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## FOOD PRESERVATION

### Pickling basics

# In a Pickle

Nutritional Sciences  
University of Missouri Extension

### Start with the best 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 could make the brine cloudy. Flake salt varies in density, so don't use it to make pickled and fermented foods.

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. Caution: 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 reliable recipes, may produce undesirable flavors. Use white distilled and cider vinegars of 5 percent acidity (50 grain). White vinegar is usually preferred when light color is desirable. Never use home-made vinegar when making pickles.

### Quality for Keeps



### Containers, weights and covers for fermenting

A 1-gallon container holds five pounds of fresh cucumbers; a 5-gallon container holds 25 pounds. Glass, unchipped enamel-lined pans and food-grade plastic containers are excellent substitutes for the traditional stone crock.

You may use other 1-gallon to 3-gallon non-foodgrade containers as long as you line them with a clean, food-grade plastic bag. Do not use garbage bags or trash liners. 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. Select a pie or dinner plate small enough to just fit inside the container. Cover the weight and container top with a heavy clean bath towel to reduce mold growth on the brine

surface.

Wash all containers, plates and jars in hot, sudsy water and rinse well with very hot water before using.

**Tip:** Pickles are best if eaten within one year of processing.

### Preparation

Wash cucumbers, and cut ⅙ inch off the blossom end. If you prefer pickles that are especially firm, soak cucumbers in a mixture of 1 cup pickling lime and ½ cup salt to 1 gallon of water.

Use a 2-gallon to 3-gallon crock or enamelware container. Avoid inhaling limewater solution while mixing. Soak cucumbers in lime water for 12 hours to 24 hours.

You must remove the excess lime absorbed by the cucumbers to make safe pickles. Remove cucumbers from lime solution, rinse and soak for one hour in fresh cold water.

Repeat the rinsing and soaking steps in fresh water two more times. Handle carefully, as slices will be brittle. Drain well. Caution: Use liming procedure only when recipe indicates.

### Canning procedure

Pickle products spoil easily. Microorganisms — particularly yeasts, molds and enzymes — may affect flavor, color and texture. Process

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

Pickles	Style of pack	Jar size	Process time in minutes for these ranges of altitude	
			0–1,000 feet	1,001–6,000 feet
Quick, fresh-pack dills	Raw	Pints	10	15
		Quarts	15	20
Quick, sweet	Raw	Pints	10	15
		Quarts	15	20
	Hot	Pints/quarts	5	10
Sweet gherkin	Raw	Pints	5	10
Bread-and-butter	Hot	Pints/quarts	10	15
Pickle relish	Hot	Half-pints/pints	10	15
Dill, fermented	Raw	Pints	10	15
		Quarts	15	20

pickles in a boiling-water 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 publications GH1451, *Before You Start to Can, Learn the Basics*, and GH1452, *Steps to Success in Home Canning*, for information on correct canning procedures and for the steps to follow in boiling-water canning.

For firmer pickles, use this low-temperature pasteurization treatment.

**Caution: Use this procedure only when recipe indicates.**

This 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 degrees F to 140 degrees F) water.
- ▶ Add hot water until it is one inch above jars.
- ▶ Heat the water and maintain a 180 degrees F water temperature for 30 minutes. Use a candy or jelly thermometer to be certain that the water temperature does not fall below 180 degrees F during the entire 30 minutes.

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

### For safety's sake

The level of acid in a pickled product is as important to its safety as it is to its taste and texture.

1. Do not change the amounts of vinegar, food or water in a recipe. Don't use a vinegar with unknown acidity. Don't use homemade vinegar.
2. Only use recipes with tested amounts of ingredients.
3. There must be enough acid in the mixed product to prevent the growth of botulinum bacteria. If botulinum bacteria grow inside jars, they can produce the toxin that causes botulism, an often fatal form of food poisoning.

### Quick, fresh-pack dill pickles

- 8 pounds of 3-inch to 5-inch pickling cucumbers
- 2 gallons water
- 1¼ cups 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 1/16-inch slice off blossom ends and discard, but leave ¼ inch of cucumber stem ends attached. Dissolve ¾ cup salt in two gallons of water. Pour brine water over cucumbers and let stand 12 hours. Drain.

Combine vinegar, ½ cup salt, sugar and two 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 headspace. Adjust lids, and process jars as described in Table 1. Or, use the low-temperature pasteurization treatment.

## 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 six 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 headspace. Adjust lids, and process jars as described in Table 1. Or, use the low-temperature pasteurization treatment.

## Quick sweet pickles

- 8 pounds of 3-inch to 4-inch pickling cucumbers
- ⅓ cup canning or pickling salt
- 1 cup pickling lime (for optional liming procedure, see “Preparation” 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 1/16-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 ⅓ cup salt. Cover with two inches of crushed or cubed ice. Refrigerate three to four hours. Add more ice as needed. Drain well.

**Optional step:** For firmer pickles, use the pickling lime treatment described under “Preparation” 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 headspace.

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

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

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

## Bread-and-butter pickles

- 6 pounds of 4-inch 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 “Preparation” section above)
- 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:** Cut 1/16-inch slice off blossom ends and discard, but leave ¼ inch of cucumber stem ends attached. Cut cucumbers into ¾-inch slices. Combine cucumbers and onion slices in a large bowl. Add salt. Cover with two inches crushed or cubed ice. Refrigerate three to four hours; add more ice as needed.

For firmer pickles, use the pickling lime treatment described in the “Preparation” section above.

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 headspace. Adjust lids, and process jars as described in Table 1. Or, use the low-pasteurization treatment.

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

## Pickle relish

- 3 quarts fresh, chopped cucumbers
- 3 cups chopped, sweet green peppers
- 3 cups chopped, sweet red peppers
- 1 cup chopped onion
- $\frac{3}{4}$  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
- $1\frac{1}{2}$  quarts white vinegar (5 percent)

**Yield:** 9 pints

**Procedure:** Add salt, ice, cucumbers, peppers and onions to water and let stand four 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  $\frac{1}{2}$ -inch 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
- $\frac{1}{2}$  cup salt
- $\frac{1}{4}$  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  $\frac{1}{16}$ -inch slice off blossom end and discard. Leave  $\frac{1}{4}$  inch of stem 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 degrees F and 75 degrees F for about three to four weeks while fermenting. Temperatures of 55 degrees F to 65 degrees F are acceptable, but the fermentation will take five to six 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 the pickles become soft and slimy, or develop a disagreeable odor, discard them.** 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 five minutes. Filter brine through paper coffee filters to reduce cloudiness, if desired. Fill jar with pickles and hot brine; leave  $\frac{1}{2}$ -inch headspace. Adjust lids, and process as described in Table 1. Or, use the low-temperature pasteurization treatment.

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

For more information, visit MU Extension at:

<http://extension.missouri.edu>