

Palatinose™ – The only toothfriendly sugar for optimized energy supply

The combination of the nutritional, the sensory and the technological properties make Palatinose™ a unique carbohydrate with great potential for use in a healthy diet within an active lifestyle.

It is an ideal alternative to sucrose, glucose, maltodextrin and other highly digestible and highly fermentable carbohydrates.

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What is Palatinose™?

- It is the only fully digestible, low glycemic AND toothfriendly sugar.
- Its generic name is isomaltulose.
- It is a direct source of glucose (4 kcal/g).

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- It provides glucose in a more balanced way, supplying energy over a longer period of time.

What makes Palatinose™ special?



- Like sugar, the molecule consists of one glucose and one fructose unit. But in contrast to sucrose the molecule is much more stable, the reason for its special nutritional and technological characteristics (see 'nutritional benefits')
 - Kind to teeth as oral bacteria cannot break it down
 - Prolonged energy supply as it is metabolized much slower
 - Increased stability in beverages as micro-organisms cannot break the molecular bond
- It is derived exclusively from beet sugar.
- **It is the only fully digestible, low glycaemic AND toothfriendly sugar.**

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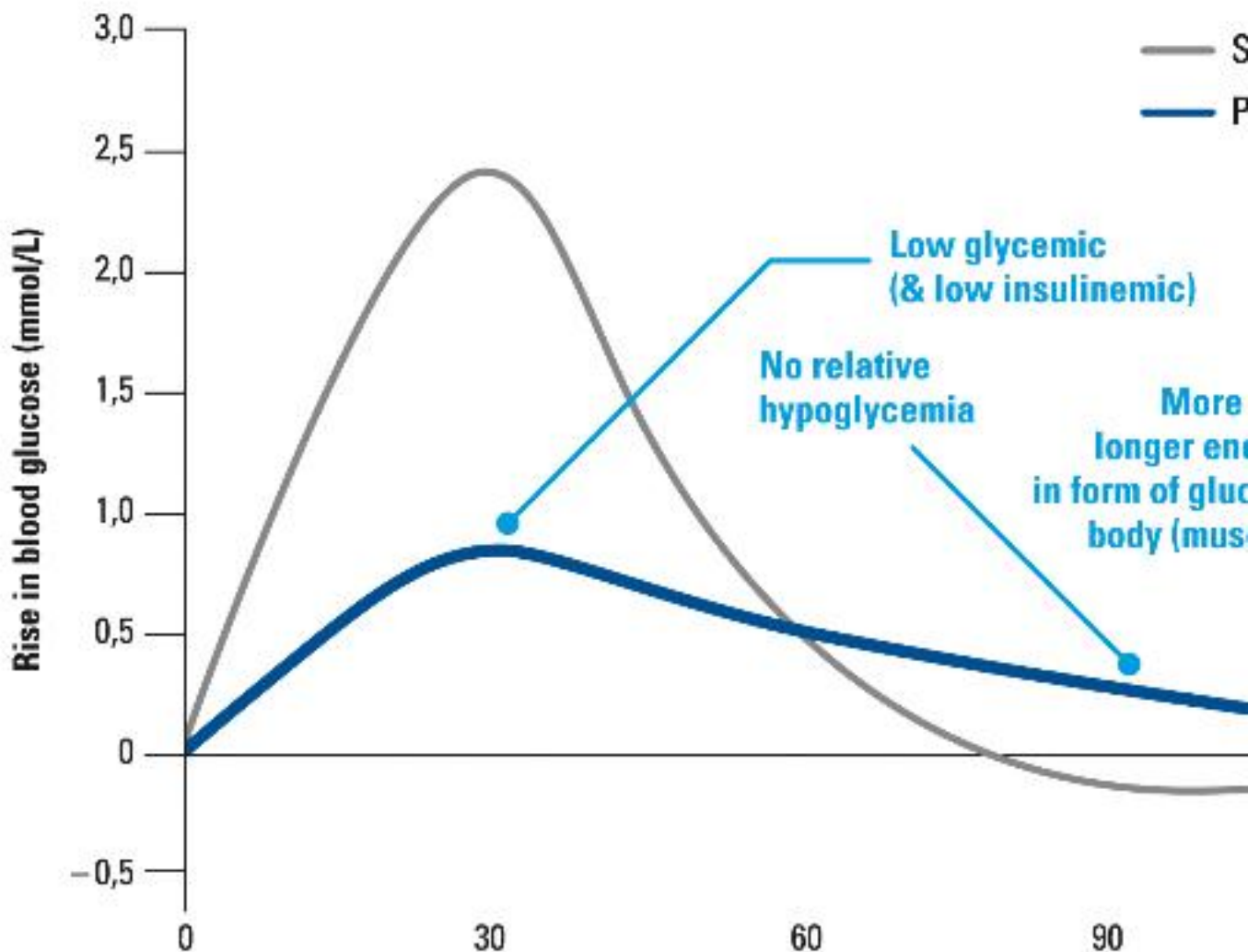
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- Due to its stable molecule structure it is non hygroscopic, acid resistant and shows a stable osmolality.
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What is the working mechanism of Palatinose™?

- Through an enzyme the bond between the glucose and the fructose part of sucrose is rearranged to gain a new carbohydrate, Palatinose™.
 - In Palatinose™ the linkage between these monomers has a higher stability. Digestion and absorption in the human body are much slower, the basis of the nutritional benefits of this new carbohydrate.
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What happens to Palatinose™ in the body?



Blood glucose response to Palatinose™ in comparison to other carbohydrates in healthy adults. The curves are from different studies and represent the response to 50 g oral carbohydrate in drinks solution. (Livesey)

- It is fully digestible but ...
- ...four to five times more slowly than sucrose.
- Before it can be absorbed by the body it has to be broken down in the gastrointestinal tract.
- Digestion and absorption are virtually complete at the end of the small intestine.

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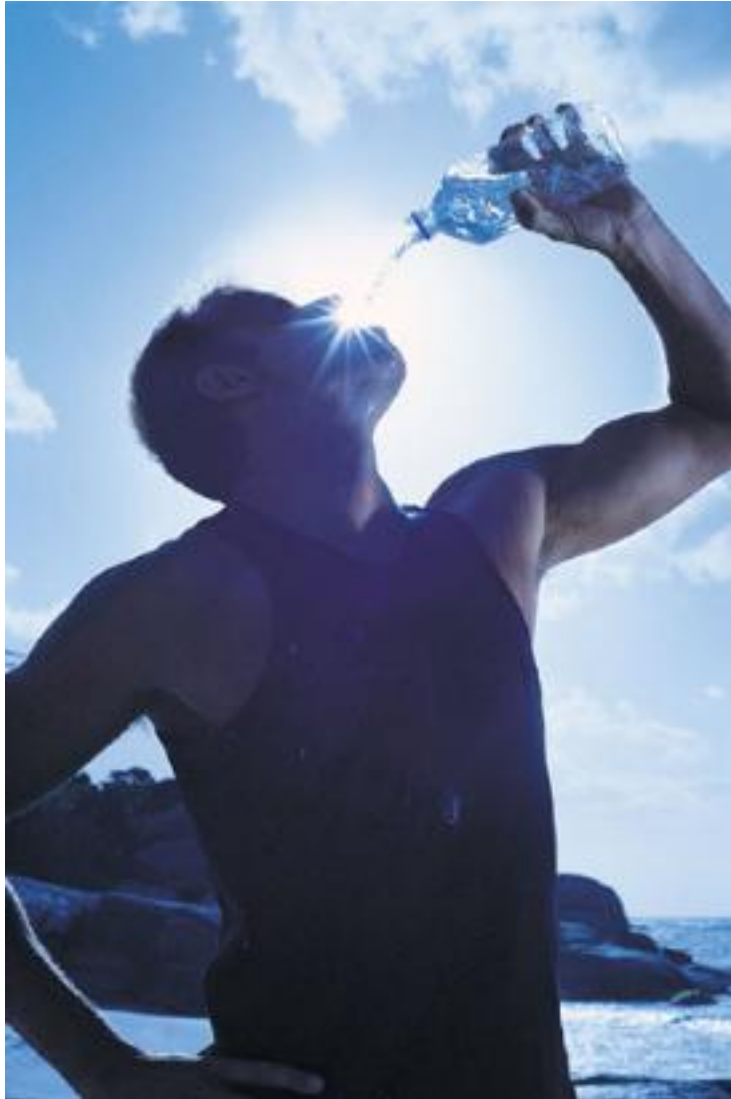
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- As it is **fully but slowly digested** it supplies the body with the **full energy** of carbohydrates (4 kcal/g) over a longer period of time
 - It displays a slower and overall lower rise in blood sugar with a **longer lasting** effect.
 - There is no significant drop below the baseline level as is the case with conventional sugars.
 - That means it **supplies energy continuously** in the form of glucose over a longer period of time which is beneficial for muscles and brain.
 - The GI of Palatinose™ is 32.
 - The low effect on blood sugar results in less insulin release with a low insulinemic index of only 30.
 - Its **low GI** facilitates a higher proportion of energy derived from fat burning in comparison to readily available carbohydrates.
 - And – it is **kind to teeth** as oral micro-organisms cannot use it as a substrate and consequently no harmful acids capable of attacking tooth enamel are produced.
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What are the nutritional benefits of Palatinose™?

- It is kind to teeth
 - It provides balanced, **longer lasting** and decelerated energy ...
 - ... in the form of a direct glucose source which is **THE energy source** for muscles and brain
 - Under specific conditions the intake of a Palatinose™ sweetened breakfast resulted in better **mental performance** when compared to an equivalent glucose breakfast
 - It is very low glycemic.
 - It avoids extreme insulin reactions.
 - It promotes **fat burning** by increasing the use of body fat and fatty acids as an energy source.
 - It is a long-term solution for blood glucose control.
 - It is a modern way of **energy management** as it is slowly but fully digested and absorbed.
 - Its gastrointestinal tolerance is the same as that of sucrose even at high intake levels.
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Who benefits from Palatinose™?



- It is good for **everyone** who eats a carbohydrate based well-balanced diet.
- It supplies the body with the necessary energy while its low glycemic response and the associated lower release of insulin have a positive effect on metabolism.

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- **Athletes** and **Sports People** who use carbohydrates in endurance training can benefit from Palatinose™ as it leads to the release of glucose energy at exactly the level where it triggers an increased rate of fat oxidation – while sparing glycogen in the human body.
 - Palatinose™ offers "better" calories for kids or anyone else during physical activity or in situations where mental focus and performance is key.
 - It enables the body's own carbohydrate stores to be spared for higher levels of endurance.
 - For a growing number of people **blood glucose control** is becoming increasingly important – this is where Palatinose™ can contribute to a tasty diet.
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Which products contain Palatinose™?

- Sports & fitness drinks
- Sports food
- Instant beverages
- Near water & functional water
- Dairy products
- Toothfriendly chocolate
- Cereal, energy and nutritional bars
- Bakery products
- Meal replacement drinks
- Clinical nutrition
- Supplements & nutraceuticals
- Table top sweeteners
- Ice cream
- Beer & beer specialities

Toothfriendly chocolate with Palatinose™

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Click on the picture to watch the film...

What does Palatinose™ taste like?



- Taste and appearance are similar to sucrose.
- It provides a **natural sweet** perception without any aftertaste and a sweetening power of 50 % compared to sucrose.
- It improves taste and texture in food and beverages.

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- A combination with other carbohydrates or high intensive sweeteners can result in improved sweetness, taste and texture of the final product.
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Where does Palatinose™ come from?

- It is derived exclusively from pure beet sugar.
 - It occurs naturally in **honey** and sugar cane molasses (juice).
 - It is the work of a natural micro organism that produces a unique enzyme that turns sucrose into Palatinose™ (isomaltulose).
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What is the history of Palatinose™?

- It was discovered in **1957** by the Südzucker AG biochemist Prof. Weidenhagen.
 - He investigated a bacterium called *Protaminobacter rubrum*.
 - This bacterium produces an enzyme which rearranges sucrose into isomaltulose. Isomaltulose acts as storage carbohydrate or energy reservoir for *P. rubrum*.
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How is Palatinose™ produced?

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- Palatinose™ is commercially produced from food-grade sucrose by enzymatic rearrangement of the glycosidic linkage between glucose and fructose from an α -1,2 linkage of sucrose to α -1,6 in Palatinose™.
 - The Palatinose™ solution is then crystallized, centrifuged, dried and sieved before packaging.
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How is it chemically described?

- The generic name of this sucrose-isomer is **isomaltulose**.
 - It is a pure, white, crystalline carbohydrate, a sucrose isomer and a **disaccharide**.
 - Its chemical name is 6-O- α -D-glucopyranosyl-D-fructose + H₂O.
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What is the scientific substantiation of the nutritional benefits of Palatinose™?

- Palatinose™ has been investigated intensely and has been tested in numerous human intervention studies conducted by universities, independent institutes and laboratories.
- These include e.g. blood glucose and insulin testing, endurance and performance studies, metabolic mechanism observations in overweight and average weight individuals as well as fat oxidation measurement by the so-called RQ (respiratory quotient) method and others.

Is there a consumption recommendation for Palatinose™?



- Like many other nutrients and especially fully digestible carbohydrates, Palatinose™ works from the very first minute and gram or serving.

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- It is recommendable to include it continuously in a diet for a long-term shift to a more balanced and healthy lifestyle.



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