



K-STATE
Research and Extension

PRESERVE IT FRESH, PRESERVE IT SAFE CUCUMBERS



When preserving fresh foods at home, follow proper techniques to prevent foodborne illness. These safety-tested methods can be used to process cucumbers.

Always wash your hands before preparing any recipe.

Making Pickles

Quality

Select firm cucumbers of the appropriate size, about 1½ inches for gherkins and 4 inches for dills. Use odd-shaped and more mature cucumbers for relishes and bread-and-butter style pickles. Use pickling varieties only.

Containers, Weights, and Covers for Fermenting

A 1-gallon container holds 5 pounds of fresh cucumbers; a 5-gallon container holds 25 pounds. Glass, unchipped enamel-lined pans, and food-grade plastic containers may be used in place of the traditional stone crock. Use a 1- to 3-gallon nonfood-grade container lined with a clean, food-grade plastic bag. Do not use garbage bags or trash liners. Before using, wash all the containers, plates, and jars in hot, soapy water and rinse well with hot water.

To hold the cucumbers under the brine, place a dinner plate or pie plate inside the container. Weigh it down with two or three sealed quart jars of water or a food-grade plastic bag containing 3 quarts of water and 4½ tablespoons of salt. Then cover the container with a heavy, clean bath towel to reduce mold growth on the brine surface.

Salt, Sugar, and Vinegar

Use canning or pickling salt. Anti-caking material in other salts may turn brine cloudy. Flake salt varies in density and is not recommended for pickled and fermented foods.

In brined pickles, salt provides characteristic flavor and is vital to safety and texture. In fermented foods, salt favors the growth of desirable bacteria and inhibits the growth of others. **Caution:** Do not reduce the amount of salt when making fermented pickles.

White granulated and brown sugars are the sweeteners most often used in pickling. Corn syrup and honey may produce undesirable flavors and should not be used unless specified in a tested recipe. Similarly, use sugar substitute only if the recipe calls for it as some sugar substitutes may cause bitterness. Use either white distilled or apple cider vinegars of 5 percent acidity (50 grain). White vinegar is preferable when a light color is desired.

Safety Tips

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

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

Canning

To learn more about water bath or steam canning, see *How-to Guide to Water Bath Canning and Steam Canning* (MF3241).

Preparing Jars and Lids

For all canning recipes processed less than 10 minutes, wash and sterilize jars by placing them inside a boiling water canner and cover with water. Boil jars for at least 10 minutes and keep them hot.

Preheating is not required for standard metal lids. Always wash lids in hot, soapy water before use. If using reusable plastic lid systems with rubber rings, follow the manufacturer's directions.

Low-Temperature Pasteurization Treatment for Canning Cucumber Pickles

Place the jars in a canner filled halfway with warm (120°F to 140°F) water. Add hot water to a level of 1 inch above the jars. Heat the water and maintain a temperature of 180°F to 185°F for 30 minutes. Use a candy or food thermometer to be sure it stays at that temperature the entire processing time. Pickles may soften at temperatures higher than 185°F. This method results in a better product texture but must be carefully managed to avoid possible spoilage. **Caution:** Use only when the recipe indicates.

After Processing

Do not retighten screw bands. Cool the jars 12 to 24 hours and remove the screw bands. Check the lid seals. If the center of the lid is indented, the jar is sealed. Wash, dry, label, date, and store sealed jars in a clean, cool, dark place. If the lid is unsealed, examine and replace the jar if it is defective, use a new lid, and reprocess as before. Wash the screw bands and store separately. After processing and cooling, the jars should be stored four to five weeks to develop ideal flavor. Pickles are best if used within one year.

Fermented Dill Pickles

Use the following quantities for each gallon capacity of your fermentation container.

- 4 pounds 4-inch pickling cucumbers
- 2 tablespoons dill seed or 4 to 5 heads fresh or dry dill
- ½ cup canning and pickling salt
- ¼ cup vinegar (5% acidity)
- 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

Rinse and scrub cucumbers. Cut a ¼-inch slice off the blossom end and discard. Leave ¼-inch of the stem attached. Place half of the dill and spices on the bottom of a clean, suitable container. Add cucumbers, remaining dill, and spices. Dissolve salt in vinegar and water and pour over cucumbers. Add a suitable cover and weight. Store at a temperature between 70°F and 75°F about three to four weeks while fermenting.

Temperatures of 55°F to 65°F are acceptable, but fermentation will take five to six weeks. Avoid temperatures above 80°F, or the 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 it slowly to a boil, and simmer 5 minutes. Filter brine through paper coffee filters to reduce the cloudiness, if desired. Fill jars with pickles and hot brine, leaving ½-inch headspace. Remove air bubbles and adjust headspace if needed. Wipe rims of jars with a damp clean paper towel. Apply lids and rings fingertip-tight. Process in a boiling water bath or steam canner as described in Table 1, or use the low-temperature pasteurization treatment as described above. Turn off heat and remove canner lid. Let jars cool 5 minutes. Remove jars from canner; do not retighten bands. Cool completely, check seals, label, date, and store.

Nutrition: Fermented Dill Pickles

Serving size: 1 4-inch spear — 16 calories, 0 g fat, 3 g carbohydrates, 1 g protein, 1 g fiber, 1090 mg sodium, 1 g sugar

Quick Fresh-Packed Dill Pickles

Yield: 7 to 9 pints

- 8 pounds of 3- to 5-inch pickling cucumbers
- 2 gallons water
- 1¼ cups canning or pickling salt (divided)
- 1½ quarts vinegar (5% acidity)
- ¼ cup sugar
- 2 quarts water
- 2 tablespoons whole mixed pickling spice
- About 3 tablespoons whole mustard seed (1 tsp. per pint jar)
- About 14 heads fresh dill (1½ heads per pint jar), or 4½ tablespoons dill seed (1½ teaspoons per pint jar)

Procedure

Rinse and scrub cucumbers. Cut $\frac{1}{16}$ -inch slice off the blossom end and discard, leaving $\frac{1}{4}$ inch of the stem attached. Dissolve $\frac{3}{4}$ cup of salt in 2 gallons of water. Pour over cucumbers and let stand 12 hours. Drain.

Combine vinegar, $\frac{1}{2}$ cup salt, sugar, and 2 quarts of water. Add mixed pickling spices tied in a clean white cloth. Heat to boiling. Fill hot jars with cucumbers. Add 1 teaspoon mustard seed and $1\frac{1}{2}$ heads fresh dill per pint. Cover with boiling pickling solution, leaving $\frac{1}{2}$ -inch headspace. Remove air bubbles and adjust headspace if needed. Wipe rims of jars with a damp clean paper towel. Apply lids and rings fingertip-tight. Process in a boiling water bath or steam canner as described in Table 1, or use the low-temperature pasteurization treatment described on page 2. Turn off heat and remove canner lid. Let jars cool 5 minutes. Remove jars from canner; do not retighten bands. Cool completely, check seals, label, date, and store.

Nutrition: Quick Fresh-Packed Dill Pickles

Serving size: 1 4" spear — 16 calories, 0 g fat, 3 g carbohydrates, 1 g protein, 1 g fiber, 1090 mg sodium, 1 g sugar

Quick Sweet Pickles

May be canned as strips or slices.

Yield: About 7 to 9 pints

- 8 pounds of 3- to 4-inch pickling cucumbers
- $\frac{1}{3}$ cup canning or pickling salt
- $4\frac{1}{2}$ cups sugar
- $3\frac{1}{2}$ cups vinegar (5% acidity)
- 2 teaspoons celery seed
- 1 tablespoon whole allspice
- 2 tablespoons mustard seed
- 1 cup pickling lime (optional, for firmer pickles)*

Procedure

Preparation Without Lime: Rinse and scrub cucumbers. Cut a $\frac{1}{16}$ -inch slice off the blossom end and discard, but leave $\frac{1}{4}$ inch of the stem attached. Slice or cut in spears, if desired. Place in a bowl and sprinkle with $\frac{1}{3}$ cup of salt. Cover with 2 inches of crushed or cubed ice. Refrigerate 3 to 4 hours. Add more ice as needed.

**Preparation With Lime for Firmer Pickles:* Rinse and scrub cucumbers. Remove $\frac{1}{16}$ -inch from the blossom end, but leave $\frac{1}{4}$ inch of the stem attached. Slice or cut the cucumbers into spears. Mix 1 cup pickling lime and $\frac{1}{2}$ cup salt per gallon of water in a 2- to 3-gallon crock or enamelware container.

Caution: Avoid inhaling lime dust while mixing lime-water solution. Use ONLY food grade lime purchased from the grocery store.

Soak cucumber slices or spears in lime water solution for 12 to 24 hours, stirring occasionally. Remove from lime solution, and rinse and resoak one hour in fresh cold water. Repeat the rinsing and resoaking two more times. **Do not skip these rinsing and resoaking steps.** Handle carefully because the slices or strips will be brittle.

To Make Pickles: Drain prepared cucumbers well. Combine sugar, vinegar, celery seed, allspice, and mustard seed in a 6-quart kettle. Heat to boiling.

Hot pack: Add cucumbers and heat slowly until vinegar solution returns to a boil. Stir occasionally to make sure mixture heats evenly. Fill sterile jars, leaving $\frac{1}{2}$ -inch headspace.

Raw pack: Fill jars, leaving $\frac{1}{2}$ -inch headspace. Add hot pickling syrup, leaving $\frac{1}{2}$ -inch headspace. Remove air bubbles and adjust headspace if needed. Wipe rims of jars with a damp clean paper towel.

Apply lids and rings fingertip-tight. Process in a boiling water bath or steam canner as described in Table 1, or use the low-temperature pasteurization treatment described on page 2. Turn off heat and remove canner lid. Let jars cool 5 minutes. Remove jars from canner; do not retighten bands. Cool completely, check seals, label, date, and store.

Variation: Add 2 slices of raw onion to each jar before filling with cucumbers.

Nutrition: Quick Sweet Pickles

Serving size: 1 3-inch spear — 20 calories, 0 g fat, 6 g carbohydrates, 0 g protein, 0 g fiber, 200 mg sodium, 5 g sugar

Bread and Butter Pickles

Yield: About 8 pints

- 6 pounds of 4- to 5-inch pickling cucumbers
- 8 cups thinly sliced onions (about 3 pounds)
- $\frac{1}{2}$ cup canning or pickling salt
- 4 cups vinegar (5% acidity)
- $4\frac{1}{2}$ cups sugar
- 2 tablespoons mustard seed
- $1\frac{1}{2}$ tablespoons celery seed
- 1 tablespoon ground turmeric
- 1 cup pickling lime (optional, for firmer pickles)*

Procedure

Preparation without lime: Rinse and scrub cucumbers. Cut $\frac{1}{16}$ -inch off the blossom end and discard. Cut into $\frac{3}{16}$ -inch slices. Combine cucumbers and onions in a large bowl. Add salt. Cover with 2 inches of crushed or cubed ice. Refrigerate 3 to 4 hours, adding more ice as needed.

**Preparation with lime:* Rinse and scrub cucumbers. Cut $\frac{1}{16}$ -inch off the blossom end and discard. Cut into $\frac{3}{16}$ -inch slices. Mix 1 cup of pickling lime and $\frac{1}{2}$ cup of salt to 1 gallon of water in a 2- to 3-gallon crock or enamelware container.

Caution: Avoid inhaling lime dust while mixing lime-water solution. Use **ONLY** food-grade lime purchased from a grocery store.

Soak cucumber slices in lime water for 12 to 24 hours, stirring occasionally. Remove from lime solution, rinse, and resoak 1 hour in fresh cold water. Repeat rinsing and soaking steps two more times. **Do not skip these rinsing and resoaking steps.** Handle carefully, as slices will be brittle. Drain well.

To make pickles: Drain cucumbers and onions well. Combine remaining ingredients in a large pot and boil 10 minutes. Add drained cucumbers and onions and reheat to boiling. Fill hot pint jars with the slices and cooking syrup, leaving $\frac{1}{2}$ -inch headspace. Remove air bubbles and adjust headspace if needed. Wipe rims of jars with a damp clean paper towel. Apply lids and rings fingertip-tight. Process in a boiling water bath or steam canner as described in Table 1, or use the low-temperature pasteurization treatment described on page 2. Turn off heat and remove canner lid. Let jars cool 5 minutes. Remove jars from canner; do not retighten bands. Cool completely, check seals, label, and store.

Variation for squash bread-and-butter pickles: Substitute slender (1 to $1\frac{1}{2}$ inches in diameter) zucchini or yellow summer squash for the cucumbers. **Caution:** Do not use the liming variation for firmer pickles.

Nutrition: Bread and Butter Pickles

Serving size: About 3 slices — 25 calories, 0 g fat, 6 g carbohydrates, 0 g protein, 0 g fiber, 300 mg sodium, 5 g sugar

Sweet Gherkin Pickles

Yield: 6 to 7 pints

- 7 pounds pickling cucumbers ($1\frac{1}{2}$ inches or less)
- $\frac{1}{2}$ cup canning or pickling salt
- 8 cups sugar
- 6 cups vinegar (5% acidity)
- $\frac{3}{4}$ teaspoon turmeric
- 2 teaspoons celery seeds
- 2 teaspoons whole mixed pickling spice
- 2 cinnamon sticks
- $\frac{1}{2}$ teaspoon fennel (optional)
- 2 teaspoons vanilla (optional)

Procedure — This is a multi-day process

Day One — Morning

Rinse and scrub cucumbers. Cut $\frac{1}{16}$ -inch slice off the blossom end and discard, but leave a $\frac{1}{4}$ inch of the stem attached. Place cucumbers in a large container and cover with boiling water. Wait 6 to 8 hours.

Day One — Afternoon

Drain and add $\frac{1}{4}$ cup of salt. Cover with fresh boiling water. Let sit overnight and morning of day two.

Day Two — Afternoon

Drain and add $\frac{1}{4}$ cup salt; cover with fresh, boiling water. Let sit overnight.

Day Three — Morning

Drain and prick the cucumbers with a fork.

To make pickling syrup, combine and bring to a boil, 3 cups of vinegar, 3 cups of sugar, turmeric, and spices. Pour over cucumbers. Wait 6 to 8 hours.

Day Three — Afternoon

Drain and save the pickling syrup. Add another 2 cups each of sugar and vinegar, add to the saved syrup and reheat to a boil. Pour over pickles. Let sit overnight.

Day Four — Morning

Drain and save the syrup. Add another 2 cups sugar and 1 cup vinegar. Heat to boiling and pour over pickles. Wait 6 to 8 hours.

Day Four — Afternoon

Drain and save the pickling syrup. Add 1 cup of sugar and 2 teaspoons of vanilla (optional), and heat to boiling.

Pack pickles in hot, sterile pint jars and cover with hot syrup, leaving ½-inch headspace. Remove air bubbles and adjust headspace if needed. Wipe rims of jars with a damp clean paper towel. Apply lids and rings fingertip-tight. Process in a boiling water bath or steam canner as described Table 1, or use the low-temperature pasteurization treatment described on page 2. Turn off heat and remove canner lid. Let jars cool 5 minutes. Remove jars from canner; do not retighten bands. Cool completely, check seals, label, date, and store.

Nutrition: Sweet Gherkin Pickles

Serving size: About 2 pickles — 30 calories, 0 g fat, 8 g carbohydrates, 0 g protein, 0 g fiber, 260 mg sodium, 8 g sugar

Reduced-Sodium Sliced Dill Pickles

Yield: About 8 pints

- 4 pounds (3- to 5-inch) pickling cucumbers
- 6 cups vinegar (5% acidity)
- 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

Procedure

Rinse and scrub cucumbers. Cut ¼-inch slice off the blossom end and discard. Cut cucumbers in ¼-inch slices. Combine vinegar, sugar, salt, celery, and mustard seeds in a large saucepan. Bring mixture to a boil. Place two slices of onion and half a dill head on the bottom of each pint jar. Fill the jars with cucumber slices, leaving ½-inch headspace. Add one slice of onion and half of a dill head on top. Pour hot pickling solution over the cucumbers, leaving ¼-inch headspace. Remove air bubbles and adjust headspace if needed. Wipe rims of jars with a damp clean paper towel. Apply lids and rings fingertip-tight. Process in a boiling water bath or steam canner as described in Table 1. Turn off heat and remove canner lid. Let jars cool 5 minutes. Remove jars from canner; do not retighten bands. Cool completely, check seals, label, date, and store.

Nutrition: Reduced Sodium Sliced Dill Pickles

Serving size: About 3 slices — 35 calories, 0 g fat, 8 g carbohydrates, 0 g protein, 0 g fiber, 90 mg sodium, 8 g sugar

Reduced-Sodium Sliced Sweet Pickles

Yield: About 4 to 5 pints

- 4 pounds (3- to 4-inch) pickling cucumbers

Brining solution:

- 1 quart distilled white vinegar (5% acidity)
- 1 tablespoon canning or pickling salt
- 1 tablespoon mustard seed
- ½ cup sugar

Canning syrup:

- 1 ⅔ cups distilled white vinegar (5% acidity)
- 3 cups sugar
- 1 tablespoon whole allspice
- 2¼ teaspoons celery seed

Procedure

Rinse and scrub cucumbers. Cut ¼-inch off the blossom end and discard. Cut cucumbers into ¼-inch slices. Combine all ingredients for the canning syrup in a saucepan and bring to a boil. Keep syrup hot until used. In a large kettle, mix the ingredients for the brining solution. Add cut cucumbers, cover and simmer until cucumbers change color from bright green to dull green (about 5 to 7 minutes). Drain the cucumber slices. Fill hot jars and cover with the hot canning syrup, leaving ½-inch headspace. Remove air bubbles and adjust headspace if needed. Wipe rims of jars with a damp clean paper towel. Apply lids and rings fingertip-tight.

Process in a boiling water bath or steam canner following instructions in Table 1. Turn off heat and remove canner lid. Let jars cool 5 minutes. Remove jars from canner; do not retighten bands. Cool completely, check seals, label, date, and store.

Nutrition: Reduced Sodium Sliced Sweet Pickles

Serving size: About 3 slices — 25 calories, 0 g fat, 6 g carbohydrates, 0 g protein, 0 g fiber, 55 mg sodium, 6 g sugar

No Sugar Added Sweet Pickle Cucumber Slices

Yield: About 4 or 5 pint jars

- 3½ pounds of pickling cucumbers
- Boiling water to cover sliced cucumbers
- 4 cups cider vinegar (5% acidity)
- 3 cups Splenda®
- 1 tablespoon canning or pickling salt
- 1 cup water

- 1 tablespoon mustard seed
- 1 tablespoon whole allspice
- 1 tablespoon celery seed
- 4 1-inch cinnamon sticks

Procedure

Rinse and scrub cucumbers. Slice $\frac{1}{16}$ -inch off the blossom ends and discard. Slice cucumbers into $\frac{1}{4}$ -inch thick slices. Pour boiling water over cucumber slices and let stand 5 to 10 minutes. Drain off hot water and pour cold water over cucumbers. Let cold water run continuously over the cucumber slices, or change water frequently until cucumbers are cooled. Drain slices well.

Mix vinegar, 1 cup water, Splenda® and all spices in a 10-quart Dutch oven or stockpot. Bring to a boil. Add drained cucumber slices carefully to the boiling liquid. Return to a boil.

Place one cinnamon stick in each jar, if desired. With a slotted spoon, fill hot pickle slices into clean, hot pint jars, leaving $\frac{1}{2}$ -inch headspace. Cover with boiling hot pickling brine, leaving $\frac{1}{2}$ -inch headspace. Remove air bubbles and adjust headspace if needed. Wipe rims of jars with a dampened clean paper towel. Apply lids and rings fingertip-tight.

Process in a boiling water canner or steam canner according to the recommendations as described in Table 1. Turn off heat and remove canner lid. Let jars cool 5 minutes. Remove jars from canner; do not retighten bands. Cool completely, check seals, label, date, and store.

Nutrition: No-Sugar-Added Sweet Pickle Cucumber Slices
Serving size: About 3 slices — 10 calories, 0 g fat, 1 g carbohydrates, 0 g protein, 0 g fiber, 75 mg sodium, 0 g sugar

Pickle Relish

Yield: About 9 pints

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

Procedure

Rinse and scrub vegetables and prepare as indicated. Combine cucumbers, peppers, onions, salt, and ice with the water and let stand 4 hours. Drain and recover the vegetables with fresh ice water for another hour. Drain again. Combine the spices in a spice or cheesecloth bag. Add the spices to sugar and vinegar in a saucepan. Heat to boiling and pour mixture over vegetables. Cover and refrigerate 24 hours. Heat mixture to boiling and fill hot jars, leaving $\frac{1}{2}$ -inch headspace. Remove air bubbles and adjust headspace if needed. Wipe rims of jars with a damp clean paper towel. Apply lids and rings fingertip-tight.

Process in a boiling water bath or steam canner following instructions in Table 1. Turn off heat and remove canner lid. Let jars cool 5 minutes. Remove jars from canner; do not retighten bands. Cool completely, check seals, label, date, and store.

Nutrition: Pickle Relish

Serving size: 1 tablespoon — 5 calories, 0 g fat, 1 g carbohydrates, 0 g protein, 0 g fiber, 230 mg sodium, 1 g sugar

Fresh Dill Cucumber Relish

A sweet relish, not a salty dill pickle relish.

Yield: About 6 to 7 pint jars

- 12 cups chopped pickling cucumbers (about $4\frac{1}{2}$ pounds pickling cucumbers as purchased)
- 3 cups chopped red bell peppers
- 1 cup chopped onion

Pre-Soak Ingredients:

- $\frac{3}{4}$ cup pickling or canning salt
- 4 cups crushed or cubed ice
- 8 cups water

Pickling Solution:

- 5 cups cider vinegar (5% acidity)
- 1 cup sugar
- 1 cup water
- 2 tablespoons mustard seed
- 1 cup chopped fresh dill
- 1 teaspoon garlic powder

Procedure

Rinse and scrub cucumbers. Slice $\frac{1}{16}$ -inch off the blossom ends and discard. Cut into about 1-inch pieces, and then chop in a food processor (using about three pulses on “chop”) to yield about $\frac{1}{4}$ -inch or slightly larger pieces. Measure 12 cups of chopped cucumber.

Rinse peppers, remove the stem, seeds and white membranes. Cut into about 1-inch pieces or slices. Chop in a food processor (using about three pulses on “chop”) to yield about ¼-inch or slightly larger pieces. Measure 3 cups of chopped pepper. Remove the skin from onions. Rinse well and chop into about ¼-inch cubes, or process to size in a food processor as for peppers. Measure 1 cup of chopped onion.

Combine measured chopped cucumber, pepper, and onion with salt, ice, and the 8 cups water in a large bowl or saucepot. Cover; let stand 3 to 4 hours in refrigerator. Drain; rinse thoroughly with ice cold water and drain well again through a cheesecloth-lined strainer (until no more water drips through, about 15 to 20 minutes). Heat vinegar, sugar, 1 cup water, and spices in a large stockpot. Heat until sugar dissolves. Add drained, chopped vegetables, and bring to a boil. Reduce heat and simmer 10 minutes.

Fill hot relish into clean, hot pint jars leaving ½-inch headspace. Remove air bubbles and adjust headspace if needed. Wipe rims of jars with a dampened, clean paper towel. Apply lids and rings fingertip-tight.

Process in a boiling water canner or steam canner as described in Table 1. Turn off heat and remove canner lid. Let jars cool 5 minutes. Remove jars from canner; do not retighten bands. Cool completely, check seals, label, date, and store.

Nutrition: Fresh Dill Cucumber Relish

Serving size: 1 tablespoon — 5 calories, 0 g fat,

1 g carbohydrates, 0 g protein, 0 g fiber, 280 mg sodium, 1 g sugar

Rummage Relish

Yield: About 8 pint jars

- 2 quarts cored, chopped green tomatoes (about 16 medium)
- 1 quart peeled, cored, chopped red ripe tomatoes (about 6 large)
- 1 quart chopped cabbage (about 1 small head)
- 3 cups chopped onions
- 2 cups chopped celery
- 1 cup chopped sweet green peppers (about 2 medium)
- 1 cup chopped cucumbers
- 1 cup chopped sweet red peppers (about 2 medium)
- ½ cup canning or pickling salt
- 4 cups brown sugar
- 2 cloves garlic, minced
- 1 tablespoon celery seed
- 1 tablespoon ground cinnamon
- 1 tablespoon mustard seed
- 1 teaspoon ground ginger
- ½ teaspoon ground cloves
- 2 quarts vinegar (5% acidity)

Procedure

Combine vegetables; add salt and mix thoroughly. Let stand 12 to 18 hours in refrigerator; drain thoroughly. Add sugar, spices and garlic to vinegar in a large saucepan; simmer 10 minutes. Add vegetables; simmer 30 minutes. Bring to a boil.

Pack hot relish into hot jars, leaving ½-inch headspace. Remove air bubbles and adjust headspace if needed. Wipe rims of jars with a dampened clean paper towel. Apply lids and rings fingertip-tight. Process in a boiling water canner or steam canner as described in Table 1. Turn off heat and remove canner lid. Let jars cool 5 minutes. Remove jars from canner; do not retighten bands. Cool completely, check seals, label, date, and store.

Variation: For curry relish, add 2 cups raisins and 1½ teaspoons curry powder when vegetables are added to pickling solution. Makes about 9 pints.

Nutrition: Rummage Relish

Serving size: 1 tablespoon — 10 calories, 0 g fat,

2 g carbohydrates, 0 g protein, 0 g fiber, 130 mg sodium, 2 g sugar

Problems and Solutions

1. Why should blossoms be removed from cucumbers before pickling?

Blossoms may be a source of enzymes that make pickles soft. Always cut off ¼-inch from the blossom end of cucumbers in any recipe.

2. Why do we recommend using pure granulated salt (canning and pickling salt), rather than table salt, for making pickles?

Pure granulated salt (canning and pickling salt) contains no anti-caking ingredients, which may make the brine cloudy. Iodized salt can also turn the pickles dark.

3. Why is processing recommended for all pickle products?

Processing kills spoilage organisms and insures a good seal on the jar.

4. For processing pickles, does the water in the water bath canner have to be at a hard rolling boil?

No. To keep the pickles crisp, gently simmer rather than boil the water in the canner.

5. Can you pressure-can pickles?

No. It will ruin the texture of the pickles. If you don't have a water bath canner, use your pressure canner as a water bath canner by not applying the weight.

6. Is hard water acceptable for pickling?

No. You can "soften" hard water by boiling it, let sit overnight, and removing scum or residues.

7. What are the differences between fresh-pack pickles and fermented pickles?

Fresh-pack pickles are made with vinegar to get acetic acid. Fermented pickles are made from bacterial fermentation to produce lactic acid.

8. Why did the liquid in my dill pickles turn pink?

It could be from two sources. One is using over-mature dill. These are safe to eat. The other source is yeast growth. These should be discarded.

9. Why did the garlic cloves in my pickles turn green or bluish green?

This could be due to iron, tin, or aluminum in the cooking pot, water, or water pipes reacting with the pigments in the garlic. Fresh garlic may also turn blue. Be sure garlic is cured 2 to 4 weeks at 70°F before pickling. The pickles are safe to eat, but discard the garlic.

10. Why did my whole dill pickles spoil when everything was "done right"?

The cucumbers were probably wedged so tightly in the jar there was no room for the boiling-hot pickling solution. Whole cucumbers should be packed fairly loosely.

11. Is it necessary to add alum to pickles to make them firm?

Alum is not necessary in pickles. As long as good quality ingredients and up-to-date procedures are used, don't use it. You can use it for fermented cucumbers. It does not work with quick process pickles. Most recipes do not have alum as an ingredient. A safer method to make crisp pickles is soaking the cucumbers in ice water for 4 to 5 hours before pickling.

12. What is Ball® Pickle Crisp or Mrs. Wages® Xtra Crunch?

This is an easy-to-use product that makes any pickled product crisp without the lengthy process of soaking produce for hours in lime and the repeated rinsing. The product is calcium chloride, which is used in commercially made pickles. Follow the directions on the jar for proper usage.

13. What percentage of acidity should vinegar be for making safe pickles?

Today's pickle recipes are made using vinegar with 5% acidity. Be sure to read the label on the vinegar container. It may be stated on the front label or in the ingredient statement. Do not use any vinegar with other acidity levels. White vinegar and apple cider vinegar are interchangeable in recipes.

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

Pickles	Style of pack	Jar size	Processing time in minutes at different elevations (in feet)	
			0- 1,000	1,001-6,000
Dill, fermented	Raw	Pints	10	15
		Quarts	15	20
Quick, fresh- packed dills	Raw	Pints	10	15
		Quarts	15	20
Quick, sweet	Raw	Pints	10	15
		Quarts	15	20
	Hot	Pints or quarts	5	10
Bread and butter	Hot	Pints or quarts	10	15
Sweet gherkin	Raw	Pints	5	10
Reduced-sodium sliced dill	Raw	Pints	15	20
Reduced-sodium sliced sweet	Hot	Pints	10	15
No sugar added sweet cucumber slices	Hot	Pints	10	15
Pickle relish	Hot	Half-pints or pints	10	15
Fresh dill cucumber relish	Hot	Pints	15	20
Rummage relish	Hot	Pints	15	20

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Complete Guide to Home Canning, USDA AIB No. 539, 2015; and *So Easy to Preserve*, 6th ed., The University of Georgia Cooperative Extension Service;
and National Center for Home Food Preservation, <https://nchfp.uga.edu/>.

Nutrition data provided by USDA FoodData Central, <https://fdc.nal.usda.gov/index.html> and ESHA Genesis R&D Food Formulation & Labeling Software, version 11.13

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