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Home Freezing Basics

Freezing is an excellent way to preserve most fresh foods. Freshness and quality at the time of freezing affect the condition of frozen foods. If frozen at peak quality, foods emerge tasting better than foods frozen near the end of their useful life. If proper techniques and correct temperatures are used, your foods will keep most of their vitamin content, natural color, flavor, and texture. With a home freezer you can have your own fresh-tasting foods available year-round.

How Freezing Affects Foods

Freezing (0°F or below) preserves food for extended periods because it prevents the growth of microorganisms (bacteria, yeasts, and molds) that cause both food spoilage and foodborne illness. The freezing process itself does not destroy nutrients. After thawing, however, microbes that may be present can become active, multiplying under the right conditions to levels that can lead to foodborne illness. Handle thawed foods like any perishable product. Thorough cooking will kill most microorganisms. Since *Clostridium botulinum*, the microorganism that is of greatest concern in canning, does not grow and produce toxin at 0°F, freezing provides a safe and easy alternative to pressure canning low-acid foods.

Trichina and other parasites can be destroyed by sub-zero freezing temperatures. However it is not recommended to rely on home freezing to destroy trichina. Thorough cooking will destroy all parasites that may be present.

Enzymes present in animal foods, fruits, and vegetables promote chemical reactions, such as ripening. Freezing slows down enzyme activity but does not halt these reactions. Enzyme activity does not harm frozen meats or fish and is neutralized by the acids in frozen fruits. But most vegetables that freeze well are low-acid and require a brief, partial cooking, known as blanching, to prevent deterioration.

Rancid or off-flavors can occur when fat, such as in meat, is exposed to air over a period of time. Rancidity can be controlled by using a wrapping material that does not permit air to reach the food. Remove as much air as possible from the container to reduce the food's contact with air.

Ideally, foods should be quick-frozen within two hours and stored at 0°F or lower. Freeze foods immediately after they are packaged to retain vitamin content, natural color, flavor, and texture. To freeze foods quickly, freeze 3 to 5 pounds per cubic foot at a time. Cool all foods before packaging. Allow space between the packages for air circulation. If the packages are packed in several layers, the packages in the middle may freeze too slowly to preserve peak quality. Once foods are frozen, you can store the packages close together.

Slow freezing creates large, disruptive ice crystals. During thawing, these crystals damage cell walls and dissolve emulsions. This causes meat to *drip,* or lose its juiciness. Emulsions such as mayonnaise or cream will separate and appear curdled. Rapid freezing prevents undesirable large ice crystals from forming throughout the product.

Foods That Don't Freeze Well

Certain foods may become soft and mushy, waterlogged, tough, or soggy when frozen, or they may separate. Some vegetables and some foods containing eggs, milk, or seasonings do not freeze well. These foods include:

Vegetables
- cabbage
- celery
- watercress
- cucumbers
- endive
- lettuce
- parsley
- radishes.

Foods with Eggs or Milk
- shell eggs or cooked egg whites
- meringue or icings made from egg whites
- cream or custard fillings
- milk sauces
- sour cream.

Miscellaneous Foods
- baked or boiled Irish potatoes
- cheese or crumb toppings
- mayonnaise or salad dressing
- gelatin
- fried foods, with the exception of French fries and onion rings.

Spices, Herbs, and Seasonings
When using seasoning, season lightly before freezing, and add additional seasoning when reheating or serving.

- Spices and herbs may
  - develop an off-flavor
  - get strong and bitter.
- Salt
  - loses flavor
  - tends to increase the rancidity of any food containing fat.

Containers for Freezing

When the surface of frozen foods comes in contact with the air, *freezer burn* (grayish-brown leathery spots) occurs. Freezer burn does not make food unsafe, but heavily freezer-burned foods may have to be discarded due to a loss of quality. Cut freezer-burned portions away either before or after cooking the food. Proper packaging helps maintain flavor, moisture content, and nutritive value in the dry climate of the freezer. The selection of containers depends on the type of food to be frozen, personal preference, and the types that are available for purchase.

Containers specially labeled "designed for freezer storage" are available in some areas. In general, freezer containers should be:

- moisture-vapor resistant
- durable and leakproof
- strong and pliable, yet crack-resistant at very low temperatures
- resistant to oil
- able to protect foods from absorption of unpleasant odors
- easy to seal and label.

Packaging and Labeling

To speed up freezing and to retain the natural color, flavor, and texture of food, cool all foods and syrup before packaging. Follow directions for specific foods to determine which ones need added liquid. Pack food tightly in the container to leave as little air as possible.

Most foods do require headspace between the packed food and the lid of the container to allow for expansion of the food as it freezes. A ½- to 1½-inch headspace is generally acceptable. Foods that *do not need* headspace include:

- asparagus
- broccoli

• bony pieces of meat
• tray-packed foods
• breads.

It is safe to freeze meat or poultry directly in its supermarket wrapping. Since this type of wrap is permeable to air, use the food within two months or overwrap these packages as you would any food for long-term storage, using airtight heavy-duty foil, plastic wrap, or freezer paper, or place the package inside a plastic bag.

Use low-temperature tape to seal plastic and aluminum-foil containers tightly and to label the contents of the container. Use a wax or soft lead pencil, a crayon, or a special waterproof marking ink on a low-temperature label or tape. Include on the label:

• name of the product
• date frozen
• weight or number of servings
• type of pack.

Freezer Management/ Storage

Good freezer management is essential if you don't want to waste food. Keeping a record of the foods in your freezer will help you use your freezer wisely. Write down everything you put in or take out of the freezer. Use up all of last year's frozen produce before the next year's crop is ready to freeze.

Color changes can occur in frozen foods. Meat usually changes from bright red at purchase to dark or pale brown, depending on its variety. This change may be due to lack of oxygen, freezer burn, or abnormally long storage. The bones of poultry and the meat near bones can become dark. Bone darkening results when pigment seeps through the porous bones of young poultry into the surrounding tissues when the meat is frozen and thawed. The dulling of color in frozen vegetables and cooked foods is usually the result of excessive drying due to improper or abnormally long storage.

Freezing can keep most foods safe almost indefinitely. However, with time, all frozen foods will deteriorate in quality such that they are unacceptable for use. Follow recommended storage times for optimum quality results.

Thawing Foods Safely

There are only three ways to safely thaw food: in the refrigerator; in cold, frequently changed water; or in the microwave. **Do not thaw foods at room temperature or outside.** These methods may result in food that can cause foodborne illness.

Refrigerator Thawing

This is the preferred method of thawing, and it is the slowest method. Small food items may defrost overnight in the refrigerator, but most foods require a day or two. For large foods, such as a turkey, allow one day for each 5 pounds of weight.

Cold-Water Thawing

This method is faster than refrigerator thawing, but it requires more attention. Food should be placed in a leakproof plastic bag and immersed in cold water. Make sure the bag doesn't leak, as bacteria from the air or surrounding environment could be introduced into the food. Also, food tissues absorb water that would result in watery, less-than-high-quality food. Change the water frequently, but at least every 30 minutes. After thawing, refrigerate the food until ready for use, or cook it immediately.

Microwave Thawing

Use this method to defrost food only when you plan to cook it immediately. Some areas of the food may become warm and begin to cook during microwaving. Microwave

thawing does not destroy bacteria, so the food still needs to be thoroughly cooked.

Power or Equipment Failure

If power for your freezer is interrupted, or if the unit is not operating normally, do not open the freezer door. Food in a loaded freezer will usually stay frozen for two days, even in the summertime. If repairs cannot be made or service restored within one to two days, use dry ice to keep the food frozen. **Discard any foods that have been warmer than 40°F for more than two hours. Discard any foods that have been contaminated by meat juices.** Dispose of soft or melted ice cream due to loss of quality.

If it is freezing outside or there is snow on the ground, you may be tempted to keep food frozen outside until the power is restored; however, foods stored in the great outdoors are exposed to the sun, environmental contamination, and roaming animals and birds. So, it is best to keep food indoors.

Accidentally frozen cans may not be safe to consume. If the seams have rusted or burst, throw the cans out immediately. If the cans are merely swollen, and you are sure the swelling was caused by freezing, the cans may still be usable. Allow the unopened can to thaw in the refrigerator. **Do not taste the contents of the can upon opening.** If the contents of the can look or smell abnormal, throw the can away. If the contents look and smell normal, thoroughly cook by boiling 10 to 20 minutes immediately after opening.

Refreezing Thawed Foods

You may safely refreeze frozen foods that have thawed *if they still contain ice crystals* or if they are still cold (about 40°F) and have not been in the refrigerator for more than one day. In general, *if a food is safe to eat, it is safe to refreeze*. Partial thawing and refreezing will lower the quality of fruits and vegetables. Meats may be cooked and then frozen again with little loss of quality. Use refrozen foods as soon as possible to maintain an acceptable quality.

Cooking Frozen Foods

Raw or cooked meat, poultry, or casseroles can be cooked or reheated from the frozen state. It will take approximately one and a half times the usual cooking time. Discard any wrapping or absorbent paper from meat or poultry. When cooking whole poultry, remove the giblet pack from the cavity as soon as it becomes loose. Cook the giblets separately.

Freezing is one of the easiest, most convenient, and least time-consuming methods of preserving foods. By following proper procedures for freezing and thawing foods, you can enjoy high-quality, nutritious foods straight from the freezer.

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