Reviewer's report

Title: The Dutch Healthy Diet index (DHD-index): an instrument to measure adherence to the Dutch guidelines for a healthy diet

Version: 1 Date: 1 February 2012

Reviewer: Patricia Guenther

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Major Compulsory Revisions:

1. It is a problem that one of the components was based on predicted usual intakes (using a method that is questionable for the current purpose) while the other food-related components are based on 2-day means. All the components should be estimated using the same methodology. For most applications of a diet quality index, scoring based on 2-day means would be fine. The authors have not justified their attempt to estimate usual intake of fish fatty acids, while not attempting to estimate usual intakes of the other food-based components. Did the survey ask about the frequency of supplement use? Perhaps people take fatty acid supplements on a daily basis. Then fish fatty acid intake would not be episodic. On the other hand, perhaps fruit and alcohol are episodically consumed. The authors should construct a table that shows for each component, the percent of participants who consumed the relevant food on both of the 2 days, on only 1 of the 2 days, and on neither of the 2 days. This table is likely to show that foods other than fish are episodically consumed.

2. Page 2, line 3--The purpose should state why the index was applied to the survey data. Was it to assess the diet quality of Dutch men and women, aged 19-30, in 2006? Was it to determine whether the diets of Dutch men and this age differed in quality? Was it to determine the relationship between the index scores and nutrient intakes?

3. Page 2, lines 14-18—These results do not clearly relate to the stated purpose of the study. The purpose, therefore, needs to be clarified.

4. Page 3, line 10—Omit “individual.” In interventions, change does not need to be detected at the individual level. Detecting change at the group level is adequate.

5. Page 5, lines 9-10—What is the operational definition of “inconsistency between first and second interview”? People do not eat the same foods every day, so how can an inconsistency be detected? How was underreporting detected and dealt with?

6. Page 5, line 16—Please explain how a continuous scoring system facilitates observing the changes in an individual’s diet. This seems unlikely to be true.

7. Page 6, lines 11-13—Please explain how these six types of juice were selected and why others were not counted. Were minimum amounts of folate and vitamin C required?
8. Page 6, lines 20-21—The guidelines recommend fish and do not state that fish oil capsules may be substituted. The authors cannot, therefore, claim that the index reflects the guidelines. Even though the amount of fish recommended is based on fatty acid content, the following quote from the Dutch guidelines suggests that substituting supplements for food would not be in keeping with their purpose: “The report emphasises that, in the context of diet-related chronic diseases, the focus needs to be on dietary pattern, not on individual foods or food components. The best way to reduce the risk of chronic diseases is to have a diet which is rich in fruit, vegetables, whole-grain cereal products and vegetable oils, which entails the regular consumption of fish and low-fat dairy and meat produce, and which is low in high energy-dense and low nutrient-dense foods, in combination with a physically active lifestyle, moderate alcohol consumption and abstinence from smoking.”

9. Page 7, line 4—Give the reference for this definition of a consumption occasion.

10. Page 7, line 16-page 8, line 9—Were the scoring standards applied to the average of the 2-day intakes available for each person; or were they applied to each day, and then the scores of the two days averaged? Because of the truncation of the scores, these two methods of scoring will not yield the same results. Are the guidelines to be met each day or over time? The scoring system should reflect the answer to this question. It appears that the guidelines are to be met over time; that is, they are intended to be daily averages, but it isn’t entirely clear, especially for the CO and alcohol components.

11. Page 7, line 16-page 8, line 1—The values were set at the 85th percentiles of what exactly? Of 2-day average intakes? Of usual (long-term average daily) intakes? Please clarify here that these distributions were the sample distributions.

12. Page 8, line 16—The NCI method “predicts” usual intake for use in statistical models, but does not “estimate” usual intakes by individuals per se as was done here.

13. Page 9, line 1—The conversion factor needs clarification. Does the 100 grams refer to the raw, whole fish; to the edible portion of raw fish; to the whole cooked fish; or to the cooked, edible portion of fish?

14. Page 9, line 1—Was the estimated intake of fatty acids from supplements added to the estimates from fish?

15. Page 9, lines 4-6—The more reasonable conclusion to draw from this result would be that the CO guideline is not a useful one to include as a component of the index. Just because something is mentioned in the guidelines, doesn’t necessarily mean it will be useful in an index.

16. Page 9, lines 10-11—Fish intake was estimated differently.

17. Page 9, lines 10-11—Were the number of COs also averaged over 2 days? If so, it’s not clear that that would be appropriate, given that one might assume that the guideline should be met each day and not on average over time.
18. Page 11, lines 1-5—The scoring system for fruit and the results presented here do not reflect the guideline for fruit, described on page 6, lines 9-10, which says that up to 100 g of fruit can be replaced with fruit juices with particular characteristics. If someone had 200 grams of fruit, including such juices, and at least 100 g of fruit that was not in juice form, they should get full credit for meeting the fruit guideline.

19. Page 11, line 16—The exception of the CO component should be mentioned here.

20. Page 11, lines 20-23—This information should be presented in the Introduction.

21. Page 12, lines 11-12—As explained above, the fruit recommendation was not properly reflected in the scoring system. This sentence and the analysis do not capture the fact that more than 100 g of juice could have counted as fruit when juice was included.

22. Page 12, lines 12-14—The study cited does not relate to the findings presented here because the current study does not compare consumers and non-consumers of fruit juice. Furthermore, such a comparison is not very useful because if someone does not consume fruit juice on one particular day, that does not mean he/she never consumes it.

23. Page 13, lines 9-10—This is a low correlation. Please add a citation for the statement that saturated fatty acids and trans-fatty acids appear largely in the same foods. If this were true, one would expect the correlation to be higher.

24. Page 13, lines 13-14—Hypotheses should be stated in the Introduction; and results of hypotheses testing should be given in the Results section, not introduced in the Methods section. The purpose of testing this hypothesis should also be stated in the Introduction.

25. Page 13, line 19—This does not make sense. Should “nutrient” be “nutrient-dense”?

26. Appendix A—The Dutch Dietary Guidelines are key to understanding the DHD index; therefore, they should be presented in a figure, not as an appendix.

Minor Essential Revisions:

1. Page 2, line 11—Associations of what?

2. Page 2, line 12—The scores, not the index, were grouped into quintiles.

3. Page 3, line 6—A priori indexes are not “estimated,” they are created or constructed.

4. Page 3, line 14—The hyphen is missing between “Index” and “2005.”

5. Page 5, line 20—“Consumption occasions” should be “number of consumption occasions per day.”

6. Page 5, line 21—This is the first time “activities” are mentioned. They need to be explained earlier.

7. Page 7, line 2—“Courses” should be “meals.”
8. Page 8, lines 20-22—This section needs editing. In lines 20-21, omit “The weighted average of the fish fatty acids of,” change “the top six of fishes” to “The top six fish,” and change “was” to “were.” In line 22, after “weighted average,” add “level of fatty acids.”
9. Page 9, line 14—This sentence does not make sense. Perhaps “adjusted” should be the beginning of a new sentence that says, “Adjusted intakes are presented as mean nutrient intakes per 9.8 MJ.”
10. Page 9, line 23—The description of the differences in education levels is unclear.
11. Page 10, line 22—Change “mg/9.8MJ/day” to “mg/9.8 MJ.”
12. Page 10, line 22—9.8 is an odd number. Is this common practice? Why not use 10?
13. Page 11, line 9—Change “without the NCI method” to “using 2-day means.”
14. Page 11, line 12—Omit “to adhere.”
15. Page 12, line 19—Please clarify by saying, “However, the use of the 85th percentiles of the distributions of the 2-day averages of 19-30-year-olds…”
16. Page 12, line 20—Change “between Dutch populations” to “with other Dutch subpopulations.”
17. Page 13, line 12—“Weighing” should be “weighting.”
18. Page 15, line 8—Change “when” to “if.”
19. Page 16, lines 12-13—“Rule” should be “role.”
20. Table 5, title—Change “participants” to “men and women.”

Discretionary Revision:
1. A reasonable conclusion to draw from the results shown in Table 5 would be that the DHD index is a good measure of the nutrient density of diets.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**
I declare that I have no competing interests.