

Stevia

WHAT IS STEVIA?

A naturally-derived intensive sweetener.

The *Stevia Rebaudiana (Bertoni)* plant is native to Northeast Paraguay which produces steviol glycosides in its leaves.

Of the 34 Varieties of Steviol Glycosides, the following glycosides are abundant in nature:

 Steviosides (5-10% w/w)	 Rebaudioside A (2 to 5%)	 Rebaudioside B, C (1%)	 Rebaudioside D, E, F (0.2%)
 Dulcoside A (~0.5%)	 Steviolbioside (0.1%)	 Rebaudioside M (0.05%)	

HOW IS STEVIA PROCESSED FOR USE IN FOODS?

A typical manufacturing process to extract Stevia from the plant is carried out in the following sequence:

1. Farming 
2. Leaves are dried immediately post-harvest
3. Extraction with hot water 
4. Concentration 
5. Purification of steviol glycosides via recrystallisation with methanol
6. Spray drying to obtain the final product 



PROPERTIES OF STEVIA



- Non-caloric: Contributes to 0kcal/g.
- 200-450x sweeter than sucrose.
- The amino acids they are composed of, while not contributing nutritive benefit due to the small quantities consumed, have no deleterious side effects.
- Research has shown that there is no accumulation of stevia or its by-products during metabolism.
 - o Human studies have illustrated that steviol glycosides are not absorbed in the small intestine. The gut bacteria hydrolyses steviol glycosides into steviol, which is then broken down in the liver excreted via urine.

FLAVOUR PROFILE OF STEVIA



- Stevia typically leaves a bitter and metallic aftertaste, causing a change in mouthfeel at high levels. As such, Stevia is often used as a partial replacement in combination with sugar.
- **Rebaudioside A** is the least astringent, the least bitter and has the least persistent aftertaste. Commercial products based on stevia are primarily composed of **Reb A**.
- **Stevioside, rebaudioside A, rebaudioside D and rebaudioside M** exhibit clean sweetness at low Sucrose Equivalent (SE) levels but have other negative taste attributes (e.g., bitterness and black licorice) at higher SE levels.
- **Stevioside** exhibits much more bitterness than **rebaudioside A, D, and M**.
- **Rebaudioside M** exhibits quick onset of sweetness, contributing to a clean sweet taste. However, It is only available in minute amounts within the stevia leaf.



APPLICATIONS

- Table top sweeteners
- Candy
- Beverages
- Ice cream
- Yoghurt
- Baked goods
- Chewing gums
- Medicines & dietary supplements
- Personal hygiene products

REGULATORY STATUS OF STEVIA

- Established ADI for Stevia: **4mg/kg body weight per day.**
- The use of Steviol glycosides have been generally regarded as safe (GRAS) or approved for use in foods across countries. However, the types and levels of approved glycosides can vary by country.
 - The sweetener is approved by international regulatory bodies

namely the European Food Safety Authority, Joint FAO/WHO Expert Committee on Food Additives (JECFA), US Food and Drug Administration (USFDA).

- The European Commission allowed the usage of steviol glycosides as a food additive and authorised the use of high-purity steviol glycosides (minimum 95% purity) across the EU in 2011.

FSANZ approved stevia for use in foods in 2008.

FSSAI allowed the use of stevia in a selected range of products.

Health Canada approved the use of stevia and steviol glycosides in Natural Health Products in 2009.

JECFA with the USFDA stated high-purity steviol glycosides (minimum 95% purity) is safe for human consumption in 2009.

CONCLUSION

All foods can have a place in our diets, and low- and no- calorie sweeteners are no different. In addition, stevia is one of many safe options that can be included in broader weight maintenance plans alongside leading a healthy lifestyle.



STEVIA IN A NUTSHELL

Scientific Name	Stevia Rebaudiana
Brand Name	Truvia®, Purevia®, Sun Crystals®
Sweetness Intensity	200-450x sweeter than sucrose
ADI Limit	4mg/kg body weight
Safe for Children?	Yes
Safe for Pregnant and Breastfeeding Women?	Yes
Nutritive Value	0 kcal/g

References

- ¹ Mérillon, J. and Ramawat, K. (2018). *Sweeteners*. Cham, Switzerland: Springer Nature.
- ¹ Hartel, R., von Elbe, J. and Hofberger, R. (2018). *Confectionery Science and Technology*. Cham: Springer International Publishing.
- ¹ O'Donnell, K. and Kearsley, M. (2008). *Sweeteners and Sugar Alternatives in Food Technology*. 2nd ed. New York, NY: John Wiley & Sons.