

Preserving your Harvest

Why Preservation?

Prevent the growth of microorganisms (bacteria, yeast, fungi) that spoil food. Some bugs can change the taste but some can sicken (Salmonella) or kill you (botulism).

Retard the oxidation of fats that cause rancidity.

Stop the enzymes in fruits and vegetables that helps ripen them and continues to turn them rotten.

Inhibit food discoloration (e.g., the browning of apples after they are cut).

Maintain the nutritional value of food.

Maintain flavor.

Here are some good ways to preserve food:

Refrigeration

Freezing

Cold storage (as in a root cellar)

Drying (dehydration)

Canning and Bottling (and high-pressure cookers)

Here are some ways to preserve food I won't cover:

Salting (or curing) draws moisture from the meat by osmosis. Meat is cured with salt and/or sugar, nitrates and nitrites and by smoking. Jerky and ham are examples. Salt and sugar are on many doctor's no-no lists and nitrates have been implicated in cancer.

Pickling, also known as **brining** or **corning** is the process of preserving food by anaerobic (without air) fermentation in brine (a solution of salt in water) to produce lactic acid, or marinating and storing it in an acid solution, usually vinegar (acetic acid). The resulting food is called a *pickle*. This procedure gives the food a salty or sour taste.

Sugaring preserves fruit in syrup or crystallized form. It is often used in combination with alcohol (brandied fruit, cordials with vodka).

Heat treating (pasteurization)

Vacuum packing

Artificial food additives (antioxidants and anti-microbials).

Lye (as in olives and lutefish)

Potting A traditional British way to preserve meat (particularly shrimp) by setting it in a pot and sealing it with a layer of fat.

Jugging is the process of stewing meat in a covered earthenware jug or casserole (with brine or gravy).

Jellying involves cooking in materials such as gelatin or agar to solidify into a gel (Aspic and jellied eels are examples).

Burial in the ground

Some tips on Refrigeration of food

Fridge not above 40 degrees nor below 34 degrees.

Reduce temperature of leftovers as quickly as possible.

Clean the fridge and don't be afraid to leave some soap. Soap is a bacteriostat (inhibits but does not kill). Bleach is a bacteriocide (kills).

Wash fruit and veggies before putting in the fridge for longer life [soap and water or veggie spray (see recipe below)].

Prevent dehydration by using airtight containers.

What about Debbie Meyer Green baggies? It has been shown that they work just as well as ziplock storage bags except for a couple of items that did better (carrots and green peppers) and some that did worse (grapes and bananas).

Food only lasts in the fridge from 5 days to 5 weeks.

Food left out for more than 2 hours at the danger temperature zone (40 to 140 degrees) should be discarded. Leftovers should be consumed within 4 days AND be reheated to 325 degrees to kill bacteria.

How long should you keep food in the fridge? Milk for only 1-2 weeks even if it smells OK and has not expired. Eggs for 3-5 weeks. Fresh meat only 3-5 days. Mayo for 2 months. Veggies depend on how solid it is. These you can give the sniff and bite test.

Homemade Vegetable Wash: Recipe

1 cup water
1 cup vinegar
2 TBS baking soda
2 TBS lemon juice

Directions: Mix ingredients then pour in clean spray bottle. Spray fresh vegetables & fruit generously. Sit for 5 minutes then rinse off well.

- *Note:* Make sure to first mix ingredients in deep container since there will be some fizzing from the baking soda & vinegar.

A mix of 50/50 vinegar and water sprayed on fruit & veggies also works as a good produce cleaner.

Some tips on Freezing

- Ensure that food is in perfect condition before freezing. (Not overripe, or been in the fridge for a while)
- Divide food into small portions. This ensures rapid freezing and better quality on defrosting.
- Use the correct type of packaging or container. (airtight being the key)
- Make sure that food is tightly wrapped or sealed and that no air or water can get in or out.
- Check that the temperature of the freezer is at 0°F or below.
- Do not freeze too many unfrozen items at once.
- Defrost items in the refrigerator or in cold water or the microwave on defrost.

The faster a food is frozen the better. When fresh food is quick frozen, the cold penetrates rapidly, freezing the water and forming a large amount of small ice crystals. The smaller the ice crystals, the better the food quality after defrosting.

If food is frozen slowly, a smaller amount of large ice crystals tend to form. This means that as the water freezes and expands, the cell walls of the food expand and rupture causing structural damage to the food.

The **ideal temperature** at which to store food items in the freezer for long periods of time is **0°F (-8°C)** or below. Foods stored at temperatures above 0°F will be prone to minimal bacteria activity, food spoilage and deterioration. At 0°F bacteria are inactivated, nutrients are retained and deterioration is at its lowest.

Bacteria, whether harmful or not, **are not destroyed** through the freezing process, as they are through the cooking process. **They are merely put out of activity** for the duration of the time that the frozen product is actually frozen solid.

If the item is thawed at a temperature above 40°F (5°C) bacteria will multiply rapidly in a very short time and could lead to food poisoning and severe illness.

For this reason, it is very important to defrost **food slowly and safely**, preferably overnight in the refrigerator.

Nutrients are retained better in frozen fruits and vegetables than in those that are transported long distances to their destination.

The only way to prevent enzyme activity during freezing is to halt it before freezing. This can be done by using two different methods.

Vegetables suitable for freezing are **blanched** (placed into fast-boiling water), **steamed or microwaved** for a specific amount of time and then rapidly cooled. This action will inactivate certain enzymes that would otherwise continue their activity even when frozen. The only downside to this is that a small amount of vitamins and nutrients are lost in the blanching process. See the appendix A-1 for blanching methods.

Foods that contain high amounts of fat such as meat, fish or poultry may turn rancid when stored in the freezer. For this reason, it is vital that animal products are carefully wrapped in airtight packaging and as much air is excluded as possible before wrapping.

How long will food keep in the Freezer?

Times are based on a freezer set at 0 degrees Fahrenheit or colder. Storing and eating frozen foods past these deadlines isn't dangerous, but flavors and textures will begin to deteriorate.

- **Bacon:** 1 to 2 months
- **Breads:** [2 to 3 months](#)
- **Casseroles:** 2 to 3 months
- **Cooked beef and pork:** 2 to 3 months
- **Cooked poultry:** 4 months
- **Cookie dough:** [3 months](#)
- **Fruit:** [8 to 12 months](#)
- **Frozen dinners:** 3 to 4 months
- **Hot dogs:** 1 to 2 months
- **Lunch meats:** 1 to 2 months
- **Sausage:** 1 to 2 months
- **Soups and stews:** 2 to 3 months
- **Uncooked chicken (parts):** 9 months
- **Uncooked chicken (whole):** 1 year
- **Uncooked steaks, chops, or roasts:** 4 to 12 months
- **Uncooked ground meat:** 3 to 4 months
- **Vegetables:** [8 to 12 months](#)
- **Butter** 6-9 months

Here is a good website that offers guidelines for how to store most foods (room temperature, refrigerator or freezer)

<http://whatscookingamerica.net/Information/FreezerChart.htm>

Some tips on Cold storage (as in a root cellar)

Since cold storage requires cool temperatures and higher humidity, this is difficult to do in Arizona. You will need to find a cool place in the garage or pantry and you may have to humidify with a pan of water on the floor of your cellar and possibly damp towels over your bushel baskets, to raise the humidity and prevent your harvest from shriveling.

Here are some tips:

- To work properly, a root cellar must be able to hold a temperature of 32° to 40° F and a relatively humidity level of 85 to 95 percent.
- A few vegetables—such as potatoes, winter squashes, and onions—need to be “cured” for a few days in warm temperatures before going into cold storage.
- Shake off loose dirt from root vegetables rather than washing it off.
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- Always handle your vegetables with care; even slightly rough treatment can cause invisible bruising, starts the produce on the road to decomposition.
- Check your vegetables regularly, and immediately remove any with signs of rot. From the lessons of the cold cellar comes the saying, “One rotten apple spoils the whole barrel.”

APPROXIMATE STORAGE TIMES:

Cabbage.....3-4 months
Brussels Sprouts.....3-5 weeks
Jerusalem Artichokes..1-2 months
Carrots.....4-6 months
Chinese Cabbage...1-2 months
Eggplant.....1-2 weeks
Parsnips.....1-2 months
Rutabagas.....2-4 months
Squash.....4-6months
Radishes.....2-3 months
Tomatoes.....1-2 months
Cauliflower.....2-4 weeks
Broccoli.....1-2 weeks
Beets.....4-5 months
Pumpkins.....5-6 months
Potatoes.....4-6 months

Some tips on Food Dehydration

Since low humidity and sun are what we have in Arizona, drying some foods is a good alternative

Dehydrated foods have a number of advantages: Dehydration is a low-cost way to preserve food that is free from concerns about botulism, the dried foods require less storage space than canned goods, and there's no freezer to keep running.

1. **Select the drying method and equipment that is right for you.** Foods can be dried in a conventional oven, a commercial dehydrator, or in the sun. Drying times vary with the method and foods chosen. Be sure to read the instructions with your dehydrator.
2. **Maintain 130F to 140F with circulating air:**

Dependable solar dehydration of foods requires 3 to 5 consecutive days when the temperature is 95 degrees F. and the humidity is very low.

Some tips on Canning and Bottling and high-pressure cooking

Home canning is an economical, low energy, safe way to preserve foods at home. Foods can be stored for long periods and will retain much of their taste and nutrition. To maintain color and flavor in canned food you must 1) remove oxygen from food tissues and jars, 2) quickly destroy the food enzymes and 3) obtain high jar vacuums and airtight jar seals.

The US Department of Agriculture and many major universities state that if you are canning at home, including making jams and jellies, you must use a water bath or pressure canner, if you want to avoid food poisoning. By food poisoning they are referring to varieties of bacteria, such as botulism, that grow in a sealed environment. Without hyperbole, death is one of the outcomes of such poisoning.

Equipment for heat-processing home-canned food is of two main types--**boiling-water canners** and **pressure canners**.

Low-acid foods must be processed in a pressure canner to be free of botulism risks.

Low-acid foods have pH values higher than 4.6 up to 6.9. (non-acidic, or alkaline foods have pH values of 7.0 or greater) .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.

Naturally acidic foods include most fruits, such as:

Apples, berries, blackberries, blueberries, cranberries, peaches, pears, raspberries and strawberries

Tomatoes are borderline - and must be considered a special case, with acid added!

Low Acid or Non-acidic Foods

These are considered to be LOW acid foods:

Certain fruits: figs, Asian pears, melons, bananas, dates, papaya, ripe pineapple, persimmons

Almost ALL vegetables, such as:

asparagus, beans corn, cucumbers, garlic, green beans
greens (lettuce, kale, collards, spinach, etc.)
onions, peas, pumpkins , squash (summer or winter varieties)

Some tips:

- Always begin with good quality, fresh foods.
- Keep most foods in a solution of 3 grams ascorbic acid to 1 gallon of cold water and it will also maintain the natural color.
- After processing make sure the jar lids cannot be pressed in to ensure lack of air.
- Reuse jars and screw lids but not seal caps.
- Increasing the process time or canner pressure compensates for lower boiling temperatures (in higher elevations).

Appendix 1

Why and How to Blanch Food

When the water in food freezes, it stops much of the cellular activity that normally causes spoiling. But there are certain enzymes in vegetables that can continue their nefarious deeds in the quiet and dark of the freezer. Blanching — either steaming or boiling the food briefly — destroys the enzymes that cause the loss of nutritional value and flavor. Onions, peppers, and herbs do not need to be blanched. Squash, sweet potatoes, and pumpkin should be fully cooked before freezing. All other vegetables should be blanched.

To blanch by boiling, use at least a gallon of water for a pound of vegetables. Put the vegetables in a wire basket, submerge them completely in the boiling water, cover with a lid, and begin timing. To blanch by steaming, put the vegetables in a steamer basket and suspend it above an inch or two of boiling water. Cover the pot, and begin timing as soon as steam starts to escape from under the lid. With either method, shake the basket a couple of times to ensure that all vegetable surfaces are exposed to the heat. After the allotted time, remove the basket, and plunge the vegetables into a bowl of ice water to stop the cooking. Once cool, remove them, drain thoroughly, and package for freezing.

On the next page is a chart for blanching or boiling times for most foods.

USDA Recommended Blanching Times (Source: USDA)

Vegetable:	Blanching time (minutes):
Asparagus, Small	2
Asparagus, Large	4
Beans, Regular Cut	3
Beans, French Cut	2
Beans, Lima, Small	2
Beans, Lima, Large	4
Beets, Small	25-30
Beets, Large	45-50
Broccoli	3
Brussel Sprouts, Small	3
Brussel Sprouts, Large	5
Cabbage, Minute	1 1/2
Carrots, Whole	5
Carrots, diced or sliced	2
Cauliflower	3
Corn, kernels	4
Corn on cob, small ear	7
Corn on cob, large ear	11
Collards	3
Spinach	1 1/2
Okra, small pods	3
Okra, large pods	4
Peas, small pods	1 1/2
Peas, large pods	2