Reviewer's report

Title: The share of ultra-processed foods and the overall nutritional quality of diets in the US: evidence from a nationally representative cross-sectional study

Version: 0 Date: 03 Oct 2016

Reviewer: Susan Krebs-Smith

Reviewer's report:

This is a well-written article which examines whether an assessment of the share of ultra-processed foods predicts overall nutritional quality of diets.

The article could be made stronger if the authors did the following:

* Demonstrated that the ultra-processed foods assessment is easier, more efficient, or more accessible than other assessments so it is clear why one would want to use this vs simply assessing overall nutrient quality. Nutrient quality could arguably be a more accessible measure, given that the food composition data are widely available whereas coding regarding degree of processing is not.

* Explained specifically what question is addressed by the PCA analysis. The introduction suggests you are interested in an indicator of dietary quality, and there are indices designed to measure that, if you would agree that quality can be defined a priori. Instead, you chose to define quality as the primary factor in an analysis which examined what are the underlying factors which account for most of the variation in nutrient intake in this population. In other words, why is some underlying factor which accounts for the amount of variation in nutrient intake used as an indicator of overall diet quality?

* Explained how food mixtures in NHANES were disaggregated/handled. Perhaps a flowchart of the disposition of various types of foods would be helpful. Related to that, are your food assignments posted somewhere so others could replicate this analysis if interested?

Line 34: It would be clearer to the reader if you gave a definition of ultra-processed foods rather than giving examples of what fits in the category. Also, "ready meals" is not clear; please define.

Page 6, lines 81-85. Make clear in this paragraph that 2 days of data were used when available. Also, suggest inserting "at least" before "one day 24-hour dietary recall…"
Line 114: what is a "handmade recipe"? Does this refer to a homemade food? If so, how do you judge whether a food is homemade? Have all foods with the same food code which are not specific as to homemade or ready-made been handled the same way?

Lines 130-132: Why weren't energy values taken directly from FNDDS?

Line 304: What you mean by 24-hour recalls are "imperfect" and that "standardized methods and approach of NHANES and use of two recalls per person minimize potential error and bias"? Presumably, you are referring to the measurement error, including within-person variation and bias. The two days of data does not address within-person variation unless you use them to correct for that in modeling; this may not be necessary in your analysis, as you are not making inferences about usual diet here, but it would be wrong to claim you've addressed it. The standardized methods do not address the bias either, although 24-hour recalls are the least-biased self-report instrument available.

Line 310: What do you mean by "national food composition data are note updated as required"? Required by whom and for what?

**Level of interest**
Please indicate how interesting you found the manuscript:

An article whose findings are important to those with closely related research interests

**Quality of written English**
Please indicate the quality of language in the manuscript:

Acceptable
Declaration of competing interests
Please complete a declaration of competing interests, considering the following questions:

1. Have you in the past five years received reimbursements, fees, funding, or salary from an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

2. Do you hold any stocks or shares in an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

3. Do you hold or are you currently applying for any patents relating to the content of the manuscript?

4. Have you received reimbursements, fees, funding, or salary from an organization that holds or has applied for patents relating to the content of the manuscript?

5. Do you have any other financial competing interests?

6. Do you have any non-financial competing interests in relation to this paper?

If you can answer no to all of the above, write 'I declare that I have no competing interests' below. If your reply is yes to any, please give details below.

I declare that I have no competing interests

I agree to the open peer review policy of the journal. I understand that my name will be included on my report to the authors and, if the manuscript is accepted for publication, my named report including any attachments I upload will be posted on the website along with the authors' responses. I agree for my report to be made available under an Open Access Creative Commons CC-BY license (http://creativecommons.org/licenses/by/4.0/). I understand that any comments which I do not wish to be included in my named report can be included as confidential comments to the editors, which will not be published.

I agree to the open peer review policy of the journal