

Freezing Vegetables

Introduction

Freezing is a quick, convenient, and easy method of preserving foods in the home. Frozen foods are easy to serve because most of the preparation is done before freezing. Freezing preserves nutritive quality so that frozen foods resemble fresh foods.

Successful Freezing

The five factors that are responsible for most of the quality losses of frozen foods are enzymes, air, microorganisms, large ice crystals, and evaporation of moisture.

Enzymes and Blanching

Enzymes are naturally occurring substances in plants that control the ripening process. Freezing only slows enzyme activity. Most frozen vegetables will lose quality in the freezer unless they have been blanched.

Why Blanch Vegetables?

- To improve flavor, color, texture, and nutrient retention
- To slow or stop the action of enzymes in the ripening process
- To cleanse the surface of dirt and organisms
- To brighten the color of green vegetables
- To wilt or soften vegetables, making it easier to fill containers

Correct blanching time is critical in having a quality product. Refer to the blanching directions in this fact sheet. Most vegetables are blanched in boiling water. Steam blanching normally takes 50 percent more time than water blanching and is ideal for delicate vegetables.

Air

Exclusion of air from the food prevents the enzyme reactions and oxidation that cause surface browning. This problem is more common in fruits, but some vegetables, such as potatoes, are also affected.

Microorganisms

Bacteria, molds, and yeast are present on all fresh foods and multiply rapidly when the temperature is between 40°F and 140°F. Unlike canning, freezing does not kill most microorganisms in food, but it does prevent their growth if the food is held at 0°F or lower. When thawed, the surviving organisms can grow again. This is why proper handling and preparation techniques are essential.



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Ice Crystals—Freeze Quickly

Small ice crystals are desirable in frozen food to preserve its texture. Large ice crystals rupture food cells and cause a soft, mushy texture. Small crystals are formed when food is frozen quickly and kept at a constant storage temperature of 0°F or lower. Avoid adding more than 2 pounds of frozen food per square foot of freezer space because a larger volume of food will slow the freezing process and may raise the temperature of already frozen food.

Evaporation of Moisture—Packaging Materials

Poor packaging that leaves food unprotected in the freezer allows foods to lose moisture, which will cause a loss of color, flavor, and texture. Long-term exposure to air causes drying of plant fibers, known as freezer burn. Use of proper packaging materials helps prevent freezer burn.

Good Packing Materials

- Resistant to moisture and vapor
- Durable and leak proof
- Resistant to cracking and brittleness at low temperatures
- Resistant to oil, grease, and water
- Able to protect foods from absorption of off-flavors and odors
- Easy to seal
- Easy to label

Select plastic bags labeled specifically for freezing food. Look for plastic containers (boxes, jars, bowls) specifically labeled for freezer storage. Tempered glass jars specifically designed for freezing are suitable. Select jars with tapered sides for easy removal of the food. Storage bags are not as resistant to



moisture and vapor. Waxed paper, paper cartons, cottage cheese containers, ice cream and juice cartons, or any rigid carton with cracks or a poorly fitting lid are not suitable for long-term storage. They do not adequately prevent the loss of moisture or the drying out of food from exposure to air.

Tips for Packing Vegetables

- Cool or chill foods before filling them into packages.
- Package foods in quantities that will be used for a single meal-sized serving.
- Allow ½ inch of headspace for all types of containers. Vegetables that pack loosely, such as asparagus and broccoli, require no headspace.
- When vegetables are packaged in bags, press the air from the bag.
- Label packages with the name of product, added ingredients (such as salt), date packaged and date to use by, number of servings or quantity, and type of pack (such as whole, sliced, or diced).
- Freeze foods as soon as they are packaged and sealed.
- Do not overload the freezer with unfrozen food.
- Spread unfrozen foods out in the freezer so that they will freeze more rapidly.

Individually Quick Freezing or Tray Freezing

Foods such as cut green beans, peas, whole-kernel corn, and small mixed vegetables are suitable for freezing quickly before being packaged. This allows a partial amount of the food to be poured from containers without being thawed. After vegetables have been blanched, cooled, and drained, place them one layer deep on cookie sheets or shallow trays and freeze uncovered just until solid (4 to 6 hours), then quickly package and seal.

Blanching Directions

- Bring 1 gallon of water to an active boil. Lower 1 pound of vegetables into the water. Cover. Return to a boil. Start counting the blanching time when the water returns to a boil.
- As soon as blanching is complete, vegetables should be cooled quickly in 3 to 4 gallons of cold water.
- Chill at least as long as vegetables were blanched.
- Drain.
- Package.

For additional information about food preservation, visit the Penn State Extension Home Food Preservation website at extension.psu.edu/food/preservation or contact Penn State Extension in your county.

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Blanching Times

Asparagus, small spears: 2 minutes

Asparagus, large spears: 4 minutes

Green, wax, or Italian beans, small: 2 minutes; large: 3 minutes

Broccoli, 1½-inch pieces: 3 minutes

Brussels sprouts, small heads: 3 minutes; large heads: 5 minutes

Cabbage, quarters: 4 minutes; wedges: 2 minutes; shredded: 1½ minutes

Carrots, sliced or diced: 2 minutes; whole: 5 minutes

Cauliflower, small pieces: 3 minutes; large pieces: 5 minutes

Corn, whole cut kernel or cream style: 4 minutes

Corn on the cob, small ears: 7 minutes; medium ears: 9 minutes; large ears: 11 minutes

Okra, small pods: 3 minutes; large pods: 5 minutes

Peas, black-eyed and green, small: 1½ minutes; large: 2½ minutes

Sugar peas, small: 2 minutes; large: 3 minutes

Zucchini or summer squash, ½-inch slices: 3 minutes

Chopped onions and peppers usually don't need blanching.

Sweet potatoes, pumpkin, spaghetti squash, and tomatoes should be cooked before freezing.

Steam blanching normally requires 50 percent more time than water blanching. Steam blanching is less likely to cause water-soaked vegetables and is ideal for broccoli and other delicate vegetables.

If you don't have a blancher, substitute a colander, sieve, or basket to lift food from the boiling water.

Did You Know?

If you have problems with frozen cauliflower turning dark, try blanching it in boiling water that contains 1 tablespoon lemon juice per quart of water.

Cooked tomatoes may be frozen successfully. Raw, whole tomatoes do not freeze well and may become watery and develop an off-flavor after a month in the freezer.

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Penn State College of Agricultural Sciences research and extension programs are funded in part by Pennsylvania counties, the Commonwealth of Pennsylvania, and the U.S. Department of Agriculture.

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Produced by Ag Communications and Marketing

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