



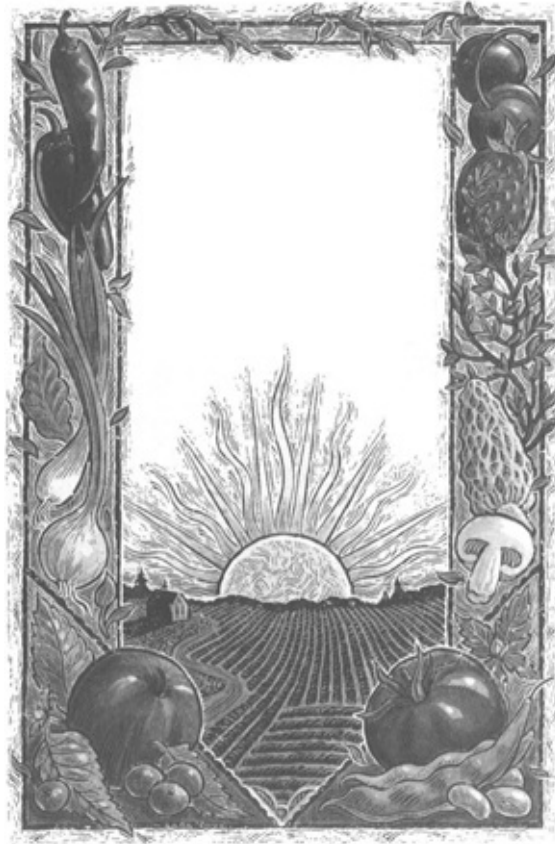
# **Making & Using DRIED FOODS**

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# Making & Using DRIED FOODS

PHYLLIS HOBSON



Storey Publishing

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# Introduction

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Who invented drying foods? We like to think some prehistoric hunter and his mate discarded a chunk of meat beside their cave fire, and a few days later noticed it had turned black and dry. Curious and daring, one of them chewed into it, uttered the Cro-Magnon equivalent of “Not bad,” and slowly realized that here was a way to save food for the leaner days that came so regularly.

By the time records were being kept, the drying of food was widespread. Phoenicians and other fishermen were drying their catches in the open air; the Chinese were sun-drying their tea leaves.

In this country, Indians taught early settlers how to dry corn and grind it into meal; jerky was made from the meat of bear, deer, elk, and buffalo living in the forests and on the plains. The French had invented a dehydrator to dry vegetables by 1795, while American families were still using fire, sun, and smoke to dry their grapes, herbs, peppers, and meats.

Today a desire for natural, healthful, and inexpensive methods of food preservation has put dehydration in modern kitchens. People in all walks of life can dry many kinds of food in all kinds of weather at home.

The art of drying foods is a natural alternative to canning and freezing and benefits the family on a tight budget, because drying fruits, vegetables, grains, and breakfast cereals can offer a low-cost, energy-efficient way of eating for less. Drying foods benefits the hiker, the camper, the skier, or the fisherman looking for a compact food supply light enough to carry in a knapsack. It benefits the homemaker looking for delicious, healthful snacks to offer the family, and it benefits vacationers with two homes, because drying can be a safe way to store food over the winter. Drying is an ideal way of storing foods for those who live in isolated locations where electricity to operate a freezer may be undependable or nonexistent, and it is a good way to stockpile an emergency supply in a small storage area.

The goal of drying foods is to remove excess moisture, getting the water content down to 5 percent to 25 percent, so bacteria that cause decay cannot survive. Since dried foods are only one-half to one-twelfth the weight and bulk of the original food, a small, dry, cool closet will provide all the storage space needed for a winter’s supply of food. If dried food is protected by airtight packaging, it will keep indefinitely.

Compared with canning, drying foods is simplicity itself. There are no complicated procedures to learn or potentially dangerous pieces of equipment to operate. You don’t need a pressure canner or a hot water bath canner, nor will you have to shop for glass canning jars and boxes of canning lids. Neither will you have to have jar lifters, filling funnels, or tongs. The only special equipment manufactured for drying is a dehydrator, and it is possible to dry without one. Everything else, from oven drying trays to storage jars, you already have on hand, or you can make from castoffs.

Compared with freezing, drying is inexpensive and worry-free. Drying in the sun or with an oven pilot flame is absolutely free. It is costly to operate a food freezer, depending on the efficiency of the freezer, the amount of food it contains, and the electricity rate in your area.

Even if drying food were not simpler, less expensive and more convenient, many people might still prefer dried foods for their taste. Dried apricots, dried apple slices, and raisins compare well with fresh fruits, and honey-dipped pineapple slices, chewy, fruity leathers, and tough, tangy meat jerky have a universal appeal.

Because drying is a more natural method of preservation than canning and freezing, many people believe drying foods preserves more of the nutritional values present in raw foods, and a USDA study backs up this belief. Vitamins are lost in blanching, a pretreatment necessary for some vegetables before drying, but this nutritional loss can be kept to a minimum if the foods are steam blanched for no more than the specified time.

Almost any food can be dried by following the instructions in this book, which are aimed at preserving as much of the nutrients and the flavor of the food as possible.

Will your dried food be as good as what you can buy on the market? Commercial manufacturers have the advantage of expensive freeze-drying equipment, but you have the advantage of sweet, tree-ripened fruit and just-picked, garden-fresh vegetables. Your own homegrown fruits and vegetables, or those bought at local farmers' markets or roadside stands, should be more delicious and nutritious than those the food processors have.

# Drying Foods Can Save You Money



If you're having trouble keeping up with the ever-increasing cost of food, a selection of dried foods on your pantry shelf can save your food budget a significant amount.

You can save the most money, of course, by drying fruits and vegetables from your own garden or foods that otherwise would go to waste. Drying is not only a safe, easy way of preserving your excess garden harvest; it also is an inexpensive method. Drying costs less than canning and freezing in equipment, energy, and storage space.

Even if you don't plant a garden, you can still save money by drying foods at home. During the harvest season, fruits and vegetables can be purchased cheaply by the bushel at the country markets and roadside stands.

Watch also for specials at the produce department of your favorite supermarket. Bananas flecked with brown, which often sell for half price, make excellent fruit leathers. Mushrooms and vegetables often are marked down because a new shipment is due.

Drying can also save you money by avoiding waste. When you have leftover cooked meat or cooked vegetables, they can be finely chopped and dried, then enjoyed another time months later. Leftover applesauce, for instance, can be pureed in the blender, dried on sheets of plastic wrap, and eaten as a leather.

Save money too by drying processed grain products. Ready-to-eat purchased breakfast cereals, noodles, and croutons are expensive not because of their ingredients, but because of the time involved in their preparation. Sometime when you have more time than money, you can make them ahead and dry them for busy days.

If there is a baby at your house, you can save money usually spent on commercially canned baby foods by cooking your own fresh fruits and vegetables (see [chapters 6](#) and [7](#) for complete instructions).

At birthday and holiday time, or any time a gift is in order, save money with a very special gift:

- For your sweet-toothed friends, save your prettiest peanut butter, pickle, or jelly jars, paint the lids, decorate with ribbon bows, and fill with a mixture of dried fruits made according to the directions in [chapter 6](#), Drying Fruits.
- For your nature-loving friends, package an assortment of dried soups and stews for their next camping trip. Directions are in [chapter 14](#), Drying Foods for Hiking and Camping.
- For your young (and young at heart) friends, package a mixed variety of fruit leather strips in plastic wrap and tie with a big ribbon. You'll find the directions in [chapter 12](#), Leathers.
- For your elegant friends, package several different aromatic sachets in colorful nylon nets. Tie with matching ribbon and attach a list of the ingredients. Several recipes for sachets and potpourris are in [chapter 15](#), Drying Flower Blossoms.
- And for your gourmet friends, fill small baby food jars with dried herbs and herb mixtures as

described in [chapter 8](#), Drying Herbs. Paste pretty labels on the jars and include a few recipes on decorative file cards.

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## CHAPTER TWO

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# How to Dry Foods



Just as with freezing and canning, the best quality dried foods must begin with the best quality foods available. Fruits and vegetables to be dried should be picked when they are at their peak of flavor.

Most vegetables are best picked while they are still slightly immature. Harvest peas and beans when the pods are still green and succulent. Spinach and other leafy vegetables should be picked before the leaves reach full size. Most root vegetables should be pulled while still undersized. Corn should be picked before the natural sugars turn to starch, while the kernels are succulent enough to squirt out juice when punctured with the thumbnail. Cabbage family vegetables — including broccol, cabbage, and kohlrabi — should be picked after the vegetable is well formed, but before it becomes strong tasting. Brussels sprouts are best after the first frost.

Fruits, including berries and tomatoes, should be left to ripen thoroughly before picking. Peaches, apricots, and apples are sweeter and more flavorful when tree-ripened.

In general, the faster a food is dried, the better the quality, but temperatures can't be so high that the food is cooked. Drying is speeded and quality improved if the food is as dry as possible when the process begins. Pick fruits, vegetables, and herbs in late morning when the sun has dried off the early morning dew. Drain cooked vegetables well. Wipe off washed fruit. Do not soak any food for more than 5 or 10 minutes. Most fruits and vegetables should be peeled to permit the air to penetrate the inner pulp.

Drying also is speeded if as much food surface as possible is exposed to the air. To do this, cut food pieces as small, and especially as thin as possible with a knife or in a food processor or salad maker. Some vegetables, such as onions, green peppers, and turnips, may be coarsely grated in a blender or shredded with a hand-held grater.

The foods then are ready to be pretreated according to the directions in [chapter 4](#), To Pretreat or Not To Pretreat. Then they may be dried according to one of the three methods that follow.

After drying, foods should be cooled, tested for any sign of moisture (see [chapter 5](#), Testing and Storing Dried Foods), then stored and labeled.

Three methods of drying are recommended for each of the foods listed in this book. Each method has its advantages and its disadvantages. The method you choose will depend upon the climate and the environment in which you live, your finances, and the amount of drying you'll be doing.

The three recommended methods are:

### Dehydrator

Drying foods was once a simple procedure. The food was harvested and spread out in the sun to dry. After a few days, it was brought inside and stored for the winter. The results weren't always perfect. Sometimes the food spoiled before it dried. Dried fruits had a tendency to turn brown and hard.

Sometimes dried vegetables were tough and stringy. Dried meats resembled well-tanned shoe leather. But once they were refreshed and cooked, sun-dried foods were quite acceptable, especially when good cooks came up with such dishes as *Dried Apple Pie* and *Fruitcake*.

Times have changed, however, as have our environments. Some of us live in the cities, where there are no expanses of unfiltered sunlight in which to dry foods, and where dust and chemicals and other pollutants will contaminate any foods spread out to dry. Some of us live too close to the leaded fumes of highways, to railroad tracks, and in the pathways of insecticide sprays. Some of us live in climates too sunless, too humid, or too cold. We cannot depend on the sun to dry our food.

Our tastes have changed. We have become accustomed to snowy white dried apples and bright orange dried apricots. Our palates have been educated. We no longer want our dried foods to taste like dried foods.

To accommodate our changed living conditions and our educated palates, dehydrators have been designed to dry our food with speed, efficiency, and a minimum of trouble.

To dry foods in an electric dehydrator, it is only necessary to prepare the food, fill the trays, and turn it on. The best dehydrators have thermostatically controlled heat settings and fans which blow warm air over the foods. A well-designed dehydrator will automatically control heat and air flow so that it is almost impossible to overdry or scorch the food being dried.

Many foods do not even need to be pretreated before drying in a dehydrator because the forced air dries the surface of the food before it can discolor. But with many foods, some forms of pretreatment are required for best results.

The price of a good dehydrator will vary depending on its size, the construction materials, and its design. For those who would dry a large portion of their food supply, an electric dehydrator could be a good investment, roughly equivalent to the cost of a household's supply of canners, canning jars, and other equipment needed for canning.

A dehydrator should be used indoors in a dry, well-ventilated room. A kitchen is not necessarily the best place, since the humidity often caused by cooking hinders its operation.

To operate an electric dehydrator, just plug it into a 110-volt outlet and preheat to the desired temperature while the food is being prepared for drying. Recommended temperatures are 115°F (46°C) for uncooked fruits, 120°F (48°C) for vegetables and some cooked fruits, 110°F (43°C) for leafy herbs, 140°F (60°C) for meat, and 115°F (46°C) for grains.

Estimated drying times and exact temperatures are included in the specific drying instructions for each food in the sections that follow. All drying times listed for foods are estimates. Exact times will depend on the efficiency of your dehydrator, the humidity of the air in the room, and the amount of moisture in the food.

As stated, some form of preparation is needed for most foods. Many must be peeled because the drying air cannot penetrate the skin. Slicing or chopping helps expose more surface to the warm moving air, speeding the drying process and producing better results. Some foods must be blanched or dipped to retard discoloration and enzyme growth, which would cause loss of flavor and nutrients. The pretreatment of foods before drying is covered in detail in [chapter 4](#), To Pretreat or Not To Pretreat.

To begin the drying process, spread the prepared foods evenly over the dehydrator trays in a thin layer. Different foods may be dried at the same time, but very moist foods should not be dried with almost-dry foods. Foods with very strong odors or flavors should be dried alone. Foods that have been pretreated with sulfur fumes should never be dried in a dehydrator.

Food should be examined and stirred or turned at least once while drying. At the same time, the trays should be rotated, front to back, side to side, and top to bottom. As the drying progresses, the



food will shrink and you will be tempted to consolidate trays and add more food to the dehydrator. You may do so, but it will lengthen the drying time to crowd the almost-dry foods on the trays. It is better to wait until the first batch is completely dried before adding more food to the dehydrator.

Dehydrator drying is so trouble-free you can leave the dehydrator operating overnight or while you're away from home. If your days are busy, you can load the dehydrator in the morning before you leave for work and let it run all day with complete safety. If a dryer load is almost dry at bedtime, just turn the heat down to 105°F (41°C) or 110°F (43°C) and go to bed. By morning the food will be ready to store.

To help you dry foods in a dehydrator, you'll need knives, a strainer, and maybe a blender. If you want to make leather, you'll need some plastic wrap or a special leather-making sheet. Dehydrators come complete with their own trays.

## Sun

If you are blessed with clean air, low humidity, and an abundance of hot, sunny days, sun drying is the least expensive and simplest method of preserving foods. The advantages to sun drying are obvious. It's absolutely free. It does not require an outlay for electricity. There isn't even an investment in equipment. All the necessary equipment can be made at home.

If you live where sun drying is practical, by all means try it. Drying in the sun is unpredictable unless temperatures are over 100°F (38°C) and the relative humidity is low. If the temperature is too low, humidity too high, or both, spoilage (souring or molding) will occur before drying is achieved. The climate in the Northeast does not lend itself to successful sun drying. Even if your location is marginal, you can use the sun when possible, then fall back on a dehydrator or the oven to finish off a batch on those days when a sudden rainstorm or a low cloud ceiling hampers your sun-drying operation.

Because sun drying is slower and the food is exposed for a longer period of time, pretreating is more important than for drying in a dehydrator. Specific instructions are listed in [chapter 4](#). *Sun drying is the only method recommended for fruits that have been sulfured.*

After pretreating, foods to be sun dried are spread over the drying trays and placed in a well-ventilated place in full sun. Foods that are attractive to birds and insects must be covered with a layer of cheesecloth propped up to keep it from touching the food.

Every few hours during the drying period, the food should be turned or stirred to expose all surfaces to the sun. Take trays inside at night to prevent the foods from reabsorbing moisture from dew. Any time out of the sun, of course, is "down time" and is not included in the drying time estimates.

All drying times given for sun drying under specific foods are estimates since the time required for any one food will vary depending on the temperature, the amount of sunshine, the humidity in the air, the amount of air movement, and the amount of moisture in the food.

To dry foods in the sun, you'll need a number of drying trays, preparation equipment, such as knives, a peeler, a strainer or blender, plastic wrap for making leathers, cheesecloth for covering foods, and containers for storage.

Drying trays may be cookie sheets or homemade wooden trays, but drying is speeded if air is allowed to circulate freely around the food, so trays made of fiberglass or stainless steel screening work best. Do not use galvanized screen. It will contaminate the food. And be careful about those wooden trays. The odors of such woods as pine and cedar will transfer to the food being dried on them.

Wooden drying trays should be well sanded and sealed with mineral oil.

Unlike other drying methods, there is no capacity limit in sun drying. The only limit to the amount of food which can be dried at one time is the number of trays available.

Before storing, foods dried in the sun should be placed in an oven set at 125°F (52°C) for 30 minutes to kill any insect eggs that may have been deposited on them, or they may be stored in glass or metal containers and set in the freezer for a day or two.

## **Oven or Homemade Dryer**

For drying small amounts of food or in an emergency when rain brings the sun-drying operation to a halt, a conventional oven may be used for drying foods.

Depending on its design and size, a homemade dryer also may be used for drying foods in large or small batches. Some homemade dryers may do the job almost as well as commercial dehydrators.

Drying foods in an oven sometimes is better than sun drying, because it is possible to have controlled, even temperatures, but it has the disadvantage of poor air circulation, and air movement is necessary for even drying. Air circulation can be improved by leaving the door ajar a few inches and placing an electric fan in front of the door, positioned so it will blow away the moist air as it accumulates.

Although commercial drying trays are available for use in an oven, homemade trays may be made of wooden frames and nylon screening. Tray sizes will depend on the oven size and must provide for circulation of air. There should be 1 inch (2.5 cm) of space on each side, 3 inches (7.5 cm) at the top and bottom, and 2½ inches (6.5 cm) between the trays.

You'll also need a thermometer that registers from 100°F (38°C) to 150°F (66°C), preparation tools, such as knives, a peeler, a strainer or blender, plastic wrap, and storage containers.

To dry foods in an oven or homemade dryer, load the trays sparsely with a thin layer of food on each tray. Different foods may be dried at the same time, but foods with different moisture content or with strong flavors or odors should not be dried together.

Using a large, easily read thermometer on the top shelf, warm the oven or dryer to the specified temperature. Place trays in the warm oven or dryer, leaving the door ajar. Set the electric fan in front of the door, as directed, to dispel moist air. Dry according to directions under each food, stirring or turning the food occasionally, and rotating trays top to bottom, front to back, and side to side every 2 to 3 hours.

Foods dried in an oven or homemade dryer must be watched more carefully than those in the sun or in a commercial dehydrator.

## **Microwave Oven**

Microwave drying is not recommended by some oven manufacturers, as removing all of the moisture from the oven creates what's known as a "no-load" situation that can damage the machine's magnetron tube over time.

Microwave drying can also cause a "volcanic effect." That is, the food feels very hot and dry on the outside, but is still moist on the inside. If stored, this moisture can turn into mold or cause the food to become rancid. In addition, the intensity of a microwave makes it very easy to overdry foods, resulting in a burned or charred flavor. Some foods, such as herbs, may even catch on fire.

So while it is possible to dry foods in a microwave oven, it is not always wise. Be sure to consult

your machine's instructions before attempting to use it to dry foods or herbs.

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## CHAPTER THREE

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# Buying a Dehydrator



Like other kitchen appliances, home food dehydrators come in an array of sizes, shapes, and colors, with a wide assortment of features. There are small-batch dehydrators styled for the apartment kitchen and floor model dehydrators big enough for the farm garden. The size of the heating element varies from 165 to 1,000 watts or more. Some are vented; some are not.

But unlike purchasing other kitchen appliances, you may have to make your choice without trying out — or even seeing — the food dehydrators available. Comparison shopping is rarely possible because most dehydrators are sold by mail, not by your hometown appliance dealer and only a few brands offer a no-risk trial period. It isn't even possible to depend on the reputation of a manufacturer you know and trust, since you may not be familiar with the companies making them.

Before you decide what to buy, write to several manufacturers and find out about the materials, the construction, the dimensions, the size and type of heating elements, and fans of several models. Specifically ask for construction details about the fan and airflow, the trays and the door. You'll get brochures, but some of them contain more adjectives than facts.

Ask for a copy of the guarantee; then, if necessary, ask for an explanation of the wording. Most mail-order dehydrators come with a limited one-year warranty against defective parts, but do not promise to pay labor costs.

To help you sort out this maze of sizes, features, and guarantees, here are some features to consider when selecting a food dehydrator.

### Safety

Always look for safety, specifically the Underwriters Laboratories (UL) seal. Found on either a hang-tag or decal, the UL seal means the appliance has met the Laboratories' safety standards. It is your assurance the dehydrator is safe from fire and shock hazard.

### Size

Models can weigh between 8 and 35 pounds (0.25 and 16 kg), range in size from 8 to 15 inches high (20 to 38 cm), 11 to 22 inches (28 to 56 cm) wide, and 17 to 23 inches (43 to 58 cm) deep. Some are round or oval, others rectangular with or without rounded corners. Whatever size you choose, make sure you have the space to accommodate one. A few extra inches in size may seem unimportant, but on a kitchen counter with little work space to spare, size is critical.

When choosing the size, also consider the square feet of drying space. Do you want only two trays or ten trays in the same amount of space? How much food will you be drying? As a rule of thumb, *12 square feet (1 sq m) of drying area is sufficient for a half-bushel of vegetables.*

## Airflow

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The key to a dryer's performance is the fan or blower used to distribute warm air evenly and to help draw off the moisture-laden air. Most models' fans tend to be side- or bottom-mounted. Side-mounted, or horizontal airflow fans tend to dry foods more evenly and require less attention than bottom-mounted styles which can require a considerable amount of tray rotation as foods closest to the fan dry faster than those at the top.

Some dryers have warm air that can be recirculated to reduce the amount of energy used by the appliance; others have the additional feature of having air recirculate or not, as you wish. If you do not want the flavors of the items you're drying (like onions and fruit leathers) to mingle, you should not use the recirculating feature.

An air vent design that allows for the escape of the moist air on one side while it pulls in dry air from the other produces excellent results in a shorter period of time. Many units have no venting systems, but rely on the escape of moist air around loosely fitting doors.

## Trays

Trays vary in number and construction. They can be made completely of plastic or a combination of plastic, metal, wood, or plastic-coated fiberglass. Regardless of material, trays should have sturdy lightweight frames. Screens of heavy plastic are safer and easier to clean than metal ones. Metal can corrode from the sulfured food, tends to hold heat, and can scorch food easily at the end of the drying process.

In their search for a lightweight, nontoxic material on which to place food, most manufacturers have settled on some form of plastic in one of two styles. The first style is made of a plastic screen embedded in a plastic or aluminum frame. The single-piece construction makes this style sturdy, but the grooves in which the screen is embedded tend to be tough to clean. These one-piece trays must also be handled with both hands when loaded with food — a difficult feat when the trays must be juggled in order to open the dryer door.

The other choice is two-piece trays. These consist of a square of plastic mesh placed on top of a plastic frame. Two-piece trays are indeed easier to clean, but their flexibility makes them hard to handle when loaded.

Regardless of what style you choose, make sure the trays are well spaced, at least 1 inch (2.5 cm) apart. They should slide in and out easily without catching, which can cause spillage when trays are full.

Most instruction sheets and books accompanying dehydrators emphasize that the rotation of trays is not necessary with their models because of advance design or a special airflow system. Results are better, however, no matter what model is used, when trays are rotated, front to back, side to side, and top to bottom, at least once during the drying period. In addition, drying is aided by stirring or turning over the pieces of food at least once or twice.

## Doors

Today, not all dryers have doors, most notably stackable models. But for those that do, it is important to have a solidly constructed door that opens easily and offers unobstructed access to trays. Some styles of dryers offer doors that can be removed completely during loading and unloading. Older styles tend to be hinged and swing down from top to bottom. Regardless of style, the best doors are

simple, but functional.

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It is also worth noting that if it should ever be broken, the door could be replaced easily.

## **Controls**

The drying unit should feature a clearly marked, adjustable thermostat control that indicates the temperature. Also look for a control setting to adjust the side vents for airflow control as well as an enclosed heating element. Some models also include a built-in automatic timer, a helpful feature if you don't already own a timer.

## **Cabinets**

Outside cabinets are made from a variety of both heavy and light materials: aluminum, steel, high impact plastic, wood, or steel with woodgrain vinyl covering. Ask yourself...is it light enough to carry around if I have to move it frequently? Is it easy to keep clean? Does it fit on my countertop? Where will I store it? How well insulated is the cabinet? (Look for double-wall construction.) Keep in mind that wood can warp, absorb odors, and harbor bacteria. Also remember that dehydrator cabinets are measured to indicate needed counter space, not food capacities.

## **Cost of Operation**

To calculate the cost of operation of a unit, use the following formula: wattage of appliance, divided by 1,000, times the local rate per kilowatt hour. For example, a 1,050 watt dryer in an 8 cent per kilowatt hour area would cost a little over 8 cents an hour to run. Remember a three-pronged plug insures proper grounding.

## **Final Thoughts**

Some final things to think about when buying a dehydrator include:

- Noise level may seem minor when choosing a dryer, but be aware that in a kitchen setting the additional noise of a dehydrator fan may be noticeable.
- The best temperature is not always the one recommended by the manufacturer. As a result, you may have to do some experimenting.
- In spite of the convenience of dehydrators and the quality of the food they produce, the size of the units, the constant noise of the fans, and the humidity they add to the air in an already humid room can be a little overpowering in a small kitchen. Most manufacturers' directions specify that they should not be used outdoors, but if you're buying a dehydrator, you might look for a spot on an enclosed back porch, a utility room, or even a spare bedroom. A small metal utility table on casters is ideal for holding a dryer and for moving it from one room to another.

Finally, look for an automatic shut-off device in case of overheating; at least a year's guarantee on workmanship and parts; and a nearby factory-authorized representative for repair.

## CHAPTER FOUR

# To Pretreat or Not To Pretreat

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There are as many arguments for and against the need to pretreat fruits and vegetables before drying as there are foods to be dried. The truth is, some foods need pretreating; some do not.

Here are the arguments for and against pretreating, plus some opinions of my own.

### For Pretreating

One of the most important substances in any fruit or vegetable is the natural enzyme. It is the catalyst that causes the plant to sprout from a seed, to develop a stem and leaves, and finally, to fruit. The enzyme causes the fruit to ripen, but the enzyme action doesn't stop then, or even when the fruit is picked. Unless it is stopped, the fruit will overmature and finally decay.

Drying foods does not stop enzymatic action. Like freezing, drying only slows it down. Some foods keep well without pretreatment, but others will continue to deteriorate in color, flavor, texture, and nutrients for months after they are dried unless they are treated. Just as in freezing, untreated vegetables tend to become tough and strong-flavored after a period of storage, and without pretreatment, some fruits — apples, bananas, peaches, and apricots — may darken considerably before and during drying, especially in sun drying. While this darkening in itself does not spoil the fruit, it is an indication that there is enzymatic action still at work on the flavor and nutritional value of the food as well as the color.

Vegetables may be pretreated before drying, just as they are before freezing, by blanching in boiling water or steam. Blanching is a method of cooking the food for a short time, just long enough to halt the natural enzymatic action. It is a form of quick, incomplete cooking.

Fruits usually are not blanched, because it spoils their fresh flavor, and their acid content makes this precaution unnecessary. Fruits may be dipped in a solution containing salt, ascorbic acid, or fruit juice to prevent darkening. Fruits also may be pretreated with sulfur fumes to keep their color bright.

Instructions for all these methods will follow.

### Against Pretreating

Some people who have years of experience in drying foods claim that pretreating is unnecessary if the foods are prepared properly and dried quickly. They say that foods should be cut into small pieces to expose as much surface as possible to the air and that it is important to have good circulation of air, whether drying is done in the sun or with artificial heat.

Furthermore, they say foods retain more of their natural nutrients and digestive enzymes when they are dried without pretreatment. They argue that blanching cooks the foods and that other methods, such as dipping and sulfuring, add undesirable chemicals to the foods.

Our choice is to select from the best of both methods. Although it is a good idea to keep food

drying as natural as possible, some foods require pretreating in order to keep their fresh taste and food values.

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Although we do not recommend submitting fruits to sulfur fumes, we have included directions for doing so if you wish. And we agree that results are better with some fruits when they are dipped in fruit juice or an ascorbic acid solution.

Some vegetables, such as peppers and onions, retain their color and flavor best without blanching, but some, such as broccoli, Brussels sprouts, and green, leafy vegetables, fade and become strong-tasting if they are not pretreated before drying. Carrots and other root vegetables may be dried in the sun without pretreating — although they tend to become tough if they are dried in a dehydrator.

## Pretreating Methods

Blanching is a method of heating the food (usually vegetables) just to the point of inactivating the enzymes without cooking the food through. Steam or water is used. Steam blanching preserves more of the vitamin and mineral values of the food, but requires a longer processing period. It also requires occasional stirring and careful watching to be sure the steam circulates around all the pieces and penetrates them to the center. Although there is more vitamin loss in water blanching, it requires less time and less special equipment.

Blanching as a pretreatment before drying is much the same as blanching as a pretreatment before freezing. After blanching, chill the food in ice water to stop the cooking action, drain, pat dry with paper towels, and place directly on the drying tray.

**Steam Blanching:** Bring to a boil about 2 inches (5 cm) of water in a steamer, a blanching kettle, or a deep pan with a tight-fitting lid. Place vegetables loosely in a wire basket or colander and spread out as much as possible, preferably one layer deep. Place basket in pan. Vegetables should be above water level, but steam should circulate well through the pieces.

Put a lid on the pan and keep heat high enough for water to boil rapidly. Use a timer and steam for the length of time specified for each vegetable. After blanching, cut up vegetables and chill in ice water to stop the cooking action. Drain, pat dry with paper towels, and place on drying trays. For high altitudes, add 1 minute for each 2,000 feet (607 meters) of elevation.

**Water Blanching:** Fill a blancher or a large pan two-thirds full of water. Use about 1 gallon (4 litres) of water to 1 pound (400 grams) of vegetables. Place vegetables in a wire basket or a cheesecloth bag or place directly in boiling water. Cover and boil for the length of time specified in the directions. Drain and cut up vegetables. Chill in ice water to stop cooking action, drain, and pat dry. Place on drying trays. For high altitudes, add 30 seconds to the time specified for each 2,000 feet (607 meters) of elevation.

**Salt Water Dip:** Dissolve 6 tablespoons (90 ml) flaked pickling salt in 1 gallon (4 litres) of lukewarm water. To keep fruit from darkening, slice or chop it directly into the water. Allow it to soak no more than 5 minutes or fruit will absorb too much water and acquire a salty taste. Drain before loading drying trays. This is not recommended for a low-sodium diet.

**Ascorbic Acid Dip:** Ascorbic acid is a form of vitamin C. Dissolve 2 tablespoons (30 ml) of ascorbic acid crystals, 2 tablespoons (30 ml) ascorbic acid powder or 5 crushed 1-gram vitamin C tablets in 1 quart (1 litre) of lukewarm water. Slice or chop fruits directly into the solution. When 1 or 2 cups (250 or 500 ml) of fruit has accumulated in the container, give it a stir and remove the fruit



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