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Fun with Fermentation - Fermentation Basics

Across many cultures, fermentation has been used as a natural method of preserving food. Fermented foods contain not only probiotic bacteria that support gut health and provide other health benefits but also prebiotic food to keep the probiotic bacteria healthy and alive. Fermented food is living food. The cultures in fermented food need to be tended. With some fermented foods, another batch of the same food can be created with a starter from the current batch, creating a rhythm of food preservation.

Sauerkraut

Yield: About 1 Quart

Ingredients:
1 large head of cabbage, at least 2 pounds
4 teaspoons canning or pickling salt

Directions:
1. Remove outer leaves. Reserve 1 or 2 leaves to cover sauerkraut during the fermentation process. Rinse cabbage head under cold running water and drain. Cut in quarters and remove cores. Shred or slice to a thickness of a quarter.
2. Put 2 pounds of shredded cabbage in a large mixing bowl. Add salt. Mix thoroughly, using clean hands until salt draws juices from the cabbage.
3. Using funnel, put brined cabbage into large glass canning jar. Be sure container is deep enough so that its rim is at least 4 - 5 inches above the cabbage.
4. If juice does not cover cabbage, add boiled and cooled brine (1 1/2 tablespoons of salt per quart of water).
5. Place cabbage leaf/ leaves over the shredded cabbage. Add plastic freezer bag filled with extra brine to weight down cabbage. Cover with a clean towel or a fermentation lid. Keep the kraut under the brine at all times.
6. Store at 70 - 75 degrees F, kraut while fermenting. At these temperatures, kraut will be fully fermented in about 3 - 4 weeks; at 60 - 65 degrees F, fermentation may take 5 - 6 weeks; At temperatures lower than 60 degrees F, kraut may not ferment. At temperatures above 75 degrees F, kraut may become soft.
7. If you weigh the cabbage down with a brine-filled bag, do not disturb the crock until normal fermentation is completed (when bubbling ceases). Remove scum if it forms.
8. Fully fermented kraut may be kept tightly covered in the refrigerator for 2 - 3 months.

Source: Adapted from the National Center for Home Food Preservation, 2018

Kombucha

Yield: About 1 Gallon

Kombucha is a fermented, slightly sweetened and slightly tangy tea that has been around for centuries. It is thought to have a variety of health benefits and it contains high levels of antioxidants, B-vitamins, and probiotics. The SCOBY (Symbiotic Colony of Bacteria and Yeast) is a mix of cultures of bacteria and yeast present when making kombucha, kefir, and other foods that are made through symbiotic fermentation.

Ingredients:
1/4 cup green and/or black tea (in a mesh bag), or 4 - 8 tea bags
1 gallon of filtered water
1 cup of cane sugar
1 - 2 cups of Kombucha Starter Liquid (from a previous batch)
1 SCOBY

Directions:
1. Heat water. In brewing vessel, make tea. Steep tea for 10 minutes.
2. Remove tea leaves or bags. While water is still hot, stir in sugar and completely dissolve.
3. Allow sweetened tea to completely cool to room temperature. Note: Alternative method to cool faster: heat only half the water in step #1, to make a strong sweet tea, then add the remaining water as cold water.
4. Once cooled to room temperature, with washed hands, add SCOBY and Kombucha Starter Liquid to sweetened tea.
5. Cover with clean cloth or coffee filter. Secure with a rubber band or bungee cord to keep insects and contaminants out but allow air flow. Record start date.
6. Allow kombucha to ferment at room temperature (ideally 64 - 79 degrees F/ 18 - 26 degrees C) for 7 - 14 days. A new SCOBY will develop on the surface of the liquid, starting as a light haze that gradually turns whitish, then opaque and thicker as time progresses. Check the kombucha flavor after a week. Stop fermenting when you like the flavor.
7. To “stop” fermenting: pour kombucha into clean jars or bottles sanitized by rinsing with boiling water or vinegar, retaining SCOBY and at least 1 - 2 cups for your next batch. Save more, at least 20%, if following continuous brew technique (see below).
8. Flavor finished kombucha as desired with 10 - 20% juice or clean fruit, and experiment with clean herbs and spices based on preference. Cap tightly. Leave at room temperature 1 - 3 days for potential carbonation or refrigerate immediately.
9. **CAUTION:** Longer time capped at room temperature could result in carbon dioxide accumulation and even explosion of the contents.

<u>Repeat batches using continuous brew technique:</u>
To minimize handling the SCOBY and reduce introduction of contaminants, it is better to leave the SCOBY and starter liquid in the vessel and not wash the vessel between uses, but only if it becomes

built up with yeast. Gently pour in new sweetened, cooled tea along the inside of the jar to limit disturbing the SCOBY. SCOBY growth can be peeled and shared with others or stored for several weeks in a similar cloth covered vessel, covered by kombucha.

Source: Colorado State University Extension, Farm to Table

Kimchi

Yield: Makes about 2 Quart Jars

Ingredients:
1 medium Napa cabbage (about 2 pounds)
1/2 cup salt for pickling and preserving or Kosher salt
1 large Asian pear, peeled, cored and cut into chunks
5 cloves garlic, minced
1 2-inch (5 cm) piece of ginger root, peeled and sliced
1 tablespoon granulated sugar
3 tablespoons fish sauce
2/3 cup Korean chili flakes (gochugaru)
1 medium daikon radish, peeled and cut into thin strips
1 bunch green onions, cut into 1-inch slices
3 large carrots, peeled and grated

Directions:
1. Wash cabbage under cold running water. Cut into quarters, remove and discard core. Slice quarters into 2-inch strips. In a large stainless steel or ceramic bowl, combine cabbage slices with salt; massage well by hand, squeezing the salt into the cabbage leaves. Cover bowl and allow to stand at room temperature for at least 1 hour.
2. In a food processor or blender, puree Asian pear, garlic, ginger root and sugar until smooth. Add the fish sauce and chili flakes to combine.
3. Drain cabbage and rinse thoroughly with cold water to remove as much of the salt as you can. Return to cleaned bowl and combine with radish, green onions and carrots. Add the pureed Asian pear mixture and combine well.
4. Divide cabbage mixture evenly between two quart (1 Liter) jars, pressing down firmly with a wooden spoon to remove as many air pockets as you can. Rinse out the mixing bowl with 1/2 cup water and divide it between the jars. If the kimchi doesn't come to the very top, clean the empty space inside the jar with a damp paper towel to minimize bacterial growth. Center lid on jar. Screw band on very loosely, so that air can escape as it ferments.
5. Place each jar on a plate in a dark, cool place (65 - 75 degrees F). It should take between 24 and 36 hours for the fermentation to take place. Once the kimchi has fermented tighten the lids and store in the refrigerator. It will continue to ferment, but much more slowly.

Note: Kimchi is the most distinctively Korean recipe, yet no two are alike. Almost every family in Korea has its own adaptation of this classic centuries-old method of vegetable fermentation. Feel free to vary the ratio of carrots and radishes to your liking. If an Asian pear is unavailable, a domestic pear, an apple or a persimmon can also be used.

Source: Ball Complete Book of Home Preserving, 2020, p. 339

Yogurt

Yield: Makes 4 -5 cups of yogurt

Yogurt is made by adding beneficial bacteria (Streptococcus thermophilus and Lactobacillus bulgaricus) into heated milk. After this inoculation the milk is held at 110°F ± 5°F until firm. The milk is thickened by an increase in acidity from lactic acid produced by the bacteria.

Ingredients:

1 quart milk (cream, whole, low fat, or skim)
1/3 - 2/3 cup Nonfat dry milk powder
1/4 cup commercial, unflavored, cultured yogurt (be sure the product label indicates that it contains a live culture)

Directions:

1. Pour milk of choice into a double boiler and heat to 180°F. This will kill competing bacteria, and the whey proteins will denature and coagulate to enhance the viscosity and texture of the final product. Maintain temperature for 10 minutes for thinner yogurt, 20 minutes for thicker yogurt.
2. After the milk has reached 180°F for the desired time, remove from heat and allow to cool to 108°F to 112°F.
3. When the milk is cooled, scoop out one cup of milk into a small mixing bowl. To this cup of milk, add the 2 to 3 teaspoons of yogurt starter per cup of milk. For example, for a quart of milk add 8 to 12 teaspoons (2 1/2 to 4 tablespoons) yogurt starter.
4. Pour this mixture back into the larger portion of heated milk and stir gently. Pour milk/yogurt starter into clean, sterilized warm container. Cover and place in incubator.
5. Incubate the yogurt by setting it in a warm place for 6 to 8 hours undisturbed. The goal is to maintain constant temperature to allow the yogurt to ferment. The time will vary depending upon the size of the inoculation culture, temperature, lactose content of the milk, and/or the freshness (vitality) of the yogurt starter used. Any one or a combination of these factors will increase the time to complete the process.
6. Refrigerate yogurt immediately once the yogurt has congealed to a jell-like consistency. Rapid chilling stops the development of acid.

Incubation

1. In the oven. Pre-warm oven to 200°F, then turn off. Turn oven on for short periods so that the temperature does not drop below 100°F. If a gas oven is used, the pilot light may maintain the temperature.

2. In an insulated cooler. Fill with warm water and place jars in warm water bath. Alternatively, line the chest with a heating pad and maintain at lowest setting.
3. In a crockpot. The crockpot can be used to heat the milk, allowed to cool then add yogurt starter for fermentation. Wrap the crockpot in a towel and allow to set in a warm area.
4. In a commercial yogurt machine. These are available to maintain constant temperature. Follow instructions from the manufacturer.

Source: Washington State University Extension, Yogurt Made Simple, FS173E, 2015

Greek-Style Yogurt **Yield: four 8-ounce jars or 2 pint jars**

Ingredients:
8 cups whole milk
1/2 cup plain, unflavored yogurt with active cultures

Directions:
1. In a large stainless steel saucepan or Dutch oven, heat milk to just below simmering 180 degrees F, stirring constantly. Remove from heat and allow to cool to 110 degrees F.
2. Gently stir in yogurt until it melts into the warm milk and is well combined. Cover pot and allow contents to sit, undisturbed for 6 - 12 hours at a constant temperature of between 100 and 110 degrees F. This will allow the milk to incubate and firm up into yogurt.
3. Once yogurt has firmed up, line a colander or large strainer with two layers of cheesecloth and set it over a bowl. Spoon the yogurt into the colander, cover loosely with plastic wrap and transfer to the refrigerator.
4. Allow yogurt to strain, removing whey as necessary, for at least 6 hours of even longer if a super thick result is desired. Transfer to jars and cover tightly. Store in the refrigerator for up to 3 weeks.

Source: Ball Complete Book of Home Preserving, 2020, p. 344

Flavored Yogurt

Add fresh or canned fruit to the finished yogurt or flavor with a spoonful of jam or jelly when you serve it, if desired.

The longer you incubate the yogurt the more sour it will become. Let the yogurt cool before you move it around or stir it. It has to set up first or it will turn into a liquid.

Sourdough Bread Basics

Caring for your Starter and Making Bread

Traditional sourdough bread is made using a starter, which may be obtained from fellow bakers, purchased from food fermentation retailers, or made from 'scratch 'by mixing flour and water. Sourdough bread can safely be made at home, following best practices to cultivate a healthy and viable sourdough starter, or culture. Maintaining a sourdough starter involves managing an ecosystem of microscopic yeast and bacteria. The key to ensuring a healthy sourdough starter is controlling the factors which influence microbial survival and growth.

Sourdough Starter

Ingredients:
1/4 cup water (non-chlorinated)
1/4 cup all purpose organic flour, organic whole wheat flour, or a mixture of both flours.

Directions:
1. Add flour and water together in a small mixing bowl and stir until mixed well.
2. Leave mixture out at room temperature (ideally 70 degrees F) covered with a loose-fitting lid or towel.
3. Before feeding the starter, you need to remove and discard half of the starter. Do this each time that you feed the starter. Feed starter with 1 tablespoon of flour and 1 tablespoon of water in the morning and in the evening. Mix well to incorporate the new addition of flour and water.
4. You should start to see bubbles in the mixture in 3-5 days depending on the environment where you live. In 5 days, your starter should be active and ready to use.
5. If you don't think that you will be baking for a few days, you can store your starter in the refrigerator and feed weekly or store at room temperature and feed daily.

Adapted from : Source: https://breadlab.wsu.edu/sourdough-starter/

When making your own sourdough starter, keep the following best practices in mind:

1. **Use safe food-handling procedures.** Start with clean kitchen equipment and surfaces, and use quality ingredients. Wash hands before handling ingredients and equipment and at any time cleanliness is compromised. Limit airborne contaminants by keeping the starter loosely covered.

2. **Flour is a raw agricultural product. Flour itself is not a ready-to-eat food and should be cooked before consuming.** Flour could become contaminated at any point along the food chain, especially at home when handling. Do not taste raw sourdough starter before baking. Instead, a bubbly appearance, tangy smell, batter-like consistency, expansion, and records of preparation steps should be used to determine when your starter is ready. The fermentation process will acidify the starter, which helps prevent pathogen growth. The baking step will kill any bacteria present.
3. **Wild yeast is naturally on the flour and in the air.** Yeast does not need to be intentionally captured from the air, nor does commercial yeast need to be added when making a sourdough starter. These wild yeasts are inactive but under suitable conditions will become activated in the presence of water.
4. **Take care of your living starter.** The fermenting microorganisms in sourdough starter need to be fed fresh flour and water regularly to survive and grow. Regular removal of some starter is an important step when feeding, to stabilize the volume of microorganisms and ensure nourishment for metabolic processes. Refrigeration can be used to prolong time between feedings in an active starter but is not needed if feeding regularly. Sourdough starter can also be dried for long-term storage.
5. **Sourdough bread is made using a traditional fermentation process**, which relies on bacteria and yeasts to produce a compositional change from the initial ingredients into a living leavening.
6. **A vibrant sourdough culture will limit growth of harmful microbes and baking will ensure a safe final product. Fermenting sourdough starter simply using flour and water takes practice and patience!**
7. **Safety considerations for bread starter variations:** Amish Friendship Bread: Although rare, there have been incidents of food borne illness associated with friendship-style bread, which differs from traditional sourdough by addition of milk and sugar, and thus provides an environment which would support growth of harmful microorganisms. To limit introductions of harmful bacteria in friendship bread starter, use pasteurized milk or cultured (soured) dairy and ferment in a refrigerator, not at room temperature. No-Knead Bread Using Commercial Yeast: Another popular style of artisan bread baking uses the 'no-knead' method, whereby commercial yeast provides the leavening, rather than the traditional fermentation process of wild yeast and bacterial cultures. Because these breads do not produce acid development, the dough should never exceed two hours at room temperature and should be refrigerated for the remaining resting time.
8. **Contaminated starter should be discarded.** Sourdough starter that shows any sign of mold (colored and/or fuzzy) should NOT be used, and the container should be thoroughly cleaned and rinsed before starting over. Sourdough starter may develop a liquid layer that smells of alcohol, and this is fine. The liquid is a by-product of the fermenting yeast and can either be poured off or stirred in. A sourdough starter that is kept in the refrigerator and not fed regularly may develop whitish clumps on the surface of the liquid layer that are safe yeasts but not mold.

A benefit from maintaining a sourdough ecosystem is a ready leavening that will yield bread and baked goods with high quality sensory characteristics and nutrient profiles. The fermentation process transforms the initial grain, developing more readily digestible protein content, decreasing starch content, improving some mineral and vitamin availability, and often increasing overall palatability.

Source: https://foodsmartcolorado.colostate.edu/sourdough-basics-caring-for-your-starter-and-making-bread/

Maintaining the Starter

Note: Keep your starter covered in an air-tight container and refrigerated when not in use. Ideally, feed and use the starter weekly. Wide-mouth quart canning jars are popular for storing sourdough starters, though larger (2 quart) restaurant-type food storage containers may be better for minimizing messy overflow.

1. Remove starter from refrigerator and loosen lid. Let warm at room temperature for 1-2 hours.
2. Stir and remove all but 1/2 cup of starter from container. Set aside the 'removed' portion of starter to use for baking. If there is more removed starter than needed (1/2 cup is needed) the excess starter can be shared, frozen, used in other recipes, composted, or discarded.
3. Feed the 1/2 cup starter in the storage container by adding 1/2 cup warm or room temperature water and stirring slightly to blend. Gradually stir in 3/4 cup - 1 cup unbleached all-purpose, high protein (11-13%) flour to yield a very thick batter.
4. Scrape down sides of container with a clean rubber spatula.
5. Loosely cover the container and let starter ferment at room temperature until doubled (depending on room temperature, this can take from 5 - 8 hours). Place a dish under your container to catch possible overflow.
6. Once the starter has doubled and then collapses back to its initial level, cover the container tightly and store in the refrigerator, ideally using and feeding weekly. Before refrigerating, clean outside of container to remove any starter overflow.

Making Sourdough Bread **Yield: 2 medium loaves**

Ingredients:
1/2 cup starter
High protein, all-purpose unbleached flour
Water
1 1/2 - 2 teaspoons salt

Supplies for Making Sourdough Bread - mixing, proofing, and shaping
Quart jar or container with tight-fitting lid for maintaining and storing the starter in the refrigerator
1 large (8+ quart) mixing bowl to mix your dough by hand
Liquid and dry measuring cups
Plastic or silicone bowl scraper
2 medium (2.5 quart) mixing bowls to proof your dough
2 food-grade bags to cover the proofing bowls
Cutting board
Sharp knife or bread lame for scoring the loaves
Plastic wrap or large (18" x 24") food-safe storage bags (available from restaurant supply sources)

Directions:
1.**Feed the 'removed' starter to make a sponge:** Into a large glass measuring container, transfer 1/2 cup of the removed starter and with a sturdy spoon, stir in 1/2 cup warm or room temperature water followed by 3/4 - 1 cup high protein all-purpose unbleached flour to yield a very thick batter. This is the same proportion of starter, water and flour that was used above to feed the starter (about 1:1:2).
2. Cover the container loosely with plastic wrap or a food-grade bag and let ferment just until double (approximately 5 - 8 hours) at room temperature before continuing to make the dough. Place a dish under your container to catch possible overflow.
3. **Mix and knead the dough:** Transfer the fed and doubled sponge to a large mixing bowl and add 2 cups of warm or room temperature water. Stir with a whisk or sturdy spoon to combine.
4. Stir in 2-3 cups all purpose flour (or up to 50% whole grain flour) and beat for 100 - 200 strokes to strengthen and stretch gluten and decrease hand kneading time.
5. Stir in 1 1/2 - 2 teaspoons salt. If adding optional ingredients such as herbs, olives, nuts, or seeds, add at this time.
6. Gradually add the flour (1/2 - 1 cup at a time) stirring and then kneading by hand to create a soft and pliable dough. If the dough is still sticking to your hands, continue kneading and adding more flour (1/8-1/4 cup at a time).
7. Remove dough from mixing bowl and lightly oil the bowl. Place dough back in the bowl and flip to coat lightly with oil on top and bottom. Cover with plastic wrap or a large food grade bag that won't touch or impede the rise of the dough.
8. **Proof the dough:** Let dough rise at room temperature until double (about 2 - 3 hours, depending on your elevation). Alternatively, you can let the dough rise for 1 hour at room temperature, and then transfer it to the refrigerator for 8-24 hours to develop a more sour flavor and enhance the health benefits from longer fermentation. If dough is refrigerated, transfer it to room temperature to let warm for approximately 1-2 hours before shaping.
9. **Shape the dough:** Turn dough out onto a lightly floured, clean counter or cutting board. Divide into two equal portions.
10. Shape each piece into the desired loaf shape, stretching the dough toward the underside of the loaf until it feels taut, and the seams are secured underneath.
11. Place each piece of dough either (1) into medium-size (2.5 quart) mixing bowls lined with parchment paper (to transfer to preheated Dutch oven), or (2) greased or parchment paper-lined loaf or pie pans. Cover with plastic wrap or a food-grade plastic bag and let rise until double, 2-3 hours depending on your elevation.
12. **Bake:** About 20 - 30 minutes before the end of the final rising period, adjust an oven rack to the lower middle position, place Dutch ovens and their lids in the oven, and preheat to 450 degrees F. If you don't have a Dutch oven, sourdough bread can also be baked on a baking sheet or in a pie pan or loaf pan. It is not necessary to preheat these pans prior to baking. Adjust oven rack in the middle position. Preheat the oven to 425 degrees F. Place an empty oven-safe container (such as a cake pan) on the lower-most oven rack to serve as a steam pan.
13. Once oven is preheated, use a sharp knife or bread lame to make two 6 inch long and 1/2 inch deep slashes to the top of each loaf (or get creative and design your own set of cuts!) to foster controlled rising as gases escape during baking. Use oven mitts to remove preheated Dutch ovens and lids from the oven. Quickly and carefully transfer the dough from the bowls, holding by the edges of the parchment paper, into the hot pans. Place lids back on pans and return to oven. Use care as these pots will be **very**

hot. If baking in pie or loaf pans, simply place pans into the preheated oven. At the same time the loaves are being placed in the oven, add 1/2 - 1 cup boiling water to the steam pan. This step is not necessary if you are baking in a Dutch oven.
14. Bake loaves for approximately 35 - 45 minutes or until golden to dark brown and an internal temperature of 205 degrees F is reached. Use a food thermometer to check loaf temperature, and continue baking, if necessary. Tip: For a crustier, darker loaf, remove the Dutch oven lids during the final 5 - 10 minutes of baking.

(Adapted from: Source: https://foodsmartcolorado.colostate.edu/sourdough-basics-caring-for-your-starter-and-making-bread/)

Blueberry-Basil Vinegar **Yield: About ten 4-ounce jars or five 8-ounce jars**

Ingredients:
4 cups blueberries
4 cups white wine vinegar, divided
1 cup loosely packed basil leaves, crushed
Grated zest of 1 lemon

Directions:
1. In a large glass bowl, combine blueberries and **1 cup** of vinegar. Using a potato masher, lightly crush blueberries. Add remaining **3 cups** vinegar, crushed basil and lemon zest, stirring to combine. Cover tightly with plastic wrap and let stand in a dark, cool place (70 - 75 degrees F) for up to 4 weeks, stirring every 2 to 3 days. Taste weekly until desired strength is achieved.
2. 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.
3. Line a strainer with several layers of cheesecloth and place over a large stainless steel saucepan. Strain vinegar without squeezing cheesecloth and residue. Place saucepan over medium heat and heat vinegar to 180 degrees F.
4. Ladle hot vinegar into hot jars, leaving 1/4 inch headspace. Wipe the rim. Center lid on jar. Screw band down until resistance is met, then increase to fingertip-tight.
5. Process 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. When finished processing, for boiling-water canner, remove lid and wait 5 minutes; for steam canner, wait 3 minutes before removing lid. Remove jars from canner. Let cool, undisturbed, 12-24 hours and check for seals. Remove rings, clean, and label jars. Store sealed jars in a cool, dry, dark location.

*process for same times if using smaller 4 ounce jars

Variation: If you wish to keep fresh whole blueberries in the vinegar, add 1/4 cup fresh blueberries to the mixture before ladling into jars.
Tips: To crush basil leaves, place them in a mortar and, one layer at a time, brush with a pestle. When picking herbs from the garden to use in preserves, pick them early in the morning before they are warmed by the sun, for the most vibrant, fresh flavor. Cheesecloth can be found at many retailers, such

as grocery stores and other stores that carry kitchen supplies. Look in the area where kitchen utensils are located.

Source: Ball Complete Book of Home Preserving, 2020

Blueberry-Basil Dressing

Use this robust vinegar to make a delicious salad dressing that is lower in calories and fat than store-bought versions.

Ingredients:

1 clove garlic
1 tablespoon chopped fresh basil
2 tablespoons Blueberry-Basil vinegar
2 tablespoons olive oil
1 teaspoon Dijon mustard
1 teaspoon granulated sugar
Zest of 1/2 of a lemon

Directions: In a blender or a food processor fitted with a metal blade, combine all ingredients and process until smooth. Drizzle over a bed of spinach for a light and healthy salad.

Source: Ball Complete Book of Home Preserving, 2020

Strawberry Vinaigrette **Yield: 6 half pint jars**

Ingredients:

5 quarts (25 cups) fresh whole strawberries, washed and stemmed
1 quart (4 cups) white distilled vinegar (5% acidity)
Sugar equal to strawberry vinegar per directions

Directions:

1. Place strawberries in a large stainless steel saucepan or plastic container. Pour vinegar over strawberries. Cover container tightly with plastic wrap and let stand overnight in a dark, cool place (70 - 75 degrees F).
2. Prepare boiling water canner or Atmospheric Steam Canner. Heat jars. Wash lids in warm soapy water and set bands aside.
3. Strain liquid from strawberries, collecting liquid in a large liquid measure. Liquid should be red and clear (no pulp). Measure liquid.
4. Place strawberry vinegar in a clean, large stainless steel saucepan. Add an equal amount of sugar, stirring to combine. Bring mixture just to a boil. Remove from heat and skim foam if necessary.
5. Ladle hot vinaigrette into a hot jar leaving 1/4 inch headspace. Remove air bubbles. Wipe jar rim. Center lid on jar and apply band, adjust to fingertip tight. Place jar in canner. Repeat until all jars are filled.
6. Process half pint jars for 10 minutes, adjusting for altitude. 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. When finished processing, for boiling-water canner, remove lid and wait 5 minutes; for steam canner, wait 3 minutes before removing lid. Remove jars from canner. Let cool, undisturbed, 12-24 hours and check for seals. Remove rings, clean, and label jars. Store sealed jars in a cool, dry, dark location.

Source: Adapted from https://www.ballmasonjars.com/blog?cid=Strawberry-Vinaigretty-Dressing

Food Safety Basics

Wash Hands Frequently
- Personal cleanliness is a must.. Wash your hands thoroughly and frequently. *E. coli* resides in the human nose and intestines. Wash your hands if you rub your nose, or if you wipe your face or skin.
- Bandage any cuts or burns on hands before handling food, or use disposable gloves.

Avoid Cross-Contamination
- Wash all fresh fruits and vegetables well under running water before preparing or eating them.
- Always wash your hands, knives, cutting boards, and food preparation surfaces well with hot soapy water before and after any contact with raw meat, fish, or poultry.
- Run sponges through the dishwasher several times a week. Change dishcloths daily.
- Use paper towels to mop up spilled juices from meat, fish or poultry.
- Use a disinfecting solution of 1 1/2 teaspoons of chlorine bleach to 1 pint of water. Dispense with a spray bottle to disinfect countertops, cutting surfaces, sinks, etc. Make a new solution weekly as the bleach loses its efficacy over time.

When in doubt, throw it out!
- Never taste food that looks or smells strange to see if it can still be used.
- Most bacteria that cause food borne illness are odorless, colorless, and tasteless.

Prevent botulism by following a reputable recipe
- There must be a minimum, uniform level of acid throughout the mixed product to prevent the growth of botulinum bacteria.
- Use a current recipe from one of the sources listed at the end of this publication. Grandma's recipe may not use the correct proportions of water and vinegar, or may have assumed a higher level of acidity in the vinegar.

Canning Basics

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, beans 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 acidity, oxygen, dryness, and low/high heat), the bacterial cell forms a protective structure

called a spore. It takes a higher temperature than boiling to destroy the spores: 240 - 250 degrees F. If you do not destroy the spores in low acid canned 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 putting hot food in hot jars, sealing it with a lid and then not processing it in a canner.)

Raw-Pack vs. Hot-Pack Methods

Filling jars with raw, unheated food prior to heat processing is called the raw-pack method. The preferred method, filling jars with preheated, hot food prior to heat processing, is called the hot-pack method. Benefits include a tighter pack and, because food expels air when heated, less float.

Jars

Check jars, lids and bands for high quality. Wash jars, lids and bands in hot, soapy water. Rinse well. Dry bands. Heat home canning jars in hot water, not boiling, until ready to use. Fill a large saucepan or stockpot half-way with water. You may also place them in your canner. Place jars in water (filling jars with water from the saucepan will prevent flotation of jars). Bring to a simmer over medium heat. Keep jars hot until ready for use. You may also use a dishwasher to wash and heat jars. Keeping jars hot prevents them from breaking when hot food is added. Leave lids and bands at room temperature for easy handling.

Headspace

Headspace is the completely empty space left in the jar underneath the lid and above the food. Headspace allows for food to expand during canning without being forced out from under the lid during processing. Recommended amounts also allow for good vacuums to be formed for holding lids in place and good food quality to be maintained during storage.

Resources

National Center for Home Food Preservation: http://nchfp.uga.edu/
Core Canning Techniques: https://ucanr.edu/sites/mfp_of_cs/files/387202.pdf
USDA Complete Guide to Home Canning, 2015
So Easy to Preserve, Cooperative Extension, University of Georgia, 2015:
https://www.fcs.uga.edu/extension/so-easy-to-preserve)
Ball Complete Book of Home Preserving, 2020
Washington State University Pub FS173E