Home Drying of Fruits and Vegetables
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Tasty ready-to-eat snacks and confections are some of the versatile products you can create by drying fruits and vegetables at home. After soaking in water, the rehydrated food can be used in favorite recipes for casseroles, soups, stews and salads. Rehydrated fruits and berries can also make excellent compotes or sauces.

Drying is appealing because the procedure is relatively simple and requires little equipment. Only minimal storage space is needed. Food can be dried in the sun, in the oven, or in a dehydrator.

Drying requires a method of heating the food to evaporate the moisture present, and some means of removing the water vapor formed.

Sun drying utilizes both radiant heat energy and heat transferred to the product from warm air. Natural air currents are usually adequate to carry away the water vapor.

Trays of wood slats, plastic mesh, or aluminum screen may be placed in the sun on support blocks or strips to allow air movement around and through the trays. Galvanized wire is not recommended as a tray material because high-acid foods will react with the zinc coating on the steel wire.

If insects or birds are a problem, a wooden frame can be constructed over the trays to support a plastic mesh or cheesecloth cover. Further protection can be provided by using a totally enclosed frame and a transparent panel to form a solar drying oven.

To dry in the kitchen oven, the thermostat should be set to its lowest temperature (generally about 150°F). Since oven vents provided for removing moisture from roasting and baking are adequate for drying only small quantities of food at one time, the oven door should be left partially opened. For larger loads, the air circulation rate can be increased by placing a household fan outside the oven, directed at one edge of the partially opened oven door.

Dehydrator cabinets may be purchased in many sizes and types. Or they may be built using plans available from State universities or U.S. Department of Agriculture plan services (ask your county Extension office about plans). All cabinets are provided with a heat source and vents for carrying off moist air.

Simpler units may rely on natural convection to carry moist air away, and the heating unit may be limited in output so that the cabinet never exceeds safe drying temperatures near the end of the drying period. This type will be slow in achieving drying temperature if sizable amounts of food are processed at one time.

Trays must be rotated during the processing period to insure even drying. Trays nearest the bottom, exposed to the hottest, driest air, will dry most rapidly.

If the natural convection type cabinet is equipped with a thermostat, it may be fitted with a larger heater. This will provide higher drying temperatures during the early stages but will not give even drying across all trays.

By using a fan to force air across the trays more rapidly, even drying can be obtained across each tray as well as between trays. The forced air system may be used with or without a thermostat.
Most food products release moisture rapidly during early stages of drying. This means they can absorb large amounts of heat and give off large quantities of water vapor while remaining at a temperature well below that of the drying air. Maximum drying rates can be achieved by providing a larger, thermostatically-controlled heat source and a fan for circulating air.

To conserve energy and still obtain rapid, even drying across all trays, much of the drying air may be reheated and recirculated. This is particularly effective during the last 70% to 90% of the drying period, when relatively small amounts of water are absorbed by the air as it passes over the partially dried food.

The recirculating system requires either a thermostat or separate switch controls on part of the heating unit to adjust heat output to match the drying load. The amount of air recirculated is determined by the size of the permanent inlet and outlet openings in the box. It can be further controlled by adjusting the door to a partially opened position.

Detailed plans for constructing the recirculation-type drier can be obtained by sending 25¢ to the Western Regional Agricultural Engineering Service (WRAES), Oregon State University, Corvallis, Oreg. 97331 and requesting WRAES Fact Sheet No. 18.

Procedure

Drying is a relatively simple process, but there are a number of recommended techniques. You may need to use a "trial and error" approach to find the drying procedure which works best in a particular situation.

Fruits and vegetables can be dried in pieces or pureed and dried in a thin sheet as a "leather."

The following information summarizes major steps in drying. Detailed instructions are available at county Extension offices. Also, various books on the market give instructions for drying and recipes for using dried food.

Fruits and vegetables selected for drying should be the highest quality

Top, enclosed frame solar drying oven with provision for air movement. Middle, dehydrator with built-in heater relies on air movement to carry off moist air. Bottom, this forced draft dryer can recirculate much of the drying air to conserve energy.
Steps in Drying
Fruits and Vegetables

PREPARE
wash, sort
peel, pit/core, slice

PRETREAT
fruits:
dip or blanch
vegetables:
blanch

DRY
oven, sun, dehydrator

CONDITION AND STORE
equalize, pasteurize
package and store

obtainable—fresh and fully ripened. Wilted or inferior produce will not make a satisfactory dried product. Immature produce lacks flavor and color. Overmature produce may be tough and fibrous or soft and mushy.

Prepare produce immediately after gathering, and begin drying at once. Wash or clean all fresh food thoroughly to remove any dirt or spray. Sort and discard defective food; decay, bruises, or mold on any piece may affect an entire batch.

For greater convenience when you finally use the food, and to speed drying, it is advisable to peel, pit, or core some fruits and vegetables. Smaller pieces dry more quickly and uniformly.

Pretreating
Enzymes in fruits and vegetables are responsible for color and flavor changes during ripening. These changes will continue during drying and storage unless the produce is pretreated to slow down enzyme activity.

Blanching is the recommended pretreatment for vegetables. It helps save some of the vitamin content, sets color, and hastens drying by relaxing tissues. Blanching may also prevent undesirable changes in flavor during storage, and improve reconstitution during cooking.

Steam blanching is preferred because it retains more water-soluble nutrients than water blanching. Blanching times differ, depending on the type of vegetable being dried. Overblanching leads to excessive leaching of vitamins and minerals. Inadequate blanching will not destroy enzymes that cause vitamin loss during drying and storage.

Many light-colored fruits (especially apples, apricots, peaches, nectarines, and pears) tend to darken during drying and storage. To prevent this darkening, the fruit may be pretreated by blanching or by a suitable dip, but effectiveness of pretreatment methods varies.

Fruit may be dipped in one of the following:
—A solution of table salt
—A solution of ascorbic acid. Commercial antioxidant mixtures containing ascorbic acid may also be used, but often are not as effective as pure ascorbic acid.

Fruits may be steam-blanced. However, blanched fruits may turn soft and become difficult to handle.

Sirup blanching may help retain the color of apples, apricots, figs, nectarines, peaches, pears and plums. A sweetened candied product will result.

Fruits with tough skins (grapes, prunes and small dark plums, cherries, figs, and some berries) may be water-blanced to crack the skins. This will allow moisture inside to surface more readily during drying.

Before drying pretreated food, remove any excess moisture by placing the food on paper towels or clean cloths. Drying trays should be loaded with a thin layer of food as directed. If needed, clean cheesecloth can be spread on the trays to prevent food pieces from sticking or falling through.

The amount of food being dried at
Drying

A temperature of 135° to 140° F is desirable for dehydrator and oven drying. Moisture must be removed from the food as fast as possible at a temperature that does not seriously affect the food’s flavor, texture, color, and nutritive value.

If the initial temperature is too low or air circulation insufficient, the food may undergo undesirable microbiological changes before it dries adequately.

If the temperature is too high and the humidity too low, as when drying small loads in the oven, the food surface may harden. This makes it difficult for moisture to escape during drying.

Oven or dehydrator drying should continue without interruption to prevent microbial growth.

To promote even drying, rotate trays occasionally and stir food if necessary.

Drying time varies according to fruit or vegetable type, size of pieces, and tray load. Dehydrator drying generally takes less time than oven drying. Sun drying takes considerably more time.

Before testing foods for desired dryness, remove a handful and cool for a few moments. Foods that are warm or hot seem softer, more moist, and more pliable than they will when cooled.

Foods should be dry enough to prevent microbial growth and subsequent spoilage. Dried vegetables should be hard and brittle. Dried fruits should be leathery and pliable. For long term storage, home dried fruits will need to be drier than commercially dried fruits sold in grocery stores.

Conditioning and Storing

Fruits cut into a wide range of sizes should be allowed to “sweat” or condition for a week after drying to equalize the moisture among the pieces before placing in long term storage. To condition, place fruit in a non-aluminum, non-plastic container and put in a dry, well-ventilated and protected area. Stir the food gently each day.

Dehydrated foods are free of insect infestation when removed from the dehydrator or oven. However, sun-dried foods can be contaminated and should be treated before storage. Insects or their eggs can be killed by heating dried food at 150° F for 30 minutes in the oven. An alternative is to package the food and place it in the home freezer for 48 hours.

Dried foods should be thoroughly cooled before packaging. Package in small amounts so that food can be used soon after containers have been opened.

Pack food as tightly as possible without crushing into clean, dry, insect-proof containers. Glass jars or moisture-vapor proof freezer cartons or bags (heavy gage plastic type) make good containers. Metal cans with fitted lids can be used if the dried food is first placed in a plastic bag.

Label packaged foods with the packaging date and the type of food.

Store containers of dried foods in a cool, dry, dark place. Check food occasionally to insure that it has not reabsorbed moisture. If there is any sign of spoilage (off-color or mold growth), discard the food. Food affected by moisture, but not moldly, should be used immediately or re-heated and repackaged.

All dried foods deteriorate to some extent during storage, losing vitamins, flavor, color, and aroma. However, low storage temperatures prolong storage life, and dried foods may be frozen for long term storage.

Dried foods can be reconstituted by soaking, cooking, or a combina-
tion of both, and will resemble their fresh counterparts after reconstitution. However, dried foods are unique and should not be expected to resemble a fresh product in every respect.

Drying does not render the food free of bacteria, yeasts, and molds. Thus, spoilage could occur if soaking is prolonged at room temperature. Refrigerate if soaking for longer than 1 to 2 hours.

To conserve nutritive value, use the liquid remaining after soaking and cooking as part of the water needed in recipes.

One cup of dried vegetables reconstitutes to about 2 cups. To replace the moisture removed from most vegetables, barely cover them with cold water and soak 20 minutes to 2 hours. Cover greens with boiling water. To cook, bring vegetables to a boil and simmer until done.

One cup of dried fruit reconstitutes to about 1½ cups. Add water just to cover the fruit; more can be added later if needed. One to eight hours are required to reconstitute most fruits, depending on fruit type, size of pieces, and water temperature. (Hot water takes less time). Over-soaking will produce a loss of flavor. To cook reconstituted fruit, cover and simmer in the soak water.

Dried or reconstituted fruits and vegetables can be used in a variety of ways.

Use dried fruit for snacks at home, on the trail, or on the ski slopes. Use pieces in cookies or confections.

Serve reconstituted fruit as compotes or as sauces. It can also be incorporated into favorite recipes for breads, gelatin salads, omelets, pies, stuffing, milkshakes, homemade ice cream and cooked cereals.

Add dried vegetables to soups and stews or vegetable dishes. Use as dry snacks or dip chips.

Include reconstituted vegetables in favorite recipes for meat pies and other main dishes, as well as gelatin and vegetable salads.

Powdered vegetables in the dried form make a tasty addition to broths, raw soups, and dressings.

Some vitamin breakdown occurs during drying and storage of dried fruits and vegetables. Ascorbic acid (Vitamin C) is the vitamin most likely to be lost.

Nutritive losses can be kept to a minimum by:
—Blanching the correct length of time
—Packaging dried foods properly and storing containers in a cool, dry, dark place
—Checking dried foods periodically during storage to insure that moisture has not been reabsorbed
—Eating dried foods as soon as possible
—Using liquid remaining after reconstitution in recipes

Powdered vegetables in the dried form make a tasty addition to broths, raw soups, and dressings.