

Drying

The most ancient food preservation method, drying remains widely in use today. Its popularity in hot, dry climates is easily understood; however, by employing solar or electric dehydrators, we can also dry food in cool, damp climates. Vegetables are much less commonly dried than fruit because many vegetables lose a good deal of their flavor when dried. Drying depletes much more of the vitamin content in vegetables than in fruits; in effect, the acidity of fruits preserves vitamins better. Fruits and vegetables should be cut into small pieces or thin slices for rapid drying and spread without touching on drying racks. Many aromatic herbs can be dried successfully for cooking, infusing for medicinal and pleasure teas, and for hair rinses and soothing baths.

Tips for drying herbs:

- pick plants in the morning, when it is dry and sunny and they are at their peak, depending on the plant and the part that you are using, and wash only when necessary

- dry plants in the shade or indoors in a well-ventilated space

- store dried plants in glass jars, away from light. Plants can also be hung in a dry, well ventilated place

Foods that are dried at a temperature below 105 degrees Fahrenheit (warm to the touch) are rich in enzymes, life force and an important component in the digestion of foods.

Cold storage

Some vegetables may remain in the ground all winter with a good mulch to protect them from frost, excess moisture and wildlife.

A well-constructed and planned root cellar should remain cool but frostproof right till the end of spring. Under cool, dry conditions, most produce will keep remarkably well, and gardeners in severe climates, where in-ground winter storage is risky, will have a viable option for preserving their harvest. Insulated cold storage containers or rooms can be used successfully in basements or garages if optimum temperatures can be controlled. Caution: Apples give off ethylene gas, which makes other produce ripen, sprout and spoil prematurely, and which can impart an off flavor to cabbage and other vegetables. Be sure to store apples separately from other produce.

Resources

- USDA Complete Guide to Home Canning: http://www.uga.edu/nchfp/publications/publications_usda.html
- Food Preservation Without Sugar or Salt: www.ext.colostate.edu/PUBS/FOODNUT/09302.html
- Drying: [Dry It ~ You'll Like It](#) by Gen MacManiman, www.dryit.com www.pcd.com/dehydrators.html
- Preserving in vinegar: [Herbal Vinegar](#) by Maggie Oster (Storey)
- [Preserving Food without Freezing or Canning](#), by Claude Aubert/Gardeners & Farmers of Terre Vivante
- [Stocking Up](#), by Carol Huppig/Rodale Food Center
- An interesting blog: <http://sharonastyk.com/category/food-storage>

Notes:



Fernie Community EcoGarden
Workshop Series 2008 - Keeping Food Real

For more information:
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Preserving Foods

Today, as home gardeners and cooks rediscover the joys of preserving, we often must confront a gap in cultural knowledge. Instead of turning to a parent or grandparent for advice, we refer to government publications, bookstores and online sources. With the many modern and traditional forms of food preservation available, we will want to base our choices of preservation on maximizing retention of flavour, nutritional content and avoiding formation of toxins in the food. Think of your pantry or cold cellar as a close cousin to the outdoor cold frame or unheated greenhouse: a simple, low-cost technology that can help you prolong the garden year and make the most of it.

The Science of it

Although it is unlikely that our kitchens will be absolutely sterile environments, there are precautions we can take while preparing foods for preserving. We can keep many disease-causing microbes in check simply by washing hands frequently, by rinsing off raw foods, by thoroughly cleaning all utensils and cutting surfaces, and by following a few commonsense food safety guidelines.

Food is spoiled when certain microorganisms begin to reproduce on and digest its surface, releasing harmful toxins as byproducts of their metabolic processes. *Clostridium botulinum* bacteria are widespread in the environment and may be found on various produce, but their spores are harmless when there is oxygen in the environment. However, the spores can produce a deadly toxin when in an anaerobic (oxygen-free), low acid environment.

Therefore, in preserving food we must ensure that it is difficult or impossible for microorganisms to reproduce or survive in it. High-salt and high-sugar mixtures preserve food because they are absorbent relative to the internal fluid of microorganisms, causing them to shrivel up and eventually die. When a layer of a high-salt or high-sugar substance is used to preserve food, the food is protected from microbial invasions. This is a more sophisticated way to preserve food than the oldest methods of storing in the ground and by drying.

Remember that the point of preserving food is not to place it forever in suspended animation, but to extend the bounty of the fresh harvest season.

Food preservation methods

Preserving in oil Garlic, vegetables or herbs in oil mixtures may support the growth of *C. botulinum* bacteria. For safety reasons, they should be made fresh. Leftovers should be frozen, refrigerated for use within 10 days, or discarded. Do not store at room temperature. Peeled garlic cloves may be submerged in oil and stored in the freezer for several months.

Preserving in vinegars High acid environments will prevent the growth of bacteria, and are used for pickling vegetables and some fruits. Steeping herbs in commercial vinegars is a simple way to preserve the flavours of fresh herbs for a variety of uses beyond salad dressings. Herbal vinegars provide a great base for marinating meats, vegetables, and fruits and make a refreshing beverage when added to water. Use a high quality vinegar with at least 5% acetic acid. Each cup of vinegar will require ½ cup of fresh herbs. Herbs are steeped in the vinegar in clean glass jars in a dark place at room temperature for 1 -3 weeks before bottling.

Preserving with salt When fresh vegetables are combined with salt and steeped in their own juices, lactic microbial organisms – similar to those that curdle milk – develop spontaneously and convert the natural sugars of the vegetable into lactic acid. This environment rapidly acidifies, to the point that it becomes impossible for bacteria responsible for food spoilage to multiply. Vegetables preserved this way will keep in a cool place, such as a cellar, for many months.

Preserving with sugar Sugar is used as a natural preservative. The sugar inhibits the bacterial growth after the food or products have been heated. This method is used for making jams and jellies.

Preserving by heating Low acid foods, meats and fish prepared without salt or sugar must be processed in a pressure canner where temperatures well beyond the boiling point can be reached. It's recommended that preparations using salt, sugar and vinegar to preserve foods should also include heating in a boiling water bath for a short period of time (5-10 minutes) to ensure jars are properly sealed and botulinum organisms are destroyed by the heat.

How canning preserves foods

The high percentage of water in most fresh foods makes them very perishable. They spoil or lose their quality for several reasons: growth of undesirable microorganisms such as bacteria, molds, and yeasts; activity of food enzymes; reactions with oxygen; moisture loss

Microorganisms live and multiply quickly on the surfaces of fresh food and on the inside of bruised, insect-damaged, and diseased food. Oxygen and enzymes are present throughout fresh food tissues.

Proper canning practices include:

- carefully selecting and washing fresh food
- hot packing many foods
- adding acids (lemon juice or vinegar) to some foods
- using undamaged jars and self-sealing lids
- processing jars in a boiling-water or pressure canner for the correct period of time

Collectively, these practices remove oxygen; destroy enzymes; prevent the growth of undesirable bacteria, yeasts, and molds; and help form a high vacuum in jars. Good vacuums form tight seals which keep liquid in and air and microorganisms out.

Food acidity and processing methods

Whether food should be processed in a pressure canner or boiling-water canner to control botulinum bacteria depends on the acidity of the food. Acidity may be natural, as in most fruits, or added, as in pickled food. Low-acid canned foods are not acidic enough to prevent the growth of these bacteria. Acid foods contain enough acid to block their growth, or destroy them more rapidly when heated. The term “pH” is a measure of acidity; the lower its value, the more acid the food. The acidity level in foods can be increased by adding lemon juice, citric acid, or vinegar.

Low-acid foods have pH values higher than 4.6. They include red meats, seafood, poultry, milk, and all fresh vegetables except for most tomatoes. Most mixtures of low-acid and acid foods also have pH values above 4.6 unless their recipes include enough lemon juice, citric acid, or vinegar to make them acid foods. Acid foods have a pH of 4.6 or lower. They include fruits, pickles, sauerkraut, jams, jellies, marmalades, and fruit butters.

Making jams, jellies and pickles

Jelly is made by cooking fruit juice with sugar. It should be clear and firm enough to hold its shape Jam is made from whole, cut or crushed fruit boiled with sugar to make a thick spread. Freezer jam is made from uncooked sweetened fruit that is sweetened and stored in the freezer. Raw fruit and berries can be frozen for later use in making jam or jelly..

Acid is required to enable the pectin to set the jam or jelly and convert some of the sugar into invert sugar to prevent the jam or jelly from crystallizing. Blueberries, elderberries, peaches, pears and most overripe fruits are low in acid. Fruits low in acid can be combined with those high in acid or lemon juice or citric acid can be added to recipes to raise the acid level.

Pectin is a natural carbohydrate found in fruits, which in combination with sugar and acid, causes jam or jelly to set. It forms in the fruit during ripening. Pectin content is highest in under ripe fruit and decreases as the fruit becomes fully ripe. Fruits high in pectin and acid are sour apples, sour cherries, crabapples, cranberries, red and black currants, gooseberries, grapes, lemons and damson plums.

Quick cooking activates the natural pectin in fruit. Boiling too long or too slowly can reduce the gelling property of natural pectin found in fruit. This can occur while extracting juice or pulp or when the juice or pulp is boiled with sugar. Pectin can be made from sour apples, crabapples, red currants or gooseberries.

Pickling vegetables such as cucumbers, carrots, onions, mushrooms, and squash in vinegar with the possible addition of herbs, salt and sugar is a popular way of preserving these foods. These seasonings and vegetables can be used alone or in many combinations to make delicious condiments. It’s important to remember that any foods prepared with high salt, acid or sugar content should be used in moderation to complement rather than replace cooked and raw vegetables in the diet.

STORAGE & PROCESSING OPTIONS FOR FOODS								
* best for preserving nutrition								
FOOD	COLD STORAGE	DRYING	FREEZING	PRESSURE CANNING	BOILING H ₂ O BATH	JAMS & JELLIES	SALTING (lactic ferm.)	PICKLING IN VINEGAR
FRUITS								
apples, pears	* wrap individually	yes	yes	yes		yes		
soft tree fruits		yes	* yes	yes		yes		yes
berries		yes	* yes	yes		yes		
bananas		yes	yes					
tomatoes	* wrap when green	yes	yes		yes	yes		
VEGETABLES								
beans, in pod			* yes	yes				yes
beans, shelled		yes						
carrots, parsnips	* yes	yes						yes
corn		yes	* yes					yes
peas -edible pod			* yes					
peas - shelled			* yes					
squash, summer		yes						yes
squash, winter	* yes		yes					
cabbage	* yes						yes	
onions, garlic	* yes	yes						yes
beets	* yes	yes		yes				yes
potatoes, turnips	* yes							
asparagus			* yes	yes				
cauliflower, broccoli			* yes					yes
leafy greens		yes	* yes					
small herbs		yes	* yes					yes
OTHER FOODS								
meat, fish			* yes	yes			yes	
poultry			* yes	yes				

Freezing foods

The best vegetables for freezing are fresh, tender and straight from the garden. The fresher the vegetables are when frozen, the more satisfactory the frozen product. Wash vegetables thoroughly in cold water. Lift them out of the water as grit settles to the bottom of the pan. Sort vegetables, peel, trim and cut into pieces, as directed for each vegetable.

An important step in preparing vegetables for freezing is heating or “blanching” before packing. Practically all vegetables, except green peppers, maintain better quality in frozen storage if blanched before packing.

The reason for blanching vegetables before freezing is that it stops the action of enzymes. Up until the time vegetables are ready to pick, enzymes help them grow and mature. After that they cause overripening, loss of flavor and color changes. If vegetables are not sufficiently blanched, the enzymes continue to be active during frozen storage. The vegetables may develop off-flavors, discolor, or toughen so that they may be unappetizing after a few weeks of freezer storage.

Blanching also wilts and softens vegetables which makes them easier to pack. Blanching time varies with the vegetable and size of pieces. For home freezing, the most satisfactory way to blanch vegetables is in boiling water with a wire basket fitted into a large covered kettle. For each pound of prepared vegetables, use at least 1 gallon of boiling water in the blancher or kettle. Put vegetables in wire basket and lower it into the boiling water. A wire cover for the basket can be used to keep the vegetables down in the boiling water.

After vegetables are heated they should be cooled quickly and thoroughly to stop the cooking. To cool blanched vegetables, plunge the basket of vegetables immediately into a large quantity of ice cold water. Change water frequently so that it stays ice cold. It will take about as long to cool the food as it did to blanch it. When the vegetable is cool, remove it from the water and drain thoroughly.