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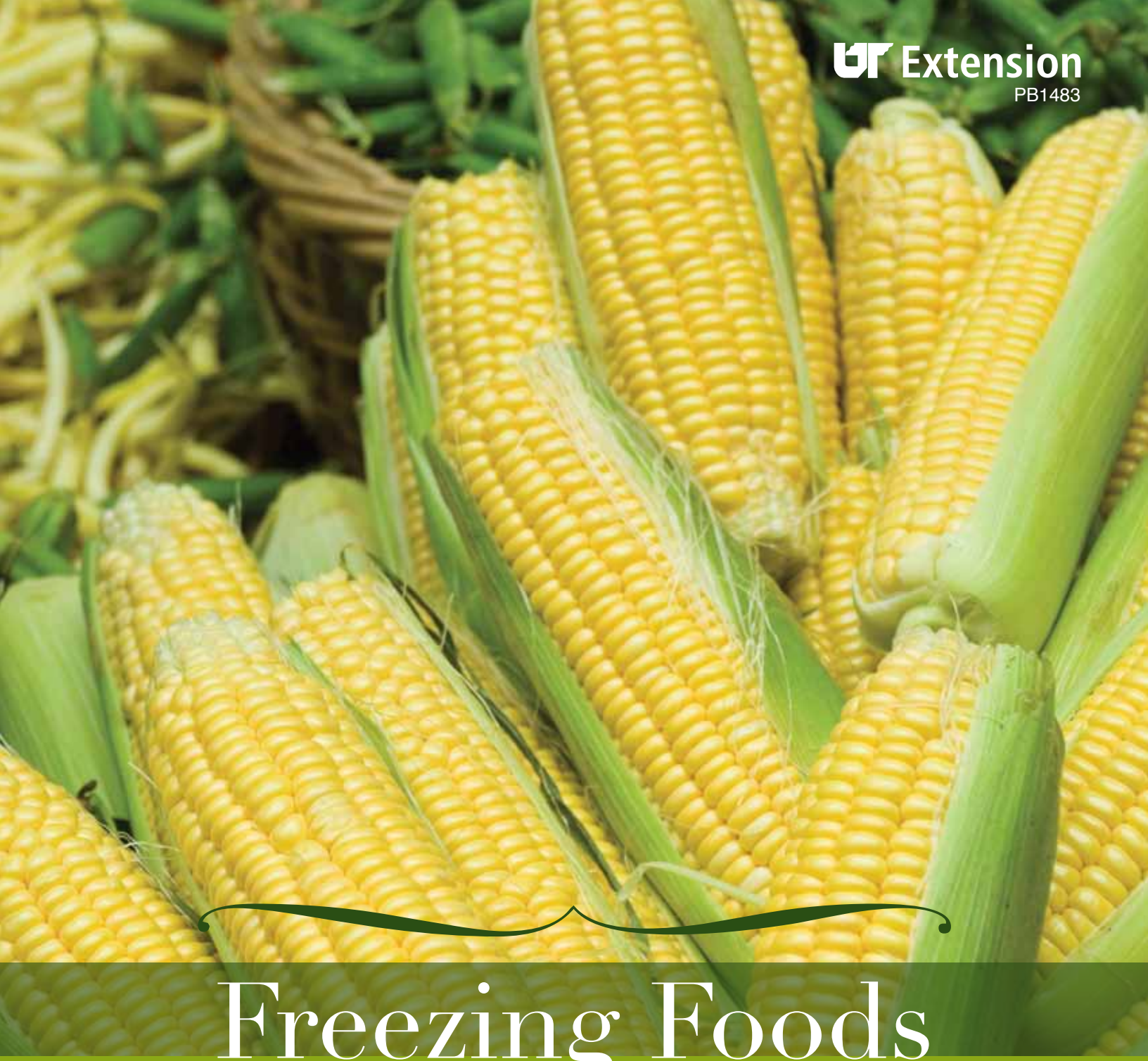


UT Extension

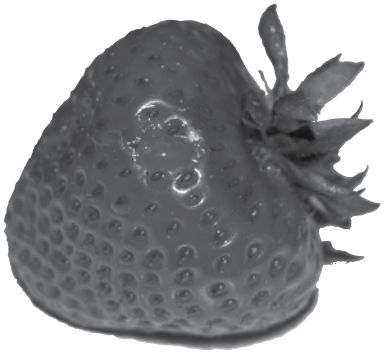
PB1483

Freezing Foods

THE UNIVERSITY of TENNESSEE

INSTITUTE of AGRICULTURE

Freezing Foods



Janie Burney
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Advantages of Freezing

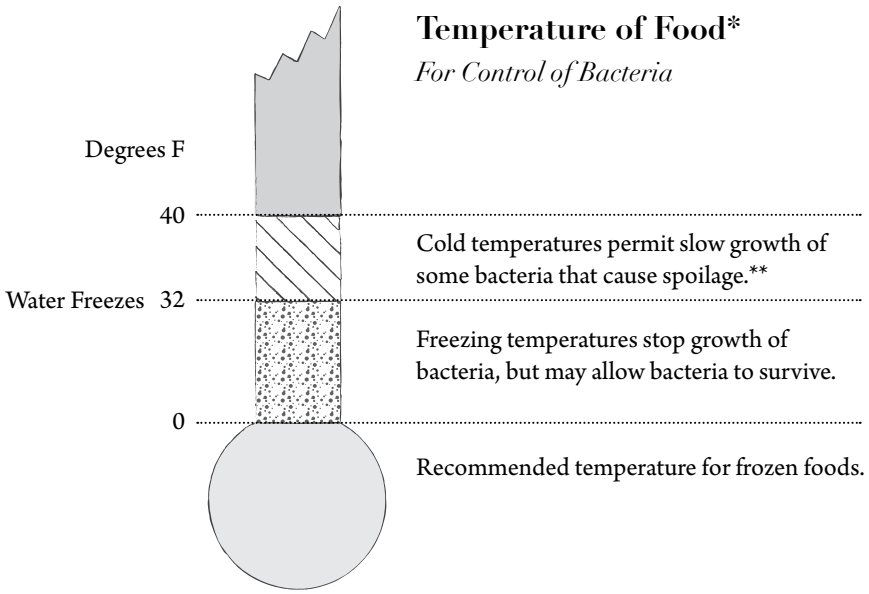
Freezing is the home food preservation method that best preserves nutrients, flavors and colors, although canning is not far behind. Used properly, home freezing has many advantages:

- saves time, work and money
- is an easy method of preserving food
- can simplify meal preparation
- provides available foods for quick service
- supplies seasonal or favorite foods year-round
- permits fewer shopping trips
- allows stocking up on special sales when prices are low

Freezing Quality Foods

The foods you freeze should be top quality, free from blemishes and suitable for freezing. The fresher the product, the more satisfactory the frozen product will be. Freezing cannot improve the flavor or quality of food.

Freezing temporarily stops the growth of spoilage organisms, but may not kill them. Once frozen foods thaw, surviving organisms grow. Fruits and vegetables must be washed before freezing to remove garden soil, which is a source of bacteria. Bacterial contamination of the food can be avoided by personal cleanliness and by using clean equipment and clean working surfaces.



*USDA Keeping Food Safe to Eat, Home & Garden Bulletin, #182.

**Do not store raw meats for more than 5 days or poultry, fish or ground meat for more than 2 days in the refrigerator.

To safeguard the nutritive quality, as well as the flavor and texture of the foods you freeze, freeze food quickly at the lowest temperature possible. This will insure that the ice crystals formed will be small, causing minimum damage to the cellular structure of food. The size and temperature of your freezer and the amount of food placed in the freezer in a single day determine how fast the food will freeze.

- To encourage more rapid freezing, set the freezer temperature to -10 F or lower about 24 hours in advance of freezing a large quantity of food.
- Freeze foods as soon as they are packaged and sealed.
- Don't freeze more than two pounds of food per cubic foot of freezer capacity per day. Overloading slows down the freezing rate and causes excessive softening of thawed fruits and vegetables.
- Place unfrozen foods in the quick-freeze section of the freezer or spread packages out in the freezer so they will freeze as rapidly as possible.
- Individually quick-freeze some foods. Diced or bite-sized food pieces and small fruits may be placed one layer deep on cookie sheets, frozen uncovered four to six hours, then quickly packaged and sealed. These individually quick-frozen foods may be poured from their package without thawing.

Baby Foods

Freezing is an option for types of baby foods not recommended for canning. Pureed vegetables and meats cannot be canned safely because of their density, but they may be frozen. Unseasoned foods may be pureed and frozen in an ice cube tray for convenient portion size and then packaged in a freezer container.

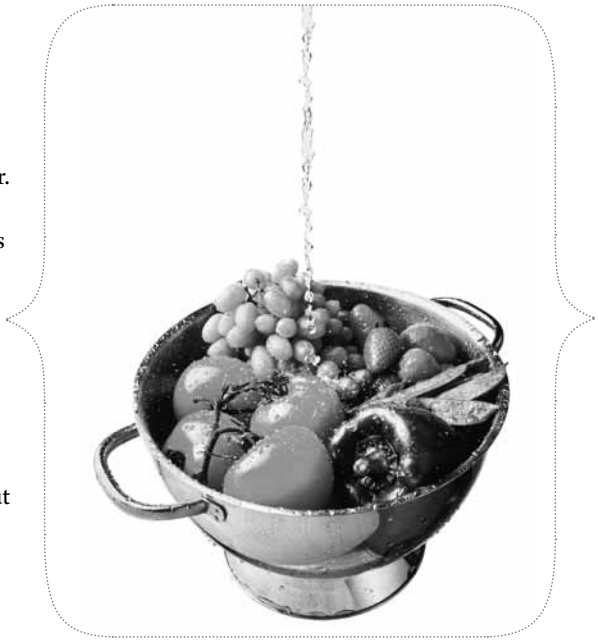
Foods Not Recommended for Freezing

Although the list of freezable foods is long, some foods should not be frozen:

- hard-cooked eggs – whites become tough and rubbery
- mayonnaise and other salad dressings – separate during freezing
- salad greens and other raw salad ingredients (radishes, cucumber, onions) – lose crispness and develop off-flavors
- sandwiches containing foods listed above
- cream pie fillings and custards – separate and become watery
- raw potatoes – may darken, undergo texture changes and become mealy
- gelatin salads or deserts – weep
- unbaked cake batter – fails to rise properly
- sour cream – separates when frozen alone; combine it with other ingredients (sugar, cream cheese) and then freeze
- meringue – shrinks; becomes tough and gummy

- sage, black pepper, cloves, artificial vanilla flavoring, basic and chives – develop bitter flavors
- uncooked garlic and onions – become strong-flavored
- cake icings made with egg whites – become frothy and weep
- most fried foods – lose crispness (exceptions are commercially frozen foods)
- sauces, gravies, pie fillings and puddings – tend to separate and appear curdled

Washing



All fruits and vegetables to be frozen should be washed thoroughly. Cleanse by rinsing in several changes of clean water. Most berries require only one gentle rinse. Do not let fruits or vegetables soak in water. Soaking will remove valuable vitamins and minerals.

Washing will:

- decrease the number of microorganisms
- remove surface dirt
- decrease pesticide residues
- remove insects, eggs and larvae
- increase the visibility of bruises so they may be trimmed out

Preventing Discoloration

Some fruits, such as peaches, nectarines, apples, pears and apricots, darken quickly when exposed to air and during freezing. They may also lose flavor when thawed. The cut surface of the fruit contains enzymes, which, when exposed to air, cause browning. Prepare only small quantities of fruit at a time if it is a fruit that darkens rapidly. Listed below are several ways to prevent darkening of fruit.

Ascorbic Acid (Vitamin C) is effective in preventing discoloration in most fruits. It adds nutritive value as well. Ascorbic acid in tablet, crystalline or powdered form is available at many pharmacies or where freezing supplies are sold. Tablets should be crushed so they will dissolve easily. An effective solution can be made by dissolving 1500 milligrams of vitamin C (three 500 milligram tablets) in one-half gallon (2 quarts) of water. Leaving fruit in this solution for two minutes will prevent discoloration.

> **In Syrup or Liquid Packs** – Add powdered or crushed ascorbic acid to cold syrup shortly before using. Stir it in gently so you do not stir in air. Keep syrup refrigerated.
>
> **In Sugar or Dry Packs** – Dissolve the ascorbic acid in two to three tablespoons of cold water and sprinkle dissolved ascorbic acid over fruit just before adding sugar.

Ascorbic Acid Mixtures – Special anti-darkening preparations made of ascorbic acid mixed with sugar or with sugar and citric acid are on the market. Fruit

Fresh© and Mrs. Wages Fresh Fruit Preserver© are examples of these products. Follow the directions on the package.

Lemon Juice – is sometimes used in place of ascorbic acid; however, lemon juice has little anti-darkening effect unless used undiluted and can mask natural fruit flavors.

A salt-and-vinegar solution is not recommended to prevent darkening of light fruits. While it does help to prevent the browning reaction, the fruit will eventually lose its light color and become somewhat gray in appearance. The salt or vinegar may also cause undesirable flavor changes. Salt adds unnecessary sodium to the fruit.

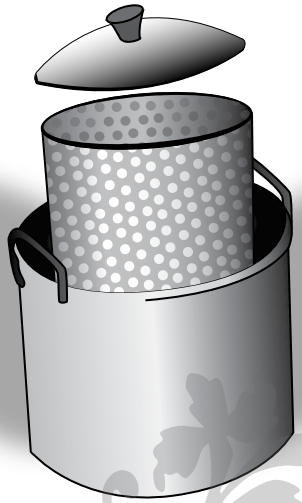
Blanching

With the exception of green pepper and onions, vegetables maintain better quality during freezer storage if they are blanched (heated enough to destroy enzymes) before freezing.

Why Blanch Vegetables?

- Blanching slows or stops the action of enzymes that can cause loss of flavor, color, texture and nutrients
- Blanching further cleanses the surface of dirt and organisms
- Blanching wilts or softens vegetables and makes filling the container easy

Blanching Time



Blanching time is crucial and varies among vegetables and sizes of food pieces. To blanch, place vegetables in boiling water. Blanching is timed beginning with the reappearance of steam after vegetables are placed in the boiling water. Under-blanching stimulates the activity of enzymes and is worse than no blanching. Over-blanching causes an unnecessary loss of flavor, color, vitamins and minerals.

While blanching is done before freezing most vegetables, some vegetables are very dense and should be thoroughly cooked before freezing. Examples are beets, pumpkin, winter squash (acorn, Hubbard, butternut, turban), sweet potatoes and white potatoes (twice-baked or re-stuffed baked potatoes and mashed potatoes).

Microwave Blanching

Microwave blanching is not recommended. Research has shown that heating may be uneven and some enzymes may not be inactivated. Off flavors and loss of texture and color may result. Microwave blanching has not been shown to save time or energy.

Packaging

To freeze food properly, the packaging material must be:

- airtight
- moisture-proof
- odor-proof
- vapor-proof

Correct packaging of food:

- prevents drying out
- preserves food value and flavor
- preserves texture and color

There are a variety of freezing products available – aluminum foil, plastic containers, freezer paper, freezer bags and transparent film to name a few. When using freezer bags, press the air from the bag, since air promotes loss of quality in frozen foods.

If you want to use glass jars for freezing, choose wide-mouth dual purpose jars made for freezing and canning. They are tempered for extremes in temperature and the wide mouths allow easy removal of partially frozen food.

Head Space

Foods expand as they freeze, so leave some room in the top of your package to allow for this.

Head Space to Allow Between Packed Food and Closure				
	Container with wide top opening		*Container with narrow top opening*	
Type of Pack	Pint	Quart	Pint	Quart
Liquid pack*	½ inch	1 inch	¾ inch	1½ inches
Dry pack**	½ inch	½ inch	½ inch	½ inch

*Fruit packed in juice, sugar, syrup or water, crushed or pureed fruit or fruit juice.
**Fruit or vegetable packed without added sugar or liquid.

Stocking Your Freezer

Be systematic about stocking your freezer. A dated check list or inventory tells you exactly what's on hand, what needs replenishing and which foods to use soon. Post the list near the freezer for quick reference. This information can be a tremendous help in

meal planning. Be sure to include the kind of food, freezing date and number of servings. You should also date the commercially frozen food you buy. Rotate the contents of your freezer so the first foods in are the first foods out.

Frozen Food Inventory			
	Freezing Date	*Servings/Package*	*#/pkgs*
Chicken Breasts	3/18	4	3
Broccoli	5/2	6	8
Strawberries	5/20	4	12
Ground Beef	6/1	4	4
Corn	7/10	6	15

Thawing Food Safely

The recommended ways to thaw foods are:

- placing package in the refrigerator (in a container to avoid dripping on other foods)
- putting package in cold water in a waterproof wrapping (Change water often to keep it cold)
- using microwave oven (on defrost cycle)

Vegetables and fruits can be cooked without thawing. Thawing meat before cooking generally produces a product that receives uniform heating. When thawing food in the microwave, cook immediately, since some parts of the food have started to cook.

Do not thaw food at room temperature. Bacteria will begin to multiply on the surface of the food while the interior is thawing.

Suppose you thaw some food for dinner and change your plans? Can the food be refrozen? Or, what if your freezer fails?

Food that contains ice crystals or is refrigerator-cold can be refrozen. Discard any thawed food that reached room temperature and remained there two hours or more. Immediately discard anything with a strange color or odor.

Freezing Foods
Questions and Answers

The following section of questions and answers summarizes some of the information in this publication as well as presenting some new information.

1. **Q** What is meant by blanching?

   A Food is dipped or plunged into boiling water or steamed for a given length of time.

2. **Q** Can I freeze meat in its store wrapper?

   A It depends on the type of packaging. Foods in newer types of packaging, called "modified atmospheric packaging" (MAP), can be frozen in the original wrap. Meat in this type of packaging is less likely than meat in traditional packages to lose moisture and develop freezer burn. Meats in this modified packaging come to stores already wrapped and ready for sale.

3. **Q** Can I use foods that are freezer-burned?

   A Foods with freezer burn are safe to eat if properly cooked, but their tissues on the outer surface will remain tough and off-flavored. Color changes (graying) are usually visible on surfaces of freezer-burned food.

4. **Q** Can I safely use meats that have been frozen for three years?

   A Yes, meats frozen three years and held at 0 F may be safely consumed if properly cooked, but expect a poor flavor.

5. **Q** You say foil is okay for wrapping, but it always rips and comes off. What am I doing wrong?

   A Foil is very susceptible to punctures and tears. Freezer films and film-coated paper are better choices. Large-size freezer bags also make good packages.

6. **Q** My frozen puree has a sticky residue all over the outside of the container. It seems to be from the inside of the container. What did I do wrong? Is it safe to use?

   A Juices and purees expand during the freezing process. It's possible you packaged the puree with too little headspace. In this case, some of the puree leaked through the container seal and ran down the outside of the container. Contents would be safe to use, but may have a freezer or oxidized flavor.

7. **Q** My green beans look all shriveled when I take them from the freezer. I blanched them and froze them in a rigid plastic freezer container. What went wrong?

   A The container did not form an airtight seal and allowed moisture vapor losses from the beans. This leaves the beans shriveled and dried looking.

8. **Q** Are any foods unsafe if frozen too long?

   A Not as long as they remain at 0 F or lower. However, they will be lower in quality.

9. **Q** My IQF-packed (individually quick frozen on a tray) frozen fruit was all stuck together when I used it. I kept it in a freezer bag. What did I do wrong?

   A IQF fruit must be frozen completely, stored quickly and sealed tightly to avoid redistribution of water in the fruit. Fluctuating temperatures inside the freezer lead to sticking among pieces of food, especially fruits that tend to form juices.

10. **Q** My frozen peaches turned brown. I used Fruit Fresh©. What happened?

    A Browning of frozen peaches will occur eventually even though they are treated with Fruit Fresh© or ascorbic acid. If properly treated, packaged and stored at 0 F the discoloration should not have happened within one year. Possible causes include "old" Fruit Fresh© and freezer temperatures above 0 F.

11. **Q** My frozen corn-on-the-cob was tough. Why?

    A Tough corn on the cob may have been caused by freezing an unsuitable variety or packages that leaked moisture vapor, causing freezer burn.

12. **Q** Can I blanch without a basket for the pot? I use a strainer type of ladle to remove my vegetables.

    A Yes, you may blanch without a specially designed blancher and basket, but you risk under- and over-blanching, which alters the taste and nutritive value of the food.

13. **Q** My friend freezes whole, washed tomatoes in bags, adding to them as she picks them. She takes out as many as she needs for soup and other foods. Is this an acceptable practice?

    A This practice is acceptable. It's strongly urged that a re-sealable container be used to maintain quality.

14. **Q** My frozen meat (pork) has an off-odor and flavor. Is it still safe to eat?

    A The pork is probably rancid. As a rule, if its freezer age is less than one year, it's acceptable to eat. Improper packaging and freezer temperatures above 0 F promote rancidity.

15. **Q** Frozen bread develops dried-out spots (on corners, or sides) in my freezer. I freeze it in its original wrapper as soon as I buy it. How can I avoid this?

    A Fresh bakery bread is not packaged properly for freezing. Dried-out spots are a form of freezer burn. It is necessary to repackage bread to prevent freezer burn.

16. Can I freeze potatoes? In what form?

    Potatoes may be sliced or cut for French frying, blanched or pan-fried, then frozen. The freezer life for pan-fried potatoes is short (three to six months).

17. May all foods be frozen satisfactorily?

    Some fruits and vegetables do not retain high quality when frozen. Lettuce, other salad greens and radishes lose their crisp texture. Tomatoes and onions also lose crispness, but these foods may be frozen for cooking purposes.

In Summary

Freezing food at home is one of the safest, easiest and most convenient methods of preserving foods. Remember that freezing does not sterilize foods; the extreme cold simply retards the growth of microorganisms and slows down changes that affect quality or cause food to spoil. By following directions for freezing food, you can enjoy high-quality, nutritious, frozen food.

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