



El Dorado County

## MASTER FOOD PRESERVERS

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University of California Cooperative Extension is committed to helping rural and urban people through teaching, research and extension. Extension takes research-based knowledge and offers it in accordance with the needs of the community.



Cooperative Extension in El Dorado County works by helping people help themselves in its commitment to provide informal, off-campus educational opportunities in food preservation.

The Master Food Preservers Program offers free public classes to teach the art and science of all phases of safe home food preservation.

Program instructors are trained by Cooperative Food Science specialists.

## Master Food Preservers present:

Amador County Master Gardener  
Presentation  
Saturday July 16, 2011

## Dehydration and Freezing



**Questions? Call the Master Food Preservers at (530) 621-5506 (VoiceMail)**

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**UNIVERSITY OF CALIFORNIA, UNITED STATES DEPT OF AGRICULTURE AND EL DORADO COUNTY COOPERATING**  
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**Dehydrating:** The overall objective is to remove moisture before the food spoils.

**Fruit:** Pretreatment of fruits applies to both dehydration and freezing.

Pretreatment of fruits is a personal preference. Food safety is not affected. Pretreatment of some fruits before drying will reduce vitamin loss, flavor loss, browning, and deterioration during storage.

**Sulfuring** means exposing fruit to fumes of burning sulfur. Some people are allergic to sulfur, especially those who suffer from asthma. Therefore, sulfuring will not be discussed in this class.

**Sodium bisulfite** is used by dissolving 2-teaspoons of the powder in 1-quart of water and adding the cut fruit. Dip the fruit in the solution then drain and dehydrate.

**Ascorbic Acid** is used by dissolving 1-tablespoon of the powder in 1-quart of cold water. Dip the fruit in the solution then drain and dehydrate.

**Citric Acid** is only one-eighth as effective as ascorbic acid. Dissolve 1-tablespoon in 1-quart of water. Dip the fruit in the solution then drain and dehydrate.

**Citrus Juices:** Pineapple, lemon and lime juice may be used, but are only one-sixth as effective as ascorbic acid. Use 1-cup of lemon or lime juice to 1-quart of water. Dip the fruit in the solution then drain and dehydrate.

**Crazing:** some fruits have a protective wax coating, such as plums, figs, cranberries, blueberries, grapes, etc. It is necessary to pre-treat these fruit by dipping them in boiling water for 1- to 2-minutes according to the size and toughness of the skin.

## **VEGETABLES:**

**Blanching:** Blanching is the process of heating vegetables sufficiently to inactivate enzymes that would cause flavor and color deterioration during either the dehydration or freezing process. Blanch with hot water or steam for the time stated in Table "Freezing Vegetables" on page 7. Green peppers, onions, garlic, mushrooms and okra require no pre-treatment.

## **TEST FOR DRYNESS**

**Fruit:** Fruit should be pliable and leather like, without any pockets of moisture.

**Vegetables:** Vegetables may dry unevenly and some pieces may need to be removed before others. Most vegetables will be hard and brittle when dried.

**Finishing:** All dried foods should be conditioned before packing. Too much moisture left in a few pieces may cause the whole batch to mold. Place dried foods in tightly closed large container. Stir or shake every day for a week. This will equalize the moisture. If moisture forms on the inside of the container the food has not been dried sufficiently. Return the food to the dehydrator for a few more hours.

Pasteurizing is necessary for any food products that could have been exposed to insect infestation or larva prior to handling or during the drying process. The food should be frozen after it has been conditioned. Pack the food in airtight containers, removing as much air as possible, place in a freezer at 0° F for at least two days.

**STORAGE:** Moisture must be kept from dried foods when they are in storage. Containers suitable for freezer use work well for storing dried food.

**Rehydrate:** There are three basic methods used to re-hydrate dried foods: 1. Soak in liquid, 2. Boil in water, and 3. Cook in liquid. Do not add salt or sugar during the first 5-minutes of rehydration as they hinder the water absorption process. Various fruit juices, yogurt, cordials, and fruit liqueurs may be used instead of water to reconstitute fruits. Place fruit pieces in a shallow pan and cover with the liquid. The general rule is to use 2-cups of fruit to 1-cup of liquid. Add more liquid as needed. Fruit will usually reconstitute in a couple of hours. Refrigerate if it takes longer.

Vegetables may be reconstituted in consommé, bouillon, vegetable juice, water, or milk. Refrigerate during rehydration. Allow plenty of time - from 1 to 2 hours up to 8 hours depending upon the vegetable.

**MEAT:** The processing of meat and meat jerky is beyond the scope of this presentation and will be covered in the class on sausage making and meat preservation.

## USING YOUR DEHYDRATOR

Some foods dry better than others.

**Fruits:** The following fruits dry well:

Apples	Blueberries
Grapes	Huckleberries
Cherries	Peaches
Cranberries	Pears
Figs	Plums
Apricots	

The following fruits dry less well:

Blackberries	Oranges	Lemons
Cantaloupe	Rhubarb	

**Vegetables:** The following vegetable dry well:

Beets	Corn	Potatoes
Cabbage	Green Peas	Carrots
Mushrooms	Tomatoes	Celery

Turnips	Onions
Green Peppers	

The following vegetables dry less well:

Lettuce	Spinach	Radishes
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**Herbs:** The following herbs dry well:

Chervil	Mint	Sage
Chives	Oregano	Dill
Tarragon	Rosemary	
Thyme		

**Fruit Leathers:** Fruit leather is an ideal way to use fruits that are bruised, overripe, or those not ideal for regular drying or freezing. Cut away bruised spots and puree. The best fruit for leathers are apples, apricots, bananas, berries, peaches, pears, and strawberries. Try the following:

### Banana Blush Leather

1 cup strawberries  
1 banana

Puree fruit in a blender. Pour onto plastic sheets and dehydrate at 135° F until leathery.

### Peachy Pear Leather

1 cup peaches, peeled  
1/2 cup pears, peeled

Blend together and sweeten, if desired. Pour onto plastic sheets and dehydrate at 135° F until leathery.

Spraying a light coating of non-stick vegetable shortening in leather trays before filling with fruit puree will help the leather peel off easily.

**Strawberries:** Choose firm, ripe, red berries with a solid color. The sweeter the better. They should be picked when fully ripe. They will not develop natural sugar if picked when slightly green and will not continue to ripen off the vine.

Berries should be gently washed in plenty of cold water. Do not let berries stand in the water. Remove the berries from the water and drain. Remove the caps and cut into 1/2-inch slices. Smaller berries may be cut in half. Place skin side down on the dryer rack.

Dry at a temperature of 150° F for 1 to 2 hours, finish at 130° F until dry. Berries should be pliable and leathery with no pockets of moisture when dry.

### **Tomatoes**

Dried tomatoes must be properly packaged because tomatoes readily reabsorb moisture. This will shorten their storage life and cause undesirable flavor changes. Some dried tomatoes turn black during storage due to low acid. This does not harm the tomatoes, just makes them unappetizing. The best varieties of tomatoes to dry are any of the firm, full-flavored varieties. The newer sweet, low acid tomatoes do not dry successfully.

Choose firm, ripe, bright red tomatoes. They should be thick-walled with a high acid content.

There is no pretreatment required for tomatoes.

Wash, core, and peel (if desired) the tomatoes. To peel a tomato, immerse in boiling water for 30 to 45 seconds. Immediately place in cold water and peel. Slice tomatoes crosswise 3/8 to 1/2 inch thick with a very sharp stainless steel knife. Try to avoid crushing the tissue. Dry at 150° F for 2 to 3 hours then finish at 130° F until dry. Tomatoes should be dried to brittle stage.

To use the dried tomatoes, crush, crumble, chop and sprinkle over salads or use in soup and stews.

High acid tomatoes will sun dry satisfactory.

### **Summer Squash and Zucchini**

Dried squash should be stored no longer than one month unless it is frozen. Choose fresh firm well shaped squash. The squash should be washed, peeled (if desired) and sliced 1/4 to 3/8 inch thick. Zucchini may be grated and spread thinly on the drying tray.

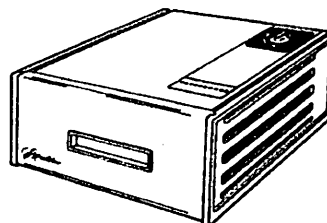
Pretreatment: if the squash is to be used in cooking, pre-treat with steam for 2 to 3 minutes. If zucchini is to be used for chips, do not pre-treat.

Start drying at 140° F for 1 to 2 hours. Finish drying at 130° F until dry (tough to brittle).

Zucchini chips may be stored at room temperature for up to 2-weeks. Other dried squash may be chopped and used in dips, soups, or in bread and muffin mixtures.

### **Peppers, Chili**

Diced pods dry faster than whole pods. Variety best for drying is Ancho and Anaheim although all pepper varieties may be dehydrated. Choose fully mature pods. Wash and cut peppers into strips or chunks, or may be left whole. Peppers may be strung and hung in a sheltered place to dry. Start drying in the sun for one day then move into a sheltered area to finish drying. Start drying at 140° F for 2 hours. Finish drying at 130° F until dry. When dry pods should appear shriveled, dark, and feel crisp. Dried peppers may be crumbled and used in salad dressings, dips and as a topping for pizza.





## FREEZING FRUITS AND VEGETABLES

### Freezing Fruits

See chart on page 6 for specific directions.

**Methods of freezing** Fruit may be frozen with or without sugar or with sugar syrup. Some fruits such as berries, cherries, and grapes may be frozen in a single layer on cookie sheets before packing in container. This prevents them from sticking together.

Strength Of syrup	Water (cups)	Sugar (cups)	Yield (cups)
Light	4	2	5
Medium	4	3	5 1/2
Heavy	4	4	6 1/4

**Methods of freezing** juicy fruits and those that will be used for pies or other cooked products are often packed in sugar. Use about 1 cup of sugar for each 2 to 3 pounds of fruit. Sugar and fruit should be gently but thoroughly mixed until the sugar has dissolved in the juice.

### Freezing Vegetables

See chart on page 7 for specific directions

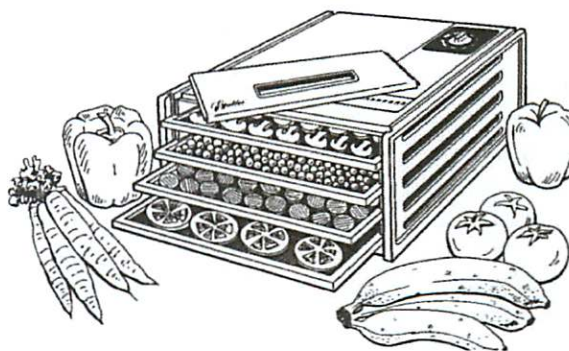
### Packing in containers

Pack foods tightly into containers. Allow ample headspace between the packed food and the lid to allow room for expansion during freezing. Products packed in pint containers require ½ inch headspace. Products packed in quart containers 1-inch headspace. When food is packed in freezer bags, squeeze out as much air as possible. Label containers with name of product, type of pack, and date.

**Freezing Juices:** A variety of fruit juices can be frozen including cherry, grape, grapefruit, plum, raspberry, and strawberry.

### Refreezing Frozen Foods:

Occasionally a home freezer stops running. The time the food will stay frozen depends on the amount of food in the freezer and the temperature of the food. A full load of food will stay for up to 2 days if the freezer is not opened. It is safe to refreeze fruits and vegetables that still have ice crystals in them. If the temperature has warmed above 40°F, foods may not be fit for refreezing.



### Freezing Fruits

<b>Apples</b>	Select crisp, firm fruit. To prevent browning during preparation, pretreat. Drain and pack in syrup, pack in sugar, or pack without sugar.
<b>Applesauce</b>	Wash apples, peel if desired, core and slice. Pretreat if desired. Cook until tender in water (1/3 cup to each quart of slices). Cool and strain if necessary. Sweeten to taste.
<b>Apricots</b>	Select firm, ripe, uniformly yellow fruit. Wash, halve, and pit. Pretreat to retard browning if desired. Peel and slice if desired. (to loosen skins, dip in boiling water for 15 to 20 seconds.) Pack in syrup or pack in sugar.
<b>Avocados</b>	Best frozen as puree (not whole or sliced). Select avocados that are soft with rinds free from dark blemishes. Peel, halve, and remove pit. Mash the pulp. Pack in sugar (1cup to 1 quart of puree) if using for ice cream or milk shakes or pack without sugar if using for salads, dips, or sandwiches.
<b>Blackberries</b>	Also boysenberries, loganberries. Select firm, fully ripe fruit with glossy skins. Wash and drain. Pack in syrup, pack in sugar, or pack without sugar.
<b>Blueberries</b>	Also Huckleberries. Select ripe berries with tender skins. Wash and drain. If desired, steam for 1 minute and cool immediately to tenderize skin. Pack in syrup or pack in sugar.
<b>Cantaloupe</b>	Also other melons. Select firm, well colored, ripe melons. Cut in half, remove seeds and peel. Cut into slices, cubes, or balls. Pack in syrup.
<b>Cherries, sour</b>	Select bright red, tree-ripened fruit. Stem and wash. Drain and pit. Pack in syrup, pack in sugar, or pack without sugar.
<b>Cherries, sweet</b>	Select tree ripened red varieties. Stem and wash. Remove pits if desired. Pretreat if desired. Pack in syrup or pack without sugar.
<b>Currants</b>	Select fully ripe, bright red fruit. Wash and stem. Pack in syrup, pack in sugar, or pack without sugar
<b>Figs</b>	Select tree-ripened, soft-ripe fruit. Wash and cut off stem. Peel if desired. Slice or leave whole. Pack in syrup, pack in sugar, or pack without sugar
<b>Gooseberries</b>	Select fully ripe (for pie) or slightly underripe (for jelly) berries. Wash and remove stems and blossom ends. Pack in syrup or pack without sugar.
<b>Grapefruit</b>	Also oranges. Select firm tree-ripened fruit, heavy for its size and free of soft spots. Divide fruit into sections, removing all membranes and seeds. Pack in syrup (made with excess juice, add water if needed) or pack in water without sugar.
<b>Nectarines</b>	Select firm, fully ripe, well-colored fruit. Wash and pit. Peel if desired. Pretreat if desired. Cut in quarters or slices. Pack in syrup, pack in orange juice, or in water without sugar.
<b>Peaches</b>	Select firm, ripe fruit with no green color in the skin. Wash peel, and pit. Cut in quarters or slices if desired. Pretreat if desired. Pack in syrup, pack in sugar, pack in orange juice, or pack in water without sugar.
<b>Pears</b>	Select well-ripened, firm fruit. Wash and peel. Cut in halves or quarters and remove cores. Pretreat if desired. Heat in boiling syrup for 1 to 2 minutes (depending on size of pieces). Drain, cool, and pack in syrup.
<b>Plums</b>	Select firm, tree-ripened fruit. Wash. Cut in halves, quarters, or leave whole. Pretreat if desired. Pack in syrup or pack without sugar.
<b>Raspberries</b>	Select fully ripe, juicy berries. Wash and drain. Pack in syrup, pack in sugar, or pack without sugar
<b>Rhubarb</b>	Select firm well colored stalks. Wash and cut into 1 to 2-inch pieces. Pack in syrup or without sugar.
<b>Strawberries</b>	Select firm, ripe red berries. Wash, drain, and remove hulls. Slice if desired. Pack in syrup or pack without sugar

\*Fruits may be frozen as purees for use later in jam making. Ascorbic acid may be used to prevent darkening and increase the vitamin C content.

## Freezing Vegetables

<b>Asparagus</b>	Select young stalks with compact tips. Wash and sort by size. Leave whole or cut in 1-to-2 inch lengths. Blanch small stalks 1 1/2 minutes, medium stalks 2 minutes, large stalks 3 minutes. Cool immediately.
<b>Beans, green snap or wax</b>	Select young stringless beans. Wash and snip off tips. Cut or break into suitable pieces or slice lengthwise into strips. Blanch 3 minutes. Cool immediately.
<b>Beets</b>	Select beets less than 3 inches across. Sort by size. Remove tops and wash. Cook until tender (small 20 to 30 minutes, medium 45 to 50 minutes). Cool. Peel and slice or dice.
<b>Broccoli</b>	Select compact dark-green heads. Wash peel strip leaves and woody ends. If necessary to remove insects, soak 30 minutes in salt brine (4-teaspoon salt to 1 gallon of water). Rinse and drain. Cut through stalks lengthwise, leaving heads 1 inch in diameter. Blanch medium heads 4 minutes, large heads 5 minutes. Cool.
<b>Brussels Sprouts</b>	Select green, firm, compact heads. Wash and trim outer leaves. Soak 30 minutes in salt brine (see broccoli). Rinse and drain. Blanch medium heads 4 minutes, large heads 5 minutes. Cool immediately.
<b>Carrots</b>	Select tender carrots. Remove top. Wash, and scrape. Dice or slice ¼ inch thick. Blanch 2 minutes. Cool.
<b>Cauliflower</b>	Select firm white heads. Wash and trim. Split heads into pieces 1 inch across. If necessary to remove insects, soak 30 minutes in salt brine (4-teaspoon salt to 1-gallon water). Rinse, drain. Blanch 3 minutes. Cool.
<b>Corn, cut or on-the-cob</b>	Select ears with plump kernels and thin, sweet milk. Husk ears, remove silk, and wash. <i>Whole-kernel or cream-style:</i> Blanch 4 to 5 minutes. Cool thoroughly. Drain cut off cob. <i>Corn-on-the-cob ears</i> 9 minutes, large ears 11 minutes. Cool, drain and wrap each ear separately or tightly pack desired number in large freezer bags or containers.
<b>Mushrooms</b>	Select edible mushrooms free from spots or decay. Wash and remove stem base. Freeze small mushrooms whole, cut large ones into 4 or more pieces. When blanching, add 1/2-teaspoon citric acid (or 3 teaspoons lemon juice or ½ teaspoon ascorbic acid) per quart of water to prevent darkening. Blanch medium or small whole mushrooms 5 minutes, cut pieces 3 minutes. Cool. Or: slice mushrooms ½ inch thick and sauté in butter until almost done. Cool by setting pan in cold water.
<b>Onions</b>	Select fully mature onions. Peel, wash and cut into sections. Blanch 1-½ minutes. Cool. May be frozen unblanched.
<b>Peas, edible-pod</b>	Select young, tender pods. Wash. Remove stems, blossom ends, and any strings. Blanch small pods 1 minute, large pods 1 ½ to 2 minutes. Cool.
<b>Peas, green</b>	Select firm bright green, plump, firm pods. Shell. Blanch 1 ½ to 2 minutes. Cool.
<b>Peppers, sweet (green)</b>	Select firm, crisp peppers. Wash, cut, and remove seeds. Halve, slice, or dice.
<b>Peppers, hot (green chill)</b>	Select firm, crisp peppers. Wash and dry. Broil for 6 to 8 minutes to loosen skin. (First make small slits in each to allow steam to escape.) Cool. Remove peel, seeds, and stems. Protect hands with rubber gloves.
<b>Potatoes</b>	Wash, pare; remove deep eyes, bruises, and green surface coloring. Cut in ¼ to ½ inch cubes. Blanch 5 minutes. Cool. <i>For French fries:</i> Pare and cut into thin strips. Fry in deep fat until light brown. Drain and cool. (To serve, bake at 400° F for 10 to 20 minutes.)
<b>Potatoes, sweet</b>	Select medium to large sweet potatoes. Wash and cook until almost tender. Peel, cut in halves, slice or mash. To prevent browning dip for 5 seconds into solution of 1 tablespoon citric acid or ½ cup lemon juice to 1 quart of water. To keep mashed sweet potatoes from darkening, mix 2 tablespoons orange or lemon juice with each quart of mashed potatoes.
<b>Pumpkin</b>	<b>Also other winter squash.</b> Select full-colored, mature pumpkin. Cut or break into fairly uniform pieces. Remove seeds, cut into pieces. Bake at 350° F or steam until tender. Cool. May be frozen in chunks or pureed and frozen.
<b>Spinach</b>	<b>Also other greens.</b> Select young, tender leaves. Remove tough stems. Wash. Blanch most leafy greens 2 minutes. Blanch collards and stem portion of Swiss chard 3 to 4 minutes. Blanch very tender spinach 1 ½ minutes. Cool.
<b>Tomatoes</b>	Best frozen stewed or pureed. Select ripe tomatoes free from blemishes. Remove stem ends, peel and quarter. Cook until tender. Cool by setting pan in cold water.
<b>Zucchini</b>	<b>Also other summer squash.</b> Select young squash with small seeds and tender rind. Wash and slice. Blanch ¼ -inch slices 3 minutes, 1 ½-inch slices 6 minutes. Cool.