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DRYING

FRUITS

*and*

VEGETABLES

EXAMINED AND CHECKLISTED



Extension Service · Colorado State College

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# Drying Fruits and Vegetables

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These are days when the thrifty homemaker has her eye on the extras from the garden, the surplus fruits and vegetables. Some of the surplus will be canned, some will be frozen, and other products will be stored. Still others can very profitably be dried.

Drying is a simple and practical method of preserving fruits and vegetables for winter use. This is especially true in Colorado because of its plentiful sunshine and dry air. Drying is simple and requires so little outlay for equipment.

Fruits and vegetables lose some vitamin A, much thiamin or B<sub>1</sub>, and most of the ascorbic acid or vitamin C, and if the dehydration period is prolonged these losses may be serious. Sun drying has been found more destructive than artificial dehydration. Though some vitamin values are lost during drying, the product is still valuable as a source of food.

The aim in drying any food is to remove enough moisture to insure keeping, and to preserve the food value with as much of the natural flavor and cooking quality as possible.

## Selection and Harvesting

Good-quality, dried fruit depends on the use of ripe, firm, good-quality, fresh food. Vegetables for drying should be fresh, young, and tender.

Apples, pears, peaches, apricots, cherries, plums, and berries are the best fruits for drying. Corn, mature beans and peas, celery, squash, pumpkin, okra and greens, such as spinach, vegetable-soup mixtures, and green beans are some of the most popular vegetable products for drying. See time and temperature chart for further directions.

## Preparation for Drying

1. **Sort and clean products carefully.** One poor fruit or vegetable may give off flavors to the entire lot. Keep cutting knives and boards clean.

2. **Quick handling and drying is desirable.**

3. **Peel, slice, or cut product for quick drying.** Do not slice much thinner than one-fourth inch. Uniformity makes for quick and even drying.

4. **Steam or scald vegetables or fruit to retain color and flavor.** Some foods change color and flavor considerably during drying. To decrease this, steam or scald before they are dried. This preserves the natural color, softens the tissue, and prevents further ripening. The material may be placed in a cloth sack, piece of cheesecloth, or wire basket and suspended in steam above boiling water inside a closed vessel. The blanching time in the table is for 5,000 feet or above. For altitudes lower than 5,000 feet the time should be shortened. It is important that the food in the basket should be hot to the center.

The pressure cooker, **with petcock open**, is an excellent device for steaming. A thin layer of prepared food in a wire basket suspended

## PREPARING AND DRYING FOOD<sup>1</sup>

Item	Selection of Material	Preliminary Preparation	Time in minutes for basket-blanch	Special treatment†	Maximum drying temp.	Characteristics of dried product
Apples	Sort—hard ripe	Wash, peel, core, trim Slice	Steam‡ 10 min.	Steam blanch immediately upon slicing, or sulfuring	150°F.	Springy to brittle
Apricots	Sort—firm ripe	Wash, halve, pit, peel if desired*	Steam‡ 10 min.	Sulfur if desired	140	Leathery
Beans, snap	Mature, but not tough; suitable for table use; free from strings	Wash, stem Cut if desired	Steam 20 min.	.....	150	Brittle. Tough if over-mature
Beets	Approx. same size	Wash, leave ½ inch of stems on. Precook, peel, then slice, shred or cube	Omit	Precook till done	150	Slices or shreds, brittle; cubes, hard
Beet greens	Unwilted tender leaves	Wash and stem Use whole leaves	Steam 5 min.	May be pressed into thin plates just before becoming brittle	150	Crisp
Broccoli	Buds, tender leaves and stems	Wash, and inspect carefully Halve or quarter lengthwise	Steam 15 min.	.....	130	Buds, brittle Tough stem
Cabbage	Crisp, solid heads	Trim Slice or shred	Steam 12 min.	May be pressed into thin plates just before becoming brittle	140	Crisp to brittle
Carrots	2 inches or more crown diameter, unwilted	Wash, scrub skin with brush Slice or quarter lengthwise	Steam 8 to 12 min.	.....	100	Brittle or hard
Celery, leaves	Green tender leaves, unwilted	Wash Leave whole	Steam 15 min.	.....	140	Crisp
Celery, stalks	Tender stalks	Wash, trim Slice or shred	Steam 15 min.	.....	140	Tough to brittle
Cherries, sour	Sort—ripe fruit	Pit and drain	Steam 3 min. or none	.....	130	Tough
Corn, sweetcorn	Mature but not hard	Husk (cook on cob) Leave on cob or cut from cob	Cook on cob 15 to 20 min.	If dried on cob it should be shelled when kernels become brittle	150	Hard and brittle
Corn, hominy	White or yellow shelled field corn	Prepare hominy Leave whole or cracked	Already cooked	.....	150	Hard and brittle
Pears	Firm ripe	Wash, peel, core Halve or quarter	Steam‡ 5 min.	Sulfur if desired	140	Leathery
Peas	Mature but not hard, unwilted	Shell, wash, and clean Leave whole	Boiling water 3 min. Steam 5 min.	.....	140	Hard, wrinkled
Peppers, green	Heavy meated	Halve, core, and wash Leave in halves or quarters	Steam 10 min.	May be pressed into thin plates before becoming brittle	150	Brittle to crisp
Plums	Ripe but firm	Wash Leave whole or halve	Steam 6 min. or hot lye-dip 3 min.	See‡	140	Tough
Potatoes	Fully mature or stored 60°F.	Wash, peel, slice, shred or cube, or cook in chunks. Slice, shred, cube or rice‡	Steam‡ 20 min.	Riced should be pre-cooked in chunks‡	150	Brittle
Pumpkin or squash	Mature	Wash, stem, cut open, seed, peel Cube, slice or shred	Steam 15 min.	.....	150	Tough
Spinach	Unwilted	Trim off roots, wash repeatedly Use whole leaves	Steam 2 to 3 min.	.....	160	Crisp
Tomatoes	Firm ripe	Wash, peel, trim Slice	Steam 3 min. or none	.....	140	Brittle
Turnips or Rutabagas	Sound and unwilted	Wash and peel Slice, cube, or shred	Steam 7 min.	.....	150	Tough to brittle

<sup>1</sup>This chart was prepared by W. Pyke and L. Charkey, Colorado Experiment Station.

\*Apricot or peach halves immediately upon pitting may be steamed upon a rack until the skins lift away from the flesh. Steaming promptly after halving overcomes almost completely the tendency of the fruit to brown. If peaches or apricots are not peeled, they should invariably be treated in burning sulfur fumes for 15 to 30 minutes. If they have been steam-peeled, sulfuring is optional.

‡Prompt steam treatment of products that tend to darken in air after cutting will overcome the darkening tendency and tend to conserve more of the nutritive value. Sulfuring will also correct darkening. Sulfuring preserves vitamin C but destroys much of vitamin B<sub>1</sub>. In foods rich in vitamin C but low in vitamin B<sub>1</sub>, sulfuring is both a preservative and conservation measure. Apricots, peaches, pears, and apples are often sulfured. Potatoes are sometimes sulfured.

‡If potatoes are to be riced for drying, they should be precooked until done, then riced directly upon the drying trays.

†During drying when the product becomes highly wilted and shrunken, it is an economy to turn or stir to expose new surfaces to the warm air. When large pieces are being handled, as in case of whole plums or cherries or halved apricots, peaches, or pears, it is very important to turn them.

§Whole prunes should be blanched by dipping in boiling 1 percent lye solution for 3 minutes. Rinse lye solution before tray-drying. Blanching baskets constructed from wire mesh (hardware cloth) may not be used in such lye treatment. An alternative method is to wash the plums in soda solution, then steam blanch for 6 minutes. Small native plums, for instance the Blue Damson, should be halved and stoned after blanching because of the relative size of the stone to the meat. When sugar is scarce this is an excellent method for preserving native plums.

over briskly boiling water for the desired time is recommended.

5. **Control darkening of fruits and vegetables.** If not able to blanch immediately, products that tend to darken should be held under cold water. Examples are apples, apricots, peaches, pears and potatoes. Cold water is effective if the product is not held under it too long. Water containing a little citric acid (one-fourth teaspoon of citric acid to a gallon of water) is better than cold water alone. If unable to obtain citric acid, a weak salt solution (two tablespoons salt to one gallon of water) is better than cold water alone.

6. **Sulfuring.** Use one level teaspoonful sulfur for each pound of prepared fruit (do not use too much sulfur). An easy way to use sulfur is to take a No. 2 tin can and have the sulfur to the depth of  $\frac{3}{4}$  inch in the bottom. Place the can in a pan containing sand. The sulfur may be previously melted on the stove. Light the sulfur and remove the match stub or any other inflammable material, for if this is not done the sulfur will not burn long enough. Either a barrel or a heavy cardboard box will make a good sulfuring chamber. Suspend the fruit inside the sulfuring chamber in a wire basket. Leave the required length of time.

### Methods of Drying

Food is dried by the heat of the sun or artificial heat or a rapid air current.

**Drying in the Sun.**—The oldest and simplest method of drying is to place the material in the sun. Bright, hot, sunny days with a slight breeze are best. A screen door or window screen can be taken from the house and placed upon chairs in the yard. The screen should be covered with cheesecloth and the food spread out in a thin layer on the cloth. Cheesecloth or mosquito bar should be spread over the material to be dried to protect it from flies and other insects. The material should be stirred several times during the day. It should be taken into the house at night and placed in the sun again the next day.

Beans, peas, corn, squash, pumpkins, tomatoes, peppers, apples, apricots, peaches, and berries may be dried in this manner. Before storing, sun-dried products should be placed in a warm oven for 20 minutes. Keep oven below scorching temperature, not over 150° F. This is done to complete drying by artificial heat and to destroy any germs that may have collected during the drying period.

**Artificial Heat.**—Artificial heat is a good means of drying food products. Different types include oven drying, and heat from electrical or gas appliances. The oven can be used for drying but care should be taken to keep the oven heat low and steady and to stir often to assure even drying. Leave the oven door partially open to allow the escape of moisture.

Heat from the top of the stove may be utilized in drying by the use of simple racks or trays to set or hang above the stove.

Home dehydrators can be built to use electricity or gas heat units. If electric heating units cannot be obtained, light globes will prove a satisfactory source of heat.

**Rapid air current** is obtained by the use of forced air over the product that is being dried. This can be done without the presence of heat, but the most effective means of dehydrating or drying is where heat and moving air are used in combination.

**Use of Thermometer.**—In dehydrating or drying where controlled heat is used it is important that the heat be kept low enough so that the food will not scorch. Temperatures should be according to those given in the table. A candy thermometer is satisfactory for checking on temperatures. A dairy thermometer may also be used if the temperature range is high enough. Care should be taken when using a dairy thermometer to insure that the drying heat does not exceed the temperature range on the thermometer.

### Storage and Care

1. Carefully inspect the product after it is dried.
2. Pack as soon as it is cool.
3. Store in vapor-proof containers; tin cans or glass jars with tight lids are satisfactory.
4. Store in a cool, dark, dry place. Exposure to light affects color.

### Preparation for Table Use

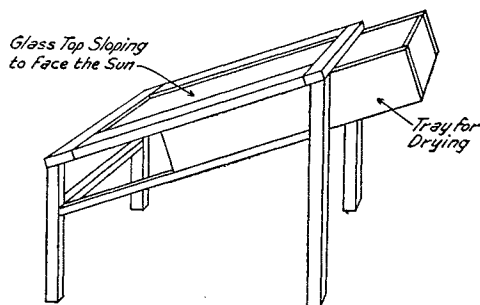
1. **Soak the product in water.** Generally one hour soaking before cooking is sufficient for vegetables. With fruits a longer time is necessary, depending upon size of pieces; overnight is generally long enough. Greens, dried and powdered, are in a very concentrated form. To each cup of puree, allow  $\frac{1}{2}$  teaspoon of the powder. Soak in cold water for  $\frac{1}{2}$  hour or longer before adding to the other ingredients.

2. Cook in the water used for soaking. Simmer. **Do not boil.** As soon as tender, cease cooking, as like fresh products, they become over-cooked and texture, flavor, and food content are destroyed.

**Vegetable Powders.** — To make a cream soup, scald milk, add vegetable powder (soaked) and enough flour and butter rubbed together to thicken slightly. Season and let heat thoroughly.

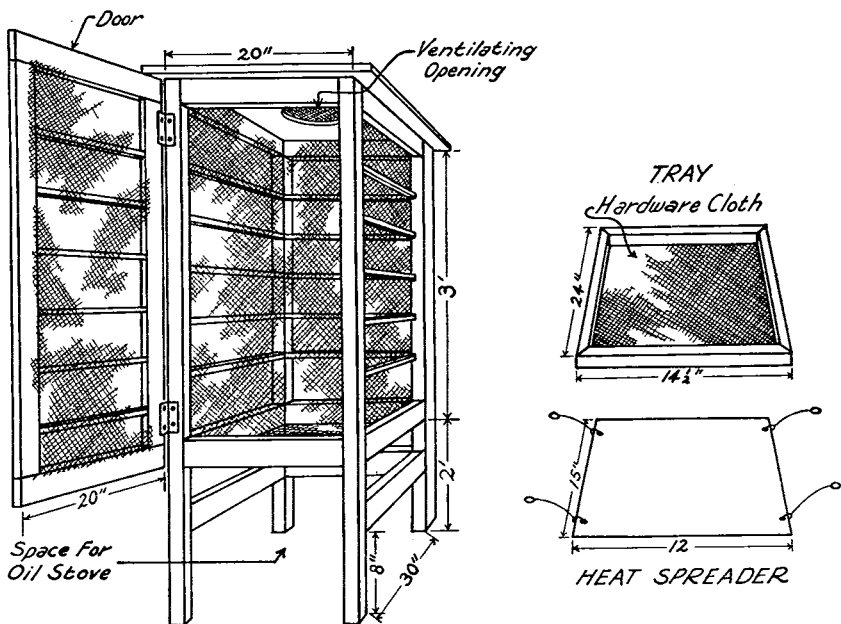
**Fruit.**—Use dried fruit as sauces, in salads, shortcakes, filled cookies, puddings, breakfast cereals, and gelatin desserts.

### Homemade Evaporators

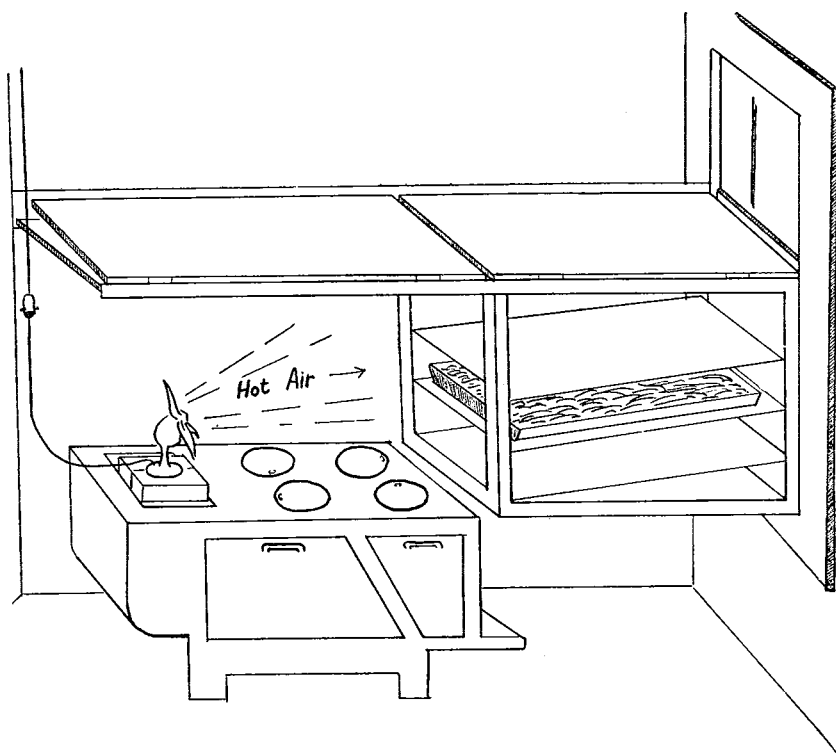


*Solar Drier*

A solar drier may be constructed as in the illustration and covered with glass top to intensify heat. Sides should be screened. Window panes or hotbed sashes may be used. Green vegetables, as spinach, can be successfully dried outdoors under glass. If a fan is available, place at lower end of drier to force air up through drier.



*Home Evaporator for Fruits and Vegetables ~*



**This is dehydration in its simplest form—trays on which to place the food, heat, and a fan to blow the heat through the trays.**  
 (Picture by courtesy of Colorado Experiment Station, Fort Collins.)