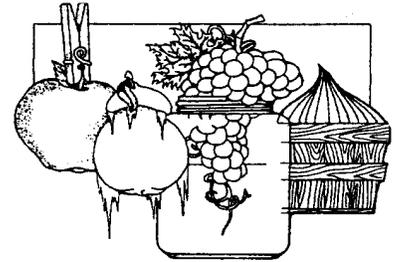


Quality for Keeps



Information for those who produce and preserve food

Drying is new again

Drying is one of the oldest methods of food preservation and has recently enjoyed a resurgence in popularity. Drying preserves food by removing the water that molds, yeast and bacteria need in order to grow. Without water, these microorganisms cannot grow and food will not spoil. These days, there are several convenient options for drying foods at home.

Sun or solar drying. These methods of preservation use solar energy from the sun to remove moisture. While cost-effective methods for preserving, sun drying is not recommended in Missouri.

To remove enough water to preserve food, several consecutive days of high temperatures and low humidity are needed. In Missouri, unfortunately, once temperatures rise adequately for sun or solar drying, so do humidity levels. Foods will likely mold before drying is complete.

Oven drying. Oven drying is a low-cost way to experiment with dried foods. It requires little initial investment and does not depend on the weather. First, the oven must maintain a temperature below 200° F. The lowest temperature setting on some ovens

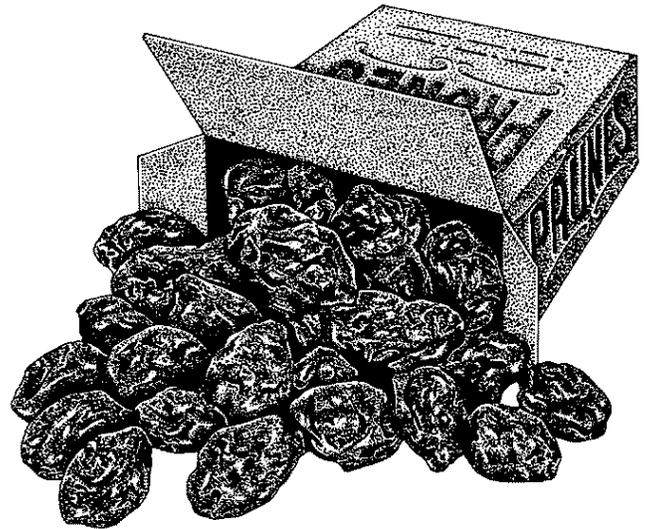
is 200° F, which is too hot for successfully drying food.

Therefore, seek an alternate method.

Optimal drying temperature for fruits and vegetables is 140 degrees.

Place an accurate oven thermometer on the top rack toward the back of the oven to ensure proper temperature. Place food, in single layers, on drying trays or wire cooling racks covered with cheesecloth. Arrange trays in the oven for adequate air circulation. Trays should be at least 1-½ inches narrower than the inside of the oven and arrange with at least 2-½ inches between trays. Keep the top tray at least 3-inches from the top of the oven. Prop the oven door open 4 inches and place a fan outside the oven door to improve air circulation, or if possible, use a convection oven. Caution—this is not a safe practice for a home with small children.

Drying in a dehydrator. While the initial investment can be high for a dehydrator, it maintains low temperatures, uses less energy than an oven and produces the best



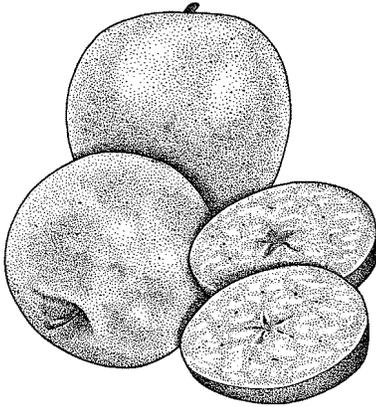
quality dried foods. Load food on trays in single layers, ensuring that pieces do not overlap. Rotate the trays within the dryer at least once during the drying period. For more information about choosing a dehydrator that fits your needs, see MU Extension Publication: *GH1562, Quality for Keeps: Drying Foods*, <http://extension.missouri.edu/p/GH1562>.

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Dried apples: a quick and healthy snack all year long

Tired of canned apples, applesauce and pie filling? Try dried apple slices for a delicious, quick and healthy snack all year long.



To prepare apple slices or rings, begin by peeling and coring apples. Cut into 1/8-inch slices and pretreat to prevent darkening – use Ascorbic acid (Vitamin C) for 5 minutes, steam blanch for 3-5 minutes depending on texture, or syrup blanch for 10 minutes.

Ascorbic acid. Mixed with water, ascorbic acid is a safe way to prevent fruit browning. Ascorbic acid is available in the powdered or tablet form from drug stores or grocery stores. One teaspoon of powdered ascorbic acid is equal to 3,000 mg of ascorbic acid in tablet form. Ascorbic acid is also available in crystalline form, which dissolves more easily, but is much more expensive.

Mix 1 teaspoon of powdered ascorbic acid (or 3,000 mg ascorbic acid tablets, crushed) in 2 cups water. Place the fruit in the solution for 3 to 5 minutes. Remove fruit, drain well and place on dryer trays. After this solution is used twice, add more ascorbic acid.

Steam blanch. Place several inches of water in a large pot with a tight-fitting lid. Heat to boiling. Place fruit, not more than 2-inches deep, in a steamer pan or wire basket over boiling water. Cover

tightly with lid and begin timing immediately. When done, remove excess moisture using paper towels and place on dryer trays.

Syrup blanch. Combine 1 cup sugar, 1 cup light corn syrup and 2 cups water in a pot. Bring to a boil. Add 1 pound of prepared fruit and simmer 10 minutes. Remove from heat and let fruit stand in hot syrup for 30 minutes. Lift fruit out of syrup, rinse lightly in cold water, drain on paper towels and place on dryer racks.

Apples will take approximately 6 to 12 hours in a dehydrator. Apples are sufficiently dry when they are soft, pliable and have no moist area in the center when cut.

Source: Adapted from "So Easy to Preserve", 5th ed. 2006. Bulletin 989, Cooperative Extension Service, The University of Georgia, Athens.

Store dried foods for highest quality and longest shelf life.

Conditioning. Conditioning is a process that evenly distributes remaining moisture that is left in the food after drying and decreases the chance of spoilage, especially by molds. First, cool dried food on trays. Once completely cooled, pour into a large, food-grade container and fill approximately 2/3 full. Cover the container and place in a convenient, warm, dry place. Shake the container daily for 10-14 days. During this time, check for condensation on the lid or any

sign of spoilage. If condensation occurs, return food to the dryer to finish the product. Restart the conditioning process again after drying.

Storing. Dried foods should be packaged in glass jars, food-grade plastic storage containers, or plastic food-storage bags. Be sure the package has an airtight seal. Store food in small amounts, since opened packages allow dried foods to re-absorb moisture from the air and allow quality to deteriorate.

Keep storage containers should be kept in a cool, dark, and dry place. Foods stored at temperatures under 60 degrees will keep approximately 1 year. If stored between 80 and 90 degrees, dried food will begin to deteriorate within several months.

Source: MU Extension Publication GH1562, Quality for Keeps: Drying Foods, <http://extension.missouri.edu/p/GH1562>. Source: MU Extension Publication GH1563, Quality for Keeps: How to Dry Food at Home, <http://extension.missouri.edu/explore/hesguide/foodnut/gh1563.pdf>.

How do I know if food is dry?

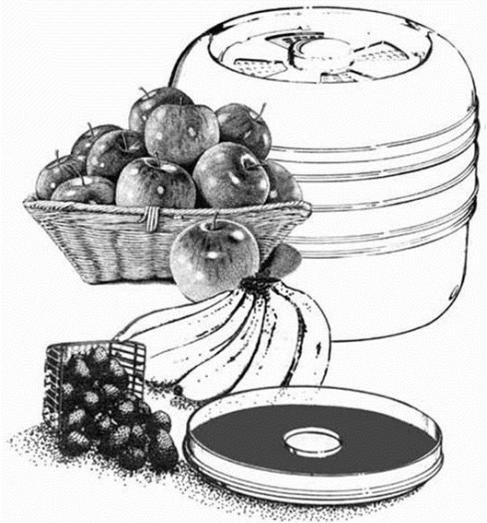
Drying times in an oven or dehydrator vary depending on the amount of food dried, its moisture content and room temperature and humidity. Some foods require several hours and others, days.

In a dehydrator, vegetables usually take 6 to 16 hours to dry and fruits can require up to 48 hours. Oven drying takes longer, as the air circulation is not as good. More specific instructions and approximate drying times can be found for many fruits and vegetables in *MU Extension Publication GH1563, Quality for Keeps: How to Dry Food at Home*, <http://extension.missouri.edu/explorepdf/hesguide/foodnut/gh1563.pdf>.

Vegetables. Sufficiently dried vegetables should be leathery or brittle. Leathery vegetables will be pliable and spring back if folded. Edges will also look sharp. Seeds should shatter when hit with a hammer.

Fruits. Fruits are adequately dry when they are tough and pliable when cut. There should be no visible moisture. Fruit leathers can be slightly sticky to the touch, but should separate easily from plastic wrap.

Meats. Meats should be extremely dry, unless they will be stored frozen or under refrigeration. Meat is sufficiently dry when it is dark, fibrous, and forms sharp points when broken.



Herbs. Dried herbs should be brittle and their leaves should shatter when rubbed together.

Botulism Poisoning Cases Result from Processing Errors

A California company is recalling a number of jarred products after two people in Ohio were diagnosed with botulism poisoning. Both individuals are improving after being on ventilation. The problem may be due to canning errors. The company is a vegetable farm that expanded into offering canned products.

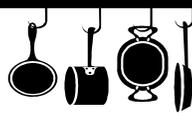
The FDA is concerned that with so many small entities beginning to process and sell processed food through the farmers' market channel, that it was only a matter of time before they would see processing errors that would result in botulism cases. Although FDA has strict regulations regarding canning foods that include requirements for registering of processes, training, testing, etc., many small entrepreneurs are either ignorant to these regulations, are incapable of implementing them, or choose not to follow.

Any farmers' market now offers a vast array of jarred food items. Are they acidified properly? Have they received the proper thermal treatment? There is a reason that those strict government regulations are in place.

Clostridium botulinum is a spore-forming pathogen that produces one of the strongest toxins known. The organism can survive boiling temperatures and if the jarred product does not have any barriers (low pH, preservatives, strict refrigeration), the organism will grow and produce toxin. The toxin, a neurotoxin, travels into the bloodstream to the nerves and it stops neurotransmission to muscles. And so, when one ingests this toxin and does not receive quick medical attention, they will die of suffocation.

Source: Adapted from News Story Links <http://pennstatefoodsafety.blogspot.com/2014/08/botulism-poisoning-cases-result-from-ca.html>

THE RECIPE BOX



Fruit Leather

- Ripe or slightly overripe fruit, such as apples, bananas, peaches, pears or plums
- Lemon juice or ascorbic acid
- Cinnamon, cloves, ginger or nutmeg (optional)



Procedure: Wash fresh fruit in cool water. Remove peel, seeds and stem. Chop fruit and use 2 cups of fruit for each 13" x 15" fruit leather. Puree until smooth. To prevent darkening, add 2 teaspoons of lemon juice or 1/8 teaspoon ascorbic acid (375 mg) for every 2 cups of light colored fruit. (Optional) Try adding 1/8 teaspoons of cinnamon, cloves, ginger or nutmeg for every 2 cups of puree. Fruit leathers can be poured into a single large sheet (13" x 15") or into several smaller sizes. Spread puree evenly, about 1/8-inch thick, onto dry tray. Avoid pouring puree too close to the edge of the cookie sheet.

- *Oven drying.* Line a 13" x 15" cookie pan with plastic wrap. Be careful to smooth out wrinkles. Do not use waxed paper or aluminum foil.
- *Dehydrator.* Specifically designed plastic sheets can be purchased or plastic trays can be lined with plastic wrap.

Approximate drying times are 6-8 hours in a dehydrator and up to 18 hours in an oven. Leather dries from the outside edge toward the center, so test for dryness by touching the center of the leather. No indentation should be evident. While warm, peel from plastic and roll. Allow to cool and then rewrap the roll in plastic. Fruit leather can be stored up to 1 month at room temperature or placed in tightly wrapped rolls for storage in the freezer for up to 1 year.

Source: Adapted from "So Easy to Preserve", 5th ed. 2006. Bulletin 989, Cooperative Extension Service, The University of Georgia, Athens.

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Mary Schroepfer

Mary Schroepfer
Nutrition & Health Specialist, Franklin County
116 W. Main
Union, MO 63084
Phone: 636-583-5141
Fax: 636-583-5145
Email: SchroepferM@missouri.edu

Bethany Bachmann

Bethany Bachmann
Nutrition and Health Specialist, Perry County
321 N. Main, Suite 1
Perryville, MO 63775
Phone: 573-547-4505
Fax: 573-547-4535
Email: schindlerb@missouri.edu

Linda S. Rellergert

Linda Rellergert
Nutrition and Health Education, St. Charles County
260 Brown Rd.
St. Peters, MO 63376
Phone: (636) 970-3000
Fax: (636) 279-3310
Email: RellergertL@missouri.edu

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