



TechNote N761 - Sugar Profile in Honey

Introduction

Columbia Food Laboratories' sugar profile N761 has been expanded to include several oligosaccharides, in addition to the more common sugars. The purpose for including these more complex sugars is to increase the ability of the profile to detect adulteration of honey with sugar syrups. Sugar syrups include corn syrup, high fructose corn syrup, rice syrup, and other syrups made by breaking down starch into simpler units. The purpose of this TechNote is to aid in the interpretation of N761 profile lab results received from CFL.

Adulteration Testing

An important concern for the honey industry is the issue of adulteration. Since honey has a higher value than sugar syrups, there is the temptation to dilute it with less expensive syrups. Detecting the addition of various sugar syrups is a challenging task. Although several good approaches to analyses exist that can often detect adulteration, none can be relied upon to work in all cases. Each test should be considered one of the tools in the toolbox that can be used to verify authenticity. Two common tests used to detect sugar syrups are SIRA (or SCIRA) and sugar profile.

Normal Sugars in Honey

The primary sugars found in honey are fructose and glucose, with minor amounts of maltose and sucrose. The ratio of fructose to glucose is also an important factor. Too much sucrose may indicate the addition of cane or beet sugar, although some types of honey (honeydew) are naturally higher in sucrose. Too much maltose could indicate the addition of rice, corn or other syrup.

Oligosaccharides in Honey

This profile detects the presence of four additional

sugars, several of which may be present naturally in certain types of honey (primarily the honeydews). However, only very small amounts, if any, are found in most blossom honey. These sugars are known as oligosaccharides, and are made up of three or more glucose units. Two oligosaccharides that are good indicators of added sugar syrups are maltotriose and maltotetrose. However, honeydew honey if present, *may* contain a significant amount of maltotriose or maltotetrose, thereby causing a suspiciously elevated lab result. To aid in distinguishing honeydew if it is present, melezitose and raffinose values are also determined. Since they are not present in sugar syrups they can serve as an indicator for the presence of honeydew honey. If maltotriose and maltotetrose are elevated but melezitose and raffinose are normal, addition of sugar syrup appears likely. The above information is summarized in the table below.

	Blossom	Honeydew	Sugar Syrup
Maltotriose		(+)	++
Maltotetrose		(+)	+
Melezitose		+	
Raffinose		+	

Sugar Profile Normals

Differences exist in the scientific literature concerning the "normal" ranges of sugars for blossom honey. No doubt much of this variation is due to the many types of nectar used by bees and the country of origin. The normal ranges for sugars reported by Columbia Food Laboratories on its laboratory reports represent the best information we have available at this time for blossom honey. Please contact us if you have further questions or need assistance with testing.