

## **Naturally Sweet Stevia** **Steviva Brands 95/60 Stevia Extract Sweetener**

There aren't many areas in life where zero achievement is the target, but that's certainly helpful when it comes to calorie count. As consumers weigh in on leaner food choices, they are also studying labels. Many of them are looking for natural claims. Most of the high intensity sweeteners, aspartame and acesulfame-K for example, are artificial, and their presence in the ingredient statement will alienate these potential buyers.

This is when it's helpful to have stevia in the food designer's toolkit. Extracted from the leaves of the South American plant *Stevia rebaudiana*, this high potency sweetener has 200 to 300 times the sweetness of sugar. There are several components within the leaf, but only two main steviol glycosides contribute sweetness, Stevioside and Rebaudioside A (Reb A). Chemically, the primary difference between these two is the presence of glucose. Reb A has three glucose moieties attached at C<sub>13</sub>. Stevioside has two. Both the balance and the purity of these compounds will impact flavor.

"We have found Reb A delivers a very sharp, intense sweetness level while the steviosides have a more mellow, less intense sweetness," says Thom King, president, Steviva Brands, Inc., Portland, OR.

While many companies gravitate toward high levels of Reb A, his company has a different approach. A blend containing 60% pure Reb A has a more pleasing flavor. Combined with steviosides at 95% purity, "this perfect combination delivers what we feel is the least bitter option," he says. It is 250 times as sweet as sugar.

No chemical solvents are used when extracting or recrystallizing Steviva Brands SteviaSweet 95-60 stevia extract. Water extraction and temperature induced spray-drying produces this naturally sweet powder. Clean processing is especially important because the meaning of the word natural is coming under scrutiny. FDA does not define the term. In Europe, the designation of stevia as a natural ingredient is being questioned because after extraction, stevia products are most often purified using ion exchange chromatography and recrystallized from methanol or ethanol.

GMO labeling is another issue because it calls into question, for many consumers, the "naturalness" of the product. Steviva Brands SteviaSweet 95-60 is certified GMO free, pesticide free and petrochemical free.

Formulating with stevia from any supplier requires a bit of know-how. When replacing sugar, it's important to build bulk. Because so little stevia is required to achieve the same sweetness level, solids must be added to the formula. Consistent with a natural claim, consider using fructose, inulin, erythritol or a label friendly starch like tapioca, corn or potato. Incorporating fructose and/or starches will contribute 4 calories per gram. Inulin has 1.5 calories per gram. Erythritol adds only 0.2 calories per gram.

Besides adding to the calorie load, the choice of bulking agent may bind water or add viscosity so adjustments might be necessary.

From a functional standpoint, it's important to remember that stevia does not contribute to the Maillard reaction. In baked goods, this browning is often central to the product's appeal. The exception, of course, is a chocolate brownie or other similarly darkly colored item. In rolls, breads, cookies and other foods that are enhanced by a golden hue, ingredients like brown sugar, molasses and nonfat dry milk can help compensate.

To make up for the humectancy sugar provides to baked goods, moisture levels may need to be increased. Fruit purees, in complementary products, can add moisture, visual interest and a healthful connotation.

Flavor is another consideration when formulating with stevia. Sugar is the gold standard, in part, because it has a full sweetness profile. It builds and rounds, and it finishes as nicely as it began. On a graph, it might look like a typical bell curve with a slight plateau at its highest point. No other sweetener is perceived in exactly the same way. High intensity sweeteners, like stevia, have a faster onset and decline. Appearance on paper would be more of a steep hill rather than a gentle arc.

These differences in sweetness perception will be more pronounced in certain applications. Complex flavor systems can help disguise this because different components will be perceived at different times. In simple beverages with a single flavor, sweetness perception will be highlighted because there's little to compete.

It's also important to consider replacing solids when using stevia in a beverage. Mouthfeel contributes to the sweetness profile. Depending on the end target, determine if the goal is a slight syrupy characteristic (like regular Coca-Cola) or if it should have a thinner profile (along the lines of Diet Coke). "In liquid production, gums such as xanthan and guar gum work exceptionally in replacing volume," says King. However, be mindful of using low levels to avoid the perception of gumminess. If replacing some of the solids with erythritol, beware that it has a slight cooling quality.

While stevia's flavor profile is sweet, it's tinted with a note that is licorice-like. If this comes through in the finished product and adds an undesirable characteristic, a masking flavor is in order. Each of the flavor houses has their own formulations. Depending on the application, one might work better than another.

Masking can help reduce the slight bitterness that is associated with stevia. Besides the primary glycosides, Reb A and steviolide, there are several minor players. Each glycoside has its own flavor characteristics, whether sweet or bitter. Growing and processing conditions can affect the impact of these components. Consistency is key to creating a low maintenance formula that doesn't need to be adjusted with each shipment. Choosing a reputable supplier with a single source of raw material and a standard process is critical to achieving lot to lot reliability and zero defects.