Reviewer’s report

Title: The 1H NMR Serum Metabolomics Response to a Two Meal Challenge: a Cross-Over Dietary Intervention Study in Healthy Human Volunteers.

Version: 0 Date: 28 Sep 2018

Reviewer: Leah Cahill

Reviewer’s report:

General comments: Although not immediately clear, this paper appears to be a 'validation' of a new method to capture food intake using metabolomics. Measuring dietary exposure accurately and objectively is a major challenge in the field of nutrition research. Therefore, the contents of this paper could be a very useful contribution to the field. However, in its current form the manuscript is confusing and leaves me with lots of questions. It could be revised to be substantially clearer. Several different models are used and compared, but no conclusion is provided about which is preferable.

Specific comments:

1. Title and abstract contain the abbreviation 1H NMR that is never explained. Other abbreviations in the abstract are never explained. Title includes a comma which should be a colon.

2. Abstract does not represent the manuscript and should be revised substantially to reflect the background (ie what gap needs to be filled by research) the aim of the work and what was actually done in the manuscript.

3. Double-spacing text and using descriptive content headings rather than numbers would be preferable, as would continuous line numbering and less abbreviations. Some of the tables are all abbreviations.

4. The background section should introduce us to the terms that will be used throughout the manuscript and provide a rationale for your methods. The current background should be condensed into 1-2 paragraphs that explains the gaps in the field of measuring diet exposure, and then a paragraph that introduces metabolomics (and what it can measure, amino acids etc) and the different types of models/statistical techniques or at least that statistical techniques need to be developed/tested. Then your aim and methods will follow nicely.

5. The methods section could do with more references, so that the reader can understand that there is a valid rationale for the methods you chose.

6. Why were participants not allowed to eat fish the day before?
7. The discussion section confused me. I thought the point of the study was to test how well the models identified the dietary exposure, so I do not understand why the authors explained their amino acid findings… I thought those were expected based on the foods eaten? I thought that was the point? That the researchers gave 2 different breakfasts and then used the metabolomics biomarkers to identify which foods the participants had been given.

8. After reading the discussion section, I am not clear what model and methods the authors would recommend.

9. I am also left not understanding the implications or future directions of this research after reading the paper. This is a topic that I would like to know more about and that could potentially help the field of nutrition, but the language and structure of the manuscript is unusual and I find it difficult to follow.

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

An article of importance in its field

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

Not suitable for publication unless extensively edited

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