

# STEVIA – THE NATURAL SWEET TASTE

*Product Information*





## STEVIA

### *Plant and cultivation*

#### **Plant**

*Stevia rebaudiana* Bertoni is a perennial herb growing originally in South America, which the Guarani Indians have used for centuries as a sweetener in foods and as a medicinal plant. The plant was officially classified by and named after the Swiss botanist Moisés Santiago Bertoni in 1889.

The sweet tasting steviol glycosides in the leaves lend the plant their special nature. After harvest, the leaves are dried in the sun and then the steviol glycosides isolated. The extracts from sweetleaf, as it is also known, can be used as calorie-free sweeteners in foods and drinks. In Japan, steviol glycosides

have been marketed industrially since the 1970s and can be found in just about all sweetened foods.

#### **Cultivation**

*Stevia* is a member of the Asteraceae family. The plant originates in the meadows of the Paraguayan highlands. *Stevia* prefers a semi-arid climate and becomes sensitive only at temperatures below 10 °C. In good conditions, the bush reaches a height of up to one metre.

Nowadays, *Stevia rebaudiana* Bertoni is grown in many countries on just about every continent.

## TERMINOLOGY AND QUALITY

### *Distinctions*

A number of distinctions have to be made regarding terminology:

- **Stevia:** The plant *Stevia rebaudiana* Bertoni and its (dried) natural parts
- **Steviol glycosides:** Sweetening substances (stevioside and rebaudioside) obtained from the *Stevia* plant by a natural extraction process
- **Rebaudioside A:** Most valuable or high-quality steviol glycoside, the content of which determines the price

In the EU countries, Switzerland, Australia and New Zealand, the standards and extracts must contain at least 95 % steviol glycosides. What is especially important when it comes to steviol glycosides is the quality of the extracts. A high quality

*Stevia* extract stands out not only for its purity but also, and more importantly, for its consistent quality. The ratio of the different steviol glycosides in a given plant depends mainly on the conditions in which the plant grows, and can vary greatly. Accordingly, many *Stevia* extracts come with major variations between batches.

A consistently standardized quality is especially important for guaranteeing consistent product quality. IMPAG supplies *Stevia* consistently at European Premium quality to meet this very demand. Regular analyses are performed as continual quality controls.

An organic certificate is also available for the *Stevia* leaves used.

## SAFETY

### *Of steviol glycosides*

The physiological safety of steviol glycosides has been investigated in numerous metabolic studies by the Joint FAO/WHO Expert Committee on Food Additives (JECFA). No harmful reactions or accumulations have been detected. The sweetener is metabolized in a normal metabolic pathway. In the gut, steviol glycosides are broken down into steviol. This is ultimately excreted as steviol glucuronide via the urine.

In June 2008, JECFA also published an acceptable daily intake (ADI) of the standardized 95 % steviol glycosides. This value has been set at 4 mg/kg body weight per day. An intake below this value has no negative effects on human health.

The studies also ruled out carcinogenic mutagenic effects and effects on fertility.



## PROPERTIES & APPLICATION

*Stevia Natura*

Steviol glycosides have a number of positive properties, making them real alternatives to sweetening with sugar or artificial sweeteners. Their high sweetness is outstanding, being 200–350 times higher than normal household sugar.

Four steviol glycosides are mainly responsible for this sweetness:

- Stevioside
- Rebaudioside A
- Rebaudioside C
- Dulcoside A

These steviol glycosides differ in the number and position of their glucose and rhamnose residues.

Stevia extracts can be used with a good conscience. Steviol glycosides are free of calories and mild on the teeth due to their non-cariogenic nature. Furthermore, steviol-sweetened products are ideally suitable for diabetics, since they have a low glycaemic index and thus do not influence blood sugar level. The sugar substitute is also particularly interesting for concepts marketed under a “natural” claim.

Regarding chemical and physical parameters, Stevia has an impressively high solubility in water. The glycosides are also

stable at high and low temperatures, meaning they can readily be used in cooking and baking as well as in frozen products.

Yet another advantage is its stability across a broad pH spectrum. That means nothing stands in the way of using it in soft drinks. The stability of steviol glycosides in the end product is generally considered very good.

### Possible applications for steviol glycosides:

- Dairy products, yoghurt
- Chocolate
- Ice cream and desserts
- Soy products
- Sauces and ketchup
- Jams, fruit and vegetable conserves
- Baked goods and pastries
- Beverages
- Fruit juices
- Table sweetener
- Cereals
- Snacks
- Chewing gum
- Sport nutrition





## PRODUCT RANGE

*Our offer*

### Our product range consists of:

- Stevia leaves (organic)
- Mixed steviol glycosides 95 %
- Steviol glycosides 95 % – 60 % Reb A
- Rebaudioside A 98 %
- Table Tops (table top sweeteners in different forms)

**As a rule of thumb:** The higher the content of rebaudioside A, the higher the price and sweetness. Steviol glycoside 95 % – 60 % Reb A are in most cases the best combination of optimal taste and price.

### STG 95 %

The product steviol glycosides 95 % is up to 250 times sweeter than sugar. As it contains all steviol glycosides occurring in Stevia leaves, STG 95 % offers a sweetening and taste profile which is very close to the one of the Stevia plant. STG 95 % has the lowest Reb A content (approximately 25 %) in our product range and therefore offer good value for money. A good application example is the use in jams.

### STG 95 % Reb A 60

STG 95 % Reb A 60 is up to 300 times sweeter than sugar and has shown excellent taste results in different consumer tests. Regarding price/performance STG 95 % Reb A 60 is a very attractive alternative to the product Reb A 98 % and is actually the most used quality for new launches in Europe. Application examples are soft drinks and dietary supplements.

### Reb A 98 %

Rebaudioside A is the molecule with the highest sweetening power of the Stevia plant. It is up to 350 times sweeter than sugar and without bitterness or aftertaste. Thus Reb A 98 % is the most expensive product on the market. Our quality guarantees a content of at least 98 % of rebaudioside A (usually it is even 99 %). Good application examples are chocolates and Table Top products.

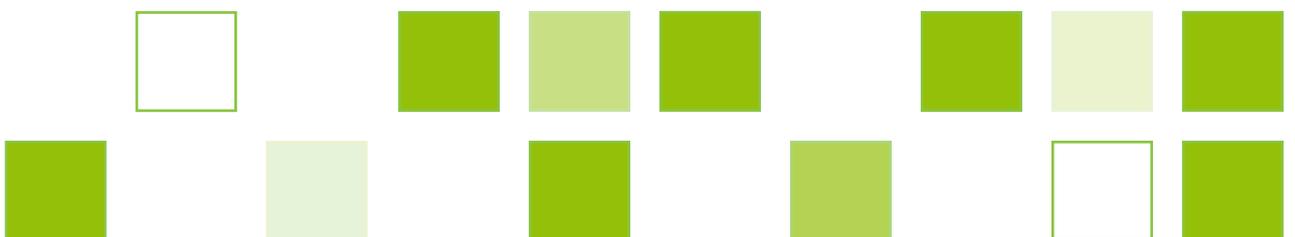
### Packaging

PE-Bags, cartons, drums, 1-10 kgs

## IMPAG GUARANTEES

*IMPAG guarantees you*

- High purity and consistent quality, and thus a highly pure sweet taste
- Highly standardized extracts (consistent sweetening power of the Stevia products)
- Sustainable agriculture and fair trade with the growers
- Production of the steviol glycosides in Europe (methanol-free)
- Stringent quality controls
- Experience and know-how in the launch of foods containing Stevia



# STEVIA NATURA

*Our partner*

Our partner Stevia Natura is a French company specialized in producing and marketing products derived from the plant *Stevia rebaudiana* Bertoni, and in particular the sweet-tasting steviol glycosides. Founded in the heart of France at the beginning of 2006, the company is located in Riom, Auvergne, near to Clermont-Ferrand. Stevia Natura's mission is to produce exclusively products from the Stevia plant and its glycosides as dietary supplements and sugar alternatives for the food industry.

By specializing in products from a single plant and its raw materials, Stevia Natura has amassed an impressive store of knowledge and experience. Stevia Natura benefits from its technological expertise and from collaborating with other modern, successful companies in the food and pharmaceuticals industry.

Stevia Natura obtains the production starting material, dried Stevia leaves, from plantations in Paraguay, the country of origin of Stevia, and from India. The cultures, drying and packaging are subject to the conditions of organic farming.

The subsequent extraction and purification of steviol glycosides takes place in France. The methods used to prepare the Stevia extracts are performed without the addition of chemical solvents, such as methanol. Stevia Natura uses only water, calcium hydroxide and organic ethanol to produce its products. Regular quality controls and analy-

ses ensure highly standardized extracts of high purity and consistent quality.

Aside from quality, the company also focuses particularly on the sustainability and traceability of the raw materials and products over the entire supply chain.



Table Top Products from Stevia Natura

Products from Stevia Natura are already available in finished product and as Table Tops. IMPAG is proud to present Stevia Natura as a partner for steviol glycosides.

## CO-BRANDING

*Marketing*

Given that options for Stevia claims are limited, co-branding with Stevia Natura presents a better alternative. When using our Stevia extracts, you can use the Stevia Natura logo on your product packaging.

This logo has high recognition value with consumers, where the combination of a Stevia leaf and the words "Stevia Natura" clearly indicates the use of steviol glycosides.

Villars Maitre Chocolatier already uses this solution for marketing its Stevia-sweetened dark chocolate.





## PRODUCTION PROCESS

*Of steviol glycosides*

The production process for Stevia extracts for use as sweeteners is very similar to the method of producing sugar from sugar beet or sugar cane.

The water-soluble properties of steviol glycosides are the basis for separating and purifying the plant components. However, only around 6 to 20 % of plant components belong to the steviol glycosides.

The production process can be broken down into two steps. The first step involves extracting the steviol glycosides before pure rebaudioside A is obtained in a second process.

The first step of industrial extraction is to obtain the water-soluble steviol glycosides from the dried leaves using suitable solvents.

Our partner Stevia Natura uses pure water and water steam for this. Different conditions, in terms of solvents, time and temperature, are employed depending on the product. Subsequent filtering or centrifuging eliminates solid particles and insoluble components.

Next, calcium hydroxide is added as a complex former and a number of soluble molecules precipitate out and are then separated off in a second filtration step. Using various separation methods, the steviol glycosides are purified from other soluble plant components. Ion resins serve to separate and remove charged materials and pigments. Steviol glycosides are uncharged and are therefore not retained by

the anionic and cationic resins. Next, thanks to their strong polarity, they are trapped by adsorption resins and then eluted with water and ethanol. The eluate obtained comprises 90 to 99 % purified steviol glycosides after the separation steps. Finally, the steviol glycosides are concentrated and spray-dried to obtain a fine, white powder.

The second processing step aims at separating pure rebaudioside A from the other steviol glycosides. Rebaudioside A crystallizes under specific conditions and can thus be obtained as a pure substance. This separation is based on the different solubilities of the individual steviol glycosides in water and alcohol.

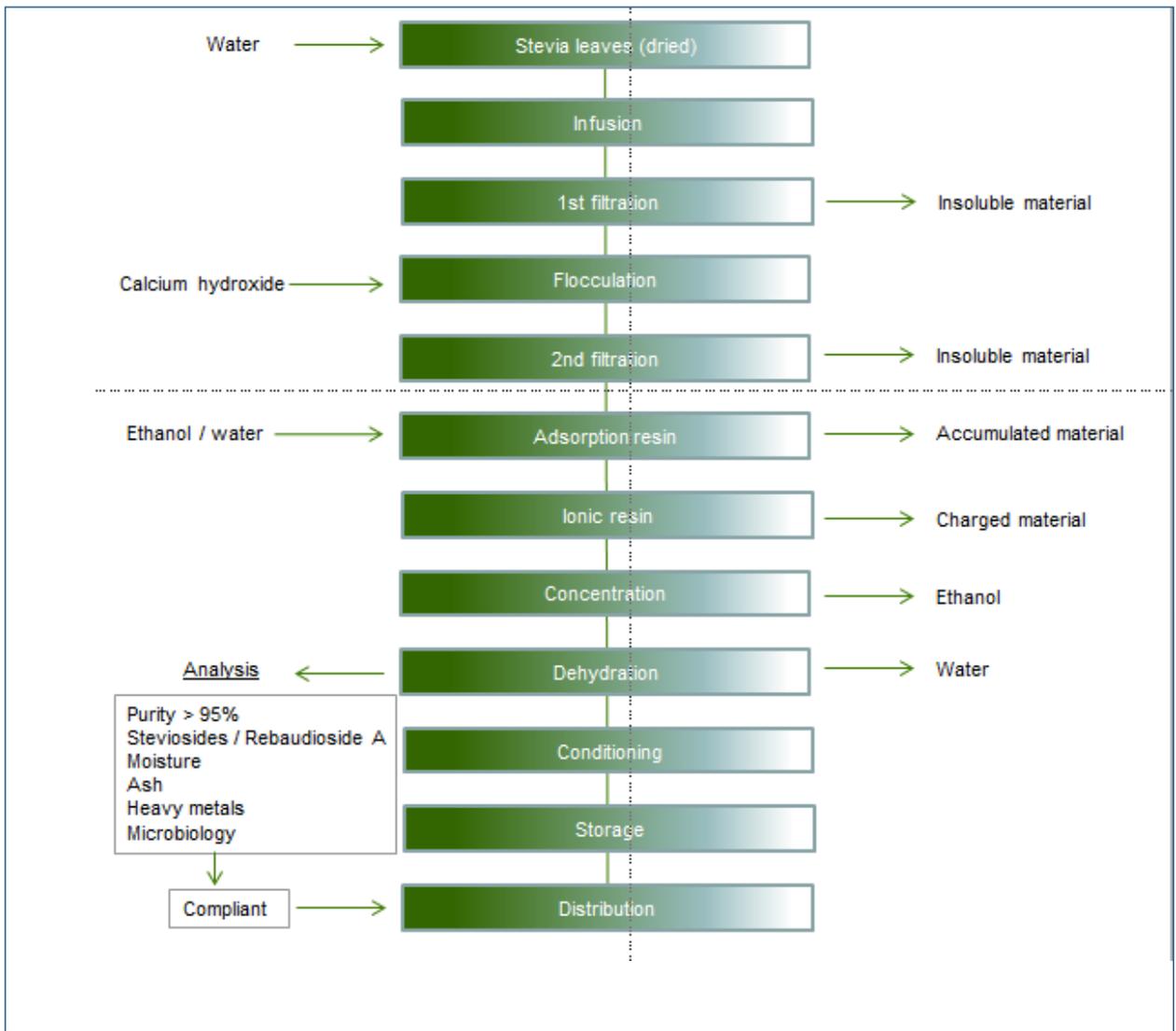
Next, the Stevia extracts are analyzed for their composition and purity. Finally, the compliant products are appropriately stored until they are distributed.

*(Pictured production process: opposite).*

### Decisive parameters

Decisive parameters for the industrial productivity are the quality of the leaves and thereby the content of steviol glycosides and rebaudioside A, as well as the choice of suitable processing technologies. Our partner Stevia Natura uses exclusively physical methods for extraction and purification. No chemical modifications or reactions are made to the extracts. The final products contain only very slight traces (< 5 %) of plant residues.





Pictured: Production process – mixed steviol glycosides 95%





## LEGISLATION

*In Europe*

After a long process, the EU Commission approved steviol glycosides obtained from the Stevia plant as food additives on 11 November 2011.

This was based on the positive assessment of Stevia given by EFSA in April 2010, which backs up the harmlessness and safety of use of Stevia with its scientific analysis. This opens up many applications for this interesting sweetener in the food industry.

Stevia can only be used under certain application conditions. The EU approval applies to a total of 31 categories of food-stuffs from sweets, to preserves and soft drinks, to table sweeteners.

Quantitative limits are specified for each of these product categories as a way to ensure the ADI (acceptable daily intake), defined by the European Food Safety Authority as 4 mg/kg body weight per day, is not exceeded overall.

These quantitative limits are defined in steviol equivalents.

As before, only steviol glycosides of 95 % purity are considered non-hazardous to health under consideration of the ADI.



[Link to the EU regulation in 23 languages](#)



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