Preserving Fresh Herbs

In Great Britain, the “h” is pronounced; in the United States, it is pronounced “erb”
Fresh herbs can be stored in an open or a perforated plastic bag in your refrigerator crisper drawer for a few days.

Making your own perforated bags

“You can make holes using a standard paper punch or a sharp object such as a pen, pencil, or knife. Punch holes approximately every 6 inches through both sides of the bag.

If using a knife to create the openings, make two cuts — in an ‘X’ shape — for each hole to ensure good air circulation.”

Source: University of Wisconsin Extension

Wash herbs under running water just before using

Dry in a salad spinner or gently pat dry with a paper towel
Chives:
• Quickly snip small bundles of chives with a kitchen scissors
• Cut bundles on a cutting board with a very sharp chef’s knife

Cilantro, parsley, and other small-leaved delicate herbs:
• Remove leaves by hand
• It’s OK to include some tender stems

Thyme, oregano, rosemary, tarragon and other sturdy stemmed, small-leaved herbs:
• Hold thumb and index finger together; run down the stem in the opposite direction the leaves have grown

Basil, mint, sage and other large, leafy herbs:
• A technique called “chiffonade” can be used with these herbs
• This method cuts these herbs into narrow ribbons
Stack 5 or 6 leaves, and roll tightly

Cut crosswise into narrow ribbons

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**Pesto** (basil is usually main herb)

**FREEZING AND DROPPING HERBS**
Opinions vary on the best way to preserve herbs

Experiment with a small amount; decide which method you prefer. Here are 2 popular methods …

Drying herbs:
Dehydrator drying is a fast and easy way to dry high quality herbs because temperature and air circulation can be controlled.* (Follow directions that come with your dehydrator.)

*National Center for Home Food Preservation
http://nchfp.uga.edu/how/dry/herbs.html

Adapted from ‘Dehydrator in Motion’ by Tom Higgins available at http://flic.kr/p/5rbMYq under a Creative Commons Attribution 3.0. Full terms at http://creativecommons.org/licenses/by-nc/3.0/

Freezing herbs in oil or water:
- Works best popped directly into cooked foods
- Chop or use sprigs/leaves
- Place in ice cube tray sections with amounts easily used in recipes
- Cover with extra-virgin olive oil or water; frozen oil turns whitish but changes back when thawed
• Cover tray lightly with plastic wrap; freeze overnight
• Label freezer bags with herb type/date; then add herbs
• Some feel this method works best with less tender herbs (i.e. rosemary, sage, thyme, oregano)
• Use in 3 to 6 months for best quality

Got extra herbs? Make an herb Brush!

Use to baste veggies, fish & poultry

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Fresh herbs: Safe Handling Practices for Consumers
Amy Simonne

Fresh herbs are highly popular in food preparation because of their flavors. Fresh herbs are often used without cooking to season or garnish ready-to-eat dishes. In recent years some foodborne illnesses have been traced back to fresh herbs such as green onions, cilantro, parsley, and basil. Here are steps you can take to reduce your risk of foodborne illness from fresh herbs.

Where You Shop:

■ Buy fresh herbs that are not dirty or damaged.
■ Select fresh herbs that are properly refrigerated.

At Home:

■ Refrigerate fresh herbs promptly. Some of the previous illnesses have been traced to prepared fresh herbs that were left at room temperature for a long period of time.
■ Leftover prepared fresh herbs should be discarded after two hours at room temperature.

During Preparation:

■ Wash hands with hot soapy water before and after:
  • handling fresh produce
  • handling raw meat, poultry, or seafood
  • using the bathroom
  • changing diapers
  • handling pets
■ Rinse or wash fresh herbs such as basil, green onions, and parsley with cool running tap water just before preparing or eating. Do not use soap or detergents.
■ Some commercial vegetable wash solutions for fresh fruits and vegetables may help remove dirt and some bacteria.
■ The action of rinsing or washing will help reduce the numbers of harmful bacteria on fresh herbs.
■ Cut away damaged pieces before preparing or eating.
■ Wash cutting boards, dishes, utensils, and counter tops often. Use hot soapy water and rinse well. Sanitize them after contact with fresh produce, or raw meat, poultry, or seafood (see box).
■ Sanitize kitchen sink frequently to avoid a build up of microbes.

1. This publication is FCS8740, one of a series of the Department of Family, Youth and Community Sciences, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. First published: January 2003. Reviewed: March 2009. Please visit the EDIS Web site at http://edis.ifas.ufl.edu
2. Amy Simonne, Ph.D., associate professor, Department of Family, Youth, and Community Sciences, Institute of Food and Agricultural Sciences, University of Florida, Gainesville FL 32611.
Do not cross contaminate! Use clean cutting boards and utensils for fresh produce.

Always sanitize the cutting board before it is used to prepare ready-to-eat foods.

If you can, use separate cutting boards for raw meat, poultry, and seafood.

Do not consume ice that has come in contact with fresh produce or other raw products.

Use a cooler with ice or ice gel packs when you take perishable foods outdoors. This includes cut fresh fruits and vegetables.

Following these steps will help reduce your risk of foodborne illness from fresh cut produce.

<table>
<thead>
<tr>
<th>To sanitize cutting boards, dishes, and utensils:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mix one teaspoon chlorine bleach in one quart water.</td>
</tr>
<tr>
<td>Pour the mixture onto all surfaces or submerge appropriate items into the above solution and let sit at least one minute.</td>
</tr>
<tr>
<td>Rinse surfaces well with hot running water.</td>
</tr>
</tbody>
</table>

Counter tops can be sanitized by using the above solution mix, sanitizing sprays or wipes as an additional safety measure.

For More Information:

Visit the Food and Drug Administration (FDA) website at: [http://www.fda.gov](http://www.fda.gov) or call FDA Consumer Inquiries at 1-888-SAFEFOOD (a toll-free number).
Fact Sheet No. 9.340 Food and Nutrition Series | Preparation

by P. Kendall and J. Rausch

Flavored vinegars and oils add excitement to salads, marinades and sauces. They also make special gifts, provided a few simple precautions are followed. Of the two, flavored vinegars are easiest and safest to make. Because vinegar is high in acid, it does not support the growth of Clostridium botulinum bacteria. However, some vinegars may support the growth of Escherichia coli bacteria. Infused oils have the potential to support the growth of C. botulinum bacteria. These products may cause great harm if not made and stored properly. By following the procedures below, both types of products can be safely prepared and used.

Flavored Vinegars
Pre-Preparation

Containers. Select and prepare containers first. Use only glass jars or bottles that are free of cracks or nicks and can be sealed with a screw-band lid, cap or cork. Wash hands well before starting any food preparation work. Wash containers thoroughly, then sterilize by immersing the jars in a pan of hot water and simmering for 10 minutes. Once the jars are sterilized, remove from the simmering water and invert on a paper towel to dry. Fill while the jars are still warm.

Lids and caps. If using screw caps, wash in hot soapy water, rinse and scald in boiling water. (To scald, follow manufacturer’s directions, or place caps in a saucepan of warm water, heat to just below boiling and then remove from the heat source. Leave caps in the hot water until ready to use.) Use non-corrodible metal or plastic screw caps. If using corks, select new, pre-sterilized corks. Use tongs to dip corks in and out of boiling water 3-4 times. Prepare two-piece metal home canning jar lids according to manufacturer’s directions for canning. If using these lids, allow enough headspace between the lid and the vinegar so that there is no contact between them. Plastic storage screw caps that are made for canning jars are also now available and would work well for flavored vinegars.

Herbs and spices. Commercial companies that make herbal vinegars dip the herbs in antibacterial agents not readily available to consumers. As an alternative, briefly dip the fresh herbs in a sanitizing bleach solution of 1 teaspoon household bleach per 6 cups (1½ quarts) of water, rinse thoroughly under cold water, and pat dry. For best results, use only the best leaves and flowers. Discard any brown, discolored, trampled or nibbled parts of the herbs. Fresh herbs are best picked just after the morning dew has dried. Allow three to four sprigs of fresh herbs or 3 tablespoons dried herbs per pint of vinegar. Spices such as peppercorns and mustard seed are also popular in flavored vinegars.

Fruits and vegetables. Fruits often used to flavor vinegars include strawberries, raspberries, pears, peaches and the peel of oranges or lemons. Allow the peel of one orange or lemon or 1 to 2 cups of fruit per pint of vinegar flavored. For variation, try fruits in combination with herbs or spices. Vegetables, such as fresh garlic cloves and jalapeno peppers, can also be used to add zest to vinegars. Thread these on thin bamboo skewers for easy insertion and removal. Thoroughly wash all fruits and vegetables with clean water and peel, if necessary, before use.
Small fruits and vegetables may be halved or left whole; large ones may need to be sliced or cubed.

**Vinegar selection.** The type of vinegar to use as the base depends on what is being added. Fruits blend well with apple cider vinegar. Distilled white vinegar is clear in color and best with delicate herbs. Red and white wine vinegars work well with garlic and tarragon. Do be aware, however, that wine and rice vinegars contain protein that provides an excellent medium for bacterial growth, if not stored properly.

**Preparation**

To make flavored vinegars, place the prepared herbs, fruits or spices in the sterilized jars, being careful to avoid overpacking the bottles. Use three to four sprigs of fresh herbs, 3 tablespoons of dried herbs or 1 to 2 cups of fruit or vegetables per pint of vinegar to be flavored. Heat vinegar to just below boiling (190°F), then pour over the herbs and cap tightly. Allow to stand for three to four weeks in a cool, dark place for the flavor to develop fully. Then, strain the vinegar through a damp cheesecloth or coffee filter one or more times until the vinegar is no longer cloudy. Discard the fruit, vegetables or herbs. Pour the strained vinegar into a clean sterilized jar. Add a fresh sprig or two of fresh herbs or berries that have been sanitized as described above. Seal tightly. Store in the refrigerator for best flavor retention.

The flavoring process can be shortened by a week or so by bruising or coarsely chopping the herbs and fruits before placing in the bottles and adding the hot vinegar. To test for flavor development, place a few drops of the flavored vinegar on some white bread and taste. When the flavor is appropriate, strain the ingredients one or more times through a damp cheesecloth or coffee filter. Pour the strained vinegar into a clean sterilized jar. Add a sprig or two of fresh herbs that have been sanitized as described above. Seal tightly. Store in the refrigerator for best flavor retention.

**Fresh Dill Vinegar**

8 sprigs fresh dill
4 cups (1 quart) white vinegar

Wash dill and dip in solution of 1 teaspoon household bleach in 6 cups water. Rinse thoroughly under cool running water. Place dill in sterilized quart jar. Heat vinegar to just below boiling point (190°F); pour over dill. Cap tightly and allow to stand in cool, dark place for three to four weeks. Strain vinegar, discarding dill. Pour vinegar into clean sterilized bottles with tight fitting covers. Add a fresh sprig of cleaned and sanitized dill, if desired. Store in the refrigerator. Makes 1 quart.

**Herbal Vinegar**

4 cups red wine vinegar
8 sprigs fresh parsley
2 teaspoons thyme leaves
1 teaspoon rosemary leaves
1 teaspoon sage leaves

Thoroughly wash herbs and dip in solution of 1 teaspoon household bleach in 6 cups water. Rinse thoroughly under cool running water and pat dry. Place herbs in sterilized quart jar. Heat vinegar to just below boiling point (190°F); pour over herbs. Cap tightly and allow to stand in cool, dark place for three to four weeks, shaking occasionally. Strain out herbs. Pour vinegar into clean sterilized bottles with tight fitting covers. Add a fresh sprig of cleaned and sanitized parsley, if desired. Store in the refrigerator. Makes 1 quart.

**Raspberry Vinegar**

1 cup raspberries
2 cups white or wine vinegar

Wash 1 cup fresh raspberries in clean water. Bruise raspberries lightly and place in sterilized quart jar. Heat vinegar to just below boiling (190°F). Pour over raspberries in jar and cap tightly. Allow to stand two to three weeks in cool, dark place. Strain mixture through a fine meshed sieve lined with cheesecloth into a 2-cup glass measuring cup, pressing firmly on the solids to extract as much liquid as possible. Discard solids. Pour vinegar into a clean sterilized pint jar. Seal tightly and store in the refrigerator. Makes 1 pint.

**Strawberry Vinegar**

2 cups fresh strawberries
3 cups cider vinegar
1/4 cup sugar

Clean strawberries, remove stems and halve; set 1/4 cup aside. Place remaining strawberries in a large bowl. Pour vinegar over strawberries; cover and set aside for 1 hour. Transfer vinegar and strawberries to a large sauce pot. Add sugar, bring to a boil. Reduce heat and simmer, covered, for 10 minutes. Strain mixture through a fine meshed sieve lined with cheesecloth into quart measure, pressing firmly on the solids to extract as much liquid as possible. Discard solids. Pour vinegar into a clean and sterilized quart jar. Add reserved strawberries. Seal tightly. Store in the refrigerator. Makes about 1 quart.

**Storage and Use**

For the best retention of flavors, store flavored vinegars in the refrigerator or a cool dark place. If properly prepared, flavored vinegars should retain good quality for two to three months in cool room storage and for six to eight months in refrigerated storage. If you notice any signs of mold or fermentation (such as bubbling, cloudiness or sliminess) in your flavored vinegar, throw it away without tasting or using for any purpose.

Some people enjoy displaying pretty bottles of herb and fruit vinegars on a kitchen window sill. If left out for more than a few weeks, these bottles should be considered as decoration and not used in food preparation.

Flavored vinegars can be used in any recipe that calls for plain vinegar. They add zest to marinades for meats and fish and interesting flavors to dressings for salads, pastas and vegetables.
Flavored Oils

Safety Concerns

Herbs- and garlic- in oil mixtures are considered potentially hazardous food items by the U.S. Food and Drug Administration (FDA) because of the large number of cases of botulism that have been traced to improperly stored commercial and home-prepared mixtures of garlic and oil. Short refrigerated or frozen storage is necessary because all other conditions that favor growth of *C. botulinum* are met: low acid environment with pH higher than 4.6, anaerobic conditions (oil), food and moisture source (garlic), not boiled before eating.

**Garlic in oil.** For added safety, the FDA now requires that all commercial garlic in oil products contain specific levels of microbial inhibitors or acidifying agents such as phosphoric or citric acid. Although most garlic products do contain these additives, some boutique or specialty mixes may not. Always check the label to be sure.

As for home-prepared mixtures of garlic in oil, the FDA recommends that these “be made fresh for use and not left at room temperatures.” Any leftovers should be refrigerated for use within three days, frozen for longer storage, or discarded.

The reason for the concern is that unrefrigerated garlic in oil mixtures lacking antimicrobial agents have been shown to permit the growth of *C. botulinum* bacteria and its toxins, without affecting the taste or smell of the products. Toxin production has been known to occur even when a small number of *C. botulinum* spores were present in the garlic. When the spore-containing garlic is bottled and covered with oil, an oxygen-free environment is created that promotes the germination of spores and the growth of microorganisms at temperatures as low as 50°F.

Botulism is a potentially fatal food poisoning characterized by blurred or double vision, speech and breathing difficulty, and progressive paralysis. Without prompt and correct treatment, one-third of those diagnosed with botulism may die. *C. botulinum* spores are widespread in the environment but cause no harm as long as oxygen is present. Also, the toxin produced by *C. botulinum* bacteria is readily destroyed by heat. Boiling a potentially suspect mixture for 10 minutes, plus one minute for each 1,000 feet above sea level, will destroy any botulism toxin that may be present.

**Vegetables and herbs in oil.** Several cases of botulism have been associated with home-prepared vegetables and herbs stored in oil. These products also should be made fresh, with leftovers refrigerated for use within 3 days, or frozen for longer storage. Vegetables have a high water activity level which further encourages the growth of *C. botulinum* bacteria in an anaerobic environment. Even when dried, there is still the potential for risk, unless the vegetable has been acidified to a pH of 4.6 or lower.

Dried tomatoes in oil are less of a safety concern than other mixtures in oil because the pH of tomatoes is generally 4.6 or lower. In addition, by sufficiently drying the tomatoes, conditions become even less favorable to growth of *C. botulinum* due to a decrease in water activity. Dried herbs in oil also are less of a safety concern because of their low water activity. However, to ensure safety, it is recommended that all tomato in oil and herb in oil products be stored at refrigerator temperatures and used within three days. If longer storage is desired, these products should be frozen in meal sized portions.

**Avoid Rancidity**

In addition to reducing the potential for growth of *C. botulinum* bacteria, storing flavored oils in the refrigerator or freezer helps keep the oils from becoming rancid. A putrid “off” odor indicates the development of rancidity. All fats and oils will become rancid given enough exposure to air, sunlight and heat. Polyunsaturated fats, like vegetable oils, are especially prone to such deterioration. Eating rancid food won’t make you sick, but it may be unhealthy in the long run. Rancid fat contains chemicals called peroxides and aldehydes that can damage cells and may even encourage cholesterol to clog arteries.

It is important to note that rancidity and the presence of botulism toxins are not necessarily related. Toxins may be present without any hint of an off-odor. Likewise, an off-odor does not necessarily indicate the presence of botulism toxin. It does, however, indicate the product may have been left for long periods at room temperature, which would promote the growth of *C. botulinum*. Therefore, it’s best to discard any oil-based mixtures that have become rancid so they’re out of the reach of humans or animals.

**References**


People have been preserving food through drying for thousands of years. Because dried food yields maximum quantity for the least volume, it has always been popular among hikers and campers. Dried food, however, is not just for people who enjoy the outdoors. Today, more and more people are eating dried food as a healthier snack alternative to candy and chips. Because dried food can be stored for long periods without spoilage, it makes good economic sense, too.

The principle behind drying is to deprive organisms such as bacteria, yeast, and mold of needed water and therefore prevent decay. Low humidity, warm temperatures (140° to 150°F), and air currents promote safe drying and produce a quality end product.

This publication discusses general techniques and guidelines for drying fruits and vegetables at home. Two tables are also provided which give information on drying particular fruits and vegetables.

**Drying Methods**

**Sun Drying**

This method is most successful in extremely sunny, arid climates where temperatures run 85°F or more, the humidity is less than 60 percent, and breezes are common. Kentucky's generally high humidity makes for poor sun drying. The following are things to remember when sun drying:

- Racks can be made using wooden slats attached to a frame or by using a screen made of nylon netting. Stainless steel, teflon-coated fiberglass, and plastic or propylene may be used as long as you are not going to dry **sulfured** fruit.
- Pretreat fruit to prevent browning and nutrient losses.
- Cover the loaded racks or screens with cheesecloth to keep out dust and insects.
- Place loaded racks and screens on blocks over a concrete surface or on a sheet of aluminum or tin. This allows for better air movement and light reflection. Be sure the racks are out of the reach of pets, wildlife, and rodents.
- Bring the food-covered racks indoors at night to avoid exposure to condensation from the night air.
- You will need to pasteurize food that has been dried in the sun (See page 5).

**Vine Drying**

This method is used for mature beans and peas such as limas, pintos, lentils, and black-eyed peas. Dry these in their pods on the vine until they rattle when shaken. The vines will be shriveled. Pick and shell the beans. Test for dryness (they should shatter when hit with a hammer). If the test beans are still moist, leave the rest on the vine to further dry them. You will need to pasteurize food that has been vine dried.

**Microwave Drying**

The microwave oven is not designed for drying fruits, vegetables, or meat. Some people have dried fresh herbs in the microwave, but doing so may result in a burned out magnetron or a fire. Read your manufacturer’s directions for information concerning microwave drying. Combination microwave/convection ovens use the convection cycle for drying. Again, read the manufacturer’s instructions.

**Oven Drying**

Oven drying is a lengthy process that takes 2 to 3 times longer than an electric dehydrator. It also consumes more energy. If, however, you do not own a dehydrator, your kitchen oven can possibly be used to dry food. First, check your
oven: (a) Does it have a vent? All gas ovens and most (not all) electric ovens do. (b) What is the lowest heat setting? You will need 140°F. Very few newer ovens can be maintained below 200°F.

To determine the lowest setting place an oven thermometer in the rear of the oven. Prop the door open 4 inches. Set the oven thermostat for its lowest setting and place a fan out and to the side of the oven door. Run the fan so that the air current flows through the oven and out the other side. Monitor the oven thermometer’s temperature reading. If the temperature runs greater than 160°F, you cannot use the oven. This heat will slow cook, not dry, the food.

Should your oven pass the test, you are ready to dry. Use open trays as discussed in the section on sun-drying. Be sure the trays are at least 1 1/2 inches narrower than the interior of the oven (for instance, if the interior of your oven is 26 inches wide and 24 inches deep, the drying rack should be no larger than 23 inches by 21 inches). Divide up to 6 pounds of food among 2 to 3 trays. Make sure the food is in single layers on the trays. Place the loaded trays into the oven. Allow 2 1/2 to 3 inches of room at the top of the oven. Proceed, setting the oven to maintain a temperature of 140°F. Be sure you prop the door open and set up a fan as discussed above. Remember to turn the food over approximately every half hour.

Dehydrator

There are two styles of dehydrators that differ in terms of where the heating element and fan are located. Foods closest to the heating element will experience warmer temperatures and dry faster unless you rotate them. If you are drying foods that have strong odors or that are sulfured, use the dehydrator in a well-ventilated area such as a breezeway or a screened-in porch.

Following these steps should help you get the most out of your dehydrator:
• Preheat the dryer to 150°F.
• Spray the trays with a vegetable spray to prevent sticking.
• Cut the food into uniform sizes and place on the trays in a single layer.

You may find it useful to weigh the loaded tray to help you later judge just how much moisture has been removed from the fruit.
• Place the trays into the dehydrator and turn down the temperature to 140°F.
• If you are drying exceptionally juicy fruit such as grapes, blueberries, and plums, preheat the dryer to 120°F. After one hour of drying, raise the temperature to 130°F. Wait 30 minutes and raise it to 140°F. Slowly raising the temperature in this way will prevent case hardening and rupture of the fruit cell. In order to kill organisms using this technique, the fruit must be held at 140°F for more than half of the total drying time.

Preparing Fruit for Drying

Start with good quality fruit and always wash them before drying. Remove pits, stems, and stones and slice fruit into uniformly thin pieces for even drying.

Because fruits contain sugar they are more difficult to dry than vegetables. They take longer to dry and tend to be sticky. Reduce sticking by spraying the drying trays with a no-stick cooking spray and by removing foods from trays while still warm. For detailed instructions follow the directions that came with your dehydrator.

Pretreatment

Drying food does not improve its quality, but food will better maintain its quality if properly processed. Pretreatment improves the appearance of dried food (preserving color and flavor), wards off insects, and helps food retain vitamins A and C. Pretreating is not required, but it is advisable. There are a variety of pretreatments depending on the food you are drying and the type of pretreatment available where you live.

Anti-oxidants: A Temporary Measure

Once peeled or cut, fruits such as apples, apricots, peaches, pears, and nectarines quickly darken. Ascorbic acid (vitamin C) will prevent this browning. Soak cut fruit 3 to 5 minutes in a fruit juice (such as orange juice) that naturally contains vitamin C; then drain before drying.

Pure crystalline ascorbic acid (1/2 teaspoon per quart of water, as a quick dip) is available in drugstores. Other forms of ascorbic acid that may be available in supermarkets include powders (read directions) for “fresh cut fruits”
and vitamin C tablets (crush 500 milligram tablets and mix 1 teaspoon per quart of water). A citric acid product that contains ascorbic acid can be used in the ratio of 1 tablespoon per quart of water. Remember vitamin C is only a short-term measure. You may still want to follow up with sulfur, a sulfite dip, or steam blanching.

Checking
This procedure is also referred to as “cracking skins” and is used on fruits such as cherries, grapes, and blueberries that have a protective wax-like coating. Checking removes this waterproofing substance and cracks open the skin’s surface. This promotes drying and prevents rupturing of the fruit.

First, briefly (in and out) dip the fruit in briskly boiling water. Next, immediately immerse fruit in ice cold water for a few seconds. Drain fruit thoroughly and lay it on absorbent toweling. Continue with the next step for drying that particular fruit.

Sulfuring
This is the best long-term guarantee for preserving the color and flavor of dried fruit. Fruits that are typically sulfured include apples, apricots, peaches, and pears. Sulfuring requires an outdoor work area that is away from people, pets, trees, plants, and shrubs. **Do not** inhale sulfur fumes, and if you have an allergy to sulfur, **do not** eat sulfured fruits.

If you choose to sulfur, information on sulfur and instructions for constructing a sulfuring box may be obtained from your county Extension office.

Sulfite Dips
These offer an alternative to sulfuring, but they are not as effective nor are they without their problems. Soaking fruit may lead to waterlogging, nutrient losses, and uneven tissue penetration. Additionally, only food grade (USP) and pure (Reagent Grade) sulfite are recommended and these are not commonly available. Some drugstores and distributors of wine-making supplies might stock them.

Mix 1/4 teaspoon of the sulfite chemical into one quart of water. Soak the fruit 3 to 5 minutes. Drain, then dry as directed for that particular fruit. Follow the same precautions regarding fumes and allergies noted above with sulfur.

Blanching
Though not as effective as sulfuring, steam blanching is an optional treatment (see steam blanching vegetables, page 4) for fruit. Blanching also eliminates the safety concerns found with sulfur and sulfite dips.

Fruit Leathers
Leathers are pureed fruit dried in a thin sheet and usually eaten as a snack. Any single fruit is good. Fruit combinations are also delicious. Spices and sweeteners are optional.

Soft fruits need no cooking before pureeing. Firmer foods or those that darken when exposed to air should be cooked with 1 cup fruit juice per gallon prepared fruit to soften the food and destroy enzymes before pureeing. Use a blender, processor, or food mill to puree the fruit.

Spread purees 1/8 to 1/4-inch thick on plastic-lined cookie sheets or a special dehydrator tray. Dry at 120-135°F until the puree is leathery and separates easily from the plastic. Cool, roll jelly-roll fashion, and cut into segments as desired. Over-wrap in moisture/vapor proof freezer bags or aluminum foil.

Some fruits that are suitable for making leathers are apples, cherries, blueberries, grapes, peaches, pears, rhubarb, and strawberries.

Preparing Vegetables
Before treating or drying your vegetables, be sure to wash them in cool water to remove any chemical residue and soil. Cut vegetables into uniform sizes. Trim away decayed spots and bruises along with any woody materials. Core if so directed. Do not store prepared vegetables that you plan to use for drying because nutrients and product quality will deteriorate significantly during storage.

Pretreating
Blanching is primarily used for pretreating vegetables. It destroys enzymes and loosens the tissue. This sets the color and affords more rapid drying. Before drying a vegetable, read the guidelines for it (Table 2). There are two methods of blanching. You will need to know which process is recommended for your product. Some vegetables such as mushrooms, green peppers, and onions do not need to be blanched.
**Water Blanching**

Fill a large pot or dutch oven two-thirds full with water and bring to a rolling boil. Loosely fill a wire basket or colander with food. Submerge the basket, cover, and leave for the recommended amount of time. If the water does not return to a rolling boil within one minute, you have overfilled the basket. Test for doneness by cutting a sample in half; the center should be translucent.

**Steam Blanching**

You will need an extra large, deep pot for steaming. Loosely fill (no more than 2 1/2 inches deep) a wire basket with vegetables and place the basket in the pot. Be sure the basket sits above the water. Cover the pot. Steam for the recommended amount of time (Table 2). Test as you do for water blanching.

**Cooling**

This halts the cooking action started by blanching. Immediately dip the blanched vegetables into cold water. Leave the vegetables in the water until they feel slightly hot to the touch. Transfer the vegetables directly from the cool water onto the drying trays (limit to single layer) over the sink. Drain. Pat the underside with paper toweling and immediately place trays in the dehydrator.

**Drying Herbs**

Harvest herbs just before the buds are ready to open. The best time of day to pick them is in the morning immediately after the dew has evaporated and before the hot midday sun has wilted them. Rinse the herbs in cool water. Gently shake off the water. Then discard any bruised, soiled, or imperfect leaves and stems. Remove excess moisture by laying the herbs on paper towels. If you plan to try-dry or use a dehydrator, transfer the seeds, leaves, and stems directly onto the trays. Do not pretreat herbs.

**Air-Drying**

The easiest way to dry herbs is to air-dry them in a well-ventilated area such as a breezeway or screened-in porch that draws good air currents. Herbs that have long stems may be tied at the stem end in small, loose bundles. Punch air holes in the sides of a paper bag. Place a bundle in the bag and secure the open end of the bag around the stem end with a rubber band or string. Hang this end from overhead racks or hooks. Be sure the bundle is not close to a wall and that it is protected from evening dew and rain. Also, avoid direct sunlight to prevent bleaching out the color of the leaves.

You may want to tray-dry seeds and large-leaved herbs or herbs with short-tip stems. Simply spread the seeds or leaves on screens and cover with cheesecloth. Again, avoid exposure to direct sunlight and moisture. Stir or turn the herbs routinely (every 4 to 6 hours) until they are crispy dry (crumple between your thumb and fingers).

**Dehydrator**

It is not necessary to remove the stems or stalks before placing herbs in a dehydrator. Herbs are delicate and should be dried at a temperature of 105°F. Read the instructions for your dehydrator.

**Microwave Oven**

There is some debate as to the advisability of drying herbs in the microwave (see Microwave Drying). Read the manufacturer’s directions for your particular model.

**Determining Dryness**

It is essential that the food be adequately dry to prevent the growth of microbes. Because you do not have the equipment necessary to measure water content, you will have to depend on the product’s appearance, feel, and taste. Allow test pieces to cool before determining dryness.

**Fruits:** Cut in half. Squeezing shouldn’t produce any wetness. The fruit should be pliable, springy, and non-sticky (except for cherries).

**Fruit Leathers:** These will be slightly sticky, but will easily peel away from plastic wrap.

**Vegetables:** Look for leathery to brittle texture depending on the vegetable. Leather-like ones will spring back when folded. Leather-like ones will spring back when folded. Peas, corn, and mature beans will shatter when hit with a hammer.

**Herbs:** These will be brittle and crumple when you rub them between your fingers.
Conditioning

When fruit comes from the dehydrator, some pieces will be under-dried and some will be over-dried depending on the thickness of the food and its location on the trays. Food that has been dried by any of the other methods may also vary in degree of dryness. To equalize moisture in dried fruit, loosely pack fruit in a closed glass jar for a week, shaking the jar once a day to separate and mix the pieces. If condensation develops in the jar, the food is not dry enough and the drying process must be continued or the product will mold.

Test for dryness as described in the previous section. If some of the thicker pieces are not dry, sort and continue drying them while the dry pieces are placed in the conditioning jar. Most vegetables become very dry or brittle during the drying process and do not require conditioning. However, some such as sweet potatoes and tomatoes that are dried to a pliable stage should be conditioned to equalize moisture.

Pasteurizing

Sun or vine-dried foods must be pasteurized in order to kill insect larva which may be present. Food dried in a dehydrator or oven is already sufficiently heated to prevent insect infestation or kill insects that are already present. Use your oven for pasteurizing sun or vine-dried food. (Set up oven as described under Oven Drying.) Place a thermometer in the oven to check the temperature and time on each batch. Spread food in a single layer on shallow pans or cookie sheets. Heat 15 minutes at 175°F or 30 minutes at 160°F. Remove each batch of dried food and spread out to cool on clean dish towels. Package as soon as food is cool.

Packaging and Storing

Use clean insect- and moisture-proof plastic or glass containers. Canning jars with tight-fitting lids are a good choice. Metal cans may be used if the dried foods are first packaged in moisture/vapor-proof plastic bags. Dried foods will reabsorb moisture and spoil if they are not packaged well.

Dried foods will keep at room temperature for a year or longer, but there is gradual loss of color, flavor, aroma, and nutritive value over time. Thus it is best to use dried food within a year.

Careful treatment and packaging of home-dried food will give you the best quality product.

Nutritional Value of Dried Foods

Fruits and vegetables are an important source of dietary fiber and drying does not alter the fiber content of the food. Dried fruits are a concentrated source of energy from naturally occurring sugar.

Vegetables and fruits are important sources of vitamins, especially A (beta carotene), C (ascorbic acid), and B vitamins such as folic acid and B₆. It is not known how much nutrient loss occurs in home-drying. With commercially-dried foods, nutrient losses occur during blanching and during drying. About 30 percent of the vitamin C in vegetables is lost during blanching. An additional 10 to 50 percent loss occurs during drying. Loss of vitamin A during drying varies from 10 to 20 percent. Similar losses occur in unsulfured fruits.

Compared with frozen or canned foods, dried foods have lower nutritive value. However, dried fruits are a concentrated source of fiber, energy, and minerals such as iron.

Using Dried Foods

Dried fruits make a delicious snack when eaten dry. Some vegetables such as zucchini and sweet potatoes also make tasty snacks. Most vegetables and fruits, however, are soaked in water and cooked to restore the moisture removed in drying. Usually, you can reconstitute dried foods by soaking them for 30 to 90 minutes in cold water. If boiling water is used, you can reduce soaking time to about 20 minutes. Use just enough water to cover the food and add more if needed.

Leafy green vegetables such as kale and spinach may be cooked in enough water to cover them without prior soaking.

Add dried vegetables directly to soups and stews to reconstitute and cook them.
**Table 1: Guide to Drying Fruits**

<table>
<thead>
<tr>
<th>Fruit</th>
<th>Preparation</th>
<th>Pre-treatment</th>
<th>Drying Time in Dehydrator (hours)</th>
<th>Dryness Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apples</td>
<td>Peel (if desired) and core. Cut into slices or rings 1/8 to 1/4-inch thick.</td>
<td>May be dried without any pre-treatment or steam blanch 3-5 minutes.</td>
<td>6-12</td>
<td>Soft, pliable.</td>
</tr>
<tr>
<td></td>
<td>Slice into anti-darkening solution. Drain.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bananas</td>
<td>Peel and slice 1/4-inch thick in slices or lengths.</td>
<td>Fruit juice dip. Drain.</td>
<td>8-10</td>
<td>Pliable to crisp.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Berries*</td>
<td>Sort and wash carefully. Leave whole except halve or slice strawberries.</td>
<td>None</td>
<td>24-36</td>
<td>Leathery or crisp.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cherries</td>
<td>Stem and remove pit. Cut in half or leave whole.</td>
<td>None</td>
<td>24-36</td>
<td>Shriveled, leathery.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No moist center.</td>
</tr>
<tr>
<td>Citrus peel</td>
<td>Peels of grapefruit, lime, lemon and navel oranges. Use outer 1/8 inch of peel.</td>
<td>None</td>
<td>8-12</td>
<td>Crisp.</td>
</tr>
<tr>
<td>Grapes</td>
<td>Leave whole.</td>
<td>None</td>
<td>12-20</td>
<td>Raisin-like texture.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>No moist center.</td>
</tr>
<tr>
<td></td>
<td>For steam or water blanching, leave whole, then pit and cut.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pears</td>
<td>Peel if desired. Cut in half. Core and slice into anti-darkening solution.</td>
<td>Steam blanch 6 minutes (optional).</td>
<td>8-16</td>
<td>Soft, pliable.</td>
</tr>
<tr>
<td></td>
<td>Drain.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Persimmons</td>
<td>Peel and slice.</td>
<td>None</td>
<td>6-8</td>
<td>Pliable, not sticky.</td>
</tr>
</tbody>
</table>

(*Blackberries, raspberries, strawberries)
### Table 2: Guide to Drying Vegetables

<table>
<thead>
<tr>
<th>Vegetable</th>
<th>Preparation</th>
<th>Blanching Time (min.)</th>
<th>Drying Time in Dehydrator (hours)</th>
<th>Dryness Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beans, green</td>
<td>Wash and string, if necessary. Cut in 1-inch pieces.</td>
<td>2-2 1/2  2</td>
<td>8-14</td>
<td>Leathery, brittle.</td>
</tr>
<tr>
<td>Broccoli</td>
<td>Trim, cut as for serving. Wash. Quarter stalks lengthwise.</td>
<td>3-3  1/2  2</td>
<td>8-15</td>
<td>Crisp.</td>
</tr>
<tr>
<td>Carrots</td>
<td>Wash and peel. Cut in 1/8-inch thick coins or strips.</td>
<td>3-3  1/2  3 1/2</td>
<td>8-12</td>
<td>Tough to brittle.</td>
</tr>
<tr>
<td>Corn</td>
<td>Husk, trim. Blanch on cob until milk is set. Cut kernels off cob.</td>
<td>2-2  1/2  1 1/2</td>
<td>8-15</td>
<td>Brittle.</td>
</tr>
<tr>
<td>Legumes, dry, shelled</td>
<td>Vine dry. Shell and rinse. Pasteurize.</td>
<td>None</td>
<td>N/A</td>
<td>Hard, brittle; shatter when hit.</td>
</tr>
<tr>
<td>Legumes, mature</td>
<td>Harvest beans or peas when pods are mature and leathery, not dry. Shell and wash.</td>
<td>3  2</td>
<td>4-10 (start at 110° and gradually increase to 140°F)</td>
<td>Hard, brittle.</td>
</tr>
<tr>
<td>Onions</td>
<td>Wash, peel and slice into 1/8 to 1/4-inch thickness.</td>
<td>None</td>
<td>4-10</td>
<td>Brittle.</td>
</tr>
<tr>
<td>Peppers, green</td>
<td>Cut open. Remove seeds. Wash. Slice 1/4-inch thick strips or rings. May chop.</td>
<td>None</td>
<td>6-10</td>
<td>Leathery to brittle.</td>
</tr>
<tr>
<td>Potatoes, sweet and white</td>
<td>Wash, peel. Cut into shoestrings or rounds 1/8 to 1/4-inch thick.</td>
<td>6-8  5-6</td>
<td>8-12</td>
<td>Leathery to brittle.</td>
</tr>
<tr>
<td>Tomatoes, for stewing</td>
<td>Wash. Blanch. Peel and slice 3/8-inch thick. Cut small pear or plum tomatoes in half.</td>
<td>3  1</td>
<td>10-24</td>
<td>Leathery.</td>
</tr>
</tbody>
</table>
Sources of Information


*So Easy to Preserve*, Susan Reynolds and Paulette Ybarra, Georgia Cooperative Extension Service.


*Effects of Food Processing on Nutritive Values*, IFT Status Summary, December 1986.