Livsmedelsverket
National Food Agency

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Annica Sohlström
Director General

Mr Bernhard Url
Executive Director
European Food Safety Authority
Via Carlo Magno 1A
43126 Parma
Italy

Dear Mr Url

Several EU Member States and international organisations have previously found scientific basis for setting a dietary recommendation for added sugars to a maximum of 10% of total energy intake. As outlined below, new scientific data have recently been published supporting efficacy of limiting intake of added sugars. Based on recently published scientific studies and in relation to weight gain, type-2 diabetes, cardiovascular disease and related risk factors, we request scientific assistance in line with Regulation (EC) No 178/2002 in assessing if a dietary reference value for sugar with particular attention to added sugar now can be set.

EFSA´s latest opinion on this matter was published 2010 and covers the scientific basis for setting reference values for carbohydrates, including dietary fibre, based on various health effects[1]. Reference values are given for intake of total carbohydrates and dietary fibre. A reference value for added sugars is not given in this opinion, however it does state that a high intake of sugars as sugar-sweetened beverages may contribute to weight gain. The opinion is based on an assessment of studies published until 2008-2009.

Since the publication of the 2010 EFSA Scientific Opinion several organisations and authorities have published reports that review more recent studies on health effects of dietary carbohydrates and sugars such as the Nordic Nutrition Recommendations (NNR) 2012[2], the World Health Organisation (WHO) 2015[3], the British Scientific Advisory

[1] EFSA NDA Panel (EFSA Panel on Dietetic Products, Nutrition and Allergies), 2010. Scientific Opinion on Dietary Reference Values for carbohydrates and dietary fibre. EFSA Journal 2010; 8(3):1462, 77 pp. doi:10.2903/j.efsa.2010.1462
[2] Nordic Nutrition Recommendations 2012. Integrating nutrition and physical activity © Nordic Council of Ministers 2014; http://norden.diva-portal.org/smash/record.jsf?pid=diva2%3A704251&dswid=-9109
[3] WHO 2015. Guideline: Sugars intake for adults and children. Geneva: World Health Organization

Postal address Box 622 SE-751 26 Uppsala Sweden
Office address Hamnesplanaden 5
Delivery address Strandbodgatan 4 753 23 Uppsala
Telephone +46 18 17 55 00
Telefax +46 18 10 58 48
E-mail livsmedelsverket@slv.se
Internet www.livsmedelsverket.se
VAT number SE202100185001

Committee on Nutrition (SACN) 2015[4], and the Dietary Guidelines for Americans (DGA) 2015-2020[5]. These include some published research not covered in the EFSA opinion. For example, the NNR 2012 recommendations for added sugars uses new evidence on health effects, including type-2 diabetes[6], body weight[10] as well as dietary patterns[7]. Further, the WHO 2015 guidance takes into consideration two systematic reviews on the associations between sugar intake and body weight[8] and dental health[9]. Based on available scientific evidence, and as outlined in the table 1 in the annex, NNR, WHO, SACN and DGA have set dietary recommendations for added sugars. It should be noted that WHO makes a conditional recommendation for reduction of the intake of free sugars to below 5% of total energy intake, while SACN recommend that the population average intake of free sugars should not exceed 5% of total dietary energy for age groups from 2 years upwards.

Recently literature searches were performed in PubMed with a focus on reviews and meta-analyses covering health effects of dietary sugars published from 2010 to April 2016. Searches were based on search terms and strategies used in a systematic review on sugars for NNR 2012[10], with addition of association with body weight and dental health (see table 2 in annex for outcome). The results show that several reviews and meta-analyses on health effects of dietary sugars have been published since the publication of the EFSA opinion 2010. Some of the most relevant reviews that could be further evaluated are included in the reference list found in the annex. Articles were selected covering health effects of "sugars", "sugar-sweetened beverages" or "added sugars" among the general population. Articles focusing on weight reduction or only covering fructose are not included in the list. In addition, the SACN report on dietary

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[4] SACN. SACN Carbohydrates and Health Report. 17 July, 2015 https://www.gov.uk/government/publications/sacn-carbohydrates-and-health-report

[5] DGA 2015-2020. http://health.gov/dietaryguidelines/2015/guidelines/. DGAC 2015 Report. http://health.gov/dietaryguidelines/2015-scientific-report/

[6] Sonestedt, Emily et al. Does high sugar consumption exacerbate cardiometabolic risk factors and increase the risk of type 2 diabetes and cardiovascular disease? Food & Nutrition Research, [S.l.], jul. 2012. http://dx.doi.org/10.3402/fnr.v56i0.19104

[7] Wirfält E, Drake I, Wallström P. What do review papers conclude about food and dietary patterns? Food & Nutrition Research 2013. 57: 20523 http://dx.doi.org/10.3402/fnr.v57i0.20523

[8] Te Morenga L, Mallard S, Mann J. Dietary sugars and body weight: systematic review and meta-analyses of randomised controlled trials and cohort studies. BMJ. 2012 Jan 15;346:e7492. doi: 10.1136/bmj.e7492 http://www.ncbi.nlm.nih.gov/pubmed/23321486

[9] Moynihan PJ, Kelly SA. Effect on caries of restricting sugars intake: systematic review to inform WHO guidelines. J Dent Res. 2014;93(1):8-18 http://www.ncbi.nlm.nih.gov/pubmed/24323509

carbohydrates and US DGA 2015-2020 include a number of reviews covering sugars that also should be considered.

Yours sincerely,

Annica Sohlström
Director General
National Food Agency,
Sweden

Matti Aho
Director General
Finnish Food Safety
Authority, EVIRA,
Finland

Christine Nellemann
Director of Institute
National Food Institute,
DTU, Denmark

Lars Hanssen
Director of Norwegian
Scientific Committee for
Food Safety, Norway

Jón Gislason
Director of Icelandic Food
and Veterinary Authority,
Iceland

Enclosure: Annex with two Tables and Examples of studies containing new scientific elements

Annex

Tables and examples of studies containing new scientific elements

Table 1. Recommendations for added sugars issued by various organizations.

Organisation	DRV	Comment
NNR 2012	< 10 E%	
WHO 2014	< 10 E%	Conditional: < 5 E%
SACN 2015		Population mean: 5 E%
DGA 2015-2020	< 10 E%	

Table 2. Outcome of searches in PubMed for different health impacts linked to sugar intake. Period January 2010 - April 2016. Search date 2016-04-14).
The number of hits for article type "review" varied between 7 (mortality) and more than 400 (dental health), and for article type "meta-analysis" between 1 (mortality) and 25 (type-2 diabetes). Most articles covered associations between consumption of sugar-sweetened beverages and health outcomes. Several reviews focused on effects of fructose, these are not included in the attached reference list. Two meta-analyses are included in the WHOs guideline (Te Morenga et al. 2012; Moynihan & Kelly 2014). A new meta-analysis by Te Morenga et al. (2014) analysed results from intervention studies regarding effects of sugar intake on blood pressure and serum lipids. One review evaluated influence of funding source on conclusions on association between sugar-sweetened beverages and body weight (Massougbodji et al. 2014).

Query	Number of hits, Reviews + meta studies	Number of hits, meta studies	Comment
Glucose tolerance and insulin sensitivity	266	16	
Type-2 diabetes	329	25	
Glucose tolerance and insulin sensitivity or type-2 diabetes	434	30	
Serum lipids	51	11	
Blood pressure	44	11	
Cardiovascular disease	162	18	
All-cause mortality	7	1	No relevant meta-analyses
Body weight and obesity	297	20	
Dental caries or dental health	140	8	No relevant meta-analyses
Dental caries or dental health or oral health	417	21	No relevant meta-analyses

Examples studies containing new scientific elements

Reports

Hauner H, Bechthold A, Boeing H, Brönstrup A, Buyken A, Leschik-Bonnet E, Linseisen J, Schulze M, Strohm D, Wolfram G; German Nutrition Society. Evidence-based guideline of the German Nutrition Society: carbohydrate intake and prevention of nutrition-related diseases. Ann Nutr Metab. 2012;60 Suppl 1:1-58 http://www.ncbi.nlm.nih.gov/pubmed/22286913

SACN. SACN Carbohydrates and Health Report. 17 July, 2015. https://www.gov.uk/government/publications/sacn-carbohydrates-and-health-report

DGA 2015-2020. http://health.gov/dietaryguidelines/2015/guidelines/ . Published Jan 2016

DGAC 2015 Report. http://health.gov/dietaryguidelines/2015-scientific-report

Type-2 Diabetes

Imamura F, O'Connor L, Ye Z, Mursu J, Hayashino Y, Bhupathiraju SN, Forouhi NG. Consumption of sugar sweetened beverages, artificially sweetened beverages, and fruit juice and incidence of type 2 diabetes: systematic review, meta-analysis, and estimation of population attributable fraction. BMJ. 2015 Jul 21;351:h3576. doi: 10.1136/bmj.h3576 http://www.ncbi.nlm.nih.gov/pubmed/26199070

Greenwood DC, Threapleton DE, Evans CE, Cleghorn CL, Nykjaer C, Woodhead C, Burley VJ. Association between sugar-sweetened and artificially sweetened soft drinks and type 2 diabetes: systematic review and dose-response meta-analysis of prospective studies. Br J Nutr. 2014;112(5):725-34 http://www.ncbi.nlm.nih.gov/pubmed/24932880

Sonestedt E et al. Does high sugar consumption exacerbate cardiometabolic risk factors and increase the risk of type 2 diabetes and cardiovascular disease? Food & Nutrition Research 2012. 56: 19104 http://dx.doi.org/10.3402/fnr.v56i0.19104.

Malik VS, Popkin BM, Bray GA, Després JP, Willett WC, Hu FB. Sugar-sweetened beverages and risk of metabolic syndrome and type 2 diabetes: a meta-analysis. Diabetes Care. 2010;33(11):2477-83 http://www.ncbi.nlm.nih.gov/pubmed/20693348

Serum lipids, blood pressure, CVD

Jayalath VH, de Souza RJ, Ha V, Mirrahimi A, Blanco-Mejia S, Di Buono M, Jenkins AL, Leiter LA, Wolever TM, Beyene J, Kendall CW, Jenkins DJ, Sievenpiper JL. Sugar-sweetened beverage consumption and incident hypertension: a systematic review and

meta-analysis of prospective cohorts. Am J Clin Nutr. 2015;102(4):914-21 http://www.ncbi.nlm.nih.gov/pubmed/26269365

Keller A, Heitmann BL, Olsen N. Sugar-sweetened beverages, vascular risk factors and events: a systematic literature review. Public Health Nutr. 2015;18(7):1145-54 http://www.ncbi.nlm.nih.gov/pubmed/25321082

Xi B, Huang Y, Reilly KH, Li S, Zheng R, Barrio-Lopez MT, Martinez-Gonzalez MA, Zhou D. Sugar-sweetened beverages and risk of hypertension and CVD: a dose-response meta-analysis. Br J Nutr. 2015 14;113(5):709-17 http://www.ncbi.nlm.nih.gov/pubmed/25735740

Huang C, Huang J, Tian Y, Yang X, Gu D. Sugar sweetened beverages consumption and risk of coronary heart disease: a meta-analysis of prospective studies. Atherosclerosis. 2014;234(1):11-6 http://www.ncbi.nlm.nih.gov/pubmed/24583500

Malik AH, Akram Y, Shetty S, Malik SS, Yanchou Njike V. Impact of sugar-sweetened beverages on blood pressure. Am J Cardiol. 2014;113(9):1574-80 http://www.ncbi.nlm.nih.gov/pubmed/24630785

Te Morenga LA, Howatson AJ, Jones RM, Mann J. Dietary sugars and cardiometabolic risk: systematic review and meta-analyses of randomized controlled trials of the effects on blood pressure and lipids. Am J Clin Nutr. 2014;100(1):65-79 http://www.ncbi.nlm.nih.gov/pubmed/24808490

Gibson S, Gunn P, Wittekind A, Cottrell R. The effects of sucrose on metabolic health: a systematic review of human intervention studies in healthy adults. Crit Rev Food Sci Nutr. 2013;53(6):591-614 http://www.ncbi.nlm.nih.gov/pubmed/23627502

Malik VS, Popkin BM, Bray GA, Després JP, Hu FB. Sugar-sweetened beverages, obesity, type 2 diabetes mellitus, and cardiovascular disease risk. Circulation. 2010;121(11):1356-64 http://www.ncbi.nlm.nih.gov/pubmed/20308626

Body weight

Trumbo PR, Rivers CR. Systematic review of the evidence for an association between sugar-sweetened beverage consumption and risk of obesity. Nutr Rev. 2014;72(9):566-74 http://www.ncbi.nlm.nih.gov/pubmed/25091794

Massougbodji J, Le Bodo Y, Fratu R, De Wals P. Reviews examining sugar-sweetened beverages and body weight: correlates of their quality and conclusions. Am J Clin Nutr. 2014;99(5):1096-104 http://www.ncbi.nlm.nih.gov/pubmed/24572563

Malik VS, Pan A, Willett WC, Hu FB. Sugar-sweetened beverages and weight gain in children and adults: a systematic review and meta-analysis. Am J Clin Nutr. 2013;98(4):1084-102 http://www.ncbi.nlm.nih.gov/pubmed/23966427

Pérez-Morales E, Bacardí-Gascón M, Jiménez-Cruz A. Sugar-sweetened beverage intake before 6 years of age and weight or BMI status among older children; systematic review of prospective studies. Nutr Hosp. 2013;28(1):47-51 http://www.ncbi.nlm.nih.gov/pubmed/23808429

Te Morenga L, Mallard S, Mann J. Dietary sugars and body weight: systematic review and meta-analyses of randomised controlled trials and cohort studies. BMJ. 2012 Jan 15;346:e7492. doi: 10.1136/bmj.e7492 http://www.ncbi.nlm.nih.gov/pubmed/23321486

Oral health

Sheiham A, James WP. A new understanding of the relationship between sugars, dental caries and fluoride use: implications for limits on sugars consumption. Public Health Nutr. 2014;17(10):2176-84 http://www.ncbi.nlm.nih.gov/pubmed/24892213

Moynihan PJ, Kelly SA. Effect on caries of restricting sugars intake: systematic review to inform WHO guidelines. J Dent Res. 2014;93(1):8-18 http://www.ncbi.nlm.nih.gov/pubmed/24323509

Other

Fardet A, Boirie Y. Associations between food and beverage groups and major diet-related chronic diseases: an exhaustive review of pooled/meta-analyses and systematic reviews. Nutr Rev. 2014;72(12):741-62 http://www.ncbi.nlm.nih.gov/pubmed/25406801

Wirfält E, Drake I, Wallström P. What do review papers conclude about food and dietary patterns? Food & Nutrition Research 2013. 57: 20523 http://dx.doi.org/10.3402/fnr.v57i0.20523.