Drying Fruits and Vegetables (Dehydration)

Introduction

Dried foods are tasty, nutritious, lightweight, and easy to store and use. The energy input is less than what is needed to freeze or can, and the storage space is less than that needed for canning jars and freezer containers.

Dried fruits make high-energy snacks. The fact that dried foods are lightweight and compact makes them desirable for hiking and camping trips.

Some fruits and vegetables suitable for drying include apples, pears, peaches, plums, apricots, bananas, cantaloupe, strawberries, blueberries, carrots, celery, corn, green beans, potatoes, and tomatoes. Fruits can also be dried as fruit leathers and rolls.

Meat can be dried as jerky (see "Let's Preserve: Meat and Poultry"). Herbs are one of the easiest foods to dry (see "Let's Preserve: Drying Herbs").

How Foods Are Dried

Increasing the temperature of food makes its moisture evaporate, and air moving over the food carries the moisture away. A balance of temperature and humidity is needed to successfully dry foods.

Methods

Food dehydrators—either commercially made or homemade—give a good-quality dried product. Oven drying works well if you can set your oven to a temperature of 140 to 150°F. Open the oven door 2 to 3 inches to allow moisture to escape. A convection oven works well because it combines low heat with a fan to move the air. Room drying at room temperature works only if heat, humidity, and air movement are adequate. Today's air-conditioned homes may be too cool to dry foods quickly enough. While sun drying works in dry climates, the high humidity in Pennsylvania makes this method impractical here.

Procedures

Peeling is optional; however, the skin tends to toughen on apples and pears. The skin reduces surface area, preventing moisture from escaping. Sliced pieces will dry more quickly than fruit or vegetables left whole or cut in half. Pieces of the same size, shape, and thickness will dry evenly. Some thinly sliced fruits and vegetables, such as apple chips or zucchini chips, will dry crisp. Pretreat foods as described below. Place pieces on drying racks without allowing them to touch or overlap.

Place trays in a preheated dehydrator. Initially, the temperature can be set at 145°F when there is surface moisture on the fruit or vegetable. After one hour reduce the temperature to 135 to 140°F to finish drying. If the food is dried at a temperature that is too high, the outer surface will harden, preventing moisture from escaping from the center of the slice—this is called case hardening. Food shrinks when it is dried, so use a fine mesh for smaller fruits and vegetables.

Pretreating Fruits

Some foods such as apples, pears, peaches, and apricots dry better when pretreated. Pretreatment reduces oxidation, giving a better color, reducing vitamin loss, and lengthening shelf life. Research studies have shown that pretreating with an acidic solution enhances the destruction of potentially harmful bacteria during drying. Place cut fruits in a solution of 3¾ teaspoons of powdered ascorbic acid (or crush 20 500-milligram vitamin C tablets) or ½ teaspoon of powdered citric acid in 2 cups of water for 10 minutes before placing on trays to dry. Equal parts of bottled lemon juice and water can be substituted for the above pretreatment.

Other methods of pretreating fruit include syrup blanching, water blanching, and sulfiting. Syrup blanching involves simmering the prepared fruit for 10 minutes in a syrup of 1 cup sugar,

1 cup white corn syrup, and 2 cups water and letting it stand in the hot syrup for 30 minutes before draining, rinsing, and placing on drying trays. Syrup-blanched fruit is sweeter but also stickier than fruit treated by other methods. Refer to a book on food drying for specific times and directions if you choose to blanch fruits. Although sulfites have been used in the past to prevent oxidation, this fact sheet does not include this method because sulfites are not recommended for use by individuals on restricted-sodium diets or who have asthmatic or respiratory conditions. Sulfited food should be dried outdoors for safety reasons.

Some fruits such as blueberries and cranberries need to be dipped into boiling water to crack the skins. Be careful not to leave the fruit in the boiling water for too long or the fruit will turn to mush. Chill quickly after cracking skins and blot dry. Home-dried cranberries and dried blueberries are not like the commercially dried product, which is sweeter.

Conditioning and Storing Fruits

Fruits are dry when they are pliable and no beads of moisture form when pressed between your fingers. Condition dried fruit by packing it loosely into an air-tight glass or plastic container for several days to distribute the remaining moisture evenly. If condensation forms inside the container, further dehydration is needed.

Unpeeled or uncovered fruits need to be treated to destroy insect eggs that might have gotten on the fruit. Heat dried fruit in the oven at 160°F for 30 minutes or chill in the freezer at 0°F or below for 48 hours. The shelf life of dried fruit is increased when it is stored in the freezer or refrigerator.

Blanching Vegetables

Blanching in a solution that contains ¼ teaspoon of citric acid per quart of water is recommended for most vegetables. Steam blanching is an option. This enhances the destruction of potentially harmful microorganisms and slows the enzyme reactions that will continue during drying and storage. Blanching also softens the cell structure, allowing moisture to escape, and allows the pieces to dry faster and later rehydrate faster. Blanched vegetables should be drained and placed on dryer trays. The heat from blanching will give them a head start in the drying process. Onions, garlic, peppers, and herbs do not need blanching.

Testing Dryness and Storage

Vegetables are tough, brittle, or crunchy when dry and do not need conditioning. Store dried vegetables in air-tight containers to prevent food from absorbing the moisture in the air. Storing them in a dark place retains the vitamin content of the food.

Leathers

Leathers are made from purees and take their name from the texture of the dried product. Leathers can be made from fresh, frozen, or drained canned fruit or vegetable purees. If puree is thin, as in a berry puree, add applesauce as an extender. Add 2 teaspoons of lemon juice or ⅛ teaspoon of ascorbic acid to every 2 cups of light-colored fruit to prevent darkening. Sweeteners are usually unnecessary because of the concentration of the natural sweetness during the drying process. If desired, add ¼ to ½ cup of corn syrup or honey for every 2 cups of fruit. Sugar can be used, but it will crystallize after a while. Sweetened leathers will be somewhat sticky.

Pour prepared puree about ¼ inch thick onto plastic dehydrator trays or line a cookie sheet with plastic wrap (be careful to smooth out wrinkles; tape edges to prevent sliding). Do not use waxed paper or regular aluminum foil as the leather will stick. Nonstick foil works well. Two cups of puree will make one large fruit roll for a 13-inch by 15-inch sheet. Several smaller ones can be made. Depending on the fruit and its moisture content, leather size, and type of dryer used, it may take anywhere from 6 hours to several days to dry at 140°F. Test for dryness by touching the center of the leather; no indentation should be evident and no "wet" spots should show. While warm, peel from the sheet and roll, allow to cool, and rewrap in plastic wrap. Leathers can be kept for up to one month at room temperature and up to one year if frozen.

For additional information about food preservation, visit the Penn State Extension Home Food Preservation website at **extension.psu.edu/food/preservation** or contact Penn State Extension in your county.

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