All maple syrup is not created equal. The flavors of maple syrup vary significantly from producer to producer, from various production systems, from different production areas, from year to year with a single producer and even from specific woodlots. One only needs to serve as a maple syrup judge at a fair or maple meeting to experience the range of flavor diversity. These flavor distinctions can be part of developing customer loyalty as they find that another producer’s syrup is “just not the same”. Sometimes the flavors are less pleasing and this can lead to difficulty keeping customers. Noticeable and even severe flavor problems can often be identified and the cause corrected. The recognition of off flavors and the severity of those flavors is part of the rules and regulations for grading maple products in New York State.

The New York State Agriculture and Markets Circular 947 “Manufacture, Distribution and Sale of Maple Syrup and Sugar” quite broadly describes how off flavors influence the syrup grade. The rules define several flavor related terms. First, “damage” means any defect that materially affects the appearance, edibility or shipping quality of the syrup or sugar. Second, “serious damage” means any defect that seriously affects the edibility or market value of the syrup. Badly scorched syrup, buddy syrup, fermented syrup, or syrup that has any distasteful foreign flavor or disagreeable odor shall be considered seriously damaged. Third, “buddy flavor or buddiness” is an unpleasant flavor characteristic of syrup or sugar made from sap collected from maple trees as they come out of dormancy. For syrup to be labeled as Grade A for table use it must have good flavor and odor, be practically free from damage and practically clear. No serious damage or buddiness is acceptable. The rule also states that the syrup shall have a good maple flavor characteristic of the color. For syrup to be labeled as Grade B for reprocessing or “Extra Dark for Cooking” it must have fairly good characteristic maple flavor, shall be fairly free from damage, fairly clear, and free from serious damage. In other words a syrup that has a clearly identifiable off flavor would not be legally marketable as either Grade A or Grade B and could only be sold in bulk as substandard.

Henry Marckres with the Vermont Agency of Agriculture, Food and Markets has pulled together some excellent information on maple syrup off-flavors, their likely causes, and tips to avoid these problems. The following information has been edited from material he has written.

Chlorine (Sodium) – A solution of chlorine and water has often been used to clean sap tubing systems and storage tanks. When these systems were not fully rinsed afterward it would leave a residue inside the tubing. Sap running the next season would “scrub” the tubing, putting varying amounts of sodium into the finished syrup. A chlorine off-flavor often destroys the maple flavor and may have a salty flavor.

Detergents – The only detergents that should be used in syrup production are ones that are approved for food use. Producers have often used products that are designed for home use, damaging the flavor of the finished product. A detergent flavor in syrup may taste soapy, or have a perfume odor or flavor, depending on the type of detergent used and how much rinsing was done.

Paints – In the past, many producers painted the inside of galvanized sap buckets and holding tanks to prolong their useable life. Often these paints contained a fish oil base. This type of paint should never be used on any surface that is in direct contact with sap or syrup. The flavor derived from this material may have an oily taste. It is especially prevalent if the paint was not cured completely before using the bucket or tank.

Metallic – This off-flavor usually is the result of prolonged storage in metal syrup cans or storing bulk syrup in poor quality metal barrels. Always check the interior condition of galvanized and epoxy coated barrels and do not use any with obvious rust or cracked epoxy. The recommendation for metal syrup cans is to only pack what will be sold in a three-month period. If the exposure has been prolonged, the product may have a greenish tinge to it and it may taste "tinny".

Plastic – The type of material that causes this off-flavor is most often a nonfood grade plastic or a plastic not meant for exposure to hot syrup. Using the wrong type of pail to move syrup from the evaporator to the filter or packaging syrup in containers not designed for hot filling creates a bitter flavor or a flavor that tastes the way some plastics smell.

Filters – There are several off-flavors that can be attributed to the way filters are manufactured or the methods used to clean and store them. New filters: These are the type of filters that use the weight of the syrup to filter, usually a cone type or flat filter. During the manufacturing process, these filters pick up and retain a slight chemical odor and flavor. Before use, they should be boiled in clear water and dried thoroughly. If not, they impart a chemical
flavor to the syrup. Previously used filters: Once used, filters should never be washed with any detergent, as they may pick up detergent residue in the fibers. After the season is over, filters should be washed in water and dried thoroughly before storing in a dry location free of contaminating odors. Filters not dried thoroughly will mold, creating musty off-flavor when hot syrup is filtered through them the next season. Never store filters with mothballs, as this will create a chemical off-flavor.

Defoamers – Many different products are used to reduce the foaming of the boiling sap during evaporation. Commercially available vegetable fat derivatives, either liquid or powdered, butter, milk, or vegetable oil is often used. Only a small amount is needed to control foaming and using too much will create an off-flavor in the syrup. A defoamer off-flavor may taste like whatever was used for a defoamer or have a rancid taste.

Chemicals – The technology used in producing syrup today often requires the use of powerful cleaners and preservatives. It is very important to follow the manufacturer's recommendations carefully and rinse thoroughly before continued use. The off-flavor usually relates to the smell of the chemical used.

Lubricants and Fuels – Care should be taken to avoid contamination of the sap or syrup from exhaust fumes or improperly operating equipment. Also, only food grade lubricants should be used in any pumps or equipment that comes in contact with sap or syrup. Off-flavors attributed to this type of contamination will taste and smell just like the contaminant smells.

Musty – This off-flavor can become present in the syrup in two ways - from putting hot syrup through filters that contain mold or from poorly sealed containers. The musty off-flavor tastes yeasty or moldy and usually has a moldy odor.

Ferment – Fermented syrup usually develops from one of two problems with the product. If syrup has not been boiled enough to concentrate the correct amount of sugar, then the syrup may work like apple cider. At times, we find correct density syrup fermented and that is usually from syrup stored in barrels that have not been properly cleaned. Even barrels that have been previously steam cleaned may have moisture in them that have revealed yeast, mold, and bacteria in great numbers. Syrup that is fermented will have a sickening sweet flavor, at times a honey like similarity. Depending on the type of ferment, it may have an alcoholic or fruity taste. Severe ferment may have a foamy appearance.

Sour Sap – As the weather warms near the end of the sugaring season, sap left in a tank begins to warm, basically beginning to spoil the sap. Syrup made from this sap has a ropy appearance when poured. The flavor is very sour.

Burnt Niter – When sap is boiled, minerals that are in the raw sap precipitate out of the solution and form niter that collects in the compartment in the front pan where the syrup is being drawn off. To prevent this from becoming a problem, the producer switches draw-off sides as needed, or changes front pans if the evaporator is constructed in that manner. If this is not done, a build up occurs in the pan, creating a combination off-flavor. The syrup will have a burned taste from the niter rising off the front pan and the syrup burning, and it will also have a niter flavor, which has a slightly fizzy affect like baking soda on the tongue.

Scorch – This off-flavor is a burned flavor in the syrup. Operating the evaporator with too low a level of product in the front pan actually burns the syrup.

Earthy flavor – Tapping into punky wood, dark colored or stained areas in the tree, or cracked wood produces syrup with this off-flavor. The flavor tastes and smells like garden soil. Care should be taken while tapping to avoid the potential for this problem.

Metabolism – This is an off-flavor that is attributed to changes in the metabolism of the tree due to a warming of temperatures. This can be present at any time during the sugaring season, from the first run on. A metabolism off-flavor robs the product of most of its maple flavor. The resulting flavor has been described as woody, peanut butter, or popcorn. An almost cardboard like flavor may be present. A chocolaty smell may be detected.

Buddy – Buddy syrup is usually produced during the late season, depending on the weather conditions present. The tree begins to produce buds, and the sap takes on a distinctive quality that is transferred into the syrup. Buddy syrup usually tastes chocolatey, almost a tootsie roll type flavor. If very strong, it may take on a bitter chocolate characteristic.

At the New England Grading School we had the opportunity to sample many of the off flavors known to damage the maple syrup flavor. Learning to identify these off flavors should be helpful to recognize the likely source of a production problem. I would like to conduct similar schools in New York in the future but to be effective I need to have samples of off flavored syrups. I would love to accept donations of a gallon or less from any producer with some off flavor batches available. I’m not suggesting anyone purposely make some off flavor syrups but I would be grateful for any sample you might be willing to donate.