

FOOD PRESERVATION



Making Pickled Products

Julie Garden-Robinson, Ph.D., R.D., L.R.D.
Food and Nutrition Specialist
North Dakota State University Extension Service

Pickling is one of the oldest known methods of food preservation. Pickled foods add a special touch to many snacks and meals.

The many varieties of pickled and fermented foods are classified by ingredients and method of preparation. The four general classes are: brined or fermented, fresh-pack or quick-process, fruit and relishes.

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

- Do not alter vinegar, food or water proportions in a recipe or use a vinegar with unknown acidity.
- Use only recipes with tested proportions of ingredients.
- You must have a minimum, uniform level of acid throughout the mixed product to prevent the growth of botulinum bacteria.

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Ingredients

Produce

Select fresh, firm fruits or vegetables that are free of spoilage. Use a pickling variety of cucumber because the table or slicing varieties may result in a poor-quality pickle.

Plan to pickle fruits or vegetables within 24 hours after the harvest for highest quality. If produce cannot be used immediately, refrigerate it and use it as soon as possible.

A bushel of cucumbers weighs 48 pounds and yields 16 to 24 quarts, an average of 2 pounds per quart. Choose the appropriate size. Use cucumbers about 1½ inches long for gherkins and 4 inches for dills. Odd-shaped and more mature cucumbers can be used for relishes and bread-and-butter style pickles. Measure or weigh produce carefully. Weighing gives the most accurate measures.

Salt

Use a canning or pickling salt. Noncaking material added to other salts may make the brine cloudy. Do not reduce salt in fermented pickles because proper fermentation depends on the correct proportions of salt and other ingredients. Flake salt varies in density and is not recommended for use.

Some fresh-pack pickles can be prepared safely with reduced or no salt. Use only tested recipes formulated to produce the proper acidity. Both the texture and flavor of these pickles may be noticeably different than expected. The quick pickle recipes in this publication may be made with reduced-sodium salts, such as light salts. Use of salt substitutes is not recommended.

CAUTION: The use of reduced-sodium salt in fermented pickle recipes is not recommended.

Vinegar

White distilled or cider vinegars of 5 percent acidity (50 grain) are recommended. White vinegar usually is preferred when light color is desirable, as for fruits and cauliflower.

Do not dilute vinegar unless the recipe so specifies. If a less sour pickle is preferred, add sugar rather than decrease vinegar.

Sugar

White granulated and brown sugars are used most often. Brown sugar gives a darker color and distinct flavor. Corn syrup and honey may alter the flavor.

Water

A soft water is recommended for pickle making. Very hard water may have an undesirable effect on the color and flavor of pickled products. However, some hard water might produce a firmer pickle.

Hard water may be softened somewhat by the following method: Boil the water for five minutes. Skim off the scum and let the water sit for 24 hours. Then ladle off the water without disturbing the sediment in the bottom. Another option is to dilute hard water with soft water. To dilute, mix one part hard water with two parts soft water.

Spices

Use fresh, whole spices for the best flavor in pickles. Powdered spices may cause the product to darken or become cloudy. Tying whole spices loosely in a cheesecloth bag, putting the bag in the pickling liquid and then removing the bag before canning is best. If desired, add individual spices, such as a cinnamon stick, from the bag to each jar. Spices deteriorate and quickly lose their pungency in heat and humidity. Store opened spices in an airtight container in a cool, dark place.

Firming Agents

Alum may be used safely to firm fermented pickles. However, it is unnecessary and is not included in the recipes in this publication. Alum does not improve the firmness of quick-processed pickles. The calcium in lime definitely improves pickle firmness. Food-grade lime may be used as a lime-water solution for soaking fresh cucumbers before pickling them. Excess lime absorbed by the cucumbers must be removed to make safe pickles. To further improve pickle firmness, you may process cucumber pickles for 30 minutes in water at 180 degrees Fahrenheit (F). This process also prevents spoilage, **but the water temperature should not fall below 180 F**. Use a candy or jelly thermometer to check the water temperature.

Equipment

For Pickling Liquids

For heating pickling liquids, use unchipped enamelware, stainless steel, aluminum or glass pots. **Do not** use copper, brass, iron or galvanized utensils. These metals may react with acids or salts and cause undesirable color and flavors, or even form toxic compounds in the pickle mixture.

For Brining or Fermenting

A 1-gallon container holds 5 pounds of fresh cucumbers and a 5-gallon container holds 25 pounds. Glass and food-grade plastic containers are excellent substitutes for stone crocks. Other 1- to 3-gallon food-grade containers may be used if lined inside with a clean food-grade plastic bag. **Do not use garbage bags or trash liners.** A large sealed food-grade plastic bag containing 4½ tablespoons of salt and 3 quarts of water may be used as a weight to hold cucumbers under the surface of the brine. A plate and jars of water also may be used. Select a pie or dinner plate just small enough to fit inside the fermentation container. Cover the weight and container top with a heavy, clean bath towel to reduce mold growth on the brine surface.

Preparation

Wash fruits and vegetables and sort according to size when they are used whole. Cut 1/16 inch off the blossom end of cucumbers.

If especially firm pickles are preferred, mix 1 cup of pickling lime and ½ cup of salt to 1 gallon of water in a 2- to 3-gallon crock or enamelware container. Do not use aluminum. Avoid inhaling the lime-water solution while mixing it. Soak cucumbers in lime water for 12 to 24 hours. Remove the cucumbers from the lime solution, rinse and resoak one hour in fresh, cold water. Repeat the rinsing and soaking steps in fresh water two more times. Handle carefully because slices will be brittle. Drain well.

Canning Procedure

Wash jars. Prepare lids according to the manufacturer's instructions. Fill jars uniformly with the product. Avoid packing so tightly that the brine or syrup cannot surround and cover the food. Remove the air bubbles by running a rubber scraper or nonmetal spatula between the food and the jar. Wipe the sealing edge of the jars with a clean, damp paper towel. Add lids and tighten the screw bands. Process jars in a boiling-water canner or use the low-temperature pasteurization treatment.

To process in a boiling-water canner, fill the canner halfway with water and preheat to 180 F for hot packs or 140 F for raw packs. Load sealed jars into the canner rack and lower with handles or load one jar at a time with a jar lifter onto a rack in the canner. Cover the canner and turn the heat to high. Add water if needed to a level of 1 inch above the jars. When the water boils vigorously, lower the heat to maintain a gentle boil and process the jars for the time given in Table 1.

To process using the low-temperature pasteurization treatment, 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 180 F water temperature for 30 minutes. Use a candy or jelly thermometer to be certain that the water temperature is at least 180 F during the entire 30 minutes. Temperatures higher than 185 F may cause unnecessary softening of pickles. This treatment results in a better product texture but must be managed carefully to avoid possible spoilage.

CAUTION: Use only when the recipe indicates.

After processing is completed, remove the jars from the canner with a jar lifter and place them on a towel or rack. 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 and store sealed jars in a clean, cool, dark place. If the lid is unsealed, examine and replace the jar if defective, use a new lid and reprocess as before. Wash the screw bands and store separately. Pickles are best if used within a year but are safe as long as the lids remain vacuum sealed.

RECIPES

Quick Fresh-pack Dill Pickles

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

YIELD: 7 to 9 pints

PROCEDURE: Wash cucumbers. Leave ¼ inch of cucumber stem ends attached but cut 1/16-inch slice off the blossom end. Dissolve ¾ cup of salt in 2 gallons of water. Pour the brine water over the cucumbers and let stand 12 hours. Drain. Combine vinegar, ½ cup of salt, sugar and 2 quarts of water. Add mixed pickling spices tied in a clean white cloth. Heat to boiling. Fill jars with cucumbers. Add 2 teaspoons of mustard seed and three heads of fresh dill per quart. Cover with boiling liquid, leaving ½ inch of head space. Adjust the lids and process jars as described in Table 1 or use the low-temperature pasteurization treatment described under “Canning Procedure.”

Pickled Horseradish Sauce

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

YIELD: About 2 half-pints

PROCEDURE: The pungency of fresh horseradish fades within one to two months, even when refrigerated. Therefore, make only small quantities at a time. Wash horseradish roots thoroughly and peel off the brown outer skin. The peeled roots may be grated in a food processor or cut into small cubes and put through a food grinder. Combine the ingredients and fill into sterile jars, leaving ¼ inch of head space. Seal jars tightly and store them in a refrigerator.

Reduced-sodium Sliced Dill Pickles

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

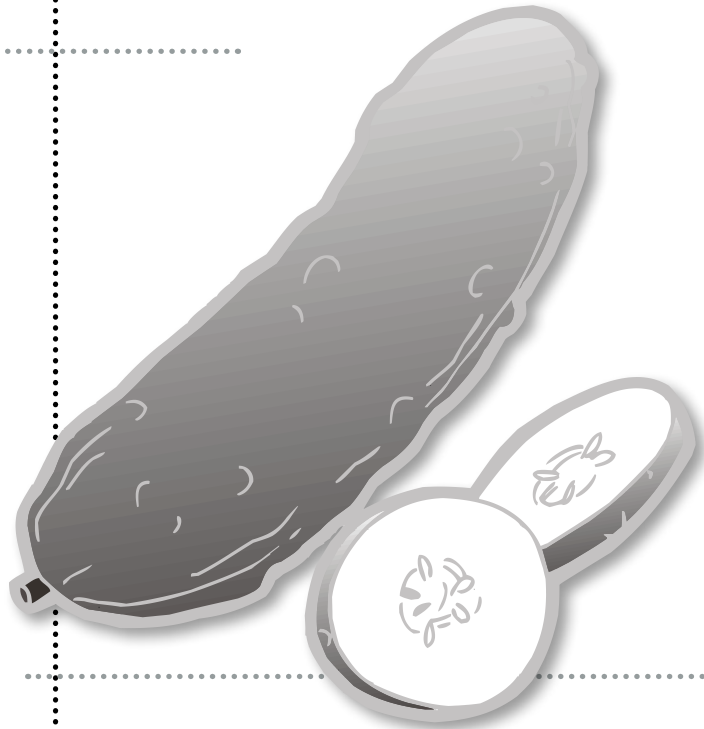
PROCEDURE: Wash cucumbers. Cut 1/16-inch slice off the blossom end and discard. Cut the cucumbers in ¼-inch slices. Combine vinegar, sugar, salt, celery and mustard seeds in a large saucepan. Bring the mixture to boiling. Place two slices of onion and one-half dill head on the bottom of each pint jar. Fill the jars with cucumber slices, leaving ½ inch of head space. Add one slice of onion and one-half dill head on top. Pour hot pickling solution over the cucumbers, leaving ¼ inch of head space. Adjust the lids and process according to Table 1.

Fermented 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
- ½ cup salt
- ¼ cup vinegar (5%)
- 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 1/16-inch slice off the blossom end and discard. Leave ¼ inch of stem attached. Place half of dill and spices on the bottom of a clean, suitable container (see Equipment). Add cucumbers, remaining dill and spices. Dissolve the salt in the vinegar and water and pour over cucumbers. Add a suitable cover and weight. Store where the temperature is between 70 F and 75 F for about three to four weeks while fermenting. Temperatures of 55 to 65 F are acceptable, but the fermentation will take five to six weeks. Avoid temperatures above 80 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 or 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 five minutes. Filter the brine through paper coffee filters to reduce cloudiness, if desired. Fill the jar with pickles and hot brine, leaving ½ inch of head space. Adjust the lids and process as directed in Table 1 or use the low-temperature pasteurization treatment described under “Canning Procedure.”



Reduced-sodium Sliced Sweet Pickles

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

Brining solution:

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

Canning syrup:

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

YIELD: About 4 to 5 pints

PROCEDURE: Wash cucumbers and cut 1/16 inch off the blossom end and discard. Cut cucumbers into ¼-inch slices. Combine all ingredients for canning syrup in a saucepan and bring to boiling. Keep the syrup hot until used. In a large kettle, mix the ingredients for the brining solution. Add the cut cucumbers, cover and simmer until the cucumbers change color from bright to dull green (about five to seven minutes). Drain the cucumber slices. Fill jars and cover with hot canning syrup, leaving ½ inch of head space. Adjust the lids and process according to Table 1.

Quick Sweet Pickles

May be canned as either strips or slices

8 pounds of 3- to 4-inch pickling cucumbers
1/3 cup canning or pickling salt
4 1/2 cups sugar
3 1/2 cups vinegar (5%)
2 teaspoons celery seed
1 tablespoon whole allspice
2 tablespoons mustard seed
1 cup pickling lime (optional - for use in variation
below for making firmer pickles)

YIELD: About 7 to 9 pints

PROCEDURE: Wash cucumbers. Cut 1/16 inch off the blossom end and discard, but leave 1/4 inch of stem attached. Slice or cut in strips, if desired. Place in a bowl and sprinkle with 1/3 cup of salt. Cover with 2 inches of crushed or cubed ice. Refrigerate three to four hours. Add more ice as needed. Drain 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 the vinegar solution returns to a boil. Stir occasionally to make sure the mixture heats evenly. Fill sterile jars, leaving 1/2 inch of head space.

Raw pack — Fill the jars, leaving 1/2 inch of head space. Add hot pickling syrup, leaving 1/2 inch of head space.

Adjust the lids and process according to Table 1 or use the low-temperature pasteurization treatment described under “Canning Procedure.”

VARIATION FOR FIRMER PICKLES: Wash cucumbers. Cut 1/16 inch off the blossom end and discard, but leave 1/4 inch of stem attached. Slice or strip cucumbers. Mix 1 cup of pickling lime and 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 the lime-water solution.** Soak the cucumber slices or strips in the lime water solution for 12 to 24 hours, stirring occasionally. Remove the slices from the lime solution and rinse and resoak one hour in fresh, cold water. Repeat the rinsing and resoaking two more times. Handle carefully because the slices or strips will be brittle. Drain well.

STORAGE: After processing and cooling, jars should be stored four to five weeks to develop ideal flavor.

VARIATION: Add two slices of raw, whole onion to each jar before filling with cucumbers.

Sweet Gherkin Pickles

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

YIELD: 6 to 7 pints

PROCEDURE: Wash cucumbers. Cut a 1/16-inch slice off the blossom end and discard, but leave 1/4 inch of stem attached. Place the cucumbers in a large container and cover with boiling water. Six to eight hours later, and again on the second day, drain and cover with 6 quarts of fresh, boiling water containing 1/4 cup of salt. On the third day, drain and prick the cucumbers with a table fork. Combine and bring to boil 3 cups of vinegar, 3 cups of sugar, turmeric and spices. Pour over the cucumbers. Six to eight hours later, drain and save the pickling syrup. Add another 2 cups each of sugar and vinegar and reheat to boiling. Pour over pickles. On the fourth day, drain and save the syrup. Add another 2 cups of sugar and 1 cup of vinegar. Heat to boiling and pour over the pickles. Drain six to eight hours later and save the pickling syrup. Add 1 cup of sugar and 2 teaspoons of vanilla and heat to boiling. Fill sterile pint jars with pickles and cover with hot syrup, leaving 1/2 inch of head space. Adjust the lids and process according to Table 1 or use the low-temperature pasteurization treatment described under “Canning Procedure.”

Bread and Butter Pickles

6 pounds of 4- to 5-inch pickling cucumbers
8 cups thinly sliced onions (about 3 pounds)
½ cup canning or pickling salt
4 cups vinegar (5%)
4½ cups sugar
2 tablespoons mustard seed
1½ tablespoons celery seed
1 tablespoon ground turmeric
1 cup pickling lime (optional - for use in variation below for making firmer pickles)

YIELD: About 8 pints

PROCEDURE: Wash cucumbers. Cut $\frac{1}{16}$ inch off the blossom end and discard. Cut into $\frac{3}{16}$ -inch slices. Combine the cucumbers and onions in a large bowl. Add salt. Cover with 2 inches of crushed or cubed ice. Refrigerate three to four hours, adding more ice as needed.

Combine the remaining ingredients in a large pot. Boil 10 minutes. Drain and add the cucumbers and onions and slowly reheat to boiling. Fill pint jars with slices and cooking syrup, leaving $\frac{1}{2}$ inch of head space. Adjust the lids and process according to Table 1 or use the low-temperature pasteurization treatment described under “Canning Procedure.”

VARIATION FOR FIRMER PICKLES: Wash 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. Avoid inhaling lime dust while mixing the lime-water solution. Soak the cucumber slices in the lime water for 12 to 24 hours, stirring occasionally. Remove the cucumber slices from the lime solution, rinse and resoak one hour in fresh, cold water. Repeat the rinsing and soaking steps two more times. Handle carefully because slices will be brittle. Drain well. Continue as above.

STORAGE: After processing and cooling, jars should be stored four to five weeks to develop ideal flavor.

Pickled Mixed Vegetables

4 pounds of 4- to 5-inch pickling cucumbers, washed and cut into 1-inch slices (cut off $\frac{1}{16}$ inch from blossom end and discard)
2 pounds peeled and quartered small onions
4 cups cut celery (1-inch pieces)
2 cups peeled and cut carrots ($\frac{1}{2}$ -inch pieces)
2 cups cut sweet red peppers ($\frac{1}{2}$ -inch pieces)
2 cups cauliflower flowerets
5 cups white vinegar (5%)
 $\frac{1}{4}$ cup prepared mustard
 $\frac{1}{2}$ cup canning or pickling salt
 $3\frac{1}{2}$ cups sugar
3 tablespoons celery seed
2 tablespoons mustard seed
 $\frac{1}{2}$ teaspoon whole cloves
 $\frac{1}{2}$ teaspoon ground turmeric

YIELD: About 10 pints

PROCEDURE: Combine vegetables, cover with 2 inches of cubed or crushed ice and refrigerate three to four hours. In an 8-quart kettle, combine the vinegar and mustard and mix well. Add the salt, sugar, celery seed, mustard seed, cloves and turmeric. Bring to a boil. Drain vegetables and add them to the hot pickling solution. Cover and slowly bring to a boil. Drain the vegetables but save the pickling solution. Fill the vegetables into sterile pint jars or clean quarts, leaving $\frac{1}{2}$ inch of head space. Add the pickling solution, leaving $\frac{1}{2}$ inch of head space. Adjust the lids and process according to Table 1.

Pickle Relish

3 quarts chopped cucumbers
3 cups each of chopped sweet green and red peppers
1 cup chopped onions
¾ cup canning or pickling salt
4 cups ice
8 cups water
2 cups sugar
4 teaspoons each of mustard seed, turmeric, allspice and whole cloves
6 cups white vinegar (5%)

YIELD: About 9 pints

PROCEDURE: Add cucumbers, peppers, onions, salt and ice to water and let stand four hours. Drain and re-cover the vegetables with fresh ice water for another hour. Drain again. Combine the spices in a spice or cheesecloth bag. Add the spices to the sugar and vinegar. Heat to boiling and pour the mixture over the vegetables. Cover and refrigerate 24 hours. Heat the mixture to boiling and fill hot into clean jars, leaving ½ inch of head space. Adjust the lids and process according to Table 1.

Pickled Pepper-Onion Relish

6 cups finely chopped onions
3 cups finely chopped sweet red peppers
3 cups finely chopped green peppers
1½ cups sugar
6 cups vinegar (5%), preferably white distilled
2 tablespoons canning or pickling salt

YIELD: 9 half-pints

PROCEDURE: Wash and chop the vegetables. Combine all ingredients and boil gently until the mixture thickens and the volume is reduced by one-half (about 30 minutes). Fill sterile jars with hot relish, leaving ½ inch of head space, and seal tightly. Store in the refrigerator and use within one month.

CAUTION: If extended storage is desired, this product must be processed according to Table 1.

Pickled Corn Relish

10 cups fresh whole-kernel corn
(16 to 20 medium-sized 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
1¼ cups diced onions
1¾ cups sugar
5 cups vinegar (5%)
2½ tablespoons canning or pickling salt
2½ teaspoons celery seed
2½ tablespoons dry mustard
1¼ teaspoons turmeric

YIELD: About 9 pints

PROCEDURE: Boil ears of corn five minutes. Dip in cold water. Cut whole kernels from the cob or use six 10-ounce frozen packages of corn. Combine peppers, celery, onions, sugar, vinegar, salt and celery seed in a saucepan. Bring to a boil and simmer five minutes, stirring occasionally. Mix the mustard and turmeric in ½ cup of the simmered mixture. Add this mixture and corn to the hot mixture. Simmer another five minutes. If desired, thicken the mixture with flour paste (¼ cup of flour blended in ¼ cup of water) and stir frequently. Fill jars with hot mixture, leaving ½ inch of head space. Adjust the lids and process according to Table 1.



Pickled Hot Peppers

Hungarian, banana, chili, jalapeno

4 pounds hot, long red, green or yellow peppers

3 pounds sweet red and green peppers, mixed

5 cups vinegar (5%)

1 cup water

4 teaspoons canning or pickling salt

2 tablespoons sugar

2 cloves garlic

YIELD: About 9 pints

CAUTION: Wear rubber gloves when handling hot peppers or wash hands thoroughly with soap and water before touching your face.

PROCEDURE: Small peppers may be left whole. Large peppers may be quartered. Wash, slash two to four slits in each pepper and blanch them in boiling water. Blister to peel tough-skinned hot peppers.

Peppers may be blistered using one of the following methods:

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

Place the peppers in a pan and cover with a damp cloth. This will make peeling the peppers easier. After several minutes of cooling, peel each pepper.

Flatten small peppers. Fill jars, leaving ½ inch of head space. Combine and heat other ingredients to boiling and simmer 10 minutes. Remove the garlic. Pour the hot pickling solution over the peppers, leaving ½ inch of head space. Adjust the lids and process according to Table 1.

Marinated Peppers

Bell, Hungarian, banana or jalapeno

4 pounds firm peppers*

1 cup bottled lemon juice

2 cups white vinegar (5%)

1 tablespoon oregano leaves

1 cup olive or salad oil

½ cup chopped onions

2 cloves garlic, quartered (optional)

2 tablespoons prepared horseradish (optional)

***NOTE:** Adjusting the intensity of pickled jalapeno peppers is possible by using all hot jalapeno peppers (hot style) or blending with sweet and mild peppers (medium or mild style).

For hot style: Use 4 pounds of jalapeno peppers.

For medium style: Use 2 pounds of jalapeno peppers and 2 pounds of sweet and mild peppers.

For mild style: Use 1 pound of jalapeno peppers and 3 pounds of sweet and mild peppers.

YIELD: About 9 half-pints

PROCEDURE: Select your favorite pepper. **CAUTION:** If you select hot peppers, wear rubber or plastic gloves while handling them or wash your hands thoroughly with soap and water before touching your face. Peppers may be left whole. Large peppers may be quartered. Wash, slash two to four slits in each pepper and blanch them in boiling water or blister to peel tough-skinned hot peppers.

Peppers may be blistered using one of the following methods:

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

Allow peppers to cool. Place them in a pan and cover them with a damp cloth. This will make peeling the peppers easier. After several minutes of cooling, peel each pepper. Flatten whole peppers. Mix all remaining ingredients in a saucepan and heat to boiling. Place ¼ garlic clove (optional) and ¼ teaspoon of salt in each half pint, or ½ teaspoon per pint. Fill jars with peppers; pour the hot, well-mixed oil/pickling solution over the peppers, leaving ½ inch of head space. Adjust the lids and process according to Table 1.

Pickled Dilled Beans

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

YIELD: About 8 pints

PROCEDURE: Wash and trim the ends from the beans and cut to 4-inch lengths. In each sterile pint jar, place one to two dill heads and, if desired, one clove of garlic. Place whole beans upright in jars, leaving ½ inch of head space. Trim the beans to ensure proper fit, if necessary. Combine the salt, vinegar, water and pepper flakes (if desired). Bring to a boil. Add the hot solution to the beans, leaving ½ inch of head space. Adjust the lids and process according to Table 1.

Pickled Three-bean Salad

1½ cups cut and blanched green or yellow beans (prepared as below)
1½ cups canned, drained, red kidney beans
1 cup canned, drained garbanzo beans
½ cup peeled and thinly sliced onion (about 1 medium onion)
½ cup trimmed and thinly sliced celery (1½ medium stalks)
½ cup sliced green peppers (½ medium pepper)
½ cup white vinegar (5%)
¼ cup bottled lemon juice
¾ cup sugar
¼ cup oil
½ teaspoon canning or pickling salt
1¼ cups water

YIELD: About 5 to 6 half-pints

PROCEDURE: Wash and snap off ends of fresh beans. Cut or snap into 1- to 2-inch pieces. Blanch three minutes and cool immediately. Rinse kidney beans with tap water and drain again. Prepare and measure all other vegetables. Combine vinegar, lemon juice, sugar and water and bring to a boil. Remove from the heat. Add oil and salt and mix well. Add beans, onions, celery and green pepper to the solution and bring to a simmer. Marinate 12 to 14 hours in the refrigerator, then heat the entire mixture to a boil. Fill clean jars with solids. Add hot liquid, leaving ½ inch of head space. Adjust the lids and process according to Table 1.

Pickled Beets

7 pounds of 2- to 2½-inch diameter beets
4 cups vinegar (5%)
1½ teaspoons canning or pickling salt
2 cups sugar
2 cups water
2 cinnamon sticks
12 whole cloves
4 to 6 onions (2- to 2½-inch diameter), if desired

YIELD: About 8 pints

PROCEDURE: Trim off beet tops, leaving 1 inch of stem and roots to prevent bleeding of color. Wash thoroughly. Sort for size. Cover similar sizes together with boiling water and cook until tender (about 25 to 30 minutes). **CAUTION: Drain and discard liquid.** Cool beets. Trim off roots and stems and slip off skins. Slice into ¼-inch slices. Peel and thinly slice onions. Combine vinegar, salt, sugar and fresh water. Put spices in a cheesecloth bag and add to the vinegar mixture. Bring to a boil. Add the beets and onions. Simmer five minutes. Remove the spice bag. Fill jars with beets and onions, leaving ½ inch of head space. Add the hot vinegar solution, allowing ½ inch of head space. Adjust the lids and process according to Table 1.

VARIATION: Pickled whole baby beets. Follow the above directions but use beets that are 1 to 1½ inches in diameter. Pack whole; do not slice. Onions may be omitted.

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%)
3 cups brown sugar

YIELD: 9 half-pints

PROCEDURE: Wash, chop and combine the vegetables with ½ cup of salt. Cover with hot water and let stand 12 hours. Drain and press in a clean white cloth to remove all possible liquid. Tie spices loosely in a spice bag and add to the combined vinegar and brown sugar and heat to a boil in a saucepan. Add the vegetables and boil gently 30 minutes or until the volume of the mixture is reduced by one-half. Remove the spice bag. Fill hot, sterile jars with the hot mixture, leaving ½ inch of head space. Adjust the lids and process according to Table 1.

Cucumber Hot Dog Relish

4 cups ground, unpeeled cucumbers (about 4)
1 cup ground sweet green peppers (about 2)
½ cup ground sweet red peppers (about 1)
3 cups ground onion
3 cups finely diced celery
¼ cup salt
3½ cups sugar
2 cups distilled white vinegar
1 tablespoon celery seed
1 tablespoon mustard seed

YIELD: About 6 pint jars

PROCEDURE: Use the coarse blade on a grinder to grind the vegetables. Combine all the vegetables in a large bowl. Sprinkle with salt and cover with cold water; let stand four hours. Drain thoroughly in a colander; press out all excess liquid. Combine the sugar, vinegar, celery seed and mustard seed. Bring to a boil, stirring until the sugar is dissolved. Add the drained vegetables and simmer 10 minutes. Pack hot relish into hot jars, leaving ½ inch of head space. Remove air bubbles. Wipe jar rims. Adjust the lids and process according to Table 1.

Marinated Whole Mushrooms

7 pounds small whole mushrooms
½ cup bottled lemon juice
2 cups olive or salad oil
2½ cups white vinegar (5%)
1 tablespoon oregano leaves
1 tablespoon dried basil leaves
1 tablespoon canning or pickling salt
½ cup finely chopped onions
¼ cup diced pimento
2 cloves garlic, cut in quarters
25 black peppercorns

YIELD: About 9 half-pints

PROCEDURE: Select very fresh unopened mushrooms with caps less than 1¼ inches in diameter. Wash. Cut stems, leaving ¼ inch attached to the cap. Add the lemon juice and water to cover. Bring to a boil. Simmer five minutes. Drain the mushrooms. Mix olive oil, vinegar, oregano, basil and salt in a saucepan. Stir in onions and pimento and heat to boiling. Place ¼ garlic clove and two to three peppercorns in a half-pint jar. Fill jars with mushrooms and the hot, well-mixed oil/vinegar solution, leaving ½ inch of head space. Adjust the lids and process according to Table 1.

For more information on this and other topics, see www.ag.ndsu.edu.

(Click on "Nutrition, Food Safety and Health" then "Food Preservation and Storage")

Source: Based on "Complete Guide to Home Canning," Agriculture Information Bulletin 539, 2006 revision, and information from the National Center for Home Food Preservation, University of Georgia, Athens, Ga.: www.uga.edu/nchfp/

The information given herein is for educational purposes only. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Extension Service is implied.

Table 1

Recommended processing times in a boiling water-bath canner.

Food	Style of Pack	Jar Size	Process Times at Altitudes of		
			0-1,000 ft.	1,001-6,000 ft.	
1. Quick fresh-pack dills	Raw	Pints	10	15	
		Quarts	15	20	
2. Fermented dills	Raw	Pints	10	15	
		Quarts	15	20	
3. Reduced-sodium dills	Raw	Pints	15	20	
4. Quick sweet	Hot	Pints or Quarts	5	10	
		Raw	Pints	10	15
			Quarts	15	20
5. Sweet gherkins	Raw	Pints	5	10	
6. Reduced-sodium sliced sweet	Hot	Pints	10	15	
7. Bread-and-butter	Hot	Pints or Quarts	10	15	
8. Pickle relish	Hot	Half-pints or Pints	10	15	
9. Pepper-onion relish	Hot	Half-pints or Pints	5	10	
10. Corn relish	Hot	Half-pints or Pints	15	20	
11. Hot peppers	Raw	Half-pints or Pints	10	15	
12. Mixed vegetables	Hot	Pints	5	10	
		Quarts	10	15	
13. Dilled beans	Raw	Pints	5	10	
14. Three-bean salad	Hot	Half-pints or Pints	15	20	
15. Pickled beets	Hot	Pints or Quarts	30	*	
16. Marinated peppers	Raw	Half-pints or Pints	15	20	
17. Marinated mushrooms	Hot	Half-pints	20	**	
18. Piccalilli	Hot	Half-pints or Pints	5	10	
19. Cucumber hot dog relish	Hot	Half-pints or Pints	10	15	

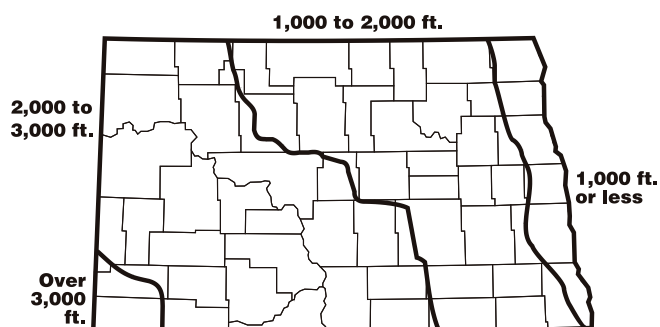
* 1,001-3,000 ft. - 35 minutes
3,001-6,000 ft. - 40 minutes

** 1,001-3,000 ft. - 25 minutes
3,001-6,000 ft. - 30 minutes

Adjust for Altitude

As altitudes increase, air becomes thinner, and this affects both pressures and boiling points in home canning. Using the water-bath process times for canning food at sea level may result in spoilage if you live at altitudes of 1,000 feet or more. Water boils at lower temperatures as altitude increases. Lower boiling temperatures are less effective for killing bacteria. Increasing the processing time or canner pressure compensates for lower boiling temperatures. Select the proper processing time and canner pressure for the altitude where you live.

The altitude in North Dakota varies from 800 feet above sea level in the east to 3,000 feet in the west. The map below shows the approximate altitude of areas of North Dakota.



For more specific information regarding altitude in your county, contact your county Extension office.

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