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Foods For The Future 2

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Leo E. Lucas, Director of Cooperative Extension Service, University of Nebraska, Institute of Agriculture and Natural Resources.

The Cooperative Extension Service provides information and educational programs to all people without regard to race, color, national origin, sex or handicap.
What You Will Learn

- New words
- The boiling-water bath method of canning
- Where to store canned foods
- The history of some of your favorite foods
- How to use the products you make
- How to keep an inventory

What You Will Do

- Can peaches
- Can tomatoes
- Make pickles
- Freeze vegetables
- Freeze squash
- Dry vegetables
- Make beef jerky
DEFINITIONS

HISTORICAL FOOTNOTES — Interesting historical facts about food preservation and those foods that we like to preserve.

YOU’RE THE CONSUMER — Important information you need to make wise consumer decisions.

KITCHEN SAFETY — Hints on how to work in the kitchen safely.

FOOD SAFETY — Hints on how to work with food to keep it safe to eat.

WORDS TO KNOW — New words and their meanings to be used in a chapter.

I DON’T GET IT? — A question/answer format for questions you may have.

EXPERIMENTS — Activities that help you understand what happens to food under varying conditions.

KNOW-HOWS — Mini-projects that you need to know how to do before you can complete the major project.

HOW-TOS — Major project that tells you how to preserve your food.

A RAINBOW OF SERVING IDEAS — Suggestions on how you can use your preserved food.

QUIZ TIME — A fun time to answer some questions on what you have learned.
CHAPTER 1

Boiling-Water Bath Method

All food products as they naturally occur become contaminated because the microorganisms that cause food spoilage — molds, yeast and bacteria — are always present in the air, water and soil.

You learned in the first unit of Foods For The Future that we can keep our foods from spoiling by freezing, drying, or heating. You then learned how to freeze and dry fruits. In this unit you will learn the boiling-water bath method of canning, and what foods you can preserve using this method.

The boiling-water bath is only used to preserve acid foods. Processing in a water bath canner gives enough protection for acid foods like fruits, tomatoes and pickled vegetables. However, low-acid foods such as corn and squash must be canned in a pressure canner.

WORDS TO KNOW

Boiling-water bath — A canning method of heating acid foods in a boiling-water bath to preserve the food from spoilage.
Acid Foods — Those foods containing a fairly large amount of natural acid. Also, foods preserved in vinegar.
Hot Pack — Food is preheated and packed into jars while hot.
Raw pack — Raw food is packed into jars.
Preserving — Processing food so that it will not spoil. Three ways to preserve food are canning, freezing and drying.

HISTORICAL FOOTNOTE — M. Nicholas Appert of Paris is known as “The Father of Canning.” In 1795, during the Napoleonic wars there was great need for a food supply that would not spoil. The French government offered a reward of 12,000 francs (U.S. exchange is about $3,000) to the person who could develop a satisfactory method of food preservation. In 1809 Appert was awarded the 12,000 francs. This was the very beginning of the boiling-water bath method of canning.
YOU’RE THE CONSUMER: Boiling-Water Bath Canner

Special water bath canners are available for canning fruits and other acid foods. However, you can use any large, metal container as a boiling-water bath canner if it is deep enough so that water can boil freely, well above the jar tops. There should be 2 to 4 inches above jar tops for brisk boiling. See Figure 1. The canner must have a tight-fitting cover and a wire or wooden rack to hold jars and keep them from touching the bottom of the canner. Mineral deposits will form on the container so you may not want to use your best large, metal container for continuous canning.

If your steam-pressure canner is deep enough you can use it for a water bath canner. Cover, but do not tightly fasten it. You may use another lid if you have one which fits closely. Or, if you use the steam-pressure canner lid, leave the pet-cock wide open so that steam escapes and leave the lid unfastened so pressure does not build up inside the canner.

Use what you have on hand or buy a boiling-water bath canner...You’re the consumer, you decide.

KNOW-HOW: to choose jars and closures

You should only use jars made especially for home canning. Other jars may break during heat processing. You can select jars with small or wide mouths. The wide mouth jars may have shoulders or may be gradually tapered from top to bottom. The tapered jar is preferred for freezing, but you can use either shape for canning most foods. See Figure 2.

Be sure all canning jars are perfect. Irregular, nicked or cracked sealing surfaces prevent airtight seals. See Figure 3. Small cracks or defects may cause the jars to break in the boiling-water bath canner.

Closures for glass jars are of two main types. One is a metal screw band and flat metal lid with a sealing compound. See Figure 4. You can use metal lids with sealing compound only once. Use new lids each year. You can reuse the screw bands if they are in good condition.
Self-seal jar

How to use

- Clean off the top of the jar.
- Lay the metal lid on top of the jar with the sealing compound next to the jar.
- Screw on the metal band following directions of the manufacturer.
- Remove metal screw band before storing so that it will not rust.

Wash jars, lids and bands in hot, soapy water. This reduces the number of microorganisms on the jars and lids. The fewer the number of microorganisms present, the easier it is to destroy them during processing. See Figure 5.

Rinse all jars, lids and bands. Metal lids with sealing compound may need boiling or holding in boiling water for a few minutes. Follow the manufacturer’s directions. See Figure 6.

Sterilize jars in boiling water for 10 minutes at elevations of 1,000 feet or less. Add 1 minute for each additional 1,000 feet elevation. You need not presterilize jars if fruits, tomatoes and pickled or fermented foods will be processed 10 minutes or longer.

Boiling-water Canners

These canners are made of aluminum or porcelain-covered steel. They have removable perforated racks and fitted lids. The canner must be deep enough so that at least 1 inch of briskly boiling water will be over the tops of jars during processing. Some boiling-water canners do not have flat bottoms. A flat bottom must be used on an electric range. Either a flat or ridged bottom can be used on a gas burner. To ensure uniform processing of all jars with an electric range, the canner should be no more than 4 inches wider in diameter than the element on which it is heated.

Using Boiling-water Canners

Follow these steps for successful boiling-water canning:

1. Fill the canner halfway with water.
2. Preheat water to 140°F for raw-packed foods and to 180°F for hot-packed foods.
3. Load filled jars, fitted with lids, into the canner rack and use the handles to lower the rack into the water; or fill the canner, one jar at a time, with a jar lifter.
4. Add more boiling water, if needed, so the water level is at least 1 inch above jar tops.
5. Turn heat to its highest position until water boils vigorously.
6. Set a timer for the minutes required for processing the food.
7. Cover with the canner lid and lower the heat setting to maintain a gentle boil throughout the process schedule.
8. Add more boiling water, if needed, to keep the water level above the jars.
9. When jars have been boiled for the recommended time, turn off the heat and remove the canner lid.
10. Using a jar lifter, remove the jars and place them on a towel, leaving at least 1-inch spaces between the jars during cooling. Cool jars at room temperature.
11. Do not retighten lids after processing jars.

Maintaining Color and Flavor in Canned Foods

To maintain good natural color and flavor in stored canned food, you must:

- Remove oxygen from food tissues and jars,
- Quickly destroy the food enzymes,
- Obtain high jar vacuums and airtight jar seals.

Follow these guidelines to ensure that your canned foods retain optimum colors and flavors during processing and storage:

- Use only high quality foods which are at the proper maturity and are free of diseases and bruises.
- Use the hot-pack method, especially with acid foods to be processed in boiling water.
- Don’t unnecessarily expose prepared foods to air. Can them as soon as possible.
- While preparing a canner load of jars, keep peeled, halved, quartered, sliced, or diced apples, apricots, nectarines, peaches and pears in a solution of 3 grams (3000 milligrams) ascorbic acid to 1 gallon of cold water. This procedure is also useful in maintaining the natural color of mushrooms and potatoes, and for preventing stem-end discoloration in cherries and grapes. You can get ascorbic acid in several forms:
  
  - **Pure powdered form**—seasonally available among canners’ supplies in supermarkets. One level teaspoon of pure powder weighs about 3 grams. Use 1 teaspoon per gallon of water as a treatment solution.
  - **Vitamin C tablets**—economical and available year-round in many stores. Buy 500-milligram tablets; crush and dissolve six tablets per gallon of water as a treatment solution.
  
  - **Commercially prepared mixes of ascorbic and citric acid**—seasonally available among canners’ supplies in supermarkets. Sometimes citric acid powder is sold in supermarkets, but it is less effective in controlling discoloration. If you choose to use these products, follow the manufacturer’s directions.
  
  - Fill hot foods into jars and adjust headspace as specified in recipes.
  - Tighten screw bands securely, but if you are especially strong, not as tightly as possible.
  - Process and cool jars.
  - Store the jars in a relatively cool, dark place, preferably between 50 °F and 70 °F.
  - Can no more food than you will use within a year.

### Preparing and using syrups

<table>
<thead>
<tr>
<th>Syrup Type</th>
<th>Aprox. % Sugar</th>
<th>Cups Water (For 9 Pt. Load)</th>
<th>Cups Sugar (For 9 Pt. Load)</th>
<th>Cups Water (For 7 Qt. Load)</th>
<th>Cups Sugar (For 7 Qt. Load)</th>
<th>Fruits commonly packed in syrup**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Light</td>
<td>10</td>
<td>6-1/2</td>
<td>3/4</td>
<td>10-1/2</td>
<td>1-1/4</td>
<td>Approximates natural sugar level in most fruits and adds the fewest calories.</td>
</tr>
<tr>
<td>Light</td>
<td>20</td>
<td>5-3/4</td>
<td>1-1/2</td>
<td>9</td>
<td>2-1/4</td>
<td>Very sweet fruit. Try a small amount the first time to see if your family likes it.</td>
</tr>
<tr>
<td>Medium</td>
<td>30</td>
<td>5-1/4</td>
<td>2-1/4</td>
<td>8-1/4</td>
<td>3-3/4</td>
<td>Sweet apples, sweet cherries, berries, grapes.</td>
</tr>
<tr>
<td>Heavy</td>
<td>40</td>
<td>5</td>
<td>3-1/4</td>
<td>7-3/4</td>
<td>5-1/4</td>
<td>Tart apples, apricots, sour cherries, gooseberries, nectarines, peaches, pears, plums.</td>
</tr>
<tr>
<td>Very Heavy</td>
<td>50</td>
<td>4-1/4</td>
<td>4-1/4</td>
<td>6-1/2</td>
<td>6-3/4</td>
<td>Very sour fruit. Try a small amount the first time to see if your family likes it.</td>
</tr>
</tbody>
</table>

* This amount is also adequate for a 4-quart load.

** Many fruits that are typically packed in heavy syrup are excellent and tasteful products when packed in lighter syrups. It is recommended that lighter syrups be tried, since they contain fewer calories from added sugar.
Food may be canned in glass jars or metal containers. Metal containers can be used only once. They require special sealing equipment and are much more costly than jars.

**HOW TO: can peaches**

The directions available here are for peaches, however, if there is another fruit more available to you, use it. Follow the directions in the USDA Home and Garden Bulletin Number II.

—Because of the time it takes to bring the water of the boiling water bath to a boil, fill that container now and bring it to a boil while you start to prepare your fruit.

—Choose firm peaches that are evenly ripened. There should be no green color in the skins. Peaches of uniform size cook more evenly.

—Carefully wash and drain. Do only a few at a time to prevent bruising. See Figure 7.

Choose the kind of syrup your family prefers, considering how tart the peaches are. (Syrups are: thin—with 4 cups water and 2 cups sugar, or medium with 4 cups water and 3 cups sugar.)

—Stir the sugar in water (or juice) and boil for 5 minutes. Skim if necessary. If you want to, you can use a fruit juice instead of syrup.

**Rawpack**

Prepare peaches as directed above. Pack raw fruit in desired container to 1/2 inch from the top. Cover with boiling syrup, leaving 1/2 inch space at top of jar. Adjust jar lids. Process in boiling-water bath (212 °F) ---

- Pint jars — 25 minutes
- Quart jars — 30 minutes

Add 5 minutes processing for each 2,000 feet above 1,000 feet.

**Hotpack**

Prepare peaches as directed above. Heat peaches through in hot syrup. Pack hot fruit in desired container to 1/2 inch from the top. Cover with boiling liquid leaving 1/2-inch space at top of jar. Adjust jar lids. Process in boiling-water bath (202 °F) See Figure 9 ---

- Pint jars — 20 minutes
- Quart jars — 25 minutes

Add 5 minutes processing for each 2,000 feet above 1,000 feet.

Remove jars of food immediately when the processing time is up. There are many
types of tongs for lifting hot jars out of the water bath. Select a type which holds jars securely and which is easy for you to use. See Figure 10.

Take the jars from the canner. If the liquid boiled out during processing, do not open the jars to add more liquid. Losing liquid does not cause spoilage. However, food that is not covered may discolor and be less attractive.

Cool jars, top side up. Give each jar enough room to let air get at all sides. Never put a hot jar on a cold surface. Instead, set jars on a rack or on a folded cloth. Keep hot jars away from drafts, but don’t slow the cooling by covering the jar. See Figure 11.

Wash the metal bands and dry them carefully. You can also dry bands by placing them in a 200 °F (93 °C) oven until dry. Store the bands in a cool, dry place to prevent rusting.

To evaluate your canned fruit refer to page 38 and see what criteria judges use. Use this score card for all your canned foods.

I Don’t Get It.

Why can’t you put the hot jars on a cold surface?

Answer:

If you put a hot glass jar on a cold surface there is too great a temperature change in the jar and it will break.
KNOW-HOW:

to test a sealed jar

Later in the day or the day after canning, check each jar to see that it is sealed. To test a jar that has a flat metal lid, press the center of the lid. If the lid is down and will not move, the jar is sealed. To check seal of a porcelain-lined cap, turn each jar partially over in your hands. Examine the top. If no leaks occur around the rubber ring, the jar is sealed.

If the jar is not sealed, use the unspoiled food right away. Or can the food again. Empty the jar, check for defects, repack the food and process as if it were fresh, using a new lid.

If the jars are sealed, carefully remove the screw bands if you used them. Wipe all jars clean before storing them. Label the jars to show contents and date — month and year. If you know the variety and canned more than one variety, write the variety name on the label, too. See Figure 12. Store them in a cool, dry place.

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RAINBOW OF SERVING IDEAS:

Tropical Baked Peaches

6 to 8 peach halves
1 banana
1/3 cup brown sugar (packed)
1/4 cup coconut
1/4 cup orange juice
1/3 cup fine dry bread crumbs

Place peaches in a small flat baking dish. Slice banana over them. Combine brown sugar and orange juice and boil 3 minutes until thickened. Pour over peaches. Top with coconut and crumbs blended together. Bake at 350°F about 25 minutes. Serve warm. Serves 4 to 5.

Can you think of other ways to use your canned peaches?

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QUICK TIME

1. Choose three foods that can be canned using the boiling-water bath method.
   A. Green beans       D. Meat
   B. Peaches           E. Tomatoes
   C. Pickled vegetables

2. Who is known as the father of canning?
   A. Pasteur           C. Ben Franklin
   B. Appert

3. When do you begin to time when using the boiling-water bath?
   A. After the water comes back up to a rolling boil.
   B. As soon as the jars are put in the water.
   C. As soon as the water is put on to boil.

4. What does “Hot Pack” mean?
   A. That the food was cooked in the oven.
   B. That the food is preheated and packed into jars while hot.
   C. That the jars were hot when packed with fruit.

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Chapter II

CANNING TOMATOES

Historical Footnote

Did you know that the tomato was once thought to be poisonous? It was called the love apple or paradise apple. Then around 1830 it started being used as a food. The exact origin of the tomato is still unknown but various legends say it came from Africa, India or China. Historians claim that they were first found in Peru. The Spaniards found them growing in the gardens of Peru while searching for Inca treasures.

KNOW HOW:

to store your canned food for the future

Store canned food in a cool, dry place. Warmth can cause canned food to lose quality. Hot pipes behind a wall sometimes make a shelf or closet too warm for storing food. Canned food should not be in a place where it can freeze. Freezing may crack a jar or break a seal and let in bacteria that cause spoilage. Dampness can corrode metal lids and eventually cause leakage. Properly canned and stored, canned food will retain good eating quality for a year or longer.

FOOD SAFETY

Don’t ever use canned food that shows any sign of spoilage! Look closely at each container before you open it. Bulging can ends or jar lids or any sign of a leak may mean spoiled food. When you open the container, look for other signs of spoilage — spurting liquid, an off-odor or mold. If food shows any sign of spoilage, don’t use it — or even taste it. Throw it away.
All About Acidity

In Chapter I you learned that acid foods are those foods containing a fairly large amount of natural acid. These also include those foods preserved in salt and vinegar like sauerkraut. Have you ever wondered how the acidity of a food was measured? How do you know whether a tomato or green bean is acidic? Flavor gives you a general idea. Oranges and grapefruit have a high acid content, that’s why they are called citrus fruits. Citrus comes from citric acid. Tart flavors are usually acidic.

Another way to measure the acid content of a food is by a pH meter. A pH meter measures acid strength. Acid strength is measured on a pH scale that ranges from 1 to 14. One is the strongest acid, 14 is the strongest alkali and 7 is neutral like water.

By looking at the pH scale you can see that foods range in acidity from about pH 2.5 to slightly over neutral. The acid strength of a food is important in how a food is preserved. As the acid strength increases (pH decreases), the temperature or time required to destroy molds, yeasts or bacteria decreases. Look again at the pH scale. Food below pH 4.5 can be canned using the boiling-water bath method, the temperature reaches 212°F. Foods with less acid need higher temperatures to destroy spoilage organisms. For those with less acid, a pressure canner is used which reaches 240°F.

Here is an illustration which shows acid strength versus the time required to destroy bacteria using the boiling water bath method.

---

**pH Scale**

<table>
<thead>
<tr>
<th>Boiling Water Bath</th>
<th>Pressure Canner</th>
</tr>
</thead>
<tbody>
<tr>
<td>below pH 4.5</td>
<td>above pH 4.5</td>
</tr>
<tr>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>gooseberries, vinegar, pickles, citrus fruits, rhubarb, apples, plums, blackberries, peaches, sour cherries, pineapple, kraut, sweet cherries, prunes, tomatoes, peaches</td>
<td></td>
</tr>
<tr>
<td>sweet potatoes, okra, pumpkin, squash, carrots, string beans, celery, brocoli, asparagus, potatoes</td>
<td></td>
</tr>
<tr>
<td>lima beans, tuna fish, peas, meat, corn, mushrooms</td>
<td></td>
</tr>
<tr>
<td>Neutral hominy, shrimp</td>
<td></td>
</tr>
<tr>
<td>few foods above pH 8.0</td>
<td></td>
</tr>
</tbody>
</table>

---

Increasing Acidity

Decreasing Acidity
TRY AN EXPERIMENT

Let's measure acidity. In a school science class you have probably worked with litmus paper. pH paper is much the same only it is more sensitive. It comes in a pH range of 3.0 to 5.5 and 1/2- to 1/4-inch wide rolls like transparent tape. On one side of the dispenser is a guide to pH colors for comparison.

The pH papers can be purchased from laboratory supply houses, for example, Scientific Stores at the University of Nebraska-Lincoln. They can also be purchased at your local drug store or your high school science teacher may have a supplier's catalog that you could use.

Once you get the pH paper:
1. Gather several fruits and vegetables and a piece of meat. Also try lemon juice concentrate and vinegar; how about soda pop and milk? Can you think of others?*
2. Slice the fruits and vegetables so that the pH paper can get wet and the paper can turn color.

3. Match the color of your pH tape with a color on the dispenser to determine its pH.
   On the pH scale provided, write in the pH's of your products.

   1
   2
   3
   4
   5
   6
   7

*Remember that the foods with a pH below 4.5 can be safely processed in a boiling water bath. Those above 4.5 (most vegetables) will be processed using the pressure canner.

Canning Tomatoes

You can safely process tomatoes in a boiling water bath canner since the acid in the tomatoes helps preserve them after canning. However, the ripeness of the tomato will determine how acidic the tomatoes are. If you do not add acid to these, they may spoil more easily. Since there is no easy way for you to determine the exact acid level of tomatoes, it is a good idea to add acid to all tomatoes before canning. Do this by adding citric acid or lemon juice.

Citric Acid/Lemon Juice
1/4 teaspoon citric acid or 1 tablespoon bottle lemon juice per pint.
1/2 teaspoon acid or 2 tablespoon bottled lemon juice per quart.

HOW TO: can tomatoes

Use only firm, ripe, red tomatoes. Do not use overripe tomatoes because they lose acidity as they mature. Tomatoes with soft spots or decayed areas are not suitable for canning.

—Sort the tomatoes for size and ripeness. They cook more evenly that way. See Figure 13.
—Wash the tomatoes thoroughly. Dirt contains some of the bacteria hardest to destroy. Wash small amounts at a time under running water or change wash water frequently. If you use a basin of water, lift the tomatoes out of the water so dirt that has been washed off won’t stick back onto the tomatoes. See Figure 14.

—To make peeling quicker and easier, blanch the tomatoes by dipping them into boiling water for about 1/2 minute. Then dip them into cold water. See Figure 15.
—Cut out stem ends and peel tomatoes. See Figure 16.

**Raw Pack**

The raw pack method of preserving tomatoes is no longer recommended because of recent research findings. When sufficient research has been accomplished to establish safe, new processes, instruction will be included in a revised edition of the USDA Home and Garden Bulletin Number III.

**Hot Pack**

Quarter peeled tomatoes. Bring to boil; stir to keep tomatoes from sticking. Pack boiling-hot tomatoes in desired container to 1/2 inch of top. See Figure 17. Add 1/2 teaspoon salt to pints; 1 teaspoon to quarts (optional). Add acid. Adjust jar lids. Process in boiling-water bath (212 °F):

<table>
<thead>
<tr>
<th>Type</th>
<th>Processing Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pint jars</td>
<td>35 minutes</td>
</tr>
<tr>
<td>Quart jars</td>
<td>45 minutes</td>
</tr>
</tbody>
</table>

Add 5 minutes processing for each 2,000 feet above 1,000 feet.

Remove jars from the canner when processing time is up and allow the jars to cool. Test the seals, label, evaluate and store.
A RAINBOW OF SERVING IDEAS

- Make spaghetti sauce with your tomatoes.
- Stew the tomatoes. Dish up in serving bowls and put dried toast pieces on top (1/2 inch by 1/2 inch).
- Puree the tomatoes alone or with celery, carrots and green peppers and make some tomato juice.

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**QUIZ TIME**

1. Where do you store your canned foods for the future?
   A. Above the stove.
   B. In the refrigerator or freezer.
   C. In a cool, dry place.
   D. In a warm, moist place.
2. What happens when canned foods are stored in warm, moist places?
   A. The lids may rust and the food may spoil.
   B. The food will keep its quality for a long period of time.
   C. The food will lose its quality.
3. Should you use canned foods that:
   A. Are bulging at the lid? Yes or No
   B. Leak? Yes or No
   C. Have an off odor? Yes or No
   D. Are moldy? Yes or No
   E. Smell fresh? Yes or No
4. One food (a) has the pH of 2.5, another food (b) has the pH of 3.9. Which of the statement(s) are true?
   A. Food (b) has a higher pH than food (a).
   B. Food (b) has a lower pH than food (a).
   C. Food (b) has a higher acidity than food (a).
   D. Food (b) has a lower acidity than food (a).

Answers: 1-C, 2-A and C, 3-A through D, no and D.
Chapter III

MAKING PICKLES

Pickled products add zest to meals or snacks. The skillful blending of spices, sugar and vinegar with fruits and vegetables give crispy, firm texture and pungent, sweet-sour flavor.

Pickles and relishes provide some nutritive value. They contain little or no fat, but many kinds contain a high salt content. And, except for the sweet type, they are low in calories. Food markets today offer a wide variety of pickles and relishes. However, many homemakers like to make their own pickle products when garden vegetables and fresh fruits are plentiful.

There are many, many kinds of pickled products. This chapter can only skim the surface of all there is to know about pickles. Fruits, vegetables and meats can be pickled, and they all have their own rules. In this chapter you will make fresh-packed dill pickles. They take less time to prepare than the several week process of fermented or brined dill pickles. But if you are a "Pickle Lover" buy a good book on pickles, or use some favorite home recipes and ALWAYS remember to follow the directions carefully. Make sure that the home recipes have been tested for safety.

Words to Know

PICKLE — To preserve in vinegar or brine (salt water). May be vegetables, meat or fruit. In general there are four classes of pickles.

1. Fruit Pickles — simmered in a sweet-sour sauce are easiest to make. Crab apples, pears, and peaches are preserved in this way.

2. Quick-processed pickles — made from vegetables salted down overnight and combined the next day with boiling-hot vinegar and spices. These include bread and butter and Kosher style dills.

3. Brined pickles — also called fermented pickles because they go through a curing process lasting several weeks. Sauerkraut and brined beans belong to this group along with green tomato and cucumber dills.

4. Relishes — this group includes tomato catsup, chili sauce and chutneys made of vegetables or fruits, chopped and seasoned, or cooked down to a spicy sauce.
Ingredients For Successfully Pickling Cucumbers

When you pickle whole cucumbers, use unwaxed ones. Brine cannot penetrate waxed cucumbers. Sort for uniform size and select the size best suited for the recipe you are using.

Use cucumbers as soon as possible after gathering from the garden or after purchasing from the market. If you cannot use them immediately, refrigerate them or spread them where they will be well ventilated and cool. This is particularly important for cucumbers because they deteriorate rapidly, especially at room temperatures.

Do not use cucumbers that show even slight evidence of mold. Proper processing kills organisms that may cause spoilage, but it does not destroy the off-flavor that mold growth may produce in the tissue.

Vinegar

Use a high grade cider or white distilled vinegar of 5 percent acidity. Do not use vinegars of unknown acidity or your produce may spoil. Also, a too strong solution of vinegar may cause your pickles to become shirveded and tough.

Cider vinegar, with its mellow acid taste, gives a nice blending of flavors, but may darken white or light-colored fruits and vegetables. White distilled vinegar has a sharp, pungent taste. Use it when light color is important, such as pickled pears, onions, cauliflower, etc.

Do not dilute the vinegar unless the recipe calls for you to do so. If you want a less sour product, add sugar rather than decreasing the vinegar.

Salt

Use canning or pickling salt. You can use non-iodized table salt. Materials added to most table salt to prevent caking may cause the brine to become cloudy and should be avoided if pure salt can’t be found.

Do not use iodized table salt. It may darken pickles.

Spices

The general term "spices" includes the sweet herbs and pungent spices. Herbs are the leaves of aromatic plants grown in the temperate zone. Spices are the stems, leaves, roots, seeds, flowers, buds and bark of aromatic plants grown in the tropics.

Use fresh spices for the best flavor in pickles. Spices deteriorate and quickly lose their pungency in heat and humidity. If you cannot use them immediately, store them in an airtight container in a cool, dry place.

Water

Use soft water. If your water is not soft, you can soften it by boiling for 15 minutes. Let it stand for 24 hours. Remove scum from top and carefully ladle water from kettle so sediment in the bottom is not disturbed. Add 1 tablespoon vinegar per gallon of boiled water before using it.

KNOW-HOW:

to choose equipment

The right kinds, size and amount of equipment save you time and energy. Read the complete recipe before you start any food preparation. Make sure you have the utensils and tools you need.
For heating pickling liquids, use utensils of unchipped enamelware, stainless steel, aluminum or glass. Do not use copper, brass, or galvanized iron utensils since these metals may react with acids or salts, causing undesirable color changes in the pickles or the forming of undesirable compounds.

There are small utensils that help make home pickling easy and convenient: measuring spoons, large wooden or stainless steel spoons for stirring, measuring cups, sharp knives, large trays, tongs, vegetable peelers, ladle with lip for pouring, slotted spoon, footed colander or wire basket, large-mouthed funnel, food chopper or grinder and wooden cutting board.

KNOW-HOW:
for successful pickling
It is important to follow recommended procedures to have a quality pickle that is safe to eat. You waste ingredients, time and money if you use outdated or careless canning procedures.

Preparing Fruits and Vegetables
— Wash fruits and vegetables thoroughly in cold water. Wash them whether they are to be pared or left unpared. Use a brush and wash only a few at a time. Wash under running water or through several changes of water. Clinging soil may contain bacteria that are hard to destroy. Lift the fruits or vegetables out of the water each time so soil that has washed off will not drain back over them. Rinse the pan thoroughly between washings. Handle fruits and vegetables gently to avoid bruising.

HISTORICAL FOOTNOTE
Pickles date back as far as 2030 B.C. It is thought that the pickle’s origin is in Chinese culture because workers on the Great Wall of China were known to eat lunches of “Salted Vegetables.” In India, cucumber seeds were planted in the Tigris Valley. The Romans ate pickles because Julius Caesar thought that pickles would keep his men healthy. The taste for pickled foods spread through Europe into the New World. Today pickles are still a favorite on the American table.

Each country has its favorite pickled food. In England ‘cold catsup’ is a favorite with cold roast beef and other cold cuts. ‘Cold catsup’ is a tomato-and-vegetable combination that many Americans enjoy as a condiment. Truly American pickled foods are pickled melon rinds, peaches and pears! Another American favorite is mustard pickle. It is served with hot or cold roast ham or with smoked tongue and made with onions, cucumbers, cauliflower, peppers, and green tomatoes. Pickled boiled eggs are a favorite in many homes, too! And, how many of you like sauerkraut?
— Be sure to remove all the blossoms from cucumbers. Blossoms may be a source of the enzymes that soften cucumbers during fermentation.

Filling Jars
— Fill the jars firmly and uniformly with the pickle product. Avoid packing so tightly that the brine or syrup cannot fill around and over the product. Be sure to leave the recommended amount of head-space at the top of the jar.
— Wipe the rim and threads of the jar with a clean, hot cloth to remove any particles of food, seeds or spices. Even a small particle can prevent an airtight seal.
— When you use a porcelain-lined zinc cap with a rubber ring that fits on the shoulder of the jar, put the wet rubber ring on the shoulder of the jar before you fill it. Do not stretch the rubber ring more than necessary. After you fill the jar, wipe the rubber ring, jar rim and threads clean.

Heat Treatment
Pickle products require a heat treatment to destroy the organisms that cause spoilage. A heat treatment also inactivates enzymes that affect flavor, color and texture. Adequate heating is best achieved by processing the filled jars using a boiling-water bath method.
Use heat processing for all pickled products. There is always danger of spoilage organisms entering the food when you transfer it from the kettle to the jar. This is true even when you are very cautious.
— Pack pickled products into glass jars according to the directions given in the recipe. Adjust the lids.
— Immerse the jars into actively boiling water in a canner or deep kettle. Be sure the water comes an inch or two above the tops of the jars. (Add boiling water if necessary, but do not pour it directly on the jars.)
— Cover the container with a close-fitting lid and bring the water back to boiling as quickly as possible. Start to count processing time when the water returns to boiling. Use this method for pickled products other than fermented cucumbers and fresh-pack dills — (Refer to note). Continue to boil gently and steadily for the time recommended for the food being canned.
— Remove jars immediately. Set the jars upright, several inches apart, on a wire rack to cool.

*NOTE: Processing procedures for fermented cucumbers and fresh-pack dills are slightly different from the usual water-bath procedures. For these products, start to count the processing time as soon as you put the filled jars in the actively boiling water. This prevents development of a cooked flavor and a loss of crispness.

HOW TO:
make fresh-pack dill pickles
Ingredients:
17 to 18 pounds cucumbers, 3 to 5 inches in length, packed 7 to 10 per quart jar.
About 2 gallons of 5 percent brine (3/4 cup of pure granulated salt per gallon of water).
6 cups (1 1/2 quarts) vinegar
3/4 cup salt, pure granulated
1/4 cup sugar
9 cups (2 1/4 quarts) water
2 tablespoons per quart jar whole mustard seed
1 or 2 cloves per quart jar garlic, if desired
3 heads per quart jar dill plant, fresh or dried
or
1 tablespoon per quart jar dill seed

Directions:
- Wash cucumbers thoroughly. Scrub with a vegetable brush. Drain.
- Cover with the 5 percent brine — 3/4 cup of salt per gallon of water. Let sit overnight. Drain.
- Combine vinegar, salt, sugar, water and mixed pickling spice that you have tied in a clean, thin, white cloth. Heat to boiling.
- Pack cucumbers into clean, hot jars. Add mustard seed, dill plant or seed and garlic to each jar. Cover with boiling liquid to within 1/2 inch of the top of the jar. Adjust jar lids.
- Process in boiling water.

**Pints** — 20 minutes
**Quarts** — 25 minutes

Add 5 minutes processing for each 2,000 feet over 1,000 feet.

Start to count the processing time as soon as you place the hot jars into the active boiling water.

---

**I DON'T GET IT:**

Why do I have to use soft water when I pickle? What's wrong with hard water?

**ANSWER:**

The minerals in the hard water interfere with the pickling process and it may cause soft, slippery, slimy pickles. They may also get discolored. Discard pickles you find this way because they are spoiled.

---

**A RAINBOW OF SERVING IDEAS**

- Serve your pickles whole for an afternoon snack with friends.
- Slice them length-wise and serve with the noon or evening meal.
- Slice the pickles anyway you want to add a wonderful crunch and flavor to a meat or cheese sandwich.

Can you think of other ways to serve them?

---

**Tively boiling water.**

- Remove the jars. Set the jars upright, several inches apart, on a wire rack or folded towel to cool.
- Cool jars then test for the seal. Label, evaluate and store.

---

**QUIZ TIME**

1. Which of these are pickled?
   A. Sauerkraut
   B. Dill Pickles
   C. Relish
   D. Pigs Feet
   E. All of the above

2. Why can’t you use waxed cucumbers?
   A. Wax sticks in your teeth
   B. Brine cannot penetrate them

3. Why can’t you use a vinegar of unknown acidity?
   A. It may cause shriveled and tough pickles
   B. Product may spoil
   C. You don’t know where it’s been

4. What happens if you use iodized salt for pickling?
   A. The pickles may taste like candy
   B. It may darken pickles
   C. It may cause shriveled and tough pickles

5. What is different from the heat treatment of fermented cucumbers and fresh-pack dill pickles that you DO NOT do with other boiling-water bath procedures?
   A. Immerse the jars into actively boiling water, wait until the water comes back to a rolling boil and begin timer.
   B. Immerse jars into actively boiling water and immediately begin timer
   C. Do not put the jars through any heat treatment

6. What is the purpose of the heat treatment?
   A. To give the pickles a cooked flavor
   B. To destroy organisms that cause spoilage
   C. To inactivate enzymes that may affect flavor, color and texture

---

**ANSWERS:** 1-3, 5, 8; 2, 4, 5, 6, 7
Chapter IV

FREEZING VEGETABLES

In this chapter you will learn how to freeze green beans. However, the same principles learned here can be applied to most vegetables. If another vegetable is more readily available, use it.

An important step in preparing vegetables for freezing is "blanching." Nearly every vegetable has a better quality if you heat and quickly cool it before you pack and freeze it.

The reason for blanching vegetables before freezing is that it slows or stops the action of enzymes. Until the time vegetables are ready to pick, enzymes help them grow and mature. After picking, enzymes cause loss of flavor and color. If you do not blanch vegetables enough, the enzymes continue to be active during frozen storage and the vegetables may develop off-flavors, discoloration or toughness. In a few weeks they may become unappetizing. Blanching also results in keeping more vitamin C in the vegetable.

Blanching wilts or softens vegetables and makes them easier to pack. Heating time will vary with the vegetables and the size of the pieces.

Words to Know:

Blanching — Heating food for a certain length of time to stop the action of enzymes.

Enzymes — A protein found in small amounts in all plant and animal life that promotes ripening and decomposition.

Freezer Burn — Dehydration of frozen food due to improper packaging. Results in loss of color, flavor and texture.

YOU'RE THE CONSUMER:

In the first Food For The Future manual you learned that packaging materials play an important part in the quality of your fruits. The same is true with all foods you freeze including vegetables. If the packaging material is not air tight, the product may get freezer burn. This means the cold dry air of a freezer dries out areas on your fruit, vegetables or meat and causes a noticeable flavor, texture and color change. This also means that all the time you spent preparing your food to freeze was wasted. The food will be safe to eat but will not taste good!
KNOW-HOW:
to blanch vegetables

There are two main methods of blanching vegetables—the boiling water method and steam blanching.

Boiling Water Method
For home freezing, the most satisfactory way to blanch nearly all vegetables is in boiling water. Use a blancher with a blanching basket and cover. Or fit a wire basket into a large kettle and add a cover.

For each pound of prepared vegetables, use at least 1 gallon of boiling water in the blancher or kettle. Put vegetables into the blanching basket or wire basket and lower it into the boiling water. Use a wire cover for the basket to keep the vegetables down in the boiling water.

Put the lid on the blancher or kettle and start counting time immediately. Keep the heat high for the time given in the directions for the vegetable you are freezing.

Steam Blanching
Steaming is a satisfactory method of blanching for many vegetables.

To steam, use a kettle with a tight lid and a rack that holds a steaming basket at least three inches above the bottom of the kettle. Put an inch or two of water into the kettle and bring the water to a boil.

Put the vegetables in the basket in a single layer so that steam reaches all parts quickly. Cover the kettle and keep the heat high. Start to count steaming time as soon as the lid is on. Mushrooms and broccoli might be blanched this way.

Microwave Blanching
If you have a microwave oven, this method is quick and easy. Follow the instructions in your microwave manual. If large quantities of food are to be blanched and frozen, this method of blanching may not be a good choice since it would take too much time.

TRY AN EXPERIMENT:
1. Let’s find out what happens when beans are not frozen in an air-tight container.
   A. Freeze one cup of blanched green beans in an open container.
   B. Leave them stored in the freezer for several meetings.
   C. When a future meeting allows some extra time, thaw and cook the beans. NOTICE: Color, flavor, texture change. How do they differ in color, flavor, and texture from beans that were frozen in an airtight container.
   D. Write down your observations in the space provided.

TRY ANOTHER EXPERIMENT:
2. As you learned in Words to Know, blanching stops the action of enzymes that cause your vegetables and fruits to ripen. To see the effect of enzymes on your green beans:
   A. Freeze one cup of green beans following the instructions given in the How To section, but without blanching them. Carefully label them so they don’t get mixed up with the blanched beans.
   B. Leave them stored in the freezer for several meetings.
   C. When a future meeting allows some extra time, thaw and cook the beans. NOTICE: color, flavor, texture changes. How do they differ in color, flavor and texture from beans that were blanched, then frozen? Are they tough?
   D. Write down your observations in the space provided.
HOW TO:
freeze green beans

- Select young, tender, stringless beans that snap when broken. Allow 2/3 to 1 pound of beans for one pint frozen. Sort beans for quality and uniform maturity. Remember, freezing cannot improve poor quality green beans. See Figure 18.
- Wash the beans thoroughly. See Figure 19.
- Remove the stem ends.
- Cut the beans into 1- or 2-inch pieces. You can slice them lengthwise (called French cut) or keep them whole to use in salads. See Figure 20.

- Put the beans in a blanching basket. Lower the basket into rapidly boiling water and cover. You need at least a gallon of water for one pound of green beans. Start counting time immediately. Heat for three minutes. Keep water boiling. See Figure 21.

- Plunge the basket of heated beans into cold water to stop cooking. It takes about as long to cool vegetables as to heat them. When the beans are thoroughly cooled, remove them from the water and drain. See Figures 22 and 23.
— Fill the containers, leaving 1/2-inch headspace. Polyethylene boxes or plastic bags placed inside cardboard cartons are good choices of containers. Do not use ice cream or milk cartons. See Figure 24.

— Label containers with the product name and date — month and year. Include the variety if you know it and if you freeze more than one variety. If you put your name on the packages, you will be able to evaluate them later. See Figure 25.

— Seal the containers tightly. Freeze immediately. Store at 0°F (0°C) or -18 degrees Celsius (-18°C) or lower. See Figure 26.
KNOW-HOW:

long to store your vegetables
The storage life of vegetables, in general, ranges from 8-12 months, at 0°F. Remember in freezing that for every rise of 10 degrees Fahrenheit, the storage life is cut in half! Green beans should be of good quality up to 12 months when frozen at 0°F.

A RAINBOW OF SERVING IDEAS
*Place your unthawed green beans into 1/2 cup boiling, salted water and cook until tender. This should take about 8-12 minutes after the water returns to a gentle simmer. Now they may be treated as fresh beans.
— To give your beans a wonderful flavor, add fried bacon pieces (1/4 - 1/2 inch) as the beans cook, or almond slivers to the beans after they cook. This is a delight to serve with almost any meat and potato meal.

—— QUIZ TIME ——

1. What is the primary purpose of blanching?
   A. To color the vegetables
   B. Stops the action of enzymes
   C. To kill bugs found in vegetables

2. What do enzymes do?
   A. Helps in the digestion of vegetables
   B. Colors the vegetables green
   C. Cause ripening and decomposition

3. What is freezer burn?
   A. Dehydrated spots on improperly wrapped food
   B. Causes ripening and decomposition
   C. Stops the action of enzymes
   D. Damage in vegetables due to too high a temperature in the freezer

4. Three methods of blanching vegetables are:
   A. Boiling water, steam, microwave
   B. The stove, the freezer, the dryer
   C. The garden, the store and the market

5. How long can vegetables be stored at 0°F?
   A. 2 years (24 months)
   B. 8-12 months
   C. 4 months

6. How long can vegetables be stored at 10°F?
   A. 12 months
   B. 2 months
   C. 4-6 months

Chapter V

FREEZING EVERYTHING ELSE

Up to this point you have learned several ways to freeze fruits, and how to blanch and freeze vegetables. As with most things, there is always an exception to the rule. Squash isn't blanched before it is frozen, so in this chapter you will learn how to freeze squash. Also, there has been no mention so far about freezing meats, baked goods, or convenience foods. Some general rules for freezing these foods will be included in this chapter.

KNOW-HOW:

to keep an inventory

Fruits can be stored in the freezer up to 12 months; vegetables, 8-12 months; baked goods, seafood and other meats each have a different storage life. Because of this, it is difficult to keep track of what you have in the freezer and when it needs to be used. To help resolve this problem, let's develop an inventory system.

Your foods have already been dated before they are put in the freezer. Also, it is helpful to arrange the freezer so that similar foods are together. This makes finding them easier when you want to use them.

The purpose of an inventory is to keep track of those foods going in and coming out of the freezer so that foods can be used while they still are at their peak quality.

Here is one way you can keep an inventory. If you know another way that you are more comfortable with or can find helpful modifications to this one, feel free to share it with your group.

Have a separate sheet of paper for each of the food groups. If you use a lot of one kind of food, put that one food on a sheet by itself. In this way the inventory sheets are modified to fit the needs of your family. For example: MEATS, FRUITS, VEGETABLES, BAKED FOODS, CONVENIENCE FOODS, MISC.

Put these headings on the top of the sheet. A three-ring notebook works best since you can add more paper where and when you need it.

Another benefit of using an inventory is that during the season you'll get a better idea of the needs of your family. When the time comes to start planting the garden and your freezer is still full from the season before, you know you planted too much for what you need.

Can you think of other benefits?

The chart at the top of the next page gives you an example of an inventory sheet for fruits.
## FRUITS

<table>
<thead>
<tr>
<th>DATE (Mo. &amp; Yr.)</th>
<th>FOOD PRODUCT (Description)</th>
<th>QUANTITY (Quarts, Pints, Pounds, etc.)</th>
<th>DATE TO BE USED BY</th>
<th>AMT (+/-)</th>
<th>BALANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sept. 84</td>
<td>Peaches, dry pack</td>
<td>Quarts</td>
<td>Sept. 85</td>
<td>+5</td>
<td>5 quarts</td>
</tr>
<tr>
<td>Sept. 84</td>
<td>Peaches, syrup pack</td>
<td>Pints</td>
<td>Sept. 85</td>
<td>+4</td>
<td>4 pints</td>
</tr>
<tr>
<td>Nov. 84</td>
<td>Peaches, dry pack</td>
<td>Quart</td>
<td></td>
<td>-1</td>
<td>4 quarts</td>
</tr>
<tr>
<td>Dec. 84</td>
<td>Peaches, syrup pack</td>
<td>Pint</td>
<td></td>
<td>-1</td>
<td>3 pints</td>
</tr>
</tbody>
</table>

### HOW TO: freeze squash

The fact that squash freezes well does not mean that freezing it is practical for everyone. Winter squash also stores well unrefrigerated in a cool (55 to 60 °F), dry place. If you have good storage, you may want to save freezer space for something else. However, you may decide freezing is practical for one or more of these reasons: your storage space is too warm or too cool; you do not have enough storage space; you have too large a quantity to use in the length of time squash will keep in storage; or you want greater convenience at mealtime.

Both summer and winter squash are suitable for freezing. Acorn squash, a winter variety, is shown here to illustrate a slightly different procedure for freezing vegetables.

- Select firm, mature squash. Wash and cut in half. For safety, cut directly toward the cutting board.
- Remove the seeds. A tablespoon is convenient for this.
- Place the halves cavity side down on a baking sheet. Bake at 350 °F (177 °C) for 45 to 60 minutes, depending upon the size. See Figure 27.
- Remove the pulp from the rind and mash it or press it through a sieve. See Figure 28.
— To cool, place the pan containing the squash in cold water. Stir the squash occasionally.
— Pack the squash into the containers, leaving 1/2 inch headspace. Seal the containers completely. Label with the name of product and date—month and year. See Figure 29.
— Freeze immediately. Store at 0°F (-18 °C) or lower.

Convenience Foods
You should know how to freeze convenience foods if:
— you have a small family,
— you don’t always have the time to prepare meals from scratch,
— you want to be ready for unexpected guests or emergencies,
— you want to stock up for a party that you know you won’t have time to prepare for.

Convenience foods are foods that you prepare ahead of time so that all the food needs is thawing out and reheating before it is served.
HOW TO:
make your convenience food

It really is quite simple. When you are taking the time to prepare a meal it doesn’t take that much more time to make a larger amount than you normally do. For example, make a larger batch of spaghetti sauce, take out what you know you will use for the meal, then put the rest of it in containers that hold about what your family needs for a meal. Then all you need to do is thaw it and reheat it.

You can do the same thing with many casseroles and soups, creamed foods, stews, meat pies, and meat which is covered by a broth or gravy.

KNOW ABOUT:
unsuccessful foods for freezing

— Hard-cooked egg whites become tough and rubbery when frozen.
— Crumbs, cheese, potato chips, and other toppings on casseroles tend to get soggy when frozen, so add them when the food is thawed and ready to be reheated.
— Fried foods should only be stored for a short period of time to avoid becoming rancid, tough and dry.
— Sauces with milk and cheese sometimes curdle when frozen.
— Write down other foods and experiences you know that lead to unsuccessful convenience foods.

Baked Goods

Baked goods are convenient to have on hand for the same reason given for convenience foods. When freezing baked foods make sure they are thoroughly cooled. Then, tightly wrap and freeze at 0 °F. The various baked goods will be fresh if frozen at 0 °F for up to the following months:

<table>
<thead>
<tr>
<th>Product</th>
<th>Use by this date (Months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quick breads</td>
<td>2-4</td>
</tr>
<tr>
<td>Yeast breads</td>
<td>6-12</td>
</tr>
<tr>
<td>Rolls</td>
<td>2-4</td>
</tr>
<tr>
<td>Cheese, chiffon, sponge, gingerbread, angel cakes</td>
<td>4-6</td>
</tr>
<tr>
<td>Fruit cakes</td>
<td>12</td>
</tr>
<tr>
<td>Cookies</td>
<td>4-6</td>
</tr>
<tr>
<td>Fruit Pies</td>
<td>12</td>
</tr>
<tr>
<td>Chiffon and Pumpkin Pie</td>
<td>1</td>
</tr>
</tbody>
</table>

To thaw baked goods, thaw at room temperature or warm in the oven for 20 to 30 minutes at a low temperature.
Meat

For freezing, all red meats, poultry and fish need to be fresh. If bones are taken out of the meat cuts it will take up less space in the freezer. However, with some cuts this will not be practical.

Have your butcher package your meat cuts into the amounts practical for your needs. For example, have your ground beef packaged into one or two pound packages if you have a small family, larger pound packages if it fits your family needs better.

Meat, fish and poultry will be of good quality if frozen at 0°F for up to the following months:

- Beef: 12 months
- Veal, lamb: 8 months
- Pork: 6-8 months
- Sausage: 4 months
- Bacon: 3 months
- Poultry: 6-12 months
- Seafood: 3-4 months
- Haddock, cod, flounder, trout, etc.: 6 months

To thaw any meat, **NEVER** thaw at room temperature. Bacteria grow quickly at room temperature, therefore, thaw in the refrigerator — small roasts - 3 hours per pound, large roasts - 4 to 5 hours per pound. The smaller your packages the less time it takes to thaw. If you have a microwave, follow the defrost directions that come with your unit.

---

**QUIZ TIME**

1. List several reasons to keep an inventory.

2. Give 3 or 4 reasons for freezing convenience foods.
   A.
   B.
   C.
   D.

3. Where would you **Never** thaw meat? Why?

---

ANSWERS:

3. Refer to page 30
2. Refer to page 28
1. Refer to page 26
Chapter VI

DRYING VEGETABLES

Drying is one of the oldest methods of preserving foods. In Unit I you learned how to dry fruits and make fruit leather. In this chapter you will learn how to dry a variety of vegetables and in Chapter VII you will learn how to make beef jerky.

Vegetables to Dry

<table>
<thead>
<tr>
<th>Dry Well</th>
<th>Do NOT Dry Well</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beans (all kinds)</td>
<td>Greens</td>
</tr>
<tr>
<td>Beets</td>
<td>Broccoli</td>
</tr>
<tr>
<td>Corn</td>
<td>Peas — fresh shelled</td>
</tr>
<tr>
<td>Okra</td>
<td>Peas — mature</td>
</tr>
<tr>
<td>Onions</td>
<td>Peppers — green</td>
</tr>
<tr>
<td>Carrots</td>
<td>and red</td>
</tr>
<tr>
<td>Parsnips</td>
<td>Pumpkins</td>
</tr>
<tr>
<td>Turnips</td>
<td>Squash</td>
</tr>
<tr>
<td>Rutabagas</td>
<td>Soybeans</td>
</tr>
<tr>
<td>Sweet potatoes</td>
<td>Celery</td>
</tr>
<tr>
<td>Cabbage</td>
<td>Potatoes</td>
</tr>
<tr>
<td>Mushrooms</td>
<td></td>
</tr>
</tbody>
</table>

KNOW HOW:

to choose your vegetables

Pick vegetables at the best stage of maturity and use while they are fresh and in prime condition. Do not use over-mature vegetables since they tend to be tough and stringy or hard. Remember that drying does not improve quality.

Pretreating Vegetables

Most vegetables should be treated before drying. Blanch vegetables in steam or boiling water until tender but firm. Use the same time recommended for preparing vegetables for freezing. Cool in water and drain.

Blanching is essential for all vegetables except peppers, onions, mushrooms and herbs.

Blanching for Drying:

1. Helps save some of the vitamin content
2. Sets color
3. Hastens drying by relaxing the tissue
4. Helps prevent undesirable changes in flavor during storage
5. Helps insure satisfactory reconstitution during cooking
YOU'RE THE CONSUMER: on drying

Consider the cost of your drying project. Do you have to buy these vegetables? Or are they extras you have grown in the garden or received from a neighbor? Does your family even like the flavor of vegetables that have been dehydrated and then reconstituted? Or will you be using them where the flavor changes are unnoticed — such as soup, stews or baked dishes?

Before you begin any preservation project you need to consider your family’s needs and you and your family’s likes and dislikes. For example, maybe you have a family that likes to do a lot of hiking or camping where you need to carry your provisions. In this case, dried fruits and vegetables would be ideal.

Before you begin any drying project for your family make sure it is one of the preservation methods practical for you.

Drying Methods

Choose the drying method you will use considering the options you learned in Unit I, pages 24 and 28. For this chapter, directions will be given for the oven drying method. However, if you have a food dehydrator follow the directions that come with it.

Conditioning The Food

It’s a good idea to condition dried foods before storage. Place dried food in a large, heavy plastic bag, seal and refrigerate for 1 to 2 days. Check it again for dryness. If necessary, heat the food in a 150 °F oven until completely dry. The conditioning step evens out the moisture content from piece to piece.

Storing Your Dried Vegetables

Cook and pack dried vegetables in plastic bags placed in glass jars, plastic containers, or waxed paper cartons with close fitting lids. Store in a cool, dark, dry place. Well dried vegetables will keep for 6-12 months. However, if there is any evidence of spoilage, discard the food!
# HOW TO: dry vegetables

Choose a vegetable available to you at this time and dry it. Dry several if time permits.

<table>
<thead>
<tr>
<th>VEGETABLE</th>
<th>PREPARATION</th>
<th>PRETREATMENT</th>
<th>DRYING PROCEDURE</th>
<th>DRYNESS TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green beans</td>
<td>Cut in 1 inch (2.5 cm) pieces.</td>
<td>Steam or water blanch 3 minutes.</td>
<td>Arrange on a thin layer on trays.</td>
<td>Brittle, dark green or brownish.</td>
</tr>
<tr>
<td>Beans, lima</td>
<td>Shell</td>
<td>Choose one: Steam 10 to 15 minutes.</td>
<td>- Spread on tray about 1/2&quot; deep.</td>
<td>Dry until hard and brittle. Bean</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Place in boiling water 5 minutes.</td>
<td>- Stir frequently at beginning.</td>
<td>will break clean when broken.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Drain.</td>
<td>- Drying time averages 6 to 10 hours in controlled heat.</td>
<td></td>
</tr>
<tr>
<td>Beets</td>
<td>Cook and skin; slice or dice.</td>
<td>Already cooked, no further blanching required.</td>
<td>Arrange in a thin layer on trays.</td>
<td>Brittle, dark red.</td>
</tr>
<tr>
<td>Cabbage</td>
<td>Shredded</td>
<td>Steam 2 minutes.</td>
<td>Arrange in a thin layer on trays.</td>
<td>Crisp, pale yellow to green.</td>
</tr>
<tr>
<td>Carrots</td>
<td>- Select crisp, tender carrots, free from woodiness. Wash. Trim the roots and tops. Cut into slices or strips about 1/8&quot; thick.</td>
<td>Steam or water blanch 4 to 5 minutes.</td>
<td>Arrange in a thin layer on trays.</td>
<td>Hard, brittle.</td>
</tr>
<tr>
<td>Corn</td>
<td>- Select tender, sweet corn. Husk.</td>
<td>- Steam on the cob 5 to 8 minutes or until milk is set. - Cut from cob after blanching and cooling enough to handle</td>
<td>- Spread kernels 1/2&quot; to 3/4&quot; deep on trays.</td>
<td>Dry, brittle, translucent.</td>
</tr>
<tr>
<td>Any good table variety.</td>
<td>- Sort ears on basis of maturity. Young corn requires longer blanching time.</td>
<td>- Steam-blanch 4 to 5 minutes. - Dip in boiling water 3 to 4 minutes.</td>
<td>- Drying time averages 6 to 10 hours in controlled heat.</td>
<td></td>
</tr>
<tr>
<td>Mushrooms</td>
<td>Stem and slice.</td>
<td>None</td>
<td>Arrange in a thin layer on trays.</td>
<td>Very dry and leathery.</td>
</tr>
<tr>
<td>Onions</td>
<td>- Peel. Remove outer discolored layers. Cut uniform slices 1/8&quot; to 1/4&quot; thick.</td>
<td>No treatment necessary.</td>
<td>- Spread thinly on trays. In controlled heat, dry 6 to 10 hours at 140 °F.</td>
<td>- Dry until brittle and light colored. - For onion powder, crush slices after drying.</td>
</tr>
<tr>
<td>Peas</td>
<td>- Select young, tender peas of a sweet variety. Shell.</td>
<td>Steam-blanch 4 to 5 minutes. - Dip in boiling water 3 to 4 minutes.</td>
<td>- Spread thinly on trays. - Drying time averages 6 to 10 hours in controlled heat.</td>
<td>- Dry until hard and shriveled. Peas should shatter when hit with a hammer. - Tough, leathery.</td>
</tr>
<tr>
<td>Peppers</td>
<td>- Remove seeds, stem, and core; slice or dice.</td>
<td>- None</td>
<td>Arrange in a thin layer on trays.</td>
<td></td>
</tr>
<tr>
<td>Peppers, green chili</td>
<td>- To loosen skin, rotate pepper over flame or scald in boiling water. Peel, split pods, and remove seeds and stem.</td>
<td>Choose one: No treatment necessary. - Steam-blanch 10 minutes.</td>
<td>- Spread in a thin layer on trays.</td>
<td>Dry until crisp and brittle.</td>
</tr>
<tr>
<td>Peppers</td>
<td>- Select mature pods. Wipe clean with damp cloth.</td>
<td>No treatment necessary.</td>
<td>- Drying time in controlled heat, 6 to 10 hours at 150 °F.; for room temperature drying. String whole pods together with needle and cord or hang bunches root side up, in airy place. May take several weeks to dry.</td>
<td>- Dry until pods are shrunked, dark red, flexible.</td>
</tr>
<tr>
<td>Tomatoes, for stewing.</td>
<td>- Steam or dip in boiling water to loosen skin and chill. Peel. Cut large tomatoes into 3/4&quot; sections or slice. Cut small tomatoes in half.</td>
<td>Steam-blanch 3 minutes.</td>
<td>- Spread in single layer on trays. - Drying time averages 4 to 8 hours in controlled heat.</td>
<td>Tough to crisp.</td>
</tr>
</tbody>
</table>
A RAINBOW OF SERVING IDEAS
Soak your dried vegetables about 20 minutes in 6 to 8 times as much water as the dried vegetable. It is better to add water during the cooking process than to start out with more than needed. Bring to a boil and simmer in the same water and cook gently until just tender. The cooking time will vary with the food and may take from 10 to 30 minutes.

Vegetables may be seasoned with salt, garlic, onion, or fat. Use them in soups, stews, and baked dishes. Some vegetables may have a different flavor; others will taste very much like they do cooked fresh. This is especially true if the vegetable is served with a sauce or combined with other ingredients in a stew or casserole.

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**QUIZ TIME**

1. Which is true about blanching?
   A. Vegetables are completely cooked
   B. Sets color
   C. Hastens drying
2. Explain how and why you condition dried vegetables before storage.

3. Where would you store your dried vegetables?
   A. In the refrigerator
   B. In the cupboard
   C. In the oven
   D. In a warm, dark, moist place
   E. In a cool, dark, dry place

**Evaluation**
Evaluate your dried vegetables using the score card on page 34 of Unit I for dried fruits and/or vegetables.
Some think jerky came to us from the Indians, others think that it came to us long before that. It is believed that primitive man built fires to keep insects away from the drying meat. By doing this it was discovered that the meat and fish exposed to smoke kept longer, and had an enjoyable flavor. Later they found that salting also helped the flavor and storage life.

Today we know there are chemicals in smoke that slow bacterial growth. Also we know that certain salts contained chemical compounds that are used today to preserve and give flavor to meats. These are known as the nitrates.

**YOU'RE THE CONSUMER:**

**Choosing meat for drying**

Some meats are better than others for drying. Those meats that are lean (have little fat) will have better quality after drying. These cuts of meat also tend to be less expensive, such as GOOD or UTILITY grades rather than CHOICE.

**Beef** — Beef yields a good quality jerky and the meat is readily available. The round and flank cuts work well.

**Pork** — Never use fresh pork for jerky since the drying temperature is not high enough to kill the harmful bacteria that can be found on this meat. Ham can be made into jerky, but only fully-cooked ham. It should be used within one or two weeks.

**Poultry** — Poultry is best when cooked first, then dried in small pieces to be used for soups and stew (a dried, cooked meat).

**Lamb** — Lamb has a higher fat content than other meats and may make a less desirable jerky.

**Game Meats** — The loin, round and flank cuts are best to use for game animals. Elk meat has a higher fat content, but deer and antelope and other game meats all make good jerky. (Freeze game meats for at least 60 days at 0°F [-18°C] before drying as a precaution against disease.)
Words To Know

CURING — Seasoning, salting, smoking, drying or any combination of these.

JERKY — Raw meat or fish that has been salted, sometimes smoked, before drying.

DRIED COOKED MEAT — Meat is cooked, cut into small pieces then dried. The meat is reconstituted by adding water and is usually used for soups and stews.

SMOKED FISH — Salted, smoked and partially dried fish. It has a high moisture content and must be refrigerated.

BRINE CURING — Salt, seasoning, and water mixture to soak meat in before drying.

DRY CURING — Salt and seasonings applied directly to meat without water.

KNOW-HOW: to store jerky

When the meat is dry, let it cool. Store the jerky in plastic bags or close-fitting jars if the air humidity is below 30 percent. If the storage area has a high humidity (more than 30 percent), store the jerky in an air-tight container. The meat will stay fresh for one to two months at room temperature. The storage life will be longer if refrigerated, and can be kept up to a year in the freezer.

I Don't Get It

What does the air humidity have to do with spoiling my jerky?

ANSWER:

If your storage area has a high humidity (a high amount of moisture in the air), that moisture could be allowed around your dried meat. If this happens, mold could grow on your jerky and all your work was for nothing! If your area of the country has a lower humidity rating you wouldn’t need an air-tight container, and it would be best not to use an air-tight container since the meat could “sweat” inside an air-tight container and cause spoilage.

KITCHEN SAFETY

The meat needs to be cut into thin slices. If you are not comfortable using a large knife have someone older help you. When washing the knife, be very careful you don’t cut yourself. If you buy the meat at a locker or meat counter, have them cut it into slices the width you need. This will give you more even slices than trying it at home.

FOOD SAFETY

When preparing your meat to be dried, always use clean utensils and counter space. Always have clean hands when working with meat; your hands touch many things during the day that can contaminate the meat. Never use the meat if it does not smell fresh; use only fresh meat. Never eat any of the beef jerky if it does not smell fresh. If you see mold growth, throw it out.
MARINATED OVEN-DRIED JERKY

1 1/2 to 2 pounds boneless meat partially frozen
1/4 cup soy sauce
1 tablespoon Worcestershire sauce
1/4 teaspoon pepper
1/4 teaspoon garlic powder
1/2 teaspoon onion powder
1 tablespoon brown sugar
1 teaspoon hickory smoke flavored salt (optional)

- trim and discard all fat from meat
- cut into 1/8- to 1/4-inch thick slices (the slicing is easier if the meat is partially frozen)
- combine soy sauce, Worcestershire sauce, pepper, garlic and onion powder, brown sugar and smoke flavored salt (optional). Mix well.
- add meat strips to the mixture, coat all sides, let stand one hour or cover and refrigerate overnight.
- drain meat strips.
- arrange close together but not overlapping on oven racks or on cake racks set in shallow baking pans or cookie sheets.
- dry meat at lowest oven temperature, 150 °F, with oven door slightly open to allow for air circulation. It will take up to seven hours for beef or venison. Pat off any beads of fat. (If you have an electric food dehydrator available, use the directions that come with it.)
- Dryness Test: cool one piece, then bend it; it should crack but not break. There should be no moist spots.
- Cool, store in appropriate container, and label.

A RAINBOW OF SERVING IDEAS

Beef jerky is perfect for hiking, biking, camping or any outdoor activity where you need something lightweight. At home you can serve a variety of jerky and cheeses on a platter as an appetizer for your friends.

Also, consider some of the serving ideas that come with fruit leather specialties in the last unit, page 33.

--- QUIZ TIME ---

1. What is the difference between a jerky and a dried cooked meat?_______

2. Humidity is:
   A. A machine that produces steam
   B. Small baking dish
   C. Moisture in the air
   D. A lean meat
   E. The use of water to soak meat in

3. List 5 ways you would use your jerky.
   A. 
   B. 
   C. 
   D. 
   E. 

ANSWERS: 1-Refer to page 36; 2-C; 3-Use your imagination!

EVALUATION

Evaluate your beef jerky by using the score card found on page 35 of Unit 1 for Dried Fruit Leather and Meat Jerky.

Once again you’re prepared to what lies ahead with “Food For The Future.” In Food For The Future, Unit III, you will learn:
- all about canning vegetables and meats using the pressure canner,
- and how to make jams, jellies and preserves

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Name ____________________________________________
County ____________________________________________

SCORE CARD

Canned Goods
Appearance
Uniform
Natural color
Clear liquid
No indication of spoilage

Pack
Full
Not crowded
Proper headspace
Air bubbles removed

Container
Clean
Standard jar
Appropriate closure
Properly labeled

Canned by
recommended method

Ribbon Awarded:
Purple   Blue   Red   White   No Award

Good

Needs
Improvement

Comments

__________________________________________
__________________________________________