

Drying Foods at Home



Lunch & Learn
12 noon to 1 pm
June 30, 2014

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Extension
Cooperative Extension

Resources

- How Do I...Dry Foods (National Center for Home Food Preservation) www.uga.edu/nchfp
 - Fruits and vegetables
 - Fruit leathers
 - Drying herbs
 - Nuts and seeds
 - Vegetable leathers
- So Easy to Preserve book & video
- Making Safe Jerky at Home
 - <http://fyi.uwex.edu/safepreserving/> Key word - Jerky



The Basics of Drying

The goal of dehydration, or drying, is to remove water without damaging quality.

Drying may be:

- Natural, relying on the sun (solar drying)
- Controlled, using an oven or dehydrator

Drying uses simple equipment that almost everyone already has at home. Drying reduces the size and weight of food BUT it can take a long time and is not suitable for all foods.



How does drying preserve foods?

- Drying foods removes water.
 - Water is needed for microorganisms to grow and for chemical and enzymatic reactions in foods to take place.
- Microbial growth is stopped.
 - BUT microbes can still survive!
 - The lack of a ‘kill step’ is a concern with drying meats, vegetables, herbs and spices.
- Chemical and enzymatic reactions that cause changes in color and texture, and which decrease quality, are slowed or stopped.



Water Activity

The amount of active water in a food

1=High 0=Low

Food	Water Activity	Notes
Fresh meats, fruits and vegetables, dairy	0.9-1.0	High water activity allows deterioration
Bread, crumb	0.97	Baked bread is high in active water!
Bread, crust	0.30	
Bacteria - minimum	0.90	Water is removed, bacteria will not grow
Yeasts - minimum	0.87	Yeasts tolerate slightly less active water
Hard cheeses, jam	0.75	Drier foods will eventually spoil due to mold
Molds	0.7	Mold can grow where other microbes can't
Rolled oats, dry pasta, sugar	0.6-0.2	Removing enough water means that even mold will not grow

A little mold....just scrape it off?!

Up until the late 1990's Extension suggested scraping mold off of food, and eating the rest. Now we know this isn't a good idea.

- Molds can produce some of the most toxic compounds known to man.
- Molds can penetrate deeply into a food, but only be visible on the surface. **The iceberg effect!**
 - Hard cheeses like Parmesan, cut 1" off in all directions
 - Any other molded food - DISCARD



Steps for Success in Drying Foods

Successful drying removes water from food while preserving quality. Factors to consider:

- **Surface area.** The larger the surface area, the more rapid the drying.
- **Temperature.** The hotter the air, the more moisture it can hold. A hotter temperature means a shorter drying time. Temperatures should generally be 120°-150° F.
- **Air movement.** Moving air will sweep moisture away from food and speed drying.
- **Humidity.** Dry air = quick drying.



Preparing Food for Drying

- Select firm, ripe fruits and vegetables for drying.
- Do **not** dry spoiled or heavily damaged produce.
- Fruits and vegetables to be dried should be carefully **rinsed**, **pre-treated** if necessary, blotted **dry**, and **trimmed** prior to dehydrating.
 - Thin, uniform slices work best for rapid dehydrating.
 - Increasingly, foodborne illnesses have been linked to dried herbs and spices.

Sun or Solar Drying



Sun or solar drying may take many days

- Suitable in some climates for fruits high in acid and sugar, and for whole peppers, beans and peas
- Weather must be **hot** (85° or higher) and **dry**
- Food is placed on racks or screens, and turned 2-3 times per day (drying may take days)
- Cover with cheesecloth to control insects

All foods dried out-of-doors should be pasteurized to kill insects and their eggs.

- Freezer method – 48 hours at 0°F
- Oven method – ‘bake’ in preheated 160°F oven for 30 minutes

Room Drying



Room drying can be a good option for herbs which lose flavor if dried in the sun.

- Harvest herbs in the ‘bud bursting’ stage.
- Herbs for flower arrangements or sachets can be dried ‘as is.’ Herbs dried for culinary uses should be rinsed (and blotted dry) prior to drying.
- Hang in small bundles in a dry, well ventilated area.
- Tender herbs like mint, tarragon and lemon balm will mold if not dried quickly. Hang small bunches. Use paper bags (with holes in the sides) to catch leaves that may drop.

Best for rosemary, sage, thyme, lavender, and summer savory.

Oven Drying



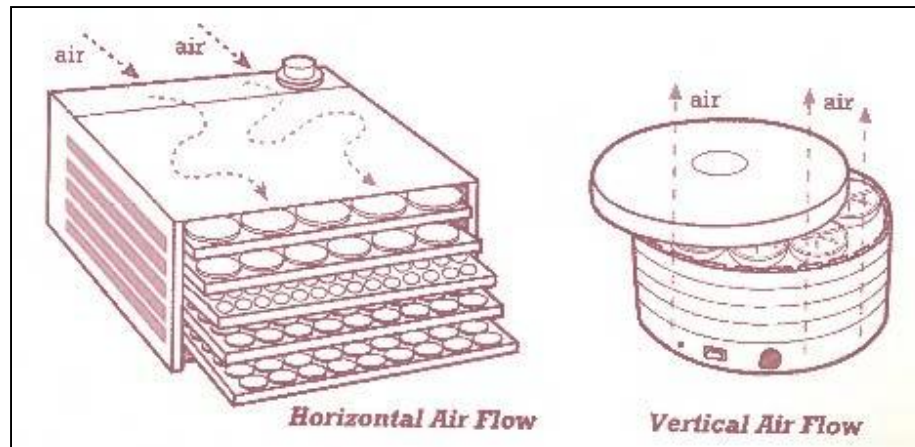
An oven set at 120°-150° can be used to dry herbs, seeds, tomatoes, and other fruits.

- Place food in a single layer on cookie sheets.
 - Use a fan to circulate air (keep the oven door propped open if necessary); a convection oven works great to dry foods at home.
 - To dry herbs, place leaves (no stems) on paper towels. Stack paper towels 5-high. Dry in a cool oven.
 - Dry pumpkin seeds 3-4 hours at 120°F. Toss with oil and salt; roast at 250°F for 10-15 min.
 - Sprinkle tomato slices with salt and dry 150° for 8-18 hours.
- It can take twice as long to dry food in an oven compared to a dehydrator.

Using a Food Dehydrator

Horizontal Air Flow heat and fan on side/back	Vertical Air Flow Heat and fan in base/lid
<ul style="list-style-type: none">• Reduces flavor mixing• Equal heat dispersal• No drips onto heating unit• Less limit on height of food pieces	<ul style="list-style-type: none">• Flavors can mix as air moves up/down• Uneven heat dispersal• Dipping onto heating element• Height limited to height of tray• Removing cover may stop heating

Excalibur Home Dehydrator - \$250
9 trays



Gardenmaster Pro by Nesco - \$130
5-20 trays

Dehydrator 'Dos' and 'Don'ts'

- **Don't** purchase a dehydrator with clear plastic lids or trays. You'll lose more nutrients with these.
- **Do** purchase a dehydrator with a high-wattage heater and strong fan.
- **Don't** overload the dehydrator. Drying a few pounds of food at any one time is the max.
- **Do** consider safety when drying meat. Only the Excalibur and Gardenmaster have been shown to make safety-ensured jerky at home.

Drying Fruits

- Wash fruit, and peel and core if desired.
- Prepare thin, uniform slices for fastest drying.
 - Apple slices sprinkled with cinnamon sugar are a great snack.
- Spray trays or racks so fruits can be easily removed once dry.
 - Prepare grapes and blueberries by ‘checking’ skins.
- Try something new like dried watermelon and cantaloupe.



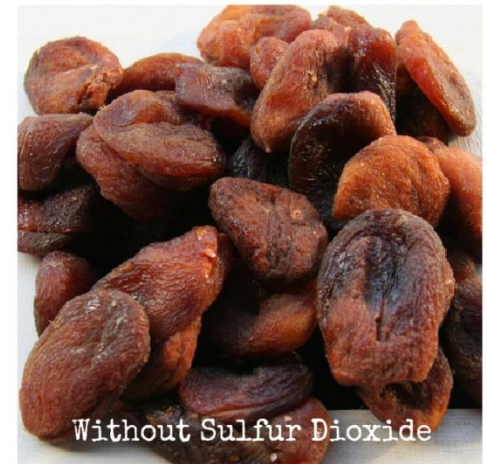
Drying Fruits

Pre-treat light-colored fruits to prevent darkening.

- Sulfuring – treating fruits with sulfites effectively prevents browning.
 - But some people with asthma are allergic to sulfites.
- Ascorbic acid (vitC) – dipping fruits in an ascorbic acid solution, or sprinkling with a mixture like FruitFresh™ can help prevent browning
- Fruits can also be dipped in fruit juice, in honey, or blanched in syrup



With Sulfur Dioxide



Without Sulfur Dioxide

Drying Fruits

- Place fruit in a single layer on trays.
- Dry fruits of similar thicknesses together.
- Dry fruit until still **soft** and **pliable**, but not sticky or tacky.
 - A piece folded in half should not stick together.
- Cool for 30-60 min before packaging.
 - Packaging warm fruit can lead to sweating and moisture buildup. [Pasteurize sun-dried fruit.]
- **Condition** fruits for best keeping quality.
 - Pack fruit loose in a glass jar, seal and let stand 1 week. If condensation appears, place fruit back in the dehydrator.

Drying Vegetables

Vegetables are dried until they are brittle.

- Rinse vegetables in water, trim, peel and cut or slice to desired shape. Uniformly sized pieces dry best.
- Most vegetables should be blanched in steam or water before drying.
- Slightly cool blanched vegetables, then dry and place on trays in a single layer.
- Dry until brittle or crisp.
- Cool and package.



Remember....

- Cleanliness, including hand washing, is key!
- Use a thermometer to check dehydrator temperature.
 - Insert a thermometer between trays or place on tray.
 - Adjust appliance dial as needed.
- Cool foods to room temperature before packing, generally 30-60 min, but don't wait so long that moisture is re-absorbed.
- Store dried food in a cool, dark location.
- Used canning jars, vacuum sealed containers, and aluminum containers help to protect dried foods.

Tips on Drying Foods

- **Herbs** are the only food which can be successfully dried in a microwave oven. Work carefully and **WATCH for BURNING!**
- **Dry herbs** in a dehydrator at only 100°F. Herbs are done when they are crumbly.
- **Don't mix** foods with strong smells or drying times. **Dry onions, shallots and garlic in a dehydrator set in a closed garage.**
- Use a very light coat of **vegetable oil or spray** on dehydrator trays to keep food from sticking.
- For even drying, **don't overlap** pieces of food on drying trays.

More Tips on Drying Foods

- Fresh produce should be rinsed and blotted dry before drying. Don't add excess moisture to the process.
- Remember...the longer the drying time, the more nutrients lost.
- Some foods such as mushrooms (especially morels!), tomatoes, onions, and garlic are wonderful when dried, while others such as whole berries and citrus fruits are best preserved in other ways.
- Running out of tray liners? No problem! Use parchment paper to line trays.



Kitchen Hints



- Dry extra amounts of squash, carrots, mushrooms, tomatoes, beans, onions and other vegetables.
 - Create a flavorful soup ‘mix’ by blending dried product into a powder. Use as a no-salt-added replacement for commercial soup mixes.
- Dry tomatoes until they are crisp and blend to a powder. Use when making bread or pasta. Add to soup or stew for a rich, full flavor.
- Imitate a sun-dried tomato but stopping dehydration when fruit still is still soft and pliable. Store frozen as a topping for pizza.
- Thinly slice zucchini or summer squash. Dry with or without seasoning for a healthy snack ‘chip’.

Kitchen Hints

- Try drying vegetable leathers to use as soup starters.*
 - Cook tomatoes, with or without added onion, celery and salt, until thickened. Puree. Spread on a cookie sheet or dehydrator tray. Dry at 140°F.
 - Add as a tomato concentrate to soups and sauces.
- Try drying pumpkin leather.*
 - Blend canned pumpkin (or fresh pumpkin cooked and pureed) with honey, cinnamon, nutmeg and cloves. Dry at 140°F.



*Ingredients for vegetable leathers should be cooked and pureed prior to drying. For safety sake, do not just blend and dry.

Kitchen Hints



Fruit leathers can be a fun and delicious snack.

- Dry extra pureed fruit from making jam into fruit leather, or dry fruit pulp left from making jelly.
 - Use fresh, frozen, or canned fruit for leather.
 - Here's a place were slightly overripe fruit 'shines.'
 - Experiment with flavors such as strawberry-kiwi
 - Add spices and extracts
 - Add chopped nuts or raisins
 - Once dried, spread with softened cream cheese, melted chocolate, peanut butter, jam or cheese spread.
- Store refrigerated.

