University of California Cooperative Extension
Master Food Preserver

DRYING FOOD INDOORS

Most foods can be dried indoors using modern dehydrators, counter-top, convection ovens or conventional ovens. Microwave ovens are recommended only for drying herbs, because there is no way to create enough air flow in them.

FOOD DEHYDRATORS

A food dehydrator is a small electrical appliance for drying foods indoors. A food dehydrator has an electric element for heat and a fan and vents for air circulation. Dehydrators are efficiently designed to dry foods fast at 140°F. The following are some features to look for:

- Double wall construction of metal or high-grade plastic. Wood is not recommended as it is a fire hazard and is difficult to clean.
- Enclosed heating elements.
- Counter-top design.
- An enclosed thermostat from 85° to 160°F and a dial for regulating temperature.
- Fan or blower.
- Four to 10 open mesh trays made of sturdy, lightweight plastic for easy washing.
- A timer. Often completed drying time may occur during the night and a timer could turn off the dehydrator and prevent scorching.
- UL seal of approval, one-year guarantee and convenient service.

There are two basic designs for a dehydrator: one has horizontal air flow and the other has vertical air flow. In units with horizontal flow, the heating element and fan are located on the side of the unit. The major advantages to horizontal flow are it reduces flavor mixture so several different foods can be dried at one time, all trays receive equal heat penetration, and juices or liquids do not drip down into the heating element. Vertical air flow dehydrators have the heating element and fan located in the base.

OVEN DRYING

Everyone who has an oven has a food dehydrator. By combining the factors of heat, low humidity and air current, an oven can be used as a dehydrator. Oven drying is slower than dehydrators because it does not have a built-in fan for the air movement. (However, some convection ovens do have a fan.) It takes twice as long to dry food in an oven than it does in a dehydrator. Thus, the oven is not as efficient as a dehydrator and uses more energy. Follow these directions to use your oven:

- Check your dial and see if it has a reading as low as 140°F. If your oven does not go that low, then your food will cook instead of dry.
- For air circulation, leave the door propped open 2 to 6 inches. Circulation can be improved by placing a fan outside the oven near the door. CAUTION: This is not a safe practice in homes with small children.
- Because the door is left open, the temperature will vary. An oven thermometer placed near the food gives an accurate reading. Adjust the temperature dial to achieve the needed 140°F.
- Trays should be narrow enough to clear the sides of the oven and should be 3 to 4 inches shorter than the oven from front to back. For some foods, cake cooling racks placed on top of a cookie sheet work well. For leathers, a tray lined with parchment paper or a silicone liner works well. The oven racks holding the trays should be 2 to 3 inches apart for air circulation.

ROOM DRYING

This method differs from sun drying since it takes place indoors in a well-ventilated attic, room, car, camper or screened-in-porch. Herbs, hot peppers, nuts in the shell and partially dried, sun-dried fruits are the most common air dried items.

Herbs and peppers can be strung on a string or tied in bundles and suspended from overhead racks in the air until dry. Enclosing them in paper bags, with openings for air circulation, protects them from dust and other contaminants.

DRYING FRUITS

Dried fruits are unique, tasty and nutritious. They have been called nature's candy because they taste sweeter than fresh fruit. This is because the water has been removed, thus concentrating the fruit's flavor. Dried fruits can be eaten as a snack or added to cereals or baked goods.

For a high quality end product, choose only a high quality, mature fruit. When fruits are mature their natural sugar content and nutritional content is high. Remove moisture quickly to prevent spoilage. Use only firm fruit to dry into slices. Soft fruits are better pureed for leather.

PREPARING THE FRUIT

Begin by washing the fruit and coring it, if needed. For drying, fruits can be cut in half or sliced. Some can be left whole. See specific directions for preparing each fruit ("Fruits at a Glance" p. 342 in So Easy to Preserve).

Thin, uniform, peeled slices dry the fastest. The peel can be left on the fruit, but unpeeled fruit takes longer to dry. Fruits dried whole take the longest to dry. Before drying, skins need to be "checked" or cracked to speed drying. To "check" fruit, place it in boiling water and then cold water. The skins will crack.

Because fruits contain sugar and are sticky, spray the drying trays with non-stick cooking spray before placing the fruit on the trays. After the fruit dries for 1 to 2 hours, lift each piece gently with a spatula and turn.

PRETREATING THE FRUIT

Pretreatments prevent fruits from darkening. Many light-colored fruits, such as apples, darken rapidly when cut and exposed to air. If not pretreated, these fruits will continue to darken after they are dried. For long-term storage, sulfuring or using a sulfite dip are the most effective—but due to health concerns, many people want to use alternative shorter-term pretreatments. See alternatives below:

Ascorbic Acid (Vitamin C): Mix one teaspoon of powdered ascorbic acid (or 3000 mg of ascorbic acid tablets crushed) in two cup of water. Place in solution for 3 to 5 minutes. Remove fruit, drain well and place on dryer trays.

Ascorbic Acid Mixtures: Fruit Fresh and other commercial brands are a mixture of ascorbic acid and sugar. They are more expensive and less effective than using pure ascorbic acid.

Fruit Juice Dips: A fruit juice that is high in vitamin C also can be used as a pretreatment, although it might not be as effective as pure ascorbic acid. High vitamin C juices include lemon, orange, pineapple, grape and cranberry. Soak 3 to 5 minutes, remove fruit, drain well and place on dryer trays.

Honey Dip: Many commercial dried fruits have been dipped in a honey solution. Mix ½ cup sugar with 1½ cups boiling water. Cool to lukewarm and add ½ cup of honey. Place fruit in dip and soak 3 to 5 minutes. Remove fruit, drain well and place on dryer trays. Note: Honey-dipped fruit is much higher in calories.

DRYING THE PREPARED FRUIT

Whichever drying method you choose, outside (sun drying or solar drying) or inside (oven drying or dehydrator) remember the following:

- Be sure the fruit is placed in a single layer on the drying trays and that the pieces don't touch or overlap.
- Follow the directions for the drying

method you choose and dry until the food tests dry. Approximate drying times are given on pp. 343-345 in So Easy to Preserve. Note: Food dries much faster at the end of the drying period, so watch it closely.

- Since most dried fruits are eaten without being rehydrated, they should not be dried to the point of brittleness. Most fruits should have about 20% moisture content when dried.
- To test for dryness, cut several cooled pieces in half. There should be no visible moisture and you should not be able to squeeze any moisture from the fruit. Some fruits may remain pliable, but they should not be sticky or tacky. If a piece is folded in half, it should not stick to itself. Berries should rattle when shaken.
- After drying, cool fruit 30 to 60 minutes before packaging. Avoid packaging warm food that could lead to sweating and moisture buildup. However, excessive delays in packaging can allow moisture to re-enter food.
- It is not necessary to pasteurize your dried fruit unless it was dried outdoors. If so, place it into a freezer bag and place in the freezer at 0°F or below for 48 hours or place in a single layer on a tray in a pre-heated 160°F oven for 30 minutes. This will kill insects and their eggs.

CONDITIONING FRUITS

The moisture content of dried fruit should be about 20% when taken from the dehydrator, but the remaining moisture may not be distributed equally among the pieces because of their size or their location in the dehydrator. Conditioning is the process used to equalize the moisture. It reduces the risk of mold growth.

To condition the fruit, take the cooled dried fruit and pack it loosely in plastic or glass jars. Seal the containers and let them stand for 7 to 10 days. The excess moisture in some pieces will be absorbed by the drier pieces. Shake the jars daily to separate the pieces and check the moisture condensation. If condensation develops in the jar, return the fruit to the dehydrator for more drying.

PACKAGING AND STORING FRUITS

After conditioning, package the fruit in clean, dry insect-proof containers as tightly as possible without crushing. Glass or plastic jars with tight-fitting lids, plastic freezer bags, or vacuum packaging are good options. Avoid frequently re-opening containers as moisture will enter and lower the quality. Pack fruits in smaller containers when possible.

Dried fruit should be stored in a cool, dry, dark area. Most dried fruits can be stored for 1 year at 60°F or for 6 months at 80°F.

REFERENCES

Andress, E. L., J. A. Harrison, and S. J. Reynolds. 2014. So easy to preserve. Athens, GA: University of Georgia. Cooperative Extension Service.

Preserve it naturally: The complete guide to food dehydration. 2012. Sacramento, CA: Excalibur.

IMPORTANT SAFETY NOTE

Research on food preservation is ongoing, and recommendations may change. Make sure your information is current. Always follow up-to-date, tested guidelines and recipes from reliable sources.

LOCAL CONTACT

For more information, contact the University of California Cooperative Extension office in your county. See your telephone directory for addresses and phone numbers, or visit http://mfp.ucanr.edu/Contact/Find_a_Program/.

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