Comments on the draft SACN Carbohydrates and Health Report, dated June 2014.
Comments by Professor Andrew Rugg-Gunn.

1. I have been a member of SACN and was a member of the 1989 COMA panel on Dietary Sugars and Human Disease. My area of expertise is nutrition, diet and oral disease.
2. Dental caries remains a disease of medical, social and economic importance (Marcenes W *et al.* J Dent Res 2013;92:592-7). I agree with the statistics presented in Paragraphs 4.14 to 4.18. In addition, extraction of carious teeth is a major cause of hospital admissions of young children in the UK (Elmer TB *et al.* BDJ 2014;216:248): this is both expensive and a negative experience for child and family.
3. I agree with the summaries and conclusions of evidence given in Paragraphs 6.59 to 6.70, 6.77 to 6.79, and 12.9. Had the review of evidence included all published studies on dietary sugars and dental caries, including animal studies, laboratory studies and human ecological studies, the evidence base for concluding that dietary sugars are the major cause of dental caries would have been much stronger: all types of study point in the same direction. It should be noted that in free-living populations there is a close correlation (+0.77) between frequency of intake and weight of intake of high sugar foods. Both are important, and the failure to record significant associations between frequency of intake of sugars and dental caries (Paragraph 6.62) is likely to be because (a) frequency is a difficult variable to record and therefore subject to error, and (b) frequency is a discrete variable with the attendant difficulties of recording statistically significant correlations as you have indicated in your reference to Appleton *et al.* 1986.
4. The lack of evidence regarding the relation between dietary starch and dental caries is noted (Paragraphs 7.24, 12.13). Three case-control studies of people with inborn errors of sugar metabolism (hereditary fructose intolerance, sucrase-isomaltase deficiency) show virtual absence of caries in these people who avoid sugars despite similar (or raised) starch intakes. Many ecological studies point to the same conclusion (Rugg-Gunn AJ *Nutrition and Dental Health* OUP 1993). In the one study to simultaneously record sugars and starch intake (Rugg-Gunn *et al.* 1987; quoted by you), sugars intake was significantly positively related to caries increment while starch intake was weakly negatively related to caries increment.
5. I agree with the change to the term 'free sugars' (Paragraphs 11.7, 12.26); despite being a member of the COMA panel which created 'NMES'. This aligns with WHO terminology. I would urge that your report includes a recommendation for food labelling to list 'free sugars' concentration, rather than total sugars. The health effects of foods and drinks containing free sugars (e.g. soft drinks, confectionery) as opposed to intrinsic (fresh fruit and vegetables) and milk sugars, are very different.
6. I share your concern regarding the high intake of NMES (Table 3.5, page 263) -- 15-16% of energy in 11-18 year olds. It should be noted that 35% of this high intake comes from 'soft drinks' and 'confectionery' (Table 3.17), both of which are marketed for frequent consumption.
7. I agree with the Recommendations (Paragraphs 12.24 to 12.33) that total carbohydrate should be maintained at about 50%E and that the DRV for free sugars should be set at 5%E. This will benefit oral health considerably: the resultant increase in starch intake is not a threat to oral health. I would point out that the widespread use of fluoride-containing toothpastes has resulted in major improvements in oral health. However, use of fluoride toothpastes and reduction in sugars consumption are not alternatives -- both are needed if oral health is to be improved.

8. END.

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