

# Drying Fruits and Vegetables

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yields foods that are tasty and nutritious. The purpose of drying is to remove enough water from the food so that bacteria, yeast and molds cannot grow to harmful amounts causing food poisoning and spoilage. Making safe dried foods requires cleanliness at every step, protecting the food from airborne spoilers and other contaminants, and using food-grade containers, equipment and ingredients.

In order to facilitate the drying process, equipment should be gathered beforehand. The following equipment will be needed:

- Stainless steel knife and cutting board to prepare and cut foods.
- Pan and drainer for washing and draining fruits and vegetables.
- Equipment for sulfuring (this is optional), including wooden trays to hold fruit, a large box to cover trays, small container for sulfur, sulfur and matches.
- Drying trays (clean screens and shallow wooden crates with slotted bottoms, such as those used to ship fruit, can be used, or trays can be constructed.
- Clean, loosely woven cloths or screening to cover trays.
- Large kettle or steamer for pretreatment of vegetables.
- Thermometer for checking controlled drying temperatures if oven is used.
- Commercial food dehydrator (this is optional) with the following optimal features:
  - Underwriter Laboratories (UL) approval

- Constructed of metal or plastic for safety and ease of cleaning. Wood dehydrators may be a fire hazard and are difficult to clean.
- Fan or blower to help remove moisture.
- Thermostat with temperature range at least from 85 to 160 degrees F.
- Controls to regulate temperature.
- Timer to help prevent scorching if drying time is completed during the night.

## **Special Treatment for Fruits**

Select good quality fruits – right for eating.

Wash fruits and dry with paper towels. Fruits can be dried safely without any pretreatment, but most dried fruit results are improved by pretreating with one or more of the following methods before drying.

### ***Sulfite Dip***

This method yields similar results to sulfuring. Sulfite dip involves soaking fruit in sodium bisulfite and water, thereby allowing the sodium bisulfite to soak into the fruit which reduces browning and loss of vitamins. Some individuals, especially asthmatics and those with allergies, may be sensitive to sodium bisulfite (even to airborne particles while drying) so check with your doctor before using sodium bisulfite. Use only food-grade sodium bisulfite found in wine-making stores and some pharmacies. Use 1 to 2 tablespoons sodium bisulfite per gallon of water. Soak sliced fruits 5 minutes and halved fruits 15 minutes. Rinse the fruit with cold water. This process may take 20 percent longer to dry because of the extra water absorbed during soaking. Keep all ingredients and soaking solutions out of the reach of children and discard promptly after use. Dry foods in well-ventilated area.

### ***Anti-Discoloration Treatments***

Coating cut fruit with ascorbic acid will help keep it from darkening as it is being prepared for drying. Mix pure ascorbic acid in water. For apples, use 2½ teaspoons per 2 cups cold water. For most other fruits, 1 teaspoon of ascorbic acid per 2 cups of water is adequate. Place fruit in the ascorbic acid-water mixture as soon as it is peeled for 3 to 5 minutes. One cup of the mixture will treat about 5 quarts of cut fruit.

Commercial antioxidant mixtures containing ascorbic acid, citric acid, sodium bisulfite or similar compounds also may be used according to manufacturer's directions. As mentioned previously, some individuals with allergies and asthma may suffer severe allergic reactions to sulfites. This should be taken into consideration when deciding upon an anti-browning agent.

### ***Sulfuring***

Light colored fruits – such as apples, apricots, peaches, nectarines and pears – tend to darken during drying and storage. Sulfuring preserves color, flavor and vitamins by decreasing loss of vitamins A and C. Sulfuring also minimizes microbial spoilage and insect infestation. This method is usually recommended, although not mandatory, for cut fruits that are to be sun-dried.

Sulfuring must be done outdoors. To sulfur fruit, place pieces cut side up one layer deep on wooden trays. (*Do not* use metal trays as sulfur fumes corrode metal.) Stack the trays at least 1½ inches apart so that sulfur fumes can circulate. Separate the trays with small wooden blocks or strips of wood. Set the bottom tray on blocks or on bricks to raise it 6 to 8 inches above the ground. Cover the stack of trays with a cardboard box. The box should have a slash near the bottom of one side and near the upper edge of another side. The box should be large enough to allow 1½ inches of space above the top tray and space on all four sides of the stack. The sulfur fumes must circulate around, through and over the trays of fruit. One side of the cardboard box should be propped up in order to light the sulfur.

To begin the sulfur process, place pure refined sulfur in a clean shallow metal or aluminum foil container. Use elemental sulfur, also called Sulfur Flowers (U.S.P. Standard) or flowers of sulfur. It is free of impurities, burns readily and may be purchased at most pharmacies. Do not use garden dusting sulfur.

The amount of sulfur needed varies with length of time the fruit is to be sulfured, weight of fruit and the dimensions and airtightness of the sulfuring box. In general, allow 1 tablespoon of sulfur per pound (0.45 kg) of fruit prepared for drying.

Place the pan of sulfur under the box near the lower opening, allowing enough space between the sulfur container and the sides of the box and trays of fruit to prevent chance of fire. Do not inhale the sulfur fumes because they can cause damage to the lining of the lungs.

Light the sulfur with a match, taking care not to breathe any fumes. Do not leave bits of paper or the match in the sulfur container as this will hinder burning.

Immediately lower the box over the stack of fruit and seal the bottom edges with dirt. Start timing. When the sulfur is burning well (clear blue flame), cover the slash openings in the box. It is the sulfur dioxide fumes that one smells that protect the fruit.

The burning time of sulfur will vary with the ventilation, shape of container and weather conditions. Sulfuring is complete when the fruit appears bright and glistening and a small amount of juice appears in the pit cavity of the fruit.

When sulfuring is complete, remove the sulfuring box at an angle to avoid consumption of any remaining fumes. Remove the trays to where they are to be dried. This exposure of fruit to sulfur is not injurious to health. The heat of drying will dispel practically all of the sulfur compound.

### ***Steam and Water Blanching***

Steam blanching is the least effective method for pretreating fruits as it destroys the flavor, texture and vitamin A and C content more than other methods. It also is used to soften cherries and to crack the skins of some fruits so that they dry faster. To steam blanch products, heat 2 inches of water to boiling in a large kettle that has a close-fitting lid. Put a layer of fruit not more than 2 ½ inches deep into a wire basket, colander or sieve that will fit into the kettle above the water. Cover kettle and let food steam until each piece is heated through and is relaxed in texture and appearance. Test by removing a piece from center of the container and pressing it. It should feel soft, but not cooked. Spread the fruit on a clean cloth or paper towel to remove excess moisture before placing on drying trays.

Cherries, grapes, figs, plums, blueberries, huckleberries and cranberries will dry faster if their waxlike coating is removed and their skins cracked lightly in several places. This can be done by dipping the whole fruit for 30 to 60 seconds in briskly boiling water, followed by a similar dip in ice cold water and thorough draining.

## Special Treatment for Vegetables

Select vegetables in prime eating conditions. Wash thoroughly. Prepare vegetables immediately after gathering and begin drying at once. Steam or parboil all vegetables except green peppers, onions, mushrooms, horseradish, okra, herbs and zucchini before drying to prevent undesirable changes in flavor during storage. Steaming is preferred to parboiling, but both methods can be used. To steam products, use the steam blanch method described above for fruits.

When steaming is impractical for lack of equipment, parboil the vegetables in boiling water the shortest time possible to heat the vegetables throughout.

## Post-Drying Treatment and Storage

After food is dried, it should be conditioned for a week or two to assure that pieces are uniformly dried. To do this, loosely pack the dried food to about two-thirds full in a large nonmetal container. Place the container in a warm, dry, well-ventilated place away from animals, insects and dust. Cover with a clean cloth and stir once or twice daily.

At the end of the conditioning or curing time, foods dried in the sun should be pasteurized to prevent possible infestation from insects or insect eggs. This is done by reheating dried foods on trays in an oven at 160 degrees F for 30 minutes or 175 degrees F for 15 minutes. Allow pasteurized food to cool to room temperature before packaging for storage. Insects or insect eggs also may be killed by placing the packaged dried vegetables in the home freezer for 48 hours.

Pack dried foods in small amounts in dry, scalded glass jars (preferable dark colored) or in moisture vapor-proof freezer cartons or plastic bags. Bags may be heat-sealed or closed with twist tapes.

Foods that seem “bone dry” when packed can be spoiled by reabsorption of moisture during storage. Any moisture that collects on the inside of glass jars or plastic containers can be noticed. If this happens the food can be rescued by heating to 150 degrees F for 15 minutes and resealing the container.

Dried foods should be stored in a dark, dry, cool place. Low temperatures extend the shelf life of the dried product. Storage time for dried fruits range from 4 months to 1 year and for dried vegetables from 2 to 6 months.

## Using Dried Fruits and Vegetables

To cook fruit, just cover with boiling water and simmer, covered, until tender. Remove from heat and cool, covered. Fruit may be sweetened at the end of the cooking period.

If fruit is to be reconstituted for use in a cooked dish, such as a pie, place fruit in a bowl, just cover with boiling water; let soak until tender – one hour or longer. If they are soaked longer than two hours, the fruits should be refrigerated. Thinly sliced fruits may not require soaking before being used in cooked dishes.

Cover dried vegetables with cold water and let them soak until they are nearly restored to their original texture (½ to 2 hours). If they are soaked longer than two hours, the vegetables should be refrigerated. Bring to a boil in the soaking water and simmer, covered, until done. The amount of water used for soaking and cooking should be the amount they take up. Add more water during cooking if needed. Salt can be added to vegetables any time – during soaking, while cooking, or before serving.

Powdered onions, herbs, greens, cabbage and tomatoes do not need soaking.

## Additional Resources

*Putting Food By* by Janet Greene, Ruth Hertzberg and Beatrice Vaughan. 4th Edition, Revised

*So Easy to Preserve* by the Cooperative Extension Service of the University of Georgia

*How to Dry Foods* by Deanna DeLong



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