Working with Nature

Charles Tremewen, Kevin Li and Carl Horn Af Rantzien unmask the myths surrounding formulating products with stevia.

Contrary to the perception by a few manufacturers that stevia cannot be used in baked goods, the sweetener is stable at high temperatures found in baking facilities.

There is a narrow gap between the consumer acceptance of stevia extracts and higher quality solutions today, making the all-natural, zero-calorie sweetener an increasingly desirable product for formulators. The appeal for stevia by consumers is meanwhile driven by an increased demand for products with natural, low calorie food ingredients.

Stevia has formerly been shrouded in several myths that have haunted both extract producers and product formulators. These arose from past concerns with stevia extracts that include bitterness and aftertaste; inconsistent taste quality among batches; the inherent difficulties working with the fine powdery extracts; unsatisfactory applications in baked goods; and that they are more expensive than sugar.

These issues have caused extract producers to tell the truth about the natural herb by reinventing the way stevia is grown, processed and sold as the "next generation sweetener". The race is on to produce a pure, high quality and great tasting sweetener solution with a taste profile that is similar to sugar and is therefore acceptable to consumers. Here are more details.

Myth #1: Stevia extracts have an undesirable bitterness, licorice note and aftertaste.

Reality: They have a clean, sweet taste that is close to sugar.

Stevia needs to overcome the common perception that it ranks low in taste. The issues with bitterness, a licorice note and aftertaste are what formulators refer to as the "long tail" or lingering taste on the tongue (see Chart 1). As sugar sets the gold standard with its short tail for stevia extract manufacturers to meet, cutting the "tail" will ultimately lead to a better consumer acceptance and closer taste to sugar.

Traditional extraction methods have been based on purifying Reb-A glycosides to a high purification level of 95-100%. Although this method reduces the negative perceptions of the herb, it does not eliminate the compounds that cause the lingering taste issues.

Using masking agents and creating sugar/stevia blends can alleviate but not eliminate the taste problem in stevia. Innovative producers have since created newer and advanced extraction technologies that focus on isolating the positive glycosides and removing the negative ones from stevia extracts, thereby creating shorter "tails" and taste profiles that are close to sugar.

Combining stevia with flavors would greatly improve mixing, which is as effective as using high speed blending techniques.

Stevia producers are cultivating higher quality and yield plants with predictable amounts of preferred steviol glycosides for constant supply.

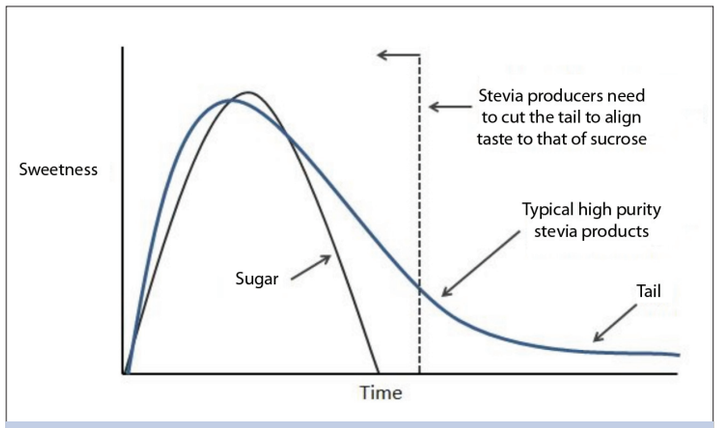

Chart 1: Issues with bitterness, a licorice note and aftertaste of stevia are what formulators refer to as the "long tail" or lingering taste on the tongue.

Myth #2: The quality of stevia varies and is inconsistent from batch to batch.

Reality: Innovative extraction methods ensure reliable and consistent quality of stevia.

Formulators have been experiencing product inconsistency when using stevia extracts in food and beverages. Even though the industry provides high grade stevia extracts, the quality of these compounds may vary from batch to batch. This results to issues when formulators manage the natural plant-based product. The annual harvest of stevia can also be affected by variables such as cropping practices and climatic conditions that affect the growing season, which impact plant quality and yields. Such inconsistencies will ultimately affect formulation irregularities and complicate the management of product outcomes.

Stevia producers are overcoming this problem by selectively cultivating higher quality and yield plants with predictable amounts of preferred steviol glycosides. The use of newer and more innovative extraction methods, as well as solutions of blended steviol glycosides, is producing high quality and pure extracts with predictable, reliable and consistent taste profiles.

Myth #3: Stevia extracts are difficult to handle and mix with other ingredients.

Reality: Combining stevia extracts with flavors makes mixing easy.

Stevia extract users often say the sweetener is difficult to handle and mix, which could be overcome with more knowledge and experience. There are challenges to dissolving fine grade high-purity extracts such as a Reb-A 97% or Stevioside 97% into a solution, as the fine and powdery consistency tends to become airborne during transfer and mixing. It is also buoyant on liquid surfaces.

Combining the sweetener with flavors would improve mixing, which is as effective as using high speed blending techniques. There are also viable methods for dissolving these light, high purity glycosides with a better understanding of the nature of the product and the management techniques recommended by suppliers of stevia extracts. Manufacturers are also coming up with different particle sizes and combinations to aid the mixing process.

Myth #4: Stevia extracts cannot be used in baked goods.

Reality: They are used as calorie reducing agents for baking.

Contrary to the perception by a few manufacturers that stevia cannot be used in baked goods, the sweetener is stable at high temperatures found in a baking facility. As zero-calorie is not an important factor in baking and sugar is usually added into baked goods, stevia is best used as a calorie reducing agent, which lowers the calories of the final product, reduces cost and is a natural sweetener replacement.

Myth #5: Stevia extracts are too expensive to use.

Reality: Prices of sugar are soaring worldwide.

Historically, the cost of using high-purity stevia extracts as a sweetener has been higher than that of sugar and other natural high-calorie sweeteners such as sugar beet and high fructose corn syrup. In the past 12 months the cost of high-purity stevia extracts has however been coming down, as the cost of sugar rose.

A *Food Business News* report in August 16 last year said "with major sugar cane and beet processors offering bulk refined sugar at $0.59 to $0.60 per pound through 2012, sugar users are dealing with historically high prices with no short term let-up in sight". Compared to other available zero-calorie, all natural sweeteners, stevia has therefore shown to be cheaper to use than alternatives such as monk fruit and agave.

The increasing demand for sugar by Asian countries such as China and India, as well as the limited supply of sugar beet and sugar cane acreage in the market would most likely keep sugar prices up. This makes stevia extracts a viable all-natural, zero-calorie sweetener solution today. In addition, manufacturers are improving horticultural practices, as production methods become more efficient.

Conclusion

Stevia extract producers have made inroads towards understanding the herb and improving its taste, usability and cost of use. By turning to innovative, ground breaking solutions that companies have worked hard to eliminate stevia's less desirable attributes, formulators are seeing the truth about using the ingredient, as consumer enjoy healthy, sweetened food. ■

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