

PROFILES IN SWEETNESS

Reducing sugar in flavored water with **BESTEVI[®]** Reb M stevia leaf sweetener

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The case for next-generation stevia sweetener Reb M

In a 2014 report, the World Health Organization encouraged governments to introduce measures that its research indicated could help reduce the consumption of sugar, an ingredient the organization associated with growing rates of obesity and diabetes.¹ Governments around the globe have responded to the guidance with commitments to sugar taxes, traffic light-labeling systems and other instruments — a trend that has encouraged innovation in the formulation of sweet foods and beverages.

The WHO released its guidance into a global sweetness market in which food and beverage manufacturers already had been increasing their use of steviol glycosides, a noncaloric sweetener derived from the stevia plant. Global stevia volumes nearly doubled from 2010 to 2015, exhibiting a compound annual growth rate of 15 percent, according to research firm LMC International.² These high intensity sweeteners have been most commonly associated with the flavor profile of Rebaudioside A, a steviol glycoside that when used at high levels — greater than 50 percent sugar reduction — has been reported to deliver a bitter aftertaste.³

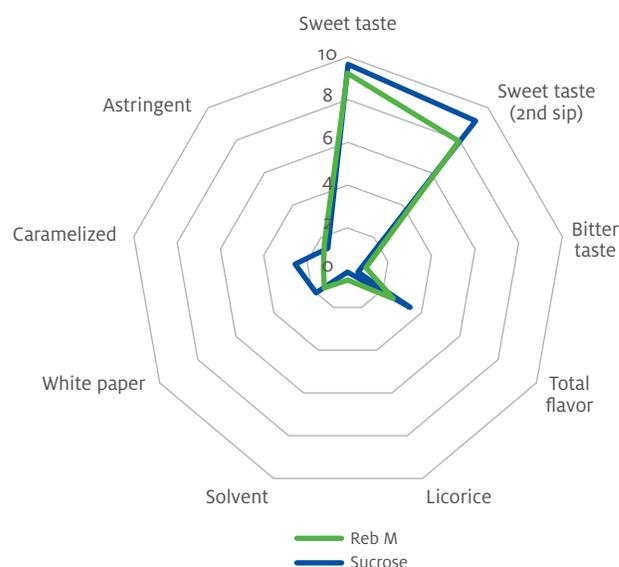
Rebaudioside M, a steviol glycoside found in significantly lower quantities than Reb A in the stevia leaf, however, has been associated with a true sugar-like sweetness.³ Sensory testing conducted by Ingredion demonstrates that the flavor profile of this next-generation stevia sweetener, derived from the stevia leaf, is very similar to that of sucrose and does not impart a significant bitter aftertaste, even at high usage levels.

Ingredion recognizes the potential of this next-generation sweetener to replace higher levels of sugar and has partnered with SweeGen Inc., a company dedicated to the development and manufacture of stevia-based sweeteners, to be an exclusive distributor of BESTEVIA® stevia leaf sweeteners to customers in all markets except China.

The 95 percent pure, Non-GMO Project-verified BESTEVIA Reb M stevia leaf sweetener is processed using a cost-effective, proprietary technology. The result is a white crystalline powder, 200 to 300 times sweeter than sugar when delivered at the same volume. BESTEVIA Reb M can be used in a variety of food and beverage applications to reach target levels of sweetness while maintaining a clean

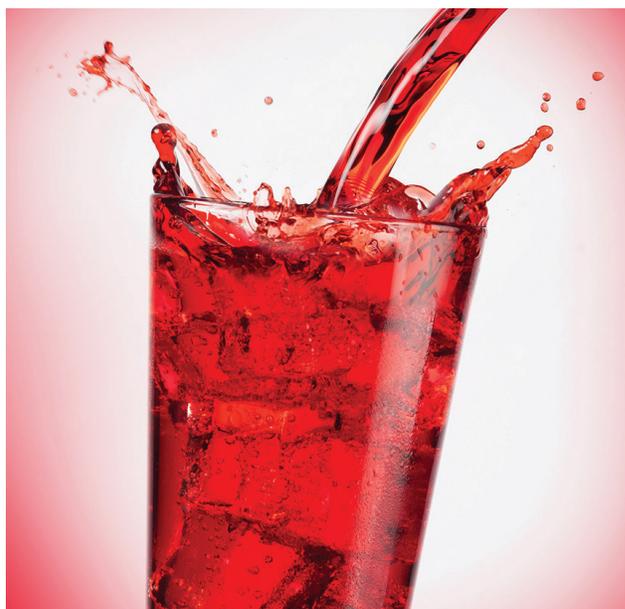
flavor profile. The ingredient enables product developers to formulate no-sugar and reduced-sugar products with a taste comparable to sucrose or high-fructose corn syrup sweetened products — and significantly less bitterness than Reb A-sweetened products (Figure 1).⁴

FIGURE 1: Sensory descriptive profiles: Reb M is remarkably close to sucrose



Scale of evaluation: 0 to 15
Samples evaluated in water at 10% SSE and -70°F

Source: Ingredion Global
Sensory, trained panel



Adding BESTEVIA® Reb M stevia leaf sweetener to flavored water

Formulation guidance

Sweetness intensity: 200 to 300 times sweeter than sucrose

Dissolution: Good

Solubility: 1,500 ppm at room temperature

Stability: High process and storage stability

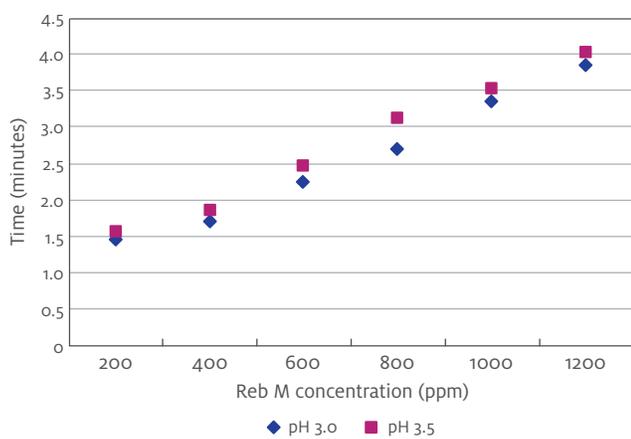
The flavored water beverage category currently is experiencing bold innovation. Consumers are willing to try unique flavors as they look for great tasting yet healthy alternatives to sugar-sweetened beverages, creating an opportunity for BESTEVIA Reb M stevia leaf sweetener.

CASE STUDY:

Mixed berry-flavored water

The manufacturing process for flavored water is fairly simple and involves water treatment, blending, filling, packaging and distribution. BESTEVIA Reb M shows good dissolution and solubility at the prescribed usage levels and can be incorporated easily into the flavored water manufacturing process (Figure 2).

FIGURE 2: Dissolution time of varying concentrations of BESTEVIA Reb M when added to 70 °F water using a magnetic stirrer under medium speed



Stability

The typical shelf life of flavored water is six to nine months at ambient storage conditions. BESTEVIA Reb M stevia leaf sweetener was found to be stable in the pH range for flavored water when evaluated at both refrigerated and ambient storage conditions. Ingredient's in-house mixed berry-flavored water (pH 3.5), formulated with BESTEVIA Reb M stevia leaf sweetener, exhibited a crystal-clear appearance with a refreshing, clean flavor profile.

Sensory experience

During descriptive sensory profiling of mixed berry-flavored water formulated with stevia, participants reported that flavored water formulated with BESTEVIA Reb M stevia leaf sweetener was significantly sweeter (taste, aromatics), less bitter and lower in some undesirable attributes (solvent, floral) than a comparable sample prepared with Reb A. In a third-party study of U.S. consumers, sponsored by Ingredion, 60 percent of participants preferred the flavored water sweetened with BESTEVIA Reb M stevia leaf sweetener over Reb A.

Visit insideidealabs.com to step inside our virtual beverage lab. You'll find a sample formulation of the mixed berry-flavored water featured in this white paper, as well as sensory white paper "Comparing BESTEVIA Reb M to common sweeteners in flavored water."



References

- ¹ Global status report on noncommunicable diseases, World Health Organization, 2014
- ² Global markets for low-calorie and caloric sweeteners, LMC International, 2016
- ³ Ingredion Global Sensory Trained Panel, 2017
- ⁴ Third-party consumer research study conducted for Ingredion, May 2017

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