

# Food Preservation



## PURPOSE

God sustains us physically through food. Food, however, is a limited commodity. As good stewards, we should not want to waste anything God gives us. Learning food preservation techniques can teach Cadets ways to save food, resources, and money.

## LEARNING

1. **Freezing:** Food is put inside a freezer or the freezer part of a refrigerator to cool it to the point of freezing. The temperature of the freezer should be 0°F (-18°C) or lower.

**Advantages:** Freezing keeps the nutrients in, often retains the original color, and often retains the fresh flavor. If the air is removed to reduce freezer burn, and the food stays frozen, most food can last safely for months.

**Disadvantages:** Food must continually stay frozen until you're ready to eat it. Thawing the food to eat it requires time. You need something to freeze it in.

2. **Drying:** Drying food means removing moisture from the food so that bacteria, yeast, and mold cannot grow and spoil the food. Modern food dehydrators are available for this purpose.

**Advantages:** The food is lighter to carry once the water is removed. This makes it beneficial for backpacking trips. It can be kept for a long time.

**Disadvantages:** It requires time to prepare the food for drying and an even longer time to dry the food. It usually requires access to a food dehydrator or an oven for several hours, although you don't have to continually watch it.

3. **Canning:** Canning food involves cooking it and then sealing it in sterile cans or jars. The containers are boiled to kill or weaken any bacteria.

**Advantages:** The food is ready to eat as soon as you pop the lid. It can be stored for a long time.

**Disadvantages:** This process requires equipment, such as a canner, canning jars and lids, sugar (for canning fruits), and sugar and pectic (for jams and jellies).

4. **Smoking:** This process exposes the food to smoke from burning plant materials, usually wood. As the smoke deposits products onto the food, it aids in the drying and preservation of meats and other foods.

**Advantages:** The food is ready to eat as soon as the container is opened.

**Disadvantages:** It requires a special smoker and special wood chips. It takes some time, though the cook does not need to continually watch it.

5. Definitions:

*Blanch* — to scald vegetables; to immerse briefly in boiling water

*Dehydrate* — to remove water from a food item

*Pare* — to cut or trim away the rind or skin

*Peel* — to cut or trim away the rind or skin.

6. Preservation methods:

Food Type	Freezing	Drying	Canning	Smoking
Apples	X	X	X	
Bananas		X		
Blueberries	X		X	
Fish	X		X	X
Fowl	X		X	X
Green beans	X		X	
Green peppers	X			
Jams and jellies	X		X	
Jerky		X		X
Venison	X			

## DOING

In any food preservation, the first step is to wash your hands and any utensils you will be using.

### Freezing

Freezing fruit requires little effort. For berries, simply clean them, drain the water from cleaning off, remove stems, put them in an airtight container, and freeze. Or you may freeze them on a cookie sheet and then move them to an airtight container. This prevents the berries from freezing together in a big clump.

Other fruits may require peeling, slicing, or even cooking before freezing. Again put fruit in an airtight container to freeze. Applesauce is one example of a cooked frozen fruit.

Most vegetables require blanching before they are frozen. Blanching helps them retain their texture and color. It's best to check to see how long each particular vegetable should be blanched before freezing as there are different times for different vegetables.

A few vegetables can simply be rinsed well, patted dry, and frozen in an airtight bag. These include onions, peppers, celery, carrots, and grated zucchini; these are best when they are being used in dishes that will be cooked or baked (soups, casseroles, zucchini bread, etc.).

### Drying

Drying foods involves extracting the moisture from them to prevent bacteria and other organisms that cause rotting or decay from forming in those foods. Drying works best when it occurs in an oven or a food dehydrator. Vegetables, fruits, herbs, and meats can withstand the food-drying process.

Prepare to dry vegetables by cleaning fresh vegetables, and trimming away any bruises with a knife. Cut food into smaller pieces (½" [1.3 cm]) for easier drying. Blanch vegetables in boiling water for up to six minutes, then immediately cool in cold water for the same amount of time.

Prepare fruit by cutting into ½" (1.3 cm) pieces or in halves to ensure even drying. In a large bowl, add a quart (or liter) of water and up to 1.5 teaspoons (7.3 ml) of food-grade quality sodium sulfate or sodium bi-sulfate to the water. Soak fruit for approximately 5–15 minutes, depending on how you sliced the fruit. Rinse fruit pieces with cold water before placing them on a rack to dry.

Prepare herbs for drying by rinsing them in cool water and shaking off any excess.

Prepare lean meats and fish by slicing into ¼–½" thick (0.64–1.3 cm) pieces. Cut off all fat because it spoils the meat during the drying process. Freeze any meat or fish you plan to dry for around 30 days (0°F [-18°C] or lower). Then thaw meat/fish in refrigerator. Add salt, seasonings, and any marinades.

Choose your drying method — oven or dehydrator. Arrange sliced food in single layers on drying trays. Place trays inside of an oven or dehydrator. If you marinated the meat, line the bottom of the drying appliance with foil to catch the drippings. Begin drying process. If you use an oven, leave door open slightly and keep a fan nearby for ventilation.

At 140°F (60°C), vegetables will dry in 4–18 hours, fruit in about 36 hours, and meat in approximately 12 hours. Herbs will dry within 1–4 hours at 115°F (46°C).

## Canning

Canning is typically done in a water-bath, so you will need a large pot that will hold enough water to cover whatever size jars you will be using. A jar lifter is also very handy. This is the most inexpensive way to can foods, but you can also use pressure canners to can a low-acid foods, such as meats and many vegetables.

Begin with good-quality fresh foods at their peak of quality — within six to twelve hours after harvest.

Sterilize the jars and then place them upside down on a clean towel and cover with another clean towel until you're ready to use them. Place jar seals into boiling water in a saucepan and heat evenly.

Peel and cut up fruits or vegetables. Remove pits, stems, cores, skins, or any other part you do not eat. If canning jam, cook it first. Cook and/or soak pickles. Prepare relish, applesauce, etc. according to their recipes.

There are two different methods of canning: raw-packing and hot-packing. Raw packing will result in food discoloration within 2–3 months of storage, unless using a pressure canner for vegetable processing.

Hot-packing requires heating freshly prepared food to boiling, simmering it for a specified time, and promptly filling clean jars loosely with the boiled food. Juice, syrup, or water is typically added and should also be boiled.

Fill the jars, leaving space at the top called head space. Check instructions as the amount of head space varies. Add

any preservatives, syrups, or liquids; then remove air bubbles by running a long knife along the sides and jiggling or lightly pressing down on the food.

Wipe the rims and threads of the jar with a clean, damp cloth, especially the top surface. Then the lids are placed on the top of the jar, screw bands are secured, and the jars are processed in the water bath in the large pot (hot water for hot-packed foods and cold water for cold packed foods). After they've processed, remove them from the hot water and cool them on a clean towel in a place free from drafts. Lids will "pop" when they seal. If the center of the lid springs back when touched, it does not have a proper seal and the food should be refrigerated and used promptly.

## Smoking

A salt brine is the main ingredient common to all curing/smoking processes. It contributes to the flavor and texture of the meat, and discourages growth of spoilage microorganisms that could render the meat inedible. Additional ingredients are often used to enhance the flavor and improve the appearance of the finished product — such as sugar, preservatives like saltpeter, and spices like pepper, onion, or garlic.

The curing solution and meat are kept cool to discourage possible growth of microorganisms. Temperatures of 35–40°F (2–4.5°C) are ideal during the curing phase. After the curing process is complete, carcasses are removed from the brine and allowed to drain. Additional brine can be removed by rinsing in cool water. Before smoking, allow the carcasses to dry slightly to improve the adhering of the desirable smoked color.

Various hardwoods are used to smoke the meat — such as hickory, oak, maple, mesquite, apple, cherry, plum, and peach. Each type of wood contributes a distinctive effect on the flavor and color of the finished product. Soft woods are never used due to the presence of resinous substances in the woods.

Hot smoking takes a few hours and the idea is to create the smoke flavor and cook the food at the same time. You want the heat in the chamber the food is placed to be between 130–180°F (55–82°C).

Cold smoking takes even longer — often days. The food is placed so that there is no heat from the fire. The smoke area should remain at room temperature during the smoking process — usually between 60–80°F (16–27°C). Cooking does not take place during the process and microbes living in the food are not eliminated. Foods that are cold smoked are usually cured with curing-salts. A good example of this would be ham and bacon. After they have been smoked for preservation and flavor, they must be cooked before being eaten.

You can also combine cold and hot smoking. You smoke the foods at a low temperature for a longer period of time and then slowly over a few hours increase the temperature to 170°F (77°C) for cooking. Always check the internal temperature of meats and be sure they reach the temperature needed for safe eating (160°F [71°C]).