

12

THE
MOST IMPORTANT
**FACTS ABOUT
SWEETENERS**





Meet the Sweet family.

What are sweeteners and what effects do they have on body and health?
Are sweeteners monitored and how do we know if they are contained within a foodstuff?
The Sweet family have critically evaluated sweeteners and carried out a lot of research.

We have collated all the most important facts together with the Sweet family, so that ongoing myths and misunderstandings about sweeteners can be seen in the correct light.

The 12 most important facts about sweeteners

Sweeteners – everyone knows them, but not everyone knows what exactly lies behind the designation. In this case, sweeteners are precisely defined, stringently monitored and researched in depth.

Nevertheless, there are many myths and misunderstandings, some of which have lingered since the start of industrial production of sweeteners in 1887 – without ever being fully confirmed. It's therefore high time that the key facts about sweeteners are made clear.

Let's start with the most important: Consumption of sweeteners is safe. Sweeteners are among the most strictly controlled food additives. They have been repeatedly checked by the European Food Safety Authority (EFSA) and classified as harmless by the respective regulatory authorities. This applies to adults as well as children and pregnant women.

Sweeteners do not provide any calories, are tooth-friendly, and do not impact blood sugar levels or have an effect on the intestinal microbiome. Therefore sweeteners can contribute to a delicious and nutritionally balanced diet, improving many people's quality of life. With this booklet, we would like to briefly and clearly explain the most important facts about sweeteners.

Would you like to know more?

Visit our websites

www.suessstoff-verband.info and
www.so-suess-wie-du.de – we will gladly answer your queries there.

Isabelle Begger

Süßstoff-Verband e.V.
Chairperson



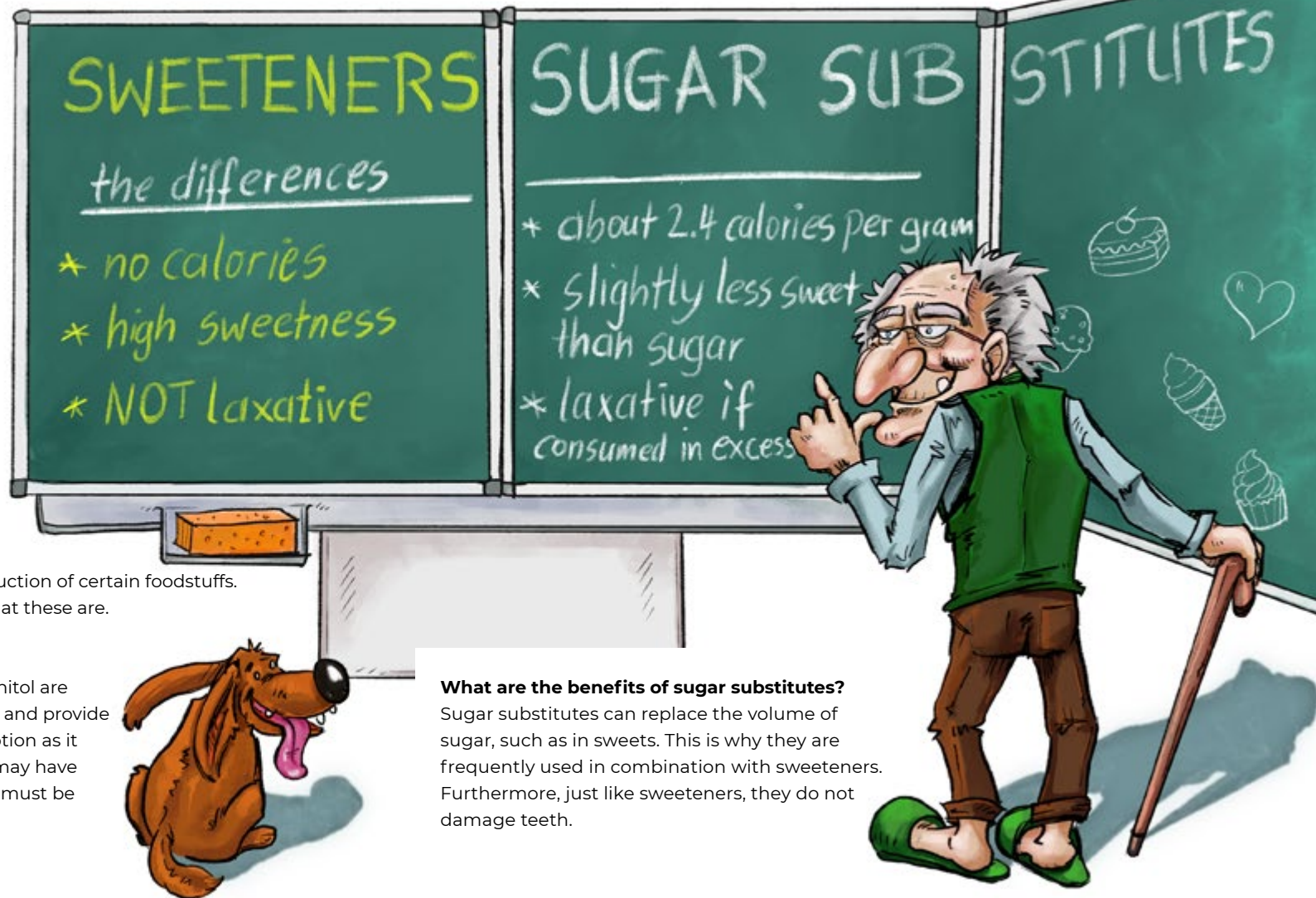
Fact #1

These sweeteners exist

The European regulations on sweeteners define sweeteners as substances that can be used to sweeten foodstuffs and as table-top sweeteners. Sweeteners are split into two groups – artificial sweeteners and sugar substitutes, which are also known as sugar alcohols, polyols or polyvalent alcohols. As they are considered to be additives, they are subjected to an approval process – without such approval, they are not allowed to be used in the production of foodstuffs. Furthermore, sweeteners must only be used in the production of certain foodstuffs. European regulations on additives determine what these are.

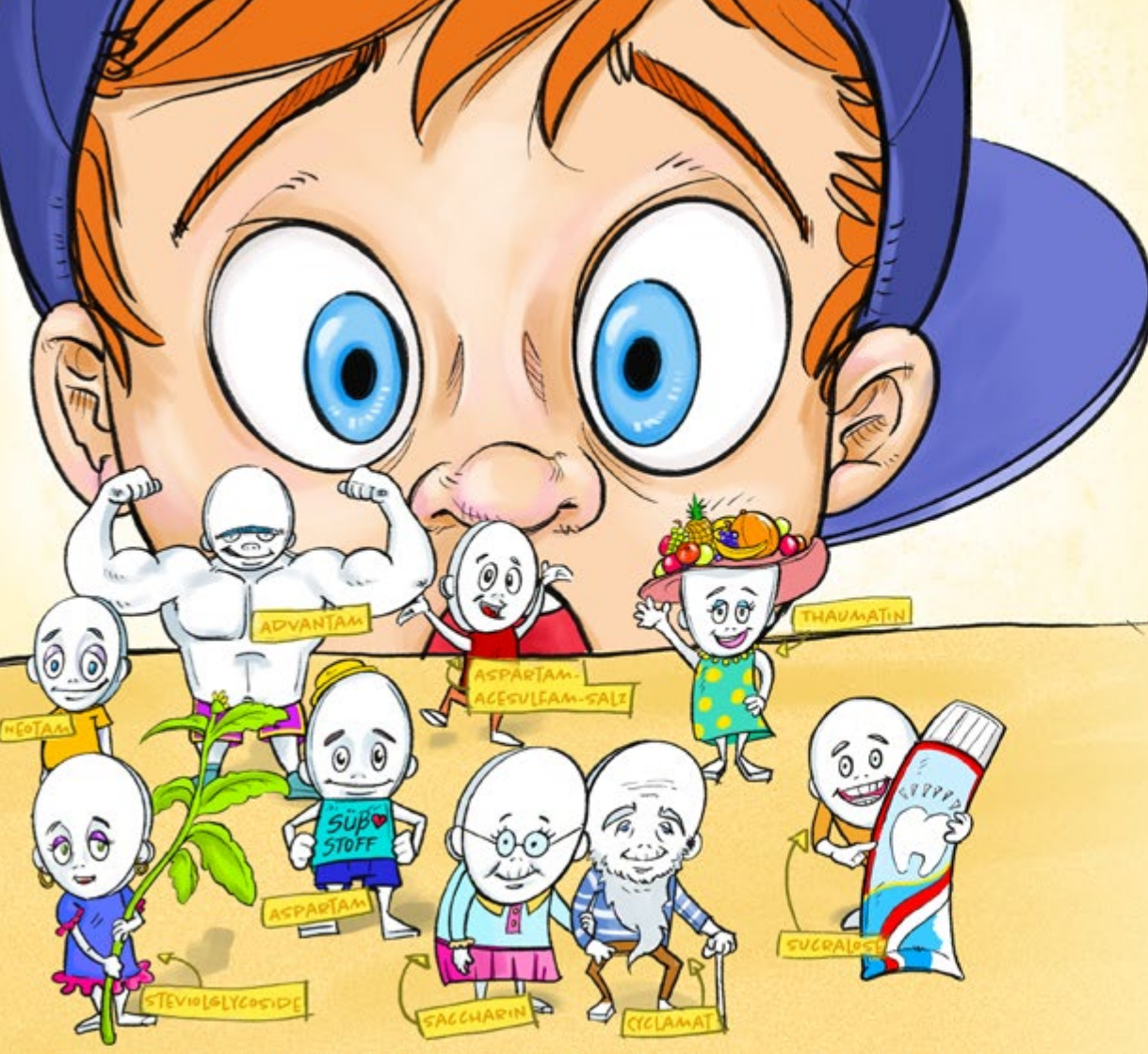
What are the features of sugar substitutes?

Sugar substitutes such as sorbitol, xylitol, or mannitol are somewhat less sweet, or about as sweet as sugar and provide about half as much energy. Erythritol is an exception as it does not provide any energy. Sugar substitutes may have laxative effects with excessive consumption and must be labelled accordingly.



What are the benefits of sugar substitutes?

Sugar substitutes can replace the volume of sugar, such as in sweets. This is why they are frequently used in combination with sweeteners. Furthermore, just like sweeteners, they do not damage teeth.



Fact #2

Sweeteners as sweet things

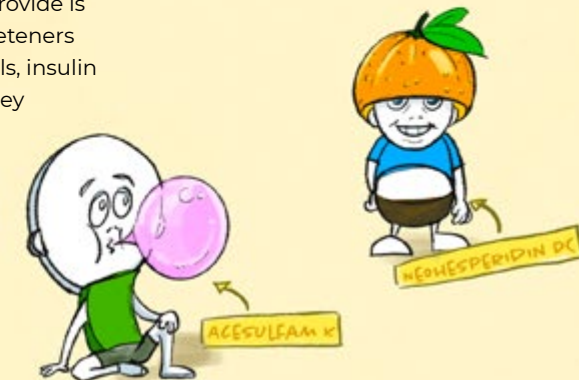
Sweeteners are exceptionally sweet. Compared to sugar, cyclamate is around 40 times sweeter, whilst advantame is 37,000 times sweeter.

Low-calorie sweetness

However, they provide no or practically no energy. That means they are used in such small quantities that even if, like aspartame, they have 4 kcal/g, the number of calories they provide is insignificant. In addition, sweeteners do not affect blood sugar levels, insulin release or digestion, nor do they damage teeth.

Are there different sweeteners?

At the moment there are eleven sweeteners permitted for use in foodstuffs within the European Union. They differ in structure, degree of sweetness, their technological properties and also in decomposition processes.



Fact #3

Sweeteners are **strictly controlled** additives

How is the safety of sweeteners ensured?

The EFSA (European Food Safety Authority) carries out a detailed risk assessment before a sweetener is legally permitted by the EU Risk Manager (European Commission, member states, and the European Parliament).

Approved sweeteners are tested over a period of years

Extensive scientific testing over many years is a prerequisite for approval. This covers all aspects that could have an impact on the human organism. These investigations often last more than ten years. A sweetener is only approved when it is established as harmless. In this case, the highest completely safe consumption levels are defined for each sweetener. It also sets out the products and quantities in which the sweetener can be used.

Even after approval, sweeteners are examined over time so that the assessment is always in line with the most up-to-date scientific insights.



Fact #4

Consumption of sweeteners is safe

What does the ADI value say about the safety of sweeteners?

The ADI value (Acceptable Daily Intake) states the quantity of an additive that can be consumed daily throughout life without any adverse health effects. It is not a threshold value for maximum consumption, but is a guarantee of safety that is aimed at lifelong consumption.

How is the ADI value calculated?

The ADI value is calculated based on long-term studies. In this case, initial investigations show the daily lifelong consumption levels where it is guaranteed that no adverse effects occur. This is known as the NOAEL value (No Observed Adverse Effect Level). This quantity is reduced by a high safety factor – usually a hundred times over, then applied as an ADI value.

How much sweetener is permitted?

EU-wide maximum quantities for sweetener usage in various foodstuff categories are established based on the ADI value. As an example, the ADI value of aspartame is 40 mg*. According to law, soft drinks may contain 600 mg of aspartame per litre. A person weighing 70 kg could drink 23 glasses (200 ml each) per day for the rest of their life. However, only 150 mg of aspartame is used, meaning the safe quantity rises to 93 glasses.

*Calculated per kilogram of body weight



Fact #5

Sweet due to sweeteners – what makes it sweet is listed

In which foodstuffs are sweeteners used?

Above all, sweeteners are used on calorie-reduced foodstuffs such as low-calorie drinks. These also include granular, liquid and table-top sweeteners that end users apply to their own food and drinks to sweeten them without adding extra calories.

How do I recognise foodstuffs sweetened with sweeteners?

Often, descriptions such as “zero”, “with sweetener”, “no sugar”, or “tooth-friendly” indicate the presence of sweeteners. However, EU regulations on packaging foodstuffs and a duty of disclosure are of the utmost priority here. As sweeteners are additives, they must be stated in the list of ingredients along with their class category and description, such as “Sweetener: saccharine”. Instead of the description, the

E number can also be stated: “Sweetener: E 954”. The gastronomy sector also has a duty of disclosure. In this case, simply stating the category name is enough.

What does nutrition labelling state?

Packaged foodstuffs must have nutrition labelling. These cover, amongst other things, carbohydrates and sugar. Sweeteners have practically no nutritional value. However, sugar substitutes count as carbohydrates, but not as sugar.



Ingredients: Isomalt and maltitol syrup as sweeteners, water, vegetable fat (palm oil), gelatine, acidifier (citric acid), emulsifier (mono- and diglycerides of fatty acids), flavourings, beta-carotene as colouring, sucralose and acesulfame K as sweeteners.

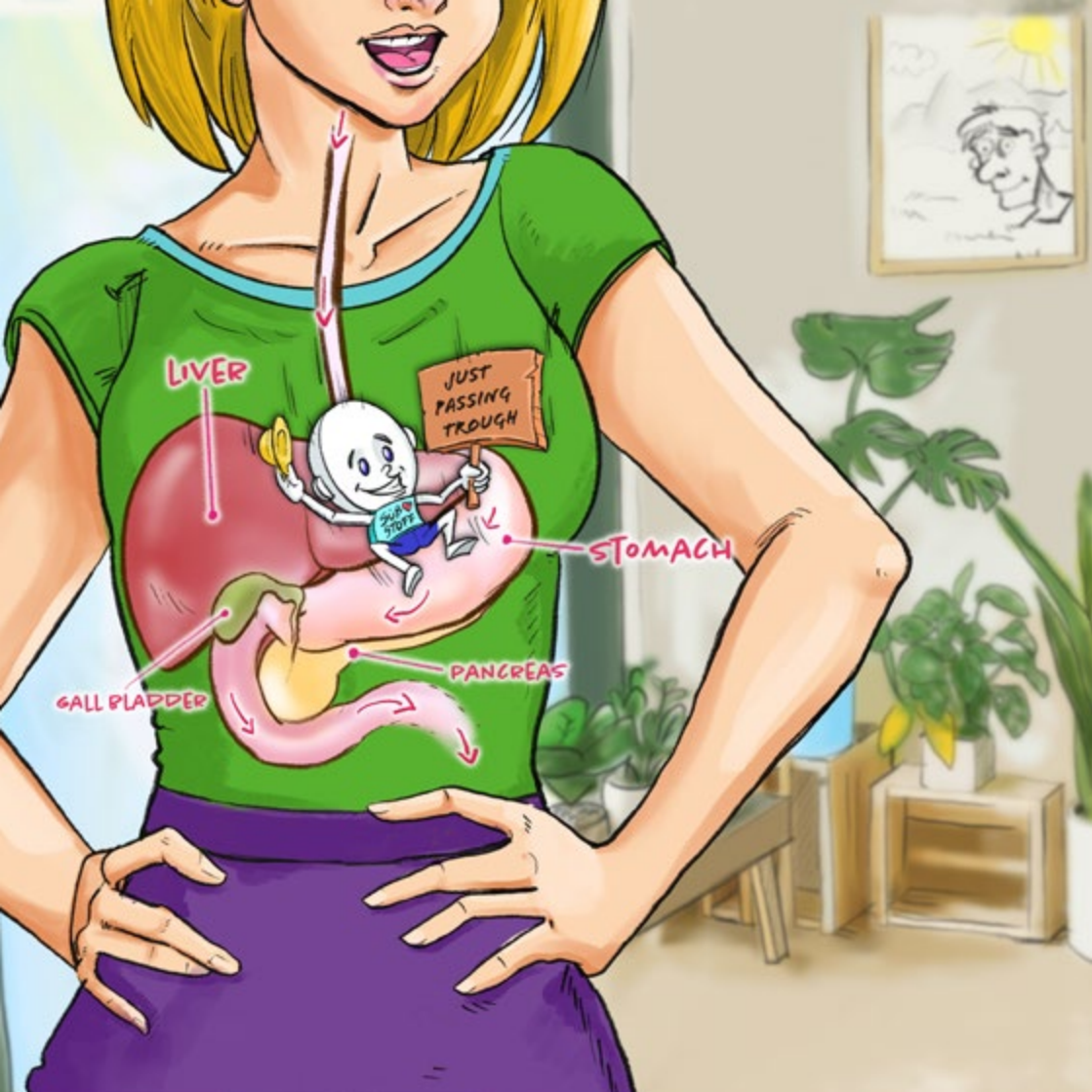
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Average nutritional values per 100 g	
Energy(kJ/kcal)	1067/257
Fat (g)	5,5
of which are fatty acids (g)	3,4
Carbohydrates(g)	83,0
of which are sugars (g)	0,0
of which are polyvalent alcohols(g)	83,0
Fibre (g)	0,0
Protein (g)	1,0
Salt (g)	0,0

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Find out more at:
www.suessstoff-verband.info

Excessive consumption may induce laxative effects.



Fact #6

Sweeteners have **no effect** on blood sugar levels

The thesis was proposed at the end of the 1980s that merely the sweet taste of sweeteners triggered insulin release in the body ("cephalic insulin reflex") and whilst it appears feasible at first glance, it has not been confirmed in practice.

How do sweeteners act in the human body?

Whilst sweeteners trigger a sweet taste on the tongue, they act like water within the body. They do not have an effect on insulin release, hunger, or appetite. Insulin and blood sugar levels do not change after consuming sweeteners – neither directly after eating, nor during the digestion process. This has been demonstrated by a series of well-designed human studies.

As an example, daily consumption of two cans (330 ml each) of a fizzy drink containing sweeteners over a twelve-week period has no discernible effect on insulin sensitivity or insulin secretion on healthy and overweight people.

Health claim for sweeteners

The European Food Safety Authority (EFSA) also confirmed via assignment of a health claim that "consumption of foodstuffs with sweeteners instead of sugar lead to a lower increase in blood sugar levels after consumption than consumption of foodstuffs containing sugar".



Fakt #7

Tastes are different

The preference for sweet things is innate, however various factors determine how and whether tastes change during our lives. Our genetics determine the sensitivity towards bitter, sweet, salty, sour and umami foods, and probably also with fatty foods too.

How does taste develop?

What we like also depends on what was offered to us as children and how frequently we ate something – known as the *mere exposure effect*. In contrast, there is a specific sensory saturation. This biological evolutionary process ensures increasing aversion to constantly repeating tastes. Phrases such as “eat until it comes out of your ears” are in common parlance.

What factors influence our taste?

The examples set by our parents or guardians, and how we experienced mealtimes also have an impact on our preferences and dislikes. Furthermore, our choice of food also has social, political, economic, psychological and cultural dimensions. During each person's life, they create a personalised archive of tastes.

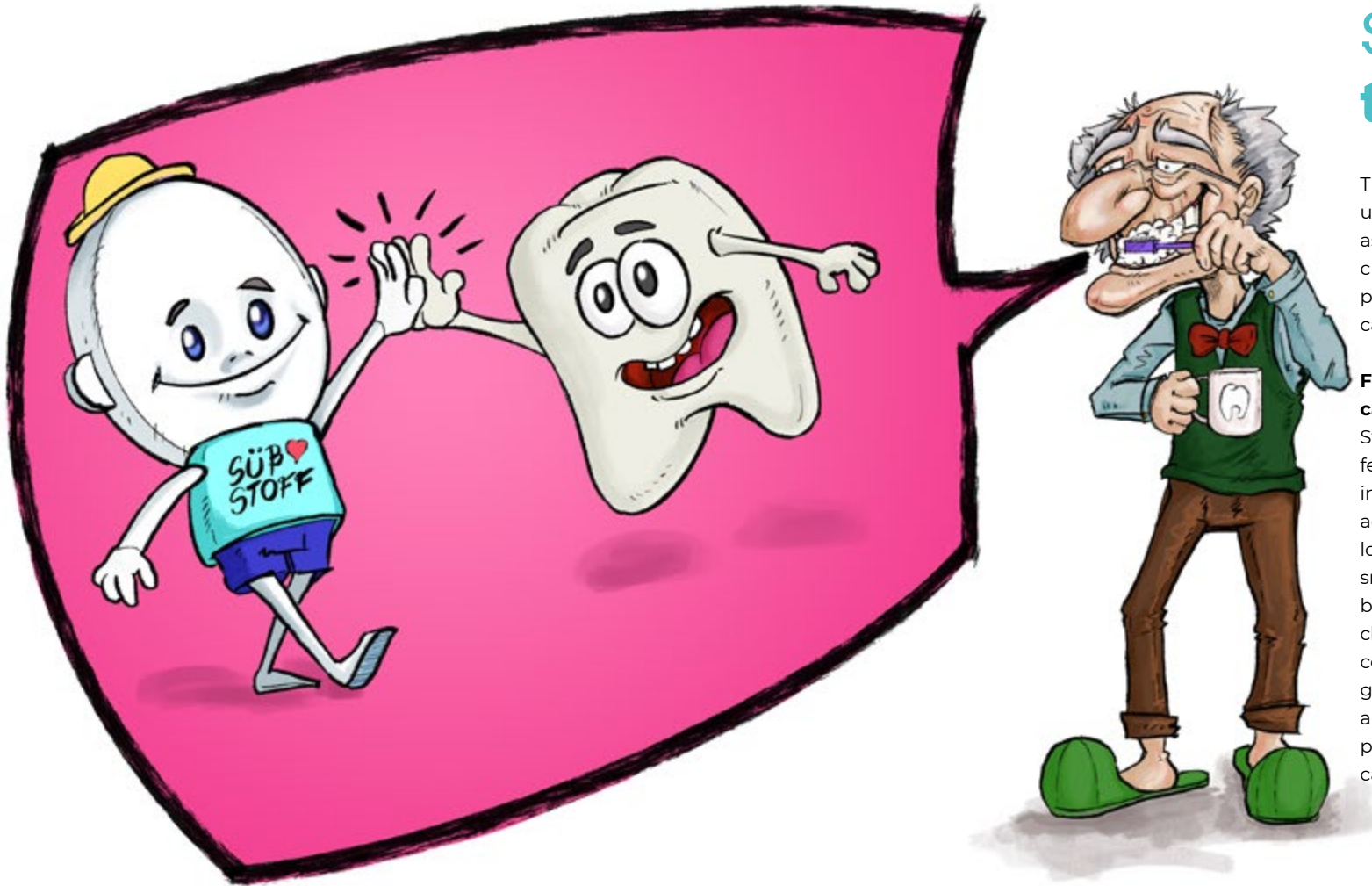
Fact #8

Sweeteners are tooth-friendly

The minerals in tooth enamel are extremely resilient under normal conditions. However, carbohydrates such as sugar or starch can represent a risk to them. Bacteria create acids out of carbohydrates – which destroy the protective surface of the teeth, erode the enamel and cause cavities.

Food and drinks with sweeteners lower the risk of cavities

Sweeteners do not contain carbohydrates that may ferment. For this reason, they do not provide bacteria in the mouth with anything that can help produce acids. Food and drinks containing sweetener therefore lower the risk of cavities. It is better to choose sugar-free snacks for the sake of your teeth, especially for snacks between meals. This is particularly important with chewing gum, sweets and lollipops as they come into contact with teeth for prolonged periods. As expected, good oral health is also important. Sweeteners are also used to improve the taste of oral and tooth care products that contain fluoride, so help protect against cavities.



Fact #9

Sweeteners have **no effect** on the intestinal microbiome

The human intestine is unique and complex

Microbiome research over the last two decades has shown that the human intestine houses a unique and complex ecological system: Insights acquired from animal experiments are therefore not fully applicable to humans, as experiments on humans are more difficult to control whilst in-vitro systems mean that it is not possible to take the whole, complex interactive system of the human digestive system and microbiota into account. There are also studies that have focused on “sweeteners and the microbiome”.

We only consume low quantities of sweeteners

In quantity terms, sweeteners are only a minimal proportion of our diet. For that reason alone, their impact on the microbiome is therefore minimal. This is shown by studies that there is no impact on the microbiota, short-chain fatty acids in stools or oral glucose tolerance tests (oGTT) both in human test subjects and in mice.

Important: The colon is not always the final stage!

As an example, aspartame is broken down into its constituents and absorbed in the small intestine. Saccharine and Acesulfame K are also reabsorbed in the small intestine and then excreted, unchanged, in urine.



Fact #10

Preference for sweet things is innate



A preference for sweet things is innate

All newborns react positively to sweet-tasting things. Bitter and sour tasting things are rejected, and salty things are accepted after the first few months. Very old structures in the brain stem in phylogenetic terms are responsible for this reflex-like preference or aversion to various tastes.

Our ancestors also liked sweet things

They searched for foodstuffs with a sweet taste. When searching for things to eat, a sweet taste has always signalled: "This is safe!" However, if berries or roots tasted bitter or sour, then caution is required – evolution has taught a



need to distinguish between safe and harmful-tasting things. Amniotic fluid and mother's milk also taste sweet.

Preference for sweet foodstuffs was necessary to survive

A sweet taste, such as from ripe fruits, also means a good source of carbohydrates and therefore calories – which was of essential importance for our ancestors. This preference for sweet foods may well have provided a survival advantage during periods when food was scarce.



Fact #11

Sweeteners do **not**
stimulate cravings
for sweet foods

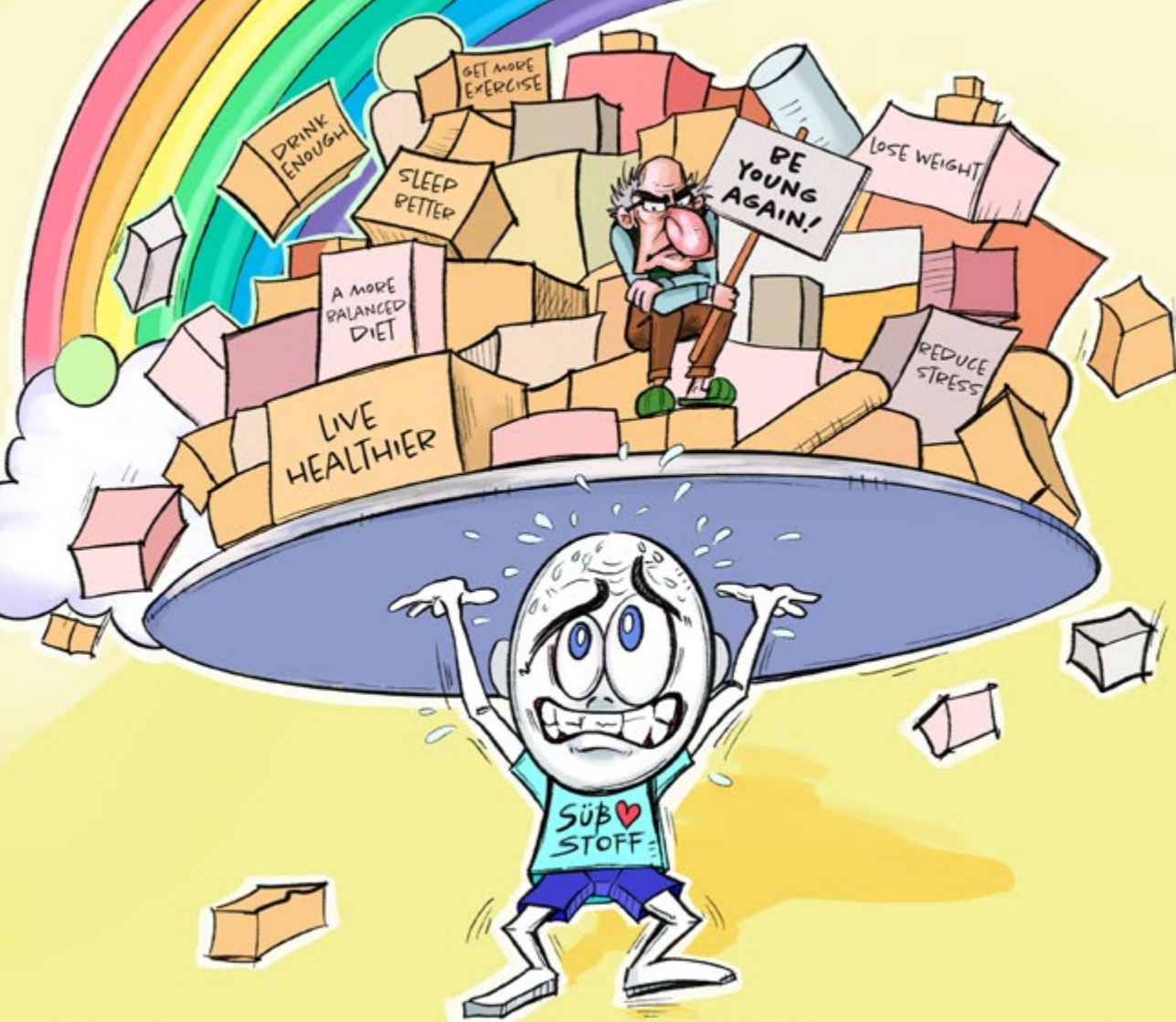
Sweeteners are far sweeter than sugar

The sweetness of sweeteners can even be several thousand times higher than that of sugar. So that the sweetness corresponds to that of sugar, sweeteners are only used in exceptionally small quantities.

The product does not become sweeter due to the use of sweeteners, but significantly lower in calories.

Users of sweeteners often have healthy eating behaviours

Studies show that consumption of sweet foods and drinks does not necessarily have an impact on a preference for sweet things. There is no vicious circle where consumption of sweet things leads to consuming more of them. By the same token, the eating habits of those who use sweeteners do not get worse. On the contrary: Eating habits that include the use of sweeteners or foods and drinks with calorie-free sweeteners are often associated with overall better nutrition and healthy eating habits, as shown by scientific research.



Fact #12

Sweeteners and the alibi feature

Drinks and snacks with sweeteners can help with doing without certain foods

Whilst sweeteners certainly don't aid slimming on their own, and they should not be used as an alibi for poor eating habits, they do provide a wide range of sweet-tasting options with few or even no calories. They provide a sweet hit that helps the user go without calorific drinks and snacks.

Sweeteners support a balanced diet

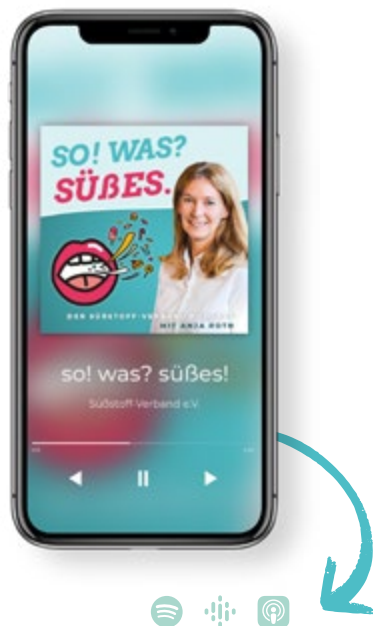
When used instead of sugar and as part of a balanced diet, they can play a useful part in reducing sugar and calorie intake as well as for controlling blood sugar levels. If, for example, a drink is taken with a meal, it is shown that exactly the same is consumed with calorie-free and calorific drinks. Energy intake due to calorific drinks is not reduced during the meal, but increased. Drinks sweetened with sweetener do not add any calories.

More information is available in our podcast

so! was? süßes.

Did you know that the oldest sweetener, saccharine, is already over 130 years old and was actually only discovered by accident? This and more exciting facts about sweet foodstuffs are covered in our podcast so! was? süßes. Our hostesses Anja Roth (dietician and specialist on sweeteners) and Sophie Samrock (host) talk about everything relating to diet, sweet-tasting things and sweeteners. Podcast guests come from the field of sweeteners, nutritional advice and science, sport, medicine, or simply pass comment on everything sweet from day-to-day life.

You can find out everything you need to know about sweeteners approved in the EU on our portals. We look forward to seeing you there!



Have a listen!

www.suessstoff-verband.info

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Fact #4 // Consumption of sweeteners is safe

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