



03

Sweet Science

The Truth About Sugar

Sugar Knowledge for Nutrition Professionals



Sugar makes you fat, causes type 2 diabetes, is addictive, and harms your teeth: at least, that's what many common myths claim. These misconceptions remain deeply rooted in public consciousness. Yet current scientific evidence shows: none of these beliefs are scientifically proven. Weight gain is not caused by individual foods but results from a positive energy balance. Type 2 diabetes also has multiple causes: besides genetic predisposition, lack of physical activity and obesity are the most significant risk factors. The goal of modern nutrition counseling should be to debunk sugar myths and consider beet sugar as a part of a balanced and sustainable diet – without prohibitions.

Does Sugar Make You Fat? Sugar and Obesity

According to the Robert Koch Institute (RKI), two-thirds of men (60.5 %) and nearly half of women (46.6 percent) in Germany are overweight. One-fifth (19.7 percent) of adults are obese. Children and adolescents are also affected: 15 percent of 3- to 17-year-olds are overweight, 6 percent of them obese.¹

Obesity increases the risk of chronic diseases such as type 2 diabetes and cardiovascular disease. While the causes are diverse, the decisive factor is a positive energy balance: a caloric surplus inevitably leads to weight gain. No single food or nutrient is responsible; it's the overall diet that counts.

Still, sugar consumption is often singled out. Yet studies show: at constant caloric intake, sugar does not significantly influence body weight. Specifically, when sugar is isoenergetically replaced with other carbohydrates or fats, body weight remains unchanged.^{2,3}



Thus, what matters is not whether you eat sugar, but how it is incorporated into the overall diet. A mindful, balanced, and varied diet can include sugar – without bans, but with moderation and awareness.

Sustainable eating habits are best supported by a realistic and adaptable approach that allows enjoyment without guilt and fits into everyday life.



Did you know? One-third of the EU population is not physically active enough. Experts recommend at least 150 minutes of physical activity per week for adults and 90 minutes daily for children.

Does Sugar Cause Diabetes? Sugar and Type 2 Diabetes



About 8.5 million people in Germany live with type 2 diabetes.⁴ The main risk factor is overweight, especially obesity.

In this pathophysiological state, liver, muscle, and fat cells no longer respond adequately to insulin. To maintain glucose uptake, the pancreas produces more and more insulin – until beta cells become exhausted and insulin secretion

declines. The result: hyperglycemia, the defining characteristic of diabetes mellitus – and the true reason behind the term “sugar disease.”

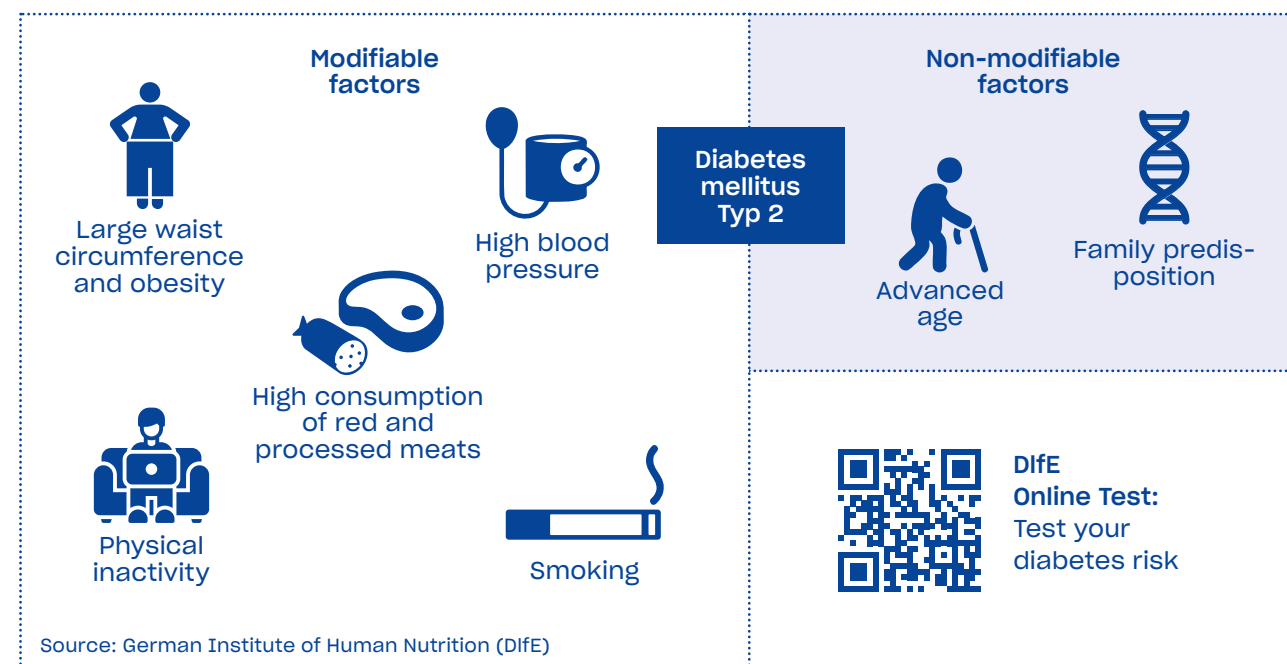
This widespread label often leads to misconceptions, suggesting that excessive sugar intake causes diabetes. However, multiple systematic studies have clearly disproven a direct link between sugar consumption and type 2 diabetes.^{5,6}

Weight Loss = Remission

Body weight plays a key role in both prevention and treatment of type 2 diabetes. Major studies like the EPIC observational study and the DIRECT intervention trial show that significant weight loss can lead to diabetes remission.^{7,8}

Guidelines of the German Diabetes Association (DDG) emphasize individualized treatment strategies that include both physical activity and dietary change.⁹

Risk Factors for Type 2 Diabetes



Nutrition for Type 2 Diabetes

Type 2 diabetes is a complex lifestyle-related disease. Since sugar intake itself has no direct impact on its development – but body weight does – a healthy, diverse diet with portion control remains the most effective prevention strategy.

Even people with diabetes should follow the general guidelines for a balanced, wholesome diet.¹³ Sugar does not need to be excluded. Moderate sugar consumption is acceptable for people with diabetes.



Did you know? Beet sugar (sucrose) has only a moderate glycemic index (GI). While pure glucose has a GI of 100, sucrose's GI is about 65 – lower than often assumed.

Glycemic Index – More Individual Than You Think

A common myth: eating sugar causes extreme blood sugar spikes. In reality, blood glucose responses vary greatly between individuals. Meal composition, gut microbiota, insulin sensitivity, and personal metabolic reactions all influence the degree of blood glucose rise. Therefore, even identical foods can produce different glycemic responses in different people.¹⁴

Nutrition is highly individualized. Judging sugar or single foods solely by glycemic index (GI) is too simplistic. Instead, focus should be on a balanced and diverse diet that takes individual metabolic traits into account.¹⁵

Does Sugar Cause Tooth Decay? Sugar and Oral Health

Caries is often seen as a “sugar problem.” However, it’s really a matter of diet, oral hygiene, and preventive care. According to the latest German Oral Health Study (DMS 6), tooth decay among children in Germany has declined by around 90 percent since the 1990s – primarily thanks to better oral hygiene, targeted prophylaxis, and regular dental checkups.¹⁰

Caries occurs when bacteria in plaque ferment carbohydrates like sugar or starch, producing acids that erode enamel.¹¹ The key is not the amount, but the frequency of consumption and the duration of acid exposure: the more often fermentable carbs are consumed, the more acid is produced.¹²

Effective strategies include good dental hygiene and regular checkups. As part of a healthy diet, it also helps to reduce the intake frequency of fermentable carb – but a complete avoidance of sugar is neither necessary nor advisable.



Is Sugar Addictive? Sugar and Sweet Preference



It's often claimed that sugary foods increase the craving for more sweets. A recent study disproves this: the preference for sweetness is innate and evolutionarily determined – not reinforced by sugar intake.¹⁶

Changes in sugar content of foods have no significant effect on sweet preference, energy intake, or body weight. Though sweet taste is universally liked, there is no evidence that increasing or reducing sugar intake alters this preference in the long term.

Sugar can be pleasurable. But it's not addictive in the classical sense. While eating sweets may trigger the release of “feel-good” hormones like dopamine, this also occurs during other enjoyable activities like listening to music or spending time with friends. There is no scientific proof of a substance-based addiction to sugar.¹⁷

Is Avoiding Sugar Helpful?

Interestingly, studies show that people who moderately include sweet foods in their diet often have more lean body mass and lead overall healthier lifestyles.¹⁸ This suggests that a balanced and flexible diet is more beneficial in the long term than the strict avoidance of certain food groups.

A large-scale Swedish study confirms: a complete sugar abstinence is unnecessary and may even be counterproductive. Results show that neither excessive nor extremely low sugar intake is linked to health benefits. Instead, the best approach is a moderate inclusion of sugar within a balanced diet.¹⁹



Tips for Nutrition Counseling

- ✓ **Diverse & wholesome:** Encourage a varied diet rich in whole grains, legumes, fruits, and vegetables. Fiber supports gut health and satiety.
- ✓ **No prohibitions:** Bans often lead to cravings. Instead, a balanced, intuitive eating approach fosters long-term healthy habits.
- ✓ **Daily movement:** Aim for 30 to 60 minutes of activity per day, not just sports, but also an active daily routine.

Sources (as of April 2025): ¹ RKI; 2025; <https://www.rki.de/DE/Themen/Nichtuebertragbare-Krankheiten/Koerperliche-Gesundheit/Adipositas-und-Uebergewicht/adipositas-und-uebergewicht-node.html>. ² Hall K. D. et al.; 2017; DOI: 10.1053/j.gastro.2017.01.052. ³ Morenga L. T. et al.; 2013; DOI: 10.1136/bmj.e7492. ⁴ drs.dife.de. ⁵ Neuenschwander M. et al; 2019; DOI: 10.1136/bmj.12368. ⁶ Tsilas C. S. et al.; 2017; DOI: 10.1503/cmaj.160706. ⁷ Forouhi N. G. et al.; 2014; DOI: 10.1007/s13668-014-0098-y. ⁸ Lean, M. E. J. et al.; 2018; DOI: 10.1016/S0140-6736(17)33102-1. ⁹ <https://www.ddg.info/behandlung-leitlinien/guide-line-practice-recommendations>. ¹⁰ IDZ; 2025; <http://www.deutsche-mundgesundheitsstudie.de/>. ¹¹ König K. G. et al.; 1995 DOI: 10.1093/ajcn/62.1.275S. ¹² Anderson C. A. et al.; 2009; DOI: 10.1111/j.1467-789X.2008.00564.x. ¹³ DGE; 2021; <https://www.dge-medienservice.de/media/productat-tach/4/0/400470.2021-ergaenzungsmaterial-beratungsleitfaden-opt.pdf>. ¹⁴ Zeevi D. et al.; 2015; DOI: 10.1016/j.cell.2015.11.001. ¹⁵ Veit M. et al.; 2022; DOI: 10.1038/s41430.022-01114-5. ¹⁶ Mueller C. et al.; 2024; DOI: 10.1016/j.appet.2024.107277. ¹⁷ Markus C. R. et al.; 2017; DOI: 10.1016/j.appet.2017.03.024. ¹⁸ Armitage R. M. et al.; 2024; DOI: 10.1038/s41366-024-01494-7. ¹⁹ Ramne S. et al.; 2019; DOI: 10.1093/ajcn/nqy268.