Drying Foods at Home Safely

Drying Fruits & Vegetables

Drying is a great way to preserve fresh produce from the garden, local farmer's market or nearby grocery store. It also lets you preserve hard-to-find or seasonal produce for later use.

Drying (or dehydration) works by removing water from the food. Without water, bacteria that cause food to spoil can't grow. Drying also slows down enzymes (naturally found in fresh produce) which cause food to spoil.

In Texas, a dehydrator is the easiest way to dry fruits and vegetables. This easy-to-use appliance can be found at hardware and discount stores. It is important to follow the manufacturer's instructions carefully when using a dehydrator to assure that the food is dried properly and safely.

Drying Fruit

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Dried fruit is great for a quick snack. It can also be added to muffins, breakfast cereal and other foods. Dried fruit often tastes sweeter because the flavor has been concentrated. Keep in mind that drying fruit also concentrates the calories so individuals with diabetes or who are watching their weight will need to control the amount of dried fruit they eat.

If this is your first time drying fruit, apples, apricots, figs, peaches, and pears are excellent choices for beginners. As shown in the chart, some fruits are better for drying than others.

Fruit	Suitability for drying
Apples	Excellent
Apricots	Excellent
Avocados	Not recommended due to fat content
Bananas	Good
Blueberries	Fair
Cherries	Excellent
Cranberries	Poor
Figs	Excellent
Grapes	Excellent
Nectarines	Excellent
Papayas	Good
Pears	Excellent
Persimmons	Fair
Pineapples	Excellent
Pomegranates	Not recommended (too many seeds)
Strawberries	Fair to Good

Source: University of Georgia Cooperative Extension. *So Easy to Preserve*, 5th edition, 2006.

As always, food safety is important when drying any food. Before beginning any type of food preparation or preservation, make sure your hands, food preparation area, dehydrator and any equipment or utensils used are clean.

Preparing the Fruit

Fruit should be washed before preparing it to dry. Otherwise one may end up with a poor quality product. Handle fruit carefully so it is not bruised or damaged. For best results, dry fruit as soon as soon as it is picked or purchased.

Next, decide how the fruit will be dried (whole, sliced, with or without the peel). Fruit can be cut in slices or halves; others can be dried whole. Specific drying instructions are given at the end of this publication for individual fruits and vegetables. Keep in mind that fruits sliced thin will dry in the least amount of time. The thicker the slice, the longer it will take for them to dry. You may also want to look at the size of your dehydrator when thinking about the fruit being dried. For example, apples that are cut in half may be too thick to

place on the trays. Leaving the peel on also increases drying time. Keep the pieces of fruit uniform in size for even drying.

If drying fruit whole, "check" or crack the skins before pre-treating. This reduces the amount of time needed for the fruit to dry. To "check" fruit, place it in boiling water for about 30 seconds then immediately put the fruit in cold water.

Pre-treating the Fruit

Light-colored fruits like apples or pears will often turn brown when cut and exposed to the air. Treating the fruit with vitamin C or fruit juice before drying can prevent this from happening. For long-term storage of dried fruit, sulfuring or the use of a sulfite dip is often recommended. However, sulfuring fruit must be done outside and the sulfite compounds used to make a dip can be difficult to find. Another concern is that some individuals are allergic or sensitive to sulfites. For these reasons, fruit is often soaked in ascorbic acid or fruit juice to prevent browning.

Ascorbic acid (Vitamin C): A solution of vitamin C mixed with water is an easy way to prevent browning in fruit that will be dried and stored for a short time. Vitamin C can be bought at most grocery stores, pharmacies, or discount stores. To make the solution, mix 3000 milligrams of vitamin C (equal to six 500 milligram tablets that have been crushed) with 2 cups of water. Add the cut fruit and let it soak for about 5 minutes. Drain fruit and place on the dehydrator trays. This solution can be used two times; afterwards, throw out and make a new solution.

Fruit juice: Fruit juice high in vitamin C can also help reduce browning although it may not work as well as the vitamin C solution. Suggested juices include orange, lemon, pineapple, grape, and cranberry. Place the cut fruit in a bowl and add enough juice to cover. Let the fruit soak in the juice for about 5 minutes, then drain before placing them on the dehydrator trays. Use the juice twice; afterwards it can be consumed or thrown away.

Other methods of pre-treating fruit include syrup blanching, steam blanching, or the use of a honey dip. Some of these methods add calories to the fruit; in the case of steam blanching the texture and flavor of the fruit will be changed. For more information on these methods of pre-treatment, visit the National Center for Home Food Preservation web site at http://www.uga.edu/nchfp/.

Drying the fruit

After pre-treating the fruit, it is ready to go into the dehydrator. Place the fruit on the tray in a single layer. Do not let the pieces touch or overlap each other. Using the chart below, dry for the length of time recommended or until there is no visible moisture. Keep in mind that the chart below is an estimate; actual drying time will depend on the size of the fruit being dried (whole, halves, or slices), the amount of moisture in the fruit, and the humidity. Cut fruit is dry enough when it can be folded in half without sticking to itself.

Fruit	How to prepare	Pre-treatment option	Time needed for drying in the dehydrator
Apples	Wash, peel and core; cut into slices or rings that are about 1/8-inch thick.	Ascorbic acid dip Fruit juice dip	6 to 12 hours
Apricots	Wash and remove pits. Cut in half. May slice if desired.	Ascorbic acid dip Fruit juice dip	24 to 46 hours
Bananas	Choose bananas that are yellow with brown flecks. Peel and slice lengthwise or crosswise 1/4- to 3/8-inch thick.	Ascorbic acid dip Fruit juice dip	8 to 10 hours
Grapes, seedless	Leave whole but wash before drying.	Dip in boiling water for at least 30 seconds to "check" the skin. No other pre-treatment needed.	12 to 20 hours
Nectarines and Peaches	Wash first. May be sliced or quartered; peel may be left on or removed.	Ascorbic acid dip Fruit juice dip	36 to 48 hours
Pears	Wash and cut in half and core; may also slice or quarter. For best results, remove the peel.	Ascorbic acid dip Fruit juice dip	24 to 36 hours
Pineapple	Use fully ripe, fresh pineapple. Wash and peel; remove thorny "eyes." Slice lengthwise and remove the core. Cut into 1/2-inch slices.	No pre-treatment needed.	24 to 36 hours

Source: University of Georgia Cooperative Extension. *So Easy to Preserve*, 5th edition, 2006.

When drying is done, let the fruit cool for up to an hour before packaging. If the fruit is warm when packaged, sweating and moisture built-up can occur. On the other hand, don't wait too long to package the dried fruit as humid air can cause moisture to re-enter the fruit.

Conditioning dried fruit

Fruit that is properly dried will have about 20% moisture. Some pieces will have more than 20% moisture; others may have less due to differences in the size of slices or their location in the dehydrator. To make sure that moisture is evenly distributed throughout the dried fruit, conditioning is necessary. To condition, place dried and cooled pieces of fruit loosely in a jar (plastic or glass) or in a plastic freezer bag. Seal the container and let the dried fruit sit for 7 to 10 days. Periodically shake the containers to separate the pieces. The extra moisture in some pieces will be absorbed by the pieces that are drier. If you see moisture in the container, put the fruit back in dehydrator for additional drying.

Drying Vegetables

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When drying vegetables, time is critical to the quality of the final product. If it takes a long time to dry a vegetable, then flavor will be lost. To reduce the amount of time needed to dry vegetables, it is often recommended that they be cut into small pieces. Vegetables should be dried until they are brittle (about 10% moisture) to make sure that no germs can grow.

As shown in the chart below, some vegetables are better for drying than others.

Vegetable	Suitability for drying
Asparagus	Poor to Fair
Beans, green	Fair to Good
Beets	Fair to Good
Broccoli	Not recommended
Brussels sprouts	Poor due to size, layered leaves & strong flavor
Carrots	Good
Celery	Poor
Garlic	Good
Mushrooms	Good
Okra	Fair to Good

Vegetable	Suitability for drying
Onions	Good to Excellent
Peas	Fair to Good
Peppers, green or red	Good
Peppers, chili	Excellent
Potatoes	Good
Tomatoes	Fair to good; will re-absorb moisture easily which leads to color and flavor changes.

Source: University of Georgia Cooperative Extension. *So Easy to Preserve*, 5th edition, 2006.

Preparing the vegetables for drying

Always start with clean preparation area and clean hands. Wash the vegetables under cool running water. Trim, peel, and slice vegetables following the directions outlined on the following page. Remove any bruised or rotten areas. When slicing vegetables, keep the slices uniform in size so they dry at the same rate. Using a food slicer or food processor may be helpful.

For best results, dry vegetables the same day they are picked from the garden or purchased from the store. If they are stored in the refrigerator before drying, the quality of the vegetable as well as the nutrients will be lost.

Pre-treating vegetables

Most vegetables need to be blanched with steam or boiling water before they can be dried. During this process, the vegetables are heated to a temperature that is hot enough to stop the enzymes that cause flavor and color loss. Vegetables that do not require blanching before drying are onions, green peppers, and mushrooms.

Water blanching: Bring a large pot of water (two-thirds full) to a rolling boil. Place the washed and sliced vegetables in a wire basket or colander and place in the boiling water. Cover the pot and blanch according to the directions given for the specific vegetable. Blanching time begins when the water comes back to a boil. If it takes more than one minute for the water to come back to a boil, too many vegetables were put in the pot. Next time, blanch a smaller amount.

Steam blanching: This method uses a large pot with a tight fitting lid and a wire basket or colander. The basket should easily fit in the pot, leaving enough space between the basket and pot so steam can circulate around the vegetables. Add

water to the pot and bring to a rolling boil. Put the washed and sliced vegetables in the basket, up to 2 inches deep. Place the basket in the pot of boiling water, making sure that the water does not touch the vegetables. Cover the pot and steam according to the amount of time list for the specific vegetable.

Cooling and Drying the Vegetables after Blanching

After blanching, immediately dip the vegetables in cold water. This stops the cooking action from the boiling water. Drain the vegetables well but do not let them cool to room temperature. Instead they should be slightly hot to the touch. The heat left in the vegetables after blanching allows the drying process to begin more quickly. Place vegetables on drying trays in a single layer and place in the dehydrator. For best results, freeze green beans for 30 to 40 minutes before placing them in the dehydrator. Dry vegetables for the amount of time listed at the end of this publication. Vegetables tend to dry faster towards the end of the drying period so watch them carefully. When sufficiently dried, vegetables should be crisp or brittle. At this point they will have about 10% moisture so conditioning is not needed.

If drying a vegetable with a strong odor (such as onions or garlic), dry them alone so flavors don't blend with other vegetables.

Vegetable	Preparation	Blanching time in (minutes)	Time needed for drying in dehydrator
Asparagus	Wash completely; cut tips in half.	Steam: 4 to 5 Water: 3 1/2 to 4 1/2	4 to 6 hours
Beans, green	Wash completely. Cut into short pieces. Freeze for 30 to 40 minutes after blanching for better quality.	Steam: 2 1/2 Water: 2	8 to 14
Beets	Wash and cook as usual; then cool and peel. Cut into strips 1/8-inch thick.	No blanching needed.	10 to 12 hours
Carrots	Use crisp, tender carrots. Wash completely; remove roots and tops. Peel and cut into slices or strips 1/8-inch thick.	Steam: 3 to 3 1/2 Water: 3 to 3 1/2	10 to 12
Garlic	Peel and chop finely.	No blanching needed.	6 to 8 hours
Mushrooms (see below about mushroom	Scrub thoroughly; remove woody stalks. Cut tender stalks into short sections. Peel large mushrooms; small ones do not have to be peeled. Slice.	No blanching needed.	8 to 10 hours

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Okra	Wash, trim and slice crosswise into disks that are 1/8- to 1/4-inch thick.	No blanching needed.	8 to 10 hours
Onions	Wash and remove outer layers. Remove top and root ends. Slice 1/8- to 1/4- inch thick.	No blanching needed.	3 to 9 hours.
Peas, green	Shell and rinse.	Steam: 3 Water: 2	
Peppers	Wash and remove the stem and partitions. Cut into disks 3/8-inch thick.	No blanching needed.	8 to 12 hours
Potatoes	Wash and peel. Cut into shoestring strips that are 1/4-inch thick or into slices that are 1/8-inch thick.	Steam: 6 to 8 Water: 5 to 6	8 to 12 hours
Tomatoes	Rinse first. Dip into boiling water to loosen skins. Chill in cold water and peel. Cut into sections that are3/4-inch wide or slice. Small plum tomatoes can be cut in half.	Steam: 3 Water: 1	10 to 18 hours

NOTE: When drying mushrooms, make sure they are edible as some varieties are poisonous. The toxins in poisonous mushrooms **will not** be destroyed by cooking or drying. Only an expert can tell the difference between those that are edible and those that are poisonous.

Storing dried fruits and vegetables

Dried fruits and vegetables should be stored right away to keep out insects and to keep moisture from re-entering the fruit. Clean and dry home canning jars, plastic containers with tight lids or plastic freezer (not regular storage) bags make excellent storage containers. Another option is to vacuum seal the food. Keep in mind that each time you open the container you are exposing the dried food to air and moisture. Over time this can reduce quality or lead to spoilage.

Store dried fruits in a cool, dry, and dark place for up to 1 year. Dried vegetables can be stored for up to 6 months. If storage temperatures are high, storage time will be reduced. For example, dried fruit can be stored up to a year if the temperature is 60 degrees F; however, at 80 degrees F the storage time is lowered to 6 months.

Using dried fruits and vegetables

Dried fruit makes a great tasting snack. Others can also be rehydrated by soaking in water for a specific period of time (see chart below for information on rehydrating

selected fruits and vegetables). For rehydrating fruit, soak in water that is at room temperature. For vegetables, use boiling water to reduce the time needed for rehydration to occur. For both fruits and vegetables if the recommended soaking time is longer than 2 hours, soak in the refrigerator to keep spoilage from occurring.

If the dried vegetables are being added to soups or stews, no soaking is needed. Just add them right in!

Rehydrating Dried Fruits and Vegetables

	Amount of water (cups) **to add to 1 cup of the dried food.**	**Minimum soaking time (hours)****
Fruit		
Apples	1 1/2	1/2
Pears	1 ¾	1 1/4
Peaches	2	1 1/4
Vegetables		
Asparagus	2 1/4	1 1/2
Beans, green	2 1/2	1
Beets	2 3/4	1 1/2
Carrots	2 1/4	1
Okra	3	1/2
Onions	2	3/4

** For vegetables, the soaking time is based on using boiling water.

Some dried vegetables, especially onion, garlic, and celery can be crushed into a powder for use as a seasoning in recipes. Other vegetables such as zucchini, tomato, squash or carrots make great vegetable chips. Be sure that these vegetables are sliced thin before they are dried. Serve with your favorite dip for a unique alternative to traditional potato chips.

Reference: *So Easy to Preserve*, 5th edition. University of Georgia Cooperative Extension, 2006.

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