



No link between **industrial sugar** and **type 2 diabetes mellitus?**

The sugar industry's fairy tales continue

We recently received a report from the "Study Service" of the German Sugar Industry Association (Wirtschaftliche Vereinigung Zucker e.V. – WVZ), entitled "*No link between sugar intake and type 2 diabetes mellitus*". A recent review was said to have refuted the assumption that sugar is causally involved in the development of type 2 diabetes mellitus.¹ We took a closer look.

What is this about?

The study was published in March 2025 in the journal *Advances in Nutrition* and was conducted by a research group led by American scientist Dr. Karen Della Corte.² It is a meta-analysis of the dose-effect relationship between different types and sources of sugar and the risk of developing type 2 diabetes mellitus. 29 studies were used to investigate the effects of the consumption of sugar-sweetened beverages, fruit juices, fructose and sucrose, as well as the intake of total sugar and added sugar.

Significant increase in risk due to sugary drinks

The analysis shows a significant increase in the risk of diabetes due to the regular consumption of sugar-sweetened beverages. Data from 17 studies were evaluated for the assessment of drinks with added sugar, such as soft drinks or cola. Each additional portion* per day was found to increase the risk by 25%. In the case of fruit juices, for which data from 14 studies was used, the increase in risk was less pronounced, but still significant. The authors conclude that any intake of sugar through beverages increases the risk of developing type 2 diabetes mellitus and for this reason, there is no maximum amount that can be classified as harmless to health.

* A portion was defined as the amount of one can. This corresponds to approximately 330 ml with a sugar content of 39 g.

Accordingly, this meta-analysis does not – as the headline of the WVZ report suggests – come to the conclusion that there is no connection between sugar intake and type 2 diabetes mellitus. On the contrary: a strong positive correlation is described for the amount of industrial sugar contained in drinks.

Protection through more sugar?

Nevertheless, the study also provides results that show sugar in a good light and are described in detail in the WVZ report. This is because the meta-analysis comes to surprising results with regard to the other types and definitions of sugar examined: No correlation is described between added sugar and fructose and the risk of developing type 2 diabetes mellitus and even a negative correlation is shown for total sugar and sucrose – i.e. a reduced risk due to a higher sugar intake. But how did these results come about?

Total sugar - low significance

For the assessment of total sugar intake, only four studies were examined, and a closer look at these studies casts doubt on the result of a negative correlation. One of the four studies found a positive correlation between an increased total sugar intake and the risk of diabetes³, another found a slightly negative correlation only for men included in the study and also a positive correlation for women⁴. Only two of the four studies essentially contribute to the conclusion of the authors of the review that a high total sugar intake reduces the risk of diabetes. Interestingly, the authors of the two studies themselves come to a different conclusion: both write that, according to their data, no significant correlation at all can be established between the level of total sugar and the development of type 2 diabetes mellitus.^{5,6} In addition, the results of one of these two studies should only be used with reservations anyway due to an unfavorable study design – a classification that the authors of the meta-analysis make themselves. For this reason, they generally attribute only a low level of significance to their analysis of the total amount of sugar.

Sucrose - moderate significance

A closer look at the assessment of sucrose is not much different. Seven studies were included in this assessment. One of them found a positive correlation³, one also found a slightly negative correlation in men and a positive one in women⁴. Two studies found no (significant) correlation.^{6,7}

This leaves only three studies which, in the evaluation of the review, are decisive for the classification that an increased sucrose intake is associated with a reduced risk of diabetes. Of these three studies, two looked at a very limited group of people, namely only women between the ages of 46 and 62⁸ or 55 and 69⁹. In one of them, no definitive association between sugar intake and diabetes risk could be found, only for a smaller subgroup a negative association for sucrose was shown. However, the authors of this study, Janket et al., relativize the result and point out that possible measurement errors and the relatively short observation period of 6 years could have led to false results. They also question the generalizability of their results due to the narrowly defined study group.⁸ Similar limitations also apply to the second of these two surveys.

In contrast, the last of the seven studies on sucrose found no correlation in the women examined – although a clear negative correlation was reported for men.¹⁰ This contributes significantly to the result of an alleged protective effect of sucrose on diabetes. But here, too, it is worth taking a closer look. Unlike the authors of the meta-analysis, the authors of this publication, Schulze et al., state that no significant association between sucrose intake and diabetes risk was found in their work. They even explicitly discuss the fact that previous studies on this issue had delivered contradictory results and that the observation of some studies in which a negative correlation is described contrasts with results from human experiments and experimental animal research. These clearly showed that a diet high in sucrose leads to reduced insulin sensitivity (and thus the potential development of diabetes mellitus). In their view, the inconsistency across studies could be due to the different effects of naturally occurring sugar and added sugar.¹⁰

These deviating results and classifications are not discussed in the meta-analysis. In summary, it can therefore be said that the seven studies used to evaluate sucrose do not support the results of the review on closer inspection. The authors of the meta-analysis rated the evaluation as having "moderate" significance.

Added sugar - low significance

Only two studies were included in the assessment of the effects of added sugar on the risk of developing type 2 diabetes mellitus. Interestingly, both were conducted by the same research group – moreover, one study examined a sub-cohort (sub-group) of the other study. This results in a certain duplication of data, which weakens the overall significance.

The authors of the review state for both studies that they show a weak negative correlation with the risk of diabetes and conclude that there is no significant association with type 2 diabetes mellitus for added sugars. The authors of the studies themselves, Olssen et al. and Ramne et al., describe a negative correlation between fruit and the development of diabetes, but a positive correlation with regard to the consumption of sweets.⁷ An association of added sugars in general was not found in their studies. However, they do not conclude from this that the consumption of added sugar actually has no effect on the risk of diabetes, but explain that inaccuracies in the data collection, possible correlations and unrecorded changes in eating habits may have led to a confounding of the association.^{7,11}

Fructose - very low significance

The evaluation of the effects of fructose on the risk of diabetes refers to five studies, two of which indicate a positive association^{3,9} and one a negative association for men and a positive one for women.⁴ Accordingly, two studies play a significant role in the conclusion that there is no association between the intake of fructose and the development of type 2 diabetes by invalidating the positive associations of the other studies with negative ones. In the meta-analysis, both appear accordingly with a negative correlation.^{6,10} However, according to the respective studies' own data, only one of the two actually found a significant negative association. However, the authors of this study, Ahmadi-Abhari et al., do not see this as a reason to give an all-clear signal for sugar in general. They explain that their results may have been

due to the fact that people with a diet rich in fruit and vegetables consume higher amounts of naturally occurring fructose and the protective effect is therefore not due to the intake of sugar, but to valuable accompanying micronutrients.⁶

In the review, the evaluation of fructose is classified as having a high risk of inaccuracy and very low significance.

Statement on significance

In conclusion, it can be said that this review, which was praised by the sugar industry associations, does not provide a good basis for the claim that sugar is not or even negatively associated with the development of type 2 diabetes mellitus. This is evident from a close examination of the publication and the accompanying material provided, as well as the studies used for the analysis, but there are surprisingly few references to the limited validity, neither in the abstract of the review nor in the detailed explanations. For example, it states in a prefaced "Statement of Significance": *"This study is the first to comprehensively establish a dose-response relationship between dietary sugar intake and type 2 diabetes risk, showing that sugar from beverages [...] increases risk, whereas total sugar, sucrose, fructose and added sugar exhibit inverse or null associations. These findings challenge the assumption that all sugars uniformly elevate type 2 diabetes risk..."*²

The last author of the review, Prof. Dennis Della Corte, is also said to have told the newspaper *Westfälischer Anzeiger*, which published an article on the study entitled "Is sugar not so harmful?": *"Our results show that sugar contained in solid food - i.e. not in drinks - does not represent an increased risk of type 2 diabetes. This applies to both naturally occurring and added sugars."*¹² But neither sugar in solid food was specifically examined, nor was there a distinction between naturally occurring and added sugar in the assessment of total sugar, sucrose and fructose.

In the interests of the industry

So why do the authors of this review present their findings as if they were a definite all-clear signal against sugar – including industrial sugar – as long as it is not consumed through drinks? To investigate this question, we checked for possible conflicts of interest and came across numerous leads.

One of the co-authors, Prof. Anette E. Buyken, states in the declaration of conflicts of interest that she received money for speaker activities from the International Life Science Institute (ILSI) Europe.² This is a lobbying organization funded by companies such as Südzucker, Danone, PepsiCo and other confectionery manufacturers.^{13,14} In the past, Prof. Buyken was part of both an ILSI Europe expert group and the ILSI Europe Carbohydrate Task Force, and in this capacity also contributed to corresponding scientific work.¹⁵

Together with first author Dr. Karen Della Corte, she is also a member of the International Carbohydrate Quality Consortium (ICQC), which was set up by the Nutrition Foundation of Italy (NFI).^{16,17} This foundation is also an association of food manufacturers. Its members include Ferrero, Coca-Cola, Danone and McDonalds.¹⁸ The ICQC itself is made up of top-class international scientists – most of them with strong links to industry.^{16,17,19} Its chairman, Prof. Dr. David Jenkins, has already served on the scientific

advisory boards of numerous companies, including Unilever, Coca-Cola, the Kellogg Company, Procter & Gamble and Herbalife International.¹⁷ Accordingly, the work of the ICQC has already been financially supported by numerous companies, such as Mondelez International, Ferrero and the Kellogg Company.¹⁷

It is also interesting to take a look at the journal in which the meta-analysis was published, *Advances in Nutrition*. This is an international scientific journal published by the American Society for Nutrition (ASN). And here, too, is a direct link to industry, as the ASN lists numerous representatives of the sugar and sugar-processing industry as sponsors and partners. These include Nestlé, General Mills, Kraft Heinz Foods, Coca-Cola, The Sugar Association, Mondelez International, PepsiCo and Unilever.²⁰ One of the co-authors of the meta-analysis, Prof. James C. LeCheminant, is a reviewer for the ASN,²¹ while another co-author, Prof. Lukas Schwingshackl, is co-editor of *Advances in Nutrition*.²

The narratives are served

And so there appears to be another study that serves the narratives of the sugar and sugar-processing industry and helps to conceal the real links between industrial sugar consumption and the development of diet-related diseases. Even if the findings on sugary drinks are certainly interesting, this does not diminish the negative effects of industrial sugar consumption. From a medical point of view, the decisive difference lies not in the consistency of the food or beverage, but in whether or not the ingested sugar is naturally combined with the micronutrients necessary for its metabolism.

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