Reviewer's report

**Title:** A bilberry drink with fermented oatmeal decreases postprandial insulin demand in young healthy adults

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**Reviewer:** Marie Alminger

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Review of Nutrition Journal manuscript
A bilberry drink with fermented oatmeal decreases postprandial insulin demand in young health adults, Elmstål & Björk

The research as presented in this manuscript is appropriate and suitable for publication in the Nutrition Journal.

1. Is the question posed by the authors new and well defined?
   Yes, the consumption of different cereals and fermented cereal products has been shown to control or improve glucose tolerance and reduce insulin resistance but to my knowledge no studies have dealt with the postprandial effects of a fermented oat meal product containing bilberries or rosehip.

2. Are the methods appropriate and well described, and are sufficient details provided to replicate the work?
   - Yes, in general but it would have been interesting to know more about the processing of the bilberries and rosehip (fresh, frozen, dried, freeze-dried) since this might have an impact on the metabolism of the different phytochemicals of the berries.

3. Are the data sound and well controlled?
   - Yes

4. Does the manuscript adhere to the relevant standards for reporting and data deposition?
   - Yes

5. Are the discussion and conclusions well balanced and adequately supported by the data?
   - Yes

6. Do the title and abstract accurately convey what has been found?
   - Yes

7. Is the writing acceptable?
   - Yes, I think it is acceptable but there are some grammatical mistakes (that I
have not bothered to list) and some of the terms could be used more consistent

Minor Essential Revisions

1. Title, superscripts 1-5? I only find 2 authors on the page

2. Abstract, the use of the term blueberries, bilberries, European blueberries could be more consistent in the abstract, although some of the different species of the Vaccinium genus are described in the Background, as the abstract is written now it can be a bit confusing and difficult to understand e.g.: a drink enriched with bilberries (10%) and a drink enriched with blueberries (47%) – are different berries used in the different series?

Suggestion: in the second sentence … following dietary supplementation with extracts from European blueberries, also called bilberries (Vaccinium myrtillus). ..and then use the term bilberries in the rest of the abstract.

3. Background, lines 58-70. From Sugars are important components of the diet etc

The purpose of referring to the current dietary recommendations is not clear to me, do the authors consider it a risk of including 100 g of fruit juice with the recommended intakes of at least 500 g of F&V/day?

If the purpose is to link the background description to the design of the study I think this need to be clarified or expressed a bit different?

4. Background, paragraph 3 (lines 87-92): a suggestion to write this more “concisely”: The present study was performed to determine the glycaemic and insulinemic responses in healthy humans after single meal intakes of fermented oat meal drinks containing different amounts of bilberries (0, 10 or 47%) or rosehip (10%). (Perhaps it is not even necessary to include the % since it is described in the methods).

5. Methods, Paragraph 2, Series 1 and Paragraph 4, Series 2, No details or information regarding the processing or the “state” of the berries are included. As discussed later in the manuscript, anthocyanins in bilberries have been suggested to have an impact on postprandial responses although the metabolic pathways for this are not clear. Based on the current literature it is widely accepted that berry phenolics/anthocyanins are poorly bioavailable but it is possible that food processing can improve (or limit) the uptake in the gastrointestinal tract, even if they are not absorbed in the small intestine they can be metabolized in different ways in the colon, possibly depending on the “state” and the food matrix. Thus it would be interesting to know whether the bilberries and rosehips were fresh, frozen dried or had been submitted to some other processing. (more than homogenized as described in series 2).

6. Methods, Subjects, From this paragraph and further on in the text (methods, results, discussion) the authors alternate between min or minutes, for consistency the same should be used (suggest min)

7. Methods, Sampling and analysis. Samples for analysis of glucose were taken
at 15, 30, 45, 70, 95 and 120 min, although this may not have a major effect on the results, it would be interesting to know why the “standard method” for taking blood samples for determining glycaemic responses was not used in this study, i.e. with samples usually taken at 15, 30, 45, 60, 90 and 120 min?

8. Methods, Sampling and analysis and Results, Series 1 paragraph 3; series 2, paragraph 5. The serum insulin concentration was not determined at 70 min, the postprandial insulin concentrations clearly peaked at 45 min (Figs 2&4) but 50 min seems to be a quite long period between the 45 and 95 min time points for assessment of the shape of the insulin curve?

9. Discussion, the discussion is very interesting and especially the hypothesis that bilberries can cause an increased uptake of glucose into peripheral cells and the reference of potential activation of AMPK in type 2 diabetic mice from bilberry extracts. However, in the paragraph 5 of the discussion, the authors suggests that the inconsistency between glycaemic and insulinaemic responses was unexpected and only previously reported for certain rye products and for cinnamon added to a rise pudding. According to my present knowledge, the inconsistency between GI and II is in line with other previous studies (Flint et al. Br. J. Nutr. 2004; Mäkeläinen et al. Eur. J. Clin. Nutr. 2007; Alminger & Eklund-Jonsson, Eur. J. Nutr. 2008)

- 10. Table 3&4, Misspelling of Tukey´s test

**Level of interest:** An article of importance in its field

**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