With some families, the annual ritual of "putting up" canned fruits, meats and vegetables is a tradition. Prize recipes are passed along from mother to daughter. Men and children join in on the project too. For generations now, canning season has been a time for relatives to congregate and a time to be thankful for a plentiful harvest.

In earlier days, canning was a near necessity. In some areas, it was virtually the only economical method for preserving a wide variety of wholesome foods for barren winter months. With all the recent developments in food distribution and technology, canning is not nearly so necessary as it once was. Yet home canning has grown tremendously in popularity in recent seasons. Why? Possibly because many are rediscovering that there is something basically satisfying and rewarding in preserving good food so it can be enjoyed at a later time when it is needed more.

More than 150 years ago, an obscure French confectioner, Nicholas Appert, discovered that food heated and sealed in glass bottles kept safely for months, or even years. Monsieur Appert did not know that his process destroyed molds, yeasts, bacteria and enzymes—he only knew that it worked. And the publication of his principles in 1810 earned M. Appert 12,000 francs, a prize from Napoleon Bonaparte, who was seeking a means of providing wholesome food for his undernourished troops.

Since then, of course, canning has been thoroughly and scientifically researched. Today, home canning is as safe and as easy as cooking a meal for immediate use, providing a few simple rules are followed. And, since its inception, the Blue Book has brought the latest technology and the best new recipes to its readers.

This is the 30th edition of the Blue Book, encompassing more than 70 years of canning knowledge and research. This edition also contains a section on preserving foods by freezing. Freezing has been used in some climates for the preservation of food since ancient times. But it wasn't until recently that the development of convenient home equipment and containers made freezing practical on a wide scale. As with canning, great attention to detail has gone into the freezing section of the Blue Book.

When former Ball Corporation president George A. Ball first began in 1905 to put together the forerunner of the Blue Book, he gathered favorite recipes from family and friends, including many from the files of his wife, Frances Woodworth Ball. Their daughter Elisabeth remembered years later that it took "quite a little doing here in our kitchen to try out the recipes and the methods to know they were all right!"

When new recipes were added to the Blue Book in later editions, Mr. Ball insisted they be turned over to a professional cook for thorough testing. Many years ago, Ball Corporation began extensive laboratory research into the preservation of food. That research has been expanded greatly and continues today. Currently, a major ongoing research project concerning heat penetration is being conducted by a leading university. George Ball's basic policy for the Blue Book has been maintained ever since the first edition.

Whether home canned and frozen foods make up a major part of your family's diet, or whether you just want to "put up" a few jars of old favorites, the revised 30th edition is designed to answer all your questions and to help you every step of the way. Like the first edition, the 30th took "quite a little doing" too. We hope and trust you'll find it interesting and informative.
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LEARNING ABOUT CANNING

Canning is a simple method for capturing food’s delicious and wholesome qualities at nature’s very best, and preserving the food for enjoyment at a later time. Besides being economical, canning is enjoyable in itself. More than one rural canner has known a moment of pride when her homemade mincemeat won a blue ribbon at the county fair. And recently, more and more urban homemakers have been discovering that canning is both a rewarding hobby and a boon to the budget.

For all canners, some understanding of what canning is and why it works will be most helpful. Canning is a perfectly safe method of preserving food and the basics of canning are easy to learn. But unless these basics are followed, canned goods are sure to be unsuccessful and can be quite harmful to eat.

This is because in the air and all around us are invisible microorganisms, such as molds, yeasts, bacteria and enzymes. Many of these microorganisms are beneficial to us, while others can be harmful under certain conditions. All fruits, meats and vegetables in their natural state contain these microorganisms to some degree. They are what cause food to spoil. It is nature’s way that food left unprotected will begin to change color and flavor, and eventually to spoil and decompose.

Canning interrupts this natural process through heating the food in containers that seal. The heat destroys the potentially harmful microorganisms and, at the same time, air is driven from the container and a partial vacuum is formed, preventing other microorganisms from entering and recontaminating the food.

TWO KINDS OF FOOD

For the purpose of canning, all foods are divided into two classifications (See Figure 1):  
1. Acid  
2. Low Acid

Acids—Acid foods are those which contain natural acid. Each food is different, and different varieties of the same food may vary in acidity. Generally, all fruits are acids. Tomatoes, which many of us think of as a vegetable, are technically a fruit and are treated as acids in canning. Sauerkraut and rhubarb and foods to which vinegar is added, such as certain pickles and relishes, are also treated as acids.

Low Acids—Low acids are foods which contain very little natural acidity. Generally, all vegetables are low acid. Meats, poultry, seafoods, mushrooms and soups are also in the low acid group. Mixed canned foods, which might contain part low acids (such as corn) and part acids (such as tomatoes) should be treated as low acids. Figure 1 lists common foods and gives their relative acidity.

The importance of acidity to the home canner is that molds and yeasts, which exist in acids, are easily destroyed by heating filled canned jars in briskly boiling water for a period of time. Acid in food protects against bacteria. The harmful elements of certain bacteria, however, thrive in low acids and cannot readily be destroyed at 212° F [100° C]. Low acids therefore must be superheated to 240° F [116° C].

The heating of the food within the canning containers is called processing. Unless canned food is thoroughly processed for the proper time and at the proper temperature, it is likely to spoil, because all the microorganisms may not be destroyed. In addition, a proper seal may not be achieved, allowing microorganisms to enter. If food is processed for too long a time, however, it will be overcooked and lose its fresh-from-the-farm tastiness.
THE SPOILERS

Molds and Yeasts—Molds are fungi that grow as silken threads that appear as fuzz on food. Molds can produce mycotoxins that are harmful to eat. Molds thrive on the acids that are a protection against more dangerous bacteria. Yeasts, which are also fungi, cause food to ferment and make it unfit to eat. Fortunately, molds and yeasts are easily destroyed at temperatures between 140° and 190° F [60° and 88° C].

Bacteria—Bacteria are not so easily destroyed, however. Certain bacteria actually thrive at temperatures that destroy molds, yeasts and enzymes. (See Figure 2.) Some bacteria thrive on foods with low acidity. Salmonella are destroyed when held at 140° F [60° C]. And Staphylococcus aureus, or “staph” bacteria, are checked if food is kept above 140° F. But staph produces a toxin that can be destroyed only by long hours of boiling, or by superheating to 240° F [116° C] for a relatively short time.

Botulism is food poisoning caused by the bacterium Clostridium botulinum. These bacteria are also readily destroyed by boiling, but they produce a spore that throws off a strong toxin and the spores cannot readily be destroyed at 212° F [100° C]. Furthermore, the botulism-causing bacteria thrive on low acids, in the absence of air and in moist environments—exactly the conditions inside a jar of canned meat or vegetables.

Because of bacteria, low acid foods must be brought to 240° F [116° C], which is hotter than the boiling point of water. This can easily be done with special canning equipment.

While the effects of “the spoilers” can be serious, the home canner should not be unduly worried about them. It is helpful to understand what they are and how they affect acid and low acid foods. Providing the directions and precautions outlined in this book are followed, food can be safely canned or frozen with little concern for spoilage.

### FIGURE 1

**APPROXIMATE GROWTH LIMIT FOR:**

1. STRONG ACID
   - PLUMS
   - GOOSEBERRIES
   - PRUNES
   - APRICOTS
   - APPLES, BLACKBERRIES
   - SOUR CHERRIES
   - PEACHES
   - KRAUT
   - SWEET CHERRIES
   - Pears
   - TOMATOES
   - PROCESS AT 212°F (100°C) IN BOILING WATER BATH
   - PROCESS AT 240°F (116°C) IN STEAM PRESSURE CANNER

2. NEUTRAL
   - OKRA
   - CARROTS
   - TURNIPS
   - BEETS, STRING BEANS
   - SPINACH
   - ASPARAGUS
   - LIMA BEANS
   - PEAS
   - CORN
   - LYE HOMINY

3. STRONG ALKALI

### FIGURE 2

**GROWTH AND DESTRUCTION OF MICROORGANISMS**

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**Legend:**
- Bacteria spores destroyed by short heating periods
- Bacteria spores not destroyed except by long heating
- Certain bacteria, known as thermophiles, grow in this range
- Growth of most microorganisms ceases
- Active growing range of molds, yeasts and bacteria
- Growing cells of bacteria killed; also molds and yeasts
- Growth ceases
TWO METHODS OF CANNING

Boiling water bath method—
High acid foods can be processed in a boiling water bath canner, which is any kettle large enough for the canning jars to be completely immersed and fully surrounded in boiling water. Boiling water bath canners are commercially available. (See Figure 3.)

Generally, they have a tight-fitting cover and a metal basket to hold the jars off the bottom of the kettle and to separate the jars from each other. The jars must be held off the bottom so the heat can penetrate properly. The jars are divided so they will not bump into each other or tip over in the boiling water. The jars should be covered by one to two inches [25 to 51 mm] of water when it is briskly boiling, so the heat thoroughly penetrates the food at the top of the jar. An additional one to two inches of air space should be allowed between the top of the boiling water and the top of the kettle.

The boiling water bath method is recommended for canning fruits, tomatoes, foods with vinegar added and other acid foods. Butters, conserves, marmalades, jams and preserves are also processed at boiling temperatures (212°F—100°C) for 10 to 20 minutes in a boiling water bath canner.

Steam pressure method—Low acid foods must be processed in a steam pressure canner, which is a heavy kettle with a lid which can be clamped or locked down to make a steam-tight seal. (See Figure 4.) The lid is fitted with a safety valve, a petcock (vent) and a pressure gauge.

Dial Gauge

Weighted Gauge

If your dial gauge reads five pounds per square inch (psi) or more too high or too low, you need a new gauge. If it is less than five pounds [35 kPa] in error, you can adjust for the variation. (See Figure 6.)

Pressure canning is usually done at 10 pounds [70 kPa] pressure, adjusted for altitude. If your gauge reads too high, add one pound [7 kPa] of pressure for each pound that it reads too high: i.e., if one pound too high, process at 11 pounds [77 kPa] pressure; two pounds too high, process at 12 pounds [84 kPa], etc. Conversely, if the gauge reads too low, subtract one pound of pressure for each pound it reads too low, i.e., if one pound too low, process at nine pounds [63 kPa]; two pounds too low, process at eight pounds [56 kPa] etc.

The petcock on your pressure canner allows steam to escape under a controlled pressure. Because the steam inside the kettle is pressurized, its temperature exceeds the boiling point of water, 212°F [100°C]. At 10 pounds [70 kPa] pressure the temperature will reach 240°F [116°C], which is hot enough to kill bacteria. If the petcock should inadvertently become plugged, the safety valve is designed to pop, releasing pressure and preventing the kettle from exploding.

Because of the twin dangers of under-processed food and steam under high pressure, it is imperative that all parts of the pressure canner be kept clean and in good working order. A string should be drawn through the petcock and safety valve openings before the canner is used to make sure they are free of obstruction. Providing the canner is clean and working well and foods are processed for the prescribed times and temperatures, pressure canning is a perfectly safe and efficient method for canning low-acid foods. If, for any reason, the pressure should drop during processing, the processing time must be recounted.

The manufacturer's directions should be followed for your own pressure canner. Generally, pressure canners have one or more racks for holding jars, and two to three inches [51 to 76 mm] of water are boiled in the canner to produce the steam.

Pressure saucepans or pressure cookers, as they are sometimes called, work similarly to pressure canners, except they usually are smaller. The smaller pressure saucepans or cookers can be used in place of a pressure canner for pint [473 mL] and half-pint [237 mL] size jars. The smaller pressure cookers, however, heat and cool more quickly than pressure canners. For this reason, when using a pressure cooker in place of a pressure canner, 20 minutes at 10 pounds [70 kPa] pressure should be added to the regular processing time given in recipes for the pressure canner.

FIGURE 6

ADJUSTING INACCURATE DIAL GAUGES

Make these adjustments for inaccurate dial gauges only when recipe calls for processing at 10 pounds [70 kPa] adjusted for altitude. If gauge is inaccurate by more than five pounds [35 kPa], replace the gauge.

<table>
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<table>
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<tr>
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<td>3</td>
<td>21</td>
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<td>4</td>
<td>28</td>
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OTHER EQUIPMENT YOU'LL NEED

With the exception of the boiling water bath and steam pressure canners, most kitchens will already have much of the equipment needed for canning. Some recipes call for specialized utensils, so the recipe should be checked in advance of canning day.

The boiling water bath and steam pressure canners are essential to canning. Any container that is large enough can be substituted for the boiling water bath canner when processing acid foods, but some means of keeping the jars separated from each other and off the bottom of the container are necessary. A pressure cooker can be substituted for the steam pressure canner for processing small jars. Adjustments in processing time must be made, however.

A good selection of long handled spoons and ladles is useful. Measuring cups and measuring spoons are necessary, since ingredients should be carefully measured. A kitchen scale helps for many dry measures.

Sharp knives of various sizes speed the work. Kitchen scissors and a vegetable peeler are sometimes needed. A food brush to help in removing all dirt is helpful for cleaning fruits and vegetables.

A colander large enough to hold two quarts or more is a useful item. It should have legs, to facilitate drainage. A one-quart sieve with brackets and a handle for holding over the edges of pans is often needed.

Certain recipes call for food choppers or grinders or a food mill. Sometimes the simple kitchen grater can be used in place of these items. And sometimes the electric blender will work well. A fruit press is sometimes a help when canning juices and jellies.

Saucepans and large kettles usually are necessary, depending upon the recipe. A dishpan or sink for washing and rinsing should be available. And, of course, jars and closures to fit the purpose are required.

In the case of pickling, ceramic, stone or glass jars or crocks are used, and sometimes wooden kegs and barrels. Implements made of copper, brass, iron and galvanized zinc should not be used for pickling. These metals may react with acids and salts in the food, causing disagreeable color changes or, possibly, creating poisonous substances.

Jar lifters are especially made for home canners and are so helpful that they're a near-necessity. So are potholders, dishcloths and towels. A wooden or plastic spoon or a specially made plastic bubble-freeer should be on hand when jars are being packed. Metal implements should be avoided, since they may damage the glass. Special funnels with wide mouths, large enough to hold a cup at a time, are made to fit inside the rims of common sized jars. Meats, poultry and seafoods require a pencil-shaped cooking thermometer. A candy thermometer is useful for checking the jellying point in jelly and soft spreads.

Some recipes require cheesecloth or a muslin bag for suspending spices, for straining and for blanching. Gummed labels and a logbook are useful, but not necessary, for record-keeping.

Some method of timing accurately is essential. If a special cooking timer is used, it should be capable of being set for the time called for in the recipe. Alarm clocks can be used, although they are usually difficult to set accurately for periods of less than an hour. Many modern ranges have a built-in timer, but these should be checked for accuracy before starting to can. Darkroom timers can be used to good advantage, since they are usually accurate down to the second.

All equipment should be assembled and checked for cleanliness and working order before starting to can. Read through the recipe ahead of time and decide in advance the equipment that will be needed. This way you'll avoid searching for a needed item during the critical time when the food is being prepared and processed.

CHOOSING THE RIGHT CONTAINERS AND CLOSURES

Home canning may never have achieved the popularity it enjoys today had it not been for a tinsmith named John Landis Mason. On November 30, 1858, nearly a half-century after Nicholas Appert discovered the principles of canning and shortly after Louis Pasteur discovered that microorganisms cause spoilage, Mason patented a glass canning jar with a threaded opening that could be sealed with a metal cap and a rubber ring for a gasket.

Until then, glass bottles and earthenware jugs sealed with cork stoppers and wax, or tin containers sealed with solder, were used. Mason's invention greatly simplified home canning, and made it easy, economical and popular.

While the term "Mason" was once a trade name, the patent on the original jar has long since expired, and "mason" jar is now a generic term. But the basic idea developed by John Mason is still used today in several variations.

CLOSURES

Wire Bails with Glass Lids—These old style closures and the jars they fit, except reproductions for nostalgia purposes, have not been manufactured for more than a decade. (See Figure 7) But many of them are still around and home canners still use them. Some of the old jars, in fact, have become collectors' items.

Rather than threads, these jars have a glass ledge on which a rubber ring rests. A domed glass lid sets over the rim of the jar and on the rubber ring. (The rubber rings are still available at local markets.) The lid is held in place by a wire clamp with two loops.

To use these jars, wet the rubber ring and place it over the neck so it rests on the glass ledge of the jar. The rubber rings should be stretched only enough to fit over the jar. They are not reusable. Put the glass lid on. Pull up the longest of the two wire bails so it rests in the groove in the glass lid. Leave the small bail up while the food is being processed. If liquid boils out of the jar during processing, do not open the jar to add more liquid because food spoilage may occur. Seal the jar just as it is. To seal, pull the small bail down to clamp the lid on tight as soon as the jar is removed from the canner.

One problem with these older style jars is that it is difficult to tell whether they have sealed properly. After the jars have cooled 12-24 hours, tip the jars to see whether leakage occurs. If the jars leak, check the food to determine if it is fit for consumption. If the food is safe for consumption, the food should be reprocessed or consumed immediately.

Figure 7

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**A GUIDE TO CANNING EQUIPMENT**

**Spoons**—a necessity for stirring, spooning, packing, and lifting. Use wooden spoons for stirring and packing; slotted spoons for lifting. Accurate measuring spoons are essential.

**Knives**—a variety of knives is necessary, including a good paring knife, a sharp chopping knife (butcher or French) and a vegetable peeler.

**Food Brushes**—food to be canned must be carefully washed. Food brushes with stiff bristles facilitate this work.

**Saucepans**—occasionally needed to heat lids.

**Measuring Cups**—both dry (metal) and liquid (glass) measuring cups should be on hand. Measurement capability should range from ¼ cup [60 mL] to 2 cups [480 mL].

**Jelly Bags**—made from a thin fabric (usually cheesecloth) to help strain juice from softened fruit and pulp.

**Colander or strainer**—helps hold fruit or vegetables after washing. Excellent for draining.

**Jelmeter**—a graduated glass tube with an opening at each end, used in jelly-making. The rate of flow of juice through the tube is used to measure the jellying power of the juice and as an index to the amount of sugar it contains.

**Scales**—essential for following recipes where ingredients are given by weight. Scale with capacity up to 25 pounds [11 kg] is desirable.

**Timer**—necessary for measuring processing times accurately by the minute.

**Pressure Canner**—available in various sizes. Size should be related to needs of the family. Pressure canners may be obtained with either weighted or dial gauges.

**Boiling Water Bath Canner**—for processing acid foods. Height of kettle is important. Jars, when seated on rack, must be covered by 1-2 inches of water [25-51 mm], with an additional 1-2 inches of air space above to permit boiling.

**Crock**—a needed item when fermenting food, as in pickling. Crock should be clean and free of cracks. Glaze should not be chipped.

**Jar Funnel**—commercially available funnels are made especially for canning. Funnel helps avoid getting particles of food on sealing surfaces of jar and aids in determining proper head space.

**Jar Lifter**—may be purchased where canning supplies are sold. Soft plastic coating prevents jars from slipping and wooden handles protect the hand from heat.

**Bubble Freer**—a commercially available plastic bubble freer, or a similar non-metallic utensil, is required to run down sides of filled jars to release air bubbles without damaging interior of jar.

**Jar**—standard home canning jars should be used. The size of the jar should be based on the needs of the family.

**Lids**—standard lids from a reliable manufacturer of home canning supplies should be used. The manufacturer's directions should be followed carefully.
Zinc Caps with Porcelain Liners
- This older style closure is made for use on jars with threads. (See Figure 8.) The inside of the cap has a porcelain liner to prevent contact of the food with the zinc. Therefore, if the porcelain is damaged, the cap should be discarded.

To use these caps, gently stretch a wet rubber ring over the neck of the jar so it rests on the glass ledge of the jar. Screw the cap on firmly, then unscrew it about \( \frac{1}{4} \) inch \( [6 \text{ mm}] \). This will allow air in the jar to vent properly. If liquid boils out of jar during processing, do not open to add more liquid because spoilage may occur. Seal the jar just as it is. As soon as the jar is removed from the canner, slowly retighten the lid, using potholders, to complete the seal. After the jar has cooled, tilt it to see if it leaks. If so, it is not sealed. The lids and jars are reusable, but the rubber rings must be discarded after one use.

Modern Two-piece Vacuum Caps and Lids - By far the most popular closure system today is the two-piece vacuum lid and cap. (See Figure 9.) The set consists of a flat metal lid with a flanged edge, the underside of which has a rubber-like sealing compound, and a threaded metal screw band which fits over the rim of the jar to hold the lid in place. The lids now come in bright decorator colors, which are especially nice when canned food is intended for gifts.

The manufacturer’s directions should be followed to use this closure. Generally the lid will be placed over the mouth of the jar so that the sealing compound rests on the rim. Screw the band down firmly.

INSTRUCTIONS FOR USING IDEAL JARS WITH WIRE BAILS AND GLASS LIDS
1. Visually examine sealing surfaces of jar and glass lid for nicks, cracks and sharp edges. Examine wire bail to make sure it works properly. Discard any defective jars or lids.

2. Wash jars, lids and rubbers in warm, soapy water and rinse in hot water. Let stand in hot water until needed.

3. Pack food into jar, leaving head space recommended in recipe. Eliminate air bubbles with non-metallic kitchen utensil. Wipe away any food residue from sealing surface of jar with clean damp cloth.

4. Fit wet rubber on shoulder of jar, stretching only enough to fit over mouth of jar.

5. Place glass lid over mouth of jar so that it rests on rubber.

6. Place long wire bail so it lies in center of groove on top of lid. Leave short wire bail in up position during processing. Process jars of food as recommended in recipe. When jar is removed from canner, push lower wire bail down against side of jar to complete seal.

7. When jars are fully cooled, tip jars to check for leaks. Store properly sealed jars in cool, dark, dry place.

INSTRUCTIONS FOR USING PORCELAIN-LINED ZINC CAPS AND RUBBERS

Steps 1 and 2 are same as above.

3. Pack food into jar, leaving head space recommended in recipe. Eliminate air bubbles with a non-metallic kitchen utensil. Wipe away any food residue from top edge, threads and shoulder of jar with a clean damp cloth.

4. Fit wet rubber on shoulder of jar, stretching only enough to fit over mouth of jar.

5. Screw zinc cap tightly onto jar. Then loosen approximately \( \frac{1}{4} \) inch \( [6 \text{ mm}] \).

6. Process jars of food as recommended in recipe. After processing, remove jars from canner and screw caps tight to complete seal. When jars are fully cooled, tip jars to check seal for leaks. Store properly sealed jars in cool, dark, dry place.

7. To open, pull rubber from beneath cap with pliers or fingers, or run point of knife between rubber and shoulder of jar. If still unable to open, stand jar, top down, in hot water for five minutes. Discard rubber; it is not reusable.
so that it is hand tight. Do not use a jar wrench or other device to tighten the screw band.

During processing, there is enough "give" in the lid to allow air to exhaust from the jar. The screw band should not be tightened or loosened after processing. As the jar cools, a vacuum inside the jar will pull the lid down in the center so that it is slightly concave. A slight pinging sound may be heard as the seal is formed. After 12-24 hours the jars will be thoroughly cooled and the screw bands can be removed, since the lid will be held in place by the vacuum. The lid must be discarded after one use, but the screw bands are reusable. A good place to store the bands is in plastic bags that are tightly sealed.

CONTAINERS

Glass Canning Jars—Glass canning jars, sometimes called mason jars, are the most popular containers for home canning and freezing. They come in a wide variety of sizes and styles. (See Figure 10.) The jars are carefully made so the home canning closures will seal well. The glass in the jars is tempered to withstand the heat of the steam pressure canner or the sub-zero temperatures of the food freezer.

Figure 10
Wide mouth jars are made to facilitate packing large pieces of food and to make them easier to clean. Some jars have measurement levels marked on them. Some of the fancier home canning jars add a nice touch to fruits, vegetables and jellies. Can or freeze jars can be used for either preservation method, and are tapered so that partially frozen food can easily be removed.

Jars are available in sizes from a half-pint [237 mL] to a half-gallon [1,893 mL]. Most canners like to choose a size that fits in well with their meal planning. Remember, however, that processing times differ according to the size of the container. See Figure 11 for estimating the number of jars that will be needed.

Tin Cans—Tin containers, of course, are still used for canning fruits, meats and vegetables, but almost entirely on a commercial basis. Home canning in tin cans (actually steel with tin coating) is still being done in some areas, but supplies are difficult to find, types of cans must be matched to the food being processed, and an expensive device for sealing the cans is needed. Tin cans do not display the food as glass jars do and are not reusable. Tin cans for home canning do not come in the quart [946 mL], 1½ pint [710 mL], pint [473 mL] and ½ pint [237 mL] sizes that are common for glass jars. For this reason, the processing times given in almost all recipes do not apply to tin cans. The processing times given in this book are for glass jars only.

CONTAINERS TO AVOID

"One-trip" jars, like the ones in which you buy commercially canned mayonnaise, peanut butter, instant coffee or baby food, should not be used for home canning. The commercial jars are made of thin glass for use on high speed packing machines. Often the glass is not highly tempered, and will not with-
stand the extremes of temperatures in home canning and freezing. The jars may have been subjected to abuse during packing and while being transported and therefore might have nearly invisible nicks and scratches. These slight imperfections can cause the jars to break, especially in the steam pressure canner.

Some of the commercial jars have mouths and threads that appear to be the same as canning jars. In fact, canning lids and caps sometimes do seem to fit the threads of the commercial jars. However, the commercial jar mouth may vary in width and the rim may have nearly invisible dips. This can prevent the jars from sealing properly.

The commercial jars often do not come in exact pint (473 mL) and quart (946 mL) sizes, but are in odd ounce measures. If the jars are not exactly the size specified in the recipe, it can cause the jars to break, especially if used for home canning, and the food may become spoiled. Containers and closures made and sold especially for home canning should be used.

### TWO WAYS TO FILL JARS

Food may be placed into jars while it is hot or cold. The "hot pack" method is usually preferred for nearly all vegetables and meats and for most fruits. "Cold pack," or "raw pack" as it's sometimes called, means placing the food in jars without any precooking, and sometimes is the better method. Either method can be used for most foods, and information throughout this book suggests which method is preferable for particular foods.

**Hot Pack**—The hot pack method is generally preferred where the food being canned is relatively firm and handles well. Precooking the food makes it more pliable, permits a tighter pack and requires fewer jars. Generally, the food is first cooked in water, a syrup or in the juice that is extracted. Fruit canned without sweetening is always hot packed.

In the boiling water bath method, food that is hot packed requires less processing time than raw packed, because it is already hot when it goes into the canner. With the steam pressure canner, however, there is no difference in processing time. This is because by the time the pressure reaches 10 pounds [70 kPa] and you begin counting processing time, the raw packed food has become as hot as it would have been if it were packed hot to begin with.

**Cold Pack**—Foods that would be delicate after they are cooked, such as whole tomatoes, are usually easier to handle if they are cold packed. The food is placed into the jars while it is raw. It should be packed firmly but should not be crushed. There usually will be some shrinkage when the food is processed, and some foods may float to the top of the jar. After packing, boiling

---

### FIGURE 11

**JAR ESTIMATING**

The actual number of jars needed in canning depends upon the size and condition of the produce and the manner of preparing and packing it into jars. The standard weight of a bushel, lug or box is not the same in all states.

<table>
<thead>
<tr>
<th>Raw Produce</th>
<th>Measure and Weight</th>
<th>Approximate Number Quart (950 mL) Jars Needed</th>
<th>Approximate Amount Needed for 1 Quart Jar (950 mL)</th>
<th>Lb</th>
<th>Kg</th>
<th>g</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fruits</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apples</td>
<td>1 bu. (48 lb)</td>
<td>22</td>
<td>16-20</td>
<td>2½ to 3</td>
<td>1130-1360</td>
<td></td>
</tr>
<tr>
<td>Applesauce</td>
<td>1 bu. (48 lb)</td>
<td>22</td>
<td>15-18</td>
<td>2½ to 3</td>
<td>1130-1590</td>
<td></td>
</tr>
<tr>
<td>Apricots</td>
<td>1 lug (22 lb)</td>
<td>10</td>
<td>7-11</td>
<td>2 to 2½</td>
<td>907-1130</td>
<td></td>
</tr>
<tr>
<td>Berries</td>
<td>24 quart crate</td>
<td>25</td>
<td>12-18</td>
<td>1½ to 3</td>
<td>680-1360</td>
<td></td>
</tr>
<tr>
<td>Cherries</td>
<td>1 bu. (56 lb)</td>
<td>10</td>
<td>22.32 (unpitted)</td>
<td>2 to 2½</td>
<td>907-1130</td>
<td></td>
</tr>
<tr>
<td>Peaches</td>
<td>1 bu. (48 lb)</td>
<td>22</td>
<td>18-24</td>
<td>2 to 3</td>
<td>907-1130</td>
<td></td>
</tr>
<tr>
<td>Pears</td>
<td>1 bu. (22 lb)</td>
<td>10</td>
<td>8-12</td>
<td>2 to 3</td>
<td>907-1130</td>
<td></td>
</tr>
<tr>
<td>Pears</td>
<td>1 lug (24 lb)</td>
<td>16</td>
<td>14-17</td>
<td>2 to 3</td>
<td>907-1130</td>
<td></td>
</tr>
<tr>
<td>Plums</td>
<td>1 bu. (56 lb)</td>
<td>10</td>
<td>24-30</td>
<td>1½ to 2½</td>
<td>680-1130</td>
<td></td>
</tr>
<tr>
<td>Tomatoes</td>
<td>1 bu. (53 lb)</td>
<td>14</td>
<td>15-20</td>
<td>1½ to 2½</td>
<td>1130-1590</td>
<td></td>
</tr>
<tr>
<td>Tomatoes</td>
<td>1 lug (30 lb)</td>
<td>10</td>
<td>20-25</td>
<td>1½ to 3</td>
<td>1130-1590</td>
<td></td>
</tr>
<tr>
<td>Tomatoes (for juice)</td>
<td>1 bu. (53 lb)</td>
<td>14</td>
<td>12-16</td>
<td>3 to 3</td>
<td>1360-1590</td>
<td></td>
</tr>
<tr>
<td><strong>Vegetables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beans, Lima (in pods)</td>
<td>1 bu. (32 lb)</td>
<td>15</td>
<td>6-10</td>
<td>3 to 5</td>
<td>1360-2270</td>
<td></td>
</tr>
<tr>
<td>Beans, Green or Wax</td>
<td>1 bu. (30 lb)</td>
<td>14</td>
<td>12-20</td>
<td>1½ to 2½</td>
<td>680-1130</td>
<td></td>
</tr>
<tr>
<td>Beets (without tops)</td>
<td>1 bu. (52 lb)</td>
<td>14</td>
<td>16-24</td>
<td>2 to 3½</td>
<td>907-1590</td>
<td></td>
</tr>
<tr>
<td>Carrots (without tops)</td>
<td>1 bu. (50 lb)</td>
<td>23</td>
<td>20-25</td>
<td>2 to 3</td>
<td>907-1130</td>
<td></td>
</tr>
<tr>
<td>Corn, Sweet (in husks)</td>
<td>1 bu. (35 lb)</td>
<td>16</td>
<td>6-10 (whole-kernel)</td>
<td>3 to 6</td>
<td>1360-2720</td>
<td></td>
</tr>
<tr>
<td>Okra</td>
<td>1 bu. (26 lb)</td>
<td>12</td>
<td>16-18</td>
<td>1½ to 6</td>
<td>680</td>
<td></td>
</tr>
<tr>
<td>Peas, Green (in pods)</td>
<td>1 bu. (30 lb)</td>
<td>14</td>
<td>5-10</td>
<td>3 to 6</td>
<td>1360-2720</td>
<td></td>
</tr>
<tr>
<td>Spinach and other greens</td>
<td>1 bu. (18 lb)</td>
<td>8</td>
<td>3-8</td>
<td>2 to 6</td>
<td>907-2720</td>
<td></td>
</tr>
<tr>
<td>Squash, Summer</td>
<td>1 bu. (40 lb)</td>
<td>18</td>
<td>10-20</td>
<td>2 to 4</td>
<td>907-1810</td>
<td></td>
</tr>
<tr>
<td>Sweet Potatoes</td>
<td>1 bu. (50 lb)</td>
<td>23</td>
<td>16-25</td>
<td>2 to 3</td>
<td>907-1360</td>
<td></td>
</tr>
<tr>
<td><strong>Meats—Poultry</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Steer (prime quality)</td>
<td>800 lb</td>
<td>363</td>
<td>175-200</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hog</td>
<td>300 lb</td>
<td>136</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chicken (with bone)</td>
<td>3-4 lb</td>
<td>1-5.2-2.0</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Whether the boiling water bath or the steam pressure canner method is being used, a certain amount of "head space" must be allowed. This is a space in the jar between the inside of the lid and the top of the food or its liquid. (See Figure 12.) Some foods, especially those that are starchy, swell more in the canner than others and therefore require more head space.

If too little head space is allowed, the food may expand and bubble when air is being forced out from the lid during processing. The bubbling food may leave a deposit on the rim of the jar or the seal of the lid and prevent the jar from sealing properly. If too much head space is allowed, the food at the top is likely to discolor. And, if there is too much head space, the jar may not seal properly because there will not be enough processing time to drive all the air out of the jar.

This book specifies the proper head space for each recipe. As a general rule for other recipes, leave a 1-inch [25 mm] head space for fruits and low acid foods; ¾-inch [13 mm] head space for vegetables; and ⅛-inch [3 mm] head space for jellies.

STARTING TO CAN

For some, the canning season starts with the planting of a garden in the spring. They know what their family's likes and dislikes are, so they start planning what and how much to can when they put in their gardens.

---

**FIGURE 13**

GARDEN PLANNING GUIDE

AMOUNT OF FOOD TO BE GROWN AND PRESERVED FOR A FAMILY OF 6 PERSONS

<table>
<thead>
<tr>
<th>Vegetables by Groups</th>
<th>Vitamin Value</th>
<th>Pounds to Raise for Preserving (lbs)</th>
<th>Quarts to Preserve</th>
<th>Yield Per 100 Ft. (30 m) Row (lbs)</th>
<th>Foot Row Needed (ft)</th>
<th>Seed or Plants Per 100 Ft. (30 m) Row (oz)</th>
<th>Days to Maturity</th>
<th>Depth to Plant Seed (in)</th>
<th>Depth to Plant Seed (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>High in Vitamin A &amp; C</td>
<td></td>
<td>40 18 20</td>
<td></td>
<td>50 23</td>
<td>90 27</td>
<td>1 28</td>
<td>40-50</td>
<td>⅛ 13</td>
<td>⅛ 13</td>
</tr>
<tr>
<td>Spinach</td>
<td></td>
<td>40 18 20</td>
<td></td>
<td>45 20</td>
<td>100 30</td>
<td>⅛ 14</td>
<td>30 80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turnip Greens</td>
<td></td>
<td>48 22 24</td>
<td></td>
<td>60 27</td>
<td>85 26</td>
<td>⅛ 60 plants</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broccoli</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High in Vitamin A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carrots</td>
<td></td>
<td>40 18 20</td>
<td></td>
<td>75 34</td>
<td>60 18</td>
<td>⅛ 100 plants</td>
<td>55-75</td>
<td>½ 13</td>
<td>½ 13</td>
</tr>
<tr>
<td>Sweet Potato</td>
<td></td>
<td>48 22 24</td>
<td></td>
<td>80 36</td>
<td>60 18</td>
<td>⅛ 100 plants</td>
<td>120</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Winter Squash</td>
<td></td>
<td>40 18 20</td>
<td></td>
<td>400 181</td>
<td>10 3</td>
<td>⅛ ⅓ or ⅓ or ⅓ or 4-5 seeds per hill</td>
<td>60-110</td>
<td>⅛ 13</td>
<td>⅛ 13</td>
</tr>
<tr>
<td>High in Vitamin C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tomato – Whole Juice</td>
<td></td>
<td>120 54 60</td>
<td></td>
<td>380 172</td>
<td>100 30</td>
<td>50 plants</td>
<td>50 plants</td>
<td>Not staked</td>
<td>Not staked</td>
</tr>
<tr>
<td>Juice</td>
<td></td>
<td>240 109 120</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peppers</td>
<td></td>
<td>44 20 22</td>
<td></td>
<td>60 27</td>
<td>75 23</td>
<td>65 plants</td>
<td>65 plants</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cauliflower</td>
<td></td>
<td>72 33 36</td>
<td></td>
<td>120 54</td>
<td>60 18</td>
<td>60 plants</td>
<td>60 plants</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green Vegetables</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peas</td>
<td></td>
<td>48 22 24</td>
<td></td>
<td>40 in pods 18</td>
<td>300 91</td>
<td>16 454</td>
<td>50-60</td>
<td>⅛ 51</td>
<td>⅛ 51</td>
</tr>
<tr>
<td>Green Beans</td>
<td></td>
<td>120 54 60</td>
<td></td>
<td>60 27</td>
<td>200 61</td>
<td>16 454</td>
<td>40-60</td>
<td>⅛ 13</td>
<td>⅛ 13</td>
</tr>
<tr>
<td>Okra</td>
<td></td>
<td>30 14 15</td>
<td></td>
<td>65 29</td>
<td>55 17</td>
<td>1 28</td>
<td>18</td>
<td>⅛ 25</td>
<td>⅛ 25</td>
</tr>
<tr>
<td>Starchy Vegetables</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sweet Corn</td>
<td></td>
<td>72 33 36</td>
<td></td>
<td>85 ears 39</td>
<td>200 61</td>
<td>4 113</td>
<td>60-90</td>
<td>⅛ 13</td>
<td>⅛ 13</td>
</tr>
<tr>
<td>Lima Beans</td>
<td></td>
<td>48 22 24</td>
<td></td>
<td>25 in pods 11</td>
<td>400 122</td>
<td>12 340</td>
<td>60-75</td>
<td>⅛ 13</td>
<td>⅛ 13</td>
</tr>
<tr>
<td>Vegetables for Variety</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Beets</td>
<td></td>
<td>24 11 12</td>
<td></td>
<td>60 27</td>
<td>40 12</td>
<td>1 28</td>
<td>50-70</td>
<td>⅛-1 13-25</td>
<td>⅛-1 13-25</td>
</tr>
<tr>
<td>Cucumbers</td>
<td></td>
<td>100 45 20</td>
<td></td>
<td></td>
<td></td>
<td>⅛ or ⅜ or ⅜ or 4-5 seeds per hill</td>
<td>14 50-60</td>
<td>⅛ 13</td>
<td>⅛ 13</td>
</tr>
<tr>
<td>Lettuce Leaf</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Onions</td>
<td></td>
<td>100 45 10</td>
<td></td>
<td></td>
<td></td>
<td>32 sets</td>
<td>907</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radish</td>
<td></td>
<td>100 45 10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turnips</td>
<td></td>
<td>24 11 12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pumpkin</td>
<td></td>
<td>24 11 12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
For others, including those who plan to buy fresh produce, plans for canning should be made well in advance. Much of the success of canning depends on timing—being ready with containers, closures and equipment when produce reaches its prime condition. For help in planning, see Figures 13 and 14.

Determine ahead of time the varieties and amounts of canned food your family will want to eat in the months ahead. This way you will not end up with large amounts of one or two fruits and vegetables that your family will soon tire of. Properly canned food will keep indefinitely, but it is better to can just the amounts that will be needed until next canning season rolls around. The longer canned food is stored, the greater the opportunity for deterioration. Properly canned food has a RECOMMENDED shelf life of approximately one year.

And it's more enjoyable to can a few jars a day for a period of days, than to devote a whole day to canning. Usually, fruits and vegetables should be canned when they reach their most perfect stage for table use, and rarely do all ripen on the same day.

Long before the produce is ready, you should decide the sizes and types of jars and closures you are going to need. Jars should be selected on the basis of the type of food being canned and the size of the family. If your family's appetite is small, plan to use the smaller size jars for most canning.

Check over your supply of jars and closures well ahead of time. Make sure you have the size of jars called for in the recipes. Visually check the rim of each jar for nicks, cracks and sharp surfaces. Discard any that are imperfect. Check to make sure screw bands are not bent. Vacuum lids or rubber rings that are old may have deteriorated and should be replaced if they are not in good shape.

Shop for any additional jars and closures that are needed well in advance of canning day. This way you will not be disappointed if you are unable to locate the supplies you need at the time fruits and vegetables are ready to can.

Check your canning equipment to make sure it is clean, in good working order and that nothing is missing. Dial gauges on pressure canners especially should be checked in advance to make sure they are accurate.

Assemble all equipment and supplies in one place so everything is ready to use when you start to can. Nothing can be more disconcerting than looking for a mislaid box of lids or the rack for the boiling water bath canner at the last minute.

Wash jars in hot soapy water and rinse well. Do not use wire brushes, steel wool or washing soda for cleaning jars; they are likely to damage the glass. Leave the jars in hot water until they are ready for use. Old style jars with wire bails and glass lids should be treated similarly. When using rubber rings, place them on the jars while they are still wet, stretching only enough to fit over the shoulder of the jar.

When everything is ready, watch the garden or produce market for fruits and vegetables that are in top condition. All fruits or vegetables to be canned together should be of the same relative size, so the heat will penetrate evenly. Any produce that is not completely ripe should be set aside for additional ripening. Badly blemished produce should not be canned at all because it may produce a product of very low quality or one that will easily spoil. Small blemishes should be carefully trimmed away.

Fruits and vegetables should be washed well and drained before cutting or breaking the skin, or before removing hulls (caps), cores, pits, seeds or skins. If necessary, use several rinses, lifting the produce out of the rinse water so the dirt that is washed off will remain in the water.

Only enough food for one canner load at a time should be prepared. Directions in the recipe should be followed closely. Special care should be taken in filling the jars. Special plastic jar funnels are available to help with packing. Head space should be carefully measured to achieve proper venting and sealing of the jar.

After the food has been packed in the jar, any air bubbles that are present should be removed. This can be done by running a wooden spoon or a plastic paddle around between the food and the jar. Metal knives or other metal devices should not be used, since they may nick the bottoms due to sudden changes of temperature.

Never put a hot jar on a cold surface or in a draft. Never pour boiling water or other liquids into a cool jar.

Closures should also be washed in hot soapy water and rinsed well. The manufacturer's directions should be followed closely in using the various closures. Generally, vacuum lids and screw bands are placed in water and brought to a simmer (180°F—82°C). Then the lids are removed from the heat and should remain in the water until ready for use, to protect them from microorganisms. Zinc caps that have previously been used should be boiled in water for 15 minutes. The zinc caps and rings should be washed in hot soapy water and rinsed well. They also should be kept in water until ready for use. Old style jars with wire bails and glass lids should be treated similarly. When using rubber rings, place them on the jars while they are still wet, stretching only enough to fit over the shoulder of the jar.

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of the jars and cause breakage. A commercially available plastic bubble-frer that does not melt or bend with ordinary kitchen use is ideal for this task.

The tops of the jars, screw threads and the top surface of rubber rings, if they are being used, should be wiped with a clean, damp cloth. Particles of food that remain on the tops of jars could prevent a tight seal.

The manufacturer's directions should be followed carefully in placing closures on jars. The method varies according to the type of closure being used.

Food should be processed immediately after the jars are closed to minimize the possibility of microorganisms entering the food. After processing, the jars should be removed promptly from the canner. Food allowed to remain in a boiling water bath canner for too long a period will be over-processed and will lose some of its nourishment. With a pressure canner, a cooling down period of 10 minutes should be allowed before removing the jars from the canner. If jars are lifted from the canner too soon, a cool draft can cause the glass to break. For safety, a commercially available jar lifter should be used to remove jars from the canner. These tong-like devices often have wooden handles to protect against burns, and soft polyethylene tips to protect the jars. If food has boiled out of the tops of the jars during processing, do not attempt to readjust the lids, since this will probably break the seal. After the jars have cooled, wipe the residue away. If, for any reason, the jar obviously has failed to seal, repack the jar and use a new lid or rubber, reprocessing for the full length of time called for in the recipe. Or the food can be refrigerated and eaten within a brief period of time.

Jars removed from the canner should be placed on cloths or wire racks to cool. They should be kept out of drafts to avoid breakage. The jars should be placed a few inches apart to facilitate cooling. Jars should be allowed to cool for 12-24 hours before storing.

**METHODS TO AVOID**

Only the boiling water bath and the pressure canner methods, with one exception, are recommended for canning. The one exception is jellies. This will be discussed in more detail later. Otherwise, instructions in this book apply only to these two proven methods. Recently, with the back-to-earth movement, some older methods of preserving food are being revived. Some of these were unreliable to begin with and that's why they no longer are recommended. Conversely, with rapid advancements in technology, new gadgetry is being tried for canning. These methods have not been proven and should be avoided by the home canner.

**Open Kettle**—Open kettle canning is not safe except for jellies. In the open kettle method, food is first cooked in an open pan and then put into jars. The lids are quickly clamped on, with the hope that a proper seal will be achieved as the food cools. Jars are filled and capped one at a time.

The open kettle method is obviously not safe for low acids, because it is impossible for the food to reach the 240°F [116°C] necessary for killing bacteria. And since the food may not be hot enough to drive all the air from the jar, some organisms may remain inside. Also, a proper seal may not be obtained. There is also the possibility that organisms will enter the food while it is being transferred from kettle to jar, or that the jar and lid are not thoroughly sterilized.

Jellies can be satisfactorily canned by the open kettle method because they contain a large amount of sugar, which helps preserve them. Also, fruits contain acids, and bacteria do not thrive in acids. Molds and yeasts thrive in acids, but they can be rendered harmless at relatively low temperatures.

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**FIGURE 14**

**CANNER'S PLANNING GUIDE**

This guide is based on the United States Department of Agriculture's *Daily Food Guide*. Only foods that may be canned are listed. It covers a one-year period. Few families serve canned meat at all meals, so we have allowed for four servings of canned meat a week; in addition 10 other servings of meat, poultry, seafood or eggs are needed weekly. Adjust this guide to your family's needs and appetites. Increase amounts if you often have guests for meals and if you give gifts of food.

<table>
<thead>
<tr>
<th>Product</th>
<th>Number Times Served</th>
<th>Approximate Size Serving</th>
<th>Amount Needed One Person</th>
<th>Amount Needed Family of 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citrus Fruit and Tomatoes (Includes Juices)</td>
<td>7 per week - 36 weeks</td>
<td>1 cup 240 mL</td>
<td>63 quarts 59,623</td>
<td>252 quarts 238,493</td>
</tr>
<tr>
<td>Dark Green and Yellow Vegetables</td>
<td>4 per week - 36 weeks</td>
<td>½ cup 120 mL</td>
<td>18 quarts 17,035</td>
<td>72 quarts 68,141</td>
</tr>
<tr>
<td>Spinach and other greens, carrots, sweet potatoes, yellow winter squash</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Fruits and Vegetables</td>
<td>17 per week - 36 weeks</td>
<td>½ cup 120 mL</td>
<td>76 quarts 71,926</td>
<td>304 quarts 287,706</td>
</tr>
<tr>
<td>Apples, apricots, peaches, pears, asparagus, green beans, Lima beans, corn, green peas, summer squash, etc.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meats, Poultry, Seafoods</td>
<td>4 per week - 36 weeks</td>
<td>½ cup (2-3 oz.) 120 mL (57-85 g)</td>
<td>18 quarts or 36 pints 17,035</td>
<td>72 quarts or 144 pints 68,141</td>
</tr>
<tr>
<td>Soups</td>
<td>2 per week - 36 weeks</td>
<td>1 cup 240 mL</td>
<td>18 quarts 17,035</td>
<td>72 quarts 68,141</td>
</tr>
<tr>
<td>Jams, Jellies, Preserves</td>
<td>6 per week - 52 weeks</td>
<td>2 tablespoons 30 mL</td>
<td>40 half-pints 9,464</td>
<td>160 half-pints 37,856</td>
</tr>
<tr>
<td>Relishes</td>
<td>3 per week - 52 weeks</td>
<td>1 tablespoon 15 mL</td>
<td>5 pints 2,366</td>
<td>20 pints 9,464</td>
</tr>
<tr>
<td>Pickles, Vegetable</td>
<td>2 per week - 52 weeks</td>
<td>13 pints 6,152</td>
<td>52 pints 24,606</td>
<td></td>
</tr>
<tr>
<td>Pickles, Fruit</td>
<td>2 per week - 52 weeks</td>
<td>13 quarts 12,303</td>
<td>52 quarts 49,203</td>
<td></td>
</tr>
</tbody>
</table>
Aspirin—Do not use aspirin as a substitute for processing. While aspirin contains a weak germicidal agent that acts as a preservative, it is not adequate for preventing spoilage. Other hazards:

—There is no evidence to indicate its acceptability for preventing spoilage.
—It has no effect on enzymatic reactions which cause deterioration.
—Because there is no heat treatment, no vacuum can form to seal the container, and so deterioration is accelerated.
—There is no reliable data on using aspirin as a preservative.

Dishwasher—Since there is no way to control the temperature or the processing time, this method is unsafe.

Microwave Oven—Otherwise identical jars of canned food placed in a microwave oven for processing do not all reach the same temperatures. In order to measure internal temperatures, the lids must be left off and a thermometer inserted. With the lids off, contamination can enter. And canning containers and lids are made in such a way that they will not seal properly unless they are on the jars during processing.

Oven Canning—Oven canning is dangerous, because jars may explode when the oven door is opened. Other than that, it is unsafe, even for acid foods, because the temperature of the food does not become hot enough to destroy bacteria.

Steam Canning—Not to be confused with pressure canning, steam canning is conducted in a tank affair no longer on the market that allowed steam to waft around the filled jars. Steam in this type of canner does not maintain a steady flow of even temperature, so it is impossible to know if the heat has penetrated properly.

ADJUSTMENTS FOR ALTITUDE

Because air is thinner at higher altitudes, both pressures and boiling points are affected. Water will boil furiously at temperatures well below 212°F [100°C] at altitudes of 1,000 feet [305 m] or more above sea level. That means that with both the boiling water bath and the pressure canner method, adjustments in processing must be made. With the boiling water bath method, additional processing time must be allowed. With the pressure canner method, additional pressure is required. Figure 15 shows the requirements for both methods at various altitudes.

The processing times given in recipes in this book are for foods canned at altitudes of less than 1,000 feet above sea level, when using the boiling water bath method. When using the steam pressure canner, the pressure given is for altitudes of less than 2,000 feet [610 m] above sea level. With the boiling water bath method, if processing time given in the recipe is 20 minutes or less, add one minute to the time for each additional 1,000 feet of altitude. If the processing time is more than 20 minutes, add two minutes for each additional 1,000 feet in altitude. In steam pressure canning, one-half pound [3.5 kPa] of additional pressure is required for each additional 1,000 feet above sea level. If your pressure canner has a weighted gauge rather than a dial gauge, use 15 pounds [105 kPa] of pressure instead of 10 [70 kPa] when canning at altitudes above 2,000 feet. Do not raw pack vegetables for pressure processing at altitudes above 6,000 feet [1829 m].

HOW TO COUNT PROCESSING TIME

It is necessary to process foods for the exact times given in recipes. Too little time may result in the food spoiling; too much time will cause the food to be overcooked.

Boiling Water Bath Method—In the boiling water bath method, jars are placed into the canner in hot water if they have been raw packed. If they have been hot packed, the water in the canner should be boiling. When the jars are placed in the canner, the temperature of the water will be reduced. Add boiling water if necessary to bring the water an inch or two over tops of the jars. Do not pour the water directly onto glass.

![Figure 15: Altitude Chart](image)

**FIGURE 15**

**ALTITUDE CHART**

The processing times given in this book are for foods canned at altitudes less than 1,000 feet [305 m] above sea level when using the boiling water bath canner. At altitudes of 1,000 feet or above, adjust the processing time according to the boiling water bath canner chart.

When using the steam pressure canner, the pressure given is for altitudes less than 2,000 feet [610 m] above sea level. At altitudes of 2,000 feet or above, adjust the processing pressure according to the steam pressure canner chart.

<table>
<thead>
<tr>
<th>BOILING WATER BATH CANNER</th>
<th>STEAM PRESSURE CANNER</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Altitude</strong></td>
<td><strong>Process at pressure of:</strong></td>
</tr>
<tr>
<td><strong>ft</strong></td>
<td><strong>psi</strong></td>
</tr>
<tr>
<td>1,000-3,000</td>
<td>113/2</td>
</tr>
<tr>
<td>3,000-4,000</td>
<td>12</td>
</tr>
<tr>
<td>4,000-5,000</td>
<td>121/2</td>
</tr>
<tr>
<td>5,000-6,000</td>
<td>13</td>
</tr>
<tr>
<td>6,000-7,000</td>
<td>131/2</td>
</tr>
<tr>
<td>7,000-8,000</td>
<td>14</td>
</tr>
<tr>
<td>8,000-9,000</td>
<td>141/2</td>
</tr>
<tr>
<td>9,000-10,000</td>
<td>15</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Increase processing time if the time called for is:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>20 Minutes or Less</strong></td>
</tr>
<tr>
<td>1 minute</td>
</tr>
<tr>
<td>2 minutes</td>
</tr>
<tr>
<td>3 minutes</td>
</tr>
<tr>
<td>4 minutes</td>
</tr>
<tr>
<td>5 minutes</td>
</tr>
<tr>
<td>6 minutes</td>
</tr>
<tr>
<td>7 minutes</td>
</tr>
<tr>
<td>8 minutes</td>
</tr>
<tr>
<td>9 minutes</td>
</tr>
<tr>
<td>10 minutes</td>
</tr>
</tbody>
</table>
jars, since they may break. Cover the canner and bring the water to a rolling boil. Start counting processing time at point the rolling boil begins. Allow the water to boil gently but steadily for the time required. (See Figure 16.) Add boiling water if needed to keep tops of jars covered. Remove the containers from the canner immediately when the processing time is up.

**Steam Pressure Canner**—In pressure canning, put two to three inches [51 to 76 mm] of hot water in the canner or the amount recommended by the manufacturer. Place the jars in the canner so that steam can flow freely around each container. Fasten the canner cover securely so that steam escapes only through the petcock. Allow steam to vent steadily according to manufacturer's instructions, or for 10 minutes to drive all air from the canner. Otherwise you will have air pressure as well as steam pressure and you'll get a faulty pressure reading. If you are using a dial gauge, close the petcock at this point. If you are using a weighted gauge, put the weight in place. Bring to 10 pounds [70 kPa] pressure. For either type of gauge, follow the manufacturer's directions to determine when 10 pounds pressure have been reached, and start counting processing time at this point. (See Figure 17.) Use the manufacturer's instructions for opening the canner. A cooling down period should be allowed before removing the jars from the canner to avoid breakage.

**AFTER CANNING**

After jars of food have thoroughly cooled, they should be checked to see if a proper seal has been obtained. Different types of closures require different tests, so the manufacturer's directions should be followed. Generally, the seal of closures using rubber rings can be tested by tipping the jar slightly. (See Figure 18.)

If any leakage occurs, the jar is not properly sealed. If bubbles start at the lid and rise through the contents, the jar is not sealed.

Modern two-piece vacuum lids with metal screw bands are easily checked for a proper seal, which helps account for their popularity. A slight pinging noise may be heard as the jar cools. This indicates that a vacuum has formed, sealing the food. The center of the lid is pulled down by the vacuum, creating a slightly concave surface. If you are not sure the surface of the lid is concave, push down in the center. (See Figure 19.)

If it does not push down, the jar is sealed. If it pushes down but then springs up, the jar is not sealed, and the food has to be eaten or reprocessed promptly. If the lid is not concave, but pushes down and holds, the seal is questionable. In this case, remove the screw band and lift the jar by the edges of the lid. Care
The longest period of time should be of food. The date that the food was canned should be included. Food that was canned, the recipe information on the type and variety should be taken in doing this, because the jar may break or spill. Hold over a padded surface and lift off the lid. When it has been determined that a tight seal exists, the screw bands should be removed. Bands that are left in place may become corroded, making the jars difficult to open.

It is a good idea to label each jar of food. The date that the food was canned should be included. Food that has been properly canned will keep indefinitely, but after a year some chemical changes do occur. For this reason, food that has been canned the longest period of time should be used first. The label might also include information on the type and variety of food that was canned, the recipe used, whether the food was hot or cold packed, and any additional information desired. This kind of information can help in the future to duplicate successes and eliminate failures.

Canned food should be kept in a cool, dark, dry place. Even foods that are properly processed will lose some of their nourishing qualities over a period of time. This process is accelerated if the food is stored at temperatures above 50°F [10°C]. On the other hand, the food should not be stored where it might be subject to freezing, since the food can expand and break the seal.

Light hastens the oxidation and destroys certain vitamins, so the food should be stored in a place that is dark most of the time. Light will also cause certain foods to fade in color. To protect canned food from the deteriorating effects of light, jars may be stored in the cardboard cartons in which they were purchased.

Damp storage areas can cause the metal lids and closures to corrode or rust and endanger the seal. Jars of food should be arranged in their storage place so they are convenient to locate, and so the oldest jars can be used first. Canned food should be checked regularly for signs of spoilage. Any food that has spoiled should be carefully destroyed so that it cannot be eaten by humans or animals.

To open jars with threads, various rubber-like devices are available for gripping the caps. To open jars with vacuum lids, break the vacuum and lift off the lid. This method of removing lids will prevent damaging the jar mouth surface. The vacuum lids are not reusable.

### FIGURE 17
**CANNING TIME REFERENCE FOR STEAM PRESSURE CANNER**

<table>
<thead>
<tr>
<th>Low-acid Vegetables</th>
<th>Type Pack</th>
<th>Steam Pressure Canner (240°F-116°C) Processing Time In Minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>10 Pounds Pressure (70 kPa)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 ½ Pints and Pints (240 and 480 mL)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 ½ Pints and Quarts (720 and 950 mL)</td>
</tr>
<tr>
<td>Asparagus</td>
<td>Raw or Hot</td>
<td>25</td>
</tr>
<tr>
<td>Beans—Green, Snap, Wax Beans</td>
<td>Raw or Hot</td>
<td>20</td>
</tr>
<tr>
<td>Beans—Lima and Butter Beets</td>
<td>Raw or Hot</td>
<td>40</td>
</tr>
<tr>
<td>Carrots</td>
<td>Hot</td>
<td>30</td>
</tr>
<tr>
<td>Corn, Whole-kernel</td>
<td>Raw or Hot</td>
<td>25</td>
</tr>
<tr>
<td>Corn, Cream-style</td>
<td>Hot</td>
<td>85</td>
</tr>
<tr>
<td>Greens (all kinds)</td>
<td>Hot</td>
<td>70</td>
</tr>
<tr>
<td>Homey</td>
<td>Hot</td>
<td>60</td>
</tr>
<tr>
<td>Okra</td>
<td>Hot</td>
<td>25</td>
</tr>
<tr>
<td>Peas—Blackeye, Crowder, Field Peas</td>
<td></td>
<td>Hot</td>
</tr>
<tr>
<td>Peas—Green or &quot;English&quot;</td>
<td>Raw or Hot</td>
<td>40</td>
</tr>
<tr>
<td>Peppers, Green</td>
<td>Hot</td>
<td>35</td>
</tr>
<tr>
<td>Potatoes, White</td>
<td>Hot</td>
<td>65</td>
</tr>
<tr>
<td>Potatoes, Sweet</td>
<td>Hot and Dry</td>
<td>55</td>
</tr>
<tr>
<td>Potatoes, Sweet</td>
<td>Hot and Wet</td>
<td>40</td>
</tr>
<tr>
<td>Rutabagas</td>
<td>Hot</td>
<td>30</td>
</tr>
<tr>
<td>Salsify or Oyster Plant</td>
<td>Hot</td>
<td>25</td>
</tr>
<tr>
<td>Spinach</td>
<td>Hot</td>
<td>15</td>
</tr>
<tr>
<td>Squash, Summer</td>
<td>Hot</td>
<td>30</td>
</tr>
<tr>
<td>Tomatoes with Okra</td>
<td>Hot</td>
<td>15</td>
</tr>
<tr>
<td>Tomatoes, stewed</td>
<td>Hot</td>
<td>30</td>
</tr>
<tr>
<td>Turnips</td>
<td>Hot</td>
<td>30</td>
</tr>
<tr>
<td>Meats, Poultry, Seafoods</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chili</td>
<td>Hot</td>
<td>75</td>
</tr>
<tr>
<td>Chopped Meat—Beef, Veal, Lamb, Mutton, Pork, Chevon, Venison</td>
<td>Hot</td>
<td>90</td>
</tr>
<tr>
<td>Corned Beef</td>
<td>Hot</td>
<td>75</td>
</tr>
<tr>
<td>Meat Sauce, Stew</td>
<td>Hot</td>
<td>75</td>
</tr>
<tr>
<td>Headcheese, Pork Sausage</td>
<td>Hot</td>
<td>75</td>
</tr>
<tr>
<td>Pork Tenderloin</td>
<td>Hot or Raw</td>
<td>75</td>
</tr>
<tr>
<td>Roasts—Beef, Veal, Lamb, Mutton, Pork, Chevon, Venison</td>
<td>Hot</td>
<td>75</td>
</tr>
<tr>
<td>Hot</td>
<td>75</td>
<td>90</td>
</tr>
<tr>
<td>Spareribs</td>
<td>Hot</td>
<td>75</td>
</tr>
<tr>
<td>Steaks and Chops—Beef, Veal, Lamb, Mutton, Pork, Chevon, Venison</td>
<td>Hot</td>
<td>90</td>
</tr>
<tr>
<td>Poultry, Rabbit and Squirrel—Boned</td>
<td>Hot or Raw</td>
<td>75</td>
</tr>
<tr>
<td>Poultry and Rabbit—On Bone</td>
<td>Hot</td>
<td>65</td>
</tr>
<tr>
<td>Chicken à la King</td>
<td>Hot</td>
<td>65</td>
</tr>
<tr>
<td>Clams</td>
<td>Hot</td>
<td>70</td>
</tr>
<tr>
<td>Crab Meat</td>
<td>Hot</td>
<td>80</td>
</tr>
<tr>
<td>Mackerel, Trout, Salmon, Shad, etc.</td>
<td>Not recommended</td>
<td>100</td>
</tr>
<tr>
<td>Shrimp</td>
<td>Hot</td>
<td>45</td>
</tr>
<tr>
<td>Smelt (in Tomato Sauce)</td>
<td>Hot</td>
<td>50</td>
</tr>
<tr>
<td>Soups</td>
<td>Hot</td>
<td>50</td>
</tr>
<tr>
<td>Bean</td>
<td>Hot</td>
<td>60</td>
</tr>
<tr>
<td>Clam Chowder and Fish Chowder</td>
<td>Hot</td>
<td>100</td>
</tr>
<tr>
<td>Vegetable</td>
<td>Hot</td>
<td>Length of time needed for vegetable requiring longest processing time</td>
</tr>
</tbody>
</table>
Foods high in acidity are perhaps the easiest products to can. Fruits are fun to put up, convenient to have on hand and they add dessert excitement to family and party meals. Other acid foods are also easy for the home canner to preserve.

Tomatoes, which are botanically classified as fruits, are especially popular with home canners. Rhubarb, which is grown like a vegetable but is processed as an acid, and sauerkraut, which is cabbage fermented in salt, have higher acidity than raw vegetables. And sauerkraut and therefore falls into the easiest products to can. Fruits are classified as acids, but because handling is somewhat different than for other acids, so a special section of the Blue Book is devoted to pickles and relishes.

Because bacteria do not thrive in acids, the lower temperature of the boiling water bath canner (212°F—100°C) is adequate for processing acids. The times given in recipes in this book are for foods processed at altitudes under 1,000 feet [305 m] above sea level. For higher altitude areas, adjustments in processing time must be made as in Figure 15.

TO PREVENT DARKENING

Apples, apricots, peaches, pears and some other fruits tend to darken while they are being prepared for canning or after they are in the jar. To prevent the darkening, use ascorbic and citric acid mixtures according to manufacturer's instructions. If using ascorbic acid, sprinkle over the fruit % teaspoon [1.25 mL] to each quart [950 mL] just before capping.

Fruits are canned with a syrup made ahead of time with sugar and sometimes corn syrup or honey and water or fruit juice. (See Figure 20.)

Measure sugar and liquid into a saucepan. Cook until sugar dissolves. Keep syrup hot until needed, but do not let it boil down. Usually 1 to 1½ cups [240 to 360 mL] of syrup are needed for each quart [950 mL] of fruit.

STEP-BY-STEP CANNING OF ACID FOOD

2. Assemble all equipment and utensils. Make sure everything is clean.
4. Select only the best produce and treat to prevent darkening. See instructions on this page. Drain, core, pare and slice cooking apples (or cut into halves or quarters). Make light or medium syrup. Wash, drain, core, pare and slice cooking apples (or cut into halves or quarters). Make syrup (1 cup [240 mL] sugar to 4 or 5 cups [960 or 1200 mL] water). Follow recipe for Apples—Hot Pack.
6. Pack food in jars loosely enough for juice to circulate between pieces without wasting space.
7. Cover food with boiling syrup, juice, brine or pickling solution as directed in recipe. Leave recommended head space.
8. Remove air bubbles.
9. Wipe top and threads of jar with clean, damp cloth. Attach closures.
10. Place each jar as it is filled onto rack in canner. When canner is filled, add hot water to cover jars 1 to 2 inches [25 to 51 mm]. Cover canner and bring water to boil. Reduce heat to hold water at a steady boil. Start counting processing time when water reaches a full boil. If, during processing time, water should boil away and the tops of jars become exposed, cover them with 1 to 2 inches [25 to 51 mm] of boiling water.
11. When processing time has been completed, remove jars from canner. Stand jars on cloths, out of drafts and with space between. Complete seal if necessary.
12. After 12-24 hours, test seals.
13. Store sealed jars in dark, dry, cool place.

FIGURE 20
SYRUPS FOR CANNING

<table>
<thead>
<tr>
<th>Type of Syrup</th>
<th>Sugar to One Quart (950 mL) Liquid</th>
<th>Yield of Syrup</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light</td>
<td>2 cups (480 mL)</td>
<td>5 cups (1200 mL)</td>
</tr>
<tr>
<td>Medium</td>
<td>3 cups (720 mL)</td>
<td>5 1/2 cups (1320 mL)</td>
</tr>
<tr>
<td>Heavy</td>
<td>4 1/4 cups (1140 mL)</td>
<td>6 1/2 cups (1560 mL)</td>
</tr>
</tbody>
</table>

Medium with Corn Syrup: Use 1 1/2 cups (360 mL) sugar, 1 cup (240 mL) corn syrup to 3 cups (720 mL) liquid.

Medium with Honey: Use 1 cup (240 mL) sugar, 1 cup (240 mL) honey to 4 cups (960 mL) liquid.
APPLE RINGS

Choose medium size, well shaped, just ripe, bright red apples which hold their shape when cooked (allow 1 1/2 pounds [680 g] of apples for each pint).

Wash the apples in cold water. Core, then slice into 1/4-inch (6 mm) rings. To prevent discoloration, drop into salt-vinegar water or ascorbic acid water. See page 17.

Dissolve 4 cups [960 mL] sugar in 1 quart [950 mL] water. Add food coloring for desired color. Place over heat, bring to a boil and allow to stand 10 minutes. This helps firm the apples. Return to heat, and bring to a rolling boil, then simmer 30 minutes or until apples are the desired color. Set the saucepan off the heat and allow the apple rings to cool in the syrup.

Drain off the syrup and bring to a boil. Pack the apple rings loosely in preheated jars, leaving 1/2-inch [13 mm] head space. Cover with the boiling syrup, leaving 1/2-inch [13 mm] head space. Remove air bubbles and adjust caps. Process pints 25 minutes, quarts 30 minutes, in boiling water bath.


APRICOTS

Tree-ripened apricots may be canned whole. Pits should be removed from fruit harvested before it was fully ripe. Some varieties of apricots should be packed raw because they do not hold their shape when heated before packing.


berries may be prepared by using a spiced syrup.

APPLIESAUCE

Wash, pare, if desired, quarter and core cooking apples. Simmer, covered, in a small amount of water, until tender. Press apples through sieve or food mill. Sweeten sauce to taste (about 1/4 cup [60 mL] sugar to 4 medium apples). Reheat to boiling. Pour, boiling hot, into hot jars, leaving 1/2-inch [13 mm] head space. Stir with rubber bottle scraper or similar non-metallic utensil to remove air bubbles. Adjust caps. Process pints and quarts 20 minutes in boiling water bath.

Without Sugar—Use in Pies—

BLUEBERRIES AND HUCKLEBERRIES

These berries may be canned in syrup or water, but the method given here is better if berries are to be used in muffins, etc. Put 2 or 3 quarts [1900 to 2850 mL] clean berries in square of cheesecloth. Hold cloth by corners and dip into boiling water until spots appear on cloth. Dip into cold water. Pack into hot jars, leaving 1/2-inch [13 mm] head space. Add neither sugar nor liquid. Adjust caps. Process pints 15 minutes, quarts 20 minutes, in boiling water bath.

ELDERBERRIES

Follow any recipe for berries. You may add 1 tablespoon [15 mL] vinegar to each quart [950 mL] to improve flavor.

GOOSEBERRIES

Make medium or heavy syrup. Wash and drain green berries. Use scissors to snip off "heads and tails." Pour 1/2 cup [120 mL] boiling syrup into hot jar. Fill jar with berries. Shake jar to pack berries closely without crushing, leaving 1/2-inch [13 mm] head space. Add more boiling syrup, if needed, to cover berries, leaving 1/2-inch [13 mm] head space. Remove air bubbles. Adjust caps. Process pints 15 minutes, quarts 20 minutes, in boiling water bath.

STRAWBERRIES

Use firm, red-ripe berries, which have neither white nor hollow centers. Hull (cap), wash, drain and measure berries. Use 1/2 to 3/4 cup [120 mL to 180 mL] sugar to each quart berries. Let stand two hours. Cook until sugar dissolves and berries are boiling hot. Pour, hot, into hot jars, leaving 1/2-inch [13 mm] head space. If there is not enough syrup to cover berries, add boiling water, leaving 1/2-inch [13 mm] head space. Remove air bubbles. Adjust caps. Process pints 15 minutes, quarts 20 minutes, in boiling water bath.

Note—Strawberries tend to fade and lose flavor when canned.
**CHERRIES**

**Cold or Raw Pack—** If cherries are sweet, make a light or medium syrup; if sour, use medium or heavy syrup. Cherries for pies may be canned in water, but hold color better when sweet, make a light or medium syrup; boiling water, leaving \(\frac{1}{2}\)-inch [13 mm] space. Cover with boiling syrup or \(\frac{1}{2}\) cup [120 mL] boiling syrup into hot jar. Fill jar with cherries. Shake jar to pack cherries closely without crushing, leaving \(\frac{1}{2}\)-inch [13 mm] head space. Cover with boiling syrup or boiling water, leaving \(\frac{1}{2}\)-inch [13 mm] head space. Remove air bubbles. Adjust caps. Process pints 20 minutes, quarts 25 minutes, in boiling water bath.

**Hot Pack—** Prepare cherries as for Cold or Raw Pack. Measure after pitting. Mix \(\frac{1}{2}\) to \(\frac{3}{4}\) cup [120 mL to 180 mL] sugar with each quart cherries. Heat slowly until sugar dissolves and cherries are hot through. If cherries are unpitted, add a little water to prevent sticking. Pack, hot, into hot jars, leaving \(\frac{1}{2}\)-inch [13 mm] head space. If there is not enough syrup to cover cherries, add boiling water or light syrup, leaving \(\frac{1}{2}\)-inch [13 mm] head space. Remove air bubbles. Adjust caps. Process pints 10 minutes, quarts 15 minutes, in boiling water bath.

**CURRANTS**

Follow recipes for Berries.

**DRIED FRUITS**

- **Prunes, Apricots, Peaches, etc.**
  - Wash fruit. Cover with cold water. Let stand 12 to 18 hours in cool place. Drain off water and save. Pack fruit into hot jars, leaving \(\frac{1}{2}\)-inch [13 mm] head space. Make syrup of water and 2 tablespoons [30 mL] sugar for each quart [950 mL] of fruit. Pour hot syrup over fruit, leaving \(\frac{1}{2}\)-inch [13 mm] head space. Remove air bubbles. Adjust caps. Process pints 15 minutes, quarts 20 minutes, in boiling water bath.

**GRAPEFRUIT**

Make light syrup. Wash and drain firm, heavy, fresh, tree-ripened fruit. Pare grapefruit, cutting deep enough to remove white membrane. Run a thin knife between pulp and skin of each section and lift out the pulp or “heart” without breaking. Discard seeds. Pack fruit into hot jars, leaving \(\frac{1}{2}\)-inch [13 mm] head space. Cover with boiling syrup, leaving \(\frac{1}{2}\)-inch [13 mm] head space. Remove air bubbles. Adjust caps. Process pints and quarts 10 minutes in boiling water bath.

**GRAPES—RIPE**

Make light or medium syrup. Wash and drain grapes. Remove stems. Pour about \(\frac{1}{2}\) cup [120 mL] boiling syrup into hot jar. Fill jar with grapes. Shake jar to pack grapes closely without crushing, leaving \(\frac{1}{2}\)-inch [13 mm] head space. Cover with boiling syrup, leaving \(\frac{1}{2}\)-inch [13 mm] head space. Remove air bubbles. Adjust caps. Process pints 15 minutes, quarts 20 minutes, in boiling water bath.

**GRAPES—UNRIPE**

Green grapes, canned before the seeds harden, are used in pies. Make medium or heavy syrup. Wash, drain and stem grapes. Pack into hot jars, leaving \(\frac{1}{2}\)-inch [13 mm] head space. Cover with boiling syrup, leaving \(\frac{1}{2}\)-inch [13 mm] head space. Remove air bubbles. Adjust caps. Process pints 20 minutes, quarts 25 minutes, in boiling water bath.

**GUAVAS**


**GUAVAS**


**LOQUATS**

Make light syrup. Wash and drain firm-ripe fruit. Remove stem and blossom ends; cut in half and remove seeds. Cook 3 to 5 minutes in syrup. Pack, hot, into hot jars, leaving \(\frac{1}{2}\)-inch [13 mm] head space. Cover with boiling syrup, leaving \(\frac{1}{2}\)-inch [13 mm] head space. Remove air bubbles. Adjust caps. Process pints 15 minutes, quarts 20 minutes, in boiling water bath.

**MIXED FRUITS**

Use three or more fruits, such as apricots, grapefruit, peaches, pears, green gage plums, pineapple, white cherries, white grapes. Make light syrup. Prepare each fruit as given in the recipe for canning it. If to be used for salad or dessert, leave in large pieces, cut into small pieces for cocktails. Simmer fruit in syrup until hot through. Pack, hot, into hot jars, leaving \(\frac{1}{2}\)-inch [13 mm] head space. Cover with boiling syrup, leaving \(\frac{1}{2}\)-inch [13 mm] head space. Remove air bubbles. Adjust caps. Process pints 20 minutes, quarts 25 minutes, in boiling water bath.

**NECTARINES**

Follow recipes for canning Apricots.

**PEACHES**

See pages 20-21 for the best way to handle evenly ripened peaches. Scrape cavities to remove pink or red fibers. The fibers are likely to become an ugly brownish color; there is no other reason for removing them. Cling peaches are easier to cut into halves if a pitting spoon is pushed all the way through from the stem end to the end of the stone. If no spoon is available, cut both sides through to stone; begin at stem end and follow crease. After cutting, hold peach with both hands and twist in opposite directions.


Note—For juicy peaches, measure after pitting and peeling. Add 1 to 2 cups [240 mL to 480 mL] sugar to each 5 quarts [4750 mL] fruit. Heat slowly until sugar dissolves and fruit is boiling hot through. Pack and process as for Peaches—Hot Pack. If there is not enough syrup, add boiling water to cover peaches, leaving ¼-inch [13 mm] head space.

BRANDIED PEACHES

4 pounds [1.8 kg] whole peeled peaches
3 pounds [1.4 kg] sugar
1 teaspoon [5 mL] salt
1 quart [950 mL] boiling water
1 pint [480 mL] peach brandy

Dissolve one-half of the sugar and the salt in the boiling water. Add one layer of peaches at a time and boil gently for 6 minutes. Peaches will darken if not heated through, but should not be cooked until soft. Put heated peaches in deep bowl; boil syrup 5 minutes and pour over fruit. Cover bowl and let stand overnight. Drain syrup into kettle, add remaining sugar, boil 5 minutes and pour back over peaches. Next day, pack peaches to within ¼-inch [13 mm] of top of pint fruit jars. Add 3 or 4 tablespoons [45 to 60 mL] of brandy to each jar. Boil syrup until about as thick as warm honey, and pour over peaches. Syrup should come to within ¼-inch [6 mm] of top of jar. Put vacuum lid on jar; screw band tight. Process for 10 minutes in boiling water bath. Peaches should be ready to use in about a month. Yield: about 3 quarts [2850 mL].

1. Visually examine jars for nicks, cracks and sharp edges on sealing surface.
2. Wash jars and closures in hot soapy water. Rinse. Leave jars and closures in hot water until needed.
5. Cut peaches into halves, pit and peel. Drop halves into salt-vinegar solution, 2 tablespoons [30 mL] each per gallon [3800 mL] of cold water. Rinse before packing.
9. Wipe top and threads of jar with clean, damp cloth. If using vacuum lids with metal screw bands, put lid on with sealing compound next to jar. Screw band down evenly and tightly.
10. As each is filled, stand it on rack in boiling water bath canner. Water in canner should be hot, but not boiling. If needed, add more hot water to cover jars 1-2 inches [25-51 mm]. Put cover on canner.
Peaches may be raw (cold) packed as shown here, or hot packed as described on page 20.

3. Select firm-ripe peaches. Sort, wash and drain just enough fruit for one canner load. Fill boiling water bath canner half full with hot water. Put canner on to heat. Prepare sugar syrup as described on page 17.

4. Put peaches in wire basket or cheesecloth. Dip peaches into boiling water one half to one minute to loosen skins. Dip into cold water. Drain.


7. Cover peaches with boiling hot syrup, leaving 1/2-inch [13 mm] head space. It will take 1-1 1/2 cups [240-360 mL] syrup for each quart jar.

8. Run non-metallic kitchen utensil gently between fruit and jar to release air bubbles. Add more syrup if needed.

11. Bring water to a boil. At altitudes less than 1,000 feet [305 m] above sea level, process pints 25 minutes, quarts 30 minutes, at a gentle but steady boil.

12. Remove jars and stand several inches apart and out of drafts. Allow to cool for about 12 hours. Do not retighten bands. Test for seal. Remove bands. Store jars in dry, dark, cool place.
PEARS

Pears should be removed from the tree when full-grown and stored in a cool place (60°-65°F [16°-18°C]) until ripe, but not soft. Bartlett pears are considered best for canning, but Kieffers and similar varieties are satisfactory, if properly ripened and then cooked until almost tender in plain water before sugar is added.


Cinnamon Pears—Add 2 sticks cinnamon and a few drops of red food coloring per quart syrup. Remove cinnamon before packing pears. Process pints 20 minutes, quarts 25 minutes, in boiling water bath.

Mint Pears—Add oil of peppermint and green food coloring, a drop at a time, until syrup is flavored and colored as wanted. Cook pears in syrup 10 minutes before packing. Process pints 20 minutes, quarts 25 minutes, in boiling water bath.

Orange Pears—Cook peel of ¼ orange with each quart [950 mL] of syrup. Remove orange peel before packing pears. Process pints 20 minutes, quarts 25 minutes, in boiling water bath.

Pineapple Pears—Use pineapple juice instead of water for making syrup. Process pints 20 minutes, quarts 25 minutes, in boiling water bath.

Pear and Melon Balls—Make light syrup. Use equal measure of ball or cubes of firm—ripe fruit, using with the pears any combination of these varieties of melon: cantaloupe, Casaba, Crenshaw, Honeydew or Persian. Cover with boiling syrup. Let stand until cold. Drain. Pack fruit into hot jars, leaving ½-inch [13 mm] head space. Add 1 teaspoon [15 mL] lemon juice to each quart [950 mL], ½ tablespoon [7.5 mL] to each pint [480 mL]. Heat syrup to boiling. Pour over fruit, leaving ½-inch [13 mm] head space. Remove air bubbles. Adjust caps. Process pints and quarts 20 minutes in boiling water bath.

PEAR MINCEMEAT

7 pounds [3.2 kg] ripe
Bartlett pears
1 lemon
2 pounds [454 g] seedless
raisins
6¼ cups [1620 mL] sugar
1 tablespoon [15 mL] cloves
cinnamon
1 tablespoon [15 mL] nutmeg
1 tablespoon [15 mL] allspice
1 teaspoon [5 mL] ginger
1 cup [240 mL] vinegar


Yield: about 9 pints [4320 mL].

BRANDIED PEARS

5 pounds [2.3 kg] ripe, unblemished pears
3 pounds [1.4 kg] sugar
4 cups [960 mL] water
3 cups [720 mL] brandy

Pare pears, making sure fruit entirely unblemished. Split and remove cores. In the meantime, make a syrup with sugar and water. Cook the pears in syrup a layer at a time, until just tender—about 5 minutes. Lift out, cool slightly and pack in jars. Cook the syrup about 15 minutes longer or until thickened. Add brandy and pour liquid over the fruit. Leave ¼-inch [6 mm] head space. Use white brandy for good-looking pears, but any brandy will preserve and flavor the fruit equally well. Seal at once. Process for 15 minutes in a boiling water bath canner.

Yield: about 4 quarts [3800 mL].

PINEAPPLE

Make light syrup. Scrub firm-ripe pineapple. Cut thin slice from bottom, then cut fruit into ½-inch [13 mm] slices, crosswise. Pare, remove “eyes” and core after slicing. This may be done with heavy doughnut cutter. Pineapple may also be cut into 8 wedge-shaped slices, lengthwise; cut into halves, then quarters, etc. Simmer pineapple in syrup until tender. Pack, hot, into hot jars, leaving ¼-inch [13 mm] head space. Cover with boiling syrup, leaving ¼-inch [13 mm] head space. Remove air bubbles. Adjust caps. Process pints 15 minutes, quarts 20 minutes, in boiling water bath.

PLUMS AND FRESH PRUNES

Green gage and other meaty plums are better for canning than the more juicy varieties. Plums may be scalded and peeled, but are usually canned unpeeled. Prick plums with sterilized needle. Pricking does not prevent skins cracking, but helps prevent the fruit bursting. Make medium or heavy syrup. Wash and drain plums. Heat syrup to boiling. Add plums (not more than two layers in pan). Remove pan from heat two minutes after adding fruit. Cover. Let stand 20 to 30 minutes. Pack plums into hot jars, leaving ¼-inch [13 mm] head space. Reheat syrup to boiling. Pour over plums, leaving ¼-inch [13 mm] head space. Remove air bubbles. Adjust caps. Process pints 20 minutes, quarts 25 minutes, in boiling water bath.

RHUBARB


TOMATOES

Use fresh, firm, red-ripe tomatoes which are free of decayed spots, weather cracks and fungus growths. Wash tomatoes clean before scalding. Scald a few at a time to loosen skins, then dip in cold water. Cut out all core and green spots; skin.

Cold or Raw Pack—See pages 24-25 for “Canning Tomatoes—Step by Step” picture series. Prepare as instructed. Pack into hot jars, pressing tomatoes until spaces fill with juice, leaving ¼-inch [13 mm] head space. Add 1 teaspoon [5 mL] salt to each quart [950 mL], ½ teaspoon [2.5 mL] salt to each pint [480 mL], if desired. Remove air bubbles. Adjust caps. Process pints 35 minutes, quarts 45 minutes, in boiling water bath.

A WORD ABOUT TOMATOES

Recent research by a leading university confirms that tomatoes, even those designated as "low acid," are perfectly safe to can by the boiling water bath method as long as standard canning procedures are followed. The study showed that tomatoes for canning should be firm, ripe and fully colored. Overripe tomatoes—those that are ordinarily soft, juicy, deep red in color and have wrinkled skins—should not be canned. Tomatoes that are too ripe result in an inferior canned product. More importantly, the study showed that acidity decreases as tomatoes ripen and that if tomatoes are overly ripe when canned they may not have enough natural acidity to kill all the microorganisms present. The final product therefore may be unsafe to eat.

In canning tomatoes, normal sanitary precautions as outlined elsewhere in this book, should be followed closely. The tomatoes should be processed by the boiling water bath method for the full length of time recommended in the recipe.

In the university study, 109 different varieties of tomatoes were tested. The research included several "low acid" varieties. The tomatoes were grown in different fields under various soil treatment conditions. The results showed that all those tested, even the "low acid" types, contained enough acid when the tomatoes were not overripe to make them completely safe for boiling water bath processing.

TOMATOES FOR SALAD

Prepare tomato juice. (See recipe below or use canned tomato juice.) Pack peeled and cored whole tomatoes into hot jars, leaving ½-inch [13 mm] head space. Pour hot tomato juice over tomatoes, leaving ½-inch [13 mm] head space. Remove air bubbles. Adjust caps. Process pints 45 minutes, quarts 15 minutes, in boiling water bath.

TOMATO JUICE

Wash and drain firm, fresh, red-ripe tomatoes. (One small decayed spot can cause the whole batch to spoil.) Remove core and blossom ends. Leave tomatoes whole and bake in oven, or cut into small pieces and cook slowly (simmer) until soft, stirring often. Press through fine sieve or food mill. Salt, sugar and spices, to taste, may be added to the juice. Reheat juice until it is almost, but not quite, boiling. Pour, hot, into hot jars, leaving ¾-inch [6 mm] head space. Adjust caps. Process pints 10 minutes, quarts 15 minutes, in boiling water bath.

TOMATO PASTE

8 quarts [7600 mL] peeled, cored, chopped tomatoes (about 4 dozen large)
1½ cups [360 mL] chopped sweet red peppers (about 2)
2 bay leaves
1 tablespoon [15 mL] salt
1 clove garlic (optional)

Combine first four ingredients and cook slowly 1 hour. Press through a fine sieve; add garlic, if desired. Continue cooking slowly until thick enough to round up on a spoon, about 2½ hours. Stir frequently to prevent sticking. Remove garlic and bay leaves. Pour, hot, into hot half-pint jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 45 minutes in boiling water bath. Yield: about 9 half-pints [2160 mL].

TOMATO PURÉE

Wash, scald, peel and core tomatoes. Cook until soft. Press through fine sieve. Cook until thick; stir frequently to prevent sticking. If permitted in diet, 1 teaspoon [5 mL] each salt and sugar may be added to each quart [950 mL] puree. Pour, hot, into hot half-pint jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process half-pints and pints 30 minutes in boiling water bath. Yield: about 9 half-pints [2160 mL].

TOMATO PURÉE—SEASONED

4 quarts [3800 mL] peeled, cored, chopped tomatoes (about 2 dozen large)
3 cups [720 mL] chopped onions
2 cups [480 mL] sliced carrots (about 4 medium)
2 cups [480 mL] chopped celery
1½ cups [360 mL] chopped green peppers (about 3 medium)
1 tablespoon [15 mL] salt

Combine all ingredients; cook until tender. Press through fine sieve. Cook pulp until thick, about 1½ hours. Stir frequently to prevent sticking. Pour, hot, into hot jars, leaving ¾-inch [6 mm] head space. Adjust caps. Process half-pints and pints 45 minutes in boiling water bath. Yield: about 9 half-pints [2160 mL].

FRUIT JUICES

APRICOT OR PEACH JUICE, NECTAR OR PÜRÉE

Although it may be thinned with a light or medium syrup before canning, the pulp of apricots is usually canned as a purée and thinned with ice-cold water when used as a drink.

To Prepare: Wash, drain, pit and measure ripe apricots. Add 1 cup [240 mL] boiling water to each quart [950 mL] fruit. Cook until fruit is soft. Press through sieve or food mill. Add sugar to taste, also 1 tablespoon [15 mL] lemon juice to each quart [950 mL] if wanted. Reheat until sugar dissolves. Pour, hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process half-pints and pints 15 minutes in boiling water bath. (3½ quarts [3088 mL] prepared fruit and 3¼ cups [780 mL] water yield about 9 pints [4320 mL] canned purée).

Note: If using blender to make purée, fruit should be peeled.

BERRY JUICES

Use boysenberries, loganberries, raspberries, etc. Wash, crush and simmer berries until soft. Strain through cotton flannel, jelly bag or four layers of cheesecloth. (For a greater yield of juice, twist the two ends of the bag in opposite directions until most of the juice is extracted.) Add 1 to 2 cups [240 mL to 480 mL] sugar to each gallon juice. Reheat to 190°F [88°C]. Pour, hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process pints and quarts 30 minutes in boiling water bath. Note: If clearer juice is desired, before adding sugar let juice stand for 24 hours in refrigerator. Carefully ladle juice into pan (do not disturb sediment), add sugar, proceed as above.

BLACKBERRY CORDIAL

To 2 quarts [1900 mL] blackberry juice (see Berry Juices, above, for how to prepare juice), add 3 cups [720 mL] sugar, and 1 tablespoon [15 mL] each whole cloves, whole allspice, whole cinnamon and whole nutmeg (tied in bag). Simmer 30 minutes. Bring to boiling. Discard spice bag. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process pints and quarts 15 minutes in boiling water bath.
**CRANBERRY JUICE**

Wash cranberries. Boil equal measure of berries and water together until berries burst. Strain juice through cotton flannel, jelly bag or four layers of cheesecloth. (For a greater yield of juice, twist the two ends of the bag in opposite directions until most of the juice is extracted.) Add sugar to taste. Boil 1 minute. Pour boiling hot, into hot pint or quart jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath.

**GRAPE JUICE I**

Wash, stem, crush and measure fresh, firm-ripe grapes. Add 1 cup [240 mL] water to each gallon, [3800 mL] crushed grapes. Heat 10 minutes at 190° F [88° C]. (Boiling develops a poor flavor.) Strain through cotton flannel, jelly bag or 4 layers of cheesecloth. (For greater yield of juice, twist the two ends of the bag in opposite directions until most of the juice is extracted.) Let stand 24 hours in refrigerator. Strain again. Add 1 to 2 cups [240 mL to 480 mL] sugar to each gallon juice. Reheat to 190°F [88°C]. Pour, hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process, pints and quarts, 15 minutes, in boiling water bath.

**GRAPE JUICE II**

Wash and stem fresh, firm-ripe grapes. Put 1 cup [240 mL] grapes into a hot quart jar. Add ½ to 1 cup [120 mL to 240 mL] sugar. Fill jar with boiling water, leaving ¼-inch [6 mm] head space. Adjust cap. Process quarts 10 minutes in boiling water bath.

**GRAPEFRUIT JUICE**

Wash fresh, tree-ripened grapefruit. Extract and strain juice. Add sugar to taste. Heat to 165° F [74° C]. Pour, hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process pints and quarts 30 minutes in boiling water bath. (Yield depends upon juiciness of fruit used.)

**ORGANIC GARDENING**

For those who grow their vegetables and fruits by the organic method, process by the processing methods and times as given in this book.

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**CANNING TOMATOES—STEP BY STEP**

1. Set out all equipment and utensils needed. Fill large saucepan two-thirds full of hot water; put on high heat to boil.

5. Put tomatoes in wire basket and lower into boiling water in large saucepan. Remove after about 30 seconds or as soon as skin starts to crack. Dip into cold water.

9. Wipe top and threads of jar with clean, damp cloth. If using vacuum lids with metal screw bands, remove one lid from simmering water with tongs, and place it flat on top of jar so sealing compound is against jar. Screw band down evenly and tightly.

10. As each jar is filled, stand it on rack in canner of hot, not boiling, water. Water should cover jars 1-2 inches [25-51 mm]. Add more water if necessary.
2. Visually examine jars for nicks, cracks or sharp edges on sealing surface. Fill boiling water bath canner half full of hot water. Put canner on to heat.

3. Wash jars and closures in hot soapy water. Rinse. Leave jars and closures in hot water until needed. If using vacuum lids and metal screw bands, put lids in saucepan filled with water and place on stove to simmer.

4. Select just enough tomatoes for one canner load. Make sure tomatoes are fresh, firm and red ripe. Don't use any with spots, cracks or growths. Wash tomatoes carefully and drain.

5. Cut out core, remove skins and trim off any green spots. Remove one jar from hot water and drain. Place clean jar funnel on jar. Drop whole tomato into jar. (Large tomatoes should be cut into quarters.)

6. Remove the funnel. Use a non-metallic kitchen utensil to press the tomato until the juice runs out. Add additional tomatoes, pressing out the juice, until the jar is filled to within \( \frac{1}{2} \) inch [13 mm] of the top. If necessary, pour off a little juice or add tomato to achieve the proper head space.

7. Repeat process for each jar. Add 1 teaspoon [5 mL] canning salt to each quart jar, \( \frac{1}{2} \) teaspoon [2.5 mL] to a pint jar.) Run a non-metallic kitchen utensil between tomatoes and jar to release any trapped air bubbles.

8. Put cover on canner. Bring water to boil. Process quarts 45 minutes (pints 35 minutes) at a gentle but steady boil, at altitudes under 1,000 feet [305 m] above sea level. For higher altitudes, see chart on page 13.

9. Remove jars and stand several inches apart and out of drafts. Allow to cool for about 12 hours. Do not retighten bands. Test for seal. Remove bands. Store jars in dry, dark, cool area.
Pickles are one of the favorites of home canners and pickling is among the oldest known methods of preserving food, dating back to Biblical times. In today's meals, pickles are great for snacks and are the perfect companion for sandwiches.

When we speak of pickles, many of us think only of cucumbers. But in canning terms, pickles mean any fruit, meat or vegetable prepared by a pickling process, and include a wide variety of relishes.

Pickle products are either fermented in brine (salt) or packed in vinegar to aid preservation. Many older recipes called for pickles to be packed into jars and sealed without processing. This method is no longer recommended. There is always a danger of harmful microorganisms entering the food when it is transferred from pickling container to jar. Processing destroys organisms that can cause spoilage and inactivates enzymes that may affect flavor, color and texture.

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

Pickle products are generally grouped into four classes:

**Brined pickles**—Also called fermented pickles. They are made from vegetables, usually cucumbers, and are submerged in a brine solution to ferment or cure for about three weeks. Dilled cucumbers and sauerkraut belong in this group, and green tomatoes may also be brined. Dill, garlic and other herbs and spices are often added to the solution for flavoring.

**Fresh-pack pickles**—Also called quick-process pickles. Sometimes fresh-pack pickles are canned in a spicy vinegar solution without brining, but usually they are brined for several hours or overnight. Whole cucumber dills, sweet gherkins and dilled green beans are among products that may be prepared by this method.

**Relishes**—Relishes are prepared from fruits and/or vegetables which are chopped and cooked to desired consistency in a spicy vinegar solution. Sometimes sugar is added if a sweet relish is desired, and sometimes hot peppers or other spices are added for a hot relish. Relishes include piccalilli, pepper-onion, chutney, horseradish and corn relish.

**Fruit pickles**—Fruit pickles are usually prepared from whole fruits and simmered in a spicy, sweet-sour syrup. Pears, peaches and watermelon rind are among the products prepared in this manner.

**TOP QUALITY INGREDIENTS—THE KEY TO SUCCESSFUL PICKLING**

Pickling is one area of canning where it is essential to have top quality ingredients and to follow proper procedures carefully to achieve satisfactory results. And the ingredients and procedures may be right, but if the correct proportions of sugar, salt, vinegar and spices are not maintained, the quality will likely suffer.

**Fruits and vegetables**—Ideally, fruits and vegetables should be fresh from the garden, hopefully gathered no more than 24 hours before pickling. If preparation is delayed, the produce should be kept refrigerated until ready for use. Cucumbers especially deteriorate rapidly at room temperatures.

Select tender vegetables and firm fruit. Unlike other areas of canning, some recipes call for slightly underripe fruits and vegetables for pickling, such as pears and peaches and green tomatoes. Unwaxed cucumbers to be pickled whole should be used, since the brine cannot penetrate wax. Produce should be of the ideal size for the recipe being followed, and each fruit or vegetable should be of uniform size.

Ingredients for relishes should be chopped into uniform pieces for an attractive product. And cabbage for sauerkraut should be uniformly cut (about the thickness of a dime), with all large, coarse pieces of leaves or core eliminated.

Fruits and vegetables should be washed thoroughly in cold water.

Wash whole before paring. Use a brush if possible, and scrub under running water or through several rinses. Clinging soil may contain bacteria that are hard to destroy. Remove blossoms from cucumbers, since they may be the source of enzymes which could soften the cucumbers during fermentation.

**Salt**—Brine solutions should be carefully prepared. Pure granulated or pickling salt should be used if at all possible. Un-iodized salt can be used, but additives in the salt that prevent caking may make the brine cloudy. Iodized table salt should not be used; it may darken pickles. The salt acts as a preservative and adds flavor and crispness to pickles. Brine draws juices and sugar from foods and forms lactic acid, a preservative.

**Vinegar**—Vinegar gives pickles a tart taste and acts as a preservative. Use a high-grade cider or white distilled vinegar of four to six percent acidity (sometimes listed as 40 to 60 grain). Vinegars of unknown acidity should not be used, since their preservative power is unknown. Cider vinegar, with its mellow acid taste, gives a nice blending of flavors, but may darken white or light-colored fruits and vegetables. Wherever color is important, such as in pickled pears, onions and cauliflower, white distilled vinegar should be used. It has a sharp, pungent, acetic acid taste. Vinegar should not be diluted unless the recipe so specifies. If a less sour product is preferred, add sugar rather than decrease vinegar, because otherwise the preservative balance will be upset.

**Sugar**—Use white granulated sugar, cane or beet, unless the recipe calls for another sweetener. Brown sugar will darken the product. Honey and maple syrup are sometimes called for in a recipe, and should be used if specified. Sugar substitutes should not be used unless the manufacturer's specific instructions for pickling are followed.

**Spices and herbs**—Spices and herbs readily flavor pickles, adding immeasurably to their tastiness. Only fresh spices and herbs should be used. Whole fresh spices are preferred—
the dry, powdered and salt forms may cloud the pickling mixture. Spices and herbs lose their pungency readily in heat and humidity and therefore should be stored in airtight containers in a cool place. Seasoning can be added directly to pickling mixtures, but usually spices and herbs are tied in a bag of cheesecloth or muslin and held in the solution, just like a teabag.

**Water**—Soft water should be used for making brine. The minerals in hard water will have a definite negative effect on the quality of pickles. If soft tap water is not available, the water can be softened by boiling it for 15 minutes and then letting it stand for 24 hours. A scum will likely appear on the top of the water and this should be carefully skimmed off. Then the water should be ladled from the container without disturbing the sediment on the bottom. Add 1 tablespoon [15 mL] of vinegar per gallon [3800 mL] of boiled water before using. Distilled water, although it is relatively expensive, can be substituted in hard water areas.

**Other ingredients**—Some older recipes call for the use of alum and/or lime to add crispness or firmness to pickles. If the proper ingredients are used, these items are unnecessary and can cause digestive upset if used in excess. Coloring agents are not recommended.

**EQUIPMENT AND UTENSILS**

Very little specialized equipment is needed for pickling, and those who have done other types of canning will already have most of the needed utensils. There are some differences, however.

Implements made of zinc, iron, brass, copper or galvanized metal should not be used. Enamelware with cracks or chips in the enamel also should not be used. The metal in these utensils may react with acids or salts and cause undesirable color changes in pickles or create even more serious problems.

For the fresh-pack method, where vinegar is the pickling ingredient, almost any large container of the proper material is suitable. Unchipped enamelware, stainless steel or glassware is best.

For fermenting and brining, a crock or stone jar, an unchipped enamel-lined pan, a large glass jar, a bowl or a casserole can be used for small quantities. Kegs and barrels can be used for large quantities; they should be of hardwood and either enamel, glass or paraffin lined.

The container used must be fitted with a heavy plate or lid which will fit inside the container to cover the food in the brine. A weight is necessary to hold the cover down and to keep the food below the surface of the brine. A glass jar filled with water makes a good weight.

Much of the rest of the equipment will be readily available in the kitchen.

**STEP-BY-STEP PICKLING**

1. Read "Learning About Canning" on pages 2-15.
2. Read recipe to determine equipment and ingredients necessary. Assemble all equipment and utensils. Make sure everything is clean.
4. Remove pickle products from pickling solution and pack into jars according to directions in recipe. Use just enough for one canner load at a time.
5. Leave proper head space.
6. Remove air bubbles.
7. Wipe top and threads of jar with clean, damp cloth. Attach closures.
8. Place each jar as it is filled onto rack in canner containing hot water. Reduce heat to hold water at a steady boil. Start timing process as soon as placed in boiling water. If, during processing time, water should boil away and the tops of the jars become exposed, cover them with 1 to 2 inches [25 to 51 mm]. Cover canner and bring water to boil. Reduce heat to hold water at a steady boil. Start counting processing time when water reaches a full boil, except for fermented cucumbers and fresh-packed dills. For these products, start counting processing time as soon as placed in boiling water. If, during processing time, water should boil away and the tops of the jars become exposed, cover them with 1 to 2 inches of boiling water.
9. When processing time has been completed, remove jars from canner. Stand jars on cloths, out of drafts and with space between. Complete seal if necessary.
10. After 12-24 hours, test seals.
11. Store sealed jars in dark, dry, cool place.

**BRINED CURED PICKLES**

Pickle making begins with the brine, and to make carelessly or to maintain carelessly a brine is the reason for most of the soft and unfit pickles.

Remember these key points: Use clean stone or glass jars, use only a recommended pickling variety of cucumbers, use only pure granulated salt, do not use hard water.

**FERMENTED OR BRINED PICKLED VEGETABLES**

Pickles must be placed in a brine and fermented for approximately 6 weeks before the addition of the final and last brine.

**GENERAL DIRECTIONS**

1. Wash cucumbers carefully. Use only freshly harvested, slightly immature pickling variety.
2. Weigh cucumbers. Put in a clean crock or glass jar and cover with a 10 percent brine solution—made by dissolving 1 cup [240 mL] salt in 2 quarts [1900 mL] water. (Cucumbers may be added during the first day or two of curing process if enough brine is added to cover them and if salt is added in definite amounts to maintain a 10 percent brine.)
3. Weight cucumbers down under brine with a clean plate or something similar. A glass jar filled with water makes an excellent weight.
4. Store in a cool, dark place.
5. Next day, add salt at the rate of 1 cup for each 5 pounds [2.3 kg] of cucumbers. This is necessary to maintain a 10 percent brine solution. Salt should be added on top of plate or clean cloth (and not directly on the cucumbers) to prevent its going to the bottom and forming too strong a brine there.
6. Remove scum when it forms on top of brine. This, if left on, will destroy the acidity of the brine and result in spoilage of the product.
7. At the end of the week and for 4 or 5 succeeding weeks, add ¼ cup [60 mL] salt for each 5 pounds [2.3 kg] of cucumbers. Add in same manner as in No. 5.
8. Fermentation resulting in bubble formation should continue about 4 weeks. Test for bubbles by tapping container on the side with your hand. As a second test, cut a cucumber in half; if it is the same color throughout and has no
noticeable rings or white spots, fermentation is complete.

9. Cucumbers may be kept in this 10 percent brine solution—no more salt added after they are cured—until made into pickles. Pour a layer of paraffin \( \frac{1}{4} \) inch \([6 \, \text{mm}]\) thick on top of brine; cover with a lid and store in a dark, dry, cool place.

10. The best temperature for brining cucumbers is about 80-85°F \([27-28^\circ \text{C}]\). To use brined cucumbers in pickle recipes, they need to be soaked in water to remove salt.

11. To use brined cucumbers in pickle recipes, they need to be soaked in water to remove salt.

**DESALTING CURED CUCUMBERS**

1. Cover cucumbers with hot water \((180^\circ \text{F} [82^\circ \text{C}])\) (at least 3 times as much water as cucumbers.) Let stand about 4 hours. Stir occasionally.

2. Lift cucumbers out of water; pour out water, rinse container.

3. Cover cucumbers with hot water \((180^\circ \text{F} [82^\circ \text{C}])\). Let stand about 4 hours. Stir occasionally.

4. Lift cucumbers out of water; pour out water, rinse container.

5. Cover cucumbers with hot water \((180^\circ \text{F} [82^\circ \text{C}])\). Let stand about 4 hours. Stir occasionally.

6. Lift cucumbers out of water; pour out water, rinse container.

7. Prick the cucumbers through and through in several places to prevent shriveling, using silver or stainless steel fork.

8. Then let stand in a weak vinegar solution (1 part water to 3 parts cider vinegar) for 12 hours.

9. Taste to see if sufficient salt has been removed; if not, let stand 12 hours longer.

10. Place the "desalted" cucumbers into your favorite pickling solution. Note: If in no hurry, salted cucumbers can be soaked in cold water. Use 3 or 4 times as much water as cucumbers. Change the water every 8 hours. Stir the cucumbers occasionally. The salt should be removed in a 24-hour period.

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**CUCUMBER CHUNKS**

4 quarts \([3800 \, \text{mL}]\) \(1\)-inch \([25 \, \text{mm}]\) slices to medium cucumbers

*Brine 1*

1\(\frac{1}{2}\) cups \([360 \, \text{mL}]\) salt

4 quarts \([3800 \, \text{mL}]\) water

*Brine 2*

1 quart \([950 \, \text{mL}]\) vinegar

2 cups \([480 \, \text{mL}]\) sugar

3 cups \([720 \, \text{mL}]\) water

2 tablespoons \([30 \, \text{mL}]\) mixed pickling spices

Add to brine 2 to 3 cups \([480-720 \, \text{mL}]\) sugar

Put cucumber slices in a stone jar, large glass container or stainless steel container. Dissolve salt in 4 quarts \([3800 \, \text{mL}]\) water. Pour over cucumber slices. Cover cucumbers with dinner plate or glass pie plate. Fill jar with water and use to hold plate under brine. Cover stone jar and let stand 36 hours in a cool place. Drain. Pour 1 quart \([950 \, \text{mL}]\) vinegar over cucumbers; add water to cover. Simmer 10 minutes. Drain, discarding liquid.

Combine 2 cups \([480 \, \text{mL}]\) sugar, 5 cups \([1200 \, \text{mL}]\) vinegar and 3 cups \([720 \, \text{mL}]\) water. Tie spices in a cheesecloth bag; add to vinegar mixture. Simmer 10 minutes. Pour over cucumbers; cover and let stand 24 hours. Drain, reserving syrup; add remaining 2 to 3 cups of sugar to syrup according to taste; heat to boiling. Pack cucumbers. Process quarters 15 minutes in boiling water bath.

Yield: about 8 pints \([3840 \, \text{mL}]\).

**CUCUMBER SANDWICH PICKLES**

6 cups \([1440 \, \text{mL}]\) \(\frac{1}{4}\)-inch \([6 \, \text{mm}]\) slices to medium cucumbers

*Brine 1*

1\(\frac{1}{2}\) cup \([120 \, \text{mL}]\) salt

2 quarts \([1900 \, \text{mL}]\) cold water

*Brine 2*

3 cups \([720 \, \text{mL}]\) vinegar

3 cups \([720 \, \text{mL}]\) water

*Brine 3*

1 cup \([240 \, \text{mL}]\) brown sugar

1 cup \([240 \, \text{mL}]\) sugar

\(\frac{1}{2}\) teaspoon \([2.5 \, \text{mL}]\) celery seed

\(\frac{1}{2}\) teaspoon \([2.5 \, \text{mL}]\) mustard seed

\(\frac{1}{2}\) teaspoon \([2.5 \, \text{mL}]\) turmeric

2 cups \([480 \, \text{mL}]\) vinegar

1 cup \([240 \, \text{mL}]\) water

Sprinkle salt over cucumbers; add 2 quarts \([1900 \, \text{mL}]\) cold water and let stand 2 to 3 hours. Drain thoroughly. Combine 3 cups \([720 \, \text{mL}]\) vinegar and 3 cups \([720 \, \text{mL}]\) water; bring to boiling. Add cucumbers, simmer about 8 minutes. (Cucumbers should not become soft.) Drain well, discarding liquid. Combine 2 cups \([480 \, \text{mL}]\) vinegar and 1 cup \([240 \, \text{mL}]\) water with remaining ingredients; simmer 10 minutes. Add drained cucumbers. Bring to boiling. Pack, boiling hot, into hot pint jars, leaving \(\frac{1}{4}\)-inch \([6 \, \text{mm}]\) head space. Remove air bubbles. Adjust caps. Process 10 minutes in boiling water bath.

Yield: about 3 pints \([1440 \, \text{mL}]\).
CURED OR BRINED DILL PICKLES
40-50 medium size cucumbers
1 pound (1½ cups) [454 g] pure salt
½ cup (2 oz.) [56 g] whole mixed pickling spices
2-3 bunches fresh or dried dill
1 pint [480 mL] vinegar
2 gallons [7600 mL] water

Wash and drain the cucumbers. Place half of pickling spices and a layer of dill in a 5-gallon [19 L] crock. Add cucumbers to within 4 inches [102 mm] of top. Mix well vinegar, salt and water and pour over cucumbers. Place a layer of dill and other half of pickling spices over the top. Garlic may be added to recipe if desired.

Cover with a heavy clean plate or something similar to hold the cucumbers under the brine. Use only enough brine to cover the plate, since the liquid drawn from the cucumbers may overflow the crock.

Keep container at about 70°F [21°C]. Daily remove the scum that forms over the top. Let pickles ferment until well-flavored with dill and clear throughout, with no white spots when cut. In about 2 to 3 weeks the pickles should be ready to use.

Pack the cured pickles into hot quart jars, leaving ½-inch [6 mm] head space. Strain the pickle brine, bring to a boil and pour over pickles. Let stand 24 hours. Rinse well and drain. Tie spices in a cheesecloth bag; add to remaining ingredients. Bring to boiling; pour over cucumbers. Cover and let stand 2 weeks in a cool place. (If scum forms, remove it each day.) Drain, discard brine, and cut cucumbers into 1-inch [25 mm] chunks. Cover with cold water; let stand 24 hours. Rinse well and drain. Tie spices in a cheesecloth bag to remaining ingredients. Bring to boiling; pour over cucumbers. Let stand 24 hours. Drain, saving syrup. Heat syrup to boiling and pour over pickles. Let stand 24 hours. Repeat the last step three times. Pack pickles into hot pint jars, leaving ½-inch [6 mm] head space. Remove spice bag. Bring syrup to boiling. Pour, boiling hot, over pickles, leaving ½-inch [6 mm] head space. Remove air bubbles. Adjust caps. Process pints and quarts 10 minutes in boiling water bath. Yield: about 3 pints [1440 mL].

Note: You may use cured cucumbers in this recipe. If so, make these changes:
1. Use only ¼ cup [60 mL] salt.
2. Let set in this pickling solution 3 weeks before sealing; and
3. Drain liquid off weekly, bring to a boil and pour over cucumbers.

SWEET CHUNK PICKLES
2 dozen (3 to 4-inch) [76-102 mm] cucumbers

Brine 1
½ cup [120 mL] salt
½ cup [120 mL] vinegar
2 quarts [1900 mL] water

Brine 2
6 cups [1440 mL] sugar
1 stick cinnamon
1½ teaspoons [7.5 mL] whole cloves
1½ teaspoons [7.5 mL] mixed pickling spices
3 cups [720 mL] vinegar


SWEET CUCUMBER PICKLES
3 pounds [1.4 kg] cucumbers brined
1½ pounds [680 g] sugar
2 sticks cinnamon
1 tablespoon [15 mL] ginger root
1 tablespoon [15 mL] whole cloves
1 tablespoon [15 mL] whole mace
2 pints [950 mL] vinegar

Remove cucumbers from brine and desalt as on page 29. Dissolve sugar in vinegar; add spices tied loosely in cheesecloth. Bring to a boil, add drained cucumbers and boil 3 minutes. Pour into a container and allow to stand for 3 days. Each morning drain off liquid, bring to a boil and pour over cucumbers. Pack the cucumbers in hot pint jars, leaving ¼-inch [6 mm] head space. Heat vinegar solution to boiling and cover the cucumbers, leaving ¼-inch [6 mm] head space. (Throw away the spice bag). Adjust caps. Process 15 minutes, in boiling water bath. Cool and store pickles. Yield: about 5 pints [2400 mL].

SOUR CUCUMBER PICKLES
May be made by following directions for Sweet Cucumber Pickles, except omit all or part of sugar.

SWEET ICICLE PICKLES
20 cucumbers, 4 to 6 inches [102-152 mm] long, cut into quarters

Brine 1
1 cup [240 mL] salt
2 quarts [1900 mL] water

Brine 2
1½ tablespoons [22.5 mL] mixed pickling spices
5 cups [1200 mL] sugar
5 cups [1200 mL] vinegar

Put cucumber strips in stone jar, large glass container, or stainless steel container. Add salt to water and bring to boiling. Pour over cucumbers. Cover cucumbers with dinner plate or glass pie plate. Fill jar with water and use to hold plate under brine. Cover stone jar and let stand 1 week in a cool place. (If scum forms, remove it each day.) Drain, discard brine; rinse cucumbers thoroughly. Cover with boiling water; let stand 24 hours. Drain. Cover with boiling water. Cover; let stand 24 hours. Drain. Tie spices in a cheesecloth bag. Add to sugar and vinegar; bring to boiling. Pour over cucumbers; cover and let stand 24 hours. Drain syrup; bring syrup to boiling and pour over cucumbers. Repeat this step each day for 4 days. Pack pickles into hot jars, leaving ¼-inch [6 mm] head space. Remove spice bag. Heat syrup to boiling. Pour, boiling hot, over pickles, leaving ¼-inch [6 mm] head space. Remove air bubbles. Adjust caps. Process pints and quarts 10 minutes in boiling water bath. Yield: about 6 pints [2880 mL].

FRESH PACK

The food product is placed in jars, brine is added and jars processed. It requires a time period of about 4 to 5 weeks for the food item to cure and develop a satisfactory flavor.
**APPLE CHUTNEY**

2 quarts [1900 mL] chopped, cored, pared, tart apples (about 16 medium)
2 pounds [907 g] seedless raisins
1 cup [240 mL] chopped onions
1 cup [240 mL] chopped sweet red peppers (about 2 medium)
4 cups [960 mL] brown sugar
3 tablespoons [45 mL] mustard seed
2 tablespoons [30 mL] ground ginger
1 half [360 mL] chopped onion
1 half [360 mL] chopped sweet red peppers (about 3 medium)
1 cup [240 mL] seedless raisins
3 cups [720 mL] brown sugar
1 hot red pepper
1 clove garlic, crushed
1 tablespoon [15 mL] ground cinnamon
1 teaspoon [5 mL] salt
1 teaspoon [5 mL] ground cinnamon
3 cups [720 mL] vinegar

Combine ingredients; simmer until thick, about 1 hour and 15 minutes. As mixture thickens, stir frequently to prevent sticking. Pour, boiling hot, into hot pint jars, leaving 6 mm head space. Adjust caps. Process 10 minutes in boiling water bath. Yield: about 10 pints [4800 mL].

Note: For a milder chutney, another quart of chopped apples may be used.

**Peach or pear chutney**

4 quarts [3800 mL] finely chopped, peeled peaches or pears
1 cup [240 mL] seedless raisins
1 cup [240 mL] chopped onions
2 to 3 cups [480-720 mL] brown sugar
1/2 cup [60 mL] mustard seed
2 tablespoons [30 mL] ground ginger
2 teaspoons [10 mL] salt
1 clove garlic, minced (optional)
1 hot red pepper
5 cups [1200 mL] vinegar

Combine all ingredients and cook slowly until thick, about 40 minutes. Stir frequently to prevent sticking. Pour, boiling hot, into hot pint jars, leaving 6 mm head space. Adjust caps. Process 10 minutes in boiling water bath. Yield: about 7 pints [3360 mL].

Note: For a milder chutney, remove seeds from hot pepper. Use rubber gloves to prevent burning hands.

**TOMATO APPLE CHUTNEY**

2 1/2 quarts [2375 mL] peeled, cored, chopped ripe tomatoes (about 15 large)
1 quart [950 mL] chopped, cored, pared apples (about 4 to 6)
2 cups [480 mL] chopped cucumber (about 1 large)
1 1/2 cups [360 mL] chopped onion
1 1/2 cups [360 mL] chopped sweet red peppers (about 3 medium)
1 cup [240 mL] seedless raisins
3 cups [720 mL] brown sugar
1 hot red pepper
1 clove garlic, crushed
1 tablespoon [15 mL] ground ginger
1 teaspoon [5 mL] salt
1 teaspoon [5 mL] ground cinnamon
3 cups [720 mL] vinegar

Combine all ingredients and cook slowly until thick, about 40 minutes. As mixture thickens, stir frequently to prevent sticking. Pour, boiling hot, into hot pint jars, leaving 6 mm head space. Adjust caps. Process 10 minutes in boiling water bath. Yield: about 3 pints [1400 mL].

**Fruit pickles**

**CRAB APPLE PICKLES**

2 quarts [1900 mL] crab apples with stems (about 2 1/2 pounds [1.1 kg])
6 cups [1440 mL] sugar
2 sticks cinnamon
1 1/2 tablespoons [22.5 mL] whole allspice
1 1/2 tablespoons [22.5 mL] whole cloves
3 cups [720 mL] water
3 cups [720 mL] vinegar

To prevent apples from bursting, run a large sterilized needle through each. Tie spices in a cheesecloth bag. Combine remaining ingredients; add spices and boil 5 minutes. Add apples, a layer at a time, cook gently until the apples are almost tender. Carefully remove apples. Repeat until all apples are cooked. Pour boiling syrup over apples. Cover and let apples stand 12 to 18 hours in a cool place. Carefully pack apples into hot jars, leaving 6 mm head space. Remove spice bag. Heat syrup to boiling. Pour boiling syrup over apples, leaving 6 mm head space. Remove air bubbles. Adjust caps. Process 20 minutes in boiling water bath. Yield: about 3 quarts [2850 mL].

**FIG PICKLES**

4 quarts [3800 mL] firm-ripe figs
3 cups [720 mL] sugar
2 quarts [1900 mL] water
2 cups [480 mL] sugar
2 sticks cinnamon
1 tablespoon [15 mL] whole allspice
1 tablespoon [15 mL] whole cloves
3 cups [720 mL] vinegar

Peel figs. (If unpeeled are preferred, pour boiling water over figs and let stand until cool; drain.) Add 3 cups [720 mL] sugar to water and cook until sugar dissolves. Add figs and cook slowly 30 minutes. Add 2 cups [480 mL] sugar and vinegar. Tie spices in a cheesecloth bag; add to figs. Cook gently until figs are clear. Cover and let stand 12 to 24 hours in a cool place. Remove spice bag. Heat to simmering; pack, hot, into hot jars, leaving 6 mm head space. Remove air bubbles. Adjust caps. Process pints and quarts 15 minutes in boiling water bath. Yield: about 8 pints [3840 mL].

**PEACH PICKLES**

8 pounds [3.6 kg] peeled peaches (small to medium sized)
3 pounds [1.4 kg] sugar
4 sticks cinnamon (2 inches long) [51 mm]
2 tablespoons [30 mL] whole cloves, crushed
1 tablespoon [15 mL] whole allspice
1 quart [950 mL] ginger
1 quart [950 mL] vinegar

Wash and peel peaches with a sharp knife, and drop into a cold salt and vinegar water solution (2 tablespoons [30 mL] each of salt and vinegar per gallon [3800 mL] water). Dissolve sugar in vinegar in preserving kettle and put on range to heat. Boil 5 minutes and skim. Add spices (tied loosely in cheesecloth). Wash salt-vinegar water off peaches and drain well. Drop drained peaches into boiling syrup and cook until they can be pierced with a fork, but not soft. Remove from range and allow peaches to set in syrup overnight to plump. Bring to a boil and pack into hot, preheated jars, leaving 6 mm head space. Cover with syrup, leaving 6 mm head space. Remove air bubbles. Adjust caps. Process 20 minutes in boiling water bath. Yield: about 3 quarts [2850 mL].
PEACH PICKLES
24 small firm-ripe peeled peaches
2 cups [480 mL] sugar
2 sticks cinnamon
1 tablespoon [15 mL] whole allspice
1 tablespoon [15 mL] whole cloves
1 piece ginger root
3 cups [720 mL] vinegar
2 cups [480 mL] water
2 cups [480 mL] sugar

Clingstones are best for pickling, but freestone peaches may be used. Prepare peaches as given in recipe on page 31. Tie spices in a cheesecloth bag. Add spice bag, 2 cups [480 mL] sugar and water to vinegar. Bring to boiling. Pour boiling syrup over peaches; cover and let stand 12 to 18 hours in a cool place. Pack peaches into hot jars, leaving 14-inch [6 mm] head space. Add remaining 2 cups [480 mL] sugar to syrup. Bring to boiling, pour over peaches, leaving 14-inch [6 mm] head space. Remove air bubbles. Adjust caps. Process pints and quarts 15 minutes in boiling water bath. Yield: about 6 pints [2880 mL].

Note: Sugar is added in small amounts to avoid shriveling the peaches.

PEAR PICKLES
4 dozen firm-ripe Seckel pears
3 cups [720 mL] sugar
1 tablespoon [15 mL] mixed pickling spices
1 teaspoon [5 mL] whole cloves
1 piece ginger root
1½ lemon, thinly sliced
2½ cups [600 mL] water
1½ cups [360 mL] vinegar

Pare pears, leaving whole with stem intact. Tie spices in a cheesecloth bag; add to remaining ingredients; simmer 5 minutes. Add pears, a layer at a time, and cook gently until just tender, about 15 minutes. Carefully remove pears. Repeat until all pears are cooked. Pour boiling syrup over pears. Pack pears into hot jars, leaving 14-inch [6 mm] head space. Remove air bubbles. Adjust caps. Process pints and quarts 15 minutes in boiling water bath. Yield: about 7 pints [3360 mL].

Note: Sugar is added in small amounts to avoid shriveling the peaches.

WATERMELON RIND
2 quarts [1900 mL] prepared watermelon rind
3 cups [720 mL] cold water
3 tablespoons [45 mL] salt
8 cups [1920 mL] sugar
3 sticks cinnamon
2 tablespoons [30 mL] whole cloves
2 pieces ginger root
1 lemon, thinly sliced
1 quart [950 mL] vinegar
1 quart [950 mL] water

To prepare watermelon rind, trim dark skin and pink flesh from thick watermelon rind; cut in 1-inch [25 mm] pieces or as wanted. Dissolve lime or salt in 2 quarts [1900 mL] water, pour over rind. If needed, add more water to cover rind. Let stand 2 hours if lime is used, or 6 hours if salt is used. Drain; rinse and cover rind with cold water. Cook until just tender; drain. Tie spices in a cheesecloth bag. Combine spices with remaining ingredients and simmer 10 minutes. Add watermelon rind and simmer until clear. Remove spice bag. Pack, boiling hot, into hot pint jars, leaving 14-inch [6 mm] head space. Remove air bubbles. Adjust caps. Process 10 minutes in boiling water bath. Yield: about 10 half-pints [2400 mL].

BEET OR RED RELISH
1 quart [950 mL] chopped cooked beets
1 quart [950 mL] chopped cabbage (about 1 small head)
1 cup [240 mL] chopped onions
1 cup [240 mL] chopped sweet red peppers (about 2 medium)
1½ cups [360 mL] sugar
1 tablespoon [15 mL] prepared horseradish
1 tablespoon [15 mL] salt
3 cups [720 mL] vinegar


CHOW-CHOW RELISH
1 quart [950 mL] chopped sweet red peppers (about 2 medium)
3 cups [720 mL] chopped cabbage (about 1 small head)
2 cups [480 mL] chopped green tomatoes (about 4 medium)
2 cups [480 mL] chopped onions
2 cups [480 mL] chopped sweet green peppers (about 4 medium)
1 cup [240 mL] chopped sweet red peppers (about 2 medium)
3 tablespoons [45 mL] salt
1½ cups [360 mL] sugar
2 teaspoons [10 mL] celery seed
2 teaspoons [10 mL] dry mustard
1 teaspoon [5 mL] mustard seed
1 teaspoon [5 mL] turmeric
½ teaspoon [2.5 mL] ground ginger
2½ cups [600 mL] vinegar

Combine chopped vegetables; sprinkle with salt. Let stand 4 to 6 hours in a cool place. Drain well.
Combine vinegar, sugar and spices; simmer 10 minutes. Add vegetables; simmer 10 minutes. Bring to boiling. Pack, boiling hot, into hot pint jars, leaving \( \frac{3}{4} \)-inch [6 mm] head space. Adjust caps. Process 10 minutes in boiling water bath. Yield: about 4 pints [1920 mL].

**CORN RELISH**

- 2 quarts [1900 mL] cut corn (about 18 ears)
- 1 quart [950 mL] chopped cabbage (about 1 small head)
- 1 cup [240 mL] chopped onions
- 1 cup [240 mL] chopped sweet green peppers (about 2 medium)
- 1 cup [240 mL] chopped sweet red peppers (about 2 medium)
- 1-2 cups [240-480 mL] sugar
- 2 tablespoons [30 mL] dry mustard
- 1 tablespoon [15 mL] celery seed
- 1 tablespoon [15 mL] mustard seed
- 1 tablespoon [15 mL] salt
- 1 tablespoon [15 mL] turmeric
- 2 teaspoons [10 mL] whole allspice
- 2 teaspoons [10 mL] whole cloves
- 1 quart [950 mL] vinegar

To prepare corn: Boil 5 minutes, cut from cob. Combine with remaining ingredients and simmer 20 minutes. Bring to boiling. Pack, boiling hot, into hot pint jars, leaving \( \frac{3}{4} \)-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 6 pints [2880 mL].

To make corn relish with frozen corn: Defrost overnight in refrigerator, or for 2 to 3 hours at room temperature. You may place frozen corn in front of fan to hasten defrosting. Follow directions in recipe.

To make corn relish with vacuum packed canned whole kernel corn: Drain enough canned corn to measure 2 quarts [1900 mL], and combine with ingredients listed. Follow directions in recipe.

**CUCUMBER RELISH**

- 2 quarts [1900 mL] chopped cucumbers (about 4 medium)
- 2 cups [480 mL] chopped sweet green peppers (about 4 medium)
- 2 cups [480 mL] chopped sweet red peppers (about 4 medium)
- 1 cup [240 mL] chopped onions
- \( \frac{1}{2} \) cup [120 mL] salt
- 2 quarts [1900 mL] cold water
- 1% cups [360 mL] brown sugar
- 2 sticks cinnamon
- 1 tablespoon [15 mL] mustard seed
- 1 tablespoon [15 mL] turmeric
- 2 teaspoons [10 mL] whole allspice
- 2 teaspoons [10 mL] whole cloves
- 1 quart [950 mL] vinegar

Combine cucumbers, peppers and onions; sprinkle with turmeric. Dissolve salt in 2 quarts [1900 mL] cold water and pour over vegetables; let stand 1 hour. Drain thoroughly. Tie spices in a cheesecloth bag; add to sugar and vinegar. Heat to boiling and pour over vegetables. Cover and let stand 12 to 18 hours in a cool place. Simmer until vegetables are hot. Bring to boiling. Pack, boiling hot, into hot pint jars, leaving \( \frac{3}{4} \)-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 7 half-pints [1680 mL].

**HORSERADISH RELISH**

- 1 cup [240 mL] grated horseradish
- \( \frac{1}{4} \) teaspoon [1.25 mL] salt
- \( \frac{1}{2} \) cup [120 mL] vinegar

Wash horseradish roots thoroughly, and remove the brown, outer skin. (A vegetable peeler is useful in removal of outer skin.) The roots may be grated, or cut into small cubes and put through a food chopper or a blender. Combine ingredients. Pack into clean jars. Seal tightly. Store in refrigerator.

**PEAR RELISH**

- 1 peck pears [8810 mL]
- 6 large onions
- 6 sweet green peppers
- 6 sweet red peppers
- 1 bunch celery

Wash the above ingredients in cold water. Peel and core the pears. Remove stem and seed from the peppers. Clean the celery, peel the onion, and put them through a food chopper. Then add:

- 3 cups [720 mL] sugar
- 1 tablespoon [15 mL] allspice
- 1 tablespoon [15 mL] salt
- 5 cups [1200 mL] vinegar


**DIXIE RELISH**

- 1 quart [950 mL] chopped cabbage (about 1 small head)
- 2 cups [480 mL] chopped onions
- 2 cups [480 mL] chopped sweet green peppers (about 4 medium)
- 2 cups [480 mL] chopped sweet red peppers (about 4 medium)
- \( \frac{1}{2} \) cup [120 mL] salt
- 2 quarts [1900 mL] cold water
- \( \frac{3}{4} \) cup [180 mL] sugar
- 3 tablespoons [45 mL] mustard seed
- 2 tablespoons [30 mL] celery seed
- 1 quart [950 mL] vinegar

Dissolve salt in 2 quarts [1900 mL] cold water. Pour over chopped vegetables and let stand 1 hour. Drain. (If too salty, rinse and drain again.) Add vegetables, sugar and spices to vinegar; simmer 20 minutes. Bring to boiling. Pack boiling hot, into hot half-pint jars, leaving \( \frac{3}{4} \)-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 7 half-pints [1680 mL].
PEPPER-ONION RELISH
2 quarts [1900 mL] chopped sweet green peppers (about 16 medium)
2 quarts [1900 mL] chopped sweet red peppers (about 16 medium)
1½ cups [360 mL] chopped onions
3½ cups [180 mL] vinegar
2 tablespoons [10 mL] whole mixed pickling spices
1 hot pepper
1½ cups [360 mL] vinegar

Cover chopped vegetables with boiling water; let stand 5 minutes. Drain; cover again with boiling water and let stand 10 minutes. Drain. Tie sugar and salt to vinegar; simmer 15 minutes. Add drained vegetables and heat 10 minutes. Remove spice bag. Bring to boiling. Pour, boiling water bath. Yield: about 6 half-pints [1440 mL].

GREEN TOMATO RELISH
4 quarts [3800 mL] peeled, cored, chopped green tomatoes (about 32 medium)
2 quarts [1900 mL] chopped cabbage (about 1 large head)
2 cups [480 mL] chopped sweet red peppers (about 4 medium)
1 cup [240 mL] chopped onions
½ cup [120 mL] salt
1½ cups [360 mL] brown sugar
2 tablespoons [30 mL] mustard seed
1 tablespoon [15 mL] celery seed
4½ cups [1080 mL] vinegar
1 tablespoon [15 mL] prepared horseradish

Sprinkle salt over vegetables and mix thoroughly; let stand 3 to 4 hours. Drain thoroughly. Press to remove free liquid. Add sugar, spices and horseradish to vinegar; simmer 15 minutes. Add vegetables and heat to boiling. Pack, boiling hot, into hot pint jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 10 minutes in boiling water bath. Yield: about 7 pints [3360 mL].

RED PEPPER RELISH
7 cups [1680 mL] finely chopped sweet red peppers (14-16 medium)
6 cups [1440 mL] sugar
2 tablespoons [30 mL] salt
1 quart [950 mL] vinegar

Combine peppers and salt; let stand 3 to 4 hours. Add sugar and vinegar; cook, stirring frequently, until thick, about 45 minutes. Pour, boiling hot, into hot half-pint jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 10 minutes in boiling water bath. Yield: about 6 half-pints [1440 mL].

RUMMAGE RELISH
2 quarts [1900 mL] cored, chopped green tomatoes (about 16 medium)
1 quart [950 mL] peeled, cored, chopped ripe tomatoes (about 6 large)
1 quart [950 mL] chopped cabbage (about 1 small head)
3 cups [720 mL] chopped onions
2 cups [480 mL] chopped celery
1 cup [240 mL] chopped cucumbers
1 cup [240 mL] chopped sweet green peppers (about 2 medium)
1 cup [240 mL] chopped sweet red peppers (about 2 medium)
¾ cup [120 mL] salt
4 cups [960 mL] brown sugar
2 cloves garlic, minced
1 tablespoon [15 mL] celery seed
1 tablespoon [15 mL] ground cinnamon
1 tablespoon [15 mL] mustard seed
1 teaspoon [5 mL] ground ginger
½ teaspoon [2.5 mL] ground cloves
2 quarts [1900 mL] vinegar

Combine vegetables; add salt and mix thoroughly. Let stand 12 to 18 hours in a cool place; drain thoroughly. Add sugar, spices and garlic to vinegar; simmer 10 minutes. Add vegetables; simmer 30 minutes. Bring to boiling. Pack, boiling hot, into hot pint jars, leaving ¾-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 8 pints [3840 mL].

BARBECUE SAUCE
4 quarts [3800 mL] peeled, cored, chopped red-ripe tomatoes (about 24 large)
2 cups [480 mL] chopped onions
2 cups [480 mL] chopped celery
2 cups [480 mL] chopped peppers (about 3 medium)
2 hot red peppers
1 cup [240 mL] brown sugar
2 cloves crushed garlic
1 tablespoon [15 mL] dry mustard
1 tablespoon [15 mL] paprika
1 tablespoon [15 mL] salt
1 teaspoon [5 mL] peppercorns
1 teaspoon [5 mL] Tabasco sauce
½ teaspoon [.6 mL] cayenne pepper
1 cup [240 mL] vinegar

Combine tomatoes, quartered onions, celery and peppers. Cook until vegetables are soft, about 30 minutes. Press through a fine sieve or food mill. Cook until mixture is reduced to about one-half, about 45 minutes. Tie peppercorns in a cheesecloth bag; add with remaining ingredients and cook slowly until mixture is the consistency of catsup, about 1½ hours. As mixture thickens, stir frequently to prevent sticking. Pour, hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process half-pints and pints 20 minutes in boiling water bath. Yield: about 4 to 5 pints [1920-2400 mL].

CHILI SAUCE
4 quarts [3800 mL] peeled, cored, chopped, red-ripe tomatoes (about 24 large)
2 cups [480 mL] chopped onions
2 cups [480 mL] chopped sweet red peppers (about 4 medium)
1 hot red pepper
1 cup [240 mL] sugar
3 tablespoons [45 mL] salt
3 tablespoons [45 mL] mixed pickling spices
1 tablespoon [15 mL] celery seed
1 tablespoon [15 mL] mustard seed
2½ cups [600 mL] vinegar

Combine tomatoes, onions, sweet and hot peppers, sugar and salt. Cook gently 45 minutes. Tie spices
in a cheesecloth bag; add to tomato mixture; cook until very thick, about 45 minutes. As mixture thickens, stir frequently to prevent sticking. Add vinegar and cook slowly until as thick as wanted. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 6 pints [2880 mL].

PERUVIAN SAUCE

4 quarts [3800 mL] peeled, cored, chopped, red-ripe tomatoes (about 24 large)
1 quart [950 mL] chopped, cored, pared apples (4 to 5 medium)
1 quart [950 mL] chopped onions
1½ cups [360 mL] chopped sweet green peppers (about 3 medium)
1 hot red pepper
1 clove crushed garlic
3 cups [720 mL] brown sugar
1 tablespoon [15 mL] ground allspice
1 tablespoon [15 mL] mustard seed
1 tablespoon [15 mL] salt
1 teaspoon [5 mL] ground cinnamon
3 cups [720 mL] vinegar

Combine tomatoes, onions, apples, peppers, garlic and sugar. Cook slowly until thick, about 1 hour. As mixture thickens, stir frequently, to prevent sticking. Add salt, spices and vinegar. Cook until thick as wanted, 45 to 60 minutes. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 6 pints [2880 mL].

RED HOT SAUCE

2 quarts [1900 mL] peeled, cored, chopped red-ripe tomatoes (about 12 large)
1½ cups [360 mL] chopped, seeded, long, hot red peppers (about 24)
2 cups [480 mL] vinegar
1 cup [240 mL] sugar
2 tablespoons [30 mL] mixed pickling spices
1 tablespoon [15 mL] salt
2 cups [480 mL] vinegar

Use rubber gloves to prevent burning hands when seeding hot peppers. Combine tomatoes, peppers and 2 cups [480 mL] vinegar; cook until tomatoes are soft. Press through a sieve or food mill. Add sugar and salt. Tie spices in a cheesecloth bag and add to tomato mixture. Cook about 30 minutes or until thick. As mixture thickens, stir frequently to prevent sticking. Add remaining 2 cups [480 mL] vinegar. Cook until thick as wanted, about 20 to 30 minutes. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 4 half-pints [950 mL].

TOMATO CATSUP

2 quarts [1900 mL] seasoned tomato purée (see page 23).
1½ cups [320 mL] vinegar
¼ cup [120 mL] sugar
2 teaspoons [10 mL] whole allspice
2 sticks cinnamon
1½ teaspoons [7.5 mL] paprika
1 teaspoon [5 mL] whole cloves mustard
1 teaspoon [5 mL] salt
¼ teaspoon [1.25 mL] cayenne pepper

Combine purée, vinegar and sugar. Tie whole spices in a cheesecloth bag. Add to tomato mixture; add remaining ingredients and cook slowly until thick as wanted, about 45 to 60 minutes. As mixture thickens, stir frequently to prevent sticking. Remove spice bag. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 2 to 3 pints [950-1440 mL].

TOMATO CATSUP

Using Whole Tomatoes

4 quarts [3800 mL] peeled, cored, chopped, red-ripe tomatoes (about 24 large)
1 cup [240 mL] chopped onions
½ cup [120 mL] chopped sweet red peppers (about 1 medium)
1 cup [240 mL] sugar
1 tablespoon [15 mL] sugar
1 tablespoon [15 mL] paprika
1½ teaspoons [7.5 mL] celery seed
1 teaspoon [5 mL] whole allspice
1 teaspoon [5 mL] mustard seed
1 stick [30 mL] cinnamon
1 cup [240 mL] vinegar

Combine puree, vinegar and sugar. Tie whole spices in a cheesecloth bag. Add to tomato mixture; add remaining ingredients and cook slowly until thick as wanted, about 45 to 60 minutes. As mixture thickens, stir frequently to prevent sticking. Remove spice bag. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 3 pints [1440 mL].

SPICY CHILI SAUCE

4 quarts [3800 mL] peeled, cored, chopped, red-ripe tomatoes (about 24 large)
2 cups [480 mL] chopped onions
1½ cups [360 mL] chopped sweet green peppers (about 3 medium)
1½ cups [360 mL] sugar
1 tablespoon [15 mL] celery seed
1 tablespoon [15 mL] salt
1 teaspoon [5 mL] ground allspice
1 teaspoon [5 mL] ground cloves
1 teaspoon [5 mL] ground cinnamon
1 teaspoon [5 mL] ground ginger
1 to 1½ cups [240-360 mL] vinegar

Combine all ingredients. Bring to boiling; simmer until thick as wanted. Stir frequently to prevent sticking. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 8 pints [3840 mL].

WHOLE CRANBERRY SAUCE

8 cups [1920 mL] cranberries
4 cups [960 mL] sugar
4 cups [960 mL] water

JELLIED CRANBERRY SAUCE
4 1/4 cups [1020 mL] cranberries
1 1/4 cups [420 mL] water
2 cups [480 mL] sugar
Wash, sort and stem berries. Boil berries and water together until skins burst. Press through sieve or food mill. Add sugar to pulp and juice. Boil almost to jelly point (see page 42.) Pour, boiling hot, into hot jars, leaving 1/4-inch [6 mm] head space. Adjust caps. Process 10 minutes in boiling water bath. Yield: about 2 pints [960 mL].

Note: A stick of cinnamon or a few whole cloves may be cooked with the sauce to give a spicy flavor. Remove spices before packing sauce.

VICTORIA SAUCE (RHUBARB)
2 quarts [1900 mL] chopped rhubarb
1 1/2 cups [360 mL] chopped, seedless raisins
1/2 cup [120 mL] chopped onions
3 1/2 cups [840 mL] brown sugar
1/2 cup [120 mL] vinegar
1 teaspoon [5 mL] ground allspice
1 teaspoon [5 mL] ground cinnamon
1 teaspoon [5 mL] ground ginger
1 teaspoon [5 mL] salt
Combine rhubarb, onion, raisins, sugar and vinegar. Cook until thick, about 25 minutes. As mixture thickens, stir frequently to prevent sticking. Add spices; cook 5 minutes longer. Pour, boiling hot, into hot jars, leaving 1/4-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 4 pints [1920 mL].

CUCUMBER CHIPS
24 thinly sliced cucumbers, 4 to 5 inches long [102-127 mm]
1/2 cup [120 mL] salt
1 tablespoon [15 mL] turmeric
3 cups [720 mL] vinegar
1 quart [950 mL] water
2 cups [480 mL] sugar
2 sticks cinnamon
1 piece ginger root
1 tablespoon [15 mL] mustard seed
1 teaspoon [5 mL] whole cloves
1 quart [950 mL] vinegar
1 cup [240 mL] water
2 cups [480 mL] brown sugar
Sprinkle salt over cucumber slices; mix thoroughly. Let stand 3 hours: drain thoroughly. Combine turmeric, 3 cups [720 mL] vinegar and 1 quart [950 mL] water; bring to boiling and pour over cucumbers. Let stand until cold; drain. (Taste cucumbers; if too salty, rinse thoroughly, drain.) Add sugar to 1 quart [950 mL] vinegar and 1 cup [240 mL] water. Tie spices in cheesecloth bag. Add to vinegar mixture and simmer 15 minutes; pour over cucumbers. Let stand 12 to 24 hours in a cool place. Remove spice bag. Drain syrup into canner. Yield: about 7 pints [3360 mL].

DILL PICKLES KOSHER
Follow recipe for Dill Pickles—Short Method. When packing cucumbers, add to each jar:
1 bay leaf
1 clove garlic
1 piece hot red pepper
1/2 teaspoon [2.5 mL] mustard seed
Process as recommended.

DILL PICKLES SWEET
1 quart [950 mL] medium dill pickles
4 cups [960 mL] sugar
3 tablespoons [45 mL] mixed pickling spices
1 cup [240 mL] vinegar
Cut pickles into 1/4-inch [6 mm] slices. Pack loosely into hot jars, leaving 1/4-inch [6 mm] head space. Tie spices in cheesecloth bag; add to sugar and vinegar. Bring mixture to boil, cool to room temperature. Remove spice bag. Pour syrup over pickle slices, leaving 1/4-inch [6 mm] head space. Remove air bubbles. Adjust caps. Immediately place in refrigerator and leave there a minimum of one week before using to develop flavor. Yield: about 2 pints [960 mL].

Note: These pickles have not been sealed air tight, and must be stored in the refrigerator.

FRESH PACK PICKLED FOODS
CRYSTAL PICKLES
7 pounds [3.2 kg] green tomatoes
2 gallons [7600 mL] water
1/2 ounce [9 g] lime
4 1/2 pounds [2 kg] sugar
6 sticks cinnamon, 2 inches long [51 mm]
2 tablespoons [30 mL] salt
1 teaspoon [5 mL] grated nutmeg
1 teaspoon [5 mL] ground ginger
2 quarts [1900 mL] vinegar
Wash green tomatoes thoroughly: drain; slice 3/4-inch [6 mm] thick; place in large container. Dissolve lime in water. If brine is cloudy, pour through a cheesecloth. Pour brine over tomato slices; let stand 24 hours, stirring occasionally. Remove. Rinse well through several cold waters to remove all lime sediment; soak in cold water for 4 hours; change water each hour; drain. Dissolve sugar in vinegar, add spices tied loosely in cheesecloth and bring to a boil. Add tomato slices and boil rapidly until slices are glazed and syrup clings to the spoon in drops. Remove from heat and allow to set in syrup overnight. Drain off syrup and bring to a boil. Pack tomato slices loosely into hot jars, leaving 1/4-inch [6 mm] head space. Cover with boiling syrup, leaving 1/4-inch [6 mm] head space. Remove air bubbles. Adjust caps. Process 10 minutes in boiling water bath. Yield: about 7 pints [3360 mL].
**MIXED PICKLES**
1 quart [950 mL] small cucumbers (cut into 1-inch [25 mm] slices)  
2 cups [480 mL] pared carrots (1 1/2-inch [38 mm] slices)  
2 cups [480 mL] celery (1 1/2-inch [38 mm] slices)  
2 cups [480 mL] peeled pickling onions  
2 sweet red peppers (cut into wide strips)  
1 small cauliflower (broken into flowerets)  
1 cup [240 mL] salt  
4 quarts [3800 mL] water  
2 cups [480 mL] sugar  
3/4 cup [60 mL] mustard seed  
2 tablespoons [30 mL] celery seed  
1 hot red pepper  
6 1/2 cups [1560 mL] vinegar

Dissolve salt in cold water. Pour over prepared vegetables. Let stand 12 to 18 hours in a cool place. Drain thoroughly. Add spices, hot red pepper and sugar to vinegar; boil 3 minutes. Add vegetables; simmer until thoroughly heated. Pack, boiling 12 to 18 hours in a cool place. Drain hot, into hot jars, leaving 1 1/4-inch [6 mm] head space. Remove air bubbles. Adjust caps. Process pints and quarts 10 minutes in boiling water bath. Yield: about 6 pints [2880 mL].

**OLIVE OIL PICKLES**
3 quarts [2850 mL] small cucumbers (1/4-inch [6 mm] slices)  
3 medium sliced onions  
1/2 cup [120 mL] salt  
3 tablespoons [45 mL] mustard seed  
2 tablespoons [30 mL] celery seed  
3 quarts [1900 mL] vinegar  
3 cups [720 mL] water  
3/4 cup [160 mL] sugar  
3/4 cup [160 mL] olive oil

Add salt to cucumbers and onions; let stand 3 to 4 hours. Drain. (Taste; if too salty, rinse with cold water and drain again.) Combine vinegar, water and spices; bring to boiling. Add vegetables and return to boiling. Remove from heat; add salt and olive oil and mix thoroughly. Return to boiling. Pack, boiling hot, into hot jars, leaving 1 1/4-inch [6 mm] head space. Remove air bubbles. Adjust caps. Process 10 minutes in boiling water bath. Yield: about 6 pints [2850 mL].

**BEET PICKLES**
3 quarts [2850 mL] peeled, cooked small beets  
2 cups [480 mL] sugar  
2 sticks cinnamon  
1 tablespoon [15 mL] whole allspice  
1 1/2 teaspoons [7.5 mL] salt  
3 1/2 cups [840 mL] vinegar  
1 1/2 cups [360 mL] water

To cook beets: Wash and drain beets. Leave 2 inches [51 mm.] of stems and the tap roots. Cover with boiling water and cook until tender. Combine all ingredients, except beets; simmer 15 minutes. Pack beets into hot jars, leaving 1 1/4-inch [6 mm] head space. (Cut larger beets in half, if necessary.) Remove cinnamon. Bring liquid to boiling. Pour, boiling hot, over beets leaving 1 1/4-inch [6 mm] head space. Adjust caps. Process pints and quarts 30 minutes in boiling water bath. Yield: about 6 pints [2880 mL].

**CARROT PICKLES**
2-3 bunches small carrots  
1 cup [240 mL] sugar  
1 tablespoon [15 mL] mixed pickling spices  
1 stick cinnamon  
1 teaspoon [5 mL] salt  
2 cups [480 mL] vinegar  
1 1/2 cups [360 mL] water

Cook carrots until just tender. Drain and remove skins. Leave small carrots whole; cut larger ones into pieces as desired. Combine sugar, vinegar, water and salt. Tie spices in a cheesecloth bag; add to vinegar mixture. Boil 5 to 8 minutes. Pack carrots into hot jars, leaving 1 1/4-inch [6 mm] head space. Remove spice bag. Heat syrup to boiling. Pour, boiling hot, over carrots, leaving 1 1/4-inch [6 mm] head space. Adjust caps. Process pints and quarts 30 minutes in boiling water bath. Yield: about 8-10 pints [3840-4800 mL].

**OTHER VEGETABLES**
DILL BEANS
2 pounds [907 g] trimmed green beans
1/4 cup [60 mL] salt
4 heads dill
4 cloves garlic
1 teaspoon [5 mL] cayenne pepper
2 1/2 cups [600 mL] vinegar
2 1/2 cups [600 mL] water
Pack beans, lengthwise, into hot jars, leaving 1/4-inch [6 mm] head space. To each pint, add 1/4 teaspoon [1.25 mL] cayenne pepper, 1 clove garlic and 1 head dill. Combine remaining ingredients and bring to boiling. Pour, boiling hot, over beans, leaving 1/4-inch [6 mm] head space. Remove air bubbles. Adjust caps. Process pints and quarts 10 minutes in boiling water bath. Yield: about 4 pints [1920 mL].

DILLED BRUSSELS SPROUTS
2 pounds [907 g] Brussels sprouts
1 teaspoon [5 mL] cayenne pepper
4 cloves garlic
4 heads dill
3 tablespoons [45 mL] salt
2 1/2 cups [600 mL] water
2 1/2 cups [600 mL] vinegar
Cook Brussels sprouts until just tender, leaving whole. Combine water, vinegar, salt, pepper and dill; boil about 5 minutes. Pack Brussels sprouts into hot jars. Pour vinegar solution, boiling hot, over Brussels sprouts, leaving 1/4-inch [6 mm] head space. (A clove of garlic and 1 head of dill can be placed into each jar if desired). Adjust caps. Process pints about 15 minutes in boiling water bath canner. Yield: about 4 pints [1920 mL].

OKRA PICKLES
3 1/2 pounds [1.6 kg] small okra pods
1/4 cup [80 mL] salt
3 small hot peppers
2 teaspoons [10 mL] dill seed
1 garlic bud
1 quart [950 mL] water
1 pint [480 mL] vinegar
Pack okra firmly into hot jars, leaving 1/4-inch [6 mm] head space. Put a garlic bud in each jar. Pour boiling brine to cover, leaving 1/4-inch [6 mm] head space. Adjust caps. Process 10 minutes in boiling water bath. Yield: about 4 to 5 pints [1920-2400 mL].

ONION PICKLES
4 quarts [3800 mL] tiny, peeled pickling onions
1 cup [240 mL] salt
2 cups [480 mL] sugar
1/4 cup [60 mL] mustard seed
2 1/2 tablespoons [38 mL] prepared horseradish
2 quarts [1900 mL] distilled vinegar
7 bay leaves
7 small red hot peppers
To peel pickling onions: cover onions with boiling water; let stand 2 minutes. Drain; dip in cold water; peel.
Sprinkle onions with salt; add cold water to cover. Let stand 12 to 18 hours in a cool place. Drain; rinse and drain thoroughly. Combine sugar, mustard seed, horseradish and vinegar; simmer 15 minutes. Pack onions into hot jars, leaving 1/4-inch [6 mm] head space, adding 1 pepper and 1 bay leaf to each jar. Heat pickling liquid to boiling. Pour, boiling hot, over onions, leaving 1/4-inch [6 mm] head space. Adjust caps. Process half-pints and pints 10 minutes in boiling water bath. Yield: about 7 pints [3360 mL].

PEPPERS, PICKLED
4 quarts [3800 mL] long red, green or yellow peppers (Hungarian, Banana or other varieties)
1 1/2 cups [360 mL] salt
4 quarts [3800 mL] water
1/4 cup [60 mL] sugar
2 tablespoons [30 mL] prepared horseradish
2 cloves garlic
10 cups [2400 mL] vinegar
2 cups [480 mL] water

ONION PICKLES
12 medium green peppers or green tomatoes
1 quart [950 mL] shredded cabbage (1 medium head)
1 cup [240 mL] salt
4 quarts [3800 mL] water
1/4 cup [60 mL] sugar
2 tablespoons [30 mL] mustard seed
1 teaspoon [5 mL] salt
1/2 teaspoon [2.5 mL] white pepper
1 quart [950 mL] vinegar
2 cups [480 mL] water
Cut tops off peppers or tomatoes; save. Scoop out centers. Dissolve 1 cup [240 mL] salt in 4 quarts [3800 mL] cold water; pour over vegetable shells and tops; let stand 24 hours in a cool place. Drain; rinse and drain thoroughly. Combine cabbage, 1 teaspoon [5 mL] salt and the pepper and mustard seed; press into shells. Replace tops and fasten with toothpicks or sew with coarse thread. Pack into hot jars, leaving 1/4-inch [6 mm] head space. Combine vinegar, water and sugar. Bring to boiling and pour, boiling hot, over peppers or tomatoes, leaving 1/4-inch [6 mm] head space. Remove air bubbles. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 3 quarts [2850 mL].

SAUERKRAUT
About 50 pounds [23 kg] cabbage
1 pound [454 g] pure, granulated salt
Remove the outer leaves and any undesirable portions from firm, mature, heads of cabbage; wash and drain. Cut into halves or quarters; remove the core. Use a shredder or sharp knife to cut the cabbage into thin shreds about the thickness of a dime.
In a large container, thoroughly mix 3 tablespoons [45 mL] salt with 5 pounds [2.3 kg] shredded cabbage. Let the salted cabbage stand for several minutes to wilt slightly; this allows packing without excessive breaking or bruising of the shreds.
Pack the salted cabbage firmly and evenly into a large clean crock or jar. Using a wooden spoon or tamper or the hands, press down firmly until the juice comes to the surface. Repeat the shredding, salting, and packing of cabbage until the
crock is filled to within 3 or 4 inches [76-102 mm] of the top.

Cover cabbage with a clean, thin, white cloth (such as muslin) and tuck the edges down against the inside of the container. Cover with a plate or a round paraffined board that just fits inside the container so that the cabbage is not exposed to the air. Put a weight on top of the cover so that the brine comes to the cover but not over it. A glass jar filled with water makes a good weight.

Another method of covering cabbage during fermentation consists of placing a plastic bag filled with water on top of the fermenting cabbage. The water-filled bag seals the surface from exposure to air, and prevents the growth of film, yeast or molds. It also serves as a weight. For extra protection, the bag with the water in it can be placed inside another plastic bag.

Any bag used should be of heavy-weight, watertight plastic and intended for use with foods.

The amount of water in the plastic bag can be adjusted to give just enough pressure to keep the fermenting cabbage covered with brine.

Formation of gas bubbles indicates fermentation is taking place. A room temperature of 68-72°F [20-22°C] is best for fermenting cabbage. Fermentation is usually completed in 5 to 6 weeks.


***SOUR ONION PICKLES***

1 quart [950 mL] tiny, peeled pickling onions
½ cup [60 mL] salt
3 tablespoons [45 mL] sugar
1 tablespoon [15 mL] mustard seed
2 teaspoons [10 mL] prepared horseradish
Small hot red peppers
3 cups [720 mL] distilled vinegar

**To peel pickling onions:** cover onions with boiling water; let stand 2 minutes. Drain; dip in cold water; peel.

Sprinkle onions with salt; add cold water to cover. Let stand 12 to 18 hours in a cool place. Drain; rinse and drain thoroughly. Combine sugar, mustard seed, horseradish and vinegar; simmer 15 minutes. Pack onions into hot jars, leaving ⅜-inch [6 mm] head space, adding 1 hot red pepper to each jar. Heat pickling liquid to boiling. Pour, boiling hot, over onions, leaving ⅜-inch [6 mm] head space. Adjust caps. Process half-pints and pints 10 minutes in boiling water bath. Yield: about 4 half-pints [960 mL].

***ZUCCHINI PICKLE***

2 pounds [907 g] fresh firm zucchini
2 small onions
¼ cup [60 mL] salt
2 cups [480 mL] sugar
2 teaspoons [10 mL] mustard seed
1 teaspoon [5 mL] celery salt
1 teaspoon [5 mL] turmeric
3 cups [720 mL] vinegar

Wash zucchini and cut in thin slices. Peel and cut onions in quarters, then slice very thin. Add to zucchini. Cover zucchini and onions with 1-inch [25 mm.] water and add salt. Let stand 2 hours. Drain thoroughly.

Bring remaining ingredients to boiling. Pour over zucchini and onions. Let stand 2 hours. Bring all ingredients to boiling point and heat 5 minutes.


***DILLED FRESH ZUCCHINI***

6 pounds [2.7 kg] zucchini
2 cups [480 mL] thinly sliced celery
2 cups [480 mL] chopped onion
½ cup [120 mL] sugar
2 tablespoons [30 mL] dill seed
2 cups [480 mL] white vinegar, 5% acetic acid
6 halved cloves garlic

Prepare zucchini, peel, seed and slice lengthwise into thin strips about 4-inches [102 mm] long (makes about 16 cups [3840 mL]). Mix all vegetables together in large bowl. Put ice cubes over the top. Cover with a towel. Let stand at room temperature for about 3 hours. Drain. Combine sugar, dill seed and vinegar. Heat and stir constantly to boiling. Add vegetables and reheat to boiling. Pack, hot, into hot jars, adding 1 to 2 pieces peeled, halved garlic per jar. Adjust caps. Process 15 minutes in boiling water bath canner. Yield: about 12 half-pints [2880 mL].

***SQUASH PICKLES***

4 medium summer squash (about 2 pounds) [907 g]
2 small (or medium) quartered or sliced onions, (optional)
½ cup [120 mL] coarse salt (pickling salt is best)
½ cup [120 mL] sugar
1½ cups [360 mL] white vinegar, 5% acetic acid
3 tablespoons [45 mL] dry mustard
1 tablespoon [15 mL] ground ginger
1 tablespoon [15 mL] curry powder
6 peppercorns

Peel, halve, seed and cut squash into ½-inch [13 mm] cubes. Layer with salt in a large bowl. Cover bowl with a towel, allow to stand about 4 hours. Rinse squash in cold water. Two or three times in fresh water will remove most of the salt. Drain thoroughly. Place rinsed squash in a heavy kettle. Combine sugar, vinegar and spices in a heavy saucepan. Heat to boiling. Boil for 5 minutes, pour over squash (and onions). Reheat to boiling. Cook 5 minutes or just until squash is tender, but not mushy. Pack, hot, into hot jars, leaving ⅜-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath canner. Yield: 4 pints [1920 mL].
Jellies and related semi-soft spreads—jams, conserves, preserves, marmalades and butters—are particularly fun to make and add a special touch to any meal. These popular spreads, put up in fancy jars or glasses with decorator lids, make excellent gifts.

Actually there is very little difference between the various spreads. They are all made of fruit and sugar and are jellied to various degrees. They differ mostly in consistency.

**Jelly**—Just the strained juice from fruit is used to make jelly. It is usually prepared in a way that keeps it crystal clear and shimmering. It is gelatinized enough to make it firm and capable of holding its shape outside the jar, yet it is soft enough to spread easily.

**Butters**—Butters are made by cooking fruit pulp and sugar to a thick consistency that will spread easily. Spices may be added; the amount and variety depend upon personal taste. After sugar is added, butters should be cooked slowly and stirred frequently to prevent scorching. Since less sugar is used in butters than in some other products, it is advisable to process them 10 minutes in a boiling water bath canner. If a fine-textured butter is desired, the pulp can be strained through a food mill and then re-strained through a fine-meshed sieve.

**Conserves**—Conserves are jam-like products made by cooking two or more fruits with sugar until the mixture will either round up in a spoon, like jam, or else flake from it like jelly. A true conserve contains nuts and raisins. But recipes may be varied according to personal taste by either adding or omitting these two ingredients. Conserves should be made in small batches, and cooked rapidly after the sugar has dissolved.

**Marmalades**—Marmalades are soft fruit jellies containing small pieces of fruit or peel evenly suspended in the transparent jelly. They should be cooked in small batches and, after the sugar is added, brought rapidly to, or almost to, the jellying point. In preparing oranges, lemons and grapefruit for marmalade, part of the white rind should be cooked, for it contains most of the pectin found in citrus fruits.

**Preserves**—Preserves are fruits preserved with sugar with the fruit retains its shape, is clear and shiny, tender and plump. The syrup is clear, and varies from the thickness of honey to that of soft jelly. Preserves should be cooked in small batches, and in wide pans. If the syrup becomes too thick before the fruit is tender and clear, boiling water (⅔ cup [60 mL] at a time) should be added. If the fruit is clear and tender but the syrup is too thin, the fruit should be removed and the syrup cooked rapidly to the desired consistency (to, or almost to, the jellying point).

**INGREDIENTS**

Proper amounts of four ingredients—fruit, pectin, acid and sugar—are needed to make a jellied fruit product.

**Fruit**—Fruit provides the flavoring for soft spreads. As in other canning, the selection and handling of fruit are critical to success. Only top quality fruit, slightly underripe or barely ripe, is best for these products.

**Pectin**—Pectin is a natural substance of high molecular weight found in varying amounts in fruits. It is pectin that causes jelly to gel. Fruit that is slightly underripe contains more pectin than fully ripe fruit. Overripe fruit used in spreads will likely cause a runny final product. Many recipes call for the skins and cores of various fruit to be included in preparing fruit for juice or pulp. This is because the pectin is concentrated in these areas.

**Acid**—Acid adds to the flavor and helps with the gel formation in spreads. Like pectin, the acid content varies in different fruits, but is higher in slightly underripe fruit than in fruit that is fully ripe. To test for acid content, mix a teaspoon [5 mL] of lemon juice, 3 tablespoons [45 mL] of water and ½ teaspoon [2.5 mL] of sugar. Taste this mixture and then the fruit juice you're planning to use. Unless your juice tastes as tart as the lemon juice mixture, it does not have enough acid to gel properly. Citric acid, available commercially, or lemon juice can be added to fruits low in natural acid. One tablespoon [15 mL] of strained lemon juice to 1 cup [240 mL] of fruit juice usually will supply the acid needed.

**Sugar**—Sugar helps in gel formation, contributes to flavor, and serves as a preserving agent. Beet and cane sugar may be used with equal success. Light corn syrup can be used to replace part of the sugar in recipes. In recipes without added pectin, one-fourth of the sugar can be

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**JELLIES & SEMI-SOFT SPREADS**

Tart apples, Concord grapes, sour blackberries, cranberries, currants, gooseberries, quinces and sour plums are examples of fruits which contain considerable natural pectin. Apricots, blueberries, cherries, peaches, pineapple, rhubarb and strawberries are low in pectin.

Many recipes call for the addition of pectin. It is available commercially, either in liquid or powdered form. The two forms are not interchangeable, so the type called for in the recipe should be used, and the manufacturer's directions should be followed.

There are several methods for determining the amount of pectin in fruit juice. One is to cook ¼ cup [60 mL] juice with 2½ tablespoons [38 mL] of sugar. If the mixture gels, there is enough pectin in the juice. A more exact method is to use a jelmeter. This is a graduated glass tube with an opening at each end. The rate of flow through the tube measures the jellying power of the juice and, therefore, is an index to the amount of sugar to be used.
replaced with syrup. Where powdered pectin is used, corn syrup can replace one-half the sugar. And with liquid pectin, 2 cups \([480 \text{ mL}]\) of the sugar can be replaced with corn syrup. Honey can also be used to replace sugar. Light, mild-flavored honey generally is the best kind to use. In recipes without added pectin, honey can replace one-half the sugar. When pectin is added, 2 cups \([480 \text{ mL}]\) of honey can replace 2 cups of sugar in most recipes; \(\frac{3}{4}\) to 1 cup \([180 \text{ to } 240 \text{ mL}]\) of sugar can be replaced by honey in small recipes (5-6 glasses).

**JELLY**

A large kettle is essential for making jelly. A kettle of 8-10 quarts \([7600-9500 \text{ mL}]\) capacity with a broad flat bottom is ideal for most recipes. This size permits the jelly mixture to come to a full rolling boil without boiling over.

A jelly bag is another necessity. It is used for straining juice from the fruit pulp. An adequate bag can be made of several thicknesses of closely woven cheesecloth or of cotton flannel with the napped side in.

A clock or watch with a second hand is invaluable for timing jelly made with pectin added. And a thermometer—the jelly, candy or deep-fat type—is a great aid in making jelly without pectin.

Increasing the size of jelly recipes is not recommended. Better success is obtained, for example, by making two separate batches of a recipe rather than doubling the size. Only enough fruit for one batch should be prepared at a time, since the fruit will deteriorate rapidly.

The fruit selected should include some that is underripe, but not green, for added pectin and acid, and some that is firm ripe for flavor. It should be washed and rinsed thoroughly, either under cold running water or with several complete rinses in a pan. Lift fruit from the rinse water instead of pouring the water off, since most of the dirt settles to the bottom.

All damaged parts of the fruit should be discarded. Caps, stems and blossom ends should be removed, but fruits should not be peeled or cored. Larger fruit should be cut into small pieces. Berries should be handled carefully to prevent loss of juice.

The fruit is boiled in water to extract the juice. For apples and other hard fruits, add enough cold water to cover the fruit in the kettle. For berries and grapes, use only enough water to prevent scorching. Soft fruits, such as berries and grapes, should be crushed to start the flow of juice. Bring the water to a boil. Excess boiling tends to destroy pectin, flavor and color. Stir to prevent scorching.

Grapes and berries need about 10 minutes to cook soft; apples and other hard fruit need 20 to 25 minutes, depending upon the firmness of the fruit.

Pour the cooked product into a damp jelly bag which has been placed over a stand or colander to allow the juice to drain. Do not squeeze the bag; a cloudy jelly will result. If a fruit press is used to extract the juice, the juice should be re-strained through a jelly bag. The jelly bag should not be squeezed.

The pectin content of the juice should be tested as suggested earlier. At this point the juice is ready and can be used immediately, or can be canned or frozen for making jelly at a later time.

The techniques for jelly making vary slightly, depending upon whether pectin is added or not, whether home canning jelly glasses or jars are being used, and whether standard vacuum lids with metal screw bands or paraffin is used as a closure.

Jelly glasses and jars should be examined for nicks and cracks. Jars or glasses and lids and bands should be washed in hot, soapy water and rinsed well in hot water. Glasses and jars should be placed in a deep container, covered with water and boiled for 10 minutes. Lids and bands should be covered with water in a small saucepan and brought to a simmer \((180^\circ \text{ to } 185^\circ \text{ F [82^\circ to 85^\circ C]})\). The lids and bands should be removed from heat and allowed to remain in the water until ready for use.

In recipes that call for added pectin, remove jars or glasses from hot water just before putting jelly on to cook. In recipes that do not call for pectin, leave glasses or jars in hot water until jelly has cooked five or ten minutes. Remove jars or glasses from water at the proper time, invert on clean towels to drain. Keep out of drafts. Follow the manufacturer's directions.

In making jelly without pectin added, the jellying point must be tested. First put the juice into a large kettle and bring to boiling. Jars or glasses are removed from water at this point. With juice boiling, add sugar and stir until it dissolves. Boil rapidly to jellying point.

**JELLYING POINT**

The jellying point can be tested using the sheet test. (See Figure 21.) Dip a cool metal spoon into the boiling jelly mixture. Lift out a spoonful of the mixture and tip the spoon so the juice will drop into the kettle. When the mixture first starts to boil, the drops will be light and syrupy. Later, the drops will become heavier and show signs of sheeting.

When jellying point is reached, jelly breaks from spoon in a sheet or flake.

![Figure 21](image)

Figure 21

**TEST FOR JELLYING POINT**

without pectin added

Jelly drops at first are light and syrupy

Then they become heavier and show signs of sheeting

When jellying point is reached, jelly breaks from spoon in a sheet or flake

(continued on page 45)
**JELLY MAKING—STEP BY STEP**

**Using Liquid Pectin**


2. Following pectin manufacturer's directions, measure prepared juice and sugar into an 8-10 quart (7600-9500 mL) kettle. Stir to dissolve sugar. Remove jars and lids from hot water. Invert on towel to drain.

3. Put kettle of juice and sugar on high heat. Quickly bring to a full rolling boil — one that cannot be stirred down — stirring constantly. Boil for one minute.

4. Remove kettle from heat. Following pectin manufacturer's directions, immediately stir in liquid pectin.

5. Skim off foam. Quickly fill jar to ⅛ inch [3 mm] from top. Wipe top and threads of jar with clean, damp cloth. Put lid on with sealing compound next to jar. Screw band down evenly and very tightly. Jelly may trickle down sides of jar if bands are not tight enough.

6. Invert jar for a few seconds so hot jelly can destroy mold or yeast which may have settled on lid. Then stand jars upright to cool. When jars are cool, test for seal. Store in a dry, dark, cool place.
MAKING APPLE JELLY—STEP BY STEP
Without Pectin and Using Paraffin

1. Use about 3 pounds [1.4 kg] firm, tart apples. Select about one-fourth under-ripe apples, three-fourths ripe. Sort and wash apples. Remove stem and blossom ends. Do not pare or core. Cut into small pieces.

2. Put apples into large kettle. Add 1 cup [240 mL] water per pound [454 g] of apples. Cover, bring to boil on high heat. Reduce heat and simmer until apples are tender, about 20 to 25 minutes, depending on the firmness or ripeness of the fruit.

3. Pour cooked apples into a jelly bag inside a colander, so the juice will drain into a container.

4. Measure 4 cups [960 mL] of apple juice into a large kettle. Add 3 cups [720 mL] of sugar. If desired, 2 tablespoons [30 mL] of lemon juice may also be added. Stir to dissolve sugar.

5. Place on high heat and boil rapidly to 8°F [4°C] above the boiling point of water, or until jelly mixture sheets from spoon. Remove from heat. Quickly skim off foam.

6. Pour jelly immediately into hot jelly glasses to within 1/2 inch [13 mm] of top of glass. Cover immediately with a 1/2 inch [3 mm] layer of hot, but not smoking, paraffin. To assure a good seal, paraffin must touch all sides of the glass. Prick any air bubbles that appear. Allow glasses to stand until paraffin hardens and jelly cools. Cover glasses with metal lids. Store in dry, dark, cool place. If jelly jars are used instead of glasses with paraffin, follow instructions on page 42.
Differences in altitude and barometric pressure will cause the jelly mixture to boil at different temperatures. Before cooking the jelly, test the candy or jelly thermometer in boiling water to find out what the boiling point of water is in your area. Cook the jelly to a temperature of 8°F [4°C] higher than the boiling point of water for your area. At that point, a satisfactory gel should be achieved.

For an accurate thermometer reading, hold the thermometer in a vertical position and read it at eye level. The bulb of the thermometer must be completely covered with the jelly mixture, but must not touch the bottom of the saucepan.

Jelly must be boiling hot to achieve a seal when using vacuum lids and metal screw bands. Pour jelly into jar, holding ladle or kettle close to the top of the jar. This prevents air bubbles from forming. Quickly fill jar to within ¼ inch [3 mm] of the top. Wipe top and threads with clean, damp cloth. Put hot lid on with sealing compound next to jar. Screw band on evenly and tightly.

Invert jar for a few seconds so hot jelly can destroy any mold or yeast which may have settled on the lid. Cool, test for seal, remove bands and store.

Jelly glasses are filled in a manner similar to jars, except a ¼-inch [13 mm] space is left at the top. Then the jelly is immediately covered with a ¼-inch [3 mm] layer of melted, but not smoking, paraffin. A single, thin layer of paraffin holds a seal better than a thick layer. To insure a good seal, paraffin must touch all sides of the glass. Prick any air bubbles that appear on the paraffin. Bubbles cause holes to appear as the paraffin hardens, and an imperfect seal may result.

Allow glasses to stand until paraffin hardens and then cover with metal lids. Store in a cool, dark, dry place.

**APPLE JELLY**
4 cups [960 mL] apple juice (takes about 3 pounds [1.4 kg] apples and 3 cups [720 mL] water)
2 tablespoons [30 mL] strained lemon juice, if desired
3 cups [720 mL] sugar

**To prepare juice:** Select about one-fourth firm-ripe and three-fourths fully ripe tart apples. Sort, wash, and remove stem and blossom ends. Do not pare or core. Cut apples into small pieces. Add water, cover and bring to boil on high heat. Reduce heat and simmer for 20 to 25 minutes, or until apples are soft.

**To make jelly:** Measure apple juice into a kettle. Add lemon juice and sugar and stir well. Boil over high heat to 8°F [4°C] above the boiling point of water, or until jelly mixture sheets from a spoon.

**BLACKBERRY JELLY**
4 cups [960 mL] blackberry juice (takes about 2½ quart [2375 mL] boxes blackberries and ⅜ cup [180 mL] water)
3 cups [720 mL] sugar

**CHERRY JELLY**
3 cups [720 mL] cherry juice (takes about 3 quart [2850 mL] boxes berries)
7½ cups [1800 mL] sugar
1 bottle liquid pectin

**To prepare juice:** Select fully ripe cherries. Sort, wash, and remove stems; do not pit. Crush the cherries, add water, cover, and bring to boil on high heat. Reduce heat and simmer 10 minutes. Extract juice.

**BLACKBERRY JELLY**
4 cups [960 mL] blackberry juice (takes about 3 quart [2850 mL] boxes berries)
7½ cups [1800 mL] sugar
1 bottle liquid pectin

**To make jelly:** Measure juice into a kettle. Stir in the sugar. Place on high heat and stirring constantly, bring quickly to a full rolling boil that cannot be stirred down.

Add the pectin and heat again to a full rolling boil. Boil hard for 1 minute. Remove from heat; skim off foam quickly. Pour jelly immediately into sterilized hot containers and seal.

**Yield:** about 3 to 4 eight-ounce [720-960 mL] glasses.

**APPLE JELLY**
4 cups [960 mL] blackberry juice (takes about 3 quart [2850 mL] boxes berries)

**Yield:** about 3 to 4 eight-ounce [720-960 mL] glasses.

**CHERRY JELLY**
3 cups [720 mL] cherry juice (takes about 3 quart [2850 mL] boxes berries)
**CRAB APPLE JELLY**

4 cups [960 mL] crab apple juice (takes about 3 pounds [1.4 kg] crab apples and 3 cups [720 mL] water)

4 cups [960 mL] sugar

To prepare juice: Select firm, crisp crab apples, about one-fourth firm-ripe, the rest fully ripe. Sort, wash, and remove stem and blossom ends; do not pare or core. Cut crab apples into small pieces. Add water, cover, and bring to boil on high heat. Reduce heat and simmer for 20 to 25 minutes, or until crab apples are soft. Extract juice.

To make jelly: Measure juice into a kettle. Add sugar and stir well. Boil over high heat to 8°F [4°C] above the boiling point of water, or until jelly mixture sheets from a spoon. Remove from heat; skim off foam quickly. Pour jelly immediately into sterilized hot containers and seal. Yield: about 5 to 6 eight-ounce [1200-1440 mL] glasses.

**GRAPE JELLY**

4 cups [960 mL] grape juice (takes about 3½ pounds [1.6 kg] Concord grapes, and ½ cup [120 mL] water)

3 cups [720 mL] sugar

To prepare juice: Select about one-fourth firm-ripe and three-fourths fully ripe grapes. Sort, wash, and remove grapes from stems. Crush grapes, add water, cover, and bring to a boil on high heat. Reduce heat and simmer for 10 minutes. Extract juice. To prevent formation of tartrate crystals in the jelly, let juice stand in a cool place overnight, then strain through two thicknesses of damp cheesecloth to remove crystals that have formed.

To make jelly: Measure juice into a kettle. Stir in the sugar. Place on high heat and, stirring constantly, bring quickly to full rolling boil that cannot be stirred down. Add the pectin and heat again to a full rolling boil. Boil hard for 1 minute. Remove from heat; skim off foam quickly. Pour jelly immediately into sterilized hot containers and seal. Yield: about 8 to 9 eight-ounce [1920-2160 mL] glasses.

**GRAPE JELLY**

Made from Frozen Concentrated Juice

6½ cups [1560 mL] sugar

2½ cups [600 mL] water

1 bottle liquid pectin

3 6-ounce [510 g] cans (2½ cups) [540 mL] frozen concentrated grape juice

Stir the sugar into the water. Place on high heat and, stirring constantly, bring quickly to a full rolling boil that cannot be stirred down. Boil hard for 1 minute.

Remove from heat. Stir in the pectin. Add thawed concentrated grape juice and mix well. Pour immediately into sterilized hot containers and seal. Yield: about 8 to 9 eight-ounce [1920-2160 mL] glasses.

**FRESH GRAPEFRUIT WINE JELLY**

1 cup [240 mL] freshly squeezed, strained grapefruit juice

1 cup [240 mL] claret or ruby red port

3½ cups [840 mL] sugar

½ bottle (3 ounces) [84 g] liquid pectin

In small heavy saucepan, combine grapefruit juice, wine and sugar; stir over very low heat until well blended. Warm mixture just until bubbles appear around edge of pan and sugar is dissolved, about 5 to 6 minutes. Remove from heat and immediately stir in pectin. Skim off foam, if necessary. Pour immediately into hot sterilized jars and seal. Yield: about 5 eight-ounce jars [1200 mL].

**GREEN PEPPER JELLY**

6 large green peppers, cut in pieces

1½ cups [360 mL] cider vinegar (4%-6% acid strength)

6 cups [1440 mL] sugar

½ teaspoon [2.5 mL] salt

1 teaspoon [5 mL] crushed red pepper

1 bottle liquid pectin

Green food coloring

Put half the green peppers and half the vinegar into blender container, cover and process at LIQUEFY until pepper is liquefied. Pour into a saucepan. Repeat with remaining peppers and vinegar. Add the red pepper, sugar and salt. Bring to a boil and add pectin. Boil until it thickens when dropped from spoon, about 20 minutes. Add a few drops of green food coloring. Pour into sterilized hot jars, and seal. Yield: about 4 half-pints [960 mL].

**JELLY from CANNED or FROZEN FRUIT JUICES**

Home Canned

Unsweetened canned or frozen fruit juices are excellent for making jelly. Commercial canned or frozen juices make excellent jelly, however, commercial pectin will be needed.
APPLE JUICE for JELLY

Use fresh, or can for future use.

Select fresh, sound, tart fruit. Wash. Cut out and discard blossom and stem ends. Do not pare or core. Slice or chop apples. Add 2 cups [480 mL] water to each slightly heaped quart [950 mL] prepared apples. Cover and cook gently until soft. Drain through damp cotton flannel, jelly bag or 4 layers of cheesecloth.

If to be canned, reheat just to boiling. Pour, hot, into hot jars, leaving 1/4-inch [6 mm] head space. Adjust caps. Process pints and quarts 10 minutes in boiling water bath.

GRAPE JUICE for JELLY

Use fresh or can for future use.

Wash, stem, crush and measure fresh, firm, ripe Concord type grapes. Wash, stem, crush and measure fresh, firm, ripe Concord type grapes. Add 2 cups [480 mL] water to each quart [950 mL] prepared grapes. Heat 10 minutes at simmering. Do not boil. Drain through damp cotton flannel, jelly bag or 4 layers of cheesecloth. If to be used fresh, let juice stand in refrigerator from 12 to 24 hours. Then, strain through damp cheesecloth. If to be canned, reheat to simmering. Pour into sterilized hot jars and seal. Adjust caps. Process pints and quarts 10 minutes in boiling water bath. Strain before using.

ORANGE-SAUTERNE JELLY

Made from Frozen Concentrated Juice

3 1/4 cups [780 mL] sugar
1 cup [240 mL] water
3 tablespoons [45 mL] lemon juice
1/2 bottle liquid pectin
6 ounces (1/4 cup) [180 mL] frozen concentrated orange-and-grapefruit juice

Stir the sugar into the water. Place on high heat and, stirring constantly, bring quickly to a full rolling boil that cannot be stirred down. Add lemon juice. Boil hard for 1 minute.

Remove from heat. Stir in the pectin. Add thawed concentrated orange-and-grapefruit juice and mix well.

Pour immediately into sterilized hot containers and seal. Yield: about 3 to 4 eight-ounce glasses [720-960 mL].

STRAWBERRY JELLY

4 cups [960 mL] strawberry juice (takes about 3 quart [2850 mL] boxes berries)
7 1/2 cups [1800 mL] sugar
1 bottle liquid pectin

To prepare juice: Sort and wash fully ripe berries; remove any stems or caps. Crush the berries and extract juice.

To make jelly: Measure juice into a kettle. Stir in the sugar. Place on high heat and, stirring constantly, bring quickly to a full rolling boil that cannot be stirred down.

Add the pectin and heat again to a full rolling boil. Boil hard for 1 minute.

Remove from heat: skim off foam quickly. Pour jelly immediately into sterilized hot containers and seal. Yield: about 6 half-pint glasses [1440 mL].

PLUM JELLY

5 1/2 cups [1320 mL] prepared juice
1 package powdered pectin
7 1/2 cups [1800 mL] sugar

Measure the prepared juice into a 8 or 10 quart [7600-9500 mL] kettle. Add the pectin. Stir mixture well and place kettle over high heat. (Keep stirring.) Bring mixture to a fast rolling boil. Stir in sugar and bring mixture again to a fast rolling boil, (a boil that cannot be stirred down). Boil jelly for 1 minute; quickly skim off the foam. Pour the boiling hot jelly into hot, sterilized jelly jars and seal. Adjust vacuum lids on jars; screw bands on tightly. Immediately invert filled jelly jars for a few seconds and then place jars upright to cool. Inverting the jelly jars will help to kill any mold spores which may have entered the jars during the transfer process. Yield: about 10 half-pint jars [2400 mL].

MINT JELLY

1 cup [240 mL] firmly packed mint leaves
1 cup [240 mL] boiling water

Pour the boiling water over the firmly packed mint leaves and let stand for one hour. Press the juice from the leaves.

Using Apple Juice portion of Apple Jelly recipe on page 45, to each cup [240 mL] of apple juice, add 2 tablespoons [30 mL] of the mint extract and bring to a boil. Follow Apple Jelly recipe above. Just before pouring into jars or jelly glasses, tint the jelly with a few drops of green food coloring.

SPICED APPLE JELLY

Follow recipe for Apple Jelly on page 45, except tie a few whole spices in a cheesecloth bag and cook with the apples when preparing the juice.

UNCOOKED JELLIES

Uncooked berry jellies can be made from fresh red raspberries, boysenberries or loganberries. Jellies can be made from frozen concentrated juice of these berries or from frozen orange or grape juice concentrates.

To prepare juice from fresh berries, sort and wash fully ripe berries; remove any stems and caps. Wash in cold running water, or wash them in several changes of cold water, lifting them out of the water each time. Do not let fruit stand in water.

Put the fruit in a damp jelly bag or fruit press to extract juice. Pressed juice should be re-strained through a double thickness of damp cheesecloth or a damp jelly bag; the cloth or bag should not be squeezed.
SEMI-SOFT SPREADS

The fun foods in home canning, and often the ones that produce the most satisfaction, are the butters, conserves, jams, marmalades and preserves. With these semi-soft spreads, the home canner can emphasize the natural fruit flavor or change it entirely by adding a tiny pinch of salt, a small amount of spice, extract, orange peel or lemon juice to any of the recipes.

With a little experimentation, the home canner can easily find the right combination of orchard-fresh fruits, sugar and personally chosen extra ingredients that will please the family and have a distinctive flavor that cannot readily be duplicated in commercial products.

Canning these soft spreads is similar to making jelly. But there is one essential difference. While jellies can safely be put up using the open kettle method, butters, conserves, jams, marmalades and preserves must be processed at boiling temperature (212°F -100°C) in a boiling water bath canner for full safety. Processing time varies from 10 to 20 minutes, depending upon the product, size of container and the recipe. Each of the various soft spreads is distinctive, and each requires techniques that vary slightly.

A kitchen scale is a profitable investment for serious "jam-makers." For best results, sugar and fruits should be accurately weighed to achieve the proportions outlined in the recipe. Butters take ½ pound [227 g] of sugar for each pound [454 g] of fruit; preserves, jams and marmalades, ¼ pound [340 g] of sugar to each pound of fruit; preserves, 1 pound [454 g] of sugar to each pound [454 g] of fruit.

Corn syrup or honey may be substituted for cane or beet sugar in making soft spreads. Up to one third of the granulated sugar may be replaced with corn syrup; up to one half of the sugar may be replaced with honey. Honey changes the fruit flavor and may mask it.

A heavy, 8 to 10 quart [7600-9500 mL] kettle with a broad, flat bottom is essential in making conserves, jams, preserves and marmalades. The fruit and sugar mixture must bubble and cook rapidly without boiling over the sides of the kettle. A light, thin kettle will likely cause scorching. These products should be cooked in small batches. Do not double the recipes, since double-size mixtures will not cook in the same manner as smaller ones. The sugar and juice mixtures should be stirred over low heat until the sugar dissolves. Then the mixture should be boiled rapidly for a bright and sparkling finished product. The fruit-sugar mixture should be stirred frequently as it thickens.

Butters are cooked slowly for long periods of time. They will stick and scorch unless stirred regularly. For this reason, a heavy kettle is preferable to a light, thin one.

The soft spreads continue to thicken as they cool. How thick the finished product will be is hard to judge when it is still hot. Jams, conserves, marmalades and preserves must be cooled until the temperature is 80°F [27°C] above the boiling point of water. (See instructions in jelly section for determining boiling point of water in your area.) A firm product will result when cooked to this temperature. For a softer product, shorten the cooking time; for a firmer product, lengthen it. The jellying point test and the thermometer test, as explained in the section on jellies, can be used for the other soft spreads. Cooking times in the recipes in this book are intended as a guide only, since the actual time will vary according to the kettle used, the humidity and the altitude.

If pectin is used for jams or marmalades, the manufacturer's directions should be followed exactly. Generally, powdered pectin is added to the strained juice before heating; liquid pectin is added after the mixture is brought to a full boil. Directions given in the section on jelly should be followed for the other soft spreads for preparing the fruit, handling and checking containers, sealing, testing the seal and storing.

Apple butter

OLD-FASHIONED KIND
Using Whole Apples

2 dozen medium apples, quartered (about 6 pounds) [2.7 kg]
2 quarts [1900 mL] sweet cider
3 cups [720 mL] sugar
1½ teaspoons [7.5 mL] ground cinnamon
½ teaspoon [2.5 mL] ground cloves

Cook apples in cider until tender. Press through a sieve or food mill; measure 3 quarts [2850 mL] apple pulp. Cook pulp until thick enough to round up in a spoon. As pulp thickens, stir frequently to prevent sticking. Add sugar and spices. Cook slowly, stirring frequently, until thick, about 1 hour. Pour, hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process pints [480 mL] and quarts [950 mL] 10 minutes in boiling water bath. When cool, test for seal. Remove bands and store. Yield: about 5 pints [2400 mL].

Using Apple Pulp

2 quarts [1900 mL] cooked apple pulp
4 cups [960 mL] sugar
2 teaspoons [10 mL] ground cinnamon
¼ teaspoon [1.25 mL] ground cloves

Use apple pulp left from preparing apple juice for jelly. See page 45. Press through a sieve or food mill. Measure pulp. Add sugar and spices. Cook until the flavors are well blended, about 15 minutes. To prevent sticking, stir frequently as mixture thickens. (If too thick, add a small amount of water for desired consistency.) Pour, hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process pints [480 mL] and quarts [950 mL] 10 minutes in boiling water bath. When cool, test for seal. Store. Yield: about 5 pints [2400 mL].
December 23, 1975, was an important date in the history of the United States. On that date, President Gerald Ford signed the Metric Conversion Act of 1975 or Public Law 94-168, calling for the voluntary conversion to metric measurements by all segments of American society. In the spirit of that law, Edition 30 of the Ball® Blue Book contains metric equivalents for all measurements of length, pressure, temperature, volume and weight.

Ever since George Washington's first address to Congress, the United States has been trying to adopt a reliable system of weights and measures. Most experts agree that the metric system is superior to the U.S. Customary System we have been using because it is based on the decimal system and because there are only seven basic measurement units. The United States was the last industrialized nation in the world to adopt the metric system.

Either the U.S. Customary or the metric system may be followed when using this edition of the Blue Book. To use metrics, kitchen implements containing metric measurements are necessary. Metric measuring cups and spoons, thermometers, scales and rulers are now available commercially.

In metrics, units of volume, such as cups or tablespoons, are converted to milliliters. Larger units, such as gallons, convert to liters. Units of weight, such as ounces, are converted to grams. Heavier amounts, such as pounds, convert to kilograms. Units of length, such as inches, convert to millimeters. Longer lengths, like feet, yards and miles, may be stated in centimeters, meters or kilometers. Degrees Fahrenheit are stated in degrees Celsius. On the Fahrenheit scale, water freezes at 32° and boils at 212°. The Celsius equivalents are 0° and 100°. Pounds per square inch (psi) of pressure are stated in kilopascals (kPa) in metrics.

To simplify things, the Blue Book has rounded off decimal points, since a high degree of accuracy is not needed for cooking purposes. There are 453.59237 grams in a pound, for example, if carried to the fifth decimal point. The equivalent for a pound in the Blue Book, however, is stated simply as 454 grams.
METRIC TERMS

The metric system is not as difficult to understand as it may seem at first. For canning purposes, the basic metric measurements most often used are:

Basic metric unit to indicate

<table>
<thead>
<tr>
<th>Basic metric unit</th>
<th>To indicate</th>
<th>Approximate U.S. equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>meter</td>
<td>linear measure</td>
<td>1 meter = 39.37 inches</td>
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<tr>
<td>gram</td>
<td>weight</td>
<td>1 gram = .0353 ounces</td>
</tr>
<tr>
<td>liter</td>
<td>volume measure</td>
<td>1 liter = .2642 gallons</td>
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</table>

The metric system uses decimals, much the same as the U.S. money system: 10 pennies make a dime, 10 dimes make a dollar, etc. Just as our money system uses different terms for different denominations, the metric system has different prefixes: a kilo- means a thousand times, for example. One may have a kilometer, a kilogram or a kiloliter. A kilometer simply means 1,000 meters.

Although there are many other metric prefixes, all in multiples of 10, here are some more commonly used prefixes and their meanings:

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Equivalent</th>
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<tr>
<td>milli</td>
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<tr>
<td>centi</td>
<td>1/100</td>
</tr>
<tr>
<td>kilo</td>
<td>1000 times</td>
</tr>
</tbody>
</table>

The three basic metric measurement units given above, along with the three prefixes, will cover most canning measurement situations.

Some commonly used metric symbols, or abbreviations, are:

- mm millimeter
- cm centimeter
- mL milliliter
- kPa kilopascal
- C Celsius
- kg kilogram
### U.S. Customary and Metric Conversions

(To the fourth decimal point)

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<tr>
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Actual metric equivalents have been rounded off throughout the book, except in the introductory portion:
- one quart = 946 mL rounded to 950
- one pint = 473 mL rounded to 480
- one half-pint = 237 mL rounded to 240
FAHRENHEIT and CELSIUS (CENTIGRADE) CONVERSIONS

To convert Fahrenheit to Celsius, subtract 32 and then multiply by 5/9 (.5556). To convert Celsius to Fahrenheit, multiply by 9/5 (1.8) and then add 32.

EXAMPLES
To convert 72°F to Celsius:

\[
\begin{align*}
72 & \quad -32 \quad \times \quad 5 \quad \div \quad 9 \quad = \quad 200 \quad \div \quad 9 \\
40 & \quad = \quad 22.2 \quad = \quad 22°C
\end{align*}
\]

To convert 22°C to Fahrenheit:

\[
\begin{align*}
22 & \quad \times \quad 1.8 \\
39.6 & \\
+32 & \\
71.6 & = \quad 72°F
\end{align*}
\]

POUNDS per SQUARE INCH and KILOPASCAL CONVERSIONS

To convert kilopascals to pounds per square inch, multiply by .1470. To convert pounds per square inch to kilopascals, multiply by 6.8.

EXAMPLES
To convert 68 kPa to pounds per square inch:

\[
\begin{align*}
.1470 & \quad \times \quad 68 \\
10176 & \\
8820 & \\
9.9960 & = \quad 10 \text{ psi}
\end{align*}
\]

To convert 10 psi to kilopascals:

\[
\begin{align*}
10 & \quad \times \quad 6.8 \\
80 & \\
60 & \\
68.0 & \text{ kPa}
\end{align*}
\]
APRICOT BUTTER
1½ quarts [1425 mL] apricot pulp
3 cups [720 mL] sugar
2 tablespoons [30 mL] lemon juice

To prepare pulp: Cook pitted apricot halves until soft, adding only enough water to prevent sticking. Press through a sieve or food mill. Measure pulp.

Add sugar; cook until thick, about 30 minutes. As mixture thickens, stir frequently to prevent sticking. Add lemon juice; pour, hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process pints [480 mL] and quarts [950 mL] 10 minutes in boiling water bath. Yield: about 2 pints [960 mL].

PEACH BUTTER
2 quarts [1900 mL] peach pulp
(about 1½ dozen medium, fully ripe peaches)
4 cups [960 mL] sugar

To prepare pulp: Wash, scald, pit, peel and chop peaches; cook until soft, adding only enough water to prevent sticking. Press through a sieve or food mill. Measure pulp.

Add sugar; cook until thick, about 30 minutes. As mixture thickens, stir frequently to prevent sticking. Press through a sieve or food mill. Measure pulp.

Add sugar; cook until thick, about 30 minutes. As mixture thickens, stir frequently to prevent sticking. Pour, hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process pints [480 mL] and quarts [950 mL] 10 minutes in boiling water bath. Yield: about 4 pints [1920 mL].

SPICED PEACH BUTTER
Follow recipe for Peach Butter. Add ½ to 1 teaspoon [2.5-5 mL] each ground ginger and ground nutmeg with sugar to peach pulp. Process pints [480 mL] and quarts [950 mL] 10 minutes in boiling water bath.

PEAR BUTTER
2 quarts [1900 mL] pear pulp
(about 20 medium, fully ripe pears)
4 cups [960 mL] sugar
1 teaspoon [5 mL] grated orange rind
1½ cups [80 mL] orange juice
1½ teaspoons [2.5 mL] ground nutmeg

To prepare pulp: Quarter and core pears. Cook until soft, adding only enough water to prevent sticking. Press through a sieve or food mill. Measure pulp.

Add remaining ingredients; cook until thick, about 15 minutes. As mixture thickens, stir frequently to prevent sticking. Pour, hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process pints [480 mL] and quarts [950 mL] 10 minutes in boiling water bath. Cool. Test for seal. Store. Yield: about 2 half-pints [1440 mL].

CONSERVE RECIPES

Don't forget to process in boiling water bath canner!

APPLE-BLUEBERRY CONSERVE
1 quart [950 mL] chopped, cored, pared tart apples
(about 4 medium)
½ cup [120 mL] seedless raisins
1 quart [950 mL] stemmed blueberries
6 cups [1440 mL] sugar
¼ cup [60 mL] lemon juice

Combine all ingredients; slowly bring to boiling, stirring occasionally until sugar dissolves. Cook rapidly until thick, about 20 minutes. As mixture thickens, stir frequently to prevent sticking. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 8 half-pints [1920 mL].

NOTE: Canned pineapple may be used.

APPLE-CHERRY-PINEAPPLE CONSERVE
1 quart [950 mL] pitted sweet cherries
(about 2 pounds) [907 g]
1½ cups [360 mL] chopped, cored, pared tart apples
1 cup [240 mL] finely chopped, cored, pared fresh pineapple
5 cups [1200 mL] sugar
½ cup [120 mL] chopped walnuts or other nuts
¼ cup [60 mL] lemon juice

Drain and chop about two No. 2½ cans unpeeled or 1 lb. [454 g] dried apricots. If dried, first cook uncovered in 3 cups [720 mL] water until tender (about 20 minutes). Finely shred orange peel. Combine all ingredients except nuts in large kettle. Cook until thick, stirring constantly. Add nuts last 5 minutes of cooking; stir well.

Remove from heat; skim and stir alternately for 5 minutes. Pour into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 10 minutes in boiling water bath. Yield: about 5 to 6 half-pints [1200-1440 mL].
**BLUEBERRY CONSERVE**

2 cups [480 mL] water
4 cups [960 mL] sugar
½ thinly sliced lemon
½ thinly sliced orange
½ cup [120 mL] seedless raisins
1 quart [950 mL] stemmed blueberries

Bring water and sugar to boiling. Add lemon, orange and raisins; simmer 5 minutes. Add blueberries and cook rapidly until thick, about 30 minutes. As mixture thickens, stir frequently to prevent sticking. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 4 half-pints [960 mL].

**BLUEBERRY-PINEAPPLE CONSERVE**

1 quart [950 mL] stemmed blueberries
2 cups [480 mL] finely chopped cored, pared fresh pineapple (about 1 small)
5 cups [1200 mL] sugar

Combine fruit and sugar; slowly bring to boiling, stirring occasionally until sugar dissolves. Cook rapidly until thick, about 30 minutes. As mixture thickens, stir frequently to prevent sticking. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 4 half-pints [960 mL].

**CHERRY-RASPBERRY CONSERVE**

3 cups [720 mL] raspberry pulp
3 cups [720 mL] pitted sweet cherries
4 cups [960 mL] sugar

To prepare raspberry pulp:
Press berries through a sieve or food mill to remove seeds. Simmer cherries until tender; add berry pulp and sugar.

Cook slowly until sugar dissolves, stirring occasionally. Cook rapidly until thick, about 30 to 40 minutes. As mixture thickens, stir frequently to prevent sticking. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 4 half-pints [960 mL].

**CRANBERRY CONSERVE**

1 unpeeled finely chopped orange
2 cups [480 mL] water
3 cups [720 mL] sugar
1 quart [950 mL] stemmed cranberries
½ cup [120 mL] seedless raisins
½ cup [120 mL] chopped walnuts or other nuts

Combine orange and water; cook rapidly until peel is tender, about 20 minutes. Add cranberries, sugar and raisins. Bring slowly to boiling, stirring occasionally until sugar dissolves. Cook rapidly almost to jellying point, about 8 minutes. As mixture thickens, stir frequently to prevent sticking. Add nuts the last 5 minutes of cooking. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 6 half-pints [1440 mL].

**DRIED FRUIT CONSERVE**

1½ cups [360 mL] cut-up dried apricots (¼ pound) [227 g]
1¼ cups [320 mL] cut-up dried peaches (¾ pound) [227 g]
1¼ cups [320 mL] cut-up dried pears (½ pound) [227 g]
1 medium unpeeled chopped orange, (about 1 cup) [240 mL]
3 cups [720 mL] water
2 cups [480 mL] sugar
½ cup [120 mL] seedless raisins
1 tablespoon [15 mL] lemon juice
½ teaspoon [2.5 mL] ground cinnamon (optional)
½ teaspoon [6 mL] ground cloves (optional)
½ cup [120 mL] chopped walnuts or other nuts

Combine all ingredients; heat to boiling, stirring occasionally until sugar dissolves. Cook rapidly until thick, about 15 minutes. Stir frequently to prevent sticking. Add nuts the last 5 minutes of cooking. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 7 half-pints [1680 mL].

**GOOSEBERRY CONSERVE**

1½ quarts [1425 mL] gooseberries, stem and blossom ends removed
1 medium unpeeled chopped orange
4 cups [960 mL] sugar
1 cup [240 mL] seedless raisins

Combine all ingredients; heat slowly to boiling, stirring occasionally until sugar dissolves. Cook almost to jellying point, about 30 minutes. As mixture thickens, stir frequently to prevent sticking. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 6 half-pints [1440 mL].

**GRAPE CONSERVE**

2 quarts [1900 mL] stemmed grapes (about 4 pounds) [1.8 kg]
1 cup [240 mL] chopped walnuts or other nuts
6 cups [1440 mL] sugar

If using Tokay or Malaga grapes, cook grapes whole. Otherwise, separate pulp from skins of grapes. Cook skins 15 to 20 minutes, adding only enough water to prevent sticking (about ½ cup) [120 mL]. Cook pulp without water until soft; press through a sieve or food mill to remove seeds. Combine skins, pulp and sugar. Bring slowly to boiling, stirring occasionally until sugar dissolves. Cook rapidly until thick, about 15 minutes. Stir frequently to prevent sticking. Add nuts the last 5 minutes of cooking. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 7 half-pints [1680 mL].

**PEACH CONSERVE WITH RUM**

1 medium sized seedless orange
½ cup [120 mL] light rum
2 quarts [1900 mL] chopped peaches
6½ cups [1560 mL] sugar
3 tablespoons [45 mL] lime juice
¼ cup [180 mL] crushed pineapple
½ to ¼ cup [60-120 mL] chopped maraschino cherries
½ teaspoon [2.5 mL] salt
½ teaspoon [2.5 mL] ground ginger
¼ teaspoon [1.25 mL] ground mace

Combine first 5 ingredients; cover and cook until fruits are tender, about 15 to 20 minutes. Uncover and add remaining ingredients except nuts. Slowly bring to boiling, stirring occasionally until sugar dissolves. Cook rapidly, stirring frequently, until thick, about 15 minutes. Add nuts the last 5 minutes of cooking. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 5 half-pints [1200 mL].
Use sharp knife to remove thin yellow part of orange peel. Finely chop rest of orange, add just enough water to prevent sticking, and cook until peel is tender. Put container of rum in hot water. Keep hot, but don't boil. Wash, drain, peel, coarsely chop and measure peaches. With exception of rum, mix all ingredients including water in which orange was cooked and boil almost, but not quite, to jellying point. Quickly skim off until peel is tender. Put container of cooked and boil almost, but not quite, including water in which orange was chopped and measure peaches. With exception of rum, mix all ingredients including water in which orange was cooked and boil almost, but not quite, to jellying point. Quickly skim off until peel is tender. Cut rhubarb into ¼-inch [6 mm] slices before measuring. Hull (cap), crush and measure peaches. Finely chop orange peel and pulp: add to 1 cup [240 mL] water and cook until sugar dissolves. Cook rapidly until thick. About 15 minutes in boiling water bath. Yield: about 7 half-pints [1680 mL].

NOTE: When made without rum, this recipe yields a better than average peach conserve.

• PEACH CONSERVE

1 unpeeled chopped orange
7 cups [1680 mL] chopped, peeled, firm, ripe peaches
5 cups [1200 mL] sugar
½ teaspoon [2.5 mL] ground ginger
½ cup [120 mL] blanched, slivered almonds

Add orange to peaches; cook gently about 15 to 20 minutes. Add sugar and ginger. Bring slowly to boiling, stirring occasionally until sugar dissolves. Cook rapidly until thick, about 15 minutes. As mixture thickens, stir occasionally to prevent sticking. Add nuts the last 5 minutes of cooking. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 8 half-pints [1920 mL].

• PLUM CONSERVE

2 ½ quarts [2375 mL] chopped, pitted plums (about 4 pounds) [1.8 kg]
3 ¼ cups [180 mL] thinly sliced orange peel
1 ¾ cups [420 mL] chopped orange pulp (about 2 large)
2 cups [480 mL] seedless raisins
6 cups [1440 mL] sugar
2 cups [480 mL] broken pecans or other nuts

Combine plums, orange pulp and peel, raisins and sugar: slowly bring to boiling, stirring occasionally until sugar dissolves. Cook rapidly almost to jellying point, about 15 to 20 minutes. As mixture thickens, stir frequently to prevent sticking. Add nuts the last 5 minutes of cooking. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 10 half-pints [2400 mL].

• RHUBARB-STRAWBERRY-ORANGE CONSERVE

1 large orange
3 cups [720 mL] sliced rhubarb
3 cups [720 mL] crushed strawberries
1 cup [240 mL] water
5 cups [1200 mL] sugar
¼ teaspoon [1.25 mL] salt
1 cup [240 mL] raisins
½ cup [120 mL] chopped filberts, pecans or walnuts

Wash, rinse and drain orange, rhubarb and berries. Finely chop orange peel and pulp: add to 1 cup [240 mL] water and cook until peel is tender. Cut rhubarb into ¼-inch [6 mm] slices before measuring. Hull (cap), crush and measure strawberries. Put all ingredients, including water in which orange is cooked, except the nuts, into saucepan. Let boil until mixture begins to thicken. Add nuts and cook about 5 minutes longer. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 7 half-pints [1680 mL].

• RHUBARB-STRAWBERRY-ORANGE CONSERVE

2 cups [480 mL] blanched strawberries
2 cups [480 mL] blanched rhubarb
1 cup [240 mL] water
4 cups [960 mL] sugar
1 teaspoon [5 mL] lemon juice

Pit plums; wash, rinse and drain orange, rhubarb and berries. Finely chop orange peel and pulp: add to 1 cup [240 mL] water and cook until peel is tender. Cut rhubarb into ¼-inch [6 mm] slices before measuring. Hull (cap), crush and measure strawberries. Put all ingredients, including water in which orange is cooked, except the nuts, into saucepan. Let boil until mixture begins to thicken. Add nuts and cook about 5 minutes longer. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 8 half-pints [1920 mL].

• BERRY JAMS

Blackberry, Blueberry, Boysenberry, Dewberry, Gooseberry, Loganberry, Raspberry, Youngberry

NOTE: If seedless jam is preferred, crushed berries may be heated until soft and pressed through a sieve or food mill; then add sugar and proceed as above.

• APRICOT JAM

2 quarts [1900 mL] crushed, peeled apricots
6 cups [1440 mL] sugar
¼ cup [60 mL] lemon juice

Combine all ingredients; slowly bring to boiling, stirring occasionally until sugar dissolves. Cook rapidly until thick, about 25 minutes. As mixture thickens, stir frequently to prevent sticking. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 5 pints [2400 mL].

• APRICOT JAM

2 cups [480 mL] blanched strawberries
2 cups [480 mL] blanched rhubarb
1 cup [240 mL] water
4 cups [960 mL] sugar
1 teaspoon [5 mL] lemon juice

Pit plums; wash, rinse and drain orange, rhubarb and berries. Finely chop orange peel and pulp: add to 1 cup [240 mL] water and cook until peel is tender. Cut rhubarb into ¼-inch [6 mm] slices before measuring. Hull (cap), crush and measure strawberries. Put all ingredients, including water in which orange is cooked, except the nuts, into saucepan. Let boil until mixture begins to thicken. Add nuts and cook about 5 minutes longer. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 3 to 4 pints [1440-1920 mL].

• BERRY JAMS

Blackberry, Blueberry, Boysenberry, Dewberry, Gooseberry, Loganberry, Raspberry, Youngberry

9 cups [2160 mL] crushed berries
6 cups [1440 mL] sugar

Combine berries and sugar; bring slowly to boiling, stirring occasionally until sugar dissolves. Cook rapidly to, or almost to, jellying point, depending upon whether a firm or soft jam is desired. As mixture thickens, stir frequently to prevent sticking. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 3 to 4 pints [1440-1920 mL].

NOTE: If seedless jam is preferred, crushed berries may be heated until soft and pressed through a sieve or food mill; then add sugar and proceed as above.
**BING CHERRY JAM**

4 cups [960 mL] pitted, chopped bing cherries  
1 package powdered pectin  
1/4 cup [60 mL] lemon juice  
1/4 cup [60 mL] almond liqueur  
1/4 teaspoon [1.25 mL] salt  
1/2 teaspoon [2.5 mL] ground cinnamon  
1/2 teaspoon [2.5 mL] ground cloves  
4 1/2 cups [1080 mL] sugar

Place all ingredients into a 4-6 quart (3800-5200 mL) kettle, bring the mixture to a boil that cannot be stirred down. Immediately add the sugar. Bring the mixture to a boil and continue boiling for 2 minutes. Skim mixture. Pour hot jam immediately into hot jars, leaving 1/4-inch [6 mm] head space. Adjust caps. Process 10 minutes in a boiling water bath. Yield: about 5 or 6 half-pint jars [1200-1440 mL].

**BLUEBERRY-CURRANT JAM**

1 quart [950 mL] stemmed blueberries  
1 cup [240 mL] water  
3 cups [720 mL] sugar  
2 cups [480 mL] stemmed currants  
1 cup [240 mL] water

Combine blueberries and 1 cup [240 mL] water; cook slowly 5 minutes. Combine currants and 1 cup [240 mL] water; cook slowly 10 minutes, press through a sieve or food mill to remove seeds. Combine blueberries and currant pulp; cook rapidly 5 minutes. Add sugar, stirring occasionally until sugar dissolves. Cook rapidly until thick. As mixture thickens, stir frequently to prevent sticking. Pour, boiling hot, into hot jars, leaving 1/4-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 3 pints [1440 mL].

**ELDERBERRY JAM**

2 quarts [1900 mL] crushed elderberries  
6 cups [1440 mL] sugar  
1/4 cup [60 mL] vinegar

Combine berries, sugar and vinegar. Bring slowly to boiling, stirring occasionally until sugar dissolves. Cook rapidly until thick. As mixture thickens, stir frequently to prevent sticking. Pour, boiling hot, into hot jars, leaving 1/4-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 3 pints [1440 mL].

**CARROT JAM**

4 cups [960 mL] grated raw carrots  
3 cups [720 mL] sugar  
Juice and grated rind of 2 lemons  
1/2 teaspoon [2.5 mL] ground cloves  
1/2 teaspoon [2.5 mL] ground allspice  
1/2 teaspoon [2.5 mL] ground cinnamon

Combine all ingredients. Bring to slow boil, reduce heat, and simmer, stirring constantly, until thick. Pour, hot, into hot jars, leaving 1/4-inch [6 mm] head space. Adjust caps. Process 10 minutes in boiling water bath. Yield: about 6 to 7 half-pint jars [1440-1680 mL].

**DAMSON PLUM JAM**

5 cups [1200 mL] coarsely chopped Damson plums  
(about 2 pounds) [907 g]  
3 cups [720 mL] sugar  
1/4 cup [180 mL] water

Combine all ingredients; bring slowly to boiling, stirring occasionally until sugar dissolves. Cook rapidly to, or almost to, jellying point. As mixture thickens, stir frequently to prevent sticking. Pour, boiling hot, into hot jars, leaving 1/4-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 3 pints [1440 mL].

**FIG JAM**

2 quarts [1900 mL] chopped fresh figs (about 5 pounds) [2.3 kg]  
3/4 cup [180 mL] water  
6 cups [1440 mL] sugar  
1/4 cup [60 mL] lemon juice

To prepare chopped figs: Pour boiling water over figs; let stand 10 minutes. Drain, stem and chop figs. Measure and add 3/4 cup [180 mL] water and sugar to figs. Slowly bring to boiling, stirring occasionally until sugar dissolves. Cook rapidly until thick. Stir frequently to prevent sticking. Add lemon juice and cook 1 minute longer. Pour, boiling hot, into hot jars, leaving 1/4-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 5 pints [2400 mL].

**GRAPE JAM**

2 quarts [1900 mL] stemmed Concord grapes  
6 cups [1440 mL] sugar

Separate pulp from skins of grapes. If desired, chop skins in a food blender or chopper. Cook skins gently 15 to 20 minutes, adding only enough water to prevent sticking (about 1/2 cup [120 mL]). Cook pulp without water until soft; press through a sieve or food mill to remove seeds. Combine pulp, skins and sugar. Bring slowly to boiling, stirring occasionally until sugar dissolves. Cook rapidly almost to jellying point, about 10 minutes. As mixture thickens, stir frequently to prevent sticking. Pour, boiling hot, into hot jars, leaving 1/4-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 3 pints [1440 mL].

**MUSCADINE OR SCUPPERNONG JAM**

Follow recipe for Grape Jam above. Process 15 minutes in boiling water bath canner.

**PEACH JAM**

2 quarts [1900 mL] crushed, peeled peaches  
1/2 cup [120 mL] water  
6 cups [1440 mL] sugar

Combine peaches and water; cook gently 10 minutes. Add sugar; slowly bring to boiling, stirring occasionally until sugar dissolves. Cook rapidly until thick, about 15 minutes, stirring frequently to prevent sticking. Pour, boiling hot, into hot jars, leaving 1/4-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 4 pints [1920 mL].

**NOTE:** For Spiced Peach Jam follow Peach Jam recipe above except add to jam during cooking, spice bag tied in cheesecloth, containing the following ingredients:  
1 teaspoon [5 mL] whole cloves  
1/2 teaspoon [2.5 mL] whole allspice  
1 stick cinnamon

Remove spice bag before pouring jam into jars. Process as shown above.

**PINEAPPLE JAM**

1 quart [950 mL] finely chopped, cored, pared fresh pineapple (about 1 large)  
2 1/2 cups [600 mL] sugar  
1 cup [240 mL] water  
1/2 thinly sliced lemon
Combine all ingredients. Slowly bring to boiling, stirring occasionally until sugar dissolves. Cook rapidly until thick, about 20 minutes. As mixture thickens, stir frequently to prevent sticking. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 4 pints [960 mL].

PLUM JAM
2 quarts [1900 mL] chopped tart plums (about 4 pounds) [1.8 kg]
6 cups [1440 mL] sugar
1½ cups [360 mL] water
½ cup [60 mL] lemon juice
Combine all ingredients; bring slowly to boiling, stirring until sugar dissolves. Cook rapidly to prevent sticking. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 4 pints [960 mL].

RASPBERRY-CURRANT JAM
2 cups [480 mL] currant pulp
2 cups [480 mL] crushed raspberries
3 cups [720 mL] sugar
To prepare currant pulp: Cook currants until soft, press through a sieve or food mill. Measure pulp.
Combine currant pulp, raspberries and sugar. Bring slowly to boiling, stirring occasionally until sugar dissolves. Cook rapidly to jellying point, about 30 minutes. As mixture thickens, stir frequently to prevent sticking. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 10 to 11 half-pints [2400-2640 mL].

CARROT AND ORANGE MARMALADE
4 cups [960 mL] grated raw carrots
2 oranges
Water, about 6 cups [1440 mL]
4 lemons
Sugar
Pinch salt
Squeeze oranges and lemons and save the juice. Then grate the rinds of 1 orange and 2 lemons and cook until tender—about 30 minutes in 3 cups [720 mL] of water. Add the grated carrots and 3 cups [720 mL] of water and cook until tender—about 20 minutes. Add the orange and lemon juice. Measure the mixture. For each cup [240 mL] of this mixture add ½ cup [160 mL] sugar. Boil to the marmalade stage. This will require about an hour. Add pinch salt. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 10 minutes in boiling water bath. Yield: about 10 to 11 half-pints [2400-2640 mL].

CHERRY MARMALADE
1 finely chopped orange, with peel
3½ cups [840 mL] sugar
4 cups [960 mL] pitted sweet cherries
¼ cup [60 mL] lemon juice
Cover chopped orange with water and boil until soft; cool. Add cherries, lemon juice and sugar to orange. Bring slowly to boiling, stirring until sugar is dissolved. Cook rapidly to jellying point, about 35 minutes, stirring frequently. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 4 half-pints [960 mL].

CHERRY-PINEAPPLE MARMALADE
2 cups [480 mL] finely chopped, pitted, tart red cherries
2 cups [480 mL] sugar
2 cups [480 mL] finely chopped, cored, pared, fresh pineapple (about 1 medium)
Combine all ingredients. Bring slowly to boiling, stirring occasionally until sugar dissolves. Cook rapidly until thick, about 10 minutes. As mixture thickens, stir frequently to prevent sticking. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 3 half-pints [720 mL].

CITRUS MARMALADE
1½ cups [360 mL] thinly sliced grapefruit peel (about 1)
½ cup [120 mL] thinly sliced orange peel
1½ cups [360 mL] chopped grapefruit pulp (about 1)
¾ cup [180 mL] chopped orange pulp (about 1 medium)
½ cup [120 mL] thinly sliced lemon (about 1 medium)
1½ quarts [1425 mL] water
Sugar, about 6½ cups [1560 mL]
Add 1½ quarts [1425 mL] water to fruit peel. Boil 5 minutes; drain. Repeat. To drained peel, add fruit pulp, lemon and 1½ quarts [1425 mL] water; boil 5 minutes. Cover and let stand 12 to 18 hours in a cool place. Bring to boiling and cook rapidly until peel is tender, about 35 to 40 minutes. Measure fruit and liquid. Add 1 cup [240 mL] sugar for each cup [240 mL] of fruit mixture. Bring slowly to boiling, stirring until sugar dissolves. Cook rapidly to jellying point, about 30 minutes, stirring frequently. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 10 minutes in boiling water bath. Yield: about 5 half-pints [1200 mL].

NOTE: If sour cherries are to be used, reduce lemon juice to 2 tablespoons [30 mL].
GRAPE-CRANBERRY MARMALADE
2 cups [480 mL] Concord grape juice
2 cups [480 mL] stemmed cranberries
1/2 teaspoon [2.5 mL] grated orange peel
3 cups [720 mL] sugar

To prepare grape juice, see page 24. Combine juice, cranberries and orange peel; bring to boiling. Add sugar; bring slowly to boiling, stirring until sugar dissolves. Cook rapidly to jellying point, about 5 minutes. Stir occasionally to prevent sticking. Pour, boiling hot, into hot jars, leaving 1/4-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 4 half-pints [2400 mL].

GRAPEFRUIT MARMALADE
3/4 cup [160 mL] thinly sliced grapefruit peel
1 1/2 cups [320 mL] chopped grapefruit pulp (about 1)
1 quart [950 mL] water
Sugar, about 4 cups [960 mL]

Cover grapefruit peel with water; boil 10 minutes and drain. Repeat 2 or 3 times. To drained peel, add chopped pulp and 1 quart [950 mL] water. Cover and let stand 12 to 18 hours in a cool place. Cook rapidly until peel is tender, about 40 minutes. Measure fruit and liquid. Add 1 cup [240 mL] sugar for each cup [240 mL] of fruit mixture. Bring slowly to boiling, stirring until sugar dissolves. Cook rapidly to jellying point, about 45 minutes. Stir occasionally to prevent sticking. Pour, boiling hot, into hot jars, leaving 1/4-inch [6 mm] head space. Adjust caps. Process 10 minutes in boiling water bath. Yield: about 8 half-pints [1920 mL].

GREEN GRAPE MARMALADE
2 quarts [1900 mL] stemmed, young, green Concord grapes
2 cups [480 mL] water
8 cups [1920 mL] sugar

Add water to grapes and cook until tender. (If seeds of grapes are not tender, cut grapes in half and remove seeds before cooking.) Add sugar; bring slowly to boiling, stirring occasionally until sugar dissolves.

Cook rapidly to jellying point, stirring frequently. Pour, boiling hot, into hot jars, leaving 1/4-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 10 half-pints [2400 mL].

• ORANGE-LEMON MARMALADE
1 1/2 quarts [1425 mL] water
3 cups [720 mL] thinly sliced orange peel (about 4 large)
3 1/2 cups [840 mL] chopped orange pulp (about 4 large)
Sugar, about 5 1/2 cups [1320 mL]

Add water to fruit; cover and let stand in a cool place overnight. Bring to boiling and cook until peel is tender. To each cup [240 mL] of fruit mixture, add 1 cup [240 mL] sugar. Stir until sugar is dissolved. Cook rapidly to jellying point, about 15 minutes. As mixture thickens, stir frequently to prevent sticking. Pour, boiling hot, into hot jars, leaving 1/4-inch [6 mm] head space. Adjust caps. Process 10 minutes in boiling water bath. Yield: about 6 half-pints [1440 mL].

• ORANGE-PINEAPPLE MARMALADE
1 quart [950 mL] water
6 thinly sliced oranges
1 thinly sliced lemon
6 cups [1440 mL] chopped, cored, pared, fresh pineapple (about 1 large or 2 medium)
Sugar, about 6 1/2 cups [1560 mL]

Add water to oranges and lemon. Cover and cook gently for 1 hour; let stand 12 to 18 hours in a cool place. Add pineapple and cook until pineapple is tender. Measure fruit and liquid. Add 1 cup [240 mL] sugar for each cup [240 mL] of fruit mixture. Bring slowly to boiling, stirring until sugar dissolves. Cook rapidly until thick. As mixture thickens, stir frequently to prevent sticking. Pour, boiling hot, into hot jars, leaving 1/4-inch [6 mm] head space. Adjust caps. Process 10 minutes in boiling water bath. Yield: about 9 half-pints [2160 mL].
**PEACH-ORANGE MARMALADE**

2 quarts [1900 mL] chopped, peeled, firm, ripe peaches (about 10 large)

3/4 cup [180 mL] sliced orange peel

1 1/2 cups [360 mL] chopped orange pulp (about 2 medium)

2 tablespoons [30 mL] lemon juice

5 cups [1200 mL] sugar

Combine all ingredients; bring slowly to boiling, stirring occasionally until sugar dissolves. Cook rapidly until thick, about 20 minutes. As mixture thickens, stir frequently to prevent sticking. Pour, boiling hot, into hot jars, leaving 1/2-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 6 half-pints [1440 mL].

**QUINCE-APPLE MARMALADE**

3 cups [720 mL] chopped, cored, pared quinces (about 6 medium)

2 cups [480 mL] chopped, cored, pared tart apples (about 3 medium)

Sugar, about 2 1/2 cups [600 mL]

When preparing quinces, discard all gritty parts. Add water to quinces just to cover; cook rapidly until tender. Add apples and cook 10 minutes. Measure fruit and liquid. Add 3/4 cup [180 mL] sugar to each cup [240 mL] of fruit mixture. Bring slowly to boiling, stirring until sugar dissolves. Cook rapidly almost to jellying point, about 15 to 20 minutes. As mixture thickens, stir frequently to prevent sticking. Pour, boiling hot, into hot jars, leaving 1/2-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 4 half-pints [960 mL].

**PRICKLY PEAR MARMALADE**

2 thinly sliced lemons, (about 1 cup [240 mL])

2 large unpeeled, chopped oranges (about 3 cups)

[720 mL]

1 quart [950 mL] water

1 quart [950 mL] chopped, peeled, seeded prickly pears (about 9)

6 cups [1440 mL] sugar

Combine first 3 ingredients; cover and let stand 12 to 18 hours in a cool place. Cook rapidly until peel is tender, about 30 minutes. Cool; add pears and sugar. Bring slowly to boiling, stirring until sugar dissolves. Cook rapidly to jellying point, about 25 minutes. As mixture thickens, stir frequently to prevent sticking. Pour, boiling hot, into hot jars, leaving 1/2-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 6 half-pints [1440 mL].

**STRAWBERRY-PINEAPPLE MARMALADE**

2 1/2 cups [600 mL] finely chopped, cored, pared, fresh pineapple (about 1 medium)

1 teaspoon [5 mL] grated orange peel

2 1/2 cups [600 mL] chopped orange pulp (about 4 medium)

7 cups [1680 mL] sugar

1 1/2 quarts [1425 mL] stemmed strawberries

Combine pineapple, orange peel, pulp and sugar. Bring slowly to boiling, stirring occasionally until sugar dissolves. Cook rapidly 15 minutes. Add strawberries and continue cooking rapidly until thick, about 20 to 30 minutes. As mixture thickens, stir frequently to prevent sticking. Pour, boiling hot, into hot jars, leaving 1/4-inch [6 mm] head space. Adjust caps. Process 10 minutes in boiling water bath. Yield: about 6 half-pints [1440 mL].

**APRICOT PRESERVES**

5 cups [1200 mL] halved, peeled, hard, ripe apricots (about 2 pounds) [907 g]

4 cups [960 mL] sugar

1/4 cup [60 mL] lemon juice

Thoroughly mix fruit with sugar and lemon juice. Cover tightly, let stand 4 to 5 hours in a cool place. Heat slowly to boiling, stirring occasionally until sugar dissolves. Cook rapidly until fruit is clear, about 30 minutes. As mixture thickens, stir frequently to prevent sticking. Pour, boiling hot, into hot jars, leaving 1/4-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 4 half-pints [960 mL].

**BAR-LE-DUC (CURRANT) PRESERVES**

1 cup [240 mL] currant juice

2 quarts [1900 mL] stemmed currants

4 cups [960 mL] sugar

3 cups [720 mL] sugar

To prepare juice, see page 23. Combine currant juice and fruit in a flat pan; add 4 cups [960 mL] sugar and cook 5 minutes. Let stand 12 hours or overnight in a cool place. Add remaining sugar. Bring slowly to boiling, stirring until sugar dissolves. Cook rapidly to, or almost to, jellying point, about 30 minutes. Stir occasionally to prevent sticking. Pour, boiling hot, into hot jars, leaving 1/4-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 5 half-pints [1200 mL].

**BERRY PRESERVES**

Although blackberries and others which hold shape in cooking can be used for preserves, all, except strawberries, are more satisfactory for jam. If making preserves, use 1/4 cup each pound [454 g] berries. Pour, boiling hot, into hot jars, leaving 1/4-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath.
CHERRY PRESERVES
2 pounds [907 g] pitted, tart, red cherries
4 cups [960 mL] sugar

Drain juice from cherries. Add sugar to juice (if not enough juice to dissolve sugar, add a little water) and cook until sugar dissolves, stirring occasionally. Cool. Add cherries and cook rapidly until cherries become glossy, about 15 minutes. Cover and let stand 12 to 18 hours in a cool place. Bring to boiling and cook rapidly until cherries become glossy, about 15 minutes. Cover and cook rapidly until cherries become glossy, about 15 minutes. Cover and let stand 12 to 18 hours in a cool place.

Add cherries and cook until sugar dissolves, stirring rapidly 1 minute. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 4 half-pints [960 mL].

CITRON MELON PRESERVES
1½ quarts [1425 mL] prepared citron melon (about 2 pounds) [907 g]
2 cups [480 mL] sugar
1 quart [950 mL] water
2 cups [480 mL] sugar
1 thinly sliced lemon

Both inner and outer part of melon may be used, but should be prepared separately. To prepare melon: Cut outer part into ¼-inch [19 mm] slices, crosswise, trim green rind. Cut into 1-inch [25 mm] pieces. Remove seeds from inner part; cut into 1-inch [25 mm] pieces. Add 2 cups [480 mL] sugar to water; bring to boil. Add citron and cook rapidly until tender, about 45 minutes. Cover and let stand 12 to 18 hours in a cool place.

Add remaining sugar and lemon. Boil gently until clear, about 1 hour. (If syrup becomes too thick, add a small amount of boiling water. The amount of water depends upon the melon used. If syrup is too thin when citron is done, remove citron and boil syrup until thick.) Pack into hot jars, leaving ⅛-inch [6 mm] head space. Pour boiling syrup over melon, leaving ⅛-inch [6 mm] head space. Remove air bubbles. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 10 half-pints [2400 mL].

NOTE: Although the product will not be as high in quality, figs may be preserved without peeling. If unpeeled, figs should be covered with water and boiled 15 to 20 minutes and drained before adding to syrup.

FIG PRESERVES
7 cups [1680 mL] sugar
1½ cups [60 mL] lemon juice
2 quarts [1425 mL] hot water
1½ cups [60 mL] stemmed, ripe figs (about 4½ pounds) [2 kg]
2 thinly sliced lemons

Add sugar and lemon juice to hot water. Cook until sugar dissolves. Add figs and cook rapidly 10 minutes. Stir occasionally to prevent sticking. Add sliced lemons and continue cooking rapidly until figs are clear, about 10 to 15 minutes. (If syrup becomes too thick before figs become clear, add boiling water, ¼ cup [60 mL] at a time.) Cover and let stand 12 to 24 hours in a cool place. Pack into hot jars, leaving ⅛-inch [6 mm] head space. Adjust caps. Process 30 minutes in boiling water bath. Yield: about 10 half-pints [2400 mL].

NOTE: This may be used as a substitute for commercial candied citron after draining thoroughly. Commercial citron is made from tree grown fruit. The citron melon is vine grown. The outer part is superior to the inner part for preserves.

OLD-FASHIONED PEACH PRESERVES
1 cup [240 mL] water
4 cups [960 mL] sugar
1 cup [240 mL] grated orange (pulp and rind)
⅛ teaspoon [1.25 mL] almond extract
½ teaspoon [2.5 mL] salt

To prepare peaches: Wash, rinse, scald (to loosen skins) and dip peaches into cold water. Drain. Cut peaches in halves, discard pits and skins. If peaches are small, leave in halves; if peaches are large, cut into pieces and weigh.

Mix sugar and honey with the peaches. Cover and allow peach mixture to stand while preparing the orange. The orange may be grated in the blender. Measure the grated peel, and add an equal amount of water. Cover and slowly cook the orange peel mixture until the peel is soft enough to mash with the fingers. If more water is needed to finish cooking the orange peel, add as little water as possible. Cook peaches over low heat until the sugar dissolves. Increase heat and boil about 15 minutes, add orange peel mixture and boil until peaches are "clear" and syrup is as thick as honey.

WESTERN SPECIAL PRESERVES
1 cup [240 mL] water
5 cups [1200 mL] sugar
2 cups [480 mL] stemmed loganberries
2 cups [480 mL] stemmed raspberries
2 cups [480 mL] pitted sweet cherries

Crush currants; combine currants and water; cook until soft. Drain juice through jelly bag or 4 layers of cheesecloth. Add sugar to currant juice; bring slowly to boiling, stirring until sugar is dissolved. Cook rapidly 5 minutes. Add remaining fruit and cook rapidly to, or almost to, jellying point, about 30 minutes. As mixture thickens, stir frequently to prevent sticking. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 5 half-pints [1200 mL].

HONEYED PEACH PRESERVES
2 pounds [907 g] prepared peaches
4 cups [960 mL] sugar
1 cup [240 mL] light honey
½ grated orange (pulp and rind)
⅛ teaspoon [1.25 mL] pure almond extract
⅛ teaspoon [2.5 mL] salt

To prepare peaches: Wash, rinse, scald (to loosen skins) and dip peaches into cold water. Drain. Cut peaches in halves, discard pits and skins. If peaches are small, leave in halves; if peaches are large, cut into pieces and weigh.

Mix sugar and honey with the peaches. Cover and allow peach mixture to stand while preparing the orange. The orange may be grated in the blender. Measure the grated peel, and add an equal amount of water. Cover and slowly cook the orange peel mixture until the peel is soft enough to mash with the fingers. If more water is needed to finish cooking the orange peel, add as little water as possible. Cook peaches over low heat until the sugar dissolves. Increase heat and boil about 15 minutes, add orange peel mixture and boil until peaches are "clear" and syrup is as thick as honey.
This will be 8°F [4°C] above the boiling point of water in your area. Stir almond extract and salt into peach preserves. Skim foam from the preserves. Pour hot preserves into hot jars, leaving ¼-inch [6 mm] head space at the top of the jars. Adjust caps. Process for 15 minutes in a boiling water bath canner. Yield: about 5 half-pint jars [1200 mL].

**PEAR PRESERVES**

1½ cups [360 mL] sugar
3 cups [720 mL] water
6 medium cored, pared, hard, ripe pears, cut in halves or quarters (about 2 pounds) [907 g]

1½ cups [360 mL] sugar
1 thinly sliced lemon

Combine 1½ cups [360 mL] sugar and water; cook rapidly 2 minutes. Add pears and boil gently for 15 minutes. Add remaining sugar and lemon, stirring until sugar dissolves. Cook rapidly until fruit is clear, about 25 minutes. Cover and let stand 12 to 24 hours in a cool place. Pack fruit into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 20 minutes in boiling water bath. Yield: about 5 half-pint jars [1200 mL].

**QUINCE PRESERVES**

3 cups [720 mL] sugar
2 quarts [1900 mL] water
7 cups [1680 mL] quartered, cored, pared quinces (about 3 pounds [1.4 kg] before preparing)

When preparing quinces, discard all gritty parts. Combine sugar and water; boil 5 minutes. Add quinces and cook until fruit has a clear, red color and syrup is almost at jellying point, about 1 hour. As mixture thickens, stir frequently to prevent sticking. Pour, boiling hot, into hot jars, leaving ⅛-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 4 half-pint jars [960 mL].

**STRAWBERRY PRESERVES DELUXE**

1½ quarts [1425 mL] stemmed, firm, red, ripe strawberries
5 cups [1200 mL] sugar
⅔ cup [80 mL] lemon juice

Berries with hollow cores should not be used. Combine strawberries and sugar; let stand 3 to 4 hours. Bring slowly to boiling, stirring occasionally until sugar dissolves. Add lemon juice. Cook rapidly until berries are clear and syrup thick, about 10 to 12 minutes. Pour into a shallow pan. Let stand uncovered, 12 to 24 hours in a cool place. Shake pan occasionally to distribute berries through syrup. Pack into hot jars, leaving ⅛-inch [6 mm] head space. Adjust caps. Process 20 minutes in boiling water bath. Yield: about 4 half-pint jars [960 mL].

**WATERMELON RIND PRESERVES**

1½ quarts [1425 mL] prepared watermelon rind
4 tablespoons [60 mL] salt
2 quarts [1900 mL] cold water
1 thinly sliced lemon
1 tablespoon [15 mL] ground ginger
4 cups [960 mL] sugar
½ cup [60 mL] lemon juice
7 cups [1680 mL] water

To prepare watermelon rind:
Trim green skin and pink flesh from thick watermelon rind; cut into 1-inch [25 mm] pieces. Dissolve salt in 2 quarts [1900 mL] water and pour over rind. Let stand 5 to 6 hours if salt is used. Drain; rinse and drain again. Cover with cold water and let stand 30 minutes. Drain. Sprinkle ginger over rind; cover with water and cook until fork-tender. Drain.

Combine sugar, lemon juice and 7 cups [1680 mL] water. Boil 5 minutes; add rind and boil gently for 30 minutes. Add sliced lemon and cook until the melon rind is clear. Pack, boiling hot into hot jars, leaving ⅛-inch [6 mm] head space. Adjust caps. Process 20 minutes in boiling water bath. Yield: about 6 half-pints [1440 mL].
LOW ACID FOODS

Low acid foods, while they require a little more care than acids, can easily and safely be canned at home. And vegetables especially, picked vegetables, meats, poultry, seafood, fresh from the garden or purchased easily and safely be canned at home. A little more care than acids, can be preserved by canning. The times prescribed in individual recipes. The times given in recipes for low acids in this book are for foods processed at altitudes under 2,000 feet [610 m]. For higher altitude areas, adjustments in pressure must be made as in Figure 15.

STEP-BY-STEP CANNING OF LOW ACIDS

2. Assemble all equipment and utensils. Make sure everything is clean. Clean petcock and safety valve of pressure canner by drawing a string through openings. Determine that pressure gauge is accurate.
4. For meats, poultry, seafoods and soups, see special instructions in this section.
5. For vegetables, select only the best produce and just enough for one canner load at a time. Wash and rinse thoroughly before breaking the skin.
6. Follow recipe closely.
7. Pack vegetables in jars loosely enough for water to circulate between pieces without wasting space.

8. Cover vegetables with fresh boiling water, or with water in which they were heated for packing, leaving 1-inch [25 mm] head space.
9. Remove air bubbles.
10. Wipe top and threads of jar with clean, damp cloth. Attach closures.
11. Place jars in pressure canner and fasten cover, closely following manufacturer’s instructions. Heat, allowing steam to escape for 10 minutes, or according to manufacturer’s instructions. Close petcock and bring pressure to 10 pounds [70 kPa]. Start counting processing time. Keep pressure constant for entire length of processing time specified in recipe or in manufacturer’s directions.
12. Remove canner from heat. Let pressure fall to zero naturally. Wait 2 minutes. Unfasten cover; slide cover slightly toward you, allowing steam to escape on opposite side, or according to manufacturer’s instructions. Lift cover. Then let stand 10 minutes and remove jars. Stand jars on cloths, out of drafts and with space between. Do not tighten bands on jars after processing.
13. After 24 hours, test seals.
14. Store sealed jars in dark, dry, cool place.
15. Boil low acid foods for 15 minutes before serving.

MEATS, POULTRY, SEAFOODS, SOUPS & OTHER MIXTURES (POTPOURRI)

In addition to vegetables, many other low acids can be preserved by canning to supplement the family diet. Canning is an excellent way to preserve the game caught by hunters and fishermen.

The step-by-step instructions for canning low acids at the beginning of this section should be followed for canning meats, poultry, seafoods, soups and other mixtures. In addition, other special handling tips and instructions are outlined below.

Meats—The flavor and texture of canned meats depend upon the breed, feed and manner of handling the meat at the time of, and immediately after, slaughtering. If you slaughter your own meat, contact your local county agricultural agent for complete information on slaughtering, chilling and aging the meat.

To prepare the meat, cut into pieces suitable for cooking or canning. Cut slices across the grain about 1 inch [25 mm] thick. Then cut with the grain into jar-size pieces. For stew, cut into uniform cubes.

Trim away gristle, bruised spots and fat. Too much fat is likely to cause the meat to have a strong flavor, and may also damage the compound used for sealing the jars.

Do not let meat stand in water. Strong-flavored game, however, should be soaked in salt water before canning. Prepare and pack meat according to the recipe and process for the prescribed time.

Poultry—One or two year old fowls are better than younger ones for canning. After washing fowl, cut skin between legs and body. Bend legs until hip joints snap. Slip knife under ends of shoulder blades and cut up to wings. Pull back and breast apart. Remove entrails. Rinse and dry. Do not salt. Chill 6 to 12 hours before canning.

Seafoods—Prepare freshly caught, thoroughly bled fish as for cooking. Leave backbone in small fish, remove it from large ones. Fish should be soaked in salt water before canning. Fish should not be canned in jars larger than pints, because seafood is very low in acidity, and heat penetration may be inadequate for destroying bacteria. The seafood recipes in this book are based on information supplied by the Division of Fishery Industries, United States Department of Interior. For additional seafood recipes, write to this department in Washington, D.C.


Soups—Ingredients should be cut to uniform size for even processing. For soups containing vegetables, the length of processing time should be for the vegetable requiring the longest processing. (See Figure 17.)
MEATS

**CHOPPED MEAT**
Beef, Veal, Lamb, Mutton, Pork, Venison

Put meat through food chopper; measure. Cook it in hot skillet until seared. Add 1 to 1 ½ cups [240-360 mL] boiling water, meat stock or tomato juice, and 1 teaspoon [5 mL] salt for each quart [950 mL] ground meat. Pack, hot, into hot jars, leaving 1-inch [25 mm] head space. Adjust caps. Process pints [480 mL] 1 hour and 15 minutes, quarts [950 mL] 1 hour and 30 minutes, at 10 pounds [70 kPa] pressure.

To serve: Use for meat loaf, baked hash, or stuffing vegetables.

**CORNED BEEF**
25 pounds [11.3 kg] beef (brisket, chuck, plate or rump)
2 pounds [907 g] pickling, dairy or kosher salt
1 pound [454 g] sugar
1½ teaspoons [7.5 mL] baking soda
1 ounce [28 g] saltpeter

To Cook: Cut meat into pieces 3 to 6 inches [76-152 mm] thick. Put thin layer of salt in bottom of stone jar or tight keg. Add layer of meat. Sprinkle with salt. Add other layers of meat and salt; the top layer must be salt. Let stand 12 to 18 hours in a cool place. Dissolve sugar, soda and salt-peter in a quart [950 mL] of lukewarm water; mix with 3 quarts [2850 mL] cool water; pour over meat. Cover with dinner plate or glass pie plate. Fill jar with water and use to hold plate below brine. Meat must be kept under brine at all times. Scum should be removed each day. (If brine ferments, drain and wash scald container and prepare new brine. Put meat back into keg with brine.) The meat should be ready to can in 3 or 4 weeks; it will be a bright red color.


**GRAVY TO USE IN HOT PACKING**

Remove meat from cooking pan. Add 1 cup [240 mL] boiling water, or broth, for each 1 to 2 tablespoons [15-30 mL] fat in pan. Boil 2 or 3 minutes. Do not thicken.

**PORK SAUSAGE**

Use freshly made sausage. Season with salt, black and cayenne pepper. A very small amount of spice may be added. It is better not to use sage. Make sausage into cakes or patties. Cook until lightly browned. Pack, hot, into hot jars, leaving 1-inch [25 mm] head space. Gravy may be added; however, enough fat for making gravy will cook out of the sausage during processing. Adjust caps. Process pints [480 mL] 1 hour and 15 minutes, quarts [950 mL] 1 hour and 30 minutes at 10 pounds [70 kPa] pressure.

**PORK TENDERLOIN**


**Cold or Raw Pack**... Slice, or leave in jar-length pieces. Pack into hot jars, leaving 1-inch [25 mm] head space. Add ½ teaspoon [2.5 mL] salt per pint [480 mL] OR 1 teaspoon [5 mL] salt to each quart [950 mL]. Adjust caps. Process pints [480 mL] 1 hour and 15 minutes, quarts [950 mL] 1 hour and 30 minutes, at 10 pounds [70 kPa] pressure.

**ROAST**

Beef, Veal, Lamb, Mutton, Pork, Venison

Cut meat into jar size chunks. Bake or roast meat until well browned, but not done; or brown in small amount of fat. Salt to taste. Pack, hot, into hot jars, leaving 1-inch [25 mm] head space. Cover with hot gravy or broth, leaving 1-inch [25 mm] head space. Adjust caps. Process pints [480 mL] 1 hour and 15 minutes, quarts [950 mL] 1 hour and 30 minutes, at 10 pounds [70 kPa] pressure.

**SPARERIBS**


**STEAKS AND CHOPS**
Beef, Veal, Lamb, Mutton, Pork, Venison


**Cold or Raw Pack**... Cut meat into 1-inch [25 mm] slices. Remove large bones. Pack meat into hot jars, leaving 1-inch [25 mm] head space. Add ½ teaspoon [2.5 mL] salt per pint [480 mL] OR 1 teaspoon [5 mL] salt to each quart [950 mL]. Adjust caps. Process pints [480 mL] 1 hour and 15 minutes, quarts [950 mL] 1 hour and 30 minutes, at 10 pounds [70 kPa] pressure.

**WILD RABBIT and SQUIRREL**

Soak the meat 1 hour in brine made by dissolving 1 tablespoon [15 mL] salt per quart [950 mL] water. Rinse. Use either recipe on following page for canning chicken, omitting salt.

Notice: In most states the length of time for storage of game is controlled by law. Conservation officials can supply information on this subject.
POULTRY

One or two year old fowls are better than younger ones for canning. After picking and washing fowl, cut skin between legs and body. Bend legs until hip joints snap. Slip knife under ends of shoulder blades and cut up to wings. Pull back and breast apart. Remove entrails. Rinse. Dry. Chill 6 to 12 hours. Do not salt.

CHICKEN – BONED

Use for All Poultry

Steam or boil chicken until about 2/3 done. Remove skin and bones. Pack meat into hot jars, leaving 1-inch [25 mm] head space. Add ½ teaspoon [2.5 mL] salt per pint [480 mL], OR 1 teaspoon [5 mL] salt to each quart [950 mL]. Skim fat from broth. Reheat broth to boiling. Pour over chicken, leaving 1-inch [25 mm] head space. Add 1/2 teaspoon [2.5 mL] of citric acid. Boil 2 minutes. Drain. Pack into hot pint [480 mL] jars, leaving 1-inch [25 mm] head space. Adjust caps. Process 1 hour and 10 minutes at 10 pounds [70 kPa] pressure.

CHICKEN-ON-BONE

Use for All Poultry

Hot Pack . . . Boil, steam or bake chicken until about 2/3 done. Remove skin and bones. Pack meat into hot jars, leaving 1-inch [25 mm] head space. Add ½ teaspoon [2.5 mL] salt per pint [480 mL], OR 1 teaspoon [5 mL] salt to each quart [950 mL]. Skim fat from broth. Reheat broth to boiling. Pour over chicken, leaving 1-inch [25 mm] head space. Adjust caps. Process pints [480 mL] 1 hour and 15 minutes, quarts [950 mL] 1 hour and 30 minutes, at 10 pounds [70 kPa] pressure.

Cold or Raw Pack . . . Separate chicken at joints. Pack, into hot jars, leaving 1-inch [25 mm] head space. Add ½ teaspoon [2.5 mL] salt per pint [480 mL], OR 1 teaspoon [5 mL] salt to each quart [950 mL]. Do not add liquid. Adjust caps. Process pints [480 mL] 1 hour and 5 minutes, quarts [950 mL] 1 hour and 15 minutes, at 10 pounds [70 kPa] pressure.

SEAFOODS

Prepare freshly caught, thoroughly bled fish as for cooking. Leave backbone in small fish; remove it from large ones. Use pint [480 mL] or half-pint [240 mL] jars for processing.

NOTE: The majority of these recipes are based upon information supplied by the Division of Fishery Industries, United States Department of the Interior.

CLAMS

Scrub, steam and open fresh clams. Save juice. Drop clams into weak salt water. Wash thoroughly and 1-inch [25 mm] head space. Adjust caps. Process 1 hour and 10 minutes at 10 pounds [70 kPa] pressure.

CRAB MEAT

Add ¼ cup [60 mL] lemon juice, or white vinegar, and 2 tablespoons [30 mL] salt to 1 gallon [3800 mL] boiling water. Keep hot. Remove back shell and thoroughly cleanse crabs. Wash bodies through several changes of cool water. Boil 20 minutes in the acid-brine. While crabs are boiling, add 2 cups [480 mL] lemon juice or white vinegar to 1 gallon [3800 mL] cool water. Drain cooked crabs. Remove meat from body and claws. Rinse in cool acid-brine. Squeeze meat to remove some of the liquid. Pack 6 oz. [170 g] crab meat into hot half-pint [240 mL] jars, or 12 oz. [340 g] into pint [480 mL] jars, leaving 1-inch [25 mm] head space. Do not process quarts. Add ½ teaspoon [2.5 mL] of citric acid to each half-pint [240 mL] or 1 teaspoon [5 mL] per pint [480 mL] of crab, cover with boiling water, leaving 1-inch [25 mm] head space. Adjust caps. Process half-pints and pints for 80 minutes at 10 pounds [70 kPa] pressure.

MACKEREL, MULLET, TROUT, WHITEFISH, etc.


SALMON and SHAD


SHRIMP


SMELT in TOMATO SAUCE

6 pounds [2.7 kg] cleaned smelt

2 cups [480 mL] Barbecue Sauce (see page 34)

¾ cup [180 mL] oil

⅓ cup [60 mL] vinegar

2 teaspoons [10 mL] salt


NOTE: To obtain more seafood recipes, we suggest you write Division of Fishery Industries, United States Department of Interior, Washington, D.C., or U.S. Department of Agriculture, Washington, D.C., for Home and Garden Bulletin No. 93, "Freezing Meat and Fish in the Home."
BEAN SOUP
2 cups [480 mL] dried navy beans (1 pound) [454 g]
1 ham hock or ¼ pound [113 g] salt pork
½ cup [120 mL] chopped onion
½ hot red pepper
Salt to taste

Cover beans with cold water and soak 12 to 18 hours in a cool place. Add meat, onion and pepper; bring to boiling. Cover and simmer 2 to 3 hours or until beans are mushy. Remove meat and cut into small pieces. Press remaining ingredients through a sieve or food mill; add to beans. Add boiling water, if necessary, for desired consistency. Salt to taste. Pour, hot, into hot jars, leaving 1-inch [25 mm] head space. Adjust caps. Process pints [480 mL] 1 hour, at 10 pounds [70 kPa] pressure. Yield: about 5 pints [2400 mL].

BEEF STEW WITH VEGETABLES
4 to 5 pounds [1.8-2.3 kg] beef stew meat
2 quarts [1900 mL] sliced small carrots (about 16)
3 cups [720 mL] chopped celery
3 cups [720 mL] chopped onions
3 quarts [2850 mL] cubed, pared potatoes (about 12 medium)
1¼ tablespoons [23 mL] salt
1 teaspoon [5 mL] thyme
½ teaspoon [2.5 mL] pepper

Cut meat into 1½-inch [38 mm] cubes (about 2 quarts) [1900 mL]; brown in a small amount of fat. Combine meat, vegetables and seasonings; cover with boiling water. Pack, hot, into hot jars, leaving 1-inch [25 mm] head space. Adjust caps. Process pints [480 mL] 1 hour, quarts [950 mL] 1 hour and 15 minutes, at 10 pounds [70 kPa] pressure. Yield: about 4 pints [1665 mL].

NOTE: Vegetables do not need to be precooked.

CHICKEN A LA KING
True Chicken a la King is made of all white meat, pure cream and sherry wine. The recipe given here is for a product suitable for canning or freezing.

7 to 8 pounds [3.2-3.6 kg] ready-to-cook stewing chickens, cut in pieces
2 stalks celery
1 onion
1 carrot
4 peppercorns
2 whole allspice
1 bay leaf
2 teaspoons [10 mL] salt
¾ cup [60 mL] chicken fat or butter
½ cup [120 mL] flour
5 cups [1200 mL] chicken broth
¼ cup [60 mL] chopped pimiento
1 tablespoon [15 mL] chopped parsley
Salt and pepper to taste

To Prepare Chicken: Cook chicken in water to cover. Add celery, onion, carrot, peppercorns, allspice, bay leaf and salt. Bring to boiling, reduce heat and simmer 2 to 3 hours or until chicken is tender. Remove vegetables. Allow chicken to cool in broth. Remove chicken; spoon off excess fat; strain broth. Remove skin and bones from meat. Cut meat into 1-inch [25 mm] pieces.


To Serve: Add cooked or canned pinto or kidney beans, heat and serve.

CLAM CHOWDER
½ pound [227 g] diced salt pork
1 cup [240 mL] chopped onions
3 to 4 quarts [2850-3800 mL] cleaned clams with juice
2 quarts [1900 mL] diced, pared potatoes (about 8 medium)
2 quarts [1900 mL] boiling water
Salt and pepper to taste


For Manhattan Chowder, add to above ingredients before canning:
½ bay leaf
½ teaspoon [2.5 mL] thyme
¼ cup [120 mL] chopped celery
2 cups [480 mL] cooked tomatoes

For New England Chowder, after canning, immediately before heating for serving, add to each jar:
2 tablespoons [30 mL] butter
2 cups [480 mL] milk
FISH CHOWDER
5 pounds [2.3 kg] cleaned fish
3 quarts [2850 mL] water
2 teaspoons [10 mL] salt
⅓ teaspoon [2.5 mL] peppercorns
⅔ hot red pepper
¾ pound [340 g] diced salt pork
1 cup [240 mL] chopped onions
2 quarts [1900 mL] diced, pared potatoes (about 8 medium)


MEAT SAUCE
For Spaghetti, Lasagne, or Casseroles
5 pounds [2.3 kg] ground beef
2 cups [480 mL] chopped onions
1 cup [240 mL] chopped green peppers (about 2 medium)
9 cups [2160 mL] cooked or canned tomatoes and juice
24 ounces [680 g] [2⅔ cups [640 mL]] tomato paste
2 tablespoons [30 mL] brown sugar
2 tablespoons [30 mL] minced parsley
1½ tablespoons [23 mL] salt
1 tablespoon [15 mL] oregano
½ teaspoon [2.5 mL] pepper
½ teaspoon [2.5 mL] ginger
½ teaspoon [2.5 mL] allspice
2 tablespoons [30 mL] vinegar

Brown beef; add onions and green peppers, and cook slowly until tender. Add remaining ingredients and simmer until thick enough for serving. If the meat is fat, skim off excess fat before canning. Pour, hot, into hot jars, leaving 1-inch [25 mm] head space. Adjust caps. Process pints [480 mL] 1 hour, quarts [950 mL] 1 hour and 15 minutes, at 10 pounds [70 kPa] pressure. Yield: about 3 quarts [2850 mL].

MINCEMEAT
5 cups [1200 mL] ground, cooked beef (about 2 pounds) [907 g]
1 quart [950 mL] ground suet (about 1 pound) [454 g]
3 quarts [2850 mL] chopped, pared tart apples (about 12 medium)
½ cup [80 mL] finely chopped orange peel
1½ cups [360 mL] chopped orange pulp (about 2 large)
¼ cup [60 mL] lemon juice
33 ounces [482 g] currants
8 ounces [227 g] chopped, candied citron
2 pounds [907 g] brown sugar (4½ cups) [1080 mL] (packed)
1 tablespoon [15 mL] salt
1 tablespoon [15 mL] cinnamon
1 tablespoon [15 mL] allspice
1 teaspoon [10 mL] nutmeg
1 teaspoon [5 mL] cloves
⅓ teaspoon [1.25 mL] ginger
1 quart [950 mL] sweet cider or grape juice

Mix together all ingredients in a large kettle; simmer 1 hour. Stir frequently to prevent sticking. Pack, hot, into hot jars, leaving 1-inch [25 mm] head space. Adjust caps. Process pints [480 mL] and quarts [950 mL] 20 minutes at 10 pounds [70 kPa] pressure. Yield: about 6 quarts [5700 mL].
**VEGETABLES**

**ASPARAGUS**

Hot Pack . . . Wash and drain tender, tight-tipped asparagus. Remove tough ends and scales. Wash again. Leave asparagus whole or cut into 1-inch [25 mm] pieces. Boil 3 minutes. Pack, hot, into hot jars, leaving 1-inch [25 mm] head space. Add ½ teaspoon [2.5 mL] salt to each pint [480 mL], OR 1 teaspoon [5 mL] salt to each quart [950 mL]. Cover with boiling water, leaving 1-inch [25 mm] head space. Adjust caps. Process pints [480 mL] 1 hour and 20 minutes, quarts [950 mL] 1 hour and 35 minutes at 10 pounds [70 kPa] pressure.

Cold or Raw Pack . . . Prepare as for Hot Pack. Pack as tightly as possible, without crushing, into hot jars leaving 1-inch [25 mm] head space. Add ½ teaspoon [2.5 mL] salt to each pint [480 mL], OR 1 teaspoon [5 mL] salt to each quart [950 mL]. Cover with boiling water, leaving 1-inch [25 mm] head space. Adjust caps. Process pints [480 mL] 25 minutes, quarts [950 mL] 30 minutes, at 10 pounds [70 kPa] pressure.

**BEANS**

**DRIED KIDNEY, ETC.**

Use kidney or any other variety of dried beans or dried peas. Cover beans or peas with cold water. Let stand 12 to 18 hours in a cool place. Boil 30 minutes. Pack, hot, into hot jars, leaving 1-inch [25 mm] head space. Add ½ teaspoon [2.5 mL] salt to each quart [950 mL]. Cover with boiling water, leaving 1-inch [25 mm] head space. Adjust caps. Process pints [480 mL] 1 hour and 15 minutes, quarts [950 mL] 1 hour and 30 minutes, at 10 pounds [70 kPa] pressure.

**BEANS—GREEN, SNAP and WAX**


Cold or Raw Pack . . . Wash, drain and shell tender young beans. Wash again. Pack loosely into hot jars, leaving 1-inch [25 mm] head space. Do not press or shake down. Add ½ teaspoon [2.5 mL] salt to each quart [950 mL]. Cover with boiling water, leaving 1-inch [25 mm] head space. Adjust caps. Process pints [480 mL] 40 minutes, quarts [950 mL] 50 minutes, at 10 pounds [70 kPa] pressure. If beans are large process 10 minutes longer.

**BEANS—LIMA and BUTTER**


**BEANS—BOSTON BAKED**

1 quart [950 mL] dried navy beans (about 2 pounds) [907 g]
2 teaspoons [10 mL] salt
½ pound [227 g] salt pork, cut in pieces
3 sliced small onions
¾ cup [160 mL] brown sugar, packed
2 teaspoons [10 mL] salt
2 teaspoons [10 mL] dry mustard
¾ cup [160 mL] molasses

Cover beans with 3 quarts [2850 mL] water; let stand 12 to 18 hours in a cool place. Add 2 teaspoons [10 mL] salt to beans and soaking water; bring to boil. Cover and simmer until skins begin to crack. Drain, reserving liquid. Pour beans into a baking dish or bean pot. Add pork and onions. Combine remaining ingredients. Add 4 cups [950 mL] reserved bean liquid (adding water, if necessary, to make 4 cups [950 mL]). Pour over beans. Cover and bake in a moderate oven 350°F [177°C] 3½ hours. Add water, if necessary, as beans should be “soupy.” Pack into hot jars, leaving 1-inch [25 mm] head space. Adjust caps. Process pints [480 mL] 1 hour and 20 minutes, quarts [950 mL] 1 hour and 35 minutes at 10 pounds [70 kPa] pressure. Yield: about 6 pints [2880 mL].

**BEANS WITH PORK and TOMATO SAUCE**

1 quart [950 mL] dried navy beans (about 2 pounds) [907 g]
¾ pound [113 g] salt pork, cut in pieces
1 quart [950 mL] tomato juice
3 tablespoons [45 mL] sugar
2 teaspoons [10 mL] salt
1 cup [240 mL] chopped onions
¾ teaspoon [1.25 mL] cloves
¾ teaspoon [1.25 mL] allspice

Cover beans with cold water and let stand 12 to 18 hours in a cool place. Drain and cover with boiling water; boil for 3 minutes. Remove from heat and let stand 10 minutes; drain. Pack 1 cup [240 mL] of
beans into hot jar. Top with piece of pork and fill jar about ¾ full with beans. Combine tomato juice, sugar, salt, onions and spices; heat to boiling. Pour hot sauce to within 1-inch [25 mm] of top of jar. Adjust caps. Process pints [480 mL] 1 hour and 5 minutes, quarts [950 mL] 1 hour and 15 minutes at 10 pounds [70 kPa] pressure. Yield: about 3 quarts [2850 mL].

**BEANS—SOY**

Use green soy beans. Follow recipe for Lima Beans. Process pints [480 mL] 55 minutes, quarts [950 mL] 1 hour and 5 minutes, at 10 pounds [70 kPa] pressure.

**BEETS**

Wash deep red beets. Leave 2 inches [51 mm] of stems and the tap roots. Boil until skins can be slipped. Remove skins, trim beets; leave whole, slice or dice. Pack into hot jars, leaving 1-inch [25 mm] head space. Add ½ teaspoon [2.5 mL] salt to each quart [950 mL]. Cover with boiling water, leaving 1-inch [25 mm] head space. Adjust caps. Process pints [480 mL] 25 minutes, quarts [950 mL] 30 minutes, at 10 pounds [70 kPa] pressure.

**Cabbage**

Freezing results in a better product than canning. See page 92 for proper instructions on freezing cabbage.

**CARROTS**

**Hot Pack**...Wash and scrape carrots. Wash again. Slice, dice or leave whole. Boil 3 minutes. Pack, hot, into hot jars, leaving 1-inch [25 mm] head space. Add ½ teaspoon [2.5 mL] salt to each pint [480 mL], OR 1 teaspoon [5 mL] salt to each quart [950 mL]. Cover with boiling water, leaving 1-inch [25 mm] head space. Adjust caps. Process pints [480 mL] 25 minutes, quarts [950 mL] 30 minutes, at 10 pounds [70 kPa] pressure.

**Cold or Raw Pack**...Wash and scrape carrots. Wash again. Slice, dice or leave whole. Pack tightly into hot jars, leaving 1-inch [25 mm] head space. Add ½ teaspoon [2.5 mL] salt to each pint [480 mL], OR 1 teaspoon [5 mL] salt to each quart [950 mL]. Cover with boiling water, leaving 1-inch [25 mm] head space. Adjust caps. Process pints [480 mL] 25 minutes, quarts [950 mL] 30 minutes, at 10 pounds [70 kPa] pressure.

**CAULIFLOWER**

Freezing results in a better product than canning. See page 92 for proper instructions on freezing cauliflower.

**CELERY and TOMATOES**

Use equal parts celery and peeled, cored, chopped tomatoes. Mix and boil 5 minutes (no water needed). Pack, hot, into hot jars, leaving 1-inch [25 mm] head space. Add ½ teaspoon [2.5 mL] salt to each pint [480 mL], OR 1 teaspoon [5 mL] salt to each quart [950 mL], if needed. Cover with boiling water, leaving 1-inch [25 mm] head space. Adjust caps. Process pints [480 mL] 30 minutes, quarts [950 mL] 35 minutes, at 10 pounds [70 kPa] pressure.

**CORN—WHOLE KERNEL**


**CORNS—CREAM STYLE**


**CORN—CREAM STYLE**


**CORN—WHOLE KERNEL**


**Eggplant**

Freezing results in a better product than canning. See page 92 for proper instructions on freezing eggplant.

**BRUSSELS SPROUTS**

Freezing results in a better product than canning. See page 91 for proper instructions on freezing Brussels sprouts.

**CABBAGE**

Freezing results in a better product than canning. See page 92 for proper instructions on freezing cabbage.
**GREENS**

Chard, Kale, Mustard, Spinach, Turnip, Beet Tops, Poke and Other Wild Greens

Wash greens thoroughly through several changes of water. Discard large, tough stems. Heat greens until wilted in just enough water to prevent sticking. To hasten wilting and prevent over-cooking, turn greens over when steam begins to rise around the edges of pan. Cut through greens several times with a sharp knife before packing. Pack, hot, into hot jars, leaving 1-inch [25 mm] head space. Add 2/3 teaspoon [2.5 mL] salt to each pint [480 mL], OR 1 teaspoon [5 mL] salt to each quart [950 mL]. Cover with boiling water, leaving 1-inch [25 mm] head space. Adjust caps. Process pints [480 mL] 1 hour and 10 minutes, quarts [950 mL] 1 hour and 30 minutes, at 10 pounds [70 kPa] pressure.

**LYE HOMINY**

Prepare lye hominy in a well-ventilated room.

For each quart [950 mL] dry shelled white or yellow field corn: dissolve 2 tablespoons [30 mL] lye slowly in 1 gallon [3800 mL] warm water, then bring to boil. (Use enameled ware or iron kettle. Do not use aluminum, copper, tin or zinc.) Add corn. Boil about 30 minutes, or until hulls loosen. Rinse corn through several changes of hot water to remove lye, then cover with cold water. Stir the kernels briskly in cold water to remove hulls and black tips. Let stand in fresh water 2 to 3 hours. Change water 3 or 4 times. Drain. Cover with boiling salted water, 1/2 teaspoon [2.5 mL] salt to each pint [480 mL], OR 1 teaspoon [5 mL] salt to each quart [950 mL] water. Boil until almost tender. Pour, hot, into hot jars, leaving 1 inch [25 mm] head space. Adjust caps. Process pints [480 mL] 1 hour, quarts [950 mL] 1 hour and 10 minutes, at 10 pounds [70 kPa] pressure.

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**CANNING GREEN BEANS—STEP BY STEP**

Green beans may be hot packed as shown here, or raw (cold) packed as described on page 64.


5. Stand hot jar on wood or cloth. Add 1 teaspoon (5 mL) salt per quart, 1/2 teaspoon (2.5 mL) per pint. Pack beans, leaving 1 inch (25 mm) head space, and cover with boiling water. Eliminate air bubbles with non-metallic kitchen utensil.

6. Wipe top and threads of jar with clean damp cloth. If using vacuum lids with metal screw bands, put lid on with sealing compound next to jar. Screw band down evenly and tightly.

9a. Leave vent open until steam escapes steadily for 10 minutes.

9b. Close vent. At altitudes less than 2,000 feet (610 m) above sea level, bring pressure to 10 pounds (70 kPa). Keep pressure steady for 20 minutes for pints, 25 minutes for quarts.
12. Test seal by pressing center of lid. If dome is down, or stays down when pressed, jar is sealed. Remove metal screw bands and store jars in dry, dark, cool place.

11. Stand jars several inches apart and out of drafts. Allow to cool for about 12 hours.

10. Remove canner from heat. Let pressure fall to zero naturally. Wait 2 minutes, then slowly open petcock. Unfasten cover; slide cover slightly toward you, allowing steam to escape on opposite side, or according to manufacturer's instructions. Lift cover. Let set 10 minutes and remove jars, placing jars on cloths, out of drafts with space between jars. Do not tighten bands on jars after processing.

7. Place jars into steam pressure canner containing two to three inches of water, or the amount recommended by the manufacturer.

8. Place canner over heat. Lock cover according to the manufacturer's instructions.

4. Cover beans with boiling water and boil for five minutes. Drain.

3. Trim ends; remove any strings; cut or break into pieces. Prepare only enough for one canner load.

2. Use freshly gathered beans which are young, tender and crisp. Wash beans thoroughly and rinse carefully. Lift beans out of water and drain.

1. Stand jars several inches apart and out of drafts. Allow to cool for about 12 hours.
MUSHROOMS
Use only edible fresh mushrooms. Freezing results in a better product than canning. See page 92 for proper instructions on freezing mushrooms.

OKRA
Use young, tender okra. If to be added to soup, it should be sliced; otherwise, can pods whole. Wash and drain okra. Remove stem and blossom ends without cutting into pod. Boil 2 minutes. Pack, hot, into hot jars, leaving 1-inch [25 mm] head space. Add ½ teaspoon [2.5 mL] salt to each pint [480 mL], OR 1 teaspoon [5 mL] salt to each quart [950 mL]. Add boiling water, if needed, to cover, leaving 1-inch [25 mm] head space. Adjust caps. Process pints [480 mL] 25 minutes, quarts [950 mL] 40 minutes, at 10 pounds [70 kPa] pressure.

PEANUT BUTTER
4 quarts [3800 mL] skinned, shelled, roasted Virginia peanuts
2 quarts [1900 mL] skinned, shelled, roasted Spanish peanuts
2 tablespoons [30 mL] salt

PEAS — BLACKEYE, CROWDER and FIELD
Hot Pack... Shell and wash freshly gathered green peas. Boil 3 minutes. Pour, hot, into hot jars, leaving 1-inch [25 mm] head space. Add ⅓ teaspoon [1.25 mL] salt to each pint [480 mL], OR 1 teaspoon [5 mL] salt to each quart [950 mL]. Add boiling water, if needed to cover, leaving 1-inch [25 mm] head space. Adjust caps. Process pints [480 mL] 35 minutes quarts [950 mL] 40 minutes, at 10 pounds [70 kPa] pressure.

Cold or Raw Pack... Shell and wash freshly gathered green peas. Pack loosely into hot jars, leaving 1-inch [25 mm] head space. Do not shake or press down. Add ⅓ teaspoon [1.25 mL] salt to each pint [480 mL], OR 1 teaspoon [5 mL] salt to each quart [950 mL]. Cover with boiling water, leaving 1-inch [25 mm] head space. Adjust caps. Process pints [480 mL] 35 minutes, quarts [950 mL] 40 minutes, at 10 pounds [70 kPa] pressure.

PIES — GREEN or "ENGLISH"
Hot Pack... Wash, drain and shell freshly gathered peas. Wash again. Boil small peas 3 minutes; larger ones 5 minutes. Drain, rinse in hot water, drain, fill hot into hot jars. Add ½ teaspoon [2.5 mL] salt to each pint [480 mL], OR 1 teaspoon [5 mL] salt to each quart [950 mL]. Add boiling water to cover, leaving 1-inch [25 mm] head space. Adjust caps. Process pints [480 mL] and quarts [950 mL] 40 minutes at 10 pounds [70 kPa] pressure. If peas are extra large, process 10 minutes longer.

Cold Pack... Wash, drain and shell freshly gathered peas. Wash again. Pack loosely into hot jars, leaving 1-inch [25 mm] head space. Do not shake or press down. Add ½ teaspoon [2.5 mL] salt to each pint [480 mL], OR 1 teaspoon [5 mL] salt to each quart [950 mL]. Cover with boiling water, leaving 1-inch [25 mm] head space. Adjust caps. Process pints [480 mL] and quarts [950 mL] 40 minutes at 10 pounds [70 kPa] pressure.

PARSNIPS
Freezing results in a better product than canning. See page 92 for proper instructions on freezing parsnips.

PEPPIIERS — GREEN
Wash and drain sweet bell peppers. (These do not taste bitter when cooked.) Remove stems and seeds. Boil 3 minutes. Drain. Pack, hot, into hot jars, leaving 1-inch [25 mm] head space. Add 1 tablespoon [15 mL] vinegar and ½ teaspoon [2.5 mL] salt to each pint [480 mL], OR ½ tablespoon [8 mL] vinegar and ¼ teaspoon [1.25 mL] salt to each half-pint [240 mL]. If needed, add boiling water to cover, leaving 1-inch [25 mm] head space. Adjust caps. Process half-pints [240 mL] and pints [480 mL] 35 minutes, at 10 pounds [70 kPa] pressure.

POTATOES — WHITE or IRISH

POTATOES — SWEET
Dry Pack... Use freshly dug potatoes of uniform size and color. Wash. Boil or steam slowly until skins can be rubbed off. (Do not puncture with fork.) Pack, hot, into hot jars, leaving 1-inch [25 mm] head space. Pack tightly, pressing to fill spaces. Do not add liquid. Adjust caps. Process pints [480 mL] 1 hour and 5 minutes, quarts [950 mL] 1 hour and 35 minutes, at 10 pounds [70 kPa] pressure.

Wet Pack... Use freshly dug potatoes of uniform size and color. Wash. Boil or steam slowly until skins can be rubbed off. (Do not puncture with fork.) Pack, hot, into hot jars, leaving 1-inch [25 mm] head space. Cover with boiling water or medium or light syrup, leaving 1-inch [25 mm] head space. Adjust caps. Process pints [480 mL] 55 minutes, quarts [950 mL] 1 hour and 30 minutes, at 10 pounds [70 kPa] pressure.

NOTE: If shelled, salted nuts are used, do not add salt.
PUMPKIN and WINTER SQUASH

Freezing results in a better product than canning. See page 93 for proper instructions on freezing pumpkin and winter squash.

RUTABAGAS


NOTE: Rutabagas usually discolor when canned, and also develop a strong flavor.

SAUCE—CREOLE

3 quarts [2850 mL] peeled, cored, chopped tomatoes (about 1½ dozen)
2 cups [480 mL] chopped onions
1 cup [240 mL] chopped sweet red peppers (about 2 medium)
1 clove minced garlic
1 hot red pepper
1 tablespoon [15 mL] chopped parsley
1 tablespoon [15 mL] sugar
2 teaspoons [10 mL] salt
¼ teaspoon [2.5 mL] marjoram
¼ teaspoon [1.25 mL] chili powder

Combine all ingredients and cook slowly until thick, about 1½ hours. Stir frequently to prevent sticking. Pour, hot, into hot jars, leaving 1-inch [25 mm] head space. Adjust caps. Process pints [480 mL] 25 minutes, quarts [950 mL] 30 minutes, at 10 pounds [70 kPa] pressure.

Yield: about 4 pints [1920 mL].

To Serve: Cook a small amount of chopped celery in oil, add Creole Sauce and heat to blend. Serve over rice, meatballs or shrimp.

SUCCOTASH

Boil fresh corn 5 minutes. Cut from cob. Do not scrape. Mix with ½ to equal measure of green string, or green lima beans, which have been boiled 3 minutes. Pack, hot, into hot jars, leaving 1-inch [25 mm] head space. Add ½ teaspoon [2.5 mL] salt to each pint [480 mL], OR 1 teaspoon [5 mL] salt to each quart [950 mL]. Cover with boiling water, leaving 1-inch [25 mm] head space. Adjust caps. Process pints [480 mL] 1 hour, quarts [950 mL] 1 hour and 25 minutes, at 10 pounds [70 kPa] pressure.

SUMMER SQUASH

Wash squash. Do not pare. Cut into small pieces. Steam or boil 2 or 3 minutes. Pack, hot, into hot jars, leaving 1-inch [25 mm] head space. Add 1½ teaspoons [7.5 mL] salt to each pint [480 mL], OR 1 teaspoon [5 mL] salt to each quart [950 mL]. Cover with boiling water, leaving 1-inch [25 mm] head space. Adjust caps. Process pints [480 mL] 30 minutes, quarts [950 mL] 40 minutes at 10 pounds [70 kPa] pressure.

NOTE: The following three tomato recipes must be processed in steam-pressure canner because of ingredients in recipes.

TOMATOES—STEWED

4 quarts [3800 mL] peeled, cored, chopped tomatoes (about 2 dozen large)
1 cup [240 mL] chopped celery
½ cup [120 mL] chopped onion
¼ cup [60 mL] chopped green pepper
1 tablespoon [15 mL] sugar
2 teaspoons [10 mL] salt

Combine all ingredients; cover and cook 10 minutes, stirring occasionally to prevent sticking. Pour, hot, into hot jars, leaving ½-inch [13 mm] head space. Adjust caps. Process pints [480 mL] 15 minutes, quarts [950 mL] 20 minutes, at 10 pounds [70 kPa] pressure. Yield: about 7 pints [3360 mL].

To Serve: Add 1 tablespoon [15 mL] butter, cubes of bread and cornstarch or flour to thicken before heating.

GREEN TOMATO MINCEMEAT

2 quarts [1900 mL] cored and chopped green tomatoes (about 20 small)
1 tablespoon [15 mL] salt
1 orange
2½ quarts [2375 mL] pared, chopped apples (about 12 medium)
1 pound [454 g] seedless raisins
1½ cups [360 mL] chopped suet (about 6 ounces) [169 g]
3½ cups [840 mL] brown sugar, packed
½ cup [120 mL] vinegar
2 teaspoons [10 mL] salt
1 teaspoon [5 mL] nutmeg
1 teaspoon [5 mL] cloves
½ teaspoon [2.5 mL] ginger

SPECIAL DIET FOODS

Commercially prepared special diet foods are often costly, thereby reducing the weekly food budget for the members of the family who are not required to eat specially prepared foods. Low-sugar, low-salt and baby foods may be canned at home by following the easy directions below.

General Instructions
1. Have your doctor give you a list of the foods permitted and needed for the members of your family on a special diet.
2. Half-pint [240 mL] and pint [480 mL] jars are usually the best size to use when canning special foods for one member of the family.
3. Use care in selecting, preparing, packing and processing all foods. Lose no time between these steps.
4. When canning fruits and acid vegetables, read pages 17 through 25. When canning low-acid vegetables, read pages 59 through 69. When canning meats, poultry and seafoods, read pages 17 through 25. When canning low-acid vegetables for meats, poultry and seafoods, but omit salt. Canned meats and vegetables keep just as well without salt as with it. The amount called for in the recipes is too small to help prevent spoilage; it is there only for seasoning purposes.

TO CAN LOW ACID FOODS WITHOUT SALT

Follow the recipes for canning low-acid vegetables for meats, poultry and seafoods, but omit salt. Canned meats and vegetables keep just as well without salt as with it.

APPLE JELLY from BOTTLED JUICE
2 packages or 2 tablespoons [30 mL] unflavored gelatin
1 quart [950 mL] unsweetened apple juice
2 tablespoons [30 mL] unsweetened lemon juice
2 tablespoons [30 mL] liquid sweetener
Food coloring, if desired.

In a saucepan, soften gelatin in apple juice and lemon juice. Bring to a rolling boil, dissolving gelatin; boil 1 minute. Remove from heat. Stir in liquid sweetener and food coloring. Pour into hot sterilized jars. Seal. Store in refrigerator. Yield: about 1 pint [480 mL]. 1 tablespoon [15 mL] = 11 calories.

BLACKBERRY JAM
(Long-Boil Method)
4 cups [960 mL] crushed blackberries
8 tablespoons [120 mL] liquid sweetener


GRAPE JELLY with GELATIN
2 packages or 2 tablespoons [30 mL] unflavored gelatin
1 bottle (24 ounces [720 mL]) unsweetened grape juice
2 tablespoons [30 mL] unsweetened lemon juice
2 tablespoons [30 mL] liquid sweetener

In a saucepan, soften gelatin in grape juice and lemon juice. Bring to a rolling boil, dissolving gelatin; boil 1 minute. Remove from heat. Stir in liquid sweetener. Pour into hot sterilized jars. Seal. Store in refrigerator. Yield: about 1 pint [480 mL]. 1 tablespoon [15 mL] = 11 calories.

TO CAN FRUITS WITHOUT SUGAR

Use fully ripe, firm fruit. Prepare fruit for canning as explained in the recipes found on pages 17 through 25. Then add a little water and cook the fruit until it is boiling hot. Pack, hot, into hot jars. If needed, add boiling water to cover. Adjust caps and process in a boiling water bath canner for the recommended time for the fruit being canned.

TO CAN LOW ACID FOODS WITHOUT SALT

Follow the recipes for canning low-acid vegetables for meats, poultry and seafoods, but omit salt. Canned meats and vegetables keep just as well without salt as with it. The amount called for in the recipes is too small to help prevent spoilage; it is there only for seasoning purposes.

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2 tablespoons [30 mL] unsweetened lemon juice
2 tablespoons [30 mL] liquid sweetener
Food coloring, if desired.

In a saucepan, soften gelatin in apple juice and lemon juice. Bring to a rolling boil, dissolving gelatin; boil 1 minute. Remove from heat. Stir in liquid sweetener and food coloring. Pour into hot sterilized jars. Seal. Store in refrigerator. Yield: about 1 pint [480 mL]. 1 tablespoon [15 mL] = 11 calories.

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TO CAN LOW ACID FOODS WITHOUT SALT

Follow the recipes for canning low-acid vegetables for meats, poultry and seafoods, but omit salt. Canned meats and vegetables keep just as well without salt as with it. The amount called for in the recipes is too small to help prevent spoilage; it is there only for seasoning purposes.

APPLE JELLY from BOTTLED JUICE
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1 quart [950 mL] unsweetened apple juice
2 tablespoons [30 mL] unsweetened lemon juice
2 tablespoons [30 mL] liquid sweetener
Food coloring, if desired.

In a saucepan, soften gelatin in apple juice and lemon juice. Bring to a rolling boil, dissolving gelatin; boil 1 minute. Remove from heat. Stir in liquid sweetener and food coloring. Pour into hot sterilized jars. Seal. Store in refrigerator. Yield: about 1 pint [480 mL]. 1 tablespoon [15 mL] = 11 calories.
RASPBERRY JAM
(Long-Boil Method)

4 cups [960 mL] crushed raspberries
8 tablespoons [120 mL] liquid sweetener

Measure crushed raspberries into a kettle. Add sweetener and stir well. Boil rapidly, stirring constantly until the mixture thickens. Pour, boiling hot, into hot jars, leaving ¼-inch [6 mm] head space. Adjust caps. Process 15 minutes in boiling water bath. Yield: about 1 pint [480 mL], 1 tablespoon [15 mL] = 10 calories.

RASPBERRY JAM with PECTIN
1 quart [950 mL] cleaned raspberries
3 to 4 teaspoons [15-20 mL] liquid artificial sweetener
1¾ ounce [21 g] package powdered fruit pectin
1 tablespoon [15 mL] lemon juice

Crush raspberries in saucepan. Stir in artificial sweetener, food coloring, powdered fruit pectin, and lemon juice. Bring to a boil; boil 1 minute. Remove from heat. Continue to stir 2 minutes. Pour into freezer containers. Cover; freeze. Thaw before serving. Store in refrigerator after opening. Yield: about 2% cups [640 mL], 1 tablespoon [15 mL] = 5 calories.

STRAWBERRY JAM
(Long-Boil Method)

4 cups [960 mL] crushed strawberries
8 tablespoons [120 mL] liquid sweetener

STRAWBERRY JAM with PECTIN
1 quart [950 mL] cleaned strawberries
3 to 4 teaspoons [15-20 mL] liquid artificial sweetener
1¾ ounce [21 g] package powdered fruit pectin
1 tablespoon [15 mL] lemon juice

Red food coloring as desired. Crush strawberries in 1½ quart [1425 mL] saucepan. Stir in artificial sweetener, food coloring, powdered fruit pectin, and lemon juice. Bring to a boil and boil 1 minute. Remove from heat. Continue to stir 2 minutes. Pour into freezer containers, cover and freeze. Thaw before serving. Store in refrigerator after opening. Yield: about 2½ cups [640 mL], 1 tablespoon [15 mL] = 5 calories.

STRAWBERRY JAM
(Long-Boil Method)

4 cups [960 mL] crushed strawberries
8 tablespoons [120 mL] liquid sweetener

Pears may be cooked and canned as a sauce or puree. When making sauce, follow recipe for Applesauce on page 18. Pack in half-pints [240 mL] or pints [480 mL]. Adjust caps and process as recommended. For strained fruits, follow recipes for Apricot or Peach Purée, page 88. Pack. Adjust caps and process as recommended. Follow manufacturer’s instructions when using a blender to

<table>
<thead>
<tr>
<th>Food</th>
<th>Amount</th>
<th>Calories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple butter</td>
<td>1 tablespoon</td>
<td>15 mL</td>
</tr>
<tr>
<td>Applesauce sweetened</td>
<td>1/2 cup</td>
<td>120 mL</td>
</tr>
<tr>
<td>unsweetened</td>
<td>1/2 cup</td>
<td>120 mL</td>
</tr>
<tr>
<td>Apricots</td>
<td>4 medium halves</td>
<td>30 mL</td>
</tr>
<tr>
<td>canned in syrup</td>
<td>2 tablespoons syrup</td>
<td>10 mL</td>
</tr>
<tr>
<td>Asparagus</td>
<td>4 medium stalks</td>
<td></td>
</tr>
<tr>
<td>Beans</td>
<td>1 cup</td>
<td>240 mL</td>
</tr>
<tr>
<td>kidney, canned</td>
<td>1 cup</td>
<td>240 mL</td>
</tr>
<tr>
<td>wax, canned</td>
<td>1 cup</td>
<td>240 mL</td>
</tr>
<tr>
<td>Beef, uncooked</td>
<td>4 oz.*</td>
<td>113 g*</td>
</tr>
<tr>
<td>porterhouse, lean</td>
<td>4 oz.*</td>
<td>113 g*</td>
</tr>
<tr>
<td>meat only</td>
<td>4 oz.*</td>
<td>113 g*</td>
</tr>
<tr>
<td>sirloin, lean meat</td>
<td>1 serving (1 cup)</td>
<td>240 mL</td>
</tr>
<tr>
<td>only</td>
<td>2 (1/2 cup diced)</td>
<td>120 mL</td>
</tr>
<tr>
<td>Blackberries</td>
<td>1/2 cup</td>
<td>120 mL</td>
</tr>
<tr>
<td>Blueberries</td>
<td>1/2 cup</td>
<td>120 mL</td>
</tr>
<tr>
<td>Broccoli, cooked</td>
<td>1/2 cup</td>
<td>120 mL</td>
</tr>
<tr>
<td>Brussels sprouts</td>
<td>1 cup</td>
<td>240 mL</td>
</tr>
<tr>
<td>Cabbage, cooked</td>
<td>1/2 cup</td>
<td>120 mL</td>
</tr>
<tr>
<td>Cantaloupe</td>
<td>½ (5” diam.)</td>
<td>127 mm</td>
</tr>
<tr>
<td>Carrots, cooked</td>
<td>1/2 cup diced</td>
<td>120 mL</td>
</tr>
<tr>
<td>Catup, chili sauce</td>
<td>1 tablespoon</td>
<td>15 mL</td>
</tr>
<tr>
<td>Cauliflower, cooked</td>
<td>1 cup</td>
<td>240 mL</td>
</tr>
<tr>
<td>Cherries</td>
<td>1/2 cup</td>
<td>120 mL</td>
</tr>
<tr>
<td>canned in syrup</td>
<td>3 tablespoons syrup</td>
<td>45 mL</td>
</tr>
<tr>
<td>canned, tart</td>
<td>1 cup</td>
<td>240 mL</td>
</tr>
</tbody>
</table>

* 4 oz. (113 g) raw meat will make 3 oz. (85 g) cooked.
Chop meat. Pack into hot jars, gristle and heavy connective tissue. Add boiling water to cover, leaving a %-inch [19 mm] head space. Adjust caps. Process half-pints [240 mL] 60 minutes, pints [480 mL] 60 minutes, and quarts [950 mL] 75 minutes at 10 pounds [70 kPa] pressure. Yield: 3 pounds [1.4 kg] prepared meat yields about 3 half-pints [720 mL].

Use ½ cup [120 mL] each chopped beans, carrots and potatoes to each cup [240 mL] chopped raw beef. Thoroughly wash and drain young, tender vegetables. Peel carrots and potatoes before chopping; mix vegetables with the chopped meat. Pack, loosely into hot jars, leaving ¾-inch [19 mm] head space. Add boiling water to cover, leaving ¾-inch [19 mm] head space. Adjust caps. Process half-pints [240 mL] 60 minutes, pints [480 mL] 60 minutes, and quarts [950 mL] 75 minutes at 10 pounds [70 kPa] pressure. Yield: ½ cup [120 mL] each chopped beans, carrots and potatoes and 1 cup [240 mL] chopped meat yield about 3 half-pints [720 mL].

**CHILI SAUCE**

18 medium, peeled, chopped tomatoes
2 chopped green peppers
2 medium chopped onions
7 ½ teaspoons [38 mL] salt
¾ teaspoon [4 mL] ground cinnamon
¾ teaspoon [4 mL] ground cloves
2 cups [480 mL] vinegar
3 tablespoons [45 mL] liquid artificial sweetener

Combine all ingredients and boil slowly. It may require 3 to 4 hours of cooking time. When the mixture reaches the desired thickness, pour hot mixture into hot jars leaving ¾-inch [6 mm] head space. Adjust caps and process in a boiling water bath canner for 15 minutes. Yield: about 6 half-pints [1440 mL].

**PEPPER-ONION RELISH**

1 quart [950 mL] chopped onions
1 ½ cups [360 mL] chopped red peppers
1 ¼ cups [360 mL] chopped green peppers
3 teaspoons [15 mL] salt
1 quart [950 mL] vinegar
2 tablespoons [30 mL] liquid artificial sweetener

Combine all ingredients and bring to a boil. Cook until vegetables are tender and the mixture is slightly thickened. Pour hot mixture into hot jars, leaving ½-inch [13 mm] head space. Adjust caps. Process in a boiling water bath canner for 10 minutes. Yield: about 5 pints [2400 mL].
THE PROBLEM SOLVER

This guide lists some conditions which might occur in home canned food, the causes for them and how they may be remedied. When the condition might indicate spoilage, it is so noted. Spoiled food should never be served or eaten. Signs of spoilage include spurting liquid and gas bubbles; soft, mushy, slimy or moldy food; cloudy liquid; sediment in the liquid; leaking jars, bulging caps and an unnatural odor or color. All low acid foods should be boiled for 15 minutes before tasting. If the liquid foams or the food has an unnatural odor when heated, spoilage is indicated.

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>CAUSE</th>
<th>PREVENTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foods darken in top of jar.</td>
<td>1 Liquid did not cover food product. 2 Food not processed long enough to destroy enzymes. 3 Manner of packing and processing did not produce a high vacuum. 4 Air was sealed in the jars either because head space was too large or air bubbles were not removed.</td>
<td>1 Cover food product with liquid before capping jar. (See “Loss of liquid” reference). 2 Process each food by recommended method and for recommended length of time. 3 Pack and process as recommended. 4 Use head space recommended in Blue Book. Remove air bubbles by running non-metallic kitchen utensil between food and jar.</td>
</tr>
<tr>
<td>Fruits darken after they have been removed from jar.</td>
<td>Fruits have not been processed long enough to destroy enzymes.</td>
<td>Process each fruit by recommended method and for recommended length of time. Time is counted when water reaches a full boil in the canner.</td>
</tr>
<tr>
<td>Corn is brown.</td>
<td>1 Corn was too mature for canning. 2 Liquid did not cover corn. 3 Jars were processed at too high a temperature. 4 Variety of corn used.</td>
<td>1 Use freshly picked corn which has plump, shiny kernels filled with milk. 2 Cover corn with liquid before capping jar. (See “Loss of liquid” reference). 3 Keep pressure in canner at recommended pounds; gauge may be faulty and it should be checked. 4 Use different variety next time.</td>
</tr>
<tr>
<td>Pink, red, blue or purple color in canned apples, pears, peaches and quinces.</td>
<td>A natural chemical change which occurs in cooking the fruit.</td>
<td>None</td>
</tr>
<tr>
<td>Green vegetables lose their bright green color.</td>
<td>Heat breaks down chlorophyll, the green coloring matter in plants.</td>
<td>None</td>
</tr>
<tr>
<td>Some foods become black, brown or gray.</td>
<td>Natural chemical substances (tannins, sulfur compounds and acids) in food react with minerals in water or with metal utensils used in preparing food.</td>
<td>Use soft water. Avoid using copper, iron or chipped enameled ware, also utensils from which tinplate has worn.</td>
</tr>
<tr>
<td>Green vegetables turn brown.</td>
<td>1 Vegetables were overcooked. 2 Vegetables were too mature for canning.</td>
<td>1 Time precooking and processing exactly. 2 Asparagus tips should be tight and the entire green portion tender. Pods of green beans should be crisp and meaty and the beans tiny. Peas, lima beans and all other beans and peas which are shelled should be cooked.</td>
</tr>
<tr>
<td>Crystals in grape products.</td>
<td>Tartaric acid which is naturally found in grapes.</td>
<td>In juice, carefully ladle juice into clean hot jars, cap and reprocess original length of time. In jelly, see “Jelly contains glass-like particles.”</td>
</tr>
<tr>
<td>CONDITION</td>
<td>CAUSE</td>
<td>PREVENTION</td>
</tr>
<tr>
<td>-----------</td>
<td>-------</td>
<td>------------</td>
</tr>
<tr>
<td>Yellow crystals on canned green vegetables.</td>
<td>Glucoside, natural and harmless substance, in vegetables.</td>
<td>None</td>
</tr>
<tr>
<td>White crystals on canned spinach.</td>
<td>Calcium and oxalic acid in spinach combine to form harmless calcium oxalate.</td>
<td>None</td>
</tr>
</tbody>
</table>
| White sediment in bottom of jars of vegetables. May denote spoilage. | 1 Starch from the food.  
2 Minerals in water used.  
3 Bacterial spoilage... liquid is usually murky, food soft. (Do not use.) | 1 None  
2 Use soft water.  
3 Process each food by recommended method and for recommended length of time. |
| Fruit floats in jar. | Fruit is lighter than the syrup. | Use firm, ripe fruit. Heat fruit before packing it. Use a light to medium syrup. Pack fruit as closely as possible without crushing it. |
| Cloudy liquids. May denote spoilage. | 1 Spoilage. (Do not use.)  
2 Minerals in water.  
3 Starch in vegetable.  
4 Fillers in table salt. | 1 Process each food by recommended method and for recommended length of time.  
2 Use soft water.  
3 None  
4 None, except by using a pure refined salt. |
| Loss of liquid during processing. (Food may darken, but will not spoil. Do not open jars to replace liquid.) | 1 Food not heated before packing.  
2 Food packed too tightly.  
3 Air bubbles not removed before capping the jar.  
4 Pressure canner not operated correctly.  
5 Jars not covered with water in boiling water bath canner.  
6 Starchy foods absorbed liquid. | 1 Heat food before packing.  
2 Pack food more loosely.  
3 Remove air bubbles by running non-metallic kitchen utensil between food and jar.  
4 Pressure should not be allowed to fluctuate during processing time. Allow pressure to drop to zero naturally; wait 2 minutes before opening lid.  
5 Jars should be covered 1 inch [25 mm] with water in canner throughout the processing period.  
6 None. |
| Jar seals, then comes open. Spoilage evident. (Do not use.) | 1 Food spoilage from under-processing.  
2 Disintegration of particles of food left on the sealing surface.  
3 Hairline crack in the jar. | 1 Process each food by recommended method and for recommended length of time.  
2 Wipe sealing surface and threads of jar with clean, damp cloth before capping.  
3 Check jars; discard ones unsuitable for canning. |
| Jar of food fails to seal. (Correct cause and reprocess the full time or use the food immediately.) | Many factors could be involved, such as failure to follow instructions for using jar and cap, or a bit of food may have been forced up between the jar and lid during processing. | Carefully follow methods and instructions for using jars and caps and for foods to be canned. For more information, write Consumer Service Department, Ball Corporation, Muncie, Indiana 47302, and request the pamphlet “Successful Home Canning.” |
| Hollow pickles. | 1 Faulty growth of cucumbers.  
2 Cucumbers were stale when pickling was begun. | 1 None. In washing cucumbers, hollow cucumbers usually float. They may be used in relishes.  
2 Pickling process should be started within 24 hours of picking cucumbers. |
<table>
<thead>
<tr>
<th>CONDITION (Product Usable Unless Spoilage Is Indicated)</th>
<th>CAUSE</th>
<th>PREVENTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc caps bulge. May denote spoilage.</td>
<td>1 Cap screwed too tight before processing. (Condition is evident as jar is removed from canner.) 2 Food spoils from underprocessing. (Condition evident after jar has cooled and has been stored from a day to a few months.) Do not use.</td>
<td>1 Screw cap tight, then loosen about ¼-inch [6 mm] before putting jar in canner. 2 Process each food by recommended method and for recommended length of time.</td>
</tr>
<tr>
<td>Black spots on underside of metal lid. (If jar has been sealed and then comes open, spoilage is evident. Do not use.)</td>
<td>Natural compounds in some foods cause a brown or black deposit on the underside of the lid. This deposit is harmless, and does not mean the food is unsafe to eat.</td>
<td>None</td>
</tr>
<tr>
<td>Soft or slippery pickles. Spoilage evident. (Do not use.)</td>
<td>1 Brine or vinegar used was too weak. 2 Pickles were not kept covered with liquid. 3 Scum was not kept removed from top of brine. 4 Pickles were not heated long enough to destroy spoilage microorganisms. 5 Jars were not sealed airtight while boiling hot.</td>
<td>1 Use pure refined salt. Use vinegar of 4-6% acidity. Use a recipe developed for modern day use. 2 Pickles should be covered with liquid at all times, during the brining process and when in the jar. 3 Scum should be removed daily during the brining process. 4 See “Pickles and Relishes”. 5 Each jar should be filled boiling hot and capped immediately before filling next jar, except if processed.</td>
</tr>
<tr>
<td>Darkened and discolored pickles.</td>
<td>1 Minerals present in hard water used in making the pickles. 2 Brass, iron, copper or zinc utensils were used in making the pickles. 3 Ground spices used. 4 Whole spices left in jars of pickles.</td>
<td>1 Use soft water. 2 Use enameled ware, glass, aluminum, stainless steel or stoneware utensils. 3 Use whole spices. 4 Whole cloves, stick cinnamon and other whole spices should be used only to flavor the pickling liquid; they should not be packed in the jars.</td>
</tr>
<tr>
<td>White sediment in bottom of jars of firm pickles. (If pickles are soft, spoilage is evident. Do not use.)</td>
<td>Harmless yeasts have grown on the surface and then settled.</td>
<td>None. The presence of a small amount of the white sediment is normal.</td>
</tr>
<tr>
<td>Shriveled pickles.</td>
<td>Too much salt, sugar or vinegar was added to the cucumbers at one time.</td>
<td>Start with a weaker solution of brine, sugar or vinegar and gradually add the full amount called for in recipe. Use recipe developed for modern day use.</td>
</tr>
<tr>
<td>Jelly is tough or stiff.</td>
<td>1 Too much pectin in fruit. 2 Jelly was overcooked. 3 Too little sugar, so mixture had to be cooked too long to reach jellying stage.</td>
<td>1 Use fruit which is riper. If adding pectin, don’t add as much. 2 See jelly test. 3 When pectin is not added, ¾ cup [180 mL] sugar to 1 cup [240 mL] juice is the right amount for most fruits. When measuring, use graduated dry measuring cups; level off sugar with straight edge of a knife.</td>
</tr>
<tr>
<td>Jelly ferments. Spoilage evident. (Do not use.)</td>
<td>Yeasts grow on jelly when seal is not airtight (usually noticeable on jars sealed with paraffin) causing the jelly to break through paraffin and to weep.</td>
<td>Use vacuum sealing next time. Test for seal before storing jelly.</td>
</tr>
<tr>
<td>CONDITION</td>
<td>CAUSE</td>
<td>PREVENTION</td>
</tr>
<tr>
<td>-----------</td>
<td>-------</td>
<td>------------</td>
</tr>
<tr>
<td>Jelly contains glass-like particles.</td>
<td>1 Too much sugar was used.</td>
<td>1 See instructions for jelly.</td>
</tr>
<tr>
<td></td>
<td>2 The mixture may have been cooked too little.</td>
<td>2 Too short a cooking period results in the sugar not dissolving completely and not mixing thoroughly with the fruit juice.</td>
</tr>
<tr>
<td></td>
<td>3 The mixture may have been cooked too slowly or too long.</td>
<td>3 Long, slow cooking results in too much evaporation of the water content of the fruit.</td>
</tr>
<tr>
<td></td>
<td>4 Undissolved sugar, which was sticking to the pan, washed into the jelly as it was poured.</td>
<td>4 Ladle juice into jars instead of pouring it. Or, carefully wipe side of pan free of sugar crystals with a damp cloth before filling jars.</td>
</tr>
<tr>
<td></td>
<td>5 If jelly is grape, the crystals may be tartaric acid, the natural substance in grapes from which cream of tartar is made.</td>
<td>5 Allow juice to stand in refrigerator for several days; then strain it through two thicknesses of damp cheesecloth before preparing jelly. Use canned juice; if sediment is in bottom of jar, carefully pour juice off so not to disturb sediment.</td>
</tr>
<tr>
<td>Jelly is low in fruit flavor.</td>
<td>1 Fruit used had little flavor.</td>
<td>1 Use full-flavored fruit; tree-ripened is the best.</td>
</tr>
<tr>
<td></td>
<td>2 Jelly stored too long.</td>
<td>2 Jelly should not be stored over a year.</td>
</tr>
<tr>
<td></td>
<td>3 Storage area too warm.</td>
<td>3 Storage area should be cool, dark and dry.</td>
</tr>
<tr>
<td>Jelly &quot;weeps.&quot;</td>
<td>1 Syneresis or &quot;weeping&quot; usually occurs in quick-setting jellies and is due to the quantity of acid and the quality of pectin in the fruit.</td>
<td>1 None</td>
</tr>
<tr>
<td></td>
<td>2 Storage conditions were not ideal.</td>
<td>2 Store in cool, dark and dry place.</td>
</tr>
<tr>
<td>Jelly is too soft.</td>
<td>1 Proportions of sugar and juice not correct.</td>
<td>1 See instructions for jelly.</td>
</tr>
<tr>
<td></td>
<td>2 Too large a batch made at one time.</td>
<td>2 Use not more than 4 to 6 cups [960-1440 mL] of juice in each batch of jelly. Never increase the recipe supplied by the manufacturer of pectin.</td>
</tr>
<tr>
<td>Jelly is cloudy.</td>
<td>1 Fruit used was too green.</td>
<td>1 Fruit should be firm-ripe.</td>
</tr>
<tr>
<td></td>
<td>2 Fruit may have been cooked too long before straining.</td>
<td>2 Fruit should be cooked only until it is tender.</td>
</tr>
<tr>
<td></td>
<td>3 Juice may have been squeezed from fruit.</td>
<td>3 To obtain the clearest jelly possible, let juice drip through cotton flannel bag.</td>
</tr>
<tr>
<td></td>
<td>4 Jelly poured into jars too slowly.</td>
<td>4 Next time, work more quickly.</td>
</tr>
<tr>
<td></td>
<td>5 Jelly mixture was allowed to stand before it was poured into the jars.</td>
<td>5 Immediately upon reaching jellying point, pour into jars and seal.</td>
</tr>
<tr>
<td>Bubbles are in jelly. May denote spoilage.</td>
<td>1 If bubbles are moving, jelly is spoiling; usually the airtight seal has been broken. (Do not use.)</td>
<td>1 Use vacuum sealing with two-piece caps. Be sure to test for seal before storing jars.</td>
</tr>
<tr>
<td></td>
<td>2 If bubbles are standing still, utensil from which jelly was poured was not held close to top of jar or jelly was poured slowly and air was trapped in the hot jelly.</td>
<td>2 Hold utensil close to top of jar and pour into jar quickly.</td>
</tr>
<tr>
<td>Jelly molds. May denote spoilage; if growth of mold is heavy, do not use.</td>
<td>Jar was not sealed properly, allowing mold to grow on surface of jelly.</td>
<td>Use vacuum sealing next time. Test for seal before storing jelly.</td>
</tr>
</tbody>
</table>

(The Problem Solver)
GETTING STARTED

Freezing has many advantages over other methods of preservation because frozen foods are more like fresh foods than those either canned or dried. Freezing keeps the natural color, fresh flavor and nutritive qualities of most foods better than any other known method of preservation. It also is one of the simplest and least time-consuming ways to preserve foods.

To be successful in freezing foods, start with a quality product that has been handled under the most sanitary conditions. The quality of the original product is the most important single factor in determining its quality when it is served.

Foods for freezing should be fully prepared for serving or cooking so that little or no preparation is required after they are taken from the food freezer.

For economical use of your freezer, all foods should be used within a year, and most of them should be held for much less time. By continuously using foods from the freezer, and replacing them with others in season, the space in the freezer may be used many times during a year. The higher the rate of turnover, the lower the cost per pound of frozen food.

Store like foods together; place most recently frozen foods at the top or front. At the same time move foods that have been in freezer storage longer toward the bottom or back. At the same time move foods that have been in freezer storage longer toward the top or front.

It's a good idea to keep a record of the frozen foods that are in storage. If pasted near the freezer, a list can be easily kept up to date by regular posting as you put foods in or take them out. Such a list will let you know exactly what foods you have and how long they have been in storage—thus helping you use all frozen foods within the recommended storage period.

THE SPOILERS

Preservation by freezing is based on the principle that extreme cold retards growth of microorganisms and slows down enzyme activity and oxidation. Freezing does not sterilize food.

Testing has been done by researchers to determine effective and safe methods for freezing fruits, vegetables, meats and pre-cooked foods. Directions for each product have been established to prevent changes in frozen food caused by:

- bacteria, yeast and molds;
- enzymes;
- "freezer burn";
- formation of large ice crystals;
- oxidation.

**Bacteria, Yeasts and Molds:** All fresh foods contain bacteria, yeasts and molds. These will multiply rapidly and cause spoilage if not stopped. This can be accomplished by...

- using only quality products;
- preparing the food under the most sanitary conditions;
- storing the food at a specific low temperature.

**Enzymes:** Foods contain enzymes which cause chemical changes in them. Some of these changes are desirable. Beef, for example, is aged in a chill room about a week to give the enzymes a chance to make the meat more tender. Enzymes can cause an off-color product and destroy the fresh flavor in vegetables if they are not inactivated before food is frozen. Enzyme control is most easily obtained by a short heat treatment (blanching) prior to freezing and storage. Since blanching may have a softening effect on the texture of fruits, control of enzyme activity is usually accomplished by the addition of sugar and antioxidants after blanching.

"Freezer Burn": This condition occurs when food is improperly wrapped. Dry air in freezer circulates over exposed surfaces, removing moisture from the food and causing a dry, pithy, tough surface to develop. Moisture/vapor-resistant packaging materials prevent drying and protect from contact with air. Be sure package is free of air and sealed air tight.

**Formation of Large Ice Crystals:** Freeze the packages as quickly as possible. When foods are frozen quickly, at 0°F [−18°C] or lower, the cells in the fiber retain their normal places. Slower freezing causes moisture from the fibers to form ice crystals between the groups of fiber, and the product will lose liquid and may darken.

**Oxidative Changes:** Are commonly encountered chemical changes in frozen foods. If the product is exposed to oxygen as the result of storage in direct contact with air or in packages permeable to air, it may suffer losses in quality as the result of direct participation of the oxygen in chemical reaction with other substances in the product.

EQUIPMENT NEEDED FOR FREEZING FOODS AT HOME

The equipment needed for freezing at home is little more than the pots, pans, strainers and other utensils required in the kitchen for preparing everyday meals.

TIP: As with all food storage methods, it is important to keep bacterial contamination to a minimum by using clean equipment and working surfaces.

FREEZER CONTAINERS

Proper packaging is very important to prevent:

1. **Chemical changes** which result from exposure to the air, thus causing loss of color, development of off-flavors, absorption of odors and loss of vitamins.

2. **Physical changes** which result in loss of box weight and fresh appearance due to loss of moisture.

While it is not necessary for frozen foods to be hermetically sealed (as with canned foods), the package must be moisture/vapor-proof, odorless, tasteless, grease-proof and capable of being tightly closed.

**Boxes, Bags & Jars**

There are two types of packaging materials for home freezing use—rigid containers and flexible bags or wrappers.
Rigid Containers

Excellent results can be achieved in home freezing with either can or freeze jars with large mouths and slightly tapering sides or plastic freezer boxes. (See Figure 23). Can or freeze jars may be purchased in three sizes: half-pint, pint and 1½ pint [240-480-720 mL]. Plastic freezer boxes may be found in pint, 1½ pint, quart and 2 quart [480-720-950-1900 mL] sizes. Both can be reused many times. Rigid containers should be used for most frozen foods, and are recommended for all foods that are soft or “runny” at room temperatures, such as fruits packed in syrup or sugar, butter, eggs, stews, creamed foods and meats with gravy.

Flexible Bags and Wrappers

Flexible bags are best for packaging products with irregular shapes, such as roasting turkeys or hens, fish and all cuts of meat. They can be used for vegetables, some fruits—grapes, raspberries, blueberries without syrup or added sugar and precooked foods that are not liquid at room temperature.

Plastic freezer bags come in the following sizes: pint, 1½ pint, quart, two quart, one gallon and two gallon [480, 720, 950, 1900, 3800 and 7600 mL]. These are closed by pressing out the air, then twisting the top, doubling it over, and wrapping it several times with handy ties included in the package.

Wrapping materials are similar to flexible bags except they are available in rolls and are cut to the desired size as they are used.

For Trouble Free Freezing:

Package so as to leave no air pockets. For dry pack, leave no head space. For packs that are “runny” at room temperature, leave ¼-inch [13 mm] head space in quart [950 mL] containers and ⅛-inch [6 mm] head space in pint [480 mL] containers. (Some plastic freezer boxes have the fill line marked.) Wipe mouth of container with a clean wet cloth. Seal container so it is air tight. Keep record of storage times. Label with name of product, date and any other information needed.

Reuse of Containers: Wash can or freeze jars in hot, soapy water. Rinse and drain. Invert the containers on a clean towel to cool before filling them. Wash and rinse lids. Wash plastic boxes in hot, soapy water, rinse well and drain.

THE FREEZER

There are three types of freezers on the market. The type you choose will depend on floor area available and the amount of freezer space you desire.

Any true freezer maintains 0°F [−18°C] or lower, for fast freezing and proper low temperature storage of foods.

The frostless feature eliminates the messy, tedious chore of defrosting, and frost doesn’t build up on food packages.

1. The Upright Freezer: Ranges in size from 6 to 22 cubic feet [.17 to .62 m³] and has from 3 to 7 shelves for storing food.
2. Chest Freezer: Ranges in size from 6 to 32 cubic feet [.17 to .91 m³].
3. Refrigerator-Freezer Combination: The freezer space contains from 2 to 16 cubic feet [.06 to .45 m³], has separate door and is located at top or bottom or side.

Regardless of the type of freezer selected, it should be placed in a convenient, cool, dry and well-ventilated place. The temperature should be held at 0°F [−18°C] or lower at all times. Keeping the temperature at −10°F [−23.5°C] will help keep the temperature below 0°F [−18°C] when unfrozen food is placed in the freezer. It’s good insurance to use a freezer thermometer and check it often.

Defrost once a year (if not a frostless one) or as often as ice on the sides reaches a thickness of ⅛-inch [19 mm]. Defrosting is accomplished by turning off the current, opening the door or lid, removing all the food from the freezer (protecting frozen food by covering with a blanket or quilt), and turning an electric fan on the interior of the freezer for a few minutes. Or, place pans of hot water inside. The ice loosens and then may be scraped off. After thawing, wash the inside with a warm baking soda solution (3 tablespoons [45 mL] baking soda with 1 quart [950 mL] water). Wipe dry and turn on electricity. Replace food.

Frostless freezers do not need defrosting. However, such a freezer should be cleaned at least once a year in the same way as above. If odors develop in freezer, place charcoal on paper in freezer for several days.

LOADING THE FREEZER

The quantity of food that can be frozen successfully at one time depends on the kind of food, its size, kind of package and design of freezer. Put no more unfrozen food into a food freezer than will freeze within 24 hours (usually about 2 or 3 pounds of food per cubic foot of capacity). Overloading slows down the rate of freezing and foods that freeze too slowly may lose quality or spoil. Also, overloading can raise the temperature above 0°F [−18°C] and this affects the quality of the frozen food already in the freezer. Place each package in direct contact with a refrigerated surface and leave a little space between. The original fresh flavor, color, texture and nutritive value of the frozen product will reach the table if it is properly prepared and protected at 0°F [−18°C] during storage.

FROZEN FOOD “MUSTS”

1. The home freezer should be placed in the most convenient, coolest, driest, best-ventilated place and defrosted or thawed at least once each year.
2. Foods must be in the best condition. If not, they are not worth freezing.
3. Vegetables must be properly blanched* to preserve quality. Exceptions are rhubarb and those used exclusively for flavoring, such as peppers, onions, horseradish, mint, sage and thyme.
4. For best quality, all meats and poultry must have been chilled quickly after killing. Beef must be aged about a week at 33° to 38°F [5°-3.5°C] to become tender and flavorful.
5. Everything must be properly packaged. Fruits in syrup, stews and other “runny” products should be tightly closed in rigid freezer containers such as can or freeze jars and plastic freezer boxes. Vegetables packed “loose” should be in moisture/vapor-resistant containers such as plastic freezer bags or boxes or can or freeze jars. Meats should be wrapped “skin tight” as nearly as possible.

*If you live 5,000 feet [1,524 m] or more above sea level, blanch one minute longer than times specified in recipes.
possible in moisture/vapor-proof materials.

6. Freezing must be rapid to preserve the natural color, flavor and texture of delicate fruits and vegetables, and to prevent spoilage of meats and prepared foods.

7. Frozen foods must be stored at 0°F [−18°C] or lower. Only in rare cases should they be refrozen if allowed to thaw. Meats and cooked foods may be refrozen if it is certain that the temperature did not rise above 32°F [0°C] nor remain at this point longer than a few hours.

8. Frozen foods must be used within a reasonable time since there is gradual loss of quality of all frozen foods. Most cooked foods have a relatively short shelf life. Pork should be used within six months; ground meat and liver should be used within three months; while most fruits, vegetables and other meats may be held in good condition for almost a year.

9. Frozen foods must be cooked and served properly. For best quality, meats and vegetables must be cooked and served immediately upon thawing; most vegetables (and some meats) are cooked in the frozen stage; fruits to be eaten as dessert should be served while in the sherbet stage; and precooked main dishes should be thawed, reheated and served in rapid succession.

**THESE DO NOT FREEZE WELL**

Cake icings made with egg whites become frothy or "weep" when thawed.

Cream fillings and soft frostings are unsatisfactory when frozen.

Custards and cream pie fillings become watery and lumpy.

Egg whites become cracked, tough and rubbery when frozen.

Fat may separate from gravy if too much is used in proportion to the starch or flour. Use less fat when making gravy to be frozen. Stir it well when reheating.

Foods fried lose their crispness and become soggy. (Exceptions are French fried potatoes and onion rings.)

Fruit jelly in sandwiches may soak into the bread.

Macaroni, spaghetti and some rice (frozen separately) have a warmed-over flavor and often are mushy.

Mayonnaise (not in salads) separates during freezing and thawing.

Meringue toughens and sticks to paper after a few days of freezing. Pepper, onions, cloves and synthetic vanilla become strong and bitter when used in frozen prepared food. Potatoes (Irish) cooked in stews and soups become mushy and may darken. Salt loses flavor.

---

**FIGURE 24**

**LENGTH OF STORAGE**

<table>
<thead>
<tr>
<th>Product</th>
<th>Recommended Length of Storage at 0°F (−18°C) (Months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beef, Lamb, Mutton, Veal, Venison</td>
<td>8-12</td>
</tr>
<tr>
<td>Breads, Quick, baked</td>
<td>2</td>
</tr>
<tr>
<td>Breads, Yeast, baked</td>
<td>4-8</td>
</tr>
<tr>
<td>Bread, Yeast, unbaked</td>
<td>1/2</td>
</tr>
<tr>
<td>Butter</td>
<td>5-6</td>
</tr>
<tr>
<td>Cakes</td>
<td>6</td>
</tr>
<tr>
<td>Cakes, Fruit</td>
<td>12</td>
</tr>
<tr>
<td>Candies</td>
<td>12</td>
</tr>
<tr>
<td>Cheese, cottage</td>
<td>1</td>
</tr>
<tr>
<td>Cheese, hard or semi-hard</td>
<td>6-12</td>
</tr>
<tr>
<td>Cheese, soft</td>
<td>4</td>
</tr>
<tr>
<td>Cookies, baked</td>
<td>6</td>
</tr>
<tr>
<td>Cookies, unbaked</td>
<td>4</td>
</tr>
<tr>
<td>Eggs</td>
<td>12</td>
</tr>
<tr>
<td>Fish</td>
<td>2-3</td>
</tr>
<tr>
<td>Fruits, Citrus</td>
<td>3-4</td>
</tr>
<tr>
<td>Fruits, except citrus</td>
<td>12</td>
</tr>
<tr>
<td>Gravy</td>
<td>2</td>
</tr>
<tr>
<td>Ground Meat</td>
<td>3-4</td>
</tr>
<tr>
<td>Ice Cream, Sherbet</td>
<td>1-3</td>
</tr>
<tr>
<td>Liver</td>
<td>3</td>
</tr>
<tr>
<td>Milk</td>
<td>1</td>
</tr>
<tr>
<td>Onions</td>
<td>3-6</td>
</tr>
<tr>
<td>Opossum, Rabbit, Squirrel</td>
<td>6-9</td>
</tr>
<tr>
<td>Oysters, Crab, Fish, Roe, Lobster</td>
<td>2</td>
</tr>
<tr>
<td>Pastry, unbaked</td>
<td>2</td>
</tr>
<tr>
<td>Pies, baked</td>
<td>1</td>
</tr>
<tr>
<td>Pies, unbaked</td>
<td>3</td>
</tr>
<tr>
<td>Pizza</td>
<td>1</td>
</tr>
<tr>
<td>Pork Cured</td>
<td>1-2</td>
</tr>
<tr>
<td>Pork Fresh</td>
<td>6-8</td>
</tr>
<tr>
<td>Poultry, Turkeys</td>
<td>12</td>
</tr>
<tr>
<td>Prepared Main Dishes</td>
<td>3-6</td>
</tr>
<tr>
<td>Salads</td>
<td>2</td>
</tr>
<tr>
<td>Sandwiches</td>
<td>1</td>
</tr>
<tr>
<td>Sausage</td>
<td>4-6</td>
</tr>
<tr>
<td>Shrimp</td>
<td>6</td>
</tr>
<tr>
<td>Soups, Stews</td>
<td>6</td>
</tr>
<tr>
<td>Vegetables, cooked</td>
<td>1</td>
</tr>
<tr>
<td>Vegetables, except onions</td>
<td>12</td>
</tr>
</tbody>
</table>

**FIGURE 25**

**HOW STORAGE TEMPERATURE AFFECTS STORAGE TIME OF FROZEN FOODS**

<table>
<thead>
<tr>
<th>Storage Temperature Degrees</th>
<th>Sensitive Fruits and Vegetables</th>
<th>Other Fruits and Vegetables</th>
<th>Turkeys and Cut-up Chicken</th>
</tr>
</thead>
<tbody>
<tr>
<td>°F</td>
<td>°C</td>
<td>1 year</td>
<td>5 months</td>
</tr>
<tr>
<td>0</td>
<td>18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Where discoloration occurs, such as in peaches and cauliflower.

** Where discoloration is not as critical, but does occur and flavor changes take place.

*** Whole chicken is more stable than turkey.
### Cooking and Serving

Prepared or cooked foods may be thawed and made ready for serving by either one of the following ways:

1. **Served while still frozen:** layer cakes, fruit pies, cookies, candies, ice cream, salads and similar foods.
2. **Served immediately after thawing:** at room temperature—cakes, sandwiches and similar foods.
3. **Heated only to serving temperature:** soups, meat dishes, stews and similar dishes.
4. **Cooked frozen:** uncooked pies, rolls and combination dishes.

### Refreezing

Occasionally, foods are partially or completely thawed before it is discovered that the freezer is not operating.

If foods have thawed only partially and there are still ice crystals in the package, they may be safely refrozen. Even this partial thawing reduces quality. If some of the high quality has already been lost during previous partial thawing, the additional loss may result in very low quality. Refrozen foods should be used as soon as possible.

If foods have slowly thawed and have warmed gradually over a period of several days to a temperature of 40°F [4°C] they are not likely to be suitable for refreezing. Under these conditions meats, poultry, fish, most vegetables and some prepared foods may become unsafe to eat; most fruits and fruit products soon develop an undesirable flavor.

If in doubt about any thawed foods, it is better not to take any chances with them. Eating spoiled food can be very dangerous.

### Care of Foods in Emergencies

If you know or suspect that power will be off in your home, set the freezer control at its coldest setting right away. The lower temperature of freezer and food will delay thawing if power does go off.

If the freezer stops operating because of power outage or any other reason, try to find out how long it will be inoperative.

If normal operation will not be resumed before the food will thaw, use dry ice to keep the food cold or transfer the food in insulated boxes to a freezer plant or other low-temperature storage space. If the trouble is freezer breakdown, your neighbors may have enough space in their freezers to solve your problem.

A fully loaded freezer at 0°F [−18°C] usually will stay cold enough to keep foods frozen for a couple of days; in one with half a load, food may not stay frozen for more than a day.

If dry ice is put in the freezer soon after power goes off, 50 pounds [22 kg] should keep the temperature of food in a 20-cubic-foot [.57 m³] cabinet below freezing—for three to four days; in a cabinet with half a load or less, for two or three days. Tip: Keep the phone number and address of a source of dry ice handy.

Work quickly when you put in dry ice. Place it on thick cardboard or boards on top of the frozen food or on shelves—not directly on the packages. Handle dry ice with care. Be sure the room is well ventilated when you use it. Never touch it with bare hands.

Do not open the freezer door while the freezer is not operating, except as part of food-saving procedure.

### Step-by-Step Freezing

1. Use only quality fresh products. Freezing retains quality, but cannot improve it.
2. Work under the most sanitary conditions.
3. Have everything needed organized to save time and energy.
4. Use only approved packaging materials.
5. Be an expert. Follow proper freezing instructions and . . .
   a) Blanch or scald all vegetables; cool quickly.
   b) Use ascorbic acid for certain fruits to prevent discoloration.
   c) Use dry sugar or syrup pack for fruits.
   d) Keep meats cold while preparing for freezing.
6. Package to remove all air; fasten packages airtight.
7. Label with date and name of product.
8. Promptly place packages in food freezer in single layers.
10. Keep an inventory.
11. Use all products within recommended storage period.

### Dairy Products

#### Milk

**Preparation:** Freeze only pasteurized milk. Package in can or freeze jars or plastic freezer boxes, leaving ¼-inch [6 mm] head space for pint [480 mL] or can or freeze jars or boxes, OR ½-inch [13 mm] head space for quart [950 mL] or can or freeze jars or plastic freezer boxes. Seal, label and freeze.

#### Cream

**Preparation:** Freeze only heavy cream containing 40 percent or more of butterfat. Heat to from 170° to 180°F [77-82°C] for 15 minutes. Add three tablespoons [45 mL] sugar per pint [480 mL] of cream. Cool quickly and package in can or freeze jars or plastic freezer boxes, leaving ¾-inch [6 mm] head space for pint [480 mL] or can or freeze jars or boxes, OR ½-inch [13 mm] head space for quart [950 mL] or can or freeze jars or plastic freezer boxes. Seal, label and freeze.

#### Butter

**Preparation:** Freeze only high quality butter made from pasteurized cream. Mold into desired shapes. Wrap tightly in freezer film and package in plastic freezer bags. Seal, label and freeze.

#### Ice Cream and Sherbet

**Homemade:** Prepare your favorite recipe and freeze in a hand or electrically turned ice cream freezer. Package in plastic freezer boxes. Seal, label and freeze.

**Commercially Made:** Place original carton in plastic freezer bags. Seal, label and freeze.

#### Cheese

**Preparation:** Hard or semi-hard cheese—cut in ½ to 1 pound [227-454 g] pieces. Wrap tightly in a freezer film and package in plastic freezer bags. Seal, label and freeze.

**Soft Cheese:** Wrap tightly in a freezer film and package in plastic freezer bags. Seal, label and freeze.

**Cottage Cheese:** Use uncreamed cheese. Package in can or freeze jars or plastic freezer boxes, leaving ¾-inch [6 mm] head space for pint [480 mL] can or freeze jars or boxes, OR ½-inch [13 mm] head space for quart [950 mL] can or freeze jars or plastic freezer boxes. Seal, label and freeze.
THAWING and PREPARING DAIRY PRODUCTS

Place the frozen product in the refrigerator to thaw. After thawing, it may be used as fresh.

EGGS

Selection: Select eggs as fresh as possible.

Preparation: Wash eggs, then break each egg separately into a clean, small bowl and examine by smell and appearance before mixing with others.

Whole Eggs: Gently mix the whites and yolks by putting them through a sieve or colander without forming air bubbles. Package in tapered half-pint [240 mL] jars or can or freeze jars or plastic freezer boxes, leaving ¾-inch [6 mm] head space for pint [480 mL] can or freeze jars or boxes, OR ½-inch [13 mm] head space for quart [950 mL] can or freeze jars or plastic freezer boxes. Seal, label and freeze.

Pie Apples: Place the apple slices in boiling water for two minutes and cool in ice water. Pack in plastic freezer bags. Seal, label and freeze.

Applesauce: Wash apples, peel if desired, core and slice. To each quart [950 mL] of apples, add ¼ cup [80 mL] water and ¼ teaspoon [1.25 mL] ascorbic acid. Cook apples until tender, purée and add ¼ cup [60 mL] sugar to 1 quart [950 mL] of hot purée, stirring until dissolved. Cool and package in can or freeze jars or plastic freezer boxes, leaving ¾-inch [6 mm] head space for pint [480 mL] can or freeze jars or boxes, OR ½-inch [13 mm] head space for quart [950 mL] can or freeze jars or plastic freezer boxes. Seal, label and freeze.

Apples: Place the frozen product in the refrigerator to thaw. After thawing, it may be used as fresh.

BERRIES

(Appart from Strawberries)

Select fully ripe, firm berries. Wash carefully in cold water, discarding soft, under-ripe or defective fruit. Remove caps and stems. Place berries in colander to drain. Pack in one of the following ways:

Syrup Pack: Prepare a 50% syrup (use berry juice instead of water.) Place the drained berries in can or freeze jars or plastic freezer boxes. Shake the container gently to avoid empty spaces. Cover the berries with the syrup, leaving ¾-inch [6 mm] head space for pint [480 mL] can or freeze jars or boxes, OR ½-inch [13 mm] head space for quart [950 mL] can or freeze jars or plastic freezer boxes. Seal, label and freeze.

FRUITS

APPLIES

Select full-flavored apples that are crisp and firm, not mealy in texture. Wash, peel and core. Slice medium apples into twelfths, larger ones into sixteenths. Drop immediately into ascorbic acid-citric acid water.

Syrup Pack: Use 50% syrup and add ¼ teaspoon [2.5 mL] ascorbic acid to each quart [950 mL] of syrup. Pour ½ cup [120 mL] cold syrup into can or freeze jars or plastic boxes. Press apple slices down in containers and add enough syrup to cover, leaving ¾-inch [6 mm] head space for pint [480 mL] can or freeze jars or boxes, OR ½-inch [13 mm] head space for quart [950 mL] can or freeze jars or plastic freezer boxes. Seal, label and freeze.

Pine-Apple Sauce: Place the drained apples in can or freeze jars or plastic freezer boxes. Shake the container gently to avoid empty spaces. Cover the berries with the syrup, leaving ¾-inch [6 mm] head space for pint [480 mL] can or freeze jars or boxes, OR ½-inch [13 mm] head space for quart [950 mL] can or freeze jars or plastic freezer boxes. Seal, label and freeze.

Sugar Pack: Gently mix one part sugar with four parts berries until fruit is coated with the sugar. Package in plastic freezer bags. Seal, label and freeze.

Puree: Select fully ripe berries of the finest flavor. The berries should be too mellow for freezing whole. Press the berries through a food mill. Package in can or freeze jars or plastic freezer boxes, leaving ¾-inch [6 mm] head space for pint [480 mL] can or freeze jars or boxes, OR ½-inch [13 mm] head space for quart [950 mL] can or freeze jars or plastic freezer boxes. Seal, label and freeze.

BLUEBERRIES,
HUCKLEBERRIES,
ELDERBERRIES, and
GOOSEBERRIES

Remove leaves, stems and immaturity or defective fruit. Wash thoroughly but quickly in ice water. Drain the berries. Pack in one of the following ways:

Syrup Pack: Same as berries above.

Note: you may heat syrup to boiling, immerse berries for one minute, remove, cool and package. Cool syrup and pour over berries.

Sugar Pack: One quart [950 mL] fresh berries (well washed and drained) and ¾ cup [160 mL] sugar. Fill can or freeze jars or plastic freezer boxes with alternate layers of berries and a sprinkling of sugar. Seal, label and freeze.

No-Sugar Pack: Place the drained berries in plastic freezer bags. Seal, label and freeze.

CHERRIES, SOUR

Select tender-skinned, bright, red cherries with a characteristic tart flavor. Wash in ice water, stem and pit. Mix one part sugar to four parts fruit. Package in can or freeze jars.

FIGURE 26
SYRUP FOR FREEZING FRUITS

<table>
<thead>
<tr>
<th>Type of Syrup</th>
<th>Sugar</th>
<th>Water</th>
<th>Yield of Syrup</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>cups</td>
<td>mL</td>
<td>cups</td>
</tr>
<tr>
<td>30 per cent</td>
<td>2</td>
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<td>4</td>
</tr>
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<td>3</td>
<td>720</td>
<td>4</td>
</tr>
<tr>
<td>50 per cent</td>
<td>4¼</td>
<td>1140</td>
<td>4</td>
</tr>
<tr>
<td>60 per cent</td>
<td>7</td>
<td>1680</td>
<td>4</td>
</tr>
</tbody>
</table>
or plastic freezer boxes leaving ¼-inch [6 mm] head space for pint [480 mL] can or freeze jars or boxes, OR ½-inch [13 mm] head space for quart [950 mL] can or freeze jars or plastic freezer boxes. Seal, label and freeze. These may also be frozen in a 50% syrup.

CHERRIES, SWEET
Select bright, fully ripened cherries of dark colored varieties. Wash, stem and pit. To retain the natural fruit flavor, add ⅛ teaspoon [2.5 mL] ascorbic acid to 1 quart [950 mL] of the 50% syrup. Package the same as berries (syrup pack).

COCONUT
Grate the coconut by hand or in food blender. Prepare in one of the following ways:

Method I: Mix grated coconut with its own milk and pack in can or freeze jars or in plastic freezer boxes, leaving ¼-inch [6 mm] head space for pint [480 mL] can or freeze jars or boxes, OR ½-inch [13 mm] head space for quart [950 mL] can or freeze jars or plastic freezer boxes. Seal, label and freeze.

Method II: Mix one part sugar to eight parts shredded coconut. Pack in plastic freezer bags. Seal, label and freeze.


CRANBERRIES
Select deep red, uniform color, firm with glossy skins. Wash thoroughly in cold water, stem, sort and drain. Pack in plastic freezer bags. Seal, label and freeze.

Berry Sauce: Prepare as for table: cool; pack in can or freeze jars or plastic freezer boxes, leaving ¼-inch [6 mm] head space for pint [480 mL] can or freeze jars or boxes, OR ½-inch [13 mm] head space for quart [950 mL] can or freeze jars or plastic freezer boxes. Seal, label and freeze.

CURRANTS
Select fully ripe berries. Sort, stem, wash carefully and drain. Prepare in one of the following ways:

Sugar Pack: Crush the fruit lightly and mix three parts fruit with one part sugar. Allow to stand until sugar dissolves. Package the same as peaches (syrup pack).

Whole (No Sugar): Package the same as strawberries (whole).

FIGS
Select fully ripe fruit, wash and peel. Prepare in one of the following ways:

Sugar Pack: Roll whole or halved figs in one part sugar to four parts fruit and pack in plastic freezer bags. Seal, label and freeze.

Syrup Pack: Pack whole or halved figs in can or freeze jars or plastic freezer boxes, and cover with 50% syrup, leaving ⅛-inch [6 mm] head space for pint [480 mL] can or freeze jars or boxes, OR ½-inch [13 mm] head space for quart [950 mL] can or freeze jars or plastic freezer boxes. Seal, label and freeze.

Whole (No Sugar): Place the figs in plastic freezer bags, attempting to fill all space. Seal, label and freeze.

FRUIT JUICES
Most fruit juices make excellent frozen products and retain their fresh flavor from one season to another. Prepare the juice by your favorite recipe; cool, pack in can or freeze jars or plastic freezer boxes, leaving ¼-inch [6 mm] head space for pint [480 mL] can or freeze jars or boxes, OR ½-inch [13 mm] head space for quart [950 mL] can or freeze jars or plastic freezer boxes. Seal, label and freeze.

GRAPEFRUIT and ORANGES
Select firm, tree-ripened fruit. Heaviness indicates maturity. Wash the fruit; chill in refrigerator; peel; section, removing all membranes and seed.

Syrup Pack: Prepare a 40% syrup (using juice as part of liquid). Add ⅛ teaspoon [2.5 mL] ascorbic acid. Pack fruit in can or freeze jars or plastic freezer boxes and cover with syrup, leaving ¼-inch [6 mm] head space for pint [480 mL] can or freeze jars or boxes, OR ½-inch [13 mm] head space for quart [950 mL] can or freeze jars or plastic freezer boxes. Seal, label and freeze.

GRAPE JUICE
Prepare as for table: cool; pack in can or freeze jars or plastic freezer boxes, leaving ⅛-inch [6 mm] head space for pint [480 mL] can or freeze jars or boxes, OR ½-inch [13 mm] head space for quart [950 mL] can or freeze jars or plastic freezer boxes. Seal, label and freeze.

GRAPEFRUIT and ORANGES
Select firm, tree-ripened fruit. Heaviness indicates maturity. Wash the fruit; chill in refrigerator; peel; section, removing all membranes and seed.

Syrup Pack: Prepare a 40% syrup (using juice as part of liquid). Add ⅛ teaspoon [2.5 mL] ascorbic acid. Pack fruit in can or freeze jars or plastic freezer boxes and cover with syrup, leaving ¼-inch [6 mm] head space for pint [480 mL] can or freeze jars or boxes, OR ½-inch [13 mm] head space for quart [950 mL] can or freeze jars or plastic freezer boxes. Seal, label and freeze.

DE-SEEDED GRAPES: Heat grapes to boiling. Remove seed and hulls with food mill. Add one part sugar to five parts purée. Cool and package in can or freeze jars or plastic freezer boxes, leaving ¼-inch [6 mm] head space for pint [480 mL] can or freeze jars or boxes, OR ½-inch [13 mm] head space for quart [950 mL] can or freeze jars or plastic freezer boxes. Seal, label and freeze.

Grape Juice: Prepare and heat grapes same as above, then press or strain out juice through cloth bag. Sweeten to taste with sugar. Package in can or freeze jars or plastic freezer boxes, leaving ⅛-inch [6 mm] head space for pint [480 mL] can or freeze jars or boxes, OR ½-inch [13 mm] head space for quart [950 mL] can or freeze jars or plastic freezer boxes. Seal, label and freeze.

GRAPES, MUSCAT
Select fully ripe firm sweet grapes. Sort, stem, wash and prepare in one of the following ways:

Whole Grapes: Same as bunch grapes.

De-Seeded Grapes: Separate pulps, heat to boiling, put through a food mill to separate seed. Mix juice and pulps with hulls and boil until the hulls are tender (15 to 20 minutes). Add one part sugar to six parts grapes, stirring until sugar is dissolved. Cool and package in can or freeze jars or plastic freezer boxes. Seal, label and freeze. Serve before completely thawed.

GRAPES, MUSCAT
Select fully ripe firm sweet grapes. Sort, stem, wash and prepare in one of the following ways:

Whole Grapes: Same as bunch grapes.

De-Seeded Grapes: Separate pulps, heat to boiling, put through a food mill to separate seed. Mix juice and pulps with hulls and boil until the hulls are tender (15 to 20 minutes). Add one part sugar to six parts grapes, stirring until sugar is dissolved. Cool and package in can or freeze jars or plastic freezer boxes. Seal, label and freeze. Serve before completely thawed.

PEACHES, NECTARINES and APRICOTS
Select well-ripened fruit and handle carefully to avoid bruising. Wash them in several changes of cold water. Peel the fruit by hand, and drop it into ascorbic acid-citric acid mixture. Prepare in one of the following ways:

Sugar Pack: Thoroughly mix ⅓ cup [160 mL] sugar and ¼ teaspoon [1.25 mL] ascorbic acid
for each quart [950 mL] of fruit. Pit the fruit, slice it into a bowl and sprinkle the sugar-ascorbic acid mixture. Continue until you have 1 quart [950 mL] sliced fruit mixed with the ⅔ cup [160 mL] sugar. Allow these to stand until sugar dissolves (about ten minutes). Pack the sliced fruit into can or freeze jars or plastic freezer boxes, leaving ¹⁄₄-inch [6 mm] head space for pint [480 mL] can or freeze jars or boxes. Prepare in one of the following ways:

Slices: Pack slices in can or freeze jars with two pieces of freezer paper between slices. Seal, label and freeze.

**PINEAPPLE**

Select fruit of bright appearance, dark yellow-orange color, with fragrant odor. If top pulls out easily, pineapple is ripe for freezing. Peel, core, dice, slice or cut in wedges. Prepare in one of the following ways:

**Puree:** Pit and slice 1 pound [454 g] fruit; add 2 tablespoons [30 mL] sugar and ¹⁄₄ teaspoon [1.25 mL] ascorbic acid. Place the mixture in a food blender and convert into a liquid. Pour the mixture into pint [480 mL] can or freeze jars or boxes. Prepare in one of the following ways:

**Sugar Pack:** Mix five parts fruit with one part sugar. Allow to set until sugar is dissolved. Pack in can or freeze jars or plastic freezer boxes, leaving ¹⁄₄-inch [6 mm] head space for pint [480 mL] can or freeze jars or boxes, OR ¹⁄₂-inch [13 mm] head space for quart [950 mL] can or freeze jars or plastic freezer boxes. Place a disc made from aluminum foil or plastic over the top of puree to prevent discoloration. Seal, label and freeze.

**Syrup Pack:** Prepare a 50% syrup and add ¹⁄₂ teaspoon [2.5 mL] ascorbic acid for each quart [950 mL] of syrup. Pour ¹⁄₂ cup [120 mL] syrup into can or freeze jars or boxes, OR ¹⁄₂-inch [13 mm] head space for quart [950 mL] can or freeze jars or plastic freezer boxes. Cover with a 50% syrup, leaving ¹⁄₄-inch [6 mm] head space for pint [480 mL] can or freeze jars or boxes, OR ¹⁄₂-inch [13 mm] head space for quart [950 mL] can or freeze jars or plastic freezer boxes. Seal, label and freeze.

**PEACHY-BERRY CONSERVE**

10 ounces [284 g] frozen, sweetened strawberries
¹⁄₂ teaspoon [2.5 mL] ascorbic acid
1 cup [240 mL] drained, canned peaches
1 package powdered fruit pectin
¹⁄₂ cup [120 mL] water
3 cups [720 mL] sugar
¹⁄₄ cup [60 mL] water
¹⁄₄ cup [60 mL] slivered almonds
1 tablespoon [15 mL] lemon rind

When thawed, sprinkle ascorbic acid over berries. Add peaches and let stand 20 minutes, stirring occasionally. Combine pectin and ¹⁄₂ cup [120 mL] water; boil rapidly one minute, stirring constantly. Remove from heat and immediately add sugar and ¹⁄₄ cup [60 mL] water, stirring to dissolve sugar. Add fruit to pectin, stir for two minutes. Add almonds and lemon rind. Pour into freezer jars; cover with tight fitting lids. Let stand at room temperature 24 hours. If conserve does not set properly, refrigeration will hasten the process. Freeze at 0°F [-18°C] or lower. Yield: about 4 half-pints [950 mL].

**RHUBARB**

Select stalks that are crisp, tender and well colored with red; early spring cuttings are best for freezing. Remove leaves and woody ends; discard blemished and tough stalks. Wash rhubarb well under running water and cut into 1-inch [25 mm] lengths. Prepare in one of the following ways:

**Dry Pack:** Pack in plastic freezer bags. Seal, label and freeze.

**Sugar Pack:** Mix 1 cup [240 mL] sugar to 4 cups [950 mL] rhubarb. Allow to stand until sugar is dissolved. Pack in can or freeze jars or plastic freezer boxes, leaving ¹⁄₄-inch [6 mm] head space for pint [480 mL] can or freeze jars or boxes, OR ¹⁄₂-inch [13 mm] head space for quart [950 mL] can or freeze jars or plastic freezer boxes. Place a disc made from aluminum foil or plastic over the top of puree to prevent discoloration. Seal, label and freeze.
Some fruits, especially young berries and boysenberries, make better jellies when frozen than when fresh because freezing and thawing cause the juices to be released from the cells and the natural fruit color dissolves in the juice. Freshly made jellies, jams, marmalades and preserves from frozen berries are superior in flavor, color and texture to those made from fresh berries.

**STRAWBERRIES**

Select fully ripe, firm berries with a deep red color. Sort out immature and defective fruit. Gently wash the berries in several changes of cold water. Remove caps and place berries in a colander to drain. Prepare in sugar. Allow to stand until sugar dissolves (about ten minutes). Gently stir. Package the same as peaches.

**Syrup Pack:** Leave the berries whole or slice. Pack in can or freeze jars or boxes. Cover in a colander to drain. Prepare in one of the following ways:

**Sugar Pack:** Slice the berries in halves or thirds, lengthwise. Mix six parts sliced berries with one part sugar. Allow to stand until sugar dissolves. Gently stir. Package the same as peaches.

**Syrup Pack:** Leave the berries whole or slice. Pack in can or freeze jars or plastic freezer boxes. Cover in a colander to drain. Prepare in one of the following ways:

**Sugar Pack:** Slice the berries in halves or thirds, lengthwise. Mix six parts sliced berries with one part sugar. Allow to stand until sugar dissolves. Gently stir. Package the same as peaches.

**Syrup Pack:** Leave the berries whole or slice. Pack in can or freeze jars or boxes. Cover in a colander to drain. Prepare in one of the following ways:

**Sugar Pack:** Slice the berries in halves or thirds, lengthwise. Mix six parts sliced berries with one part sugar. Allow to stand until sugar dissolves. Gently stir. Package the same as peaches.

**THAWING and PREPARING FRUITS**

When serving frozen fruits for dessert, open the package just when you are ready to serve while there are still a few ice crystals in the fruit. Frozen fruits may be used the same as fresh fruits in most recipes. When using frozen fruits in cooking, allowance should be made for any sugar that was added at the time of freezing.

Some fruits, especially young berries and boysenberries, make better jellies when frozen than when fresh because freezing and thawing cause the juices to be released from the cells and the natural fruit color dissolves in the juice. Freshly made jellies, jams, marmalades and preserves from frozen berries are superior in flavor, color and texture to those made from fresh berries.

**JELLY & SEMI-SOFT SPREADS**

**APRICOT JAM**

Follow recipe for Strawberry Jam, except 1 teaspoon [5 mL] powdered citric acid is added to the finely mashed apricots.

**BLACKBERRY JAM**

Follow recipe for Red Raspberry, except a reduction of sugar from 6 cups [1440 mL] to 5½ cups [1320 mL].

**BLACK RASPBERRY JAM**

Follow recipe for Strawberry Jam.

**CHERRY JAM**

Follow recipe for Strawberry Jam, except sour cherries are pitted and put through a food chopper before measuring.

**CHERRY JAM**

Follow recipe for Strawberry Jam, except plums are pitted and put through a food chopper before measuring.

**GRAPE JAM**

Follow recipe for Red Raspberry jam, except seeds are separated after heating Concord Grapes. Simmer grapes without adding water until skins are broken and grapes have softened. Put pulp through a colander or food mill before measuring.

**PEACH JAM**

Follow recipe for Strawberry Jam, except 1 teaspoon [5 mL] powdered citric acid is added to the finely mashed peaches.

**PEACH JAM**

Follow recipe for Red Raspberry jam, except peaches are slices or sieved red raspberries.

**RED RASPBERRY JAM**

Follow recipe for Strawberry Jam, except seeds are separated after heating Concord Grapes. Simmer grapes without adding water until skins are broken and grapes have softened. Put pulp through a colander or food mill before measuring.
JAMS from FROZEN FRUIT

20 ounces [567 g] frozen blackberries, raspberries or strawberries
3 cups [720 mL] sugar
1 box powdered pectin
1 cup [240 mL] water OR
1/2 bottle liquid pectin

Let the berries thaw. Mix berries and sugar. Let stand about 20 minutes, stirring occasionally. If powdered pectin is used, combine it with water, boil 1 minute stirring constantly. Add pectin to berries and sugar. Stir about 2 minutes.

Pour jam into freezer containers or canning jars, leaving 1/2-inch [13 mm] head space. Cover container and refrigerate until set. Store in the refrigerator or freezer.

JAMS MADE with BERRIES

3 cups [720 mL] crushed blackberries, raspberries or strawberries (about 1 1/2 quarts)
[1425 mL]
5 cups [1200 mL] sugar
1 box powdered pectin and 1 cup [240 mL] water OR
1/2 bottle liquid pectin

Measure 3 cups [720 mL] of prepared berries in extra large mixing bowl. Add sugar, mix well, and let stand for 20 minutes, stirring occasionally.

If using powdered pectin, dissolve the pectin in the water, bring to a boil, and boil for 1 minute.

Add pectin to berries and sugar and stir for 2 minutes.

Pour the jam into freezer containers or canning jars, leaving 1/2-inch [13 mm] head space. Cover container and let stand for 24 hours.

Yield: about 7 one-half pint jars [1680 mL].

NOTE: If blackberries are very seedy, put part or all of them through a sieve or food mill.

BERRY JELLY

3 cups [720 mL] fresh or frozen berry juice
4 1/2 cups [1080 mL] sugar
1 box powdered pectin
1/2 cup [120 mL] water

Add the sugar to 1 1/2 cups [300 mL] of berry juice. Stir thoroughly. Add the pectin slowly to the water. Heat almost to boiling, stirring constantly. Pour the pectin mixture into the remaining 1 1/2 cups [420 mL] of berry juice. Stir until pectin is completely dissolved. Let the pectin mixture stand 15 minutes. Stir occasionally. Mix the juice mixture with pectin mixture. Stir until all sugar is dissolved.

Pour into containers. Cover with a tight lid. Let stand at room temperature until set, from 6 hours to overnight. Store in refrigerator or freezer.

GRAPE JELLY

2 cups [480 mL] lukewarm water
1 box pectin
6 ounces [170 g] frozen grape juice concentrate
3 1/4 cups [780 mL] sugar

Mix the pectin slowly into the lukewarm water in a 2 quart [1900 mL] mixing bowl. Stir constantly Until completely dissolved. Let stand 45 minutes. Stir occasionally but do not beat. Thaw juice by placing can in cold water. When juice is thawed, pour into a 1 quart [950 mL] bowl. Add the lemon juice and 2 1/2 cups [600 mL] of the sugar. Mix thoroughly. All the sugar will not dissolve. Add the remaining 2 cups [480 mL] of sugar to the dissolved pectin. Stir until all sugar is dissolved. Mix the juice mixture with the pectin mixture. Stir constantly until all sugar is dissolved.

Pour into containers. Cover with a tight lid. Let stand at room temperature until set. Freeze or refrigerate.

MEATS

General Information

Freezing preserves the natural fresh qualities of meat better than any other method of preservation. Freezing may tenderize meat slightly, but it will not make tough meat tender.

While beef, lamb, pork, chickens and turkeys may be produced on the farm and frozen in the home, it is advisable for slaughtering, chilling and preparation of beef, lamb and pork to be done in commercial establishments. The advantages are that animals may be slaughtered at any time of the year, and the meat can be handled under sanitary conditions, controlled temperatures and inspected by local authorities.

Equipment for handling meat products should be as free of seams and cracks as possible and should be scrubbed in hot water with a good detergent and sanitizer after each use.

Many families prefer to select cuts of their choice from the market and freeze these at home. All store-packaged fresh meats should be repackaged in freezer materials at home, since “butcher paper” usually is not moisture/vapor-proof and contains air pockets.
**Beef, Lamb, Mutton, Veal and Venison Cuts:** Roasts, rolled roasts, steaks, chops, stew meat, frying meat and ground meat. All may be stored frozen for one year if desired, except ground meat. Three to four months is the maximum time to freeze ground meat. Three months is the maximum time to freeze liver.

**Preparation:** Use only good quality meat from carcasses that have been aged about one week, in a relatively dry room, at about 35°F [2°C].

Cut meats as for cooking, removing as much bone and other waste as possible, and package in family-size servings. Keep meat cold while it still contains a few ice crystals. Usually roasts and steaks over 1 ½ inches [38 mm] thick should be thawed before cooking. Thin steaks, chops or patties may be cooked from the frozen stage, but the cooking time must be longer to allow for thawing the meat. Use a recommended meat cooking chart for accurate times and temperature for completely thawed meats. Add from 12 to 21 minutes per pound [454 g] for roasting meats that are still frozen.

**THAWING AND PREPARING BEEF, PORK, LAMB, MUTTON, VEAL AND VENISON**

Leave package wrapped until ready to cook. The refrigerator is the best place to thaw meats. Slow thawing allows the meat to absorb the thawed ice crystals. Also the meat is less likely to spoil and develop off-flavor. If you must thaw meat fast, use an electric fan. Thaw frozen meats just long enough for the ice to disappear in the center. Never thaw meat and allow it to return to room temperature. It is best to put meat on to cook while it still contains a few ice crystals. Usually roasts and steaks over 1 ½ inches [38 mm] thick should be thawed before cooking. Thin steaks, chops or patties may be cooked from the frozen stage, but the cooking time must be longer to allow for thawing the meat. Use a recommended meat cooking chart for accurate times and temperature for completely thawed meats. Add from 12 to 21 minutes per pound [454 g] for roasting meats that are still frozen.

**POULTRY**

**CHICKEN**

**Chicken (Fryers, Broilers, Roasters and Hens) Selection:** Select choice birds that have grown rapidly and are well fattened. If practical, starve birds overnight before killing.

**Fryers and Broilers (Whole):** For short storage, pack the whole bird in plastic freezer bags and seal air tight. For long storage, wrap the bird in a freezer film and ovenwrap with a freezer paper. Seal, label and freeze.

**Cut Up:** Disjoint or otherwise cut birds suitable for cooking and pack closely in can or freeze jars or plastic freezer boxes. Seal, label and freeze. If several birds are prepared at one time, package the various pieces separately. Place livers in a separate package and use within three months.

**Halves:** Split the birds in halves, package in family-size packages with a double layer of moisture/vapor-proof material between each piece. Package same as whole birds.

**Roasters and Hens:** Prepare same as whole fryers.

**TURKEY**

**Preparation:** Allow carcass to chill two days; then prepare same as whole fryers.

**THAWING and PREPARING CHICKENS and TURKEYS**

**Frying Chicken:** Thaw cut-up fryers in the refrigerator until the pieces can be separated easily. They should then be prepared and cooked as fresh.

**Roasting Chickens and Turkeys:** Thaw unwrapped roasters completely either in refrigerator or closed brown paper bag or cold water—never at room temperature. They should then be prepared and cooked as fresh.
FROSTED CAKES
Prepare, bake and cool. Place in freezer to harden the frosting. Then remove and place in plastic freezer bags. Seal, label and freeze.

CANDIES
All homemade candies such as fudge, divinity, brittle, taffy, creams and caramels may be frozen. Wrap each piece individually in freezer film and pack in plastic freezer boxes to avoid crushing. Allow to thaw in the package.

CHICKEN
(Also Turkey and Fish)
Frozen creamed chicken, chicken a la king, pies, baked chicken, broth, chicken chopped for salad, barbecued ... all keep well. Do not freeze stuffed poultry. Cover chicken with a cream sauce or gravy if possible. Cool the product and package in can or freeze jars or plastic freezer boxes.

COMBINATION DISHES
Creamed Meat, Poultry and Fish: Prepare product. Cool quickly. Package in can or freeze jars or plastic freezer boxes, leaving ¾-inch [6 mm] head space for pint [480 mL] can or freeze jars or boxes. OR ½-inch [13 mm] head space for quart [950 mL] can or freeze jars or plastic freezer boxes. Seal, label and freeze.

Baked Beans, Stew, Ravioli and Meat Sauce Casseroles: Prepare as usual, keeping fat to minimum. Cool quickly and package same as creamed meat.

Cookies
Baked: Prepare, bake and cool quickly. Package in plastic freezer bags or boxes using moisture/vapor resistant paper between layers. Seal, label and freeze.

Unbaked: For bar or refrigerator cookies, form into long roll. Wrap in freezer film and put in plastic freezer bags. Seal, label and freeze.

Doughnuts: Fry in high quality fat and cool. Package as baked cookies.

DESSERTS
Mousse: Needs only to be mixed and poured into can or freeze jars, leaving ¼-inch [6 mm] head space for pint [480 mL] can or freeze jars or boxes. OR ½-inch [13 mm] head space for quart [950 mL] can or freeze jars or plastic freezer boxes. Seal, label and freeze.

Cheesecake, Baked: Cool and wrap in freezer film and store in plastic boxes. Seal, label and freeze.

Pudding, Steamed: Cool and package in covered can or baking mold and seal with freezer tape; or put into plastic freezer bags. Seal, label and freeze.

FRUITS
Such cooked fruits as baked apples, baked pears and applesauce may be prepared for the freezer. Cool quickly and package in can or freeze jars or plastic freezer boxes. Seal, label and freeze.

MEATS
Stews, creamed meats, meat sauces, casserole dishes, meat with vegetables, pies, roasted and baked meats, meat balls and meat loaf may be frozen. Package the same as chicken.

Meat, Poultry and Shell Fish: Prepare the meat. Cool. Package in can or freeze jars or in plastic freezer boxes. Seal, label and freeze. When ready to use, thaw meat and mix with other ingredients.

PAstry CIRCLES
Roll out circles large enough for pie or tart shells. Place on a cardboard circle covered with foil or film. Separate circles with double thickness of freezer paper. Freeze, then package in plastic freezer bags.

PIES
Double-crust fruit and mince pies, raw or cooked, as well as single-crust, coconut, nut, potato and similar pies may be frozen. The filling for pies to be frozen should be slightly thicker than usual. Freeze pies before packaging. Package the same as breads.

POTatoes, IRISH
Baked or Stuffed: Prepare as usual, top with melted cheese. Cool quickly. Wrap individually in freezer foil or film. Freeze. Put in plastic freezer bags.

French Fried: Cut and scald potatoes two minutes; cool and dry in clean cloth. Fry in fresh, first grade fat (370°F [188°C]) until a very light brown. Drain. Cool quickly and package in plastic freezer bags. Seal, label and freeze.

Scalloped: Prepare and place in baking dish that can withstand wide variations in temperature. Bake as usual until pale in color and not quite done. Leave in baking dish and cool quickly. Slip dish into plastic freezer bags. Seal, label and freeze.

SALADS
Fruit salads which freeze well are those served with a base of cream, cottage cheese, whipped cream or mayonnaise. Gelatin combined with those items just mentioned also freeze well. Prepare in large or individual molds. Fit a piece of freezer paper over the top and wrap total container of salad in freezer paper. Muffin tins or other individual serving containers may be lined with a freezer film, or foil, or a paper-lined dish may be used. Fill with mixture, freeze, remove from container to free use of container, wrap individually and store in plastic freezer bags. OR, you may pour mixture in can or freeze jars, leaving ¼-inch [6 mm] head space for pint [480 mL] jars or boxes, or ½-inch [13 mm] head space for quart [950 mL] jars or plastic freezer boxes. Seal, label and freeze.

SANDWICHES
Sandwiches suitable for freezing include those made with cheese, chicken, meat, peanut butter, nut pastes, egg yolk mixtures and fish. Use day-old bread spread with butter. Wrap sandwiches individually in freezer film or foil. Freeze and store in plastic freezer bags.

Open-Face Canapes: Make as usual. Be sure to spread to very edge. Space out and freeze. Pack in layers in top-opening box separating layers with freezer paper.

Sauces
Both dessert sauces and meat sauces freeze successfully. Package in serving portions in can or freeze jars or plastic freezer boxes, leaving ¼-inch [6 mm] head space for pint [480 mL] can or freeze jars or boxes, OR ½-inch [13 mm] head space for quart [950 mL] can or freeze jars or plastic freezer boxes. Seal, label and freeze.

SOUPS
Most soups freeze well. These include dried beans, split pea, oyster and those made from chicken, meats and vegetables. They should be concentrated before freezing to about one-half the strength at which they are to be served. Cool. Package in can or freeze jars or plastic freezer boxes, leaving ¼-inch [6 mm] head space for pint [480 mL] can or freeze jars or boxes, OR ½-inch [13 mm] head space for quart [950 mL] can or freeze jars or plastic freezer boxes. Seal, label and freeze.
VEGETABLES

Some fully cooked vegetables, such as baked beans and candied sweet potatoes, when frozen, keep in excellent condition for many months; but most fully cooked vegetables lose flavor rapidly and should be stored for only a few days. Loss of flavor may be retarded by covering the vegetables with a cream sauce.

FISH

Selection: Select any kind of desirable fish, as fresh as possible.

Preparation: Prepare fish for freezing the same as for cooking. Freeze small fish whole. Large fish may be cut into steaks or fillets or left whole. Steaks and fillets need a 30 second dip in a 5 percent salt solution (2 1/2 cup [160 mL] salt in one gallon [3800 mL] water). Wrap each fish tightly in a freezer film, foil or paper, then place in a plastic freezer bag. Seal, label and freeze. Fish may also be frozen by placing them in a plastic freezer box and covering with water, leaving 1/4-inch [6 mm] head space for pint [480 mL] can or freeze jars or boxes, OR 1/2-inch [13 mm] head space for quart [950 mL] can or freeze jars or plastic freezer boxes. Seal, label and freeze.

ÔYSTERS

Preparation: Prepare the oysters as for using fresh. Package in meal-size can or freeze jars or plastic freezer boxes, leaving 1/4-inch [6 mm] head space for pint [480 mL] can or freeze jars or boxes, OR 1/2-inch [13 mm] head space for quart [950 mL] can or freeze jars or plastic freezer boxes. Seal, label and freeze.

SHRIMP

Preparation: Several methods are recommended for freezing shrimp:
1. Remove the shrimp head and freeze.
2. Remove the shrimp head, shell, clean and freeze.
3. Cooked shrimp—Boil five minutes in salt solution (2 1/2 ounces [71 g] salt per gallon [3800 mL] of water).
4. Breaded shrimp—Peel the raw shrimp, de-vein it, bread with your favorite breading method and freeze.
5. Precooked shrimp.

CRAB

Preparation: Prepare crabs as for using fresh. Grade the meat by size. Package in meal-size can or freeze jars or plastic freezer boxes. Seal, label and freeze.

FISH ROE

Preparation: Thoroughly wash roe, package same as crab meat.

LOBSTER

Same as crab.

Fish, Oysters, Shrimp, Crab, Fish Roe and Lobsters: It is important that only strictly fresh products be used for freezing. Being a perishable commodity, it should be kept under refrigeration at all times. The freezing of these products shortly after catching is very important.

THAWING and PREPARING SEAFOOD PRODUCTS

Fish, Oysters, Shrimp, Crab and Lobsters: Place the unopened package in the refrigerator until thawing begins and the product softens slightly, then remove the food and cook as fresh.

SPECIAL FOODS and BABY FOODS

1. Foods for diabetics can be prepared and frozen without sugar or sweetened with a non-caloric sweetener. Consult physician and follow manufacturer's instructions.
2. Dietetic. It is often a convenience to freeze individual portions without salt or without fat for persons on special diets. These can be frozen in ice trays, then removed and stored in plastic freezer bags or boxes.
3. Purees of vegetables and fruits and meats for babies and convalescents may be made and frozen when the foods are in season. The half-pint [240 mL] can or freeze jars are excellent containers for storing these items in the freezer.

GENERAL INFORMATION

Excellent frozen products may be had from most vegetables when:
(a) the proper varieties are used; (b) they are harvested at the right time; (c) they are adequately scalded and cooled; and (d) they are packaged correctly. Many frozen vegetables are fresher than those purchased on the "fresh market." Practically all frozen vegetables may be stored for one year.

Choose a variety that is recommended for eating fresh, or a newer variety which has been found to be especially suitable for freezing.

If you grow your own, harvest tender vegetables at the best stage to be eaten fresh, or slightly younger. Process on the day harvested or bought, and never use if allowed to become over-mature either before or after harvesting. The fresher the vegetables when frozen, the more satisfactory the product.

If it is necessary to store vegetables for a short time, spread them in a cool, well-ventilated place or in the refrigerator. Prompt cooling in ice water followed by storage in the refrigerator will help retain flavor and other qualities.

SCALDING OR BLANCHING

Scalding is a critical step in preparing vegetables for freezing and must be done carefully. (This is a "must" for all vegetables to be stored frozen for more than four weeks, except those used exclusively for their flavor such as green onions, hot peppers, and herbs.) Scalding cleanses the surface of dirt and organisms, brightens the color, helps retain vitamins, and reduces the action of enzymes which otherwise would destroy the fresh flavor after about four weeks. It also shrinks the product, making packing easier.

Immediately before scalding, wash, drain, sort, trim and cut the vegetables as for cooking fresh. Use one gallon [3800 mL] water per pound [454 g] vegetables—two gallons [7600 mL] for leafy greens. Put vegetables into blancher (wire basket, coarse mesh bag, or perforated metal container) and lower it into vigorously boiling water. Begin...
counting the time as soon as the vegetable is placed in the boiling water. Keep the heat on high and stir water, or keep container covered during blanching. Follow the scalding time given in the recipe for each vegetable. This is very important because underscalding stimulates the activity of enzymes and is worse than no scalding. Prolonged scalding causes loss of vitamins, minerals, flavor and color.

COOLING
As soon as scalding is complete the vegetables should be cooled quickly to stop the cooking process. This may be done by immersing the vegetables in ice water or spreading them thinly on a wet cloth in front of a fan. They should be stirred several times during cooling which should not be longer than the scalding time. If water is used it should be as cold as possible in order to reduce the time of immersion. Otherwise nutrients, flavor, and color will be lost. To aid cooling, pour hot vegetables into a cool colander—leaving hot basket to scald more vegetables.

With a large quantity, determine how many vegetables can be blanched in fifteen minutes. Prepare this amount, leaving the others in the refrigerator; Blanch and cool these before packaging. Package, label and place in freezer. Continue until all vegetables are frozen. The same scalding water may be reused for the same product, but keep the water at the proper level.

PACKAGING
Vegetables usually are packaged loosely without seasoning. Immediately after scalding and cooling, pack the vegetables in meal-size, air-tight, moisture/vapor-proof containers. Quart or pint [950-480 mL] size plastic freezer bags have been found most suitable for home packaging of many frozen vegetables. After placing the vegetables in bag, press out all of the air possible, twist the top of the bag so as to form a spiral, bend spiral back to form a gooseneck, and then wrap it with a fastener. Bags closed in this manner need not be sealed and can therefore be used again. Can or freeze jars and plastic freezer boxes also are excellent.

FREEZE QUICKLY
Place sealed packages in freezer in single layers, leaving 1-inch [25 mm] space between packages. Use coldest part of freezer for freezing foods. Foods should freeze in 12 to 24 hours.

STORAGE
When completely frozen, packages may be compactly stacked. Keep the freezer at 0°F [-18°C] or lower at all times.

THAWING and PREPARING VEGETABLES
Most vegetables can be cooked without thawing. The exception to this is corn-on-the-cob, the only vegetable which should be completely thawed before being cooked. All greens should be partially thawed so as to separate them before cooking. Precooked vegetables should also be partially thawed.

To maintain quality, cook frozen vegetables as you would fresh ones—but cook them for a shorter period of time because they were blanched before freezing. Use the smallest amount of water possible. Time the cooking so the vegetables may be served immediately, because nutrients are lost if the vegetable is allowed to stand after cooking. Cook only the amount that can be consumed at one meal.

ARTICHOKE, GLOBE
Select those with uniformly green color, compact globes and tightly adhering leaves. Size has little to do with quality or flavor. Remove outer bracts until light yellow or white bracts are reached. Cut off tops of bud and trim to a cone. Wash the hearts in cold water as soon as trimming is completed. Drain. Scald 7 minutes. Cool, drain and package in plastic freezer bags or can or freeze jars or plastic freezer boxes. Seal, label and freeze.

ARTICHOKE, JERUSALEM
Handle like Irish potatoes.

ASPARAGUS
Select young tender tips. Wash thoroughly and sort into sizes. Trim stalks by removing scales with a sharp knife. Cut into even lengths to fit freezer containers. Scald small spears 1 ½ minutes, medium spears 2 minutes and large spears 3 minutes. Cool, drain and package in plastic freezer bags, can or freeze jars or plastic freezer boxes. Seal, label and freeze.
CABBAGE
Select solid, green heads with crisp outer leaves. Wash, discard the coarse outer leaves and cut the head into wedges or shred rather coarsely. Scald wedges 3 minutes; shredded cabbage 1½ minutes. Cool, drain and package the same as lima beans. Frozen cabbage is not suitable for use in coleslaw or salad.

CARROTS
Select young, tender, coreless, medium length carrots. Wash, scrape, wash and dice or section lengthwise. Small carrots may be frozen whole. Scald carrot sections 3 minutes and whole carrots 5 minutes. Cool, drain and package same as lima beans.

CAULIFLOWER
Choose compact heads. Trim, break into flowerets of uniform size, about 1-inch [25 mm] across; wash carefully and drain. Prepare and package same as broccoli.

CORN
Select only tender, freshly gathered corn in the milk stage. Husk and trim the ears, remove silks and wash. Corn-On-The-Cob: Scald ears 1½ inches [38 mm] in diameter 6 minutes; 2 inches [51 mm] in diameter 8 minutes, and larger ears 10 minutes. Cool, drain and wrap individually, tightly in moisture/vapor-proof film and place in plastic freezer bags. Seal, label and freeze.
Whole Kernel: Scald 5 or 6 minutes, depending on size of ears. Cool, drain and cut from cob. Package same as lima beans.
Cream Style Corn: Scald ears the same as for whole grain. Cool and drain. Cut kernel tips, crosswise ½-inch [6 mm] thick. The small roots may be left whole. Scald slices 2 minutes; whole ones 3 minutes. Cool, drain and package same as lima beans.

GREENS
Pick young, tender, green leaves. Wash thoroughly and cut off woody stems. Scald 2 minutes and avoid matting of leaves. Cool, drain and package same as cream style corn.

HERBS, GARDEN
Many garden herbs may be frozen. Wash, drain, but do not scald. Wrap a few sprigs or leaves in freezer film and place in plastic freezer bags. Seal, label and freeze. These usually are not suitable for garnish, as the frozen product becomes limp when it thaws. It can be chopped and used in cooked dishes.

KOHLRABI
Select stems when fully grown but tender. Trim top and bottom, wash, peel off the tough bark and wash. Slice the tender centers, crosswise ¼-inch [6 mm] thick. The small roots may be left whole. Scald slices 2 minutes; whole ones 3 minutes. Cool, drain and package same as lima beans.

MUSHROOMS
Select young, firm mushrooms and process quickly. Mushrooms deteriorate rapidly. Wash and remove the base of the stem. Sort the mushrooms into sizes. Smaller mushrooms may be frozen whole; larger mushrooms should be cut into smaller pieces.
Mushrooms tend to darken. To prevent discoloration, use 3 teaspoons [15 mL] lemon juice OR ½ teaspoon [2.5 mL] ascorbic acid to each quart [950 mL] of water when scalding the mushrooms. Scald small whole mushrooms 4 minutes, and larger mushrooms 3 minutes. Chill at once in cold water, drain, package and freeze. Mushrooms can be cut into slices and sautéed in butter for about 3 minutes. Cool quickly, pack and freeze. If mushrooms are sautéed, no scalding is required.

OKRA
Select young tender pods. Wash and separate into two sizes: 4 inches [102 mm] or under, and larger. Remove stems at the end of the seed cells. Scald the small pods 3 minutes, cool, drain and package same as lima beans. Scald the larger pods 5 minutes. Cool, cut into 1-inch [25 mm] lengths and package same as lima beans.

ONIONS
Choose mature bulbs and clean as for eating. Scald for 3 to 7 minutes, or until the center is heated. Cool, drain and package same as lima beans. These are suitable for cooking only. Young green onions may be washed and chopped for salads and sandwiches and frozen without scalding. They will not be crisp. These will be highly flavored but may be slightly tough.

PARSNIPS
Choose smooth, firm roots free from woodiness. Remove tops, wash thoroughly and peel. Slice, dice or cut lengthwise. Scald 3 minutes, cool, drain and package same as lima beans.

PEANUTS, SHELLED
Select fully mature peanuts, shell and package same as lima beans. These peanuts may be removed from the freezer, thawed, then used as fresh shelled peanuts in any recipe.

PEAS, FIELD (BLACKEYED)
Select pods when seeds are tender and barely grown. Wash, shell and discard over-mature and immature seeds and those injured by insects. Wash and scald smaller sizes 1 minute and larger sizes 2 minutes. Cool, drain and package same as lima beans.

PEAS, GREEN or GARDEN
Harvest when pods are filled with young tender peas that have not become starchy. Wash, shell, wash, scald 2 minutes. Cool, drain and package same as lima beans.

PEPPERS, SWEET
Select crisp, tender, green or bright red pods. Wash, cut out stems and remove seeds. Freeze whole, as halves, strips or diced. Do not scald. Package same as lima beans.
PEPPERS, PIMIENTOS
Select well-ripened pods of deep red color. Wash, cut out stems and remove seeds. Peel by roasting in oven 400°F [204°C] or cover with water and boil until peppers are tender. Cool and package same as cream style corn.

PEPPERS, HOT
Select crisp, tender, green or bright red pods. Wash and drain. Package same as lima beans.

POTATOES, IRISH
Select smooth new potatoes directly from the garden. Wash thoroughly, drain, and sort for sizes. Allow potatoes to cure for at least one week. Wash thoroughly, drain and sort for sizes.

Baked: Grease surface with fresh cooking oil, bake in a preheated oven (350°F) [177°C] until slightly soft. Cool. Wrap potatoes individually in freezer film or foil and place in plastic freezer bags. Seal, label and freeze.

Sliced: Preheat the unpeeled potatoes in water at 130°F [54°C] for 30 minutes. Peel and cut lengthwise into ¼-inch [13 mm] slices. Scald 3 minutes in boiling syrup (made with 1 ½ cups [360 mL] water to 1 cup [240 mL] sugar and 1 tablespoon [15 mL] lemon juice — prepare enough syrup to cover the slices). Cool quickly (slices and syrup). Pack closely in can or freeze jars or plastic freezer boxes. Cover with syrup, leaving ¼-inch [6 mm] head space for pint [480 mL] can or freeze jars or boxes, or ½-inch [13 mm] head space for quart [950 mL] can or freeze jars or plastic freezer boxes. Seal, label and freeze.

Pepper: Bake the potatoes in a preheated oven (350°F) [177°C] until soft. Remove peel and put potatoes through a food mill. For each 5 pounds [2.3 kg] of pureed potatoes, add ½ cup [120 mL] sugar, ¼ cup [120 mL] cold water and 1 tablespoon [15 mL] lemon juice. Cool and pack closely in can or freeze jars or plastic freezer boxes, leaving ¼-inch [6 mm] head space for pint [480 mL] can or freeze jars or boxes, or ½-inch [13 mm] head space for quart [950 mL] can or freeze jars or plastic freezer boxes. Seal, label and freeze.

PUMPKINS
Pick at optimum maturity, indicated by good color and stem that breaks loose easily. Wash thoroughly, peel, remove seeds, cut into sections, steam until soft, put through a food mill and add one part sugar to six parts puree. Cool and package same as pureed sweet potatoes (sugar may be omitted).

SQUASH, SUMMER
Choose young squash with tender skin. Wash, slice, scald 3 minutes. Cool, drain, and package same as lima beans.

SQUASH, WINTER
Harvest fully mature squash with a hard rind. Wash, cut in halves and scoop out seeds and membrane. Place cut side down on baking sheet and bake at 375°F [191°C] until tender. Scoop out pulp, put through a food mill, cool and package same as pureed sweet potatoes.

TOMATOES, COOKED
Select firm, sound, ripe tomatoes. Wash, core, cut and cook until soft. Put through a food mill, cool and package same as pureed sweet potatoes. Puree may be concentrated by boiling to one-half volume; cool and package.

TOMATO JUICE
Select firm, sound, red ripe tomatoes. Wash, core and cut into pieces. Simmer about 5 minutes, put through a food mill. Cool and package same as pureed sweet potatoes.

TOMATOES, GREEN SLICED
Select firm, sound green tomatoes. Wash, core and slice ¼-inch [6 mm] thick. Pack the slices with freezer wrap between slices. Seal, label and freeze.

TURNIPS
Select young, tender turnips. Remove tops, wash, peel, slice or dice. Scald 3 minutes. Cool and package same as lima beans.

GLOSSARY OF CANNING AND FREEZING TERMS

acid Food which normally contains from 0.36 to 2.35 percent or more natural acid. Foods which may contain very little natural acid, but which are preserved in vinegar, are treated as acids in canning. Acid foods may safely be processed in a boiling water bath canner at 212°F [100°C]. Included are fruits, rhubarb, tomatoes, sauerkraut, pickles and relishes.

antioxidant A chemical agent that inhibits oxidation, such as ascorbic acid (Vitamin C), and which controls discoloration of fruits.

ascorbic acid White, crystalline Vitamin C found in some fruits and vegetables. A commercially available brand is used to control discoloration of fruits.

bacteria Microorganisms, some of which are harmful, found in the soil, water and air around us. Certain bacteria produce harmful toxins and must be destroyed in food that is to be preserved. Some bacteria thrive in conditions common in low acid canned food, and can be conveniently neutralized only by superheating to 240°F [116°C]. For this reason, low acids must be processed in a steam pressure canner.

band (See metal band.)

blanch To loosen the skin of fruits and vegetables by scalding. Also, to scald vegetables in boiling water or steam to slow the actions of enzymes.

boil Water or food heated to 212°F, [100°C]. Boiling water, when referring to the boiling water bath canner, means a full rolling boil for the entire processing time. Water which is simmering reaches only about 180°-185°F [82°-85°C] and is not hot enough to sterilize the food and jars.

boiling water bath canner A kettle large enough to immerse completely and fully surround canning jars for processing of food. The boiling water bath canner is used for sterilizing acid foods and their containers.

botulism A poisoning caused by a toxin produced by the growth of spores of Clostridium botulinum. The spores are usually present in dust, wind and soil clinging to raw foods. The spores can grow in a tightly sealed jar of any low acid food because they belong to a species of bacteria which cannot grow in the presence of air and which do not normally thrive in acid foods. The spores are destroyed when low acid foods are correctly processed in a pressure canner. Home canners who use the correct methods of selecting, preparing, packing and processing foods have no reason to worry about botulism. As an extra precaution, all low acid foods should be boiled for 15
Glossary (continued)

minutes before tasting to destroy any toxin which could be present if some error were made in processing. Thick masses, such as greens, should be stirred while boiling.
can n. A tin-coated steel container in which food is preserved. tr. v. canned, canning, cans. To seal foods in a can or jar to preserve for future use.
cap Any of various closure devices for sealing mason canning jars. Of the most popular today are the metal screw bands which are used to hold vacuum lids in place during processing, and the zinc caps with porcelain liners used with rubber rings to seal mason jars.
citric acid An acid derived from citrus fruits, such as lemons and limes, and used as an antioxidant to control discoloration of fruits.
cold pack Filling jars with raw, rather than hot, food prior to processing. Sometimes called raw pack. Preferred where foods are delicate to handle after cooking.
cool place Used when referring to storage of canned jars of food. Ideally, a cool place should be around 50°F [10°C].
dry pack When freezing food, to pack without added liquid sugar.
enzyme A protein that functions as a catalyst in organisms. In food, enzymes start the process of decomposition, changing the flavor, texture and color. Enzyme action slows down in frozen food, increases quickly at temperatures between 85° and 120°F [29° and 49°C], and stops at temperatures above 140°F [60°C]. Thus, both freezing and processing during canning neutralize the action of enzymes.
exhausting See venting.
fermentation Caused by yeasts which have not been destroyed during processing of canned food, or yeasts which enter the food before it is sealed. With the exception of some pickles, fermented canned food should not be used. If pickles begin to ferment in the jar and some of the liquid runs out, the pickles should be rinsed and packed in clean hot jars, fresh pickling solution should be made and poured boiling hot over the pickles. The jars of pickles should then be processed in a boiling water bath canner to prevent further fermentation.
flat-sour A heat-resistant organism common in canned vegetables, caused by bacteria, which gives food an unpleasant, sourish flavor. Flat-sour is easily avoided by the use of correct and sanitary methods of selecting, handling, preparing, packing, processing and cooling foods.
freezer burn Dehydration of improperly packed food for freezing, leading to loss of flavor, texture and color.
head space An area left unfilled between the top of the food in a jar and the inside bottom of the lid. In canning, too little space can cause food to boil out of the top of the jar, possibly ruining the seal; too much head space can cause exposed food at the top of the jar to discolor and can prevent a proper seal, since all of the air may not be vented, preventing the formation of a vacuum. In freezing, inadequate head space may cause the jar to break when the food expands from the cold.
hot pack Filling jars with precooked hot food prior to processing during canning. Preferred method where food is firm; permits tighter pack and requires fewer jars.
jar A glass container, sometimes called a mason jar, which is specially designed and heat-treated for use in home canning.
lid Usually refers to the flat metal disc with a flanged edge and a sealing compound on its underside, used in combination with metal screw bands for sealing jars. Also, the notched glass top used with old style wire bale jars.
low acid Food which contains less than 0.36 percent natural acid. All vegetables, except tomatoes, and all meats, poultry, seafood, mushrooms and soups are in the low acid group. Bacteria thrive in low acid foods and can be conveniently neutralized only by superheating to 240°F [116°C] for the prescribed time in a pressure canner.
metal band A threaded screw band that is used with a metal vacuum lid to form a two-piece metal cap.
mold Microscopic fungi that grow as silken threads and appear as fuzz on food. Molds thrive on acids and produce toxins, but are easily destroyed at processing temperatures between 140° and 190°F [60° and 88°C].
open kettle An old style method of canning, no longer considered safe, in which food is cooked in an open pan and then quickly put into jars and sealed without further processing. The open kettle method can be safely used only when canning jellies.
overnight About 12 hours.
pectin A complex colloidal substance found in ripe fruits, such as apples. Pectin is available commercially in powdered, liquid form and is used to make jellies and soft spreads gel.
ph Potential of hydrogen. A measuring system in chemistry for determining the acidity or alkalinity of a solution. In canning, foods are separated into acids and low acids, and different processing techniques must be used for each.
pickling Preserving food, especially cucumbers, in a solution of brine or vinegar, often with spices added.
processing Sterilizing jars and the food they contain in a pressure or boiling water bath canner to destroy harmful molds, yeasts, bacteria and enzymes.
raw pack See cold pack.
rubber A flat rubber ring used as a gasket between a zinc cap or glass lid and a canning jar. Rubber rings should not be unduly stretched and should be placed on the jar while wet. They should not be reused. Deteriorated rubber rings should be discarded.
scaid See blanch.
simmer To cook gently just below the boiling point in the range between 180° and 200°F [82° and 93°C]. At these temperatures, bubbles rise gently from the bottom of the pot and the surface is slightly disturbed.
superheating Heating above the boiling point under pressure without causing vaporization. The pressure canner superheats water to 240°F [116°C] to kill harmful bacteria in low acid foods.
syrup A mixture of water or juice and sugar used to add liquid to canned or frozen products.
vacuum seal The absence of normal atmospheric (air) pressure in jars which are airtight. When a jar is closed at room temperature, the atmospheric pressure is the same inside and outside the jar. When the jar is heated, the air and food inside expand, forcing air out and decreasing the inside pressure. As the jar cools and the contents shrink, a partial vacuum forms, and atmospheric pressure of almost 15 pounds per square inch [105 kPa] holds the lid down to keep the jar sealed. The sealing compound on lids and the rubber rings used as gaskets with zinc and glass caps prevent the air from reentering.
venting Forcing air to escape from a jar by applying heat, or permitting air to escape from a pressure canner. Also called exhausting.
wet pack To pack fruits in sugar syrup or plain sugar for freezing.
yeast Microscopic fungi grown from spores that cause fermentation in food. Yeasts are inactive in food that is frozen and are easily destroyed by processing at temperatures from 140° to 190°F [60° to 88°C].

Processing of pickled products is recommended, since harmful microorganisms may enter the food when transferring from pickling container to jars.

pressur canner A heavy kettle with a lid which can be clamped on to make a steam tight fit. The lid is fitted with a safety valve, a petcock (vent) and a pressure gauge. The steam pressure canner is used for processing low acid foods, since the steam under pressure reaches 240°F [116°C], adequate for destroying harmful bacteria which thrive in these foods.
Dear Consumer:

Down through the near-century of Ball Corporation's existence, our affection has been with those who preserve food in their own homes. You have made us the world's largest and best known manufacturer of home preserving jars and closures. You've also helped us become a widely diversified, multi-industry company with worldwide operations. We will never forget, however, that it was you who gave us our first substantial recognition and who sustained us through good years and bad.

With this 30th Edition of the Ball Blue Book, we re-dedicate ourselves to you, the home canner. This edition has been completely redesigned and thoroughly revised. The results of much recent scientific study have been included. Our goal was to give the Ball Blue Book a fresh contemporary look, with bright color photography and artwork. But most of all, we wanted to make it easier for you to read, to follow and to use successfully.

Some day there likely will be a 31st Edition of the Blue Book, and we'd like it to be even better than this one. In the meantime, Ball Corporation, no doubt, will develop many new food preservation products. With your help we can make them better, too.

How? By listening carefully to what you have to say. We invite you to write us with any comments you have about the Blue Book, any questions you have about home canning or any thoughts you have about products made by Ball. Your comments will receive very careful attention. We regard them as the starting point for making improvements.

Sincerely,

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