

## Off-flavors in maple syrup: metabolism

By TIMOTHY D. PERKINS, ABBY VAN DEN BERG and MARK L. ISSELHARDT  
*University of Vermont  
Proctor Maple Research Center*

Maple syrup is sold primarily because it usually has a great flavor that appeals to consumers. As producers however, we recognize that off-flavors can occa-

sionally appear in maple syrup. Diagnosing, finding the sources, and eliminating an off-flavor can often be quite challenging.

Detecting off-flavors can be more challenging during a long day of production or as the season nears the end (which is often when some particular off-flavor

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issues arise) and off-flavors can be somewhat masked by the natural strong flavor of late-season syrup.

To ensure that consumers are getting the best possible product (we do want them to return for more after all), maple producers should be very careful to assess the flavor of the syrup they make by tasting it during all phases of manufacturing, especially immediately prior to packing.

Sometimes setting aside flavor grading syrup that may possess an off flavor until the day after production can be helpful. It is also a good idea to have several people taste the syrup to ensure it has good flavor characteristics.

One off-flavor that we have been hearing early reports of in several areas for the 2015 season and which is especially troubling is called "metabolism", also referred to as "woody" or sometimes called "earthy".

Although it is frequently confused with the late-season off-flavor called "buddy", it is a distinctly different off-flavor with a completely different (but distantly related) cause than buddy.

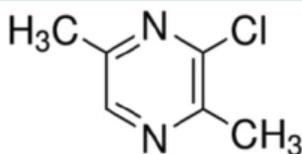
#### Off-flavor smell, taste varies

Metabolism off-flavor may present as being like wet cardboard, a woody taste, or like popcorn, and frequently has a vague chocolate-like smell.

The odor and flavor can vary in intensity from very mild to highly concentrated. There appears to be varying sensitivities to this off-flavor, with some people finding even a tiny amount of it to be strongly objectionable, while other people might find the flavor to be unusual, but not particularly bad (note that this doesn't necessarily mean they find it to be a "good" flavor, just less



A BARREL TOP of off-condition syrup at a Midwest packing facility. The market is shrinking for off-condition syrups and bulk buyers are discouraging producers from bringing them any.



FOR MORE INFO

#### Off-flavor

For more information about metabolism off-flavor and possible remediation approaches visit the University of Vermont Proctor Maple Research Center publications website at <http://www.uvm.edu/~pmrc/?Page=publications.html>

objectionable).

Metabolism often occurs in the early-season, and can be found in all color grades of

syrup, although it is frequently strongest in light-colored syrup produced from the first few runs of sap. Some sugarbushes seem to be more prone to the problem and experience a small amount of it each year.

In other years the off-flavor is widespread and occurs over broad regions of the maple-producing area. It seems to be more frequently associated with winters in which there are few or no thaw-periods (like the winter of 2014-2015), which might allow the amino-acid precursors to dissipate.

In some cases metabolism will not be noticed during production, but will be very apparent when a barrel is opened and reheated for packing.

The class of compounds implicated in the metabolism off-flavor are called pyrazines. These are naturally-occurring substances that arise from reactions between amino acids and sugars during processing.

One type, 2,5-dimethylpyrazine, is

found in relatively high concentrations of affected syrup. Unfortunately the threshold taste level for this compound is very low, so that even very small amounts of this compound seem to result in an off-flavor.

#### No Grade A

Syrup with metabolism off-flavor cannot be classified as Grade A syrup under syrup grading regulations that require maple syrup to be "...free of off flavors and odors considered as damage."

Maple syrup with metabolism off-flavor falls under the "Processing Grade" of the 2015 "United States Standards for Grades of Maple Syrup."

Even more problematic, metabolism off-flavor is extremely difficult to blend out of syrup. If the flavor is not too pronounced, affected syrup can be made into acceptable maple sugar.