The big chill: A freezer guide

Freezing is one of the most convenient and least time-consuming methods of preserving foods. The extreme cold retards the growth of microorganisms and slows down chemical changes that affect quality or cause food to spoil. No matter how many years food is frozen, it's perfectly safe to eat. In fact, it might taste just as good as the day it was frozen. However, quality largely depends on freezer savvy: how food was wrapped, how fast it froze, how long it is kept, the freezer's temperature and whether the food should have been put on ice in the first place.

Use this guide to learn the best ways to take your food from freezer to table.

— CiCi Williamson, April Umminger | Illustrations by Laura Stanton

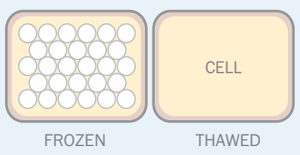
HOW FOOD FREEZES

When food is frozen, the water in its cells freezes and expands. Two methods are usually used:

QUICK FREEZING

In quick — or fast — freezing, the temperature of foods is lowered below 0 degrees* within 30 minutes.

▶**Pros:** Produces many small ice crystals, which help maintain the food's cellular structure and preserve its original texture when thawed.



▶**Cons:** Requires special equipment.

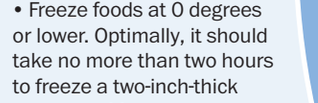
For faster freezing: Some freezers have a quick-freeze shelf that should be used.

SLOW FREEZING

Food is frozen within two to 24 hours.

▶**Pros:** Most common for household freezers.

▶**Cons:** Larger ice crystals form, which damage the food's cellular structure. That means more drip for meats and more leakage for vegetables.



FOR FASTER FREEZING

• Do not stack containers before freezing, but spread them in one layer on various shelves. Stack after food is frozen.

• Freeze foods at 0 degrees or lower. Optimally, it should take no more than two hours to freeze a two-inch-thick package of food.

• When adding a large number of foods to the freezer, set the temperature to the coldest setting several hours beforehand.

• Do not overload the freezer with unfrozen food, which slows the rate of freezing and may compromise quality. Add only the amount that will freeze within 24 hours; usually two or three pounds of food per cubic foot of storage space.

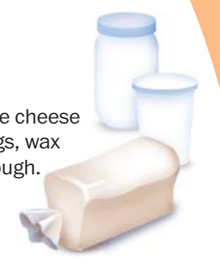
STEPS TO KEEP IN MIND

1 PREPARATION AND PACKAGING

Packaging materials must be moisture and vapor resistant, durable and leakproof to maintain the quality of food. Leave headspace of $\frac{1}{2}$ to $1\frac{1}{2}$ inches to allow for expansion. Label packages on the date food is frozen.

DO USE: Plastic freezer containers, plastic freezer-weight bags, aluminum foil, foil pans, coated freezer paper, heavy plastic wrap, milk in plastic jugs, zip bags.

DO NOT USE: Glass jars (which can break), cottage cheese or yogurt containers, bread wrappers, produce bags, wax paper. These are generally not airtight or thick enough.



Generally, foods in larger containers freeze too slowly to result in a satisfactory product. Do not freeze fruits and vegetables in containers with a capacity over one-half gallon, and never freeze vegetables without blanching.

Blanching — scalding vegetables in boiling water or steam for a short time, then immediately cooling them — is a must before almost all vegetables can be frozen. This stops enzyme actions that cause color and flavor changes, as well as a loss of nutrients. Blanching also helps to destroy microorganisms on the surface of the vegetables.

1. Boil one gallon of water per pound of prepared vegetables.
2. Put vegetables in boiling water and cover.
3. Boil for about three minutes. Times may vary depending on the type of vegetable. Allow five to eight minutes for steaming.
4. Rapidly cool vegetables in ice water to prevent them from cooking through. Allow eight to 11 minutes.

2 FREEZING POINTS

Not all foods freeze alike. In fact, only foods with a high water content freeze at 32 degrees. Foods with a high protein, fat or sugar content require lower temperatures to freeze. **Once frozen, all foods should be kept at 0 degrees or below** to prevent moisture loss and preserve quality.

Most vegetables freeze fast at or just below **32 degrees**.
Green beans: 90% water

Fish, meat and poultry don't freeze until they are around **26 degrees** and below because they contain high amounts of protein and fat.
Wild salmon: 68% water

Foods with high sugar or butterfat content are harder to freeze. At **3 degrees**, only about 75 percent of the water in **ice cream** is frozen.

Textural changes are more noticeable in fruits and vegetables that have a higher water content, and foods that are eaten raw. Changes from freezing are not as noticeable in food that is cooked later, because cooking also softens cell walls.

3 THAWING

In the refrigerator

(40 degrees or below):

Slow but safe.

Allow one day for every four pounds of whole poultry; one day for a one-pound package of meat, poultry or seafood; and two or more days for roasts, steaks or ham.

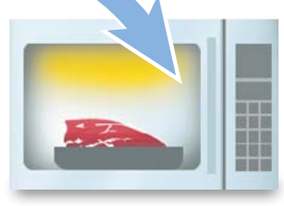
▶**Safe to refreeze? Yes.** Raw or cooked frozen food thawed in a refrigerator is safe to eat if refrozen.

In cold tap water

Faster than refrigerator thawing; must cook immediately after thawing.

Submerge food in leakproof bags in a bowl of cold tap water. Allow about 1 hour per pound for small packages of food, 30 minutes per pound for whole poultry.

▶**Safe to re-freeze? No.** Frozen food thawed by the cold-water method but not cooked is not safe to refreeze. You can refreeze it after cooking.



In the microwave

Fastest method; must cook immediately after thawing.

Rotate and break up individual items to even the thawing process. For ground meats, scrape off thawed meat and return frozen portion to microwave. Follow manufacturer's directions for setting your microwave.

▶**Safe to refreeze? No.** Frozen food thawed in the microwave oven but not cooked should not be refrozen. You can refreeze it after cooking.

In the oven

Add 50 percent additional time to the recommended time.

You can put frozen food — even a frozen turkey — directly in the oven to thaw and roast without defrosting it.

TIP

To help a package of ground meat thaw faster, create a deep indentation in the middle before freezing.

FROZEN IN TIME

All frozen foods are safe forever. For best quality, use oldest packages first. These maximum recommended storage times are for best flavor and texture:

	1 MONTH	2 MONTHS	3 MONTHS	4 MONTHS	6 MONTHS	8 MONTHS	12 MONTHS
Meats		Smoked or cured (bacon, ham, hot dogs, lunch meats, sausage)	Cooked meats	Ground meats and burger patties			Beef, lamb, pork and veal (chops, roasts and steaks)
Seafood			Fatty fish, such as bluefish, mackerel, salmon and tuna Cooked fish, shellfish and frozen breaded fish		Shellfish, such as crab meat, clams, crayfish, lobster, mussels, oysters, shrimp, scallops and squid	Lean fish, such as cod, flounder, haddock, halibut, perch and sole	
Poultry		Chicken and turkey, lunch meats, paté		Ground poultry, patties and giblets: cooked poultry and convenience meals, fried chicken and rotisserie chicken			Chicken, turkey, duck and goose (whole or parts)
Convenience foods			TV dinners, entrees and pizza Casseroles (lasagna, chili, meat sauces, etc.) Cooked leftovers				
Vegetables and fruit	Bananas, grapes, melon	Tofu		Berries, cherries	Vegetables		Soy meat substitutes, soy hot dogs, tempeh
Dairy			Milk and buttermilk	Shredded cheese Ice cream and sherbet			Butter and margarine
Bakery items		Pies (pumpkin, pecan) and quiche	Cakes, cheesecakes, bread, rolls, bagels and tortillas			Pies (fruit and mincemeat)	Cookies (baked), purchased or homemade; cookie dough

BETTER NOT FREEZE

Just because you can put any food in the freezer doesn't mean you should. Some foods don't freeze well and will have compromised quality when defrosted.

	Results of freezing
• **Cheese in blocks**	Crumbles
• **Cottage cheese**	Separates, becomes mushy
• **Cream pies**	Custard becomes watery, crust gets soggy
• **Custards**	Watery
• **Eggs:**	
Cooked eggs	Become rubbery
Cooked egg whites	Crumble
Raw yolks	Become gummy
• **Gravy**	Fat separates; whisk when reheating
• **Lettuce, green onions, tomatoes**	Become watery and limp
• **Mayonnaise, milk, milk sauces, sour cream, yogurt**	Some separation occurs
• **Potatoes, raw**	Texture changes, may darken

WHAT CAN GO WRONG

SPOILERS!

Freezing food cannot improve its quality. However, several factors can compromise good food that was frozen badly.

Microorganisms
Growth is stopped when food is frozen, but microorganisms are not destroyed. When food is thawed, they become active again and multiply; food must be cooked to be safe.

Ice crystals
Formation of small ice crystals is better for food. Large ice crystals tend to rupture cells and may cause a texture change.

Freezer temperature
The storage life of foods is shortened as temperature rises. A temperature of 0 degrees or lower should be maintained to keep foods at top quality. Fluctuating temperatures result in growth in the size of ice crystals, further damaging cells and creating a mushier product.

Air
Oxygen may cause flavor and color changes if the food is improperly packaged. Many foods change color when frozen due to lack of oxygen or especially long storage. For example, red meat can turn brown; it is still safe to eat.

Enzymes
Freezing slows enzyme activity, and most food keeps when put in the freezer. In vegetables, however, enzymes must be inactivated before freezing.

FREEZER BURN

To minimize the risk of freezer burn, caused by moisture loss, don't thaw and refreeze food numerous times. That causes food to dry out faster. If food does suffer from freezer burn, cut off the affected areas — before or after cooking — and use the rest of the food.

POWER OUTAGE

If the power is off, food in a full freezer will usually stay safe for about 2 days with the door shut. A half-full freezer or the freezer compartment in a refrigerator will keep food safe for about 24 hours. When the power returns, food is safe if it is partially frozen, contains ice crystals or is "refrigerator cold" (40 degrees). Keep an appliance thermometer in the freezer to monitor the temperature.

SOURCES: United States Department of Agriculture; University of Illinois Extension Service; "So Easy to Preserve," by Elizabeth L. Andress and Judy A. Harrison; North Dakota State University Extension Service

CiCi Wiliamson is a McLean food writer. To contact the Food section, e-mail us at **food@washpost.com**

*All temperatures are in degrees Fahrenheit