



Cut the calories,  
not the taste

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**Cargill**® Helping  
the world  
thrive

The pressure to reduce sugars in beverages continues to escalate, amid growing health concerns around overconsumption and expanding government regulations. Given the pressure, it seems the European beverage marketplace may be due for an overhaul. This is where stevia extracts can help.

## Enter stevia

A herb native to Latin America, the stevia plant contains steviol glycosides that are **150 to 300 times sweeter than sugar**.

Beverages remain the dominant application area for high potency sweeteners, such as stevia. This is because beverages are the only typical food matrix where sugar merely performs a sweetness role. In the case of a dairy product, for example, sugar is used to build up texture and secure stability in association with the protein, as well as for its sweetening properties. If you remove the sugar from confectionery, you still need something that delivers on texture and mouthfeel, as well as providing the bulk properties of the sugar itself.

This is what you can see in the mainstream launches featuring high potency sweeteners, such as cola and ice tea. They have been able to partially take the sugar out and replace it with high potency sweeteners, without having to pay too much attention to rebuilding the texture.

## Stevia as a door opener to beverage innovation

As always, meeting consumer taste expectations is crucial for a successful product launch.

At Cargill, we are making a lot of good progress on stevia and steviol glycosides. Our pathway started by using stevia extract based on high purity Rebaudioside A (Reb A). The general belief at the time of its introduction in 2008 was “the higher the concentration of Reb A, the better the sweetness profile.” But we discovered that within nature, there are other steviol glycosides naturally present in the stevia leaf (e.g. Reb M and Reb D) at very low levels, that can confer both a higher sweetness intensity and also have a lower aftertaste in terms of bitterness and licorice note. Now the industry is able to offer other blends of steviol glycosides that allow for deeper sugar reduction, and that are able to more closely mimic the taste of sugar. While sugar reduction is easier with these next generation stevia sweeteners, it still requires a delicate balance between the science and art of product development.

Sweetener components must be tailored to meet the needs of the specific beverage in development. The most successful reduced-sugar beverages are designed to optimize sweetness, replace the mouthfeel of sugar solids, and occasionally, manage minor aftertastes.

## Innovation continues

Beverage brands' ability to develop tasty reduced sugar beverages has come a long way. Stevia was first approved for use in foods in 2008. In the ensuing years, we've seen a constant evolution in the quality of available stevia-based products.

**There are two major beverage applications where we can fully/partially replace sugar in an application with steviol glycosides:**

- 1. Nectars typically contain 30-50 percent juice, together with fibers, vitamins, minerals and a from the named fruit (FTNF) flavor.** These beverages are typically sweetened with 5-7 percent added sugar. In these applications, it's possible to fully replace this sugar with new blends of steviol glycosides (ViaTech®).
- 2. Iced tea has a relatively low sugar content of 7 percent (compared to 10 percent for mainstream soft drinks).** So far we have been quite successful in replacing 50 percent of this sugar with steviol glycosides (Viatech®). This allows us to take the sugar content down to just 3.5%. For example, we have worked on a new variant of an ice tea that contains 50 percent less sugar and our stevia blends (Viatech®). We are now looking to see if we can go as far as replacing 70 percent of this sugar content. This would allow us to go as far as 2.5 percent (with or without erythritol).

## Label-friendly sugar reduction

A successful label-friendly approach to sugar reduction in beverages involves combining fructose and steviol glycosides. Fructose is not calorie free, but it is 30-50 percent sweeter than sugar. This means that if you can replace sugar with 3.5-4.0 percent fructose in a drink and combine it with a small amount of stevia, you can achieve both a better taste profile and a reduced calorie content.

The combination of fructose and steviol glycosides is a simple approach for reducing calories, that serves as a great trade-off for customers and consumers.

The below recipe and nutritionals showcase a 65% sugar reduction via the combination of fructose syrup and steviol glycosides, thereby improving the Nutri-score to a C rating.



INGREDIENTS	Standard Recipe (%)	65% sugar and calorie reduction
Water	88.0	94.3
Sugar syrup	9.4	
<b>C☆TruSweet® F95 fructose syrup (70%DS)</b>		<b>4.2</b>
Peach compound	1.35	1.35
Acidity regulators	0.255	0.255
Preservatives	0.0099	0.0099
<b>ViaTech® TS 300 stevia leaf extract</b>		<b>0.0125 – 0.0175</b>

NUTRITION FACTS		
Amount per serving (100g)		
	Standard	65% reduced
<b>Energy (kcal)</b>	<b>28</b>	<b>9.9</b>
<b>Fats %</b>		
<i>of which saturated</i>		
<b>Carbohydrates %</b>	<b>7.0</b>	<b>2.5</b>
<i>of which sugars</i>	7.0	2.5
<i>of which fibers</i>		
<b>Proteins %</b>		
<b>Salt %</b>		





## Sugar-free blends

Today, in Europe, the best way to go completely sugar free in a beverage containing high %sugar (>8% sugars, as in typical soft drinks such as cola or lemonade) is to combine steviol glycosides with another high potency sweetener. Our INFUSE by Cargill™ team can support you to develop the optimal combination of stevia & other high potency sweeteners allowing you to have a high performance taste, a cost competitive recipe and you can put a stevia leaf extract logo on your label too, in order to feature an implied natural claim. Of course you will not be able to achieve a “100 percent natural” claim and you will need to declare all sweeteners on the ingredient list. Our INFUSE team can also help you to restore the mouthfeel that might be lacking in a completely sugar free beverage.

However, more improvements are on the horizon, both in terms of the quality of stevia-based products and our understanding of optimum product development and formulations.

Cargill advances in fermentation technology make it now possible to offer affordable sweeteners based on the best-tasting glycosides in the stevia leaf, Reb M and Reb D too. Once approved in Europe, this next wave of sweeteners promises to bring us even closer to re-creating the sugar experience, making 100 percent sugar reduction possible in the future.

## MEET OUR EXPERT

Reginald Van Bokkelen is a principal application beverage scientist for Cargill (cargill.com) with over 25 years' experience in the beverage industry. He is a well-known expert in the field of beverage emulsions, juice compounds and sugar-reduced drinks. Reginald is the main inventor of approved patents on the use of sugar beet pectin for cola and beverage emulsion. Over the last ten years, he has been very active on developing systems to control off-taste in stevia-based drinks. He earned his MS degree and PhD in Food Science from the University of Leuven, Belgium.



### Learn more:

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