



UCCE Master Food Preservers of Amador/Calaveras County

12200B Airport Road
Jackson, CA 95642
(209) 223-6482

<http://cecentralsierra.ucanr.edu>



Freezing Basics

Basic Food Safety

Wash Hands Frequently

- Personal cleanliness is a must. Wash your hands thoroughly and frequently. E. coli resides in the human nose and intestines. Wash your hands if you rub your nose, or if you wipe your face or skin.
- Bandage any cuts or burns on hands before handling food, or use disposable gloves.

Avoid Cross Contamination

- Rinse all fresh fruits and vegetables well under running water before preparing or eating them. Dry them with a clean cloth or paper towel.
- **ALWAYS** wash your hands, knives, cutting boards, and food preparation surfaces well with soapy water before and after any contact with raw meat, fish, or poultry.
- Use a disinfecting solution of 1½ teaspoon of chlorine bleach to 1 pint of water. Dispense with a spray bottle to disinfect countertops, cutting surfaces, sinks, etc. Make a new solution daily.

When In Doubt, Throw It Out

- Never taste food that looks or smells strange to see if it can still be used.
- Most bacteria that cause foodborne illness are odorless, colorless, and tasteless.

Freezing Foods

Retains natural color, flavor and nutritive value of foods and is quick and simple to do. Freezing slows down the enzymes in fruits and vegetables that cause them to ripen and then decay.

Freezing Pointers

- Freeze foods at 0°F or lower. For rapid freezing, set the temperature to -10°F 24 hours in advance.
- Freeze foods as soon as they are packed and sealed.
- Water in food freezes and expands creating ice crystals, which rupture cell walls of fruits and vegetables, making them softer when thawed. Large ice crystals do more damage to food cells and cause softer, mushier textures. Minimize the size of ice crystals by keeping the temperature consistent and freezing the food quickly.
- Do not overload your freezer with unfrozen food. Add only the amount that will freeze within 24 hours, which is usually 2 to 3 pounds of food per cubic foot of storage space. Overloading slows down the freezing rate, and foods that freeze too slowly may lose quality.
- Place packages in contact with refrigerated surfaces in the coldest part of the freezer.
- Leave a little space between new packages so air can circulate freely. Stack after frozen.

Preparing Vegetables for Freezing

Select vegetables that are ripe and free of blemishes and prepare for freezing by blanching in boiling water or steam. See separate handout, Freezing Vegetables, for specific blanching times for each type of vegetable.

Blanching Vegetables

- Blanching (scalding vegetables in boiling water or steam for a short time) is a must for almost all vegetables to be frozen. It stops enzyme actions, which can cause loss of flavor, color and texture.
- Blanching cleanses the surface of dirt and organisms, brightens the color and helps retard loss of vitamins. It also wilts or softens vegetables and makes them easier to pack.
- Blanching time is crucial and varies with the vegetable and size. Underblanching stimulates the activity of enzymes and is worse than no blanching. Overblanching causes loss of flavor, color, vitamins and minerals. Follow recommended blanching times listed on the separate handout, Freezing Fruits and Vegetables.

Water Blanching

- Use one-gallon water per pound of prepared vegetables.
- Put the vegetables in a blanching basket and lower into vigorously boiling water.
- Place a lid on the blancher. The water should return to boiling within 1 minute, or you are using too much vegetable for the amount of boiling water.
- Start counting blanching time as soon as the water returns to a boil. Keep heat high for the time given in the directions for the vegetable you are freezing.

Steam Blanching

Heating in steam is recommended for a few vegetables. For broccoli, pumpkin, sweet potatoes and winter squash, both steaming and boiling are satisfactory methods. Steam blanching takes about 1½ times longer than water blanching.

- Use a pot with a tight lid and a basket that holds the food at least three inches above the bottom of the pot. Put an inch or two of water in the pot and bring the water to a boil.
- Put the vegetables in the basket in a single layer so that steam reaches all parts quickly. Cover the pot and keep heat high. Start counting steaming time as soon as the lid is on.

Microwave Blanching

Microwave blanching may not be effective, since research shows that some enzymes may not be inactivated. This could result in off-flavors and loss of texture and color. Those choosing to run the risk of low quality vegetables by microwave blanching should be sure to work in small quantities, using the directions for their specific microwave oven. Microwave blanching will not save time or energy.

Cooling Vegetables

As soon as blanching is complete, vegetables should be cooled quickly and thoroughly to stop the cooking process.

- Plunge the basket of vegetables immediately into a large quantity of cold water, 60°F or below.
- Change water frequently or use cold running water or ice water. If ice is used, about one pound of ice for each pound of vegetable is needed.
- Cooling vegetables should take the same amount of time as blanching.
- Drain vegetables thoroughly after cooling. Extra moisture can cause a loss of quality when vegetables are frozen.

Preparing Fruits for Freezing

Select premium fruits that are fully ripe and free of bruises and other blemishes. Carefully wash, dry, remove pits, and peel, if desired. Use one of the methods described below to prepare fruit for freezing.

Without sugar

Fruit may be frozen without sugar in a water pack or sugar-free fruit juice, such as citrus or berry juice. Small fruit such as berries, cherries, and grapes may be frozen in a single layer on a cookie sheet before packing in containers.

Syrup pack

Fruit may be frozen in a simple syrup of water and cane or beet sugar. If desired, part of the sugar may be replaced by corn syrup or honey. Allow about 2/3 cup of simple syrup for each pint of fruit; 1-1/3 cup for each quart of fruit. Dissolve sugar in hot water and cool before using.

Sugar pack

Juicy fruits and those that will be used for pies or other cooked products may be packed in sugar. Use about 1 cup of sugar for each 2 to 3 pounds of fruit. Gently mix until the sugar has dissolved in the fruit's juices.

Strength of Syrup	Water (cups)	Sugar (cups)	Yield (cups)
Light	4	1	4 ¾
Medium	4	1 ¾	5
Heavy	4	2 ¾	5 ½

Retarding browning

Ascorbic acid may be used to reduce browning of light-colored fruit. For syrup or liquid packs, add ½ teaspoon ascorbic acid to each quart of cold syrup. For sugar or sugarless dry packs, dissolve ½ teaspoon ascorbic acid in 3 tablespoons cold water and sprinkle over 4 cups of fruit just before adding sugar.

Packaging and Shelf Life

Packaging and Labeling Foods

- Cool all foods and syrup before packaging to speed up freezing and help retain the natural color, flavor and texture of food. (Cool in shallow containers in the refrigerator or ice bath.)
- Pack foods in single meal quantities.
- Follow directions for each individual food (see separate handout, Freezing Fruits and Freezing Vegetables) to determine which can be packed dry and which need added liquid. Some loose foods such as blueberries may be individually "tray packed."
- Pack foods tightly leaving as little air as possible in the package.
- Most foods require headspace between the packed food and closure to allow for expansion of the food as it freezes. Foods that are exceptions and do not need headspace include loose packing vegetables such as asparagus and broccoli, bony pieces of meat, tray packed foods and breads.
- Seal rigid containers carefully. Use a tight lid and keep the sealing edge free from moisture or food to ensure a good closure. Secure loose-fitting covers with freezer tape.
- Meats may be packaged using either the "drugstore wrap" or the "butcher wrap."
- Label each package, including the name of the product, any added ingredients, packaging date, the number of servings and amount of each serving, and the form of the food, such as whole, sliced, etc. Use freezer tape, marking pens or crayons, or gummed labels made especially for freezer use.

Containers: Use proper packaging materials to protect food's flavor, color, moisture content and nutritive value from the dry climate of the freezer. The type of containers depends on the type of food to be frozen, personal preference and what you have at home. Do not freeze fruits and vegetables in containers with a capacity over one-half gallon. Foods in large containers freeze too slowly to result in a satisfactory product.

Best packaging materials:

- Moisture vapor resistant
- Not become brittle and crack at low temperatures
- Resistant to oil, grease or water
- Protect foods from absorption of off flavors or odors
- Durable and leak proof
- Easy to seal and mark

Rigid: Used with liquids or soft foods

- Plastic
- Glass: wide mouth dual purpose jars
- Straight sides (no shoulder)
- Tight fitting covers/freezer tape

Flexible: Used with irregular shapes and liquids

- Flexible freezer bags
- Plastic freezer wrap,
- Freezer paper
- Heavy-weight aluminum foil

Headspace to Allow Between Packed Food and Closure Table

Type of Pack	Container with wide top opening		Container with narrow top opening	
	Pint	Quart	Pint	Quart
Liquid Pack*	½ inch	1 inch	¾ inch	1 ½ inch
Dry Pack**	½ inch	½ inch	½ inch	½ inch
Juices	½ inch	1 inch	1½ inch	1½ inch

*Fruit packed in juice, sugar, syrup or water; crushed or pureed fruit.

**Fruit or vegetable packed without added sugar or liquid.

Freezer Shelf Life

- Freezing cannot improve the flavor or texture of any food, but when properly done it can preserve most of the quality of the fresh product. Knowing how long a particular food can be stored in the freezer is not as simple as it sounds.
- The storage times listed in the following table are approximate months of storage for some food products assuming the food has been prepared and packaged correctly and stored in the freezer at or below 0°F. For best quality use the shorter storage times. After these times, the food should still be safe, just lower in quality.

Freezer Shelf Life Table

Food	Approximate months of storage at 0°F
Fruits and Vegetables	8 – 12 months
Poultry	6 – 9 months
Fish	3 – 6 months
Ground Meat	3 – 4 months
Cured or Processed Meat	1 – 2 months

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.

Resources

National Center for Home Food Preservation [Internet]. University of Georgia [cited 2014 September 4]. Available from: <http://nchfp.uga.edu/>

Complete Guide to Home Canning. 2009. USDA Agricultural Information Bulletin 539. National Institute of Food and Agriculture. Available from: http://nchfp.uga.edu/publications/publications_usda.html Also available in paper copy from Purdue Extension (online store is located at https://mdc.itap.purdue.edu/item.asp?item_number=AIG-539)

Kingry, J., & Devine, L., editors. 2006. Ball Complete Book of Home Preserving. Toronto, Canada: Robert Rose Inc.

So Easy to Preserve Fifth Edition. 2006. Bulletin 989. Cooperative Extension/The University of Georgia/Athens Ball Blue Book Guide to Preserving. 2004. Altrista Consumer Products

It is the policy of the University of California (UC) and the UC Division of Agriculture & Natural Resources not to engage in discrimination against or harassment of any person in any of its programs or activities (Complete nondiscrimination policy statement can be found at <http://ucanr.edu/sites/anrstaff/files/187680.pdf>). Inquiries regarding ANR's nondiscrimination policies may be directed to Linda Marie Manton, Affirmative Action Contact, University of California, Agriculture and Natural Resources, 2801 Second Street, Davis, CA 95618, (530) 750-1318.

Freezing Fruits and Vegetables Guide

Freezing Fruits

Apples	Select crisp, firm fruit. To prevent browning during preparation, pretreat. Drain and pack in syrup, pack in sugar, or pack without sugar.
Applesauce	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.
Apricots	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 sugar.
Avocados	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 (1 cup to 1 quart of puree) if using for ice cream or milk shakes or pack without sugar if using for salads, dips, or sandwiches.
Bananas	Select firm, ripe bananas. Peel and mash thoroughly. Add ½ teaspoon ascorbic acid per cup.
Blackberries	Also boysenberries, loganberries. Select firm, fully ripe fruit with glossy skins. Wash and drain. Pack in syrup, sugar, or without sugar.
Blueberries	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 sugar.
Cantaloupe	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.
Cherries, sour	Select bright red, tree-ripened fruit. Stem and wash. Drain and pit. Pack in syrup, sugar, or without sugar.
Cherries, sweet	Select tree-ripened red varieties. Stem and wash. Remove pits if desired. Pretreat if desired. Pack in syrup or without sugar.
Currants	Select fully ripe, bright red fruit. Wash and stem. Pack in syrup, sugar or without sugar.
Figs	Select tree-ripened, soft-ripe fruit. Wash and cut off stem. Peel if desired. Slice or leave whole. Pack in syrup, sugar, or without sugar
Gooseberries	Select fully ripe (for pie) or slightly under ripe (for jelly) berries. Wash and remove stems and blossom ends. Pack in syrup or without sugar.
Grapefruit	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 water without sugar.
Peaches	Also nectarines. Select firm, fully ripe, well-colored fruit. Wash and pit. Peel if desired. Cut in halves or slices. Pack in syrup, orange juice, or water without sugar. Pretreat to retard browning
Pears	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). Drain, cool, and pack in syrup.
Persimmons	Select orange, soft-ripe fruit. Sort, wash, peel, and cut into sections. Press fruit through a sieve to make a puree. To each quart of puree, add 1/8 teaspoon ascorbic acid. May be packed with or without sugar.

Plums	Select firm, tree-ripened fruit. Wash. Cut in halves, quarters, or leave whole. Pretreat if desired. Pack in syrup or pack without sugar.
Raspberries	Select fully ripe, juicy berries. Wash and drain. Pack in syrup, pack in sugar, or pack without sugar.
Rhubarb	Select firm, well colored stalks. Wash and cut into 1" to 2" pieces. Pack in syrup or without sugar.
Strawberries	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

Asparagus	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.
Beans, green	Also snap or wax. 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.
Beans, pinto	Also, lima or butter. Harvest beans while seeds are green. Wash, shell, and sort according to size. Water-blanch small beans 2 minutes, medium beans 3 minutes and large beans 4 minutes. cool
Beets	Select beets less than 3 inches across. Sort by size. Remove tops and wash. Cook until tender (small 25 to 30 minutes, medium 45 to 50 minutes). Cool. Peel and slice or dice.
Broccoli	Select compact, dark-green heads. Wash, trim leaves and woody ends. If necessary to remove insects, soak 30 minutes in salt brine (4 tsp salt to 1 gallon of water). Rinse and drain. Cut through stalks lengthwise, leaving heads 1" in diameter. Blanch 3 minutes. Cool.
Brussels Sprouts	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.
Carrots	Select tender carrots. Remove top. Wash, and scrape. Dice or slice 1/4" thick. Blanch 2 minutes. Cool
Cauliflower	Select firm, white heads. Wash and trim. Split heads into pieces 1" across. If necessary to remove insects, soak 30 minutes in salt brine (4 tsp salt to 1 gallon water). Rinse, drain. Blanch 3 minutes. Cool
Corn	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>On-the-cob:</i> Blanch small ears 9 minutes, large ears 11 minutes. Cool, drain and wrap each ear separately or tightly pack desired number in large freezer bags or containers.
Herbs – Fresh	Wash, drain, and pat dry. Wrap a few sprigs or leaves in freezer wrap and place in freezer bag.
Mushrooms	Select edible mushrooms free from spots or decay. Wash and remove stem base. Freeze small mushrooms whole; cut large ones into four or more pieces. When blanching, add 1/2 tsp citric acid (or 3 tsp. lemon juice or 1/2 tsp. 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 1/4" thick and sauté in butter until almost done. Cool by setting pan in cold water.
Onions	Select fully mature onions. Peel, wash and cut into sections. Blanch 1 1/2 minutes. Cool. May be frozen unblanched.
Peas, edible-pod	Select young, tender pods. Wash. Remove stems, blossom ends, and any strings. Blanch small pods 1 minute, large pods 1 1/2 to 2 minutes. Cool.
Peas, green	Select firm, bright green, plump, pods. Shell. Blanch peas 1 1/2 to 2 minutes. Cool
Peppers, sweet (green)	Select firm, crisp peppers. Wash, cut out stem and remove seeds. Halve, Blanch halved peppers 3 minutes; sliced or diced 2 minutes. Cool. May also be frozen unblanched.
Peppers, hot (green chili)	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, may be done after freezing. Protect hands with rubber gloves. May be frozen unblanched.

Potatoes	Wash, pare; remove deep eyes, bruises, and green surface coloring. Cut in ¼" to ½" 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.)
Potatoes, sweet	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 Tbsp. citric acid or ½ cup lemon juice to 1 quart of water. To keep mashed sweet potatoes from darkening, mix 2 Tbsp. orange or lemon juice with each quart of mashed potatoes.
Pumpkin	Also other winter squash. 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. Scoop pulp from rind, and mash or put through a ricer. May also be frozen in chunks.
Spinach	Also other greens. 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.
Tomatoes	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.
Zucchini	Also other summer squash. Select young squash with small seeds and tender rind. Wash and slice. Blanch ¼" slices 3 minutes, 1 ½" slices 6 minutes. Cool.

Resources

- National Center for Home Food Preservation [Internet]. University of Georgia [cited 2014 September 4]. Available from: <http://nchfp.uga.edu/>
- Complete Guide to Home Canning. 2009. USDA Agricultural Information Bulletin 539. National Institute of Food and Agriculture. Available from: http://nchfp.uga.edu/publications/publications_usda.html Also available in papercopy from Purdue Extension (online store is located at https://mdc.itap.purdue.edu/item.asp?item_number=AIG-539)
- Drying Fruits and Vegetables [Internet]. Oregon State University [cited 2014 September 4]. Available from: http://extension.oregonstate.edu/fch/sites/default/files/documents/pnw_214_freezingfruitsandvegetables.pdf
- Kingry, J., & Devine, L., editors. 2006. Ball Complete Book of Home Preserving. Toronto, Canada: Robert Rose Inc.
- So Easy to Preserve Fifth Edition. 2006. Bulletin 989. Cooperative Extension/The University of Georgia/Athens
- Ball Blue Book Guide to Preserving. 2004. Altrista Consumer Products

It is the policy of the University of California (UC) and the UC Division of Agriculture & Natural Resources not to engage in discrimination against or harassment of any person in any of its programs or activities (Complete nondiscrimination policy statement can be found at <http://ucanr.edu/sites/anrstaff/files/187680.pdf>). Inquiries regarding ANR's nondiscrimination policies may be directed to Linda Marie Manton, Affirmative Action Contact, University of California, Agriculture and Natural Resources, 2801 Second Street, Davis, CA 95618, (530) 750-1318.