

Focus on Food Safety When Making Maple Syrup

Making maple syrup is a time-honored tradition in many parts of Wisconsin, and it is as much of an art as a science. Even though sap does run in other trees such as birch and elm in early spring, maples produce more and sweeter sap than any other tree.

Sap collection. Once trees are tapped, a collecting container is placed at the site to catch the



sap as it flows. A major goal in maple production is to gather and process the sap as quickly as possible. To minimize microbial growth, particularly during warm periods, sap should normally spend no more than a few hours in the collecting container. Buckets are the most common collecting container and 16 quart galvanized buckets are most commonly used. However, sap buckets made from other materials, particularly aluminum, and of different sizes are available. The historic popularity of galvanized buckets is related, at least in part, to their relatively low cost and perceived germicidal properties. It was believed by some that the minute quantity of zinc that was dissolved from the galvanized coating by the sap tended to reduce microbial growth. If so, this germicidal effect is nullified if the zinc

coating is overlaid with a film formed from the sap.

As a general rule, only buckets specifically manufactured for maple collection should be used. Certainly no container containing lead, lead-containing paint, or lead solder should be used. No container capable of rusting should be used, and containers with thin galvanized coatings should be avoided as the coatings may quickly wear exposing a surface which will rust. Under no circumstances should a container which has ever contained a hazardous material be used.

Sap buckets of different sizes are available. Caution should be exercised, however, in selecting small buckets as they may not have adequate volume to hold large runs and will require more frequent emptying. Large buckets, in the 20 quart range, are occasionally used in "cold" sugar groves (high altitude, north-facing slopes) where the cold temperatures and ice accumulation in the buckets may permit less frequent gathering.

The state-of-the-art maple sap collection system is a plastic tubing system. The plastic tubing allows sap to flow from each tree into a central collection point, ideally in the sugar house. To maintain a clean collection system which is necessary for the production of high-volume and quality sap it is necessary to wash the tubing system as soon as possible at the end of each season. Washing removes any uncollected sap from the lines and reduces the likelihood of fungal growth occurring which could slow sap flow and lower sap quality.

Evaporation. Once the sap is collected, it is boiled to remove water and concentrate the syrup. During the evaporation process, sap is concentrated to the desired density and flavor and color develops as a result of chemical reactions that occur during heating. The extent and character of the color and flavor are determined, in part, by the length of time the sap is boiled. The longer the sap is boiled, the darker it becomes. Making high-quality, light-colored syrup requires evaporation time be kept to a minimum. Anything that slows the evaporation process (uneven fire, weak fire, excessive sap depth in evaporator, etc.) will produce darker, usually stronger flavored syrup. It may take 43 or more gallons of sap to produce one gallon of syrup.

Traditionally, maple evaporator sap and syrup pans, along with some other equipment with metal seams such as finishing pans, have been assembled using solder. Producers purchasing

new or replacement evaporator pans or other equipment with metal seams are strongly encouraged to obtain equipment with welded seams or seams assembled with lead-free solder. Equipment assembled with lead-free solder should bear a sticker stating that it was assembled using lead-free solder.

Hot packing. Once maple sap has been processed into maple syrup and the correct density is obtained, the syrup is ready for filtering and packing. Syrup is best filtered while it is still hot (185° to 190° F) for rapid removal of sediment. To prevent contamination of finished syrup by yeast or mold growth, finished syrup should be hot packed. Syrup can be hot-packed into large drums or cans, or into retail/ home-sized containers. Regardless of the type of container, syrup should be packed into clean, preferably sanitized containers. Small containers can be sanitized by boiling for 10 minutes in water. Because filling into any kind of container, sterilized or not, may cause contamination, containers hot-filled with syrup should be inverted immediately after being hot-filled and sealed.

If the temperature of the syrup following filtering is 180°F or higher, it can be packed immediately. However, if the temperature has fallen below 180°F, it should be reheated to this temperature or slightly higher. If syrup is heated above 200°F it may darken, and a lower grade product will result.

Metal cans represent maple syrup packed in the most traditional manner. If you choose to use metal containers, make sure they are clean and very dry before filling. Glass containers may be preferred because they permit the natural color of the syrup to be seen. Glass, like all containers should be stored in an inverted position before filling to avoid possible contamination.

Food-grade plastic containers have become more popular in recent years. They are available in a wide variety of sizes and have the advantage of being rust-proof and resistant to breakage. Color changes may, however, occur in syrup stored in standard plastic containers for a prolonged period. For this reason, to avoid possible grade change, syrup offered in these plastic containers should not be packed for periods longer than 3 months before the anticipated sale date. Coated plastic containers that are nonporous to air can be used to store syrup for extended periods of time.

Storage and handling. Once containers are filled with syrup, they should be cooled before they are boxed and packed close together. Cooling will be more rapid, and the quality of the product will be maintained, if air can circulate around containers as they are cooling.

Pure maple syrup should be kept in a cool, dark place for up to two years until opened and then refrigerated after opening where it will last one year. Since pure maple syrup will not freeze if properly made, the freezer is a good place to store it almost indefinitely. If excess water is present or if containers are not clean when filled, there may be the growth of bacteria, yeast or mold during storage. Because some microorganisms produce toxins as they grow, it is not recommended that mold simply be removed and the product heated; but rather the product should be discarded. For maximum flavor, bring maple syrup to room temperature or warm it before serving. The microwave works well for warming maple syrup. Use a microwave-safe container and heat on high from 30 to 60 seconds per 1/2 cup, depending on how cold it is and the power level of your microwave.

For a guide to making maple syrup at home, view the Ohio State publication *Hobby Maple Syrup* production available online <http://ohioline.osu.edu/for-fact/0036.html> revised January 2007.