

Sugar revisited – again

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For at least a thousand years sugar has been valued for its organoleptic and preservative properties and as an important trading commodity. The furore surrounding the report from WHO and FAO (1) which included a recommended upper limit for intake of free sugars, suggests that sugar is still of huge importance in the global economy.

The article by Steyn and colleagues (pp. 599–608) explains a guideline to restrict intake of sugar in South Africa. More than 20 countries are known to have similar guidelines. Yet representatives of the sugar industry claim that other authoritative reports do not provide evidence of adverse health effects to the extent that warrants appreciable reductions in sugar intake. It is therefore important to examine these apparent discrepancies.

The term “sugar” was previously understood to be more or less synonymous with sucrose derived from sugar cane or beet. In the United States and other countries high fructose corn syrup is increasingly used in manufactured foods so that while intake of sucrose may be decreasing, the total amount of sugars is not. From the perspective of human health, sugars are generally divided into two main groups: those incorporated within the structure of intact fruit and vegetables (sometimes labelled “intrinsic sugars”) and those saccharides which are added to foods and drinks by manufacturer, cook or consumer (added sugars). Dietary guidelines do not recommend restriction of intrinsic sugars or milk sugars (lactose, galactose) since these are not considered to have adverse health outcomes. However, added sugars plus concentrated sugars in honey, syrups and fruit juices (collectively described as “free sugars”) are believed to be broadly comparable when it comes to considering untoward effects and are therefore considered as a group.

A report issued in September 2002 by the Institute of Medicine (IOM) on dietary reference intakes (2) has been interpreted as suggesting that intake of added sugars may be as high as 25% of total energy without detrimental effect. This is misleading since this maximal intake level is based on ensuring sufficient US intakes of certain essential micronutrients not present in foods and beverages that contain added sugars. It

in no way implies that this is an acceptable level of intake in other respects.

An earlier FAO/WHO report (3) has also been cited by critics as failing to confirm a link between intake of sugars and chronic disease. It acknowledges that there appears not to be a direct causal association between consumption of sugars and coronary heart disease, diabetes and other chronic diseases. However, it recognizes that sugars contribute to the energy density of the diet. If sugars contribute to the global epidemic of obesity, they do indeed contribute to its health consequences, including type 2 diabetes and coronary heart disease. The question then is whether free sugars contribute to obesity.

Free sugars promote a positive energy balance. Short-term experiments in humans confirm that total energy intake increases when energy density of the diet is increased, whether by free sugars or fat (4, 5). Drinks rich in free sugars increase overall energy intake by limiting appetite control. There is thus less of a compensatory reduction of food intake after consumption of high-sugar drinks than when additional foods of equivalent energy content are provided (6). Children with a high consumption of soft drinks rich in free sugars are more likely to be overweight and gain excess weight (7). Diets limited in free sugars have been shown to reduce total energy intake and induce weight loss, even when people are encouraged to replace sugars with starches and non-starch polysaccharides (8, 9).

Two recent randomized trials provide further evidence. One found a higher energy intake and progressive increase in body weight when drinks rich in free sugars rather than energy-free artificially sweetened drinks are consumed (10). In the other, free-living subjects were randomized to a high fat diet or to one of three diets intended to be isoenergetic and in which carbohydrates provided half total daily energy (11). One diet was high in low glycaemic index (GI) foods, one in high GI foods, and the third relatively high in sucrose (about 130 g/day). Body weight decreased on the low GI diet and increased on the other three diets, the weight increase on the sucrose diet being nearly double that on the high fat

and high GI diet and significantly higher than that observed on the low GI diet. Furthermore in individuals with the metabolic syndrome, weight change and metabolic indices are favourably influenced when replacing simple by complex carbohydrate (12).

Thus there is considerable evidence suggesting that sucrose and other free sugars contribute to the global epidemic of obesity. Reducing the intake of sugars may make a useful contribution along with other measures in reducing the risk of obesity and its clinical consequences. Suggesting an appropriate upper intake requires a judgement based on dietary and disease patterns, but has been guided by the association between free sugars and dental caries, reviewed in the South African paper. The best available evidence suggests that the level of dental caries is low in countries where the consumption of free sugars is below 15–20 kg/person/year. This is equivalent to 40–55 g/person/day or 6–10% of total energy. As there is evidence that frequency of consumption contributes to dental caries there would seem to be justification for the suggested South African guideline: “Consume food and drinks containing sugar sparingly and not between meals”, and that countries which have not included a comparable recommendation in their dietary guidelines should consider doing so.

It would be helpful if the IOM could modify the text of its report before final publication, to eliminate further misinterpretation of its recommendations regarding sugars. It might also be helpful if FAO were to convene a further Expert Committee to help clarify possible ambiguities in its report of 1998. It is imperative for policy-makers in governments and other organizations (e.g. heart foundations, diabetes organizations) to have unequivocal authoritative statements on which to base guidelines. With regard to sugars, WHO has led the way, and it is encouraging to read the South African guideline document which endorses this politically important public health measure. ■

The references (1–12) for this article are available on the web version at: <http://www.who.int/bulletin>

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