

## 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.

**Use buckets specifically manufactured for maple collection. Do not use** any container containing **lead**, lead-containing paint, or lead solder. **Do not use** any container capable of **rusting** and avoid containers with thin galvanized coatings; the coatings may quickly wear, exposing a surface which will rust. **Never use or re-purpose** a container which has ever contained a hazardous material, such as pesticide.

Sap buckets of different sizes are available. **Small buckets are easy to handle** but may be too small to hold large sap runs, requiring more frequent emptying. **Large buckets**, in the 20-quart range, are occasionally used in "cold" sugar groves (high altitude, north-facing slopes) where sap is collected less frequently due to cold temperatures and a slower sap-rise.

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** for manufacture of high-volume and quality sap, **wash and sanitize** the tubing system at the end of each season. Washing removes any uncollected sap from the lines and sanitizing reduces the likelihood of fungal growth that would clog tubing and lower next season's 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 and the stronger the flavor.** Making light-colored syrup requires a short evaporation time. 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.**

**Avoid lead solder.** 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 cleaned and 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 for 1-2 minutes immediately after being hot-filled and sealed.** Turn containers right-side-up for cooling.

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.

**Maple syrup can be filled into metal, glass, or food-grade plastic containers. 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 make an attractive package because they permit the natural color of the syrup to be seen. **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. **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 a quality product, be sure to use within 2 years. Refrigerate after opening. 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. If spoilage develops, discard the product. For maximum flavor, bring maple syrup to room temperature or warm it before serving.

The North American Maple Syrup Producers Manual is available for purchase from Ohio State University: <https://extensionpubs.osu.edu/north-american-maple-syrup-producers-manual-pdf/>

Other resources:

- How to Tap Maple Trees and Make Maple Syrup (University of Maine) <https://extension.umaine.edu/publications/7036e/>
- Maple Syrup Best Management Practices (University of Massachusetts) [https://ag.umass.edu/sites/ag.umass.edu/files/pdf-doc-ppt/maple\\_bmp\\_final\\_0.pdf](https://ag.umass.edu/sites/ag.umass.edu/files/pdf-doc-ppt/maple_bmp_final_0.pdf)
- **International Grade Standards for Pure Maple Syrup** <http://www.wismaple.org/resources/international-grading-system/>