Agave Quality Assurance (AQA): A Summary of Analytical Tools Used to Evaluate Agave Syrup

The purpose of this document is to provide a summary of tools and the context for which they are used to test product authenticity in the IOAA Agave Quality Assurance (AQA) Initiative. The goal is to provide core elements to explain the nature of the tests, their findings and conclusions for a non-scientific audience.

Establishing and meeting specifications is a well-known, largely understood process in food manufacturing. The majority of processing specifications are monitored using quantitative tests. However for post processing (designed to validate product specifications and authenticity) a combination of qualitative and quantitative tests (which is less common and therefore less well known) yields more detailed results otherwise not as easily or cost-effectively attained.

Measuring the major carbohydrate (sugar) profile of agave syrup is a quantitative test. It measures the quantity of sugars in the product represented as a percentage. It does not however, identify the source of the sugar (e.g. whether the sugar is derived from agave, cane sugar, corn syrup, et cetera).

Assessing the oligosaccharide (saccharide polymer containing simple sugars) profile of agave syrup is a qualitative test. Different sugar sources (e.g. agave, cane sugar, corn syrup, et cetera) yield unique chromatographic peak signatures. The chromatographic fingerprint is quite sensitive and is recognized as a broad screen for product authenticity. The fingerprint should have no abnormal peaks. For fruit and vegetable juices, oligosaccharide profiling by gas chromatography has become a commonly used and cost effective test for post-processing authentication for many years. See Dr. Nicholas Low’s published paper of 2001.

Oligosaccharide profiling identifies the presence of sugars found from non-agave sources but does not provide quantitative sugar composition information by source. Targeted sugar composition tests are available, but are typically less sensitive and usually cost more. Therefore it is advisable to use oligosaccharide profiling first to look for authentic agave signatures to obtain information about the sugar source, avoiding less sensitive and higher cost tests. Oligosaccharide profiling has now been applied to agave syrups as reported by a new study that addresses authentic agave signatures verses those from other sources.

Commercial laboratories using oligosaccharide profiling to produce chromatograms illustrating whether a product fits an authentic profile (is it authentic or non-authentic). Products exhibiting abnormal fingerprint peaks from the addition of sugars from non-agave sources are generally not considered authentic. The profile of authentic product may be broadened in the future as more testing is done and the database of results grows larger.

From a scientific standpoint, a BRIX level and a major carbohydrate profile within specifications combined with an oligosaccharide authenticity signature is a reasonable basis to indicate purity. Lack thereof is an indication the product has been de-based (accidentally or intentionally). From a commercial standpoint, products lacking the combined profile do not comply with the NOM (Norma Official Mexicana) standards, defining Agave Syrup. More information about the IOAA AQA Initiative and NOM standards is available upon request.


2 Low, Dr. Nicholas H. "Major Carbohydrate, Polyol, and Oligosaccharide Profiles of Agave Syrup. Application of this Data to Authenticity Analysis." Journal of Agricultural and Food Chemistry 60.35 (2012): 8745.