

Stevia Expands Functional-Food Options

By Douglas Peckenpaugh, Senior Editor

When FDA gave the GRAS green light to stevia-based sweeteners late last year, the sweetener world felt a bit of a tremor. Now, for the first time, the industry had an approved, zero-calorie, all-natural sweetener at its disposal.

With stevia in their arsenals, product developers can now delve into a newly developed niche: low-calorie, all-natural functional foods. The body does not metabolize the sweet glycosides from the stevia leaf or any of its processed forms, so there is no caloric intake. Also, stevia doesn't adversely affect blood glucose levels and may be used freely by diabetics.

A question of purity

The *Stevia rebaudiana* plant, native to Central and South America, and now also cultivated in China, has long been known in natural-products circles for its sweet taste. The stevia-based sweetener approved as GRAS by FDA is rebaudioside-A (reb-A), generally considered the best-tasting steviol glycoside of the several present in the plant.

Processors extract reb-A from stevia, and the purity of the extracted reb-A dictates its flavor nuances, with less-pure extracts displaying metallic and licorice notes, and highly pure extracts coming in with a much-cleaner flavor profile. Although reb-A extracts are available in a range of purities, highly pure (99%) reb-A is the hallmark.

"If a product contains steviosides or other steviol glycosides, taste will be compromised," says Cecilia McCollum, executive vice president, Blue California, Rancho Santa Margarita, CA.

Before selecting a stevia-derived ingredient, manufacturers "need to know the difference in the various stevia products available to them, including the chemicals used in the extraction process and the residual chemicals and alcohols remaining in the powdered stevia extract," says James A. May, founder and president, Wisdom Natural Brands, Gilbert, AZ. He points to methanol and ethanol as extraction chemicals that can negatively impact a stevia ingredient's flavor, while citing purified water as a less-obtrusive extraction medium. "At least at this point in time, formulators need to investigate the sources and purity of the stevia extracts available to them," he says.

Purity and quality standards for stevia-derived ingredients have been set by the Joint FAO/WHO Expert Committee on Food Additives (see jecfa.ilsa.org/evaluation.cfm?chemical=steviol%20glycosides for complete details).

Application details

Reb-A is 200 to 400 times sweeter than sucrose and is highly light- and heat-stable. According to Varuzhan Abelyan, Ph.D., corporate vice president, R&D and process innovation, PureCircle, Kuala Lumpur, Malaysia, reb-A is most stable in solution at pH 4 to 8.

To keep a functional food “natural,” formulators can pair sugar, corn syrup and/or fructose with reb-A to design reduced-calorie products, or use reb-A as the sole sweetener. Stevia, notes May, “possesses a high level synergy with virtually all other sweeteners.” Erythritol, a natural polyol, is another option, and can augment sweetness levels without contributing significant caloric levels (0.2 calories per gram). Including citric and malic acid can improve sweetness perception and flavor. Reb-A extracts with lower purity often require a masking agent to deliver acceptable product flavor. Some reb-A manufacturers are working hand-in-hand with flavor houses to develop application-specific flavor-sweetener systems to streamline the R&D process.

“Stevia extract can be used anywhere sugar or any artificial sweetener would be used,” says May. “It can be used in cooking or baking. However, it does not brown.” If Malliard browning or caramelization is desired, a reducing sugar must be used in conjunction in the proper ratio, he notes.

Since reb-A generally replaces sugar but has a much-higher sweetness level, a bulking agent, such as erythritol, inulin or dextrose, may be required in products like baked goods. Selecting inulin as a bulking agent has the added benefit of contributing a prebiotic effect, a plus for formulators developing functional foods.