Freezing Fruits and Vegetables at Home

Advantages of Freezing

- Many foods can be frozen
- Easy to do
- Not time-consuming
- Foods can be frozen in any quantity
- Retention of
  - color
  - flavor
  - nutritive value
  - texture

However…

- Does not destroy spoilage organisms
- Does not destroy Clostridium botulinum
- Only inactivates organisms
  - Rapidly freeze
  - Maintain ≤ 0°F

- Important to keep work space clean
- Thaw in refrigerator

Getting Started

- For best quality
  - Optimum maturity and freshness
  - Immature or overripe = lower quality
- Wash and drain first
- DO NOT SOAK
- Do not use galvanized, copper or iron equipment w/ fruits

Enzymes

- Naturally present in foods
- Small proteins that promote chemical reactions
- Activity can lead to deterioration of food quality
- Freezing slows enzyme activity
- Stop enzymatic activity before freezing

Control Enzymes

Enzymes in Vegetables

- **Blanching**

  quick heat & quick cool

Enzymes in Fruits

- **Ascorbic acid**
- **Commercial mixtures**
- **Citric acid**
- **Lemon juice**

Blanching

Prevents Flavor and Color Changes

- Inactivates enzymes
- Removes microorganisms
- Required blanching times
  - http://nchfp.uga.edu/how/freeze/blanching.html
- Under-blanching
  - stimulate enzymes
  - worse than no blanching!
- Over-blanching
  - Cooks the product

How to Blanch Vegetables

Boiling Water

- 1 gallon water : 1 lb vegetables
- Timing:
  - If boiling = begin timing immediately
  - Wait for water to come back to a boil

How to Blanch Vegetables

Steam Blanching

- 1 - 2 inches boiling water in bottom of pan
- Vegetable in a single layer in basket
- Start timing when covered

∗ Takes 1-1/2 times longer than water blanching.

How to Blanch Vegetables

Microwave Blanching

- Not recommended
- Uneven heating
- Won’t inactivate all enzymes
- Improper blanching will affect quality

After Blanching

COOL QUICKLY AND THOROUGHLY

- Plunge basket into cold water
  - cold running water
  - iced water
- Cooling time = blanching time
- Drain thoroughly

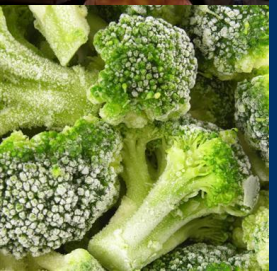
Preventing Fruit Darkening
Sweetened Options

- **Syrup Pack**
  - Percent sugar to water depends upon sweetness desired
- **Sugar Pack**
  - Sprinkle sugar over fruit
  - Allow mixture to stand to make “syrup” before packaging







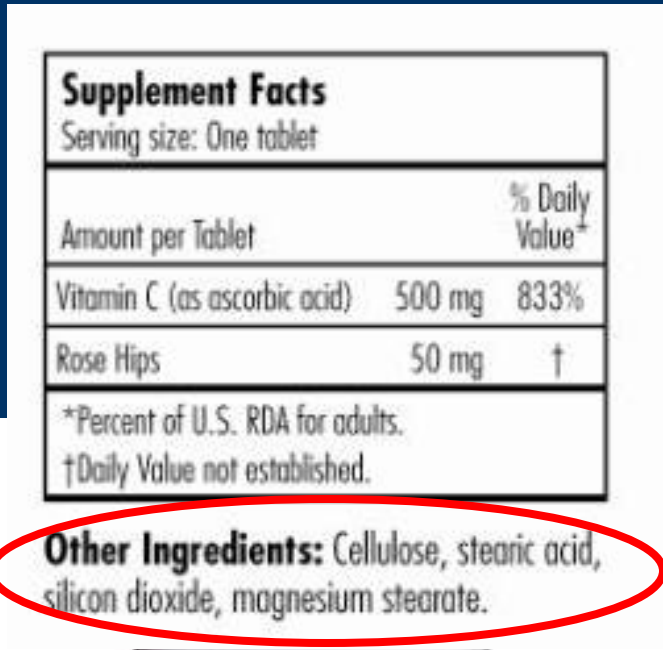



Preventing Fruit Darkening
Unsweetened Options

- **Commercial mixtures**
- **Ascorbic acid**

  (1/2 tsp = 1500 mg)

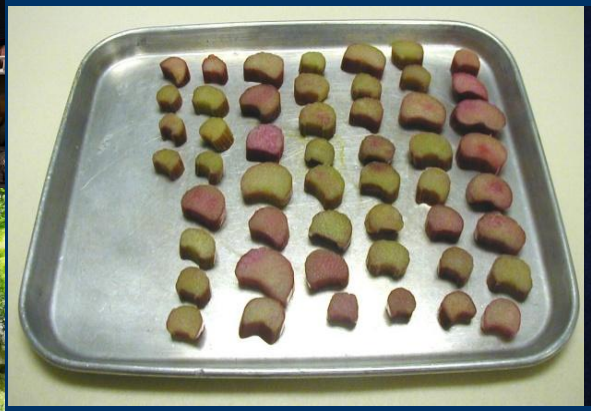
  http://nchfp.uga.edu/how/freeze.html
- **Citric acid (3x)**
- **Lemon juice (6x)**
- **Heating the fruit**
- **Packs:**
  - **Pectin syrup**
  - **Water**
  - **Unsweetened juice**



Unsweetened Packs for Fruit

Dry or Tray Pack

- Spread on trays to freeze until firm
- Pack into containers and freeze
- Will pour out of container easily
- Retain shapes



Sugar Substitutes

- Added to pectin syrup, juice or water packs
- Added just before serving
- These do not help with color retention or texture, like sugar does
- Use amounts on product labels or to taste

How Freezing Affects Food

Rancidity -meat, fish, poultry

Textural Changes

- Water freezes and expands
- Ice crystals cause cell walls to rupture
- Produce with high water content does not freeze well: celery, lettuce, tomatoes, melons

How Freezing Affects Food

Fluctuating Freezer Temperatures

- Ice in food thaws and re-freezes
- Ice crystals get bigger
  = rupture cell walls of food
  = mushy/softer texture
- Quality losses due to higher temperatures

Improperly Packaged

- Moisture loss
- Freezer burn
- Quality, not safety issue

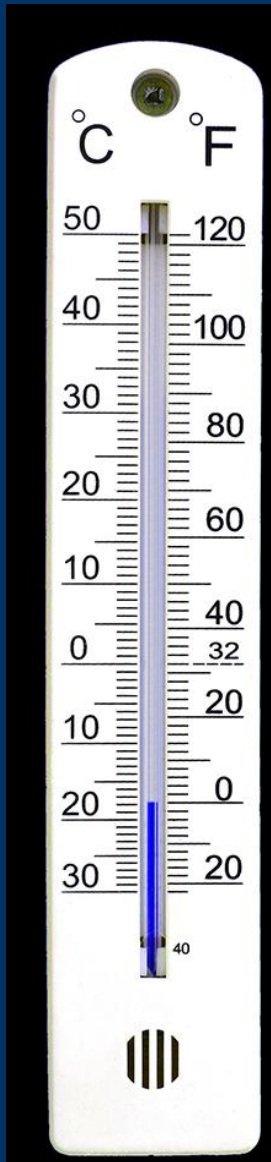






Guidelines for Best Results

1. ≤ 0°F
2. Freeze as soon as possible
3. In advance of freezing large quantities,
   - Set freezer ≤ -10°F
4. Unfrozen foods in coldest parts
5. Leave space
6. FIFO
7. Check thermometer
8. Time of storage



Types of Packs

Dry Pack

- after blanching, cool and drain
- Package quickly, pushing air out

Tray Pack

- after washing/draining, spread in a single layer on a shallow pan
- Freeze firm
- Package quickly

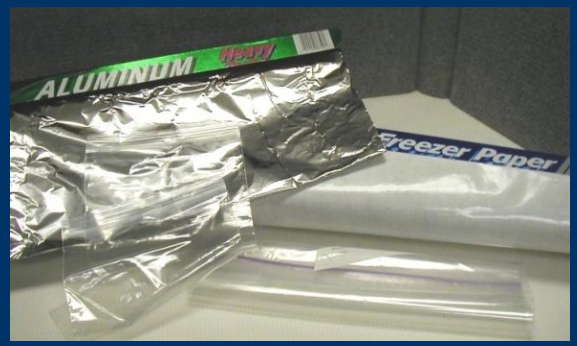






Packaging Materials

- Moisture-vapor resistant
- Durable and leak proof
- Not become brittle at low temperatures
- Resistant to oil, grease or water
- Protect foods from absorption of off-flavors or odors
- Easy to seal



Packing Foods

- Food must be cool
- Pack in serving size quantities
- Pack food tightly
- Label and Date!

Packing Foods to be Frozen

- Cool first
- Pack foods tightly
- Press out as much air as possible
- Some foods need headspace
- Tight seal/closure
- Using freezer tape
- LABEL and DATE!

How to Properly Thaw Food

- **Refrigerated temperature**
  = safest
  = best quality

- **Microwave**
- **In cold water**

Thawing Vacuum Sealed Packages

- Only defrost in the refrigerator
- Cut several holes in the plastic so environment in the bag is not “air-free”

Can food be refrozen once thawed?

- **Yes, it is safe to refreeze if:**
  - Thawed in the refrigerator
  - After cooking
  - Purchased previously frozen meat, poultry, or fish at a retail store

- **No, it is not safe to refreeze if:**
  - Thawed in the microwave
  - Thawed in cold running water

What if the Freezer Stops?

- The basis for safety is temperature
- The food is still safe to use if:
  - Ice crystals remain
  - It is cold (< 40°F)
- Group frozen foods together
- Cover the freezer with blankets to insulate

Thank you