NB Community Harvest Gardens inc.

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Canning Workshop

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Fredericton Public Library
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FOUR WAYS TO PRESERVE FOOD

1) HEAT

The easiest way to destroy micro-organisms present in food is to heat the food. Processing is the word traditionally used when filled jars of food are heated to specific temperatures for specific lengths of time. The times and temperatures required depend on the density of the food and the size of the jar.

All molds, yeasts and most bacteria are destroyed at the temperature of boiling water. However, some bacteria, such as *Clostridium botulinum*, can form spores that withstand very high temperatures. Therefore, although this bacteria is destroyed by boiling water temperatures, its spores may survive. These spores develop into bacteria that are able to grow in an airtight environment (such as a canning jar) and produce a poisonous toxin causing botulism. Fortunately these bacteria cannot grow in the presence of acids such as vinegar or lemon juice.

2) ACID

For preserving purposes, food can be divided into two categories:

High-Acid Foods are sufficiently acidic to prevent the growth of any spores that survive boiling-water processing. Most fruits, some vegetables and some tomatoes are high–acid foods. They can be processed at the lower temperatures reached with a boiling-water canner.

Low-Acid Foods are not sufficiently acidic to inhibit the growth of bacteria spores that can survive boiling-water temperatures. The food must be preserved by processing in a pressure canner which reaches much higher temperatures than can be achieved with boiling-water methods. Pressure canning is used to process the canned foods we buy.

Fortunately, there are some low-acid foods that can be safely preserved at boiling-water temperatures by adding acid. This is the secret of pickling. If the acid in a food is strong enough, most micro-organisms cannot grow. Familiar acids used in this process are many types of vinegars and lemon juice. Thus, it is essential to measure the ingredients accurately and not alter either the amount of acid or the amount of vegetable.

A few micro-organisms are able to grow at high acid concentration. Therefore, it is now recommended that all pickled foods be processed in a boiling-water canner for short periods of time.

3) SUGAR

Sugar present in high concentrations traps water in food, creating an environment where micro-organisms cannot grow. Jams and jellies are preserved in this way. Molds and some yeasts can grow on the surface of such foods, but only in the presence of air. An airtight seal achieved from heat processing prevents the growth of such molds and yeasts.

4) FREEZING

Freezing stores food at such low temperatures that no micro-organism growth can occur. However, some enzyme activity can still go on in frozen vegetables, giving “off"-flavors. To prevent this, vegetables are generally blanched briefly before freezing. Fruits may be frozen in their raw state. Several jams, spreads and curds are frozen to extend their storage.

POSSIBLE CAUSES FOR SEAL FAILURE OR SPOILED FOOD

- Food was not processed in the canner for the correct time. It is important to start counting processing time just after the water in the canner ***returns to a boil*.**
- Processing time was not adjusted for altitude.
- New sealing lids were not used or were not softened in hot water.
- Screw bands were put on too tight or were re-tightened after processing.
- Too much or insufficient head space was left in the jar.
- The jar was cracked before, during or after processing. Cracking during processing could result from adding cold water to a canner or filled jars, placing hot jars on a cold surface or using jars not designed to withstand boiling water temperatures.
- The quantity of ingredients called for in the recipe were not measured accurately.
- The vinegar was not of the standard 5% acetic acid. Always use vinegars of known acidity for canning purposes.

EASY STEP-BY-STEP PRESERVING

1. Food Selection and Preparation

The best preserves result from using the best ingredients. Use produce that is as fresh as possible and at the peak of quality. Most vegetables should be used as soon as possible, but some fruits may require further ripening. Many tender fruits are picked before they are fully ripe, so wait a day or so until their full flavor has developed. However, most fruits are best for preserving when they are slightly under-ripe.

Wash the food thoroughly to remove surface dirt and any traces of chemicals. Discard any bruised or moldy fruit since micro-organisms may have started to grow. Fruit with other surface blemishes or imperfections is fine to use. Next read through the recipe and set out the ingredients. Remember to measure accurately.

2. Equipment Preparation

For smaller jars (1 cup/250 ml), place in boiling-water canner. Add hot water to jars and canner until the water level reaches the top of the jars. For larger jars, add water to the jars and canner until the jars are about two-thirds full. Cover the canner and place over medium heat until the water is hot but not boiling. The jars do not need to be sterilized before processing, but they should be kept hot until they are filled. (Sterilization of the jars in boiling water is unnecessary as the boiling-water temperatures during the processing time will destroy any micro-organisms in the food as well as on the jars and lids.) If you live in any area with hard water, add a bit of vinegar to the water to prevent a film forming on the jars. It is helpful to have an extra kettle of boiling water at hand in case the water level needs to be topped up after the filled jars are placed in the canner.

Place the lids, but not the screw bands, in hot water for 5 minutes immediately before using. This softens the sealing compound on the lids so that an airtight seal is formed. The screw bands should be at room temperature.

3. Filling Canning Jars

The processing time given in our recipes is based on the food being hot when it is put into the jars. It is important that the jars be processed immediately following the cooking stage. Remove each jar from canner as needed. A clean wide-mouth funnel is helpful to avoid spills when filling jars. Food may be ladled into the jar or poured using a small pitcher or measuring cup.

Leave a headspace to allow for expansion of food during processing. For most foods, a headspace of ½ inch (1 cm) is needed, although the headspace may be a little as ¼ inch (5 mm) for sweet spreads. If the jars are too full, the food may boil out and interfere with the formation of the seal. Too much headspace may result in the jar not sealing since the processing time is too short to drive out the extra air. We find it easiest to get in the habit of allowing ½ inch (1 cm) for all foods being processed.

Before placing a lid on the jar, be sure to remove air trapped between pieces of food. Any air bubbles can be released by sliding a clean small wooden or plastic spatula between the food and the jar and gently moving the food. The bubble should rise to the top. Failure to remove this trapped air can cause seal failure and may affect the colour and storage quality of your preserved food. After releasing the trapped air, top up the liquid level if necessary by adding more food or liquid. Then wipe the rim and side of the jar with a clean cloth to remove any stickiness that could interfere with the formation of the vacuum seal.

Remove a lid from the hot water and centre it on the jar rim. Buy a magnetic lid lifter or glue a small magnet to the end of the wooden dowel rod to lift lids from the hot water. Then apply the screw band just until it is fingertip tight. Use only your fingertips! During processing, the air in the jar expends and is vented under the lid. When the jar cools, the air contracts and the lid "snaps" down, creating an airtight vacuum seal. If the lid is too tight, air cannot escape from the jar, possibly resulting in a failed seal.

4. Processing Canning Jars

Heating filled jars of food in boiling water for a specified time is called processing. Place the jars of filled food on the rack of a canner containing hot water. Adjust the water level to cover the jars by approximately 1 inch (2.5 cm). Cover the canner and bring water to a boil. Start counting the processing time called for in the recipe when the water has come to a **steady boil.** A kitchen timer is helpful for this. The water must remain at a full boil for the duration of the processing time. The processing time for each food is based on the size of the jar and the density and composition of the food, so follow times exactly. Under–processing can result in spoiled or off-flavored food and over-processing may overcook the food.

If you live at altitudes higher than 1,000 feet (305 m), longer processing times are needed. At higher altitudes water boils at a lower temperature. So it is necessary to increase processing time if you live at higher elevations. Adjust the time as follows:

- Elevations between 1,000 and 3,000 feet (305 and 915 m):NB to the top of Mt Carleton
  Add 5 minutes to the processing time given in the recipe.

When the processing is finished, turn off the heat and remove the lid from the canner. Allow jars to remain in the water for 5 minutes to stabilize the pressure inside the jars. After 5 minutes remove the jars from the canner. Use a jar lifter or lift the rack or lift the rack from the water by its handles. Be sure not to tilt the jar to prevent the contents from running under the lid. Transfer the jars to a wooden cutting board or a surface covered with several layers of towels or newspaper. Do not place jars on a cold hard surface or they may break.

Do not dry jars or tighten the seal. Any water on top of jars will evaporate during the cooling period. Let the jars cool, undisturbed for 12 to 24 hours. Then check the seal. It is easy to tell if the jars are sealed as the metal lids curve downwards. (You can refrigerate any jars that are not sealed and use the contents for up to three weeks.) Remove the screw bands, dry them and store separately. If you prefer, replace them loosely on the jar. The bands are not necessary for storage because the firm seal achieved by the preserving process is strong enough to keep the jar airtight.

5. Storing Preserved Food

When the jars are cool and you have checked the seals, attach labels with contents and date. Preserved foods are best kept in a dark, cool place. Light may cause food to darken and a heat source, such as hot pipes, a furnace or stove, may hasten the loss of quality. A dark closet or a storage area in the basement is ideal.(Note not in a wet basement !)

If recipes and canning procedures are followed carefully, there should be no problem with spoilage. However, before you open a jar of preserved food, it is a good idea to look closely for any sign of spoilage like a bulging lid or any leakage. The lid should be tight and give resistance when opened. If the lid is loose, or if the food has any off-flavors or mold on the surface, the food must be discarded. **Don't take any chances.** Plan to use the preserved foods within a year. As long as the seal is secure, there is no risk of spoilage for a much longer time, but the quality of the food will deteriorate with extended storage.

EASY SPICED PICKLED BEETS

Pickled beets have long been a favourite. Tiny beets are the most attractive, but larger ones cut into pieces are just as delicious.

8 - 15	fresh beets (about 2 lbs/1 kg)
2 cups	granulated sugar (AJ I use 1 cup – this is plenty sweet enough for us!)
2 cups	white vinegar or a mix of malt, apple cider and white
1/3 cup	water or beet juice
10	whole cloves
1 tsp	Allspice
2	cinnamon sticks, about 4 inches (10 cm) long or 2 tsp cinnamon
2 tsp	pickling salt (coarse or kosher salt)
1	bay leaf

1. Trim beets, leaving 1 inch (2.5 cm) of stem and tap root attached. Place in a large saucepan and cover with water. Bring to a boil over high heat, reduce heat, cover and simmer for 15 to 45 minutes or until tender. Drain and rinse under cold water. Remove skins and cut beets into large pieces. (Use gloves or you will get purple hands!)
2. Combine sugar, vinegar, allspice, cinnamon, bay leaf and salt to water in a large saucepan. Bring to a boil over high heat, stirring occasionally.
3. Remove hot jars from canner and pack beet pieces into jars.
4. Pour hot liquid over beets to within ½ inch of rim (headspace). Process 10 minutes for 2 cup (500 ml) jars and 15minutes for 4 cup (1 L) jars. Makes 4x 2 cup (500 ml) jars

Variation:
For an interesting variation, add ¼ tsp (1 ml) hot pepper flakes to each jar.
For a less sweet taste , add thinly sliced onions in layers with the beets before adding the sauce.

AUTUMN (FALL) FRUIT JAM

Plums, apples and pears are all in season at the same time. Together they make a jam that reflects the luscious essence of early fall fruits. The high pectin content of plums and apples compensates for the low pectin in pears to produce a well-set jam.

5	large plums, sliced and de-stoned
3	medium apples, peeled, cored and chopped
2	medium pears, peeled, cored and chopped
1 cup	water
2 tsp	grated lemon rind
2 tbsp	lemon juice
3 cups	granulated sugar
½ tsp	each, ground cinnamon, ginger, cardamom (optional)

1. Combine plums, apples, pears, water, lemon rind and lemon juice in a large stainless steel or enamel saucepan. Bring to a boil over high heat, cover, reduce heat and cook for 10 minutes or until fruit is softened.
2. Add sugar to fruit and return to a boil, stirring constantly until sugar is dissolved. Boil rapidly, uncovered, until mixture will form a gel*, about 30 minutes, stirring occasionally. Stir in cinnamon and ginger
3. Ladle into hot jars and process for 10 minutes. Makes 4 cups (or 250 ml jars)

Variations:
Replace cinnamon and ginger with 1 tbsp (15ml) vanilla extract added to cooked jam just before bottling.

NECTARINE PLUM APPLE JAM

Use 4 nectarines, peeled and chopped instead of pears.
Pears can be replaced with high bush cranberry pulp – boil 2 cups fruit, allow to cool slightly and strain through muslin or a strainer. Add the pulp/juice to the plum and apple mix. Continue from 2 above.
Check setting by placing a teaspoon full on a saucer in a deep freeze, it should go solid within 2 minutes and if tipped sideways no should not run to the side of the saucer, quickly. Instead it should form a wrinkled blob that moves slowly.