



MASTER FOOD PRESERVER

FREEZING

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Advantages of Freezing

- Natural color, flavor and nutritive value can be retained.
- Texture usually better than for other methods of food preservation.
- Foods can be frozen in less time than they can be dried or canned.
- Simple procedures.
- Adds convenience to food preparation.
- Proportions can be adapted to needs, unlike other methods.

Disadvantages of Freezing

- Texture of some foods is undesirable because of changes due to the freezing process.
- Initial investment and cost of maintaining a freezer is high.
- Storage space is limited by how much the freezer will hold.

Before You Start Freezing...

- Food quality going in = Food quality coming out
 - Some foods don't freeze well
- Pretreatments = Controlling enzyme reactions
 - Syrup pack, sugar pack and dry pack for fruits
 - Water blanch or steam blanch for veggies (or dry pack for some)
- Textural changes and ice crystals
- Packaging and packing is important
- Freeze quickly
- Label
- Keeping temps stable--fluctuations and refreezing
- Length of storage time

Objective #1: Freezing Options

- Quick freeze: temps below -20°F or lower
 - Primarily for commercial processed foods
 - Typically not achievable in home freezers
 - Less damage to cell structure, color, flavor
- Slow freeze: temperatures around 0°F
 - Takes longer to freeze solid
 - Harder on the food quality



Objective #2: Pretreatments

- Why pre-treatments?
 - Color
 - Flavor
 - Texture
- Veggies=heat
- Fruit=additives
- Does it really matter?

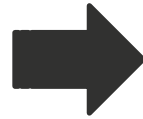


Enzymes

- Enzymes are small proteins in foods that help with reactions.
- Fruit and vegetable enzymes need to be controlled or destroyed prior to freezing. Freezing will not stop enzyme reactions.
- Blanching destroys enzyme activity through heat. This is mainly used for vegetables.
- Ascorbic acid and syrup packs control enzyme activity and prevent darkening. They are mainly used for fruits.

Controlling Enzymes in Fruit

- Soak fruit in one of these solutions during preparation.



- 1 tsp. (3,000 mg) ascorbic acid to 1 gallon of cool water
- Commercial ascorbic acid mixture + water
- Citric acid + water
- Lemon juice + water (can also use pineapple juice)
- Sugar syrup
- Heating the fruit



Controlling Enzymes During Freezing

Ascorbic Acid

- Most preferred--no additives.
- Most economical.
- Comes in powdered or tablet form.
- Tablets must be well crushed before using.
- May be hard to find.



Commercial Mix

- Has some added ingredients.
- A little pricey.
- Comes only in powdered form.
- Easy to use. Follow directions on bottle.
- Sold in most supermarkets.

Controlling Enzymes During Freezing



Ascorbic Acid



Dry packs and sugar packs

- Dissolve the powdered ascorbic acid in water and sprinkle over fruit.
- When sugar packing, add ascorbic acid to fruit before adding sugar.

Crushed fruit, purees and juices

- Mix the ascorbic acid with the prepared fruit.

Syrup and liquid packs

- Add to the covering liquid, then pour the liquid over prepared fruit, making sure to cover completely.

Destroying Enzymes By Blanching

- Primary method to destroy enzymes for vegetables.
- Removes some microorganisms.
- It brightens the color and helps retard loss of vitamins.
- It will soften hard veggies to make packaging easier.
- Blanching times are important and vary with each vegetable.
- Time tables for blanching can be found at <http://nchfp.uga.edu/how/freeze/blanching.html>.

Also see: So Easy To Preserve

Boiling Water Blanching

1. Use blancher with lid or a kettle with a basket and lid.
2. Place vegetables in blanching basket.
3. Lower vegetable into vigorously boiling water. Put lid on.
4. Wait for water to come back to a boil and begin timing.
5. After blanching, cool vegetables immediately in cold water.
6. Cooling time should be the same as the blanching time.



Steam Blanching



1. Use a pan with a tight lid and a steam basket.
2. Put 1 to 2 inches of water in bottom of pan and bring to a boil.
3. Vegetables should be in a single layer in basket. Start timing when lid is placed on pan.
4. Steam blanching takes 1½ times longer than water blanching. Check times for each food.
5. After blanching, cool vegetables in cold water.
6. Cooling time should be the same as blanching time.

Objective #3: Packaging

- Determined by food as well as pre-treatments.
 - Syrup pack on fruit will need a rigid container.
 - Dry pack on blanched peas can be in heavy duty freezer bags.



Packaging Counts!

- Moisture-vapor resistant.
 - This includes 'seal-a-meal' types
- Durable and leak-proof.
- Does not become brittle and crack at low temperatures.
- Resistant to oil, grease or water.
- Protects foods from absorption of "off" flavors or odors.
- Easy to seal and label.

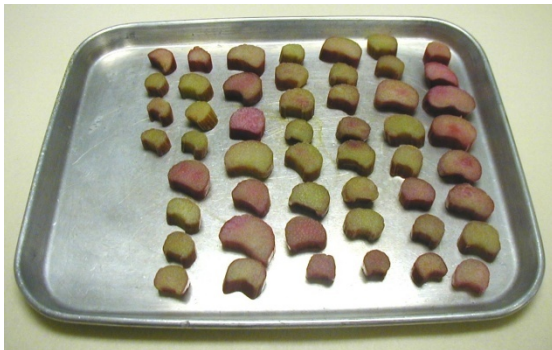


Let's Pack It Up

Dry Tray Pack

Prepared fruit or vegetable pieces are placed in a single layer on a tray.

Tray is put into the freezer and the food product is frozen until firm, then packaged in container.



Disadvantage:

- Need to have enough freezer space for trays.

Advantages:

- Good for small whole fruits and vegetables.
- Will pour out of container easily when frozen.
- No sugar needed, little equipment needed.
- Takes little time, simple to do.
- Can use rigid containers or freezer bags.

Let's Pack It Up

Unsweetened Dry Pack

Prepared small pieces of fruit or vegetables are packed into containers with no added liquid and frozen.

Disadvantage:

- Food will freeze in large chunk and individual portions cannot be taken out.



#1

Advantages:

- Simple to do, does not take a lot of time.
- No equipment needed.
- No sugar needed.
- Portions can be individualized.
- Can use rigid containers or freezer bags.



#2

Let's Pack It Up

Sugar Pack for Fruits

- Layer fruit and sugar in bowl and allow to stand for 15 minutes.
- The sugar will draw out the juice from the fruit and make a fruit syrup.
- Best for soft fruits such as peaches and berries.

Sugar Substitutes

- May be used in the pectin syrup, juice or water packs.
- Can be added just before serving.
- These do not help with color retention or texture like sugar does.
- Use amounts on product labels or to taste.

Let's Pack It Up

Sweetened Syrup Pack

- Syrup helps fruit keep its texture.
- Fruit tends to float in syrup, so crumpled water-resistant paper is used to push fruit down into syrup before sealing container.
- Source: <http://www.uga.edu/nchfp/how/freeze/syrups.html>



Let's Pack It Up

Water or Unsweetened Juice Pack

Fruit to be frozen is covered in water and frozen.



Pectin Syrup Pack

Mix 1 package powdered pectin and 1 cup water. Bring to boil, boil 1 minute. Remove from heat, cool and add 1 $\frac{3}{4}$ cups more water. Pour over fruit and freeze.

Let's Pack It Up

- Press all air from bagged foods.
 - Begin at the top of the food and press air out as you move toward the top of the bag.
 - Seal plastic bags without zippers by twisting the loose top, then folding the top of it down over itself (gooseneck). Secure with twist-tie, rubber band or string.
- Use tight lid on rigid containers.
 - Keep sealing edges clean and dry. Trapped food or liquids in sealing area will freeze, expand and loosen seal.
 - Use freezer tape over seams of looser-fitting covers.
- Label it!

7/11/2022
2 cups sliced strawberries
½ cup sugar added

Objective #4: Properly Load Freezer

- The cubic foot capacity of your freezer will determine the quantity of food to freeze at any one time.
 - Most will freeze 2 lbs. of food per cubic foot in a 24-hour time period.



Basic Rules of Freezing

- Freeze foods quickly—the faster the freezing the less damage to the cell structure.
- Set freezer temperature at -10°F for at least 24 hours ahead of time when freezing large quantities of fresh food.
- Spread packages out around the freezer until frozen, then stack.
- If possible, make packages into thin, even, stackable layers.
- Hold at 0°F for best quality.

Storage Quality of Fruits and Vegetables

Temperature

32°F

30° F.

25° F.

20° F.

15° F.

10° F.

5° F.

0° F.

Storage Time

Freezing!

5 days

10 days

3 weeks

6 weeks

3 months

6 months

1 year

Freezing Eggs and Dairy

What Can Be Frozen

(and for how long)

Eggs, whole or separated - 1 year

Butter or margarine - 1 month

Milk - 3 months

Whipped cream - 6 months

Shredded cheese - 3 months

Homemade ice cream - 1 month

Yogurt - 1 month

What Can't Be Frozen

Sour cream

Block cheese

Cooked eggs

Meringue

Custards

Milk sauces

Mayonnaise

What Else Freezes Well?

- Biscuits, quick breads, yeast breads, muffins, cakes and waffles
- Cookies, cookie dough, pastries, pies fruit pie fillings
- Hard candies, chocolates, frostings, curds, jams and jellies
- Nuts and coconut
- Meat casseroles, dressings, meat pies, meat loaves
- Non-meat casseroles, pizza, sandwiches, cooked roasts, soups
- Mashed or baked potatoes, mashed or baked sweet potatoes

Objective #5: Power Outages

- A fully-loaded freezer that is in a cool place can keep food frozen for 2 to 4 days.
- A half-full freezer will keep food frozen for about 24 hours.
- Fifty pounds of dry ice will keep a 20 cubic foot freezer below freezing for 3 to 4 days.

References

- Andress, E.L. & Harrison, J.A. (2014). *So Easy To Preserve*. Cooperative Extension/University of Georgia/ Athens.
- <http://nchfp.uga.edu/how/freeze.html>