



Section B: Preservation/Preparation

This section describes four main ways to preserve your produce: drying, freezing, canning, and pickling.

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Drying:

Drying preserves foods by removing enough moisture from food to prevent decay and spoilage. The key is to remove moisture as quickly as possible at a temperature that does not seriously affect the flavor, texture and color of the food.

Main Steps:

- **Select & Prepare**
- **Blanch**
- **Dry**
- **Store**

1) Select & Prepare

- Select vegetables at peak flavor and eating quality, usually just as they reach maturity.
- Select fruits at peak ripeness.
- Prepare produce immediately:
 - Thoroughly wash produce.
 - Drain thoroughly, shaking leafy vegetables well.
 - Sort and discard any produce with decay, bruises or mold (you can cut away the bad parts and still use what's left!)

2) Blanch

To blanch vegetables means to cook through very briefly. Leafy greens should cook only one minute and broccoli about two.

- **Steam Blanch Vegetables & Fruits (recommended method):**
 - Put a minimum of 2 inches water in a large pot.
 - Heat water to boiling.
 - Place a rack or colander in pot to keep vegetables above water.
 - Place prepared vegetables directly in colander or first in a cheesecloth bag, work with small batches vegetables.
 - Cover pot and steam.
 - Halfway through, check to see that all pieces are being steamed. Stir or shake if necessary.
 - Replace cover and continue heating.
 - Test vegetables. Leaves should be limp but stalks, etc. should be firm. All vegetables should be heated through, but not cooked.
 - Lift out vegetables and spread on clean cloth or paper towels.
- **Water Blanching Vegetables:**
 - Fill large pot half full with water and bring to a boil.
 - Put no more than 3 qts. of vegetable pieces in cheesecloth or mesh bag.
 - Dunk this bag in boiling water, making sure water covers the vegetables. Shake bag so hot water reaches all pieces. Allow vegetables to cook for a few minutes.
 - Adjust heat, so water continues to boil.
 - Remove from boiling water and dunk directly into a cold water bath to stop the cooking.
 - Drain on paper towel or cloth.

3) Dry

☐ Sun Drying

- Place trays of blanched vegetables in direct sun in a flat or tilted position that allows air to circulate around and underneath. To protect from insects, place netting or screening on both sides of tray without touching food.
- Stir or turn food several times each day to help even drying.
- An electric fan directed onto food speeds up drying and helps keep insects away.
- Do not allow sun to scorch or burn food.
- When food seems about two-thirds dry, take trays indoors or into a shaded area.
- Sun drying may take 12 hours to four or five days, depending on the size of food pieces, amount of food on a tray, and weather conditions. If drying takes more than one day, bring trays in at nightfall to protect food from dew.



☐ Oven Drying (recommended method)

- Either a gas or electric oven may be used. Both require careful watching to prevent scorching.
- Preheat oven at lowest setting (140 to 150 degrees F).
- Achieve a consistent oven temperature of 140 degrees to prevent scorching.
- Place trays of prepared food in oven.
 - **For small amounts of food and trial runs**, cheesecloth stretched over oven racks, cake racks, broiler racks or cookie sheets work fine. Attach with clothespins.
 - **For large quantities of food**, use shallow wooden trays with slatted, perforated or woven bottoms (these can be used for sun, oven or room drying). Use wooden fruit crates or make tray frames. For tray bottoms, use thin wooden slats or dowels placed 1/4 inch to 1/2 inch apart, strong curtain netting, or stainless steel screening. (do not use galvanized screening).
 - A light coat of fresh vegetable oil or nonstick substance helps protect wood slats and make cleaning easier.
- Stack trays so there is at least 3 inches of clearance at top and bottom of oven and 2-1/2 inches between trays.
- Shift trays, top to bottom and front to back, every half hour.
- Stir food often if it is 1/2-inch deep or more.
- Single layers need no stirring.
- Turn heat off when drying is almost complete, to prevent scorching and open the door wide for an additional hour or so.

☐ Room Drying

In dry climates, some foods can be dried in a warm room such as an attic or kitchen.

- Herbs – hang herbs (root side up), cover with paper bags if protection is needed from dust.
- String pumpkin rings and red chili peppers on cords and hang near the ceiling.
- Trays of vegetables, half-dried in the sun or oven, can be finished in a warm room. Stack trays 6 inches apart.
- Open screened windows to allow free circulation of air.
- Force a draft across food with an electric fan.

☐ Solar & Dehydrator Drying

- Solar and thermostatically controlled heaters and dehydrators can be purchased or built at various costs.
- Cold frames, used by some gardeners, work well as solar dryers.

☐ Testing for Dryness

- Remove a small handful of food and cool for a few minutes before testing for dryness.
- Dried vegetables should be hard and brittle.



3) Dry (cont'd)

- ❑ **Post-Drying Treatment** - Foods exposed to insects (including fruit flies and Indian meal moths) before or during the drying process should be pasteurized to destroy insect eggs. Pasteurizing also helps remove excess moisture that may have been reabsorbed during conditioning. Two methods for Pasteurization:
 - **Freezer method.** Seal dried food in heavy freezer containers (boxes or bags). Freeze for 48 hours to kill insects and insect eggs. Remove and package promptly for permanent storage. Do not allow sweating to take place inside bags.
 - **Oven method.** Reheat dried foods on trays at 150 degrees for 30 minutes or 175 degrees for 15 minutes. Remove, cool quickly and package for permanent storage. This method of pasteurizing results in additional loss of vitamins, and, if not done carefully, may scorch food.

4) Store

- ❑ Pack cooled, dried foods in small amounts in dry, scalded glass jars (preferably dark) or in moisture- and vapor-proof containers, including plastic bags.
- ❑ Packaging materials should be moisture- and vapor-proof such as glass jars or rigid plastic containers.
- ❑ Most plastic bags and heavily waxed cartons, are not moisture- and vapor-proof, but are sufficient to use.
- ❑ Paper cartons are not sufficient for quality preservation of food.
- ❑ Use containers that allow the food to be removed easily.
- ❑ Square or rectangular flat-sided containers help make the most of storage space.
- ❑ If moisture collects in the containers but the food has not molded, it can be rescued. Heat foods to 150 degrees for 15 minutes and reseal.
- ❑ Discard all food that shows signs of mold.
- ❑ Label containers with the name of the product, date, and method of pretreatment and drying.
- ❑ Store in a cool, dry, dark place.
- ❑ Properly dried and stored vegetables keep well for six to 12 months.

Source: Mary Bell's Complete Dehydrator. Mary Bell. William Morrow & Co., 1994.
 Garden Way's Guide to Food Drying. Phyllis Hobson. Garden Way Publishing Co., 1980.
 Putting Food By. Janet Greene, Ruth Hertzberg, & Beatrice Vaughn. Plume, 1991.





Freezing:

Freezing is a simple and quick way to preserve foods at home and allows you to enjoy garden/farm fresh produce all year round.

1) Select and Prepare Vegetables

- ❑ Use vegetables at peak flavor and texture.
- ❑ Ideally, harvest in the cool part of the morning and freeze within two hours.
- ❑ Sort and discard any produce or sections of produce with decay, bruises or mold.
- ❑ Wash vegetables thoroughly in cold water.

2) Blanch

Blanching and prompt cooling are necessary steps in preparing practically every vegetable for freezing. Blanching destroys bacteria, deactivates enzymes and helps remove any surface dirt. To blanch vegetables means to cook through very briefly. Leafy greens should cook only one minute and broccoli about two.

- ❑ **Steam Blanch Vegetables & Fruits (recommended method):**
 - Put a minimum of 2 inches water in a large pot.
 - Heat water to boiling.
 - Place a rack or colander in pot to keep vegetables above water.
 - Place prepared vegetables directly in colander or first in a cheesecloth bag, work with small batches vegetables.
 - Cover pot and steam.
 - Halfway through, check to see that all pieces are being steamed. Stir or shake if necessary.
 - Replace cover and continue heating.
 - Test vegetables. Leaves should be limp but stalks, etc. should be firm. All vegetables should be heated through, but not cooked.
 - Lift out vegetables and spread on clean cloth or paper towels.
- ❑ **Water Blanching Vegetables:**
 - Fill large pot half full with water and bring to a boil.
 - Put no more than 3 qts. of vegetable pieces in cheesecloth or mesh bag.
 - Dunk this bag in boiling water, making sure water covers the vegetables. Shake bag so hot water reaches all pieces. Allow vegetables to cook for a few minutes.
 - Adjust heat, so water continues to boil.
 - Remove from boiling water and dunk directly into a cold water bath to stop the cooking.
 - Drain on paper towel or cloth.

3) Select Freezing Containers

- ❑ Packaging materials should be moisture- and vapor-proof such as glass jars and metal and rigid plastic containers.
- ❑ Most plastic bags and heavily waxed cartons, are not moisture- and vapor-proof, but are sufficient to use.
- ❑ Paper cartons are not sufficient for quality frozen foods.
- ❑ Use containers that allow the food to be removed easily.
- ❑ Square or rectangular flat-sided containers help make the most of freezer space

4) Pack

- ❑ **Dry Pack:**
 - Place prepared vegetables into meal-sized freezer bags or containers.
 - Pack tightly to cut down on the amount of air in the package.
 - Leave ½ inch at the top of rigid containers and close securely. For freezer bags, fill to within 3 inches of top.
- ❑ **Tray Pack:** By freezing separately first, each piece of tray-packed food remains loose so that the amount needed can easily be taken from the container and the package resealed.
 - Place prepared vegetables in a single layer on shallow trays or pans.
 - Freeze until firm, then remove and quickly fill labeled bags or containers.
 - Close and freeze immediately.

5) Label and Store

- ❑ Label packages with the name of the product and the freezing date.
- ❑ Leave space between packages to freeze quickly.
- ❑ Once frozen, store packages close together.
- ❑ Most vegetables maintain high quality for 12-18 months at 0 degrees F or lower.
- ❑ Longer storage may impair quality.
- ❑ It is a good idea to post a list of the frozen vegetables near the freezer and to check off packages as they are used.

Source: Home Freezing, Mary Frances Sowers, Bulletin C-3401, Oklahoma State Univ. Extension Service, Stillwater, Okla.
 Home Freezing of Fruits and Vegetables, Home and Garden Bulletin No. 10, U.S. Department of Agriculture, 1971.
 Home Freezing of Vegetables, Charlotte M. Dunn, Circular B-1219, Univ. of Wisconsin Ext. Service, Madison, WI
 Just Food.



Canning and Pickling:

Recommended equipment

- ❑ Enamel Canner/Large Pot with tight fitting lid.
- ❑ Metal rack – keep jars off bottom of pot and from hitting into one another.
- ❑ Jars, Lids, Caps – jars and caps can be cleaned and reused. Lids must be new each time.
- ❑ Rubber or other non-metallic spatula.
- ❑ Jar Lifter: large metal tongs that allow you to grab hot jars.
- ❑ Dry Towels
- ❑ Knife and Cutting Board
- ❑ Water
- ❑ Vinegar, Sugar/Honey & other ingredients (based on recipes)
- ❑ Quality Fruits and Vegetables
- ❑ Heat source - stove, etc.

Pressure Canner vs. Hot Water Bath

- ❑ Pressure Canner
 - Most store-bought canned vegetables are processed using a pressure canner, which can cost around \$150.
 - Preservation of low-acid vegetables, such as beans and peppers, is usually done in a pressure canner. **However, low-acid vegetables can be successfully preserved by pickling, using a hot water bath.**
 - This Tip-sheet will not cover preservation with a pressure cooker.
- ❑ Hot-water Bath:
 - There are Enamel Canners made specifically for canning/pickling however any large vessel/pot will do.
 - The pot should be deep enough to have at least 1 – 2 inches of water covering the tops of the jars.
 - The pot should be large enough to fit several jars (5 jars), making it worth your while.
 - The jars should not be touching, the water needs to circulate between the jars.
 - A metal rack can be used to lift the jars off the bottom of the pot.
 - The pot should have a tight fitting lid.

Acidity of Foods

Food for Canning is divided into two groups, low-acid foods and high-acid foods.

- ❑ Low-acid Foods:
 - Low-acid foods have a pH above 4.6; this includes most vegetables, such as: pumpkins, carrots, beets, squash, beans, spinach, cabbage, turnips, peppers, sweet potatoes, asparagus, potatoes, mushrooms, peas, corn.
 - Low-acid foods must be heated, in a pressure cooker, to 240 degrees in order to eliminate *Clostridium botulinum* (a bacterium that is present in soil and therefore also in most fruits and vegetables) or pickled (vinegar solution added to vegetables, in order to raise acidity) in a hot-water bath.



Acidity of Foods (cont'd)

- High-acid Foods
 - High-acid foods have a pH below 4.6, this includes most fruits, such as: citrus fruits, plums, apples, strawberries, rhubarb, berries, cherries, peaches, apricots, pears, pineapple, tomatoes.
 - High-acid foods can be processed in a hot-water bath. Any large vessel/pot will do for a water-bath canner (see above).
 - **Special Note for Tomatoes:** although tomatoes are listed under high-acid foods, some varieties have lower acidity. As a precaution, add two tablespoons of bottled lemon juice per quart of tomatoes (this will raise acidity).

Procedure

- Water Bath
 - Fill canner/pot with enough water to cover closed jars. There should be 1-2 inches of water over the top of the jars and the final water level should be 2 inches below the top of canner/pot.
 - Begin heating water.
 - While water is heating...
- Jars and Lids
 - Jars
 - Jars can be reused from year to year. Rinse jars in hot water if new. Wash with soap and water if reusing.
 - Wide-mouth jars are easiest to use when packing and removing fruits and vegetables.
 - Do not use jars with even the tiniest chips or cracks on them.
 - Lids
 - Lids must be **new** every year. The seal needed for preservation is only good once. Packets of lids can be purchased separately from jars.
 - The lids should be soaked in hot water before starting.
- Syrup and Solutions
 - Syrups:
 - When preserving fruits you should use a sugar or honey solution.
 - Sugar/Honey will help to keep the fruit's color and firmness.
 - Sugar Solution/Honey Solution: Thin (1 part sugar/3 parts water), Medium (2 parts sugar – 3 parts water), Heavy (equal parts sugar and water).
 - Solutions:
 - When canning/pickling low-acid foods in a water bath, a vinegar and water solution must be used.
 - White Vinegar is recommended but other vinegars are fine to use. Consider flavor when choosing vinegars.
 - Vinegar & Water Solution: the solution can be 50-50 water to vinegar or to be safe, 60% vinegar to 40% water.



Procedure (cont'd)

- Packing Vegetables
 - Wash all fruits and vegetables
 - Cut up vegetables/fruits
 - Pack produce tightly into jars
 - Add syrup or solution - use enough liquid to fill around and cover the food. Many recipes are available, be creative - yummy!
 - Use a non-metallic spatula to remove any trapped air bubbles. Insert the spatula into the middle of the jar and move up and down to allow air bubbles to escape. Run the spatula around the inside of the jar for the same purpose. Add more liquid as necessary.
 - Wipe the jar rim with a clean damp paper towel to remove any food particles and excess water.
 - Place lid and twist cap tightly.

- Boiling Water-bath and Beyond
 - Place tightly closed jars upright into boiling water-bath.
 - Put lid on canner/pot and bring water to boil.
 - Start timing when bath comes to a boil. 5-10 minutes for most pickled vegetables, 10-30 minutes for fruits – depending on ripeness, & 30 minutes for tomatoes.
 - When time is up use jar lifter to remove jars from water-bath.
 - Place jars on a dry towel.
 - Let the jars cool, allow air to circulate around jars.
 - After half hour – the last bit of air is exhausted as the food cools, creating a vacuum.
 - You can tell that your jars have been successfully sealed by pressing down on the center of lid – there should be no pop.
 - If you do not have a good seal eat within a few days.
 - Jars that are sealed correctly can last for years. Label with contents and date. Store in a clean, cool, dry, dark place.

Resources: Canning & Preserving Without Sugar. Norma MacRae. Globe Pequot Press, 1993.
 The Busy Person's Guide to Preserving Food. Janet Chadwick. Garden Way Publishing, 1995. Preserving Summer's Bounty.
 Susan McClure. Rodale, 1998. From Asparagus to Zucchini: A Guide to Farm Fresh, Seasonal Produce.
 The Complete Guide to Home Canning. Home and Garden Bulletin, U.S. Department of Agriculture, 1994.
www.backwoodshome.com/articles/clay53.html, Cornell Cooperative Extension – NYC. Kathleen McTigue, Just Food 2002

