

## Food Drying Basics

Drying is the oldest method of preserving food. The early American settlers dried foods such as corn, apple slices, currants, grapes, and meat. Compared with other methods, drying is quite simple. In fact, you may already have most of the equipment on hand. Dried foods keep well because the moisture content is so low that spoilage organisms cannot grow.

Drying will never replace canning and freezing because these methods do a better job of retaining the taste, appearance, and nutritive value of fresh food. But drying is an excellent way to preserve foods that can add variety to meals and provide delicious, nutritious snacks. One of the biggest advantages of dried foods is that they take much less storage space than canned or frozen foods.

Recommended methods for canning and freezing have been determined by research and widespread experience. Home drying, however, does not have firmly established procedures. Food can be dried several ways, for example, by the sun if the air is hot and dry enough, or in an oven or dryer if the climate is humid.

With the renewed interest in gardening and natural foods and because of the high cost of commercially dried products, drying foods at home is becoming popular again. Drying is not difficult, but it does take time and a lot of attention. Although there are different drying methods, the guidelines remain the same.

Although solar drying is a popular and very inexpensive method, Illinois does not have a suitable climate for it. Dependable solar dehydration of foods requires 3 to 5 consecutive days when the temperature is 95 degrees F. and the humidity is very low. The average relative humidity in central Illinois on days with 95 degrees F. temperatures is usually 86 percent. Solar drying is thus not feasible.

Drying food in the oven of a kitchen range, on the other hand, can be very expensive. In an electric oven, drying food has been found to be nine to twelve times as costly as canning it. Food dehydrators are less expensive to operate but are only useful for a few months of the year. A convection oven can be the most economical investment if the proper model is chosen. A convection oven that has a controllable temperature starting at 120 degrees F. and a continuous operation feature rather than a timer-controlled one will function quite well as a dehydrator during the gardening months. For the rest

of the year it can be used as a tabletop oven.

## **GUIDELINES**

### **Speed**

For a good-quality product, vegetables and fruits must be prepared for drying as soon as possible after harvesting. They should be blanched, cooled, and laid out to dry without delay. Foods should be dried rapidly, but not so fast that the outside becomes hard before the moisture inside has a chance to evaporate.

Drying must not be interrupted. Once you start drying the food, don't let it cool down in order to start drying again later. Mold and other spoilage organisms can grow on partly dried food.

### **Temperature**

During the first part of the drying process, the air temperature can be relatively high, that is, 150 degrees to 160 degrees F. (65 degrees to 70 degrees C.), so that moisture can evaporate quickly from the food. Because food loses heat during rapid evaporation, the air temperature can be high without increasing the temperature of the food. But as soon as surface moisture is lost (the outside begins to feel dry) and the rate of evaporation slows down, the food warms up. The air temperature must then be reduced to about 140 degrees F. (60 degrees C.).

Toward the end of the drying process the food can scorch easily, so you must watch it carefully. Each fruit and vegetable has a critical temperature above which a scorched taste develops. The temperature should be high enough to evaporate moisture from the food, but not high enough to cook the food. Carefully follow directions for regulating temperatures.

### **Humidity and Ventilation**

Rapid dehydration is desirable. The higher the temperature and the lower the humidity, the more rapid the rate of dehydration will be. Humid air slows down evaporation. Keep this in mind if you plan to dry food on hot, muggy summer days. If drying takes place too fast, however, "case hardening" will occur. This means that the cells on the outside of the pieces of food give up moisture faster than the cells on the inside. The surface becomes hard, preventing the escape of moisture from the inside.

Moisture in the food escapes by evaporating into the air. Trapped air soon takes on as much moisture as it can hold, and then drying can no longer take place. For this reason, be sure the ventilation around your oven or in your food dryer is adequate.

### **Uniform Drying**

Drying the food evenly takes a little extra effort and attention. Stirring the pieces of food frequently and shifting the racks in the oven or dryer are essential because heat is not the same in all parts of the dryer. For the best results, spread thin layers of uniformly-sized pieces of food on the drying racks.

### **NUTRITIVE VALUE**

Dried fruits are a good source of energy because they contain concentrated fruit sugars. Fruits also contain a rather large amount of vitamins and minerals. The drying process, however, destroys some of the vitamins, especially A and C. Exposing fruit to sulfur before drying helps retain vitamins A and C. Sulfur destroys thiamine, one of the B vitamins, but fruit is not an important source of thiamine anyway. Many dried fruits are rich in riboflavin and iron.

Vegetables are a good source of minerals and the B vitamins thiamine, riboflavin, and niacin. Both fruits and vegetables provide useful amounts of the fiber (bulk) we need. Save the water used for soaking or cooking dried foods because this nutrient-rich water can be used in recipes to make soups, sauces, and gravy.

## **TYPES OF FOOD TO DRY**

Many kinds of fresh fruits, vegetables, herbs, meat, and fish can be dried. If you have never tried drying food before, though, it's a good idea to experiment first by drying a small quantity in the oven. This way you can see if you like the taste and texture of dried food. At the same time, you can become familiar with the drying process.

]Fruits are easier to dry than vegetables because moisture evaporates more easily, and not as much moisture must be removed for the product to keep. Ripe apples, berries, cherries, peaches, apricots, and pears are practical to dry.

Vegetables that are also practical to dry include peas, corn, peppers, zucchini, okra, onions, and green beans. Produce from the supermarket is usually more expensive and not as fresh as it should be for drying. It is a waste of time and energy to dry vegetables such as carrots that can be kept for several months in a cool, dry basement or cellar.

Fresh herbs of all types are suitable for drying. The parts of the plant to dry vary, but leaves, seeds, or blossoms usually give the best results.

Lean meats such as beef, lamb, and venison can be dried for jerky. Fish also is excellent when dried. Certain foods are not suitable for drying because of their high moisture content. Lettuce, melons, and cucumbers are a few foods that do not dry well.

## **SUCCESSFUL DRYING**

Don't be surprised to find a variety of suggestions for drying methods, temperatures, and lengths of time. The drying process is simply not as precise as canning and freezing because it involves so many different factors. You may need to use a trial-and-error approach to find what suits you best. Whatever method you use, be sure to remove enough moisture from the final product so that spoilage organisms cannot grow.

When you dry foods, remember the following:

Cleanliness and sanitation are essential.

The flavor of dried fruits and vegetables will be somewhat different from that of their fresh, canned, or frozen counterparts.