

# Pickling Fruits and Vegetables

## Fundamentals

### Food safety tips

- Wash hands and forearms frequently: after using toilet, after changing baby's soiled diaper, after touching animals, before handling food, and after touching raw meat, fish and poultry.
- 20-second rule: wash hands for 20-seconds.
- Use disposable gloves if you have a cut or sore on your hands.

### When in doubt - throw it out

- DANGER - Never taste food that looks or smells strange to see if it can still be used. Just discard it.
- Generally foods that contain bacteria will look, smell, and taste normal.
- Generally speaking most bacteria that cause food borne illness are odorless, colorless, and tasteless.

### General cleaning tips

- Run sponges and pot scrubbers through the dishwasher frequently. Change dish cloths daily.
- Mop up spilled juices from meat, fish or poultry immediately using a disposable paper towel.
- Use a disinfecting solution consisting of 1 ½ teaspoon of chlorine bleach to 1 pint of water. Dispense with a spray bottle to disinfect countertops, cutting surfaces, etc. Make a new solution every week.
- AVOID CROSS CONTAMINATION. ALWAYS wash your hands, knives, cutting boards, and food preparation surfaces well with soapy water before and after any contact with raw meat, fish, or poultry.
- Rinse all fresh fruits and vegetables well under running water before preparing or eating them. Do not soak.

### Use the Right Equipment

- Use standard canning jars, lids, and rings.
- Cook the product in a deep, non-reactive kettle, stainless steel, enameled, or glass.
- Use a reputable recipe for the best results; they have been tested for quality, flavor, and *safety*.

### Getting Ready: Be Prepared!

- Read the recipe thoroughly before you begin. Measure out all ingredients and have all needed utensils at hand. Make sure your vinegar is 5% acidity (read the label).
- Do not change the quantities of produce nor vinegar in any recipe, unless specified in a tested recipe. (If you cut a recipe in half, do the math right.)
- Check the jar for flaws. Wash jars, lids, and rings in hot soapy water and rinse well. Place clean jars into the canner to heat.

### Fill and Seal Jars Properly

- Fill hot jars using either a *Raw (Cold) Pack or Hot-Pack*.
  - The raw, or cold-pack, method means packing the cold or raw food into a hot jar, then adding boiling liquid brine. The jars are then processed in a boiling-water canner. Fruits such as apricots, berries, cherries, grapes, plums, rhubarb and tomatoes are best if packed raw. Most vegetables can be packed raw (cold-packed) if processed in the pressure canner.



- The hot-pack method requires a short pre-cooking period (boiling or heating in some manner). Then the boiling-hot product is packed into clean, hot jars and processed immediately. The hot-pack method is more satisfactory for some vegetables and fruits and it is recommended for peaches, pears and pineapple. Benefits include a tighter pack and, because food expels air when heated, less float.
- Use the method suggested in your tested recipe for best flavor and texture.
- Leave the headspace specified in the recipe.
- Wipe the rim with a clean, damp, paper towel.
- Place lids and rings on jars. Tighten the rings only fingertip tight.



### Processing

- Process jars of pickled products using either the boiling water or atmospheric steam canning method. This ensures that any foodborne pathogens in the jar are destroyed.
- **The USDA does not recommend open kettle canning**, which involves heating the food to boiling, pouring it into the jars, applying lids, and allowing the heat of the jar to cause the lid to seal, without further processing.
- Paraffin, as a sealing agent, is not recommended. No processing is involved and the wax can shrink during cold weather, exposing the food.
- **Alternative Low-Temperature Pasteurization Process:** Low-temperature pasteurization can produce a better pickle texture, but must be done very carefully to avoid spoilage and is only acceptable for certain recipes. Fill jars with room temperature pickles. Pour 165° to 180°F liquid over the product, leaving the appropriate headspace. Remove bubbles with a rubber spatula. Wipe the jars clean and adjust lids. Process at 180°F for 30 minutes. Be sure to use a thermometer. **Caution: Use this process only for cucumbers. Do not use this treatment on reduced-sodium pickles.**
- **Atmospheric Steam Canner Processing:** Use a research tested recipe and processing time developed for a **boiling water** canner when using an atmospheric steam canner. An atmospheric steam canner may be used with recipes approved for half-pint, pint, or quart jars. Processing time must be limited to **45 minutes or less, including any modification for elevation.**

### Adjusting for Altitude

- All recipes are developed using sea level as the criteria for processing times. At sea level, water boils at 212°F. At higher altitudes water will boil at a lower degree.
- Adjustments have to be made to ensure safe canning. If you are at a higher altitude you must increase the processing times according to the chart.

Altitude Chart	
Altitude in feet	Increase processing time
1,000 – 3,000	5 minutes
3,001 – 6,000	10 minutes
Above 6,001	15 minutes

## Pickles

A pickle is any fruit or vegetable preserved in vinegar or brine.

- **Brine pickles** are products fermented in salt brine. Regular dill pickles and sauerkraut are fermented and cured for about 3 weeks. They may be canned or stored in the refrigerator for 4-6 months.
- **Refrigerator dills** are not heat processed and must be stored in the refrigerator for 4-6 months.
- **Fresh-pack or quick-process pickles** are not fermented; some are brined several hours or overnight, then drained and covered with vinegar and seasonings.
- **Fruit pickles** are fruits that are pickled in spicy, sweet-sour syrup.
- **Relishes** are prepared using chopped products and cooked in a spicy vinegar solution.

Be sure to remove and discard a 1/16-inch slice from the blossom end of fresh cucumbers. Blossoms may contain an enzyme which causes excessive softening of pickles.

## Salt

- Salts are not interchangeable.
- Use canning or pickling salt. Table salt contains anti-caking ingredients which can cloud the brine. Kosher salt may also contain anti-caking ingredients so check the label.
- Since flake salt varies in density (grain size), it is not recommended for making pickled and fermented foods. (If you must substitute Kosher salt, it is lighter than canning salt so you need to use the same amount of salt by weight, not volume.
- In our class experiment, **1/2 cup pickling salt = 1 cup plus 2 Tablespoons Kosher salt.**)

## Vinegar

The level of acidity in a pickled product is as important to its safety as it is to taste and texture. When pickling, always use high-quality commercial vinegars with 5% acidity or higher (also listed as 50-grain). The acidity should be listed on the label; if not, assume it is not 5%.

- Do not alter vinegar, food, or water proportions in a recipe or use a vinegar with unknown acidity. Doing so may alter its preservative effect and undermine the safety of the product.
- Use only recipes with tested proportions of ingredients.
- White distilled and cider vinegars of 5% acidity are recommended. White vinegar is usually preferred when light color is desirable.
- Do not use homemade vinegar as the acidity is unknown.

## Water

- Soft water makes the best brine for pickles
- Hard water may cause cloudiness in the brine and discolor pickles. If only hard water is available, boil and let sit for 24 hours. Skim off scum and use water from the top of the container without disturbing the sediment.

## Pickles with reduced salt content

- When making fresh-pack pickles, cucumbers are acidified quickly with vinegar. Use only tested recipes formulated to produce the proper acidity. While these pickles may be prepared safely with reduced or no salt, their quality may be noticeably 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.

## Sugars

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

## 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.

## 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. Alum does not have an effect on quick-processes pickles.

- When pickling cucumbers, cut 1/16-inch slice off the blossom end and discard because enzymes in the blossom end causes soft pickles?

- Soaking cucumber in **ice** water for 4 to 5 hours prior to pickling is a safe method for making crisp pickles.
- The calcium in pickling 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.
- Calcium chloride for pickling is often sold where you buy canning supplies. It is usually added directly to the jars of pickles. Follow the instructions on the package.

### Other considerations:

- **Yellow crystals on pickled asparagus:** Sometimes pickled asparagus will form yellow crystals. Do not panic!!! When asparagus is heated with acid (such as vinegar), rutin is drawn out of the asparagus plant. It then becomes insoluble in the vinegar and crystallizes on the exterior of the asparagus stems. It is safe to it; it is only a cosmetic concern. In commercially canned asparagus, a small amount of tin salts are added to the pickling solution, which prevents the rutin from crystallizing.
- **Blue garlic:** Garlic contains anthocyanins, water- soluble pigments that can turn blue or purple in acidic environments like vinegar or pickling brine - the garlic is still safe to eat. Garlic should be fresh and at the peak of maturity. Immature or sprouting garlic can turn blue in the jar.

### For Best Results ...

- Store fresh-pack/quick pickles for 4-6 weeks in a cool, dry, dark place to allow the flavors to mellow and blend.
- Marinate **refrigerator** pickles (they aren't processed in heat) in the refrigerator for at least two weeks before serving and use within 3 months.

### Preventing Spoilage

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

### Resources

**National Center for Home Food Preservation:** <http://nchfp.uga.edu/>

**Complete Guide to Home Canning.** 2015. [http://nchfp.uga.edu/publications/publications\\_usda.html](http://nchfp.uga.edu/publications/publications_usda.html)

Also available in paper copy from Purdue Extension (online store is located at

[https://mdc.itap.purdue.edu/item.asp?item\\_number=AIG-539](https://mdc.itap.purdue.edu/item.asp?item_number=AIG-539))

**Canning Vegetables,** 2012. Publication 8072. University of California Ag & Natural Resources,

<http://anrcatalog.ucanr.edu>.

**So Easy to Preserve,** Sixth Edition. 2016. Bulletin 989. Cooperative Extension/University of Georgia, Athens

**Ball Complete Book of Home Preserving,** 2006/2012. Jarden Corporation.

It is the policy of the University of California (UC) and the UC Division of Agriculture & Natural Resources not to engage in discrimination against or harassment of any person in any of its programs or activities (Complete nondiscrimination policy statement can be found at <http://ucanr.edu/sites/anrstaff/files/215244.pdf>) Inquiries regarding ANR's nondiscrimination policies may be directed to John I. Sims, Affirmative Action Compliance Officer/Title IX Officer, University of California, Agriculture and Natural Resources, 2801 Second Street, Davis, CA 95618, (530) 750- 1397.

Should you need assistance or require special accommodations for any of our educational programs, please contact us at 530-621-5502.