The sugar: fat relationship revisited

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Letter

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I read with interest this analysis[1] of the Dietary and Nutritional Survey of British Adults (DNSBA), which I have also investigated extensively, to look at the relationships between body mass index (BMI) and dietary sugars and fat.[2,3] Unlike Maddiarmid *et al*,[1] I came to the conclusion that the data did not support the hypothesis that BMI was associated with 'sugar in combination with fat,' in either foods or diets. Given the close similarity between our investigations, it is a pity that the authors of the present study did not consider this earlier research in more depth, as the difference in our two approaches could be vital to understanding the true relationships in the data.

Expressing nutrients or foods as a percentage of total energy is very important, if one is looking for differences in diet composition with regard to BMI, because under normal (maintenance) conditions, BMI and energy are postively associated. The authors analysed their nutrient data both as g/d and as a percentage of energy (and criticise us for only using the latter), but then draw conclusions about 'high fat sweet foods' using food intake data that are only expressed as g/d. Omitting to show these values, relative to total energy intake, renders a true interpretation difficult (these women may have eaten more food in total, not just high-fat sweet foods) and leaves open the question of whether the differences would have been significant if presented this way.

The authors also state that 'consumption of high fat sweet foods increased with increasing BMI, with the most marked difference in obese women'. This suggests a linear relationship, when Table 4 clearly shows no association below a BMI of 30. A major conclusion (which may be subsequently quoted by others) is therefore dependent on higher intakes in a very small sample (24) of women. Furthermore, while exclusion of low energy reporters, dieters and the unwell is a valid exercise, and one adopted in the earlier studies, it should be recognised that this can never deal with all misreporting, and necessarily creates its own bias. Given the distribution curves of energy intake and of error in dietary assessment, exclusion of over 69% of the obese group is likely to leave a remnant characterised by over-estimation, unrestrained eating and/or weight gain during the week.

There are methodological differences between our respective studies that need to be emphasised, but there are also some similarities in result. We both found an inverse association between percentage energy from sugars and BMI, and this applies to extrinsic sugars (which are the focus of current dietary guidelines), as well as to total sugars intake, used by Macdiarmid *et al*.[1] Their use of the term ''sugar'' for total sugars (although explained in the text), is also liable to cause confusion if the paper is quoted inappropriately. Approaching the data the other way around, I found a tendency to a higher mean BMI in women in the highest quintile of energy from sugary fatty foods, but this was not statistically significant. Finally, when men and women were classified according to diet composition (fat and sugars energy), there was no evidence of a higher BMI in those men or women who had diets high in both fat ($>40\%$) and extrinsic sugars ($>15\%$), compared with other dietary combinations.

The papers of Macdiarmid *et al* has usefully highlighted gender differences in the BMI/diet relationships that appear to be partly (but not totally) explained by under-reporting. These may be worthy of further investigation since, where associations persist in only one gender, they are unlikely to be causal and more likely to describe dietary preferences. This is an important point in the interpretation of cross-sectional studies. Smoking is also weakly associated with both BMI and diet choice, and this was corrected for (on the advice of referees) in our paper.[2]

In conclusion, whilst it is plausible that high fat sweet foods encourage over-consumption, the DNSBA data are equally consistent with a hyperphagic impact of fat and a neutral (or even weakly inverse) influence of sugars. The composition of foods and diets, and their role in obesity, is potentially of huge significance for public health. Particularly where results support our own preconceptions, there is a need to ensure that they are statistically valid and withstand scrutiny from several angles.

References

1 Macdiarmid JI, Vail A, Cade JE, Blundell JE. The sugar-fat relationship revisited: differences in consumption between men and women of varying BMI. *Int J Obes* 1998; **22**: 1053–1061.
2 Gibson SA. Are high-sugar diets conducive to obesity? An analysis from the Dietary and Nutritional Survey of British Adults. *J Hum Nutr Diet* 1996; **9**: 283–292.
3 Gibson SA. Are high-fat, high-sugar foods and diets conducive to obesity? *Int J Food Sci Nutr* 1996; **47**: 405–415.

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