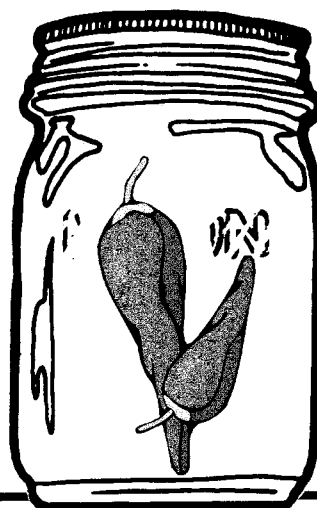




# Preparing & Canning Fermented Foods & Pickled Vegetables



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**Featuring new, research-based  
recommendations for safer and  
better quality food at home**

## **Know Your Altitude**

It is important to know your approximate elevation or altitude above sea level in order to determine a safe processing time for canned foods. Since the boiling temperature of liquid is lower at higher elevations, it is critical that additional time be given for the safe processing of foods at altitudes above sea level.

All towns and communities in Kentucky are below 2,000 feet. The processing times given in this canning guide are for altitudes up to 3,000 feet and are safe for all parts of our state.

## **DANGER!**

### **Guard Against Food Poisoning**

Pressure canning is the only recommended method for canning meat, poultry, seafood, and most vegetables. The bacterium *Clostridium botulinum* in low-acid foods is destroyed when they are processed at the correct time and pressure in pressure canners. Using boiling-water canners for these foods poses a real risk of botulism poisoning.

If these bacteria survive and grow inside a sealed jar of food, they can produce a poisonous toxin. Even a taste of food containing this toxin can be fatal. Low-acid foods should be boiled after their jars are opened, even if you detect no signs of spoilage and are certain the food has been properly processed. In Kentucky, boiling for 13 minutes destroys the toxin that causes poisoning.

This guide, containing up-to-date instructions for preparing safe home-canned foods, is based on research conducted at the Pennsylvania State University. It is adapted from the USDA Complete Guide to Home Canning.

#### **Other publications in the home-canning series include:**

- FCS3-121, *Canning Tomatoes and Tomato Juice*
- FCS3-325, *Principles of Home Canning*
- FCS3-326, *Selecting, Preparing, and Canning Fruit and Fruit Products*
- FCS3-327, *Selecting, Preparing, and Canning Tomatoes and Tomato Products*
- FCS3-328, *Selecting, Preparing, and Canning Vegetables and Vegetable Products*
- FCS3-329, *Preparing and Canning Poultry, Red Meat, and Fish*
- FCS3-331, *Preparing and Canning Jams and Jellies*

These publications are also available on our web site at:

<http://www.ca.uky.edu/agc/pubs/pubs.htm>

*No product endorsement is implied, nor discrimination against similar products intended, by the mention of brand names in this publication.*

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## Introduction to the Complete Guide to Home Canning

Home canning has changed greatly in the 170 years since it was introduced as a way to preserve food. Scientists have found ways to produce safer, higher quality products. The first part of this series explains the scientific principles on which canning techniques are based, discusses canning equipment, and describes the proper use of jars and lids. It describes basic canning ingredients and procedures and how to use them to achieve safe, high-quality canned products.

The remaining publications in this series consist of canning guides for specific foods. These guides offer detailed directions for canning fruits and fruit products, tomatoes and tomato products, vegetables, red meats, poultry and fish, pickles and relishes, and jams and jellies. Handy guidelines for choosing the correct quantity and quality of raw foods accompany each set of directions for fruits, tomatoes, and vegetables. Most recipes are designed to yield a full canner load of pints or quarts.

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This publication contains many new research-based recommendations for canning safer and better quality food at home. It is an invaluable resource for persons who are canning for the first time. Experienced canners will find updated information to help them improve their canning practices.

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## Introduction

Pickled and fermented foods are classified by their ingredients and method of preparation.

Fermented products such as regular dill pickles and sauerkraut are cured in brine for about three weeks. Refrigerator pickled products such as refrigerator dills are brined about one week. During curing, colors and flavors change and the acidity increases.

Quick-process, or fresh-pack pickles are not fermented. Some are brined several hours or overnight, then drained and covered with vinegar and seasonings.

Fruit pickles usually are prepared by heating fruit in a seasoned syrup acidified with vinegar.

Relishes are made from chopped fruits and vegetables that are cooked with seasonings and vinegar.

To avoid soft pickles, remove and discard a  $\frac{1}{16}$ -inch slice from the blossom end of the fresh cucumbers. Blossoms may contain an enzyme which causes excessive softening of pickles.

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

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

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## Ingredients

Select fresh, firm fruits or vegetables that are free of spoilage. Measure or weigh amounts carefully since the proportion of fresh food to other ingredients affects flavor and, in many instances, safety.

Use canning or pickling salt. Non-caking material added to other salts may make the brine cloudy. Since flake salt varies in density, it is not recommended for making pickled and fermented foods.

White granulated and brown sugars are most often used. Corn syrup and honey, unless called for in reliable recipes, may produce undesirable flavors.

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

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## Selection of Fresh Cucumbers

### QUANTITY:

An average of 14 pounds of cucumbers is needed per canner load of 7 quarts; an average of 9 pounds is needed per canner load of 9 pints. A bushel weighs 48 pounds and yields 16 to 24 quarts—an average of 2 pounds per quart.

### QUALITY:

Select firm cucumbers of the appropriate size—about  $1\frac{1}{2}$  inches for gherkins and 4 inches for dills. Use odd-shaped and more mature cucumbers for relishes and bread-and-butter-style pickles.

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## **Salts Used in Pickling**

Use of canning or pickling salt is recommended. Fermented and non-fermented pickles can be safely made using either iodized or noniodized table salt. However, non-caking materials added to table salts may make the brine cloudy. Flake salt varies in density and is not recommended for use in pickling.

Reduced-sodium salt, such as Lite Salt, can be used in quick-process pickle recipes as indicated in this guide. The pickles may, however, have a slightly different taste than expected. Use of reduced-sodium salt in fermented pickle recipes is not recommended.

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## **Pickles with Reduced Salt Content**

Recipes for pickles with a reduced sodium content are included in this guide. In the making of fresh-pack pickles, cucumbers are acidified quickly with vinegar. Use only recipes tested to produce the proper acidity. While these pickles may be prepared safely with reduced or no salt, their quality may be lower. Both texture and flavor may be slightly—but noticeably—different than expected. You may wish to make small quantities first to determine if you like them.

Do not attempt to make sauerkraut or fermented pickles with less salt than is called for in the recipes. The salt used in making fermented sauerkraut and brined pickles not only provides their characteristic flavors but also is vital to their safety and texture. In fermented foods, salt favors the growth of desirable bacteria while inhibiting the growth of others.

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## **Firming Agents**

Alum may be safely used 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-process pickles.

The calcium in lime definitely improves pickle firmness. Food-grade lime may be used as a lime-water solution for soaking fresh cucumbers 12 to 24 hours before pickling them. 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 fresh-water soaking steps two more times.

To further improve pickle firmness, you may process cucumber pickles for 30 minutes in 180°F water. This process also prevents spoilage. The water temperature should not fall below 180°F. Use a candy or jelly thermometer to monitor the water temperature.

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## **Equipment**

A large kettle or saucepan is needed to heat pickling liquid. Heat in an unchipped enamelware, stainless steel, aluminum or glass pan. Never use copper, galvanized, brass, or iron utensils. These metals may react with salts or acids and cause color changes or form undesirable compounds.

For safekeeping and safe eating, pickles must be processed in a boiling-water canner. You can buy a canner or use any large container that is deep enough to allow 1 to 2 inches of water above the tops of the jars, with a little extra space for boiling.

The canner also needs a close-fitting cover with wire rack partitions to keep the jars from touching each other or falling against the sides of the canner.

Some boiling-water canners do not have flat bottoms. A flat bottom must be used on an electric range. Either a flat or ridged bottom can be used on a gas burner. To ensure uniform processing of all jars with an electric range, the canner should be no more than 4 inches wider in diameter than the element on which it is heated.

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## Suitable Containers, Covers, and Weights for Fermenting Food

A 1-gallon container is needed for each 5 pounds of fresh vegetables. A 5-gallon stone crock is of ideal size for fermenting about 25 pounds of fresh cabbage or cucumbers. Food-grade plastic and glass containers are excellent substitutes for stone crocks. Other 1- to 3-gallon non-food-grade plastic containers may be used if lined with a clean food-grade plastic bag.

***CAUTION: Be certain that foods contact only food-grade plastics. Do not use garbage bags or trash-can liners.***

Fermenting sauerkraut in quart canning jars is an acceptable practice but may result in more spoilage losses.

Cabbage and cucumbers must be kept 1 to 2 inches under brine while fermenting. After adding prepared vegetables to brine, place a suitably sized dinner plate or glass pie plate inside the fermentation container. The plate must be slightly smaller than the container opening, yet large enough to cover most of the cabbage or cucumbers. To keep the plate under the brine, weigh it down with two to three sealed quart jars filled with water. Covering the container opening with a clean, heavy bath towel helps prevent contamination from insects and molds while the vegetables are fermenting.

Fine-quality fermented vegetables also are obtained when the plate is weighed down with a large, clean plastic bag filled with a mixture of 3 quarts of water and 4½ tablespoons of salt. Be sure to seal the plastic bag. Freezer bags sold for packaging turkeys are suitable for use with 5-gallon containers.

The fermentation container, plate, and jars must be washed in hot sudsy water and rinsed well with hot water before use.

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## Sterilizing Empty Jars

All pickles and relishes processed less than 10 minutes should be filled into sterile empty jars. To sterilize empty jars, place them right side up on the rack in a boiling-water canner. Fill the canner and jars with hot (not boiling) water to 1 inch above the tops of the jars. Boil 13 minutes. Remove and drain hot sterilized jars one at a time. Save the hot water for processing filled jars. Fill jars with pickles or relishes, add lids, and tighten screw bands.

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## Preventing Spoilage

Pickle products are subject to spoilage from microorganisms, particularly yeasts and molds, as well as from enzymes that may affect flavor, color, and texture. Processing pickles in a boiling-water canner will prevent both these problems. Standard canning jars and self-sealing lids are recommended. Processing times and procedures vary according to food acidity and food size.

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## Low-Temperature Pasteurization Treatment

The following treatment results in a better product texture but must be carefully managed to avoid possible spoilage. **CAUTION:** Use this treatment only when recipe indicates.

Place jars in a canner filled halfway with warm (120 to 140°F) water. Add hot water to a level 1 inch above jars. Heat the water to 180 to 185°F. Maintain this temperature for 30 minutes. Use a candy or jelly thermometer to check the water temperature. It must be at least 180°F during the entire 30 minutes. Temperatures higher than 185°F may cause unnecessary softening of pickles.

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## Fermented Foods

### 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**

One or more of the following:

**2 cloves garlic (optional)**

**2 dried red peppers (optional)**

**2 teaspoons whole mixed pickling spices (optional)**

**½ cup salt**

**¼ cup vinegar (5 percent)**

**8 cups water**

**PROCEDURE:**

Wash cucumbers. Cut a 1/16-inch slice off blossom end and discard. Leave ¼ inch of the stem attached. Place half the dill and spices on the bottom of a clean, suitable container. (See “Suitable Containers, Covers, and Weights for Fermenting

Food” on page 5 of this guide.) Add cucumbers, remaining dill, and spices. Dissolve salt in vinegar and water; pour over cucumbers. Add suitable cover and weight. Store between 70 and 75°F for 3 to 4 weeks while fermenting. Temperatures of 55 to 65°F are acceptable, but the fermentation will take 5 to 6 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, slimy, or develop a disagreeable odor, discard them.**

Fully fermented pickles may be stored in the original container for 4 to 6 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 cloudiness, if desired. Fill jars with pickles and hot brine, leaving ½-inch headspace. Adjust lids and process as below, or use the low-temperature pasteurization treatment described on page 6.

**PROCESSING TIME:**

- *Boiling-water Canner*—Raw Pack:  
process pints for 15 minutes or quarts for 20 minutes.

### Refrigerator Pickles, with vinegar

**4 quarts cucumbers, sliced**

**4 medium onions, sliced**

**½ cup salt**

**3 cups vinegar**

**3 cups sugar**

**1 teaspoon celery seed**

**1 teaspoon mustard seed**

**1 teaspoon turmeric**

**PROCEDURE:**

Place cucumbers and onions in a gallon container. Combine salt, vinegar, sugar, celery seed, mustard seed, and turmeric. Pour over cucumbers and onions. Place container in refrigerator. Stir each day for a week. Package in freezer boxes or bags. Freeze or refrigerate for 3 weeks.

## **Sauerkraut**

**25 pounds cabbage**

**¾ cup canning or pickling salt**

**YIELD:**

About 9 quarts.

**QUALITY:**

For the best sauerkraut, use firm heads of fresh cabbage. 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 into quarters; remove cores. Shred or slice to the thickness of a quarter. Place cabbage in a suitable fermentation container. (See "Suitable Containers, Covers, and Weights for Fermenting Food" on page 5 of this guide.) Add 3 tablespoons of salt. Using clean hands, mix thoroughly. Pack firmly until salt draws juices from cabbage. Repeat shredding, salting, and packing until all cabbage is in the container. The container should be deep enough so that its rim is at least 4 or 5 inches above the cabbage. If juice does not cover cabbage, add boiled and cooled brine made from 1½ tablespoons of salt per quart of water. Add cover and weight. Cover container with a clean bath towel. Store container at 70 to 75°F for 3 to 4 weeks while fermenting. At 60 to 65°F, fermentation may take 5 to 6 weeks. At temperatures lower than 60°F, the kraut may not ferment. At temperatures above 75°F, kraut may become soft. If you weigh the cabbage down with a brine-filled bag, do not disturb the crock until normal fermentation is completed (when bubbling

ceases). If you use jars as weights, you will have to check the kraut two to three times each week and remove scum if it forms. Fully fermented kraut may be kept tightly covered in the refrigerator for several months, or it may be canned.

**Hot pack**—In a large kettle, bring kraut and liquid slowly to a boil, stirring frequently. Remove kettle from heat. Fill jars rather firmly with kraut and juices, leaving ½-inch headspace.

**Raw pack**—Fill jars firmly with kraut; cover with juices, leaving ½-inch headspace. Adjust lids and process.

**PROCESSING TIME:**

- *Boiling-water Canner*—Hot Pack: process pints for 15 minutes or quarts for 20 minutes. Raw Pack: process pints for 25 minutes or quarts for 30 minutes.

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## **Pickled or Non-Fermented Foods**

### **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 percent)**

**4 cups water**

**1 teaspoon hot red pepper flakes (optional)**

**YIELD:**

About 8 pints.

**PROCEDURE:**

Wash and trim ends from beans; cut to 4-inch lengths. In each sterile pint jar, place 1 to 2 dill heads and, if desired, 1 clove of garlic. Place whole beans upright in jars, leaving ½-inch headspace. Trim beans to ensure proper fit, if necessary. Combine salt, vinegar, water, and pepper flakes. Bring to a boil. Pour hot mixture over beans, leaving ½-inch headspace.

Adjust lids and process.

PROCESSING TIME:

- *Boiling-water Canner*—Raw Pack: process pints for 10 minutes.

## **Pickled Three-Bean Salad**

**1½ cups cut and blanched green or yellow beans (prepared as stated below)**

**1½ cups canned, drained red kidney beans**

**1 cup canned, drained garbanzo beans**

**½ cup peeled, thinly sliced onion (1 medium onion)**

**½ cup trimmed, thinly sliced celery (1½ medium stalks)**

**½ cup sliced green pepper (½ medium pepper)**

**½ cup white vinegar (5 percent)**

**¼ cup bottled lemon juice**

**¾ cup sugar**

**1¼ cups water**

**¼ cup oil**

**½ teaspoon canning or pickling salt**

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 3 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; bring to a boil. Remove from heat. Add oil and salt; mix well. Add beans, onions, celery, and green pepper; return to heat and bring to a simmer. Remove from heat, cover, and marinate 12 to 14 hours in refrigerator. Reheat entire mixture to a boil. Fill clean jars with solids. Add hot liquid, leaving ½-inch headspace. Adjust lids and process.

PROCESSING TIME:

- *Boiling-water Canner*—Hot Pack: process half-pints or pints for 20 minutes.

## **Pickled Beets**

**7 pounds of 2- to 2½-inch diameter beets**

**4 to 6 (2- to 2½-inch diameter) onions, if desired**

**4 cups vinegar (5 percent)**

**1½ teaspoons canning or pickling salt**

**2 cups sugar**

**2 cups water**

**2 cinnamon sticks**

**12 whole cloves**

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. Combine similar sizes in a large pan and cover with boiling water. Cook beets until tender, about 25 to 30 minutes. Drain and discard liquid. Cool beets. Trim off roots and stems; slip off skins. Slice into ¼-inch slices. Peel and thinly slice onions. Combine vinegar, salt, sugar, and 2 cups water. Place spices in a cheesecloth bag; add to vinegar mixture. Bring to a boil. Add beets and onions. Simmer 5 minutes. Remove spice bag. Fill jars with beets and onions, leaving ½-inch headspace. Add hot vinegar solution, leaving ½-inch headspace. Adjust lids and process.

PROCESSING TIME:

- *Boiling-water Canner*—Hot Pack: process pints or quarts for 35 minutes.

**Variation:** *Pickled whole baby beets.*

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

## **Pickled Cauliflower or Brussels Sprouts**

**12 cups of 1- to 2-inch cauliflower flowerets or small Brussels sprouts (remove stems and blemished outer leaves)**

**4 cups white vinegar (5 percent)**

**2 cups sugar**

**2 cups thinly sliced onion**

**1 cup diced sweet red pepper**

**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 flowerets or Brussels sprouts. Boil in water containing 4 teaspoons of canning salt per gallon of water. Boil cauliflower for 3 minutes; Brussels sprouts, 4 minutes. Drain and cool. Combine vinegar, sugar, onion, diced red pepper, and spices in a large saucepan. Bring mixture to a boil and simmer five minutes. Divide onion and diced pepper among jars. Fill jars with pieces and pickling solution, leaving ½-inch headspace. Adjust lids and process.

**PROCESSING TIME:**

- *Boiling-water Canner*—Hot Pack: process half-pints or pints for 15 minutes.

## **Pickled Corn Relish**

**10 cups fresh whole kernel corn (16 to 20 medium-size ears) or 6 (10-ounce) packages of frozen whole kernel corn**

**2½ cups diced sweet red pepper**

**2½ cups diced sweet green pepper**

**2½ cups chopped celery**

**1¼ cups diced onion**

**1¾ cups sugar**

**5 cups vinegar (5 percent)**

**2½ tablespoons canning or pickling salt**

**2½ teaspoons celery seed**

**2½ tablespoons dry mustard**

**1¼ teaspoon turmeric**

**YIELD:**

About 9 pints.

**PROCEDURE:**

Boil ears of corn for 5 minutes, dip in cold water, and cut whole kernels from cob. Or use six (10-ounce) packages of frozen whole kernel corn. Combine peppers, celery, onion, sugar, vinegar, salt, and celery seed in a saucepan. Bring to boil; simmer 5 minutes, stirring occasionally. Mix mustard and turmeric into ½ cup of the simmered mixture. Add this mixture and the corn to the hot mixture. Simmer another 5 minutes. If desired, thicken mixture with flour paste made from ¼ cup flour blended into ¼ cup water. Stir frequently. Fill jars with hot mixture, leaving ½-inch headspace. Adjust lids and process.

**PROCESSING TIME:**

- *Boiling-water Canner*—Hot Pack: process half-pints or pints for 20 minutes.

## **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.

**PROCEDURE:**

Wash horseradish roots thoroughly; peel off 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 ingredients and fill into sterile jars, leaving ¼-inch headspace. (See “Sterilizing Empty Jars” on page 6 of this guide.) Seal jars tightly and store in the refrigerator.

**Note:** The pungency of fresh horseradish fades within 1 to 2 months, even when refrigerated. Therefore, make only small quantities of this recipe at a time.

## **Marinated Whole Mushrooms**

**7 pounds small whole mushrooms**  
**½ cup bottled lemon juice**  
**2 cups olive or salad oil**  
**2½ cups white vinegar (5 percent)**  
**1 tablespoon oregano leaves**  
**1 tablespoon dried basil leaves**  
**1 tablespoon canning or pickling salt**  
**½ cup finely chopped onion**  
**¼ cup diced pimiento**  
**2 cloves garlic, quartered**  
**25 black peppercorns**

**YIELD:**  
About 9 half-pints.

**PROCEDURE:**  
Select fresh unopened mushrooms with caps less than 1¼ inches in diameter. Wash. Cut stems, leaving ¼ inch attached to cap. Add lemon juice and water to cover. Bring to boil. Simmer 5 minutes. Drain mushrooms. Mix olive oil, vinegar, oregano, basil, and salt in a saucepan. Stir in onions and pimiento; heat to boiling. Place one-fourth of a garlic clove and 2 to 3 peppercorns in each half-pint jar. Fill jars with mushrooms and hot, well-mixed oil/vinegar solution, leaving ½-inch headspace. Adjust lids and process.

**PROCESSING TIME:**  
- *Boiling-water Canner*—Hot Pack: process half-pints for 25 minutes.

## **Pickled Dilled Okra**

**7 pounds small okra pods**  
**2 cloves garlic, quartered**  
**¾ cup canning or pickling salt**  
**6 small hot peppers**  
**4 teaspoons dill seed**  
**6 cups water**  
**6 cups vinegar (5 percent)**

**YIELD:** 8 to 9 pints.

**PROCEDURE:**

Wash and trim okra. Fill jars firmly with whole okra, leaving ½-inch headspace. Place one-fourth of a garlic clove in each jar. Combine salt, hot peppers, dill seed, water, and vinegar in large saucepan; bring to a boil. Pour hot pickling solution over okra, leaving ½-inch headspace. Adjust lids and process.

**PROCESSING TIME:**

- *Boiling-water Canner*—Hot Pack: process pints for 15 minutes.

## **Marinated Peppers, bell, Hungarian, banana, jalapeno\***

**4 pounds firm peppers**  
**1 cup bottled lemon juice**  
**2 cups white vinegar (5 percent)**  
**1 tablespoon oregano leaves**  
**1 cup olive or salad oil**  
**½ cup chopped onion**  
**2 tablespoons prepared horseradish (optional)**  
**2 cloves garlic, quartered (optional)**  
**4½ teaspoons salt**

**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 hands thoroughly with soap and water before touching your face.**

Wash peppers, slash two to four slits in each, and blanch in boiling water or blister in order to peel. Peppers may be blistered using one of the following methods:

- *Oven or broiler method:* Place peppers in a hot oven (400°F) or under broiler for 6 to 8 minutes until skins blister.

- *Range-top method:* Cover hot gas or electric burner with heavy wire mesh. Place peppers on burner for several minutes until skins blister.

Place peppers in a pan and cover with a damp cloth. Allow peppers to cool. This will make peeling them easier. After several minutes of cooling, peel each pepper. Flatten whole peppers. Quarter large peppers. Combine lemon juice, vinegar, oregano, oil, onion, and horse-radish in a saucepan; heat to boiling. Place one-fourth of a garlic clove and ¼ teaspoon salt in each half-pint jar. Fill jars with peppers. Add hot, well-mixed oil/vinegar solution, leaving ½-inch headspace. Adjust lids and process.

**PROCESSING TIME:**

- *Boiling-water Canner*—Raw Pack: process half-pints or pints for 20 minutes.

*\* It is possible to adjust the intensity of pickled jalapeno peppers by using all hot jalapeno peppers (hot-style) or blending them 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.*

## **Pickled Bell Peppers**

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

**YIELD:**

About 9 pints.

**PROCEDURE:**

Wash peppers, cut into quarters, remove cores and seeds, and cut away any blemishes. Slice peppers into strips. Boil sugar, vinegar, and water for 1 minute. Add peppers and bring to a boil. Place

one-half of a garlic clove and ¼ teaspoon salt in each sterile half-pint jar. Fill jars with pepper strips and cover with hot vinegar mixture, leaving ½-inch headspace. Adjust lids and process.

**PROCESSING TIME:**

- *Boiling-water Canner*—Raw Pack: process half-pints or pints for 10 minutes.

## **Pickled Hot Peppers, Hungarian, banana, chile, jalapeno**

- 4 pounds hot long red, green, or yellow peppers**
- 3 pounds sweet red and green peppers, 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:** *Wear rubber gloves when handling hot peppers, or wash hands thoroughly with soap and water before touching your face.*

**PROCEDURE:**

Wash peppers. Slash two to four slits in each. Blanch in boiling water or blister in order to peel. (See instructions for blistering under “Marinated Peppers” on page 11 of this guide.) Cool and peel off skin. Flatten small whole peppers. Quarter large peppers. Fill jars with peppers, leaving ½-inch headspace. Combine and heat other ingredients to boiling; simmer 10 minutes. Remove garlic. Pour hot pickling solution over peppers, leaving ½-inch headspace. Adjust lids and process.

**PROCESSING TIME:**

- *Boiling-water Canner*—Raw Pack: process half-pints or pints for 15 minutes.

## Pickled Pepper-Onion Relish

**6 cups finely chopped onion**  
**3 cups finely chopped sweet red pepper**  
**3 cups finely chopped green pepper**  
**1½ cups sugar**  
**6 cups white vinegar (5 percent)**  
**2 tablespoons canning or pickling salt**

**YIELD:**  
9 half-pints.

**PROCEDURE:**  
Wash and chop vegetables. Combine all ingredients and boil gently until mixture thickens and volume is reduced by one-half, about 30 minutes. Fill sterile jars with hot relish, leaving ½-inch headspace. (See “Sterilizing Empty Jars” on page 6 of this guide.) Seal jars tightly. Store in refrigerator and use within 1 month.

**CAUTION: if extended storage is desired, this product must be processed.**

**PROCESSING TIME:**  
- *Boiling-water Canner*—Hot Pack: process half-pints or pints for 10 minutes.

## Piccalilli

**6 cups chopped green tomato**  
**1½ cups chopped sweet red pepper**  
**1½ cups chopped green pepper**  
**2¼ cups chopped onion**  
**7½ cups chopped cabbage**  
**½ cup canning or pickling salt**  
**4½ cups vinegar (5 percent)**  
**3 cups brown sugar**  
**3 tablespoons whole mixed pickling spice**

**YIELD:**  
9 half-pints.

**PROCEDURE:**  
Wash, chop, and combine vegetables with ½ cup salt. Cover with hot water and let stand 12 hours. Drain and press in a clean white cloth to remove all

liquid. Combine vinegar and brown sugar. Tie spices loosely in a spice bag, add to vinegar mixture, and heat to a boil in a saucepan. Add vegetables and boil gently for 30 minutes or until the volume of the mixture is reduced by one-half. Remove spice bag. Fill hot sterile jars with hot mixture, leaving ½-inch headspace. (See “Sterilizing Empty Jars” on page 6 of this guide.) Adjust lids and process.

**PROCESSING TIME:**  
- *Boiling-water Canner*—Hot Pack: process pints for 10 minutes.

## Bread-and-Butter Pickles

**6 pounds of 4- to 5-inch pickling cucumbers**  
**8 cups thinly sliced onion (about 3 pounds)**  
**½ cup canning or pickling salt**  
**4 cups 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 1/16-inch slice off blossom end and discard. Cut cucumbers into 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. Combine remaining ingredients in a large pot. Boil 10 minutes. Drain and add cucumbers and onions. Slowly reheat mixture to boiling. Fill pint jars with slices and cooking syrup, leaving ½-inch headspace. Adjust lids and process as described below, or use the low-temperature pasteurization treatment described on page 6 of this guide.

**PROCESSING TIME:**

- *Boiling-water Canner*—Hot Pack: process pints or quarts for 15 minutes.

After processing and cooling, jars should be stored 4 to 5 weeks to develop ideal flavor.

**Variation for firmer pickles:** Wash cucumbers. Cut a 1/16-inch slice off blossom end and discard. Cut cucumbers into 1/16-inch slices. Mix 1 cup pickling lime and 1/2 cup salt per 1 gallon of water in a 2- to 3-gallon crock or enamelware container. Avoid inhaling the lime dust while mixing the lime-water solution. Soak cucumber slices in lime-water solution for 12 to 24 hours, stirring occasionally. Remove cucumber slices from lime-water solution, rinse, and resoak for 1 hour in fresh cold water. Repeat the rinsing and fresh-water soaking steps two more times. Handle carefully, as slices will be brittle. Drain well.

**Variation for squash bread-and-butter pickles:** Substitute slender (1 to 1 1/2 inches in diameter) zucchini or yellow summer squash for cucumbers.

## **Quick Fresh-Pack Dill Pickles**

**8 pounds of 3- to 5-inch pickling cucumbers**  
**2 gallons water**  
**1 1/4 cups canning or pickling salt**  
**1 1/2 quarts vinegar (5 percent)**  
**1/4 cup sugar**  
**2 quarts water**  
**2 tablespoons whole mixed pickling spice**  
**7-9 teaspoons whole mustard seed**  
**14 heads of fresh dill or**  
**4 1/2 tablespoons dill seed**

**YIELD:**  
7 to 9 pints.

**PROCEDURE:**  
Wash cucumbers. Cut a 1/16-inch slice off blossom end and discard. Leave 1/4 inch

of the stem attached. Dissolve 1/2 cup of salt in 2 gallons of water. Pour over cucumbers; let stand 12 hours. Drain. Combine vinegar, 1/2 cup of salt, sugar, and 2 quarts water. Add mixed pickling spices tied in a clean white cloth. Heat to boiling. Fill jars with cucumbers. Add 1 teaspoon mustard seed and 1 1/2 heads fresh dill per pint. Cover with boiling pickling solution, leaving 1/2-inch headspace. Adjust lids and process as described below, or use the low-temperature pasteurization treatment described on page 6 of this guide.

**PROCESSING TIME:**

- *Boiling-water Canner*—Raw Pack: process pints for 15 minutes or quarts for 20 minutes.

## **Reduced-Sodium Sliced Dill Pickles**

**4 pounds (3- to 5-inch) pickling cucumbers**  
**6 cups vinegar (5 percent)**  
**6 cups sugar**  
**2 tablespoons canning or pickling salt**  
**1 1/2 teaspoons celery seed**  
**1 1/2 teaspoons mustard seed**  
**2 large onions, thinly sliced**  
**8 heads fresh dill**

**YIELD:** About 8 pints.

**PROCEDURE:**  
Wash cucumbers. Cut a 1/16-inch slice off blossom end and discard. Cut cucumbers into 1/4-inch slices. Combine vinegar, sugar, salt, and celery and mustard seeds in a large saucepan. Bring mixture to boiling. Place 2 onion slices and one-half of a dill head in each pint jar. Fill jars with cucumber slices, leaving 1/2-inch headspace. Add 1 onion slice and one-half of a dill head on top. Pour hot pickling solution over cucumbers, leaving 1/4-inch headspace. Adjust lids and process.

PROCESSING TIME:

- *Boiling-water Canner*—Raw Pack: process pints for 20 minutes.

**Variation:** For less-sweet pickles, reduce sugar to 4 cups.

## **Sweet Gherkin Pickles**

**7 pounds cucumbers**

**(1½-inch or less diameter)**

**½ cup canning or pickling salt**

**6 cups vinegar (5 percent)**

**8 cups sugar**

**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:

Wash cucumbers. Cut a 1/16-inch slice off blossom end and discard. Leave ¼ inch of the stem attached. Place cucumbers in large container; cover with boiling water containing ¼ cup salt. Allow cucumbers to stand 6 to 8 hours. On the second day, drain cucumbers and cover with fresh boiling water containing ¼ cup salt. On the third day, drain cucumbers and prick them with a table fork. Combine 3 cups vinegar, 3 cups sugar, turmeric, and spices; bring to a boil. Pour over cucumbers. Allow to stand 6 to 8 hours. Then drain cucumbers, reserving the pickling syrup. Add another 2 cups each of sugar and vinegar to the pickling syrup. Reheat mixture to boiling. Pour over pickles. On the fourth day, drain cucumbers, reserving syrup. Add another 2 cups sugar and 1 cup vinegar to the pickling syrup. Heat mixture to boiling. Pour over pickles. Six to 8 hours later, drain and save pickling syrup. Add

1 cup of sugar and 2 teaspoons vanilla to the pickling syrup. Heat mixture to boiling. Fill sterile pint jars with pickles, leaving ½-inch headspace. (See “Sterilizing Empty Jars” on page 6 of this guide.) Cover with hot pickling syrup, leaving ½-inch headspace. Adjust lids and process as described below, or use the low-temperature pasteurization treatment on page 6 of this guide.

PROCESSING TIME:

- *Boiling-water Canner*—Raw Pack: process pints for 10 minutes.

## **Pickle Relish**

**3 quarts chopped cucumber**

**3 cups each of chopped sweet green  
and red pepper**

**1 cup chopped onion**

**¾ cup canning or pickling salt**

**4 cups ice**

**8 cups water**

**4 teaspoons each of mustard seed,  
turmeric, whole allspice, and  
whole cloves**

**2 cups sugar**

**6 cups white vinegar (5 percent)**

YIELD:

About 9 pints.

PROCEDURE:

Combine cucumber, peppers, onion, salt, and ice with water; let stand 4 hours. Drain and re-cover vegetables with fresh ice water for another hour. Drain again. Combine spices in a spice or cheesecloth bag. Add spices to sugar and vinegar. Heat mixture to boiling; pour over vegetables. Cover and refrigerate for 24 hours. Heat mixture to boiling, remove spice bag, and fill hot into clean jars, leaving ½-inch headspace. Adjust lids and process.

PROCESSING TIME:

- *Boiling-water Canner*—Hot Pack: process half-pints or pints for 15 minutes.

## **14-Day Sweet Pickles**

**4 pounds of 2- to 5-inch pickling cucumbers\***

**$\frac{3}{4}$  cup canning or pickling salt, divided**

**2 tablespoons celery seed**

**2 tablespoons mixed pickling spices**

**5 $\frac{1}{2}$  cups sugar**

**4 cups vinegar (5 percent)**

**YIELD:**

About 5 to 9 pints.

**PROCEDURE:**

Wash cucumbers. Cut a  $\frac{1}{16}$ -inch slice off blossom end and discard. Leave  $\frac{1}{4}$  inch of the stem attached. Place whole cucumbers in suitable 1-gallon container. (See Suitable Containers, Covers, and Weights” on page 5 of this guide.) Combine  $\frac{1}{4}$  cup salt with 2 quarts water; bring to a boil. Pour over cucumbers. Add suitable cover and weight. Place a clean towel over container. Store at about 70°F. On the third day, drain salt water and discard. Rinse cucumbers and rescald container, cover, and weight. Return cucumbers to container. Add  $\frac{1}{4}$  cup salt to 2 quarts fresh water and boil. Pour over cucumbers. Replace cover and weight, and re-cover with a clean towel. On the fifth day, drain salt water and discard. Rinse cucumbers and rescald container, cover and weight. Return cucumbers to container. Add  $\frac{1}{4}$  cup salt to 2 quarts fresh water and boil. Pour over cucumbers. Replace cover and weight, and re-cover with a clean towel. On the seventh day, drain salt water and discard. Rinse cucumbers and rescald container, cover, and weight. Slice or strip cucumbers, if desired, and return to container. Place celery seed and pickling spices in small cheesecloth bag. Combine 2 cups sugar and 4 cups vinegar in a saucepan. Add spice bag, bring to a boil, and pour pickling solution over cucumbers. Add cover and weight, and re-cover with a clean towel. On each of the next 6 days (days 8 through 13), drain syrup and spice bag, reserving each. Add  $\frac{1}{2}$  cup sugar to the

syrup each day. Heat mixture to boiling. Rinse cucumbers. Scald container, cover, and weight daily. Return cucumbers to container; add boiling syrup. Add cover and weight; re-cover with a clean towel. On the 14th day, drain syrup into a saucepan. Fill sterile jars with cucumbers, leaving  $\frac{1}{2}$ -inch headspace. (See “Sterilizing Empty Jars” on page 6 of this guide.) Add  $\frac{1}{2}$  cup sugar to the syrup; bring to a boil. Remove spice bag. Pour hot syrup over cucumbers, leaving  $\frac{1}{2}$ -inch headspace. Adjust lids and process as below, or use the low-temperature pasteurization treatment described on page 6 of this guide.

**PROCESSING TIME:**

- *Boiling-water Canner*—Hot Pack: process pints for 10 minutes or quarts for 15 minutes.

## **Quick Sweet Pickles**

**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 percent)**

**2 teaspoons celery seed**

**1 tablespoon whole allspice**

**2 tablespoons mustard seed**

**YIELD:**

About 7 to 9 pints.

**PROCEDURE:**

Wash cucumbers. Cut a  $\frac{1}{16}$ -inch slice off blossom end and discard. Leave  $\frac{1}{4}$ -inch of the stem attached. Slice or cut into strips, if desired. Place in a bowl and sprinkle with  $\frac{1}{3}$  cup salt. Cover with 2 inches of crushed or cubed ice. Refrigerate 3 to 4 hours. Add more ice as needed. Drain well. Combine sugar, vinegar, celery seed, allspice, and mustard seed in a 6-quart kettle. Heat to boiling.

*\* Cucumbers can be canned whole, in strips, or in slices. If packed whole, use cucumbers of uniform size.*

Hot pack—Add cucumbers to vinegar solution and heat slowly to a boil. Stir occasionally to make sure mixture heats evenly. Fill sterile jars with cucumbers and vinegar solution, leaving ½-inch headspace.

Raw pack—Fill jars with cucumbers, leaving ½-inch headspace. Add hot vinegar solution, leaving ½-inch headspace. Adjust lids and process as below, or use the low-temperature pasteurization treatment described on page 6 of this guide.

**PROCESSING TIME:**

- *Boiling-water Canner*—Hot Pack: process pints or quarts for 10 minutes. Raw Pack: process pints for 15 minutes or quarts for 20 minutes.

**Variation for firmer pickles:** Wash cucumbers. Cut a 1/16-inch slice off blossom end and discard. Leave ¼ inch of the stem attached. Slice or strip cucumbers. Mix 1 cup pickling lime and ½ cup salt per 1 gallon of water in a 2- to 3-gallon crock or enamelware container. Avoid inhaling the lime dust while mixing the lime-water solution. Soak cucumber slices or strips in lime-water solution for 12 to 24 hours, stirring occasionally. Remove cucumber slices from lime-water solution, rinse, and resoak for 1 hour in fresh cold water. Repeat the rinsing and freshwater soaking two more times. Handle carefully, as slices or strips will be brittle. Drain well.

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

## Reduced-Sodium Sliced Sweet Pickles

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

**Canning syrup:**

**1½ cups distilled white vinegar (5 percent)**

**3 cups sugar**

**1 tablespoon whole allspice**

**2¼ teaspoons celery seed**

**Brining solution:**

**1 quart distilled white vinegar (5 percent)**

**1 tablespoon canning or pickling salt**

**1 tablespoon mustard seed**

**½ cup sugar**

**YIELD:**

About 4 to 5 pints.

**PROCEDURE:**

Wash cucumbers. Cut a 1/16-inch slice off blossom end and discard. Cut cucumbers into ¼-inch slices. Combine all ingredients for canning syrup in a saucepan and bring to boiling. Keep syrup hot until ready to use. 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, 5 to 7 minutes. Drain. Fill jars with cucumbers, leaving ½-inch headspace. Cover with hot syrup, leaving ½-inch headspace. Adjust lids and process.

**PROCESSING TIME:**

- *Boiling-water Canner*—Hot Pack: process pints for 15 minutes.

\* Cucumbers can be canned either as strips or as slices.

## **Pickled Sweet Green Tomatoes**

**10 to 11 pounds of green tomatoes  
(16 cups sliced)**

**2 cups sliced onion**

**¼ cup canning or pickling salt**

**3 cups brown sugar**

**4 cups vinegar (5 percent)**

**1 tablespoon mustard seed**

**1 tablespoon allspice**

**1 tablespoon celery seed**

**1 tablespoon whole cloves**

**YIELD:**

About 9 pints.

**PROCEDURE:**

Wash and slice tomatoes. Place in a bowl with onion, sprinkle with ¼ cup salt, and let stand 4 to 6 hours. Drain. Heat and stir sugar in vinegar until sugar is dissolved. Tie mustard seed, allspice, celery seed, and cloves in a spice bag. Add to vinegar with tomatoes and onion. If needed, add just enough water to cover pieces. Bring mixture to a boil. Simmer 30 minutes, stirring as needed to prevent burning. Tomatoes should be tender and transparent when properly cooked. Remove spice bag. Fill jars with pieces, leaving ½-inch headspace. Cover with hot pickling solution, leaving ½-inch headspace. Adjust lids and process.

**PROCESSING TIME:**

- *Boiling-water Canner*—Hot Pack: process pints for 15 minutes or quarts for 20 minutes.

## **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 over vegetables in a large kettle. Heat to boiling and simmer 5 minutes. Drain into a colander. Return vegetables to kettle. Add sugar, vinegar, mustard, and cornstarch. Stir to mix. Heat to a boil and simmer 5 minutes. Fill sterile pint jars with hot relish, leaving ½-inch headspace. (See “Sterilizing Empty Jars” on page 6 of this guide.) Adjust lids and process.

**PROCESSING TIME:**

- *Boiling-water Canner*—Hot Pack: process pints for 10 minutes.

## **Pickled Mixed Vegetables**

**4 pounds of 5-inch pickling cucumbers, washed and cut into 1-inch slices (cut off a 1/16-inch slice from blossom end and discard)**  
**2 pounds peeled and quartered small onions**  
**4 cups cut celery (1-inch pieces)**  
**2 cups peeled and cut carrot (1/2-inch pieces)**  
**2 cups cut sweet red pepper (1/2-inch pieces)**  
**2 cups cauliflower flowerets**  
**5 cups white vinegar (5 percent)**  
**1/4 cup prepared mustard**  
**1/2 cup canning or pickling salt**  
**3 1/2 cups sugar**  
**3 tablespoons celery seed**  
**2 tablespoons mustard seed**  
**1/2 teaspoon whole cloves**  
**1/2 teaspoon ground turmeric**

**YIELD:**  
About 10 pints.

**PROCEDURE:**  
Combine vegetables, cover with 2 inches of cubed or crushed ice, and refrigerate for 3 to 4 hours. In an 8-quart kettle, combine vinegar and mustard; mix well. Add salt, sugar, celery seed, mustard seed, cloves, and turmeric. Bring to a boil. Drain vegetables and add to hot pickling solution. Cover and slowly bring to a boil. Drain vegetables, reserving pickling solution. Fill vegetables into sterile pint jars, leaving 1/2-inch headspace. (See "Sterilizing Empty Jars" on page 6 of this guide.) Add pickling solution, leaving 1/2-inch headspace. Adjust lids and process.

**PROCESSING TIME:**  
- *Boiling-water Canner*—Hot Pack: process pints for 10 minutes or quarts for 15 minutes.

## **Pickled Bread-and- Butter Zucchini**

**16 cups fresh zucchini, sliced**  
**4 cups onion, thinly sliced**  
**1/2 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 to 9 pints.

**PROCEDURE:**  
Cover zucchini and onion slices with 1 inch of water and 1/2 cup salt. Let stand 2 hours and drain thoroughly. Combine vinegar, sugar, and spices. Bring to a boil, add zucchini and onions, and simmer for 5 minutes. Fill jars with mixture and pickling solution, leaving 1/2-inch headspace. Adjust lids and process, or use the low-temperature pasteurization treatment described on page 6 of this guide.

**PROCESSING TIME:**  
- *Boiling-water Canner*—Hot Pack: process pints or quarts for 15 minutes.

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