Reviewer's report

Title: Sugar-added beverages consumption among pre-school children of Crete: effects on nutritional status and risk of obesity

Version: 1 Date: 29 January 2008

Reviewer: F Bellisle

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The present study consists in an analysis of food and beverage intake among pre-school children in Crete. The objective is to examine the relationships between intake of sugar-added beverages (sodas and fruit beverages) and body weight status. This study is cross-sectional. A three-day report of weighed intake is used as well as a questionnaire to assess the child’s physical activity. Weight and height are measured so that BMI can be computed. Waist circumference is also measured.

The data obtained in this survey are potentially interesting. The population of 856 pre-school Cretan children is 4-7 years of age, a time when many of the participants are experiencing their adiposity rebound. The population of Crete is also a very interesting one to look at today, years after the “Cretan diet” was proposed as the gold standard for optimal nutrition. So the data obtained in this survey are of potential value in our understanding of the present state of food and beverage choices in Cretan children, and of possible associations between certain choices and adiposity status. However, there are numerous methodological and conceptual problems in this paper that make it impossible to assess the value of the study.

First, this study being cross-sectional, it is totally impossible to claim that one aspect of the observed intake is a “cause” of any other observation, including body weight status. The best the authors can claim is that associations do exist between intake of certain types of beverages and body weight status. The method they used does not allow them to infer causality. The conclusion (last line of page 9) that sugar-added beverages exert a negative “effect” on risk of
obesity cannot be derived from a cross-sectional method.

Second, several aspects of the methods are imprecise, at best. Although the 3-day weighed intake report seems a valid method of intake assessment, the questionnaire used to survey physical activity is of questionable validity. Was it used before? Was it validated before? If not, it should be described in much greater detail, including how the questions were formulated and what types of answers were given (quantitative, qualitative, degree of agreement with standard statements, etc.)

The IOTF cut-off for overweight and obesity in pre-school children are not BMI 25 and 30. These values are cut-offs for adults. It is not clear (page 6) how the IOTF cut-offs were used in the present children population.

Did sugar intake data (page 7) include or exclude the sugar contained in the beverages that were used as the basis for forming the four groups of participants? If it was included, then it comes to no surprise that there was an association between sugar intake and beverage group. This amounts to correlating a variable with itself. Please clarify how this correlation was computed.

The logistic regression analysis described on page 7 seems extremely strange. The reference group should have been the non-consumers of sugar-added beverages, whatever their body weight status. There must have been some overweight and/or obese children in this group too. Therefore the comparisons made between consumer groups and this reference group of lean children are incorrect. In spite of this erroneous method, figure 1 seems to indicate that only obesity (but not overweight) was increased in the group with the highest intake of sugar-added beverages. This should be addressed in the discussion, should this effect be maintained after the regression analysis is re-computed in reference to a more realistic reference group (the non-consumers, lean or not).

It would be useful to know whether intake of sugar-added beverages is associated with an early adiposity rebound, which the authors should be able to identify easily from weight and height
measurements made in their subjects prior to their inclusion in the study. There certainly is a good follow-up of growing children in Crete, so these data should be available.

In summary, the methods used in this study are imprecise and in some cases highly questionable. The definition of child overweight and obesity should be clarified. Some statistical analyses should be recomputed. Finally the observed associations should be described without any inference to causality. All these points constitute major compulsory revisions.