Contents

Packaging and Storing Dried Foods

Dried foods are susceptible to insect contamination and moisture reabsorption and must be properly packaged and stored immediately. First, cool completely. Warm food causes sweating which could provide enough moisture for mold to grow. Pack foods into clean, dry insect-proof containers as tightly as possible without crushing.

Store dried foods in clean, dry home canning jars, plastic freezer containers with tight-fitting lids or in plastic freezer bags. Vacuum packaging is also a good option. Pack foods in amounts that can be used all at once. Each time a package is re-opened, the food is exposed to air and moisture that can lower the quality of the food and result in spoilage.
Pack food in amounts that will be used in a recipe. Every time a package is re-opened, the food is exposed to air and moisture that lower the quality of the food.

Fruit that has been sulfured should not touch metal. Place the fruit in a plastic bag before storing it in a metal can. Sulfur fumes will react with the metal and cause color changes in the fruit.

Dried foods should be stored in cool, dry, dark areas. Recommended storage times for dried foods range from 4 months to 1 year. Because food quality is affected by heat, the storage temperature helps determine the length of storage; the higher the temperature, the shorter the storage time. Most dried fruits can be stored for 1 year at 60ºF, 6 months at 80ºF. Vegetables have about half the shelf-life of fruits.

Foods that are packaged seemingly "bone dry" can spoil if moisture is reabsorbed during storage. Check dried foods frequently during storage to see if they are still dry. Glass containers are excellent for storage because any moisture that collects on the inside can be seen easily. Foods affected by moisture, but not spoiled, should be used immediately or redried and repackaged. Moldy foods should be discarded.

Conditioning Fruits
The moisture content of home dried fruit should be about 20 percent. When the fruit is taken from the dehydrator, the remaining moisture may not be distributed equally among the pieces because of their size or their location in the dehydrator. Conditioning is the process used to equalize the moisture. It reduces the risk of mold growth.

To condition the fruit, take the dried fruit that has cooled and pack it loosely in plastic or glass jars. Seal the containers and let them stand for 7 to 10 days. The excess moisture in some pieces will be absorbed by the drier pieces. Shake the jars daily to separate the pieces and check the moisture condensation. If condensation develops in the jar, return the fruit to the dehydrator for more drying. After conditioning, package and store the fruit as described above.

Determining Dryness of Vegetables
Vegetables should be dried until they are brittle or "crisp." Some vegetables actually shatter if hit with a hammer. At this stage, they should contain about 10 percent moisture. Because they are so dry, they do not need conditioning like fruits.

Freezing Onions

Bulb onions store well in a cool, dry place. Freezing is usually not recommended for preserving whole onions, but see below if desired.

Diced Onions – Peel, trim and clean thoroughly. Dice (about 1/4-inch pieces). No blanching is required. Either pack dry into recommended freezer bags or containers, leaving1/2-inch headspace. Or, freeze separated pieces on a clean tray prior to packaging. Eliminate as much air as possible from the package for this method. Onions frozen this way are best used within a few months.

Green Onions – Young green onions may be chopped for salads and cooking and frozen without blanching, but they will not be crisp. They will be highly flavored but may be slightly tough. They can be packaged by either of the methods above for diced onions.

Whole Bulb Onions - Choose mature bulbs; peel, trim and clean thoroughly as for eating. Water blanch for 3 minutes (smaller onions) to 7 minutes (larger onions) or until center is completely heated. Cool promptly, drain well, and package, leaving 1/2-inch headspace. Seal and freeze. These would be considered suitable for cooking only.

Onion Rings – Wash, peel and slice onions. Separate slices into rings. Water blanch for 10 to 15 seconds. Cool promptly, drain and coat with flour. Dip in milk. Coat with a mixture of equal parts cornmeal and pancake mix. Arrange in a single layer on a tray. Freeze. Pack into containers using plastic wrap to separate the layers. No headspace is necessary. Seal and freeze. To prepare, fry frozen rings in 375ºF oil until golden brown.

Using Boiling Water Canners

1. Before you start preparing your food, place canner rack in the bottom of a boiling water canner. Fill the canner half full with clean warm water for a canner load of pint jars. For other sizes and numbers of jars, you will need to adjust the amount of water so it will be 1 to 2 inches over the top of the filled jars.
2. Center the canner over the burner and preheat the water to 140 degrees F. for raw-packed foods and to 180 degrees F. for hot-packed foods. You can begin preparing food for your jars while this water is preheating.
3. Load filled jars, fitted with lids and ring bands, into the canner one at a time, using a jar lifter. When moving jars with a jar lifter, make sure the jar lifter is securely positioned below the neck of the jar (below the ring band of the lid). Keep the jar upright at all times. Tilting the jar could cause food to spill into the sealing area of the lid. If you have a shaped wire rack that has handles to hold it on the canner sides, above the water in the canner, you can load jars onto the rack in the raised position and then use the handles to lower the rack with jars into the water.
4. Add more boiling water, if needed, so the water level is at least one inch above the jar tops. Pour the water around the jars and not directly onto them. For process times over 30 minutes, the water level should be 2 inches above the jars.
5. Turn the heat setting to its highest position, cover the canner with its lid and heat until the water boils vigorously.
6. Set a timer (after the water is boiling) for the total minutes required for processing the food.
7. Keep the canner covered for the process time. The heat setting may be lowered as long as a gentle but complete boil is maintained for the entire process time.
8. Add more *boiling* water during the process, if needed, to keep the water level above the jar tops. Pour the water around the jars and not directly onto them.
9. If the water stops boiling at any time during the process, turn the heat on its highest setting, bring the water back to a vigorous boil, and begin the timing of the process over, from the beginning (using the total original process time).
10. When the jars have been processed in boiling water for the recommended time, turn off the heat and remove the canner lid. Wait 5 minutes before removing jars to allow the canner contents to settle. This waiting period is not required for safety of the food when using USDA or University of Georgia processing times, however.
11. Using a jar lifter, remove the jars one at a time, being careful not to tilt the jars. Carefully place them directly onto a towel or cake cooling rack, leaving at least one inch of space between the jars during cooling. Avoid placing the jars on a cold surface or in a cold draft.
12. Let the jars sit undisturbed while they cool, from 12 to 24 hours. Do *not* tighten ring bands on the lids or push down on the center of the flat metal lid until the jar is completely cooled.

13. Remove ring bands from sealed jars. Put any unsealed jars in the refrigerator and use first.
14. Wash jars and lids to remove all residues.
15. Label jars and store in a cool, dry place out of direct light.

Criteria for Safe Use of a Steam Canner (*ANR Publication 8573*)

Most foods that are high in acid can be safely canned in a steam canner, including naturally acidic foods (such as apples, cherries, and peaches) and foods that have been acidified (such as pickles and salsas made from research-tested recipes). However, there are some instances when a steam canner should not be used. See table 1 for a list of foods that can and cannot be safely processed in a steam canner.

Follow these guidelines for home use of steam canners:

1. Always **follow a research-tested recipe**. Specifically, use research-tested recipes developed for boiling water canners. Recipes must include the quantity of ingredients, the preparation instructions, and processing times for half-pint, pint, or quart jars. For research-tested recipes, visit the National Center of Home Food Preservation website or use the USDA Complete Guide to Home Canning. At this time, recipes in the product manual from the manufacturer of the steam canner are not considered research-tested.
2. Be sure the recipes you use are for foods that are **high in acid**, with a pH of 4.6 or below. If you are following a research-tested recipe for a boiling water canner, then the recipe will be for a high-acid food product.
3. **Modify processing times for elevations**, or altitude, above 1,000 feet, as instructed in research tested recipes. Elevation for any address can be determined with Google Maps at the DaftLogic website, http://www.daftlogic.com/sandbox-google-maps-find-altitude.htm.
4. Use only recipes that require **45 minutes or less of processing time**, including any additional time for altitude adjustments. Steam canners can run dry if food products are processed longer than 45 minutes, which can damage the canner, food product, and range surface. For recipes that call for processing times greater than 45 minutes (e.g. raw-packed tomatoes), use a boiling water canner. If your steam canner runs dry, your food products must be processed again for the full time indicated in the recipe.
5. **Heat jars before filling** with food product. Keep the food product as hot as possible by minimizing the time between heating jars and placing them into the steam canner. Also, you can reduce the potential for product cooling by ensuring that water in the canner has reached a boil before preheating and filling jars.
6. **Add water to the steam canner** as indicated by the manufacturer. The amount of water to add will vary with the manufacturer. Approximately 2 to 3 quarts (approximately 2 to 3 L) of water is typically added to ensure that the water does not run out during the process. The racks allow the jars to stay at or just above the water level and about 1¼ to 1¾ inches (3 to 4.5 cm) above the base of the pan.
7. **Process jars in pure steam (212°F (100°C) at sea level).** The processing time should begin only after a full column of steam (approximately 6 to 8 in, or 15 to 20 cm) appears through the canner vent holes at the bottom of the cover. Some canners come with built-in temperature sensors, which can be used to monitor the temperature. A full column of steam should be present throughout the process time. If there is an interruption in the steam, the product should be reprocessed for the full process time.
8. After processing is finished, turn off the heat source and wait 2 to 3 minutes. Cautiously open the lid away from you and remove the jars.
9. Proper cooling is important for food safety. The research-tested processes include important killing of microorganisms that occurs as the product in the jars cools down. **Jars MUST be cooled in still air at room temperature.** Jars should be cooled on a rack or towel away from drafts. Do not rush cooling by placing jars in the refrigerator. Do not use a fan or place jars in a drafty area.

Source: Adapted from Ingham 2015.

Using Pressure Canners

Make sure the pressure canner is working properly before preparing food. Clean lid gaskets and other parts according to the manufacturer's directions; make sure all vent pipes are clear and contain no trapped material or mineral deposits. Center the canner over the burner. The burner and range must be level. Your pressure canner can be damaged if the burner puts out too much heat. In general, do not use on an outdoor LP gas burner or gas range burner over 12,000 BTU's. Check your manufacturer's directions for more information about appropriate burners.

1. Put the rack and hot water into the canner. If the amount of water is not specified with a given food, use enough water so it is 2 to 3 inches high in the canner. Longer processes required more water. Some specific products (for example, smoked fish) require that you start with even more water in the canner. Always follow the directions with USDA processes for specific foods if they require more water be added to the canner.
2. For hot packed foods, you can bring the water to 180 degrees F. ahead of time, but be careful not to boil the water or heat it long enough for the depth to decrease. For raw packed foods, the water should only be brought to 140 degrees F. Place filled jars, fitted with lids and ring bands, on the jar rack in the canner, using a jar lifter. When moving jars with a jar lifter, make sure the jar lifter is securely positioned below the neck of the jar (below the ring band of the lid). Keep the jar upright at all times. Tilting the jar could cause food to spill into the sealing area of the lid.
3. Fasten the canner lid securely. Leave the weight off the vent pipe or open the petcock.
4. Turn the heat setting to its highest position. Heat until the water boils and steam flows freely in a funnel-shape from the open vent pipe or petcock. While maintaining the high heat setting, let the steam flow (exhaust) continuously for 10 minutes.
5. After this venting, or exhausting, of the canner, place the counterweight or weighted gauge on the vent pipe, or close the petcock. The canner will pressurize during the next 3 to 10 minutes.
6. Start timing the process when the pressure reading on the dial gauge indicates that the recommended pressure has been reached, or, for canners without dial gauges, when the weighted gauge begins to jiggle or rock as the manufacturer describes.
7. Regulate the heat under the canner to maintain a steady pressure at, or slightly above, the correct gauge pressure. One type of weighted gauge should jiggle a certain number of times per minute, while another type should rock slowly throughout the process – check the manufacturer's directions.
    - Loss of pressure at any time can result in underprocessing, or unsafe food.
    - Quick and large pressure variations during processing may cause unnecessary liquid losses from jars.
8. **IMPORTANT:** If at any time pressure goes below the recommended amount, bring the canner back to pressure and begin the timing of the process over, from the beginning (using the total original process time). This is important for the safety of the food.
9. When the timed process is completed, turn off the heat, remove the canner from the heat (electric burner) if possible, and let the canner cool down naturally. (Lift the canner to move it; do not slide the canner. It is also okay to leave the canner in place after you have turned off the burner. It is better to do so than to let jars inside the canner tilt or tip over if the canner is too heavy to move easily.)
10. While the canner is cooling, it is also de-pressurizing. <u>Do not force cool the canner. Forced cooling may result in food spoilage.</u> Cooling the canner with cold running water or opening the vent pipe before the canner is fully depressurized are types of forced cooling. They will also cause loss of liquid from jars and seal failures. Forced cooling may also warp the canner lid.
11. Even after a dial gauge canner has cooled until the dial reads zero pounds pressure, be cautious in removing the weight from the vent pipe. Tilt the weight slightly to make sure no steam escapes before pulling it all the way off. Newer canners will also have a cover lock in the lid or handle that must release after cooling before the lids are twisted off. Do not force the lid open if the cover locks are not released. Manufacturers will provide more detailed instructions for particular models.
12. Depressurization of older canner models without dial gauges should be timed. Standard size heavy-walled canners require about 30 minutes when loaded with pints and 45 minutes when loaded with quarts. Newer thin-walled canners cool more rapidly and are equipped with vent locks that are designed to open when the pressure is gone. These canners are depressurized when the piston in the vent lock drops to a normal position. Some of these locks are hidden in handles and cannot be seen; however, the lid will not turn open until the lock is released.

13. After the canner is completely depressurized, remove the weight from the vent pipe or open the petcock. Wait 10 minutes; then unfasten the lid and remove it carefully. Lift the lid with the underside away from you so that the steam coming out of the canner does not burn your face.
14. Using a jar lifter, remove the jars one at a time, being careful not to tilt the jars. Carefully place them directly onto a towel or cake cooling rack, leaving at least one inch of space between the jars during cooling. Avoid placing the jars on a cold surface or in a cold draft.
15. Let the jars sit undisturbed while they cool, from 12 to 24 hours. Do *not* tighten ring bands on the lids or push down on the center of the flat metal lid until the jar is completely cooled.
16. Remove ring bands from sealed jars. Ring bands can be washed and dried and put away for using another time. Put any unsealed jars in the refrigerator and use first.
17. Wash jars and lids to remove all residues. Label jars and store in a cool, dry place out of direct light.
18. Dry the canner, lid and gasket. Take off removable petcocks and safety valves; wash and dry thoroughly. Follow maintenance and storage instructions that come from your canner manufacturer.

Burning Issue: Canning in Electric Multi-Cookers

Should I can in my electric multi-cooker appliance?
Even if there are instructions for pressure canning in the manufacturer's directions, we do not support the use of the USDA canning processes in the electric, multi-cooker appliances now containing "canning" or "steam canning" buttons on their front panels. Our pressure process directions have not been developed for that type of appliance, and the canner being used does matter. Our recommendations were determined for stovetop pressure canners which hold four or more quart-size jars standing upright.

We do not know if proper thermal process development work has been done in order to justify the canning advice that is distributed with these pressure multi-cooker appliances. What we do know is that our canning processes are not recommended for use in electric pressure multi-cookers at this time.

Some of the major reasons we cannot recommend using electric multi-cookers for pressure canning:

1. Thermal process canning work relates the temperatures in the jars to the temperature inside the canner throughout the processing. No USDA thermal process work has been done with jars inside an electric pressure cooker, tracking the actual temperatures inside the jars throughout the process. It is ultimately the temperature and heat distribution inside the jars that matters for the destruction of microorganism in the food product. The position of jars in the canner and flow of steam around them also impacts the temperature in the jars. For example, there would be expected differences in jars piled together on their sides from those standing upright on the canner base.
2. What matters is temperature, not pressure. One manufacturer says its cooker reaches the pressure required for canning, that alone does not prove the food in the jars is heated throughout at the same rate as in the canner used for process development. A manufacturer should do process development work to document temperatures throughout the unit at a given pressure and throughout the whole process time. Just producing an interior pressure is not sufficient data for canning recommendations. For example, if air is mixed in the steam, the temperature is lower than the same pressure of pure steam. That's why a proper venting process is so important in pressure canning – to obtain a pure steam environment inside the canner. Also, one has to know how to make adjustments in pressure readings at higher altitudes. The same pressure and process time combination cannot be used at all altitudes.
3. In order to ensure the safety of the final product, the temperature in the canner must stay at minimum throughout the process time. Do power surges or drops with an electric canner cause the temperature to drop too low? How will you the user know if that happens with your cooker?
4. One of the big concerns is that the USDA low-acid pressure process times rely on a combination of heat from the time the canner is coming to pressure, during the actual process time, and then during the early stages of cooling the canner and jars. Even after the heat is turned off under the canner, at the end of the recommended process time, the food remains at high enough temperatures for another period of time that can still contribute to killing of bacteria. This retained heat while the canner has to cool naturally to 0 pounds pressure before opening is used to advantage in calculating the total sterilizing value of the process to preserve some food quality. If anything is done to shorten the cooling period, including using a very small cooker, then the food could cool down more quickly, and be under-

processed. (That is why we recommend using only pressure cookers that hold four or more quart-size jars.) Bacteria are not killed in the food only during the process time; the time it takes the canner to come up to pressure, the process time, and the cool-down time all matter. There is no way at this point in time to know exactly the percentage of contribution from cooling for each of the canning recommendations.

Please note: This statement about electric cookers does NOT include the Ball Automatic Home Canner for acid foods only, which is electric, but (1) is not a "multi-cooker", but a dedicated canner, (2) comes with its own instructions and pre-set canning options for specific food preparations, and (3) has had proper thermal process development done to support the recommendations with it. Jarden Home Brands also sells an electric boiling water canner, but it is not a pressurized appliance and for canning purposes operates similar to a traditional boiling water canner. Directions from the manufacturer for this Ball canner, as well as for the Weck non-pressurized electric boiling water canners, should be followed to get them assembled and for managing temperature settings to achieve a boiling process.

For more information about canning in pressure cookers, please read Burning Issue: Canning in Pressure Cookers.

General Information on Jams, Jellies, and Marmalades

Sweet spreads are a class of foods with many textures, flavors, and colors. They all consist of fruits preserved mostly by means of sugar and they are thickened or jellied to some extent. Fruit jelly is a semi-solid mixture of fruit juice and sugar that is clear and firm enough to hold its shape. Other spreads are made from crushed or ground fruit.

Jam also will hold its shape, but it is less firm than jelly. Jam is made from crushed or chopped fruits and sugar. Jams made from a mixture of fruits are usually called conserves, especially when they include citrus fruits, nuts, raisins, or coconut. Preserves are made of small, whole fruits or uniform-size pieces of fruits in a clear, thick, slightly jellied syrup. Marmalades are soft fruit jellies with small pieces of fruit or citrus peel evenly suspended in a transparent jelly. Fruit butters are made from fruit pulp cooked with sugar until thickened to a spreadable consistency.

Ingredients

For proper texture, jellied fruit products require the correct combination of fruit, pectin, acid, and sugar. The fruit gives each spread its unique flavor and color. It also supplies the water to dissolve the rest of the necessary ingredients and furnishes some or all of the pectin and acid. Good-quality, flavorful fruits make the best jellied products.

Pectins are substances in fruits that form a gel if they are in the right combination with acid and sugar. All fruits contain some pectin. Apples, crab apples, gooseberries, and some plums and grapes usually contain enough natural pectin to form a gel. Other fruits, such as strawberries, cherries, and blueberries, contain little pectin and must be combined with other fruits high in pectin or with commercial pectin products to obtain gels. Because fully ripened fruit has less pectin, one-fourth of the fruit used in making jellies without added pectin should be underripe.

Caution: Commercially frozen and canned juices may be low in natural pectins and make soft textured spreads.

The proper level of acidity is critical to gel formation. If there is too little acid, the gel will never set; if there is too much acid, the gel will lose liquid (weep). For fruits low in acid, add lemon juice or other acid ingredients as directed. Commercial pectin products contain acids which help to ensure gelling.

Sugar serves as a preserving agent, contributes flavor, and aids in gelling. Cane and beet sugar are the usual sources of sugar for jelly or jam. Corn syrup and honey may be used to replace part of the sugar in recipes, but too much will mask the fruit flavor and alter the gel structure. Use tested recipes for replacing sugar with honey and corn syrup. Do not try to reduce the amount of sugar in traditional recipes. Too little sugar prevents gelling and may allow yeasts and molds to grow.

Jams and jellies with reduced sugar
Jellies and jams that contain modified pectin, gelatin, or gums may be made with noncaloric sweeteners. Jams with less sugar than usual also may be made with concentrated fruit pulp, which contains less liquid and less sugar. See Guide 7 of the USDA Complete Guide to Home Canning for recipes.

Two types of modified pectin are available for home use. One gels with one-third less sugar. The other is a low-methoxyl pectin which requires a source of calcium for gelling. To prevent spoilage, jars of these products must be processed longer in a boiling-water canner. Recipes and processing times provided with each modified pectin product must be followed carefully. The proportions of acids and fruits should not be altered, as spoilage may result.

Acceptably gelled refrigerator fruit spreads also may be made with gelatin and sugar substitutes. Such products spoil at room temperature, must be refrigerated, and should be eaten within 1 month.

Preventing spoilage
Even though sugar helps preserve jellies and jams, molds can grow on the surface of these products. Research now indicates that the mold which people usually scrape off the surface of jellies may not be as harmless as it seems. Mycotoxins have been found in some jars of jelly having surface mold growth. Mycotoxins are known to cause cancer in animals; their effects on humans are still being researched.
Because of possible mold contamination, paraffin or wax seals are no longer recommended for any sweet spread, including jellies. To prevent growth of molds and loss of good flavor or color, fill products hot into sterile Mason jars, leaving 1/4-inch headspace, seal with self-sealing lids, and process 5 minutes in a boiling-water canner. Correct process time at higher elevations by adding 1 additional minute per 1,000 ft above sea level. If unsterile jars are used, the filled jars should be processed 10 minutes. Use of sterile jars is preferred, especially when fruits are low in pectin, since the added 5-minute process time may cause weak gels. To sterilize empty jars, see USDA Complete Guide to Home Canning, page 1-15.

Methods of making jams and jellies
The two basic methods of making jams and jellies are described in Guide 7. The standard method, which does not require added pectin, works best with fruits naturally high in pectin. The other method, which requires the use of commercial liquid or powdered pectin, is much quicker. The gelling ability of various pectins differs. To make uniformly gelled products, be sure to add the quantities of commercial pectins to specific fruits as instructed on each package. Overcooking may break down pectin and prevent proper gelling. When using either method, make one batch at a time, according to the recipe. Increasing the quantities often results in soft gels. Stir constantly while cooking to prevent burning. Recipes are developed for specific jar sizes. If jellies are filled into larger jars, excessively soft products may result.

Orange Marmalade

4 cups thinly sliced orange peel with albedo (about 2.5 to 3 lbs. oranges as purchased)
4 cups orange pulp, cut up
1 cup thinly sliced lemon (about 1 large lemon as purchased)
6 cups of water
6 cups of sugar

Yield: About 7 or 8 half-pint jars

Procedure:
1. Wash and rinse half-pint canning jars; pre-sterilize and keep hot until ready to fill. Prepare lids and ring bands according to manufacturer's directions.
2. Rinse oranges and lemons well in clean water.
3. Peel oranges and slice orange peel with albedo attached into 1/8" strips. Measure 4 cups. Remove seeds and membrane from orange pulp. Cut sections into smaller pieces; measure 4 cups.
4. Slice lemon(s) into 1/8" slices and remove seeds. If desired, cut slices into halves or quarters (we used quarter slices of a large lemon). Measure 1 cup.

5. Add water to fruit in a 10 quart stock pot. Bring to a boil and cook over medium heat until peel is tender, about 1 hour.
6. Add sugar and bring slowly to a boil; stirring until sugar dissolves. Cook rapidly to the jellying point, about 45 minutes, stirring occasionally. Be careful not to get burned with spattering marmalade. Quickly skim foam, if any, from top of mixture.
7. Fill hot marmalade into hot pre-sterilized jars, leaving ¼" headspace. Wipe rims of jars with a dampened, clean paper towel. Apply and adjust prepared canning lids.
8. Process filled jars in a boiling water canner according to the recommendations in Table 1. (If there is a partial eighth jar, refrigerate and enjoy freshly made.)
9. Let processed jars cool, undisturbed, 12 to 24 hours and check for seals.

Table 1. Recommended process time for **Orange Marmalade** in a boiling water canner.

Style of Pack	Jar Size	0 - 1,000 ft	1,001 - 6,000 ft	Above 6,000 ft
Hot	Half-pints	**5 min**	10	15

Notes:
(1) When peeling citrus fruits for marmalades, be sure to leave all or most of the white albedo (white pith or tissue) left attached to the outer peel. This is where the most pectin (needed for gelling) is located.
(2) Instead of pre-sterilizing jars, you have the option of washing and rinsing jars in hot water and then keeping them hot until filling. Then the process time is increased and becomes 10 min. (0-1,000 ft), 15 min. (1,001-6,000 ft.) or 20 min. (above 6,000 ft).
(3) For recipe development, navel oranges were used.
(4) Refrigerate any leftover marmalade from filling jars, if any, and enjoy freshly made! Refrigerate the marmalade once sealed jars are opened for use.

Causes and Possible Solutions for Problems with Canned Foods

Problem	Cause	Prevention
Loss of liquid from glass jars during processing. Do not open to replace liquid. (Not a sign of spoilage)	1. Lowering pressure in canner suddenly, after processing period.	1. Do not force pressure down by placing canner in a draft, opening the vent too soon, running cold water over the canner, etc. Allow pressure to drop to zero naturally; wait 10 minutes before opening after weight is removed from canner lid.
	2. Fluctuating pressure during processing in pressure canner.	2. Maintain a constant temperature throughout processing time.
	3. Failure to work out air bubbles from jars before processing.	3. Remove by running a plastic spatula or knife between food and jar before applying lids.
	4. Imperfect seal.	4. Use new flat lids for each jar and make sure there are no flaws. Pretreat the lids per manufacturer's directions. Use ring bands in good condition – no rust, no dents, no bends. Wipe sealing surface of jar clean after filling, before applying lid.
	5. Ring bands not tight enough.	5. Apply fingertip-tight over flat lid, but do not overtighten.
	6. Jars not covered with water in boiling water canner.	6. Jars should be covered with 1 to 2 inches of water throughout processing period.
	7. Starchy foods absorbed liquid.	7. Make sure dried beans are completely rehydrated prior to canning. Use hot pack for other starchy foods. Otherwise, none

	8. Food packed too tightly in jars cause boil over during processing.	8. Leave the appropriate headspace.
Problem	**Cause**	**Prevention**
Color changes that are undesirable	1. Contact with minerals such as iron, zinc or copper in cooking utensils or water.	1. Avoid these conditions by using carefully selected cooking utensils. Use soft water.
	2. Overprocessing.	2. Follow directions for processing times and operation of canners.
	3. Immature or overmature product.	3. Select fruits and vegetables at optimum stage of maturity.
	4. Exposure to light.	4. Store canned foods in a dark place.
	5. May be a distinct spoilage.	5. Process by recommended method and for recommended time.
	6. Natural and harmless substances in fruits and vegetables (pink or blue color in apples, cauliflower, peaches, or pears)	6. None.
Cloudy liquid (sometimes denotes spoilage)	1. Starch in vegetables.	1. Select products at desirable stage of maturity. Do not use overmature vegetables. If canning potatoes, use fresh boiling water to cover and not cooking liquid from preparing hot pack.
	2. Minerals in water.	2. Use soft water.
	3. Additives in salts.	3. Use pure refined salt (pickling or canning salt) without additives.
	4. Spoilage.	4. Prepare food as directed with published canning process. Process by recommended method and for recommended time.
Sediment in jars (not necessarily a sign of spoilage)	1. Starch in vegetables.	1. Select products at desirable stage of maturity.
	2. Minerals in water.	2. Use soft water.
	3. Additives in salts.	3. Use pure refined salt (pickling or canning salt) without additives.
	4. Yellow sediment in green vegetables or onions.	4. None (natural occurrence).
	5. White crystals in spinach.	5. None (natural occurrence).
	6. Spoilage.	6. Prepare food as directed with published canning process. Process by recommended method and for recommended time.
Problem	**Cause**	**Prevention**
Floating (especially some fruits)	1. Fruit is lighter than sugar syrups.	1. Use firm, ripe fruit. Heat before packing. Use a light to medium syrup instead of heavy syrup.
	2. Air trapped in food pieces.	2. Use hot packs.
	3. Improper packing.	3. Pack fruit as closely as possible without crushing it. Release trapped air bubbles and readjust liquid level before applying lids. Make sure liquid covers food pieces completely.

Presto Testing Unit #81288

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Designed exclusively for testing Presto® Pressure Dial Gauges • Convenient • Time-saving • Portable

Presto® Testing Unit #81288 The Presto® Testing Unit #81288 is a unique and simple device for checking dial gauges. It can be used to test dial gauges for National (those made by the National Pressure Cooker Company, Eau Claire, Wisconsin), Magic Seal (sold at Montgomery Ward), Maid of Honor (sold at Sears, Roebuck and Company), and Presto® Pressure Canners. ◆ It requires no preheating or water. The testing unit uses air rather than steam pressure. ◆ Gauges can be checked quickly and easily—usually in less than one minute. ◆ It's portable, lightweight, and needs no electricity. ◆ Gauges can be tested while attached to canner cover or separately.

2018 Reappointment Quiz Questions

1. When using a boiling water canner, the water must be heated to _____ for hot-packed foods.
   a. 140°F
   b. 160°F
   c. 180°F
   d. 200°F

2. When using a pressure canner, the water must be heated to _____ for raw-packed foods.
   a. 140°F
   b. 160°F
   c. 180°F
   d. 200°F

3. At 2900 feet elevation, the correct processing time for jams and jellies in sterile jars is:
   a. 5 minutes
   b. 6 minutes
   c. 7 minutes
   d. 8 minutes

4. Before freezing onion rings, the amount of time the rings should be blanched in boiling water is:
   a. 5-10 seconds
   b. 10-15 seconds
   c. 15-20 seconds
   d. 20-25 seconds

5. What part of citrus fruits contains the most pectin?
   a. seeds
   b. sections
   c. white albedo
   d. outer peel

6. Loss of liquid from glass jars during processing is caused by:
   a. processing at too high temperature
   b. lowering pressure in canner suddenly after processing
   c. under processing
   d. failure to remove jars from canner after specified cool downtime

7. After processing and removing the weight from a **pressure canner**, the amount of time to wait before opening the canner is:
    a. 0 minutes
    b. 3 minutes
    c. 5 minutes
    d. 10 minutes

8. After processing and removing the lid from a **boiling water canner**, the amount of time to wait before removing the jars is:
    a. 0 minutes
    b. 3 minutes
    c. 5 minutes
    d. 10 minutes

9. After processing and removing the heat source from a **steam canner**, the amount of time to wait before removing the lid is:
    a. 0 minutes
    b. 3 minutes
    c. 5 minutes
    d. 10 minutes

10. The Ball Electric Canner is suitable for home canning for which of the following reasons?
    a. is a dedicated canner, not a "multi-cooker"
    b. comes with its own instructions and pre-set canning options for specific food preparations
    c. has had proper thermal process development done to support the recommendations with it
    d. All of the above

11. Which of the following sediments in jars is NOT considered safe to eat?
    a. yellow sediment in green onions
    b. white crystals in spinach
    c. starch sediment in vegetables
    d. brown sediment in canned peas

12. Which of the following is not a cause of fruit float after processing?
    a. insufficient debubbling
    b. lid too tight preventing air escaping
    c. air trapped in food pieces
    d. syrup is heavier than fruit

13. Which of the following statements is true?
    a. only soft fruits like apricots must be conditioned
    b. properly dried vegetables do not need conditioning
    c. vegetables that contain 20% moisture are considered properly dried
    d. none of the above statements is true

14. How much processing time is required for steam canners to be safely used?
    a. 45 minutes or less
    b. 35 minutes or less
    c. 25 minutes or less
    d. 15 minutes or less

15. The Presto gauge testing unit should not be used to test dial gauges for which of the following brands?
    a. Presto
    b. National
    c. All American
    d. Magic Seal

16. Dial gauges that are off by more than _____psi must be replaced.
    a. 1
    b. 2
    c. 3
    d. 4

17. The most recently created MFP Safety Note linked to in the Resources for Volunteers section of the statewide UC Master Food Preserver site (http://mfp.ucanr.edu) is:
    a. Kitchen Knife Safety
    b. Hot Surfaces in the Kitchen Safety
    c. Induction Stove Safety
    d. Portable Butane Stove Safety