

Preserving Food: Pickled Products

Pickle products add spice to meals and snacks. The skillful blending of spices, sugar and vinegar with fruits and vegetables gives crisp, firm texture and pungent, sweet-sour flavor.

Various types of pickle products can be made depending on the ingredients used and the methods of preparation. There are four general classes:

Brined Pickles or Fermented Pickles go through a curing process in a brine (salt and water) solution for one or more weeks. Curing changes the color, flavor and texture of the product. If the product is a fermented one, the lactic acid produced during the fermentation helps preserve the product. In brined products that are cured but not completely fermented, acid in the form of vinegar is added later to preserve the food.

Fresh Pack or Quick Process Pickles are covered with boiling hot vinegar, spices and seasonings. Sometimes, the product may be brined for several hours and then drained, before being covered with the pickling liquid. These are easy to prepare and have a tart flavor. Fresh pack or quick pickles have a better flavor if allowed to stand for several weeks after they are sealed.

Fruit Pickles are prepared from whole or sliced fruits and simmered in a spicy, sweet-sour syrup.

Relishes are made from chopped fruits and vegetables cooked to desired consistency in a spicy vinegar solution.

The level of acidity in a pickled product is as important to its safety as to its taste and texture. Never alter the proportions of vinegar, food or water in a recipe and use only tested recipes. By doing so, you can prevent the growth of *Clostridium botulinum*, a type of food poisoning that can be fatal.

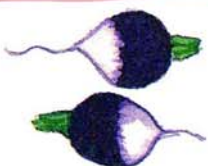
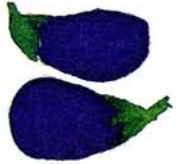
Ingredients

Produce: Select tender vegetables and firm fruits that show no signs of mold or decay. For highest quality, plan to pickle the fruits or vegetables within 24 hours after they have been picked.

Always use a pickling variety of cucumber. Do not expect good quality pickles if you use "table" or "slicing" cucumbers. If you buy cucumbers, select unwaxed ones for pickling whole because the brine or pickling solutions cannot penetrate the wax.

Just before pickling, sort the fruits and vegetables and select the size best suited for the specific recipe. Wash well, especially around the stems. Soil trapped here can be a source of bacteria responsible for the softening of pickles. Be sure to remove a 1/16-inch slice from the blossom end of the vegetables since it contains enzymes that also can cause softening.

Salt: Pure granulated salt, such as "pickling" or "canning" salt should be used. Other salts contain anti-caking materials that may make the brine cloudy. Iodized salts may darken pickles. Do not alter salt concentrations in fermented pickles or sauerkraut. Proper fermentation depends on correct proportions of salt and other ingredients.



Vinegar: Use cider or white vinegar of four to six percent acidity (40 to 60 grain). This is the range of acidity for most commercially bottled vinegars. Cider vinegar has a good flavor and aroma, but may darken white or light-colored fruits and vegetables. White distilled vinegar is often used for onions, cauliflower and pears where clearness of color is desired.

Do not use homemade vinegar or vinegar of unknown acidity in pickling. Do not dilute the vinegar unless the recipe specifies; you will be diluting the preservative effect. If a less sour product is preferred, add sugar rather than decrease the vinegar.

Sugar: Use white sugar unless the recipe calls for brown. White sugar gives the product a lighter color, but brown sugar may be preferred for flavor. If you plan to use a sugar substitute, follow recipes developed for these products.

Spices: Use fresh whole spices for the best quality and flavor in pickles. Powdered spices may cause the product to darken and become cloudy. Pickles will darken less if you tie whole spices loosely in a clean white cloth or cheesecloth bag and then remove the bag from the product before packing the jars.

Water: When brining pickles, hard water may interfere with the formation of acid and prevent pickles from curing properly. If soft water is unavailable, hard water can be softened. Simply boil it 15 minutes and let set for 24 hours, covered. Remove any scum that appears. Slowly pour water from the container so the sediment will not be disturbed. Discard the sediment. The water is now ready for use. Distilled water can also be used in pickle making.

Firming Agents: If good quality ingredients are used in pickling and up-to-date methods are followed, lime and alum are not needed for crisp pickles. If you choose to use firming agents, alum may be safely used to firm fermented cucumbers. However, since it is unnecessary, it is not included in these recipes. The calcium in lime does improve pickle firmness. Food-grade lime may be used as a lime-water solution for soaking fresh cucumbers 12 to 24 hours before pickling them. However, **EXCESS LIME ABSORBED BY THE CUCUMBERS MUST BE REMOVED TO MAKE SAFE PICKLES.** To remove excess lime, drain the lime-water solution, rinse and then re-soak the cucumbers in fresh water for 1 hour. Repeat the rinsing and soaking steps two more times.

Equipment

The right equipment prevents pickle failure and saves time and energy. Read each recipe completely to make sure you have the right equipment, before you start to make pickled products.

Containers and Weights for Fermentation: Pickles and sauerkraut can be fermented in large stoneware crocks, large glass jars or food-grade plastic containers. If you are not sure whether a plastic container is safe for food, read its label or contact its manufacturer. Another option is to line the questionable container with several thicknesses of food-grade plastic bags. Do not use aluminum, copper, brass, galvanized or iron containers for fermenting pickles or sauerkraut.

The container needs to be large enough to allow several inches of space between the top of the food and the top of the container. Usually a 1-gallon container is needed for each 5 pounds of fresh vegetables. Sauerkraut may be fermented in quart or half-gallon canning jars, but there is a greater chance of spoilage.

After the vegetables are placed in the container and covered with brine, they must be completely submerged in the brine. A heavy plate or glass lid that fits down inside the container can be used. If extra weight is needed, a glass jar(s) filled with water and sealed can be set on top of the plate or lid. The vegetables should be covered by 1 to 2 inches of brine.

Another option for submerging the vegetables in brine is to place one food-grade plastic bag inside another and fill the inside bag with some of the pickling brine. Close the end securely. Then use this filled bag as the weight on top of the vegetables. Filling the bag with brine is a precaution, in case the bags are accidentally punctured.

Equipment for Fresh-Pack Pickles: Pickling liquids should be heated in stainless steel, aluminum, glass or unchipped enamelware saucepan. Do not use copper, brass, galvanized or iron utensils. These metals can react with acids or salts and cause undesirable color changes and/or form toxic compounds in the pickles.

For short-term brining or soaking, use crocks, saucepans or bowls made from stoneware, glass, stainless steel, aluminum or unchipped enamelware. Except for the aluminum, the same containers can be used for soaking vegetables in lime. Lime pits the aluminum and can cause an increased level of aluminum in the pickles.

Boiling Water Bath Canner for Processing Pickles:

Use a boiling water bath canner or any deep pot that has a rack on the bottom and a lid.

Canning Jars and Lids: Use pint or quart canning jars specially designed for home canning. Commercial jars such as mayonnaise jars break more easily than standard jars and may not seal. Check all jars carefully for cracks or chips. Wash the jars in hot soapy water and rinse well.

Jars that will be filled with food and then processed for less than 10 minutes need to be sterilized first. To do this, cover the jars with hot water and boil for 10 minutes. Keep the jars hot until filled. Jars that will be filled with food and processed for 10 minutes or longer do not need to be sterilized.

Two-piece metal lids should be treated according to the manufacturer's instructions before use. These lids can be used only once.

Processing

Processing is necessary for all pickles and relishes to destroy yeasts, molds and bacteria that may cause the products to spoil and also to inactivate enzymes that could affect the color, flavor and texture of the pickled product. As in all canning, a seal is necessary on the jar to prevent other microorganisms from getting in.

Pickles and relishes are high acid products because of the large amount of vinegar added or because of the acid produced during the fermentation. Since they are high acid products, pickles and relishes are processed in a boiling water bath canner.

To Pack the Jars: Follow the directions in the recipe and pack the pickled product into the jar, leaving the appropriate headspace (usually 1/2-inch). Remove any trapped air bubbles by sliding a non-metal spatula around the edge of the jar. Wipe the jar rim clean with a damp cloth. Place the lid (treated according to the manufacturer's instructions) on the jar and screw the screw band down fingertip tight.

For All Pickled Products: Place each jar as it is filled onto a rack in the canner containing simmering water. When canner is filled with jars, add more hot water if necessary to cover jars by at least 1 inch. Cover canner

and bring water to a boil. Start counting the processing time when water reaches a boil. Process for the time specified in the recipe.

As an Option: Sometimes processing cucumber pickles in simmering water (180°F) for 30 minutes results in crisper products. To do so, pack the room temperature product into hot sterilized jars. Fill jars with 165°F to 180°F liquid, leaving 1/2-inch head space. Seal jars and process at 180°F for 30 minutes. Be sure to use a thermometer. This temperature is hard to maintain without one.

Caution! Altitude Adjustments: The processing times given for the pickle products in this publication are for altitudes of 0-1000 feet. If you are processing at an altitude over 1000 feet, see the chart at the end of this publication for the correct processing time.

Day-After Canning Jobs: Test the seal on the jar lids. Press flat metal lids at the center of the lid. It should be slightly concave and should not move. Screw bands may be removed from thoroughly cooled jars. Label sealed jars with contents and date.

Store the canned pickles in a cool, dry place. Stored properly, canned pickles should retain their high quality for about one year.

Unsealed jars of food need to be treated as fresh. The food can be eaten immediately, refrigerated or recanned. Recanning will make pickles softer.

On Guard Against Spoilage

Always be on the alert for signs of spoilage. Before opening a jar, examine it closely. A bulging lid or leakage may mean the contents are spoiled.

When a jar is opened, look for other signs of spoilage, such as spurting liquid, disagreeable odor, change in color or unusual softness, mushiness or slipperiness of product. If there is even the slightest indication of spoilage, do not taste contents. Dispose of the food so it cannot be eaten by humans or animals.

Pickle and Relish Recipes

FERMENTED DILL PICKLES

RECIPE

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 dill
2 cloves garlic (optional)
2 dried red peppers (optional)
2 teaspoons whole mixed pickling spices (optional)
1/2 cup salt
1/4 cup vinegar
8 cups water

Wash cucumbers. Cut 1/16-inch slice off blossom end and discard. Leave 1/4-inch of stem attached. Place half of dill and spices on bottom of a clean, suitable container. Add cucumbers, remaining dill and one or more of the optional spices. Dissolve salt in vinegar and water. Pour over cucumbers. Add suitable weight.

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

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 about 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 process fermented dill pickles – Pour the brine into a pan. Heat slowly to a boil and simmer 5 minutes. Filter brine through paper coffee filters to reduce cloudiness, if desired. Fill hot jars with pickles, leaving 1/2-inch headspace. Fill jars to 1/2 inch from top with hot brine. Remove air bubbles. Wipe jar rims. Adjust lids. Process 10 minutes for pints; 15 minutes for quarts in a boiling water bath.

QUICK SWEET PICKLE SLICES OR STRIPS

RECIPE

(about 8 pint jars)

8 pounds 3- to 4-inch pickling cucumbers
1/3 cup salt
Crushed or cubed ice
4 1/2 cups sugar
3 1/2 cups vinegar
2 teaspoons celery seed
1 tablespoon whole allspice
2 tablespoons mustard seed
1 cup pickling lime (optional)

Preparation Without Lime – Wash cucumbers. Cut 1/16-inch off blossom end and discard. Cut cucumbers into slices or strips. Place in a bowl and sprinkle with 1/3 cup salt. Cover with 2 inches crushed or cubed ice. Refrigerate 3 to 4 hours. Add more ice as needed.

Preparation With Lime – Wash cucumbers. Cut 1/16-inch off blossom end and discard. Cut cucumbers into slices or strips. Mix 1 cup pickling lime, 1/3 cup salt and 1 gallon water in a 2- to 3-gallon crock, glass or enamelware container. **CAUTION:** Avoid inhaling lime dust while mixing the lime-water solution. Soak cucumber slices or strips in the lime water solution for 12 to 24 hours, stirring occasionally. Remove from lime solution, rinse and re-soak one hour in fresh cold water. Repeat rinsing and re-soaking two more times. Handle carefully because slices or strips will be brittle.

To Make Pickles – Sterilize canning jars if processing a raw pack in pints. Combine sugar, vinegar, celery seed, allspice and mustard seed in 6-quart saucepot. Heat to boiling. Drain cucumbers. Pack the cucumbers without heating or heat cucumbers just until hot in vinegar solution. Pack pickles into jars leaving 1/2-inch headspace. Fill jars to 1/2 inch from top with hot canning liquid. Remove air bubbles. Wipe jar rims. Adjust lids. For a hot pack, process pints or quarts for 5 minutes. For a raw pack, process 10 minutes for pints, 15 for quarts. After processing and cooling, store jars for 4 to 5 weeks to allow pickles to develop ideal flavor.

Variation – Two slices of raw onion can be added to each jar before filling, if desired.

Pickle and Relish Recipes

QUICK FRESH PACK

RECIPE

DILL PICKLES

(about 7-9 pint jars)

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

Wash cucumbers. Cut 1/16-inch slice off blossom end and discard. Leave 1/4-inch of stem attached. Dissolve 3/4 cup salt in 2 gallons water. Pour over cucumbers and let stand 12 hours. Drain. Combine vinegar, 1/2 cup salt, sugar and 2 quarts water. Add mixed pickling spices tied in a clean white cloth. Heat to boiling. Fill jars with pickles. Add 1 teaspoon mustard seed and 1 1/2 heads fresh dill (or 1 1/2 teaspoons dill seed) per pint jar. Cover with boiling pickling solution, leaving 1/2-inch headspace. Remove air bubbles. Wipe jar rims. Adjust lids. Process 10 minutes for pints; 15 minutes for quarts, in a boiling water bath.

PICKLED GREEN BEANS

RECIPE

(4 pint jars)

2 pounds green beans
1 teaspoon cayenne pepper
4 heads dill or 4 teaspoons dill seed
4 cloves garlic
2 1/2 cups water
2 1/2 cups vinegar
1/4 cup salt

Sterilize canning jars. Wash, trim ends and cut beans into 4-inch pieces.

Pack beans, lengthwise, into hot jars, leaving 1/2-inch headspace. To each pint, add 1/4 teaspoon cayenne pepper, 1 clove garlic, and 1 dill head or 1 teaspoon dill seed. Combine remaining ingredients and bring to a boil. Pour boiling hot liquid over beans, leaving 1/2-inch headspace. Remove air bubbles. Wipe jar rims. Adjust lids. Process 5 minutes in boiling water bath. Let beans stand for at least two weeks before tasting to allow the flavor to develop.

BREAD-AND-BUTTER

RECIPE

PICKLES

(about 8 pint jars)

6 pounds 4- to 5-inch pickling cucumbers
8 cups thinly sliced onions (about 3 pounds)
1/2 cup salt
Crushed or cubed ice
4 cups vinegar
4 1/2 cups sugar
2 tablespoons mustard seed
1 1/2 tablespoon celery seed
1 tablespoon ground turmeric
1 cup pickling lime (optional)

Preparation Without Lime – Wash cucumbers. Cut 1/16-inch off blossom end and discard. Cut into 3/16-inch rings. Combine cucumbers and onions in a large bowl. Add salt. Cover with 2 inches crushed or cubed ice. Refrigerate 3 to 4 hours, adding more ice as needed.

Preparation With Lime – Wash cucumbers. Cut 1/16-inch off blossom end and discard. Cut into 3/16 slices. Mix 1 cup pickling lime, 1/2 cup salt and 1 gallon water in a 2- to 3-gallon crock, glass or enamelware container. **CAUTION:** Avoid inhaling lime dust while mixing the lime-water solution. Soak cucumber slices in lime water for 12 to 24 hours stirring occasionally. Remove from lime solution, rinse and re-soak one hour in fresh cold water. Repeat the rinsing and soaking steps two more times. Handle carefully, as slices will be brittle.

To Make Pickles – Add sugar and remaining ingredients to vinegar in a large pot. Boil 10 minutes. Add well-drained cucumbers and onions and slowly reheat to boiling. Fill pint or quart jars with slices, leaving 1/2-inch headspace. Fill to 1/2 inch from top with hot cooking liquid. Remove air bubbles. Wipe jar rims. Adjust lids. Process pints or quarts 10 minutes in a boiling water bath. After processing and cooling, jars should be stored 4 to 5 weeks to develop ideal flavor.

SPICED GREEN TOMATOES

RECIPE

(about 4 pint jars)

6 pounds small whole green tomatoes
9 cups sugar
1 pint cider vinegar
1 tablespoon whole mace or 1/2 tablespoon ground mace
2 sticks cinnamon
1 tablespoon whole cloves
1 tablespoon whole allspice

Small green fig or plum tomatoes are suitable for this pickle. Wash, scald, and peel. Make syrup of the sugar, vinegar and spices. Drop in the whole tomatoes and boil until they become clear. Pack tomatoes into hot jars, leaving 1/2-inch headspace. Strain syrup and cover tomatoes, again leaving 1/2-inch headspace. Remove air bubbles. Wipe jar rims. Adjust lids. Process 15 minutes in a boiling water bath.

Pickle and Relish Recipes

VIDALIA ONION RELISH

(about 8 pints)

- 1 1/2 gallons ground Vidalia sweet onions
(14 to 16 medium onions)
- 1/2 cup salt
- 1 quart apple cider vinegar
- 1 teaspoon tumeric
- 4 teaspoons pickling spice
- 4 teaspoons pimento, chopped
- 4 1/2 cups sugar

Grind enough Vidalia onions to yield 1 1/2 gallons, add 1/2 cup salt and let stand 30 minutes. Squeeze juice from onion-salt mixture and discard juice. Tie pickling spice in cheese cloth. Combine onions, vinegar, sugar, tumeric, spice bag and pimento in a large saucepot. Bring to a boil and cook until thick (approximately 30 minutes), stirring often. Remove and discard spice bag. Pack both onions and cooking liquid to cover in hot jars, leaving 1/2-inch headspace. Remove bubbles. Wipe jar rims. Adjust lids. Process 10 minutes in a boiling water bath.

RECIPE

CUCUMBER HOT DOG RELISH

(about 6 pint jars)

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

Use coarse blade on grinder to grind vegetables. Combine all vegetables in a large bowl. Sprinkle with salt and cover with cold water; let stand 4 hours. Drain thoroughly in colander, press out all excess liquid.

Combine sugar, vinegar, celery seed, and mustard seed. Bring to a boil, stirring until sugar is dissolved. Add drained vegetables and simmer 10 minutes. Pack hot relish into hot jars, leaving 1/2-inch headspace. Remove air bubbles. Wipe jar rims. Adjust lids. Process 10 minutes in a boiling water bath.

RECIPE

WATERMELON RIND PICKLES

(about 4 to 5 pints)

- 3 quarts (about 6 pounds) watermelon rind, unpared
- 3/4 cup salt
- 3 quarts water
- 2 quarts (2 trays) ice cubes
- 9 cups sugar
- 3 cups vinegar, white
- 3 cups water
- 1 tablespoon (about 48) whole cloves
- 6 cinnamon sticks, 1-inch pieces
- 1 lemon, thinly sliced, with seeds removed

Pare rind and all pink edges from the watermelon. Cut into 1-inch squares or fancy shapes as desired. Cover with brine made by mixing the salt with 3 quarts cold water. Add ice cubes. Let stand 3 to 4 hours.

Drain; rinse in cold water. Cover with cold water and cook until fork tender, about 10 minutes (do not overcook). Drain.

Combine sugar, vinegar, water and spices (tied in a clean, thin, white cloth). Boil 5 minutes and pour over the watermelon; add lemon slices. Let stand overnight.

Heat watermelon in syrup to boiling and cook slowly 1 hour. Pack hot pickles loosely into hot pint jars. To each jar add 1 piece of stick cinnamon from spice bag; cover with boiling syrup to 1/2 inch from top. Remove air bubbles. Wipe jar rims. Adjust lids. Process 10 minutes in a boiling water bath.

RECIPE

PEACH PICKLES

(about 6 pint jars)

- 8 pounds peeled peaches (small to medium sized)
- 6 3/4 cups sugar
- 4 sticks cinnamon (2 inches long)
- 2 tablespoons whole cloves, crushed
- 1 tablespoon ginger
- 1 quart vinegar

Wash and peel peaches with sharp knife, and drop into a solution of 1/2 teaspoon ascorbic acid and 2 quarts of water.

Dissolve sugar in vinegar in saucepot and put on range to heat. Boil 5 minutes and skim. Add spices (tied loosely in cheesecloth).


Drain peaches. Drop drained peaches into boiling syrup and cook until they can be pierced with a fork, but not soft. Remove from range and allow peaches to set in syrup overnight to plump. Bring to a boil and pack into hot jars, leaving 1/2-inch headspace. Cover with syrup, leaving 1/2-inch headspace. Remove air bubbles. Wipe jar rims. Adjust lids. Process 20 minutes in boiling water bath.

RECIPE

Boiling Water Bath Processing Times for Pickles at Altitudes Over 1000 Feet

Product	Style of Pack	Jar Size	Process Times (Minutes) at Altitudes of:		
			1001-3000 feet	3001-6000 feet	6001-8000 feet
Fermented Dill Pickles	Raw	Pints	15	15	20
		Quarts	20	20	25
Quick Fresh Pack Dill Pickles	Raw	Pints	15	15	20
		Quarts	20	20	25
Quick Sweet Pickle Slices or Strips	Hot	Pints or Quarts	10	10	15
	Raw	Pints	15	15	20
		Quarts	20	20	25
Bread-and-Butter Pickles	Hot	Pints or Quarts	15	15	20
Pickled Green Beans	Raw	Pints	10	10	15
Spiced Green Pickles	Hot	Pints	20	20	25
Onion Relish	Hot	Pints	15	15	20
Cucumber Hot Dog Relish	Hot	Pints	15	15	20
Watermelon Rind Pickles	Raw	Pints	15	15	20
Peach Pickles	Hot	Pints	25	30	35

Putting Knowledge to Work



**When you have a question...
Call or visit your local office of
The University of Georgia's
Cooperative Extension Service.**

**You'll find a friendly, well-trained staff
ready to help you with information, advice
and publications covering family and
consumer sciences, agriculture and natural
resources, 4-H and youth development.**

Edited by Judy A. Harrison, Ph.D., and Elizabeth L. Andress, Ph.D., Extension Foods Specialists.

The University of Georgia and Ft. Valley State University, the U.S. Department of Agriculture and counties of the state cooperating. The Cooperative Extension Service, The University of Georgia College of Agricultural and Environmental Sciences offers educational programs, assistance and materials to all people without regard to race, color, national origin, age, sex or disability status.

An Equal Opportunity Employer/Affirmative Action Organization Committed to a Diverse Workforce.

Issued in furtherance of Cooperative Extension work, Acts of May 18 and June 30, 1914, The University of Georgia College of Agricultural and Environmental Sciences and the U.S. Department of Agriculture cooperating.

Gale A. Buchanan, Dean and Director

FDNS-E-43-7

07-00