Principles of Home Food Preservation
Preservation by Canning

- Canning
  - Boiling water canning
  - Pressure canning
  - Pickling
  - Jams & Jellies
Why foods spoil

- Yeast
- Molds
- Bacteria
- Enzymes
Safe Canning

- Processing temperature
- Processing time
- Sealed lid
Determining Safe Processing

- Acid level
- Container & size
- Preparation method
- Consistency of food
- Altitude
- Research
Acid Level

- pH 4.6 or lower = acid food = BWC processing
- pH above 4.6 = low acid food = pressure processing
- **Why? – botulism!**
High Acid Foods

- pH 4.6 or lower
- Use Boiling water canner
- Temperature reaches 200-212°F
- Tomatoes, jams, fruits, BBQ sauce,
Low Acid Foods

• pH above 4.6.
• Use **Pressure canner**
• Temperature reaches 240-250°F
• Vegetables, meat, poultry, seafoods, milk, soups, etc.
Containers

- Mason jars best choice
- 4, 8, 16, and 32 oz. common
- 64 oz. only for juice
- Mayo jars okay
- 2-piece metal lids
Raw Pack & Hot Pack

**Raw pack**
Add very hot canning liquid or water to cover raw food, but leave head space.

**Hot pack**
Raw foods are boiled 3 to 5 minutes in a saucepan or blancher, then poured into jars.

Raw foods peeled and packed tightly
Raw Pack & Hot Pack

Disadvantages:
- Floating food
- Air bubbles
- Discoloration over time

Disadvantage:
- Texture loss
2 Piece Metal Lids

• Always use new lids
• Hand tighten
• Too loose (leaks)
• Too tight (no vacuum)
Sealing

- Remove air bubbles
- Wipe rim
- Preheat lid (soften sealing compound)
- Attach lid
- After processing hear seal “pop” remove screw band
Consistency of Food

• Affects heat penetration
• Liquid always required
• Some foods with different density cannot be canned
  -- cubes vs slices
  -- no added thickeners
Altitude

• Affects temperature reached when boiling
• It is temp. reached and not the action of boiling that kills microorganisms
• Higher altitudes need longer boiling water time or higher pressures in pressure canner
• Always use tested recipe/process

<table>
<thead>
<tr>
<th>Altitude (in feet)</th>
<th>Temperature when water boils</th>
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<tbody>
<tr>
<td>10,000</td>
<td>194°F</td>
</tr>
<tr>
<td>8,000</td>
<td>197°F</td>
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<tr>
<td>6,000</td>
<td>201°F</td>
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<tr>
<td>4,000</td>
<td>204°F</td>
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<tr>
<td>2,000</td>
<td>208°F</td>
</tr>
<tr>
<td>0 (Sea Level)</td>
<td>212°F</td>
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</table>
When to can

• Low quality foods make low quality canned food
• Always preserve the freshest foods (within hours of harvest)
• Before canning: Some fruits may be allowed to fully ripen off the vine. Some meats may be refrigerated for 1-2 days
Preparing Jars

- Wash jars before every use in clean soapy water
- Rinse well
- Sterilize jars and lids in boiling water for 10 min only when boiling water canning
Boiling Water Canner

- Aluminum or porcelain-covered steel
- Flat bottom
- Not more than 2” wider than burner
- Jar rack or bottom rack needed
Boiling Water Canning

1. Fill canner halfway with water.
2. Preheat to 140°F for raw pack and 180°F for hot packed foods.
3. Load filled jars with lids into rack and then lower into water.
4. Add more boiling water to cover jars at least 1 inch.
5. Turn heat to highest setting until water boils vigorously.
Boiling Water Canning

1. Cover and turn down heat until gently boiling.
2. Add more boiling water as needed.
3. When time is up turn off heat and remove lid.
4. Remove from canner and set on a towel at least 1 inch apart to cool.
5. After lids seal (pop) remove screw bands.
Pressure Canner

- Aluminum or steel
- Lid with gasket
- Flat or concave bottom
- Weighted or dial gauge (check dial gauge annually)
- Pressure safety valve
- Jar rack
Pressure Canning

1. Put 2-3 inches of water in canner, lower rack of filled and lidded jars into canner and fasten cover securely.
2. Heat until steam escapes from vent port.
3. Let steam vent for 10 minutes, then place weight on vent port or close petcock. Allow to pressurize.
4. Begin to time when recommended pressure is reached.
5. Adjust heat to regulate a steady pressure on gauge.
Pressure Canning

1. If pressure drops below required amount, reset time to zero.
2. When time is completed, turn off heat and let the canner depressurize. DO NOT force-cool the canner—may result in food spoilage.
3. After canner is depressurized, remove the weight from the vent. Wait 2 minutes, remove lid and avoid steam.
4. Remove jars and place on towel or rack to cool.
Cooling Jars

- Do **NOT** retighten lids
- Cool at room temp.
  12-24 hours on a rack or a towel
Testing Seals

1. Press the center of the lid with your finger or thumb.
2. Listen for a high-pitched ring when the lid is tapped with a spoon.
3. Note the general "concaveness" to the lid.
Reprocessing

• If any jar fails to seal or is suspected of not being fully and properly processed, it **MUST** be immediately refrigerated, then reprocessed (full time with new jars or lids within 24 hours) or eaten.
Storing Canned Foods

- Remove screw band
- Label and date jar
- Do not allow to freeze or overheat
- Shelf life: 12-18 mos. boiling water canned & 18-24 mos. for pressure canned

Clean
Cool
Dark
Dry
Spoilage of Canned Foods

- Check for swollen lid or seal breakage.
- When opening look, smell, and listen for anything unusual:
  -- off smells
  -- spurting liquid