

Savory Jams & Chutneys

“Savory” can be incorporated into jams, jellies, preserves, conserves, chutneys, and marmalades.

Savory vs Sweet, what is the difference? Sweet food has the favor or taste of sugar or honey, while savory food is not sweet but rather full-flavored and sometimes spicy.

Chutney is a relish-type condiment; its increasing popularity reflects the inclusion of ethnic world cuisine in the Western diet.

The term “chutney” includes several different varieties of sauce-type foods, drawn from traditional East Indian cuisine. The main ingredient may be an herb such as cilantro or mint; a flavoring ingredient, such as coconut, onion, ginger, tamarind; or, in the most common form, chopped fruit or vegetables simmered with spices, onion, sugar and vinegar. Chutneys are a colorful compliment to a cheese tray, omelets, grilled meat and fish.

Jams, jellies, and other soft spreads are foods with a variety of textures, flavors, and colors. They all consist of fruits, preserved mostly by means of sugar, and they are thickened or jellied to some extent.

Jams are made by cooking crushed or chopped fruits with sugar. They are thick, sweet spreads that tend to hold their shape but are less firm than jelly. The shape of fruit pieces are not retained when making jam. Jam has a uniform consistency and is thick enough to spread.

Preserves are small, whole fruits or uniformly sized pieces in a thick slightly gelled sugar syrup. The fruit should be tender and plump. The color should be characteristic of the fruit and fruit pieces should be translucent to clear.

Conserves are jam-like made with a combination of two or more fruits, nuts and raisins. Conserves are cooked until they round up on a spoon. If nuts are used, they can be added during the last five minutes of cooking.

Marmalades are soft fruit jellies containing small pieces or slices of fruit or fruit peel evenly suspended in the transparent jelly. They usually include citrus.

Lemon Peach Turmeric Chutney *Makes about 4-pint (16 oz) jars (can use smaller size jars if preferred)*

This is absolutely yummy. You'll love this sweet and savory recipe. It is a perfect complement for meats and sandwiches.

Ingredients:

3 large Meyer lemons (about 1 pound), quartered and thinly sliced	
1 medium onion, small diced	
8 to 10 peaches, roughly chopped (6 cups chopped)	
2 red chilis, minced	1 teaspoon smoked paprika
2 cloves garlic, minced	¼ cup bottled lemon juice
2 tablespoons salt	½ cup apple cider vinegar
2 teaspoons grated fresh ginger	1 cup coconut sugar
1 ½ teaspoons turmeric powder	¼ cup honey
2 teaspoons mustard seeds	

Directions:

1. Prepare boiling water canner or atmospheric steam canner. Heat jars in the canner until ready to use. Wash two-piece metal lids and rings in warm soapy water and set aside.
2. Combine all ingredients in a large stock pot and bring to a boil over high heat. Lower heat and simmer, stirring as needed, until chutney is thickened and reduced, about 30 minutes
3. Ladle hot chutney into hot jars leaving a 1/2-inch head space. Remove air bubbles. Wipe jar rim. Center lid on jar and apply band, adjust to fingertip tight. Place jar into canner. Repeat until all the jars are filled.
4. Process pint* jars in boiling water or atmospheric steam canner for 15 minutes at 0 – 1,000 feet, 20 minutes at 1001 – 3,000 ft, 25 minutes at 3,001 – 6,000ft, and 30 minutes at 8,001 – 10,000 ft.
5. Turn off heat, remove lid from boiling water canner, let jars stand 5 minutes. For atmospheric steam canner turn off heat and let stand for 3 to 5 minutes then remove lid. Remove jars and cool 12-24 hours. Check lids for seal, they should not flex when center is pressed.

*process for same times if using smaller jars

Source: www.ballmasonjars.com, 2024

Tuscan Tomato Jam *Makes about 4 (8 oz) half-pint jars*

This sweet and tart jam will liven up an autumn cheeseboard and is equally delicious in any of your favorite recipes calling for ketchup or chili sauce. Spread it on meatloaf half-way through baking to make a savory glaze or serve with eggs for brunch.

Ingredients:

6 lbs. red tomatoes (about 18 medium)
6 Tbsp Classic Pectin
1 tsp. grated lemon peel (about 1/2 medium)
2 Tbsp. bottled lemon juice
1 tsp. salt
1/4 tsp. ground black pepper
2 Tbsp. balsamic vinegar
1/4 cup dry white wine, such as pinot grigio or sauvignon blanc
2 tsp. dried herbs, such as thyme, rosemary, oregano, savory or marjoram or a combination of any of these
1-1/2 cups granulated sugar

Directions:

1. Prepare boiling water canner or atmospheric steam canner. Heat jars in the canner until ready to use. Wash two-piece metal lids and rings in warm soapy water and set aside.
2. Wash tomatoes. Core and slice into quarters. Cook until soft in large sauce pot or Dutch oven. Puree mixture using an electric food strainer or food mill to remove peels and seeds.
3. Return puree to sauce pot and simmer over medium-high heat until reduced by half, stirring frequently to prevent sticking. Add pectin, lemon peel, bottled lemon juice, salt, pepper, balsamic vinegar, white wine and herbs, stirring to blend in pectin. Bring mixture to a boil over medium-high heat, stirring constantly. Add sugar, stirring to dissolve. Bring mixture to a rolling boil that cannot be stirred down. Boil hard for 1 minute, stirring constantly. Remove from heat. Skim foam if necessary.
4. Ladle hot jam into hot jars, leaving 1/4-inch headspace. Remove air bubbles. Wipe rim. Center lid on jar. Apply band until fit is fingertip tight. Place jar in canner. Repeat until all jars are filled.
5. Process half pint jars in boiling water or atmospheric steam canner for 10 minutes at 0 – 1,000 feet, 15 minutes at 1001 – 3,000 ft, 20 minutes at 3,001 – 6,000ft, and 25 minutes at 8,001 – 10,000 ft.
6. Turn off heat, remove lid from boiling water canner, let jars stand 5 minutes. For atmospheric steam canner turn off heat and let stand for 3 to 5 minutes then remove lid. Remove jars and cool 12-24 hours. Check lids for seal, they should not flex when center is pressed.

Source: www.ballmasonjars.com, 2024

Habanero-Apricot Jelly *Yield: 6 half-pints (8oz)***Ingredients:**

- 1 ½ cups white vinegar (5% acidity)
- 2/3 cup finely chopped dried apricots
- 6 cups sugar
- 1/2 cup finely chopped red bell pepper
- 1/2 cup finely chopped red onion
- 1/4 cup finely chopped seeded habanero pepper
- 1, 3-oz pouch Ball® Liquid Pectin

Directions:

1. Prepare boiling water canner or atmospheric steam canner. Heat jars in the canner until ready to use. Wash two-piece metal lids and rings in warm soapy water and set aside.
2. Combine first 2 ingredients in a medium bowl. Cover and let stand at room temperature at least 4 hours or overnight.
3. Stir together apricot mixture, sugar, and next 3 ingredients in a 6-qt. stainless steel or enameled Dutch oven. Bring mixture to a full rolling boil that cannot be stirred down, over high heat, stirring frequently.
4. Add pectin, immediately squeezing entire contents from pouch. Continue hard boil for 1 minute, stirring constantly. Remove from heat. Skim foam, if necessary.
5. Ladle hot jam into hot jars leaving 1/4-inch headspace. Wipe rim. Center lid on jar. Apply band and adjust until fit is fingertip tight.
6. Process half pint jars in boiling water or atmospheric steam canner for 10 minutes at 0 – 1,000 feet, 15 minutes at 1001 – 3,000 ft, 20 minutes at 3,001 – 6,000ft, and 25 minutes at 8,001 – 10,000 ft.
7. Turn off heat, remove lid from boiling water canner, let jars stand 5 minutes. For atmospheric steam canner turn off heat and let stand for 3 to 5 minutes then remove lid. Remove jars and cool 12-24 hours. Check lids for seal, they should not flex when center is pressed.

Source: www.ballmasonjars.com, 2024

Tomato Apple Onion Chutney *Yield: 6 half-pints (8oz)*

Serve this tasty chutney warmed over baked Brie for an appealing appetizer. Allow a plentiful supply of crackers and apple slices for spreading the Brie. Or mix it with mayonnaise for a scrumptious sandwich spread.

Ingredients:

1-1/2 cups white vinegar
2 cups chopped cored peeled apples (about 2 medium)
5 cups chopped cored peeled tomatoes (about 7 medium)
1-1/2 cups lightly packed brown sugar
1 cup chopped English cucumber (about 1 medium)
3/4 cup chopped onions (about 1 small)
3/4 cup chopped seeded red bell peppers (about 1 large)
1/2 cup raisins
1 red chili pepper, finely chopped
1/4 teaspoon finely chopped garlic (about 1/2 clove)
1-1/2 teaspoon ground ginger
1/2 teaspoon salt
1/2 teaspoon ground cinnamon

Directions:

1. Prepare boiling water canner or atmospheric steam canner. Heat jars in the canner until ready to use. Wash two-piece metal lids and rings in warm soapy water and set aside.
2. Combine vinegar and apples in a large saucepan. Add all remaining ingredients. Bring to a boil over medium-high heat, stirring frequently. Reduce heat and boil gently, stirring frequently, until thick enough to mound on a spoon, about 30 minutes.
3. Ladle hot chutney into hot jars leaving 1/2-inch headspace. Remove air bubbles. Wipe rims with a dampened clean paper towel; adjust two-piece metal canning lids.
4. Process half-pint jars in a boiling water or atmospheric steam canner for 10 minutes at 0-1,000 feet elevation, 15 minutes at 1,001-6,000 feet, and 20 minutes above 6,000 feet.
5. Turn off heat, remove lid from boiling water canner, let jars stand 5 minutes. For atmospheric steam canner turn off heat and let stand for 3 to 5 minutes then remove lid. Remove jars and cool 12-24 hours. Check lids for seal, they should not flex when center is pressed.

Source: www.ballmasonjars.com, 2024

Jalapeño Jelly *Yield: about 5 half-pints (8oz)*

Ingredients:

12-ounce jalapeño peppers (about 12 medium) *caution; wear plastic gloves when handling peppers*
2 cups cider vinegar, divided
6 cups sugar
2 pouches of Ball Liquid Pectin (3 ounces each)
Green food coloring, optional

Directions:

1. Prepare boiling water canner or atmospheric steam canner. Heat jars in the canner until ready to use. Wash two-piece metal lids and rings in warm soapy water and set aside.
2. Purée peppers in food processor or blender with 1 cup cider vinegar until smooth. Do not strain purée.

3. In a large, deep stainless-steel saucepan, combine pepper puree, remaining 1 cup vinegar and rest of the sugar. Bring to a boil over high heat. Boil 10 minutes, stirring frequently. Stir in liquid pectin quickly. Boil hard, stirring constantly for 1 minute. Remove from heat, stir in food coloring if using, and quickly skim foam off.
4. Quickly ladle hot jelly into hot jars, leaving 1/4-inch headspace. Wipe rims with a dampened clean paper towel; adjust two-piece metal canning lids.
5. Process half pint jars in boiling water or atmospheric steam canner for 10 minutes at 0 – 1,000 feet, 15 minutes at 1,001 – 3,000 ft, 20 minutes at 3,001 – 6,000ft, and 25 minutes at 8,001 – 10,000 ft.
6. Turn off heat, remove lid from boiling water canner, let jars stand 5 minutes. For atmospheric steam canner turn off heat and let stand for 3 to 5 minutes then remove lid. Remove jars and cool 12-24 hours. Check lids for seal, they should not flex when center is pressed.

Source: *Ball Complete Book of Home Preserving, 2020*

Double Onion Marmalade *Yield: 6 half-pint jars (8oz)*

A little dab of this sweet onion marmalade is all you need to jump-start an amazing appetizer or main dish. Great on Burgers!

1-1/2 cups thinly sliced red onion
1-1/2 cups thinly sliced Vidalia onion
1/4 cup firmly packed light brown sugar
1/3 cup apple cider vinegar (5%)
1 Tbsp black peppercorns
2 bay leaves
2-1/2 cups unsweetened apple juice
1/2 cup raisins
6 Tbsp. Ball® Classic Pectin
4 cups sugar
Cheesecloth & Kitchen string

Directions:

1. Prepare boiling water canner or atmospheric steam canner. Heat jars in the canner until ready to use. Wash two-piece metal lids and rings in warm soapy water and set aside.
2. Combine first 4 ingredients in a 6-qt. stainless steel or enameled Dutch oven. Cook, stirring often, over medium heat 13 minutes or until liquid evaporates.
2. Place peppercorns and bay leaves in a 5-inch square of cheesecloth or spice bag. Add to onion mixture. Add apple juice and raisins; stir in pectin.
3. Bring mixture to a full rolling boil that cannot be stirred down, over high heat, stirring constantly. Hold spice bag to one side of Dutch oven with tongs.
4. Add sugar, stirring until dissolved. Release spice bag. Return mixture to a full rolling boil. Boil hard 1 minute, stirring constantly. Remove from heat; remove and discard spice bag. Skim foam, if necessary.
5. Ladle hot marmalade into a hot jar, leaving 1/4-inch headspace. Remove air bubbles and adjust headspace if necessary. Wipe rims. Apply lids and rings.
6. Process in a boiling water or atmospheric steam canner for 15 minutes between 0-1,000', 20 minutes between 1,001 – 3,000', 25 minutes between 3,001 – 6,000', 30 minutes between 6,001 – 8,000', and 35 minutes between 8,001 – 10,000'.
7. Turn off heat, remove lid from boiling water canner, let jars stand 5 minutes. For atmospheric steam canner turn off heat and let stand for 3 to 5 minutes then remove lid. Remove jars and cool 12-24 hours. Check lids for seal, they should not flex when center is pressed. Use within 1 year for best quality.

Source: *Ball Complete Book of Home Preserving, 2012*

Roasted Garlic Jelly *Yield: about 9 four-ounce mini jars*

Can use as a glaze for meat, or spread over warm toasted bread.

Ingredients:

3 medium heads garlic
1 tablespoon olive oil, divided
1 tablespoon balsamic vinegar, divided
1 cup dry white wine
2/3 cup water
1/2 cup white balsamic vinegar*
1 teaspoon whole black peppercorns, crushed
3 tablespoons lemon juice
3 cups granulated sugar
2 pouches (each 3 ounces) liquid pectin

Directions:

1. Preheat oven to 425°F
2. Using a sharp knife, cut off tops of garlic heads, exposing cloves. Place each head on a small square of aluminum foil set on a baking sheet. Top each head with 1 teaspoon olive oil and 1 teaspoon balsamic vinegar. Scrunch foil loosely around garlic heads and roast in preheated oven until garlic is golden and very soft, 45-60 minutes. Let stand until cool enough to handle. Separate cloves, pinching each one to extract the soft roasted garlic. Discard skins.
3. In a medium stainless-steel saucepan, combine roasted garlic, wine, water, vinegar and peppercorns. Bring to a boil over medium heat. Reduce heat and boil gently for 5 minutes. Cover, remove from heat and let steep for 15 minutes.
4. Transfer garlic mixture to a dampened jelly bag or a strainer lined with several layers of dampened cheesecloth set over a deep bowl. Let drip, undisturbed, for about 30 minutes. Measure 1-2/3 cups garlic juice. If you do not have the required amount, add up to 1/4 cup dry white wine or water.
5. Prepare boiling water canner or atmospheric steam canner. Heat jars in the canner until ready to use. Wash two-piece metal lids and rings in warm soapy water and set aside.
6. Transfer garlic juice to a large, deep stainless-steel saucepan. Stir in lemon juice and sugar. Over high heat, stirring constantly, bring to a full rolling boil that cannot be stirred down. Stir in pectin. Boil hard, stirring constantly, for 1 minute. Remove from heat and quickly skim off foam.
7. Quickly pour hot jelly immediately into hot jars, leaving 1/4-inch headspace. Wipe rims with a dampened clean paper towel; adjust two-piece metal canning lids.
8. Process in a boiling water or atmospheric steam canner for 10 minutes at 0-1,000 feet elevation, 15 minutes at 1,001-3,000 feet, 20 minutes at 3,001-6,000 feet, 25 minutes at 6,001-8,000 feet, and 30 minutes at 8,001-10,000 feet.
9. Turn off heat, remove lid from boiling water canner, let jars stand 5 minutes. For atmospheric steam canner turn off heat and let stand for 3 to 5 minutes then remove lid. Remove jars and cool 12-24 hours. Check lids for seal, they should not flex when center is pressed. Use within 1 year for best quality.

** White balsamic vinegar may be hard to find. Dark balsamic vinegar can be substituted but the resulting jelly will be dark and will have a more robust flavor*

Source: Ball Complete Book of Home Preserving, 2020

Ginger Pear Preserve (with limes) *Yield: about seven 8-ounce (half pint) jars*

Pears have a subtle favor that can easily be drowned out with competing spices. This preserve has a wonderful flavor and the combination of lime and gingerroot brings out the essence of the pear, making a delicate flavored preserve. This preserve goes well with any soft flavored cheese to enhance any charcuterie boards or platters.

Ingredients:

5 ½ cups finely chopped cored peeled pears (1.375 liters)
2 limes grated zest and juice of 3 limes
2 1/3 cups granulated sugar
1 tablespoon grated gingerroot

Directions:

1. Prepare boiling water canner or atmospheric steam canner. Heat jars in the canner until ready to use. Wash two-piece metal lids and rings in warm soapy water and set aside.
2. In large stainless-steel saucepan, combine pears, lime zest and juice, sugar, and gingerroot. Bring to a boil over medium heat stirring to dissolve sugar. Boil, stirring frequently, until mixture thickens, about 15 minutes. Remove from heat and test gel (see page 8). If gel stage has been reached, skim off foam.
3. Ladle hot preserves into hot jars, leaving 1/4-inch headspace. Remove air bubbles and adjust headspace, if necessary, by adding hot preserves. Wipe rim. Center lid on jar. Screw band down until resistance it met, then increase to finger tight.
4. Process half-pint jars in a boiling water or atmospheric steam canner for 10 minutes at 0-1,000 feet elevation, 15 minutes at 1,001-3,000 feet, and 20 minutes above 3,001-6,000 feet.
5. Turn off heat, remove lid from boiling water canner, let jars stand 5 minutes. With Atmospheric Steam canner leave lid on for 3 – 5 minutes then remove lid. Remove jars and cool 12-24 hours. Check lids for seal, they should not flex when center is pressed. Use within 1 year for best quality.

Source: Ball Complete Book of Home Preserving, 2020.

Red Onion and Port Jam *Yield: 5 half-pint jars (8oz)*

Savory flavors come together with mild heat from black pepper and mustard seeds to become the condiment everyone is reaching for. This recipe is the perfect addition to any burger, roasted meat or even served with cheese and crackers.

Ingredients:

2 pounds (1 kg) red onions, quartered and thinly sliced
½ cup (125 mL) red wine vinegar
1 ½ (375 mL) cups port wine
2 tsp salt (10 mL)
1 tsp (5 mL) ground black pepper
1 tsp (5 mL) mustard seeds
1 cup (250mL) cold water
3 tbsps (45 mL) Ball ® Low or No Sugar Needed Pectin
½ (125 mL) cup sugar

Directions:

1. Prepare boiling water canner or atmospheric steam canner. Heat jars in the canner until ready to use. Wash two-piece metal lids and rings in warm soapy water and set aside.

2. Combine first 6 ingredients in a medium saucepan. Cook over medium heat 15 minutes, or until onions are translucent, stirring occasionally.
3. Stir in water and pectin. Bring mixture to a full rolling boil that cannot be stirred down stirring constantly.
4. Add sugar, stirring to dissolve. Return mixture to a full rolling boil. Boil hard for 1 minute, stirring constantly.
5. Turn off burner and remove from heat. Ladle hot jam into a hot jar leaving a 1/4-inch (0.5 cm) headspace. Remove air bubbles. Wipe jar rim. Center lid on jar and apply band, adjust to fingertip tight. Place jar in boiling water canner. Repeat until all jars are filled.
6. Process jars 10 minutes in boiling water or atmospheric steam canner at 0 – 1,000 feet elevation, 15 minutes at 1,001 – 3,000 feet. 20 minutes at 3,001 - 6,000 feet, 25 minutes at 6,001 – 8,000 feet.
7. Turn off heat, remove lid from boiling water canner, let jars stand 5 minutes. With Atmospheric Steam canner leave lid on for 3 – 5 minutes then remove lid. Remove jars and cool 12-24 hours. Check lids for seal, they should not flex when center is pressed.

Source: www.ballmasonjars.com, 2024

Tests for Proper Gelling

- *Sheet or Spoon Test* – Dip a cool metal spoon into the boiling jelly mixture. Raise the spoon about 12 inches above the pan (out of steam). Turn the spoon so that liquid runs off the side. The jelly is done when the syrup forms two drops that flow together and sheet, or hang off the edge of the spoon.
- *Freezer Test* – Remove the jam mixture from the heat. Pour a small amount of boiling jam on a cold plate or spoon and put it in the freezing compartment of a refrigerator for a few minutes. Remove it from the freezer. If the mixture gels, it should be done.
- *Temperature Test* – Use a jelly or candy thermometer and boil until jam or jelly mixture reaches the following:

Sea Level	1,000 ft.	2,000 ft.	3,000 ft.	4,000 ft.	5,000 ft.	6,000 ft
220°F	218°F	216°F	214°F	212°F	211°F	209°F

Jars, Lids & Rings

Jelly Jar	4oz	½ cup
Half pint	8oz	1 cup
Three quarter	12 oz	1¼ cups
Pint	16 oz	2 cups
Quart	32 oz	4 cups

- Not any jar will do for canning. Canning jars are special and are made to withstand high heat and / or freezing and are designed for the lids to fit correctly.
- The lids are made specifically for canning jars in two different size jar openings, *regular and wide mouth*. Lids are self-sealing round metal disc that are held in place with a metal screw band (ring). The lids have a gasket that seals after processing. The lids are intended for one-time use. The rings are reusable.
- There are jars with clear glass lids and a replaceable rubber ring between it and the jar. These are not suitable for canning purposes.
- Wash lids and rings with warm soapy water. Do not use rusting or damaged lids or rings. Place lids seal down onto clean jar rim and follow with metal screw band. Tighten enough to hold the lid in place but loose enough to allow the air to vent from the jar, this enables the jar to have a tight vacuum seal when done.
- The rule of thumb is to tighten the screw band very gently until you feel a slight resistance. Then finger tight a little more. You do not want the bands too tight or too loose.

Processing (length of canning time)

Process foods for which you have a researched-based processing time. The process time is unique to each food, based on the amount of time needed for the contents of the jar to reach a temperature required to destroy all dangerous microorganism. Processing times are specified for jar size. All recipes specify jar size needed. You can move down in size of jar (and be safe). Use the same processing time for the smaller jar as listed in the recipe. Never use a larger jar than the recipe recommends. If a larger jar is used, processing time has to be adjusted for that size jar and content. Don't estimate on the processing time for larger jars; you need to be precise.

Canning Processes

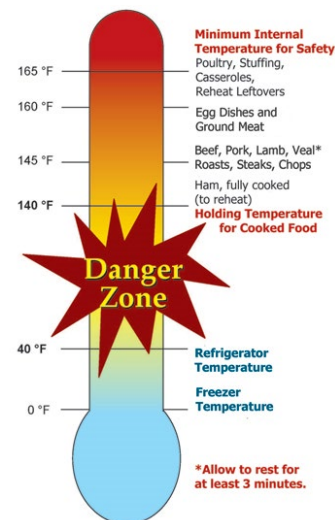
- Use an atmospheric steam canner or a boiling water canner for high acid foods: fruits, pickled and fermented products, jams and jellies.
- Use a pressure canner for low acid foods: meats, vegetables, and seafood.

Why two different processes? Low acid foods must be pressure canned because *Clostridium botulinum*, the bacteria that causes botulism, is a spore former. When conditions are not favorable for the organism to grow (high heat, dryness, oxygen, high acidity), the bacterial cell forms a protective structure called a spore. It takes a higher temperature than boiling to destroy the spores: 240° - 250°F. If you do not destroy the spores in low acid foods they will germinate and produce fatal toxins in the food when it is stored on the shelf. High acid foods have enough acidity to destroy spores.

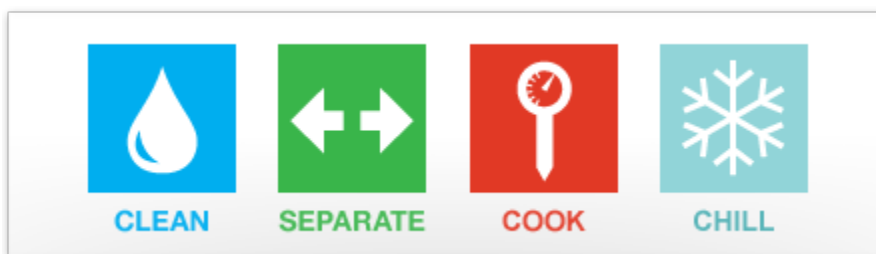
The USDA does not recommend the open kettle method of canning because it does not prevent all risks of spoilage. (*Open kettle canning is ladling hot foods into hot jars, applying the lids, and letting them seal without processing them in a canner.*)

Factors that affect growth of microorganism

1. **Temperature:** Foodborne pathogens grow best under the same conditions that allow people to thrive. Most foodborne bacteria grow fastest at temperatures from 90° to 110° F. However, foodborne bacteria will grow in the temperature range known as the **Danger Zone**, 40° to 140°F; some grow at temperatures below this range.
2. **Acidity or alkalinity (pH):** Most organisms grow best under conditions that are not highly acid or alkaline; that is, a neutral pH. (Very few foods are highly alkaline.) High acid foods generally do not support bacterial growth.
3. **Moisture:** Microorganisms require moisture for growth. Dehydration preserves foods by removing moisture.
4. **Oxygen:** Most microorganisms require oxygen to grow; a few pathogens do not, or may require limited oxygen. However, controlling oxygen content is not useful for controlling bacterial growth for home food preservers.
5. **Time:** It takes time for microorganisms to grow or multiply in foods. The time required is affected by temperature, acidity, moisture and oxygen levels. Under ideal conditions bacteria can double in number every 10 to 20 minutes.
6. **Food:** Bacteria require nutrients to reproduce. Foods provide proteins and carbohydrates for growth.
7. **Inhibitors:** Some natural compounds/food additives are bacterial inhibitors (sugar, acid).



Preventing Foodborne Illness



Clean

- Wash hands frequently and after using the toilet, changing a baby's soiled diaper, sneezing or coughing, touching animals, handling raw meat, fish and poultry and before handling food.
- 20-second rule: wash hands for 20-seconds or sing the Happy Birthday song twice.
- Bandage any cuts or burns on hands before handling food; use disposable gloves to protect food.
- Run sponges and dish scrapers through the dishwasher often. Change dish cloths daily.
- Use paper towels to mop up spilled juices from meat, fish or poultry.
- Use a disinfecting solution consisting of 1 tsp unscented chlorine bleach to 1 quart of water. Use a spray bottle to disinfect countertops, cutting surfaces, etc. Make a new solution every week.

Separate

- Avoid cross contamination. **ALWAYS** wash your hands, knives, cutting boards, and food preparation surfaces well with soapy water before and after any contact with raw meat or fish.
- Use a separate cutting board for fresh produce, raw meat and cooked meat.
- Rinse all fresh fruits and vegetables well under running water before preparing or eating them.
- When grilling or barbecuing, always use a clean plate for the cooked meat.
- Ice is food! Use clean ice to avoid contaminating food.
- Store raw meat, fish and poultry on the bottom shelf in the refrigerator or on a plate to prevent juices from dripping onto other food items.

Cook

- Must reach and maintain an internal temperature high enough to kill pathogens.
- Use a thermometer on meats; follow a reputable recipe when canning.

Chill

- Keep your refrigerator set at 40°F or below and refrigerate all perishable foods.
- Thaw frozen perishable foods in a refrigerator overnight, in a microwave oven, or under cold running water. Do not thaw frozen food on your counter.
- Do not prepare food more than 2 hours before serving without plans for proper storage in a refrigerator then reheating just before serving.
- Divide leftover hot food into shallow containers to accelerate cooling and refrigerate within 2 hours after preparation.
- Foods can spoil in as little as 1 hour in the hot sun. Discard any perishable foods from a picnic or potluck that have not been kept adequately chilled (40°F or below) or kept hot (140°F or above).

When In Doubt - Throw It Out! Never taste food that looks or smells strange to see if it can still be used. **Just discard it.** Generally, foods that contain bacteria will look, smell, and taste normal. Generally speaking most bacteria that cause foodborne illness are odorless, colorless and tasteless.

Boiling Water Canning

1. Preheat water to 140°F for raw-packed foods and to 180°F for hot-packed foods. Food preparation can begin while this water is preheating. Do not have the water boiling when you add the jars.
2. Place jars on the rack in the canner. Add enough boiling water to cover the tops of the jar by at least 1" to 2".
3. Place lid on canner. Bring the water to a rolling boil, then reduce heat to a gentle boil.
4. Begin to count processing time when the water comes to a boil.
5. Process for the time indicated in the recipe, maintaining a constant boil.
6. All recipes are developed using sea level as the criteria for processing time. If you are at a higher altitude, adjust the processing times according to the following chart:



Altitude in feet	Increase processing time
1000 - 3000	5 minutes
3001 - 6000	10 minutes
6001 - 8000	15 minutes
8001 - 10000	20 minutes

Note: these altitude adjustments are for non-jam & jelly recipes. Process jams & jellies for 5+ minutes in sterile jars as recommended on page 4.

7. When the jars have boiled for the recommended time, turn off the heat and remove the canner lid. Wait no more than 5 minutes before removing jars
8. Keep the jars upright when you remove them from the canner.
9. Place the hot jars on a rack or folded towel away from drafts or cool surfaces. Keep the jars separated so they will cool evenly. Do not disturb the seal. Do not retighten the rings.
10. Leave the ring bands on the jars until they have cooled (approximately 24 hours).
11. Do NOT invert jars: Some canning books still recommend inverting the jars after removing them from the boiling water canner. The USDA does not recommend this method.
12. After the jars have cooled, remove the ring bands. Look at the top of each jar. If the lid is slightly concave, it indicates a seal. Test the seal by pressing on the lid with your finger; the lid should not give. If you are not sure a jar is sealed, carefully lift the jar by the lid after removing the ring band. If not properly sealed, the lid will come off.
13. Wash and dry bands. Clean the jars with a damp cloth. The ring bands may be replaced on the jars if desired. The ring bands must be thoroughly dry.
14. Label and date the jars, and store in a cool, dark, dry area.



Reprocessing - If a jar did not seal, refrigerate and use within a few days, or reprocess it within 24 hours using a new lid. Check the jar for flaws. Process by the method originally advised and for the full length of time.

Atmospheric Steam Canner Processing

1. Use a research tested recipe and processing time developed for a **boiling water** canner when using an atmospheric steam canner. An atmospheric steam canner may be used with recipes approved for half-pint, pint, or quart jars.
2. Add enough water to the base of the canner to cover the rack. (Follow manufacturer recommendations.)
3. Preheat water to 140°F for raw-packed foods and to 180°F for hot-packed foods. Food preparation can begin while this water is preheating. Do not have the water boiling when you add the jars.
4. Heat jars prior to filling with hot liquid (raw or hot pack). Do not allow the jars to cool before filling.
5. Load filled jars, fitted with lids, onto the canner rack and place the lid on the canner base.
6. Turn heat to its highest position to boil the water until a steady column of steam (6-8 inches) appears from the vent hole(s) in the canner lid. Jars must be processed in pure steam environment.
7. If using a canner with a temperature sensor, begin processing time when the temperature marker is in the green zone for your altitude. If using a canner without a temperature sensor, begin processing time when a steady stream of steam is visible from the vent hole(s).
8. Set the timer for the total minutes required for processing the food, adjusting for altitude (see chart on page 5). Processing time must be limited to **45 minutes or less, including any modification for elevation**. The processing time is limited by the amount of water in the canner base. When processing food, **do not** open the canner to add water.
9. Monitor the temperature sensor and/or steady stream of steam throughout the entire timed process. Regulate heat so that the canner maintains a temperature of 212°F. A canner that is boiling too vigorously can boil dry within 20 minutes. If a canner boils dry, the food is considered under-processed and therefore potentially unsafe.
10. At the end of the processing time, turn off the heat, wait 2-3 minutes and remove the lid, lifting the lid away from you.
11. Using a jar lifter, remove the jars without tipping and place them on a towel, leaving at least 1-inch spaces between the jars during cooling. Let jars sit undisturbed to cool at room temperature for 12 to 24 hours.



Sources

National Center for Home Food Preservation: <http://nchfp.uga.edu/>
 USDA Complete Guide to Home Canning, 2015
 So Easy to Preserve, Cooperative Extension, University of Georgia, 2015
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 The All New Ball Book of Canning and Preserving, 2016
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