How to

Future Proof Your Business Against Sugar Tax

Sugar Reduction Strategies and Possibilities

Acronyms

SSBs- Sugar sweetened beverages

HFCS- High Fructose Corn Syrup

SDIL- Soft Drinks Industry Levy

GDP- Gross Domestic Product

CAGR- Compound Annual Growth Rate

Sugar Tax: What is it?

The current status of Sugar Tax

Consumer Response

Brand Response

Sugar Reduction Strategy: A necessity

The holy grail: Getting the Safety + Taste + Cost equation right

Artificial Sweeteners

Natural Sweeteners

Stevia: Clean Label + Zero Calories?

Evolution of Stevia

Launch your ‘reduced sugar’ product in 30 days

Executive summary

It is now; the right time to take the leap into implementing a sugar reduction strategy. The reasons may be different for different regions and corporations, such as sugar tax, increasing demand for low/no sugar content products, or growing competition, but one thing stays constant, "*sugar reduction is real, and it is happening at a large scale globally*".
To stay relevant and gain an advantage in today's transforming marketplace, manufacturers must take their sugar consumption into consideration.

Sugar, once considered to be the most superior ingredient out there, associated with 'feeling good', has now been reduced to one of the most controversial ingredients with links to multiple ailments. Responding to the worsening situation, 50 nations have implemented the sugar tax which is principally imposed on sugar-sweetened beverages.

This ebook will help you understand why there is a global momentum behind sugar reduction, industry and consumer trends, the available options to save on the levy, and how reformulating your products with Stevia can help you future proof your business against sugar tax and keep up with the consumer trends.

If you are an F&B owner or a food formulator looking forward to expanding the reach of your product globally without fretting over the sugar tax or looking for ways to navigate the new sugar tax in your country, this ebook is for you.

Chapter 1

Sugar Tax

1.1 Sugar tax

Sugar tax emerged as a category of **'sin tax'** first in Hungary, where it was implemented in 2011 on soft drinks, quickly escalating as part of a wider tax on pre-packed sweetened products, salty snacks, and condiments. The tax predominantly imposed on SSBs, also known as s**ugary drink tax, soda tax, or sweetened beverage tax** (SBT) was introduced to curb the adverse effects of sugar by raising awareness and decreasing consumption of sugar.

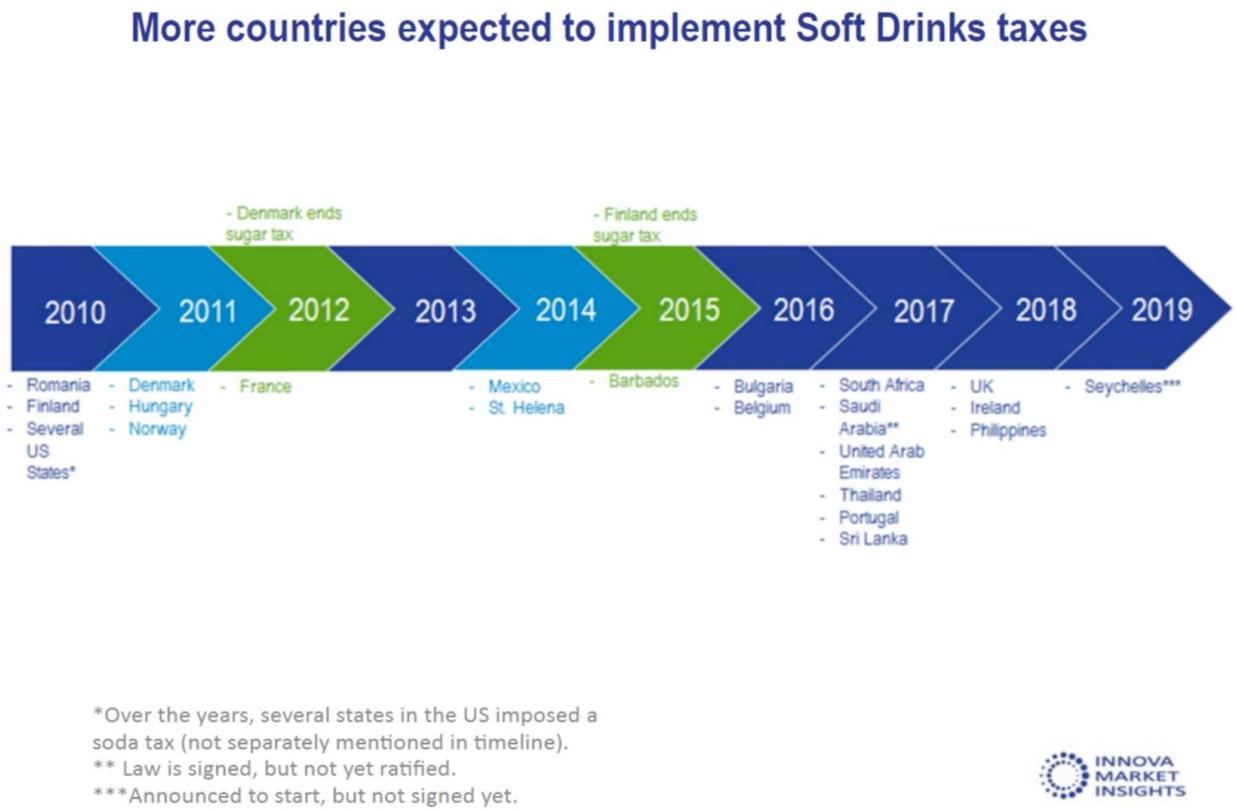
SSBs are among the leading sources of added sugars in adult and children's diets, with no nutritional value. Sweetened with several forms of added sugars like brown sugar, corn syrup, dextrose, fructose, glucose, HFCS, maltose, sucrose, etc., these sugary drinks comprise carbonated drinks, soft drinks, energy drinks, sports drinks, flavored waters, and milk-based drinks, to name a few.

The sugar tax can be structured differently depending on various parameters:

Instrument	Description
Excise tax	Tax levied on a particular product, typically at the point of manufacture or distribution. Can be either specific (based on volume or sugar content) or ad valorem (based on percentage of product value). Tiered and sliding-scale designs apply different specific tax rates depending on volume or sugar content.
Import tax (import tariff, import duty, customs duty)	Tax collected on imported products
VAT/GST	A VAT is a broad-based tax assessed incrementally as a percentage of price at each stage in the production and distribution chain. Considered a consumption tax because the ultimate cost of paying the tax is borne by the consumer at the point of purchase. A GST is, in most cases, a type of VAT.

As of 2021, around **50** countries and jurisdictions have imposed sugar tax and several others are working towards a similar course.

In countries where the sugar tax has been implemented so far - consumers and brands have taken action. F&B manufacturers must sit up and take notice- no matter if you have just been faced with the sugar tax or are a visionary wanting to use lessons to fast track your product and gain a competitive edge.

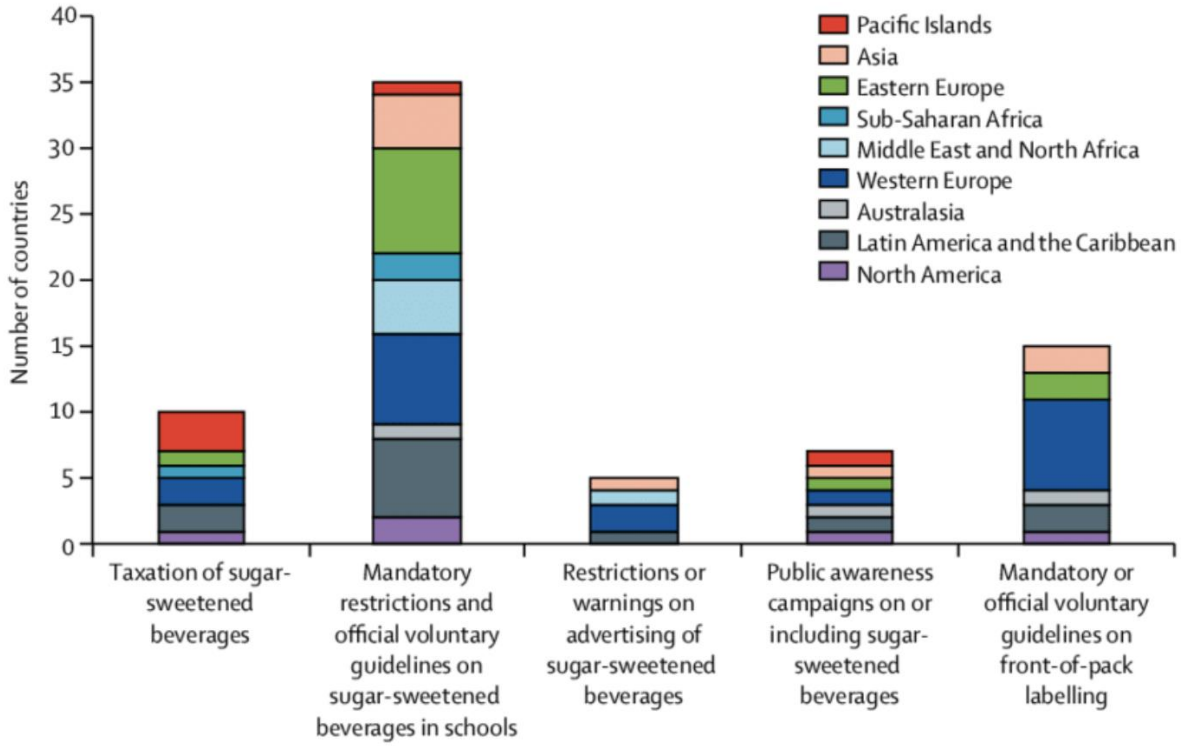


"This wise learn from the past. We don't have to make all the mistakes ourselves."

2.1 Sugar Reduction: Choice or Necessity?

Sugar reduction is an immediate necessity. It's no longer a choice or a fad that companies consider the ROI of hopping onto.

Not just the sugar tax but other policies like stern labeling guidelines, growing restrictions on marketing and advertising of HFSS (High in Fat, Salt, and Sugar) products, public awareness campaigns, prohibition on the sale of HFSS products in schools, are all collectively pushing food and beverage manufacturers to take the plunge into sugar reduction.



Number of countries that have implemented policies on sugar-sweetened beverages (including at the sub-national level) Data from World Cancer Research Fund International NOURISHING database.

2.2 Industry Response

Acknowledging the tax, several businesses have responded by opting for different sugar reduction strategies like:

- Creating new products with less sugar.
- Reducing sugar amount in existing products via product reformulation.
- Diversifying portfolio by launching and promoting new lower sugar sub-lines.
- Increasing portion control options by reducing serving sizes for one sitting.
- Reinforcing portion messaging on pack.
- Experimenting with different sugar substitutes.

In most markets where sugar tax has been introduced, international beverage majors, like Coca-Cola and PepsiCo have opted to absorb or increase their prices and have leveraged their diversified portfolio to absorb the cost of the tax increase by averaging it out against the margins of numerous products, limiting the extent to which it is passed on to the consumer. Meanwhile, these companies have also been diversifying their product offerings to lower their exposure to taxes.

Key players and their active sugar reduction policies.

- Nestle has removed 60 000 tonnes of sugars and has achieved a 4.5% reduction since 2017.
- Coca-Cola Co. removed nearly 125,000 tons of added sugar through recipe changes in 2020.
- Unilever claims to have reduced the sugar content across all sweetened tea-based drinks by 23% and across the Pepsi–Lipton joint venture by 29% since 2010.
- One way PepsiCo has improved upon its goal of reducing sugar content is by expanding the availability of Pepsi Zero Sugar around the world.
- **Dannon** cut the sugar content in 78% of its products – including all products intended for children – to less than 23 grams of total sugar per six ounces.
- Kellogg's also claims to have removed almost 11,000 metric tons of sugar from the diet of consumers since 2011 in the UK.
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2.3 Consumer response

The reasons for reducing the sugar content may be different for different regions and organizations but today's health-conscious consumers are clearly loving the range of options available to them.

The sale of high and low-sugar-content beverages and consumer purchase patterns have b drastically affected by the sugar reduction.

- 33% of sales in some **EU** markets are no and low sugar calorie drinks.

Conclusion - Sugar reduction is on the rise and it's a necessity in the present times because it is providing a platform to food and beverage manufacturers to retain a presence in the market and earn repeat business while safeguarding the possibility of disintegration due to changing times.

Proof - Global sugar reduction market is growing exponentially and is expected to grow at a CAGR of 8.76% during the period 2021-2027, according to a report by OG Analysis.

3.1 Reformulation, the way only forward:

Even though consumers are delighted to opt for low calorie/ low sugar content products, there's only so much they are willing to give up in the process.

In a 2019 study concerning portion reduction, reported by Ferrar, et al., participants were reluctant to accept portion control, and those open to the reduction did not appear entirely convinced.

Another key factor influencing consumer decisions in the present times and likely to stay rooted in the future is the impact Covid 19 had on their health and lifestyle. Now more than ever, consumers are actively looking at **nutritional labels** and eliminating products likely or believed to compromise their health and lifestyle.

With more nutritional label transparency available to consumers, products with sugar as a fundamental ingredient are likely to stay sitting on the shelves.

Though challenging to implement, food reformations when executed strategically, are a win-win-win for industries, the economy, consumers, and public health.

Stats suggest that reformulation may even increase the GDP of 42 countries by 0.51% on average each year, furthering economic growth.

Companies that went ahead with reformulating or launching new low-calorie products showed an increase in profits and greater acceptance with consumers.

So it's safe to say reformulating the products or launching new counterparts with low sugar content is the way to future proof the business in the face of sugar taxes and rapidly changing consumer preferences.

3.2

Product reformulation is complex. Sugar in different product categories fulfills different functionalities in addition to granting sweetness. Replacing sugar successfully in a product requires careful consideration of other sensory properties such as texture, mouthfeel, etc.

Sugar is considered a gold star ingredient in the F&B industry essentially because it is a single ingredient with multiple properties and functionalities including:

- Enhanced palatability
- Flavour addition
- Enhanced mouthfeel
- Providing viscosity
- Adding bulk
- Enhancing aroma
- Imparting sweetness
- Providing texture and consistency
- Reduces freezing point (essential in ice-cream and frozen desserts)
- Increasing shelf life of the product
- Providing color (Caramelization and Maillard reaction) and preserving color.
- Increasing volume by stimulating fermentation

4.1 The holy grail: Getting the Safety + Taste + Cost equation right

An important question, to begin with, is what to choose? There are a variety of sugar substitutes available in the market, from the ones chemically synthesized in the laboratory to the ones brought straight from the farm.

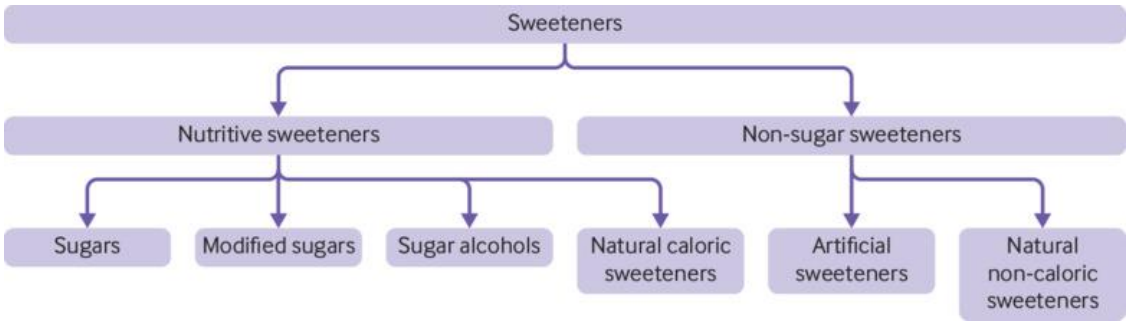
The journey is long even after you have chosen the substitute to go with. One must keep in mind which substitute works best with their product category while also being commercially profitable, providing great taste, and garnering approval from regulatory bodies and consumers.

- In line with consumer preferences (Cost+ Supply Chain+Label Claims+Taste)

- For company
    - Supply Chain: Ease of Procurement + Supply Chain Traceability + Cost + Reliability.
    - Formulation: Timeline + Innovation (Requires proprietary knowledge)+ Figuring out the regulations, labeling, and nutrition claims.

4.2

Let's take a look at the options available for replacing sugar:



Commonly used sugar substitutes include natural sweeteners, artificial sweeteners, and sugar alcohols.

Judging on the metric of safety, cost, and taste, sugar alcohols or polyols, although a better replacement, aren't good enough as a substitute for table sugar. To begin with, they have a significantly lower sweet taste, and therefore need to be used in more quantities to achieve the same level of sweetness as sugar, raising the cost in use. In addition, sugar alcohols can also cause digestive issues such as stomach aches, flatulence, and diarrhea if consumed too much, requiring products with more than 10% polyols to contain a laxative effect warning.

4.3 Artificial Sweeteners

As the name suggests, artificial sweeteners are made synthetically in factories with the help of chemical reagents, with no naturally present analog. Some commonly used artificial sweeteners in the low/no sugar sector are acesulfame-K, aspartame, sucralose, saccharin, and neotame.

Aspartame: It is similar to sugar in the caloric content, meaning calories in one hundred grams of sugar (400 kcal) is equal to one hundred grams of aspartame. Even then, aspartame can be claimed as low-calorie since it is 200 times sweeter than regular sugar, requiring only 0.5 grams of aspartame to reflect the same sweetness. The usage of relatively smaller quantities makes the calorie count negligible.

High-intensity sweeteners such as artificial sweeteners often come with the drawback of not being similar in taste to sugar and imparting off-taste like metallic aftertaste. Aspartame or acesulfame K, which is 130–200 times sweeter than regular sugar doesn't taste like sugar individually but when combined they can be perceived as quite sugary.

Sucralose is another chemical made to replace sugar by chlorinating sucrose. The obtained compound is 500–600 times sweeter than table sugar.

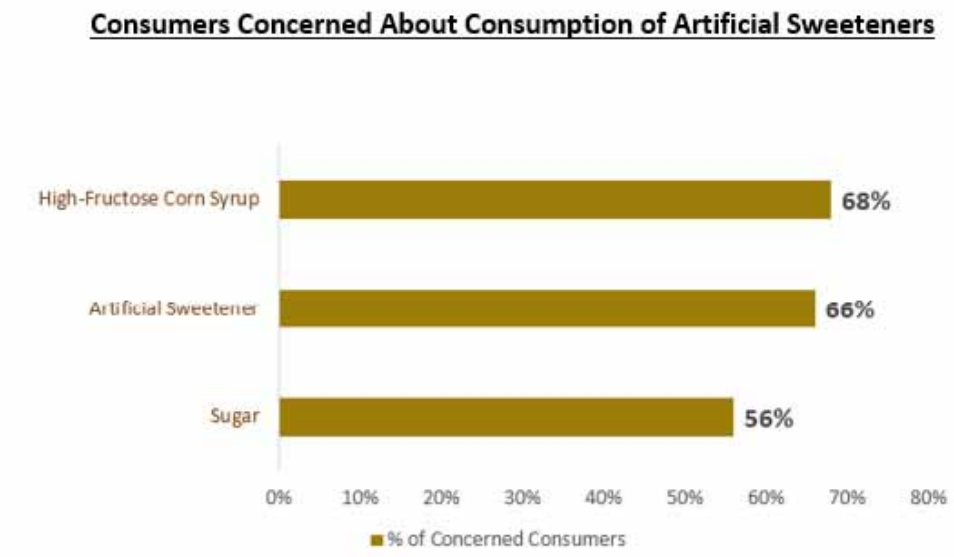
However, there is a big crux with artificial sweeteners: ***Consumers dislike them***.

Artificial sweeteners are unpopular with three in five US consumers, according to Innova's consumer survey data.

Despite the importance of familiarity, 7 in 10 consumers would be willing to give up a familiar favorite product for one that did not contain artificial ingredients. Of those who would, 4 in 10 would be willing to pay 50% more and 1 in 5 would pay 100% more.

-51% believed artificial sweeteners to be detrimental to health. While another study claims that 33% of consumers are looking forward to avoiding artificial sweeteners in their food and beverage products and shifting to plant-based sweeteners in the present times.

Studies have also linked artificial sweeteners to an increased risk of disrupted blood sugar level, inferior gut health, weight gain, and addiction.



Summing up, it can be said that while artificial sweeteners may measure up to the expectations regarding cost and taste, they fail miserably in the safety and consumer acceptance yardstick.

4.4 Natural Sweeteners

Consumers are intuitively more welcoming to natural sweeteners, with 66% of global consumers believing them to be a healthier sugar replacement.

Natural Sweeteners are sugar substitutes often extracted from plant sources. Natural Sweeteners in the market include - Stevia, monk fruit, coconut sugar, honey, agave nectar, maple syrup, etc.

The sweetness from the plants and herbs is often extracted by steeping them in a liquid solution, filtering the decoction, and finally purifying the biomass to obtain the desired sweet compounds.

Two of the most commonly known natural sweeteners are monk fruit and stevia.

Indigenous to Southern China, monk fruit or 'Luo Han Guo' is a green melon, sweeteners made out of which tend to be **150-200 times** sweeter than table sugar with **no calories and zero glycemic index.** The sweetness is derived from '**mogrosides**'; sweet compounds present in the fruit, which is typically blended with other ingredients for practicality in usage.
Monk Fruit has been **approved to be used as a sweetener by the FDA** since 2010 and has the status GRAS (Generally Recognized As Safe), however, the **EU is yet to approve** the sweetener. It **can also be allergic to a certain group**, and symptoms like rashes, rapid and weak pulse, dizziness, difficulty breathing, and swollen tongue can be observed in some people.

Indigenous to Paraguay, Stevia is another natural sweetener that has garnered significant attention among consumers and manufacturers. It is a **zero-calorie sweetener**, deriving its sweetness from **steviol glycosides**, with **150-300** times the sweetness. It is **loaded with health benefits** like diabetes management, weight loss, blood sugar regulation, potential anti-tumor properties, improved skin, and oral health, etc. It is absolutely safe for just anyone and everyone, including people managing diabetes and weight, pregnant women, and children. **FDA** declared Stevia as GRAS in 2010, it has also been stamped safe by the **European Food Safety Authority** and the **Joint Expert Committee on Food Additives**. It is widely used in countries in Asia, South America, Australia, and Europe.

Comparison between different sweeteners:

Sweetener	Plant-based/ Natural	GI	Non-Gmo	Heat stable	Easy access	Additional label claims to low-calorie	Versatile	Sustainable	Potential side effects
Stevia extracts	yes	0	yes	yes	yes	yes	yes	yes	no
Honey	yes	50	yes	no	yes	yes	yes	no	no
Monk fruit extract	yes	0	yes	yes	no	yes	yes	yes	no
Agave syrup	yes	19	yes	no	yes	yes	no	no	yes
Sucralose	no	0	no	no	yes	no	yes	no	yes
Aspartame	no	0	no	no	yes	no	no	no	yes
Maltitol	no	49	yes	yes	yes	yes	yes	no	yes
Erythritol	yes	1	yes	yes	no	yes	yes	yes	no
HFCS-42	no	68	no	yes	yes	no	yes	no	yes

Concluding the table, it can be said that even though all natural sweeteners may seem alike, that's not the case. Not all natural sweeteners are versatile enough to incorporate into all product categories (Agave), or widely available (monk-fruit), or low calorie with low GI (honey).

Stevia, on the other hand, checks all the right boxes to make a winning product with enhanced label claims, being zero-calorie with zero GI, suitable for a wide category, cultivated in several locations with multiple harvests possible in a year given the right conditions, therefore increasing the chance of winning consumer approval and making a premium product.

Owing to its versatility, stevia can also be used to reformulate a variety of product categories from soda to snacks.

5.1 Stevia reigns supreme: Clean label + zero calories

The global stevia market has been doubling every five to six years with almost 20,000 brands having launched their zero-calorie products using stevia.

In 2011, stevia was used in 10% of all food and beverage products launched with high-intensity sweeteners, whereas aspartame was found in 36% of products. In 2018, Stevia usage nearly tripled to 29% compared to aspartame which fell to just 20%.

From the available data, it can be inferred that Stevia has clearly stood up to consumer and manufacturer expectations.

The reason?

Stevia stands supreme on the metric of safety, cost, and taste, with the added benefits of a clean label and zero calories.

Safety:

Stevia's safety has been well studied and documented. Stevia extracts are approved as a food additive in several countries with safety stamped from different food regulatory bodies including, FDA, EFSA, JECFA, and FSSAI.

Cost:

Stevia is a cocktail of up to 40 different glycosides, available in the market as different extracts and grades. Depending on the product categories and the product matrice, different extracts and grades may perform differently. Identifying the extract that works best in your product category may help reduce the cost significantly.

Taste:

From slightly bitter-tasting Stevioside to sugar-alike Reb-M and enzymatically modified Stevia, this natural herb has evolved considerably since the discovery, pertaining to the growing

demand. This has allowed manufacturers to successfully deal with the taste issue that previously limited the usage of Stevia.

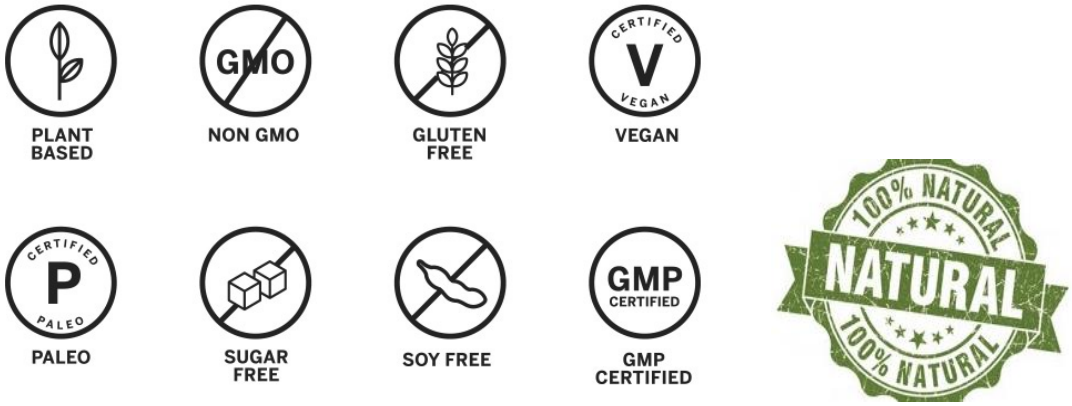
Evolution timeline:

1- Stevioside (Major glycoside, bitter and licorice-like aftertaste, uncharacterized, variable, 150-200 times sweetness potency)

2- Reb A (Major glycoside, reduced aftertaste issue, upto 250 times sweetness potency)

3- Reb M

Label claims obtained with Stevia:



Importance of clean label:

6. 1 Launch your low/no sugar product in 30 days.

Although popular, Stevia can be a challenging ingredient to work with.

F&B companies often get overwhelmed and confused by the range of extracts offered by Stevia companies under 'n' number of product ranges with complex jargon & terminologies.

Other challenges that manufacturers often face while formulating their products with Stevia include- bitterness and aftertaste; inconsistency in quality among batches; the inherent difficulties working with extracts; and premium pricing of extracts.

The right Stevia partner can help you overcome all these challenges by:
Reducing cost, providing formulation support, reducing risk, providing consistency in quality and supply, helping understand Stevia better.

Arboreal is one of the world's very few vertically integrated producers of Stevia with a traceable, scalable, and sustainable Stevia supply chain.

Having control over the entire Stevia supply chain enables us to deliver the best quality solutions consistently on a scale at budget-friendly prices.

Moreover, with six years of experience in the Stevia industry, advanced knowledge of scientific R&D, and having helped 120+ companies we at Arboreal have gained immense know-how on product development and formulation.

Contact us to learn more about how we can help you launch winning lower-calorie Stevia-based products in 30 days.

Download "Formulator's guide to working with Stevia" if you would like to know more about how to make Stevia work in your recipe.

Chapter 7

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