Author’s response to reviews

Title: Analysis of nutritional adequacy of local foods for meeting dietary requirements of children aged 6-23 months in rural central Tanzania

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Response to Reviewers Comments

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I am very much thankful to the reviewers for their deep and thorough review. I have revised my present manuscript in the light of their useful suggestions and comments. Number wise answers to their specific comments/suggestions/queries are as follows.

Response to Reviewer #1 Comments

Comment 1: This is an interesting study with important practical implications. The conclusion about the difficulty of providing all needed nutrients to children in poor countries is certainly valid, but the case would have been stronger, had the authors used a more up to date method to assess feasibility of covering all nutritional requirements with local food using a linear programming based method. The method used in this paper, based on the comparison one by one of the nutrient density of each nutrient to the density recommended in the 1998 WHO document has some weakness. It assesses the possibility of providing the recommended intake for each nutrient separately, whereas they all need to be provided together which is even more difficult. The feasibility to provide all needed nutrients together should be assessed by using a linear programming based approach as described in several articles quoted in the reference list, in particular ref. 4. Also these methods allow testing alternative diets which remain within acceptable limits, in terms of cost and food habits, which was not done either in this study. Or
maybe the authors plan to examine the feasibility of providing all needed nutrients by changing dietary habits in a further paper? In any case, the difficulty of providing all needed nutrients described in this paper is real and using a linear programming approach would show that it is even more difficult than shown in this paper.

Response: Although it is desirable to have a wholesome diet that is fully adequate for all nutrients, in practice several nutrition interventions in developing countries are implemented nutrient by nutrient. For example, iron, iodine in salt, folic acid, vitamin D, and vitamin A interventions are carried out separately in most of resource-poor countries. From a practical point of view we feel that the method used in this study is adequate. Furthermore, we have applied a linear programming approach to designing diets and we hope that the results of this analysis will be reported in a follow up paper.

Comment 2: This study confirms several other studies which reached the same conclusion. In this regard, the sentence P 4 line 60 should be qualified. It says: "Some countries like Burkina Faso, Indonesia, Bangladesh, Ethiopia and Viet Nam have implemented the approach and revealed that locally available foods can provide adequate nutrition to children at nutritional risk [13-15]." Ref 13 found that diets prepared with local foods which could provide all nutrients needed by children aged 6-8 months were unrealistic and highlighted the difficulty of relying on local foods alone. Ref 14 showed that even after optimising food based recommendations, intake of several key nutrients remained below optimal levels. Ref 15 showed it was impossible to reach recommended levels of intake for children aged 9-23 months without using fortified flour. So this sentence is not correct and should be rewritten. As far as I now, no study in a poor country ever showed that it was possible to provide all nutrients together with locally available non fortified food during the complementary feeding period. Even in industrialised countries with access to a large variety of food, iron intake is often inadequate and iron deficiency was largely eliminated with the use of iron supplements or of iron fortified infant formula or complementary foods.

Response: we have rewritten the statement and the revised section reads as follows; “However, local foods alone may not achieve the recommended nutrient requirements as has been found to be that case by studies in Indonesia, Cambodia, Guatemala and Myanmar where local foods alone could not satisfy nutritional requirements in low income communities [12–15]. Moreover, there can be significant variability of cultures and feeding practices, and the nutrient density profiles of local foods [14] and consequently dietary recommendations should follow local assessment.” (please see P4, line 58-63)

Comment 3: It is not clear why a market survey was done as the collected prices were not used in the analysis.
Response: the market survey section has been moved to a further paper

Comment 4: P 4 line 51"…and perform poorly than their…" Edit: …and perform more poorly than their…

Response: the statement has been removed after modification of the whole paragraph. (Please see P4, line 43-50)

Comment 5: P 7 lines 121-3. Clarify if WHO growth standards where used to calculate anthropometric indices

Comments 6: P 7 line 127 WHO standards are standards, not reference. Edit as follows: "based on the World Health Organization's growth standards"

Response for comment 5 and 6: The section has been corrected and the new version reads as follows: All measurements were standardized into Z-scores and the World Health Organization (WHO) growth standards were used to calculate anthropometric indices (height-for-age Z-score, HAZ; weight-for-age, WAZ; and weight-for-height WHZ) for children aged 6-23 months. The three indices were used to classify the nutritional states of children as follows: stunted when all three indices had a Z-score less than -2, underweight or wasted when the height-for-age (HAZ), weight-for-age (WAZ) and weight-for-height (WHZ) Z-scores were less than -2 SD and as severely stunted, underweight or wasted if the respective Z-scores were less than -3 SD.[18]. A child was considered within normal range if their respective indices were between -2SD and +2SD. (Please see P7, line 115-124).

Comments 7: P 7 "Dietary data were collected using 24-hour dietary recalls, weighed dietary record (WRD) and 5 days food records described in previous studies [17,20,23]. The WDR method was used to collect data on food consumption for 7 days, whereas, 24-hour dietary recalls and 5-day food records were used to describe food consumption patterns in 7 days". Not clear. Weighed dietary record should be WDR (and not WRD). The sentence suggests that weighed dietary record was taken for 7 days, in which case, not clear why 5-day record was also used.

Response: we have addressed the errors and added the following statement in the document for more description of the method; “…. food portion sizes were not collected for the 24-hour recall and 7-day food records. (Please see P7, line 127-131).
The document quoted in ref. 28 giving recommended nutrient intakes for young children is nearly 20 years old. More recent documents should be used. See:

http://www.who.int/nutrition/publications/nutrientrequirements/WHO_TRS_935/en/

http://www.who.int/nutrition/publications/nutrientrequirements/9251052123/en/

http://apps.who.int/iris/bitstream/10665/42716/1/9241546123.pdf

Arguably, changes compared to the 1998 document are minor and will not alter the general results.

Response: As suggested, we have replaced the WHO 1998 reference with the more up-to-date WHO documents on recommended nutrient intakes for young children (please see P9, line 169).

The reference 33 refers to a FAO WHO document on recommended protein intake, not energy.

Response: As suggested, we have quoted the relevant FAO/WHO/UNU document for human energy requirements. (Please see P15, line 276).

"The association between overconsumption of carbohydrate rich foods with the occurrence of childhood and adult overweight and obesity has been clearly evaluated in a previous study (34)"

Reference 34 mentions the probable causal link between high intake of sugar sweetened soft drinks and fruit juices, but says nothing about the association between overall carbohydrate intake and later risk of obesity. To my knowledge, this is not really established. Delete.

Response: as suggested, we have deleted the statement in the abstract and method sections.

Key references about the possible relationship between amino acid intake and the risk of stunting should be quoted. For instance:


Response: as suggested, we have quoted the references for the possible relationship between amino acid intake and the risk of stunting (P 16, line 296).