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To: SACN
Cc:
Subject: British Nutrition Foundation response to the draft Scientific Advisory Committee on Nutrition (SACN) report on Carbohydrates and Health

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The British Nutrition Foundation (BNF) is pleased to have the opportunity to respond to this scientific consultation on SACN's report on Carbohydrates and Health.

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Our response

In our comments we have focussed mainly on the recommendations of the draft report as presented on pages 216-17. The Foundation welcomes publication of the systematic literature reviews (SLRs) used to inform the proposals for the carbohydrate dietary reference values, which provide a useful and clearly presented summary of the body of evidence on carbohydrates and health. We congratulate SACN on the huge amount of work undertaken and the clear structure of the draft report, the helpful introductory chapters (1-4), the concise uniformly structured chapters summarising the findings of the review (5-10), and also the easy access to the supplementary information via the SACN website. The annexes are also useful, especially the data on current intakes from the NDNS (Annex 7).

We note, however, that some of the nuances of the SLRs and in Chapters 5-10 are not always carried through to the final two summary chapters. The SACN reports are hugely valued and widely used reference texts and for future users, who may not read the whole report, it would be helpful if the emphasis in the summary chapters could be consistent with that in the earlier parts of the report. In particular, it would be helpful if any food-based statements are put in context, e.g. the references to rice and potatoes on page 213 in the context of the strength of the evidence reported earlier in the report (and the caveats about reliance on prospective cohort data) and in the context of the recommendation to achieve around 50% of dietary energy intake as carbohydrate and the advice in Section 12.32.

Recommendations (as listed on pages 216-17)

Total carbohydrate

- (1) We welcome clarification of the recommendation on total carbohydrates and the proposal to retain the reference value previously set by COMA, at a population average of approximately 50% of dietary energy. We note that this should apply to all from age 2 years.

Sugars

- (1) We support the adoption of the term free sugars as it aligns with terminology used by WHO in its recent report. We agree that this simplifies the estimation of free sugars content as processed fruit does not need to be taken into account but note that, like NMES, 'free sugars' content per se cannot be determined in the laboratory and is not the definition required by EC food labelling legislation (which requires labelling of total sugars, which can be measured directly). Communications activities associated with this recommendation will need careful consideration and attention to detail to ensure that the new terminology is understood and interpreted appropriately.
- (2) The current target for NMES is a population target (11% dietary energy excluding energy from alcohol (10% total energy)); there is no target for individuals. The wording on pages 203 and 216 suggests that the decision was taken by SACN to first identify an upper limit for individuals and then to identify the population target that would achieve this (... *'This is based on the need to limit free sugars to no more than 10% of total energy intake at an individual level, which is likely to lead to a population average free sugars intake of around 5% of total energy.'*). We note that this appears to be a departure from the previous approach of setting only population-based targets for macronutrients and discussion of this change in approach is needed. Discussion of the move from a population target of 10% of total energy to an upper limit of 10% for individuals would also be helpful to readers as background. Furthermore, a commentary on how the two reference values will be used in tandem would be helpful in avoiding further confusion or speculation.
- (3) SACN's proposal of a population average for free sugars (of around 5% of total energy), based on a meta-analysis of the available RCT evidence linking free sugars intake and energy intake was unexpected in light of the 2014 WHO draft sugar guideline. WHO seemed to base its recommendation of <10% energy from free sugars solely on the observational data in the review of the oral health evidence, rather than on the findings of the parallel review of the evidence associating sugars intake with body weight (Te Morenga et al 2012), which we interpreted as a reflection of the balance of the evidence (it being strongest for oral health). Noting the implied uncertainty of the inclusion of the word 'around' in the SACN recommendation, we have since read the references cited in the SACN report and the supporting SLRs in order to appreciate better the underpinning evidence for SACN's recommendation.

We expected to find more discussion of the quality and generalisability of these RCTs in the draft report as particular emphasis has been given to them as the underpinning for the revised sugars recommendation, with little cross-referencing to the dental health evidence (particularly that relating to children's dental health) or indeed the other evidence reviewed by SACN in its comprehensive report. Given the ramifications of this particular recommendation, representing a major change from the current population recommendation of 11% dietary energy (10% total energy), the SACN report could usefully include a more detailed discussion (perhaps in Chapter 11) of the individual studies that feature in the meta-analysis, reflecting the nuances in the SLR and the earlier chapters of the report.

In our reading of the cited papers we have identified several features that are worthy of note:

- a. The studies in Figure 1 in Chapter 11 (Section 11.12) are variable in their design and most have a relatively small number of subjects [n <25 in each treatment group in all but one study (Sarisi *et al.* 2000; n ≥76 in each treatment group)] and power calculations were often not performed

or the power calculation performed did not include detection of differences in energy intakes. The number of data points plotted is relatively small and doesn't include all of the study arms in all cases, and only one study investigated sugars intake at a level near to that being proposed (Raben *et al.* 2002) - notably expressed as sucrose rather than total free sugars. [We assume that the study label 'Raben 2001' in the figure 1 key, should read 'Raben 2002'.]

- b. In Figure 1 (section 11.12), sugars intakes have been plotted using inconsistent definitions [% energy intake as sucrose (Raben *et al.* 2002), total sugars (Drummond and Kirk 1998), NMES (Drummond *et al.* 2003) and simple carbohydrates (Poppitt *et al.* 2002; Saris *et al.* 2000)], which may be important when using the data to derive information about free sugars.
- c. As most of the studies investigated the effects of increasing sugars intake, an assumption seems to have been made that the effect of decreasing consumption would have the same effect but in the opposite direction.
- d. Under-reporting is a well recognised problem for dietary data collected via self-reported food diaries and is discussed in detail in some of the included studies (e.g. Drummond and Kirk 1998) this particular study reported substantial reductions in reported energy intake over the 6-month study but no change in body weight (see below).
- e. Participant and researcher blinding was not possible in some study designs and most of the studies had a risk of bias, according to the online SLR documents supporting the SACN report.
- f. Measuring the effect of sugars intake on total energy intake was not a primary objective for a number of the studies.
- g. As noted in section 12.4 of the SACN report, 'mixed interventions that modify other dietary components could potentially affect the outcomes considered' and a number of the interventions modified other dietary components, such as dietary fatty acid and complex carbohydrate intake, potentially making it difficult to disentangle the effect of altering the intake of sugars.
- h. All included studies recruited overweight subjects.
- i. The study by Drummond and Kirk (1998) was not included in the recent WHO systematic review on dietary sugars and body weight (Te Morenga *et al.* 2012), presumably because the primary aim of the study was weight loss and as stated by Te Morenga *et al.* 'interventions designed to achieve weight loss were excluded because the ultimate aim of the WHO review was to facilitate the development of population-based recommendations rather than nutritional recommendations for the management of obesity'. It seems that SACN also set out to restrict inclusion of weight loss trials (section 5.6 of the supporting documents states 'as the focus of this SLR is the causation of weight gain and obesity (rather than treatment), the inclusion of weight loss trials will be limited.'). Inclusion of the Drummond & Kirk (1998) study is worthy of particular comment as the subjects already had an NMES intake below the SACN recommendation at baseline (9.7% energy) which is not typical of current UK diets as assessed by NDNS. The study compared advice to reduce both fat and sugars versus fat intake alone and reported a reduction in energy intake in both groups at 6 weeks. Although energy intake at 6 months remained significantly decreased in the group advised to reduce fat and sugars, there was no decrease in % energy from added sugar or NMES from baseline, so it would seem that the reduction in energy intake was driven by a reduction in % energy from fat and protein. The lack of any effect on body weight during the study (no weight reduction in the group advised to eat less fat and sugars despite a reported 17-25% drop in energy intake) was discussed at some length by the study authors, including the possibility of under reporting.

(4) So in conclusion, as the evidence from these studies on energy intake is used to support SACN's proposed changes in dietary recommendations for sugars and SACN's review concluded that there was insufficient evidence to draw conclusions on the impact of sugars intake on body weight from the available studies (Section 6.72), a more detailed discussion within the main report of the rationale for the recommendation made, based on the available evidence, should be considered. Also, there was a

limited number of studies and all of the included studies were published more than 10 years ago and so there may be new material (published since SACN completed its review) that could be considered in an updated presentation of the data.

- (5) If the population average for free sugars is around 5% of energy, this assumes that there will be a proportion of individuals within the population with very low free sugar intakes. We would be interested to know if any modelling work has been carried out to show whether a 5% population average is likely to equate with a 10% upper level for individual energy intakes from free sugars and, if so, would recommend that this is included in the revised report. A sense of what such diets might contain and deliver in terms of nutrients would be useful, to complement the information provided in Annex 7 (referred to above).
- (6) There is an emphasis in the report on the need to tackle obesity, which we wholeheartedly support, but it is unclear from the text how a reduction in the percentage of dietary energy derived from free sugars will result in lower dietary energy intake overall. Total carbohydrate intake is recommended to be at approximately 50% of energy intake; it is currently lower than this according to NDNS and so would probably need to rise. Indeed, to meet the suggested increased fibre recommendation this would probably need to be the case. On page 216, the SACN report states that 'the energy should be replaced with starches, sugars contained within the cellular structure of foods and in milk and milk products'. This wording suggests isocaloric replacement of free sugars but this is unlikely to influence body weight, which is one of the justifications given in the report for the focus on free sugars. Indeed, the calculation used in the report to derive the 5% value seems to imply no compensation of the approximately 100kcal saved. Clarification of this would be helpful.

Sugars-sweetened beverages

- (1) In Sections 6.33 and 6.34 of the SACN report (pages 89-90), it is not clear whether the meta-analysis reported is one conducted as part of SACN's review or is from the Greenwood paper (we have only accessed the abstract of the latter but the RR and CIs appear different).
- (2) This is also an example of where the nuance of the text in the supporting information (p140 of Chapter 4 on diabetes) is not carried through into the text in the draft report (Chapter 6) or the concluding chapters. As the evidence reported is the basis of one of SACN's recommendations, we suggest that consideration is given to adding a little more context, to assist interpretation.
- (3) Another aspect that seems inconsistent and would benefit from clarification concerns text in Section 6.76 on page 105 of the report which states: 'A greater risk of developing type 2 diabetes mellitus, however, is associated with the consumption of sugars-sweetened beverages in cohort studies, but there are too few trials on glycaemia, insulinaemia and insulin resistance to draw firm conclusions with regard to sugars-sweetened beverage intake.' Yet Section 12.9 on page 211, referring to diabetes risk in adults, simply states that '.... A greater risk is associated with a higher intake of sugars-sweetened beverages', without reference to the second part of the previous statement.
- (4) It might also assist those reading Chapter 12 if it were clearer which parts of the evidence on beverages stem from studies in children and which from studies in adults.

Dietary Fibre

- (1) We support the move to establish a DRV in terms of AOAC fibre to align with labelling regulations in the EU and nutrition policy elsewhere in the world. It would seem important that the references to AOAC methodology are aligned with EC labelling requirements; we are not expert in this and so unable to comment on whether this is the case.
- (2) The SACN fibre statement was published several years ago and we suggest it would be helpful to state whether or not it is fully aligned with the recent EC definition and associated European legislation.

- (3) We support the emphasis placed on the importance of dietary fibre and the need to increase intakes of fibre-rich foods, given that intakes are currently below the recommendations and the evidence for health benefits has strengthened. Labelling restrictions make it less easy to flag fibre content than is the case for some other food components (as a reference intake for fibre has not been incorporated within the FIC regulation and fibre is not included in the list of nutrients that can be declared front-of-pack). To guide consumer choice, ways round these limitations will need to be identified.
- (4) SACN recommends an increase in the dietary reference value for dietary fibre to 30 g/d (AOAC fibre). Useful graphs are presented in Chapter 11 but the reasoning behind picking 30g specifically could be made clearer in the accompanying text.
- (5) We welcome the fibre recommendations for children of different ages.
- (6) Meeting this recommendation for dietary fibre within appropriate energy limits may prove to be very challenging for some sections of the population, especially as current fibre intakes are substantially lower than 30g/day. As foods that provide fibre (either as a naturally present component or as an added ingredient, e.g. a fibre isolate) also provide energy and potentially nutrients that need to be limited such as fat, free sugars or sodium, it would be helpful if the final report included some modelling to provide reassurance about the impact on energy, micronutrient density, salt intake etc., and the feasibility of meeting the recommended level of consumption in the UK population (for different age groups) in the context of other dietary constraints (energy, sodium, fat etc.).
- (7) In recent years, as the requirements of EFSA in relation to evidence to support fibre-related health claims has become clearer, it is likely that there will have been a number of publications reporting studies in this area using a range of discrete fibre (poly- or oligo-saccharide) components. These may not have been captured owing to the timeframe of the literature search; for example we are aware of a recent RCT with increased faecal weight as an outcome that is not included in Chapter 8. We suggest that it would be helpful to check for recent papers in this field, as has been done in other parts of the review (e.g. the incorporation in the draft report of the 2014 Greenwood paper referred to above).

Conclusion

In conclusion, we would like to emphasise the importance of SACN's report on carbohydrates and the value that stakeholders in the wider nutrition community attach to such documents. The report will be used extensively and in many different ways, with the majority of users dipping into specific paragraphs for the information they require. These paragraphs will often be within the summary chapters (11 and 12). It is for this reason that we have highlighted some areas where we feel that some fine tuning could bring additional clarity to some of the important statements made. We have focused on areas that we ourselves have found difficult to interpret.

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