw onion to each jar before filling with cucumbers.

Bread-and-butter pickles

- 6 pounds of 4- to 5-inch pickling cucumbers
- 2 quarts thinly sliced onions (about 3 pounds)
- ½ cup canning or pickling salt
- 1 cup pickling lime
(for optional liming treatment described in the *Getting crisp pickles* section)
- 1 quart vinegar (5 percent)
- 4½ cups sugar
- 2 tablespoons mustard seed
- 1½ tablespoons celery seed
- 1 tablespoon ground turmeric

Yield: About 8 pints

Procedure: Wash cucumbers. Cut a ¼-inch slice off blossom ends and discard. Cut cucumbers into ¾-inch slices. Combine cucumbers and onion slices in a large bowl. Add salt. Cover with 2 inches crushed or cubed ice.

Refrigerate 3 to 4 hours; add more ice as needed.

For firmer pickles, use the pickling lime treatment described in the *Getting crisp pickles* section.

Combine sugar, spices and vinegar in a large pot. Boil 10 minutes. Drain cucumbers and onions, and add to spice mixture. Slowly reheat to boiling.

Fill pint or quart jars with slices and cooking syrup; leave ½ inch of headspace. Adjust lids, and process jars as described in Table 1. Or use the low-pasteurization treatment described earlier in this booklet.

Variation: Squash bread-and-butter pickles. Substitute slender (1½ inches to 2 inches in diameter) zucchini or yellow summer squash for cucumbers.

Note: If you're using the lime-treated variation, add the onions in with other ingredients after this step.

Pickle relish

- 3 quarts fresh, chopped cucumbers
- 3 cups chopped, sweet green peppers
- 3 cups chopped, sweet red peppers
- 1 cup chopped onion
- ¾ cup canning or pickling salt
- 2 quarts water
- 1 quart ice
- 2 cups sugar
- 4 teaspoons each of mustard seed, turmeric, whole allspice and whole cloves
- 1½ quarts white vinegar (5 percent)

Yield: 9 pints

Procedure: Add salt, ice, cucumbers, peppers and onions to water and let stand 4 hours.

Drain and cover vegetables with fresh ice water for another hour. Drain again. Combine spices in a spice bag or cheesecloth bag.

Add spices to sugar and vinegar. Heat to boiling and pour mixture over vegetables. Cover and refrigerate 24 hours. Heat mixture to boil, and fill clean jars while hot; leave ½ inch of headspace. Adjust lids, and process jars as described in Table 1.

Dill pickles

Use the following quantities for each gallon capacity of your container:

- 4 pounds of 4-inch pickling cucumbers
- 2 tablespoons dill seed or 4 to 5 heads fresh or dry dill weed
- ½ cup salt
- ¼ cup vinegar (5 percent)
- 8 cups water and one or more of the following ingredients:
 - 2 cloves garlic (optional)
 - 2 dried red peppers (optional)
 - 2 teaspoons whole mixed pickling spices (optional)

Procedure: Wash cucumbers. Cut a ¼-inch slice off blossom end and discard, but leave ¼ inch of cucumber stem ends attached. Place half of dill and spices on bottom of a clean, suitable container. Add cucumbers, remaining dill and spices. Dissolve salt in vinegar and water, and pour over cucumbers. Add suitable cover and weight.

Store where temperature is between 70 and 75 degrees F for about 3 to 4 weeks while fermenting. Temperatures of 55–65 degrees F are acceptable, but the fermentation will take 5 to 6 weeks. Avoid temperatures above 80 degrees F or pickles will become too soft during fermentation.

Fermenting pickles cure slowly. Check the container several times a week, and promptly remove surface scum or mold.

Caution

If pickles become soft and slimy, or develop a disagreeable odor, discard them.

Adapted from Complete Guide to Home Canning, USDA, Agriculture Information Bulletin No. 539.

White, Athalie, Ann Ford, Elizabeth L. Address, and Judy A. Harrison. 2014. So Easy to Preserve, 6th ed. University of Georgia Cooperative Extension Service.

Fully fermented pickles may be stored in the original container for about four to six months provided they are refrigerated and surface scum and molds are removed regularly.

Canning fully fermented pickles is a better way to store them. To can them, pour the brine into a pan, heat slowly to a boil and simmer 5 minutes. Filter brine through paper coffee filters to reduce cloudiness, if desired. Fill jar with pickles and hot brine; leave ½ inch of headspace. Adjust lids, and process as described in Table 1. Or use the low-temperature pasteurization treatment directions found on page 2.

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