

## PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form ([see an example](#)) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below. Some articles will have been accepted based in part or entirely on reviews undertaken for other BMJ Group journals. These will be reproduced where possible.

### ARTICLE DETAILS

<b>TITLE (PROVISIONAL)</b>	Impact of a reduced red and processed meat dietary pattern on disease risks and greenhouse gas emissions in the UK: A modelling study
<b>AUTHORS</b>	Aston, Louise ; Smith, James; Powles, John

### VERSION 1 - REVIEW

<b>REVIEWER</b>	Dr Peter Scarborough University of Oxford  I declare that I have no conflict of interest.
<b>REVIEW RETURNED</b>	04-May-2012

<b>THE STUDY</b>	This is a modelling study - there is no need for a supporting checklist.
<b>GENERAL COMMENTS</b>	<p>This is a very interesting manuscript. The subject area is of high importance. The modelling used to estimate the potential reduction in risk of CHD, diabetes and colorectal cancer and also the reduction in GHG emissions associated with a plausible scenario of reduced red and processed meat consumption is appropriate and the results are reported clearly. I think this is a very good piece of work, and I only have a few minor comments that the authors may wish to consider.</p> <ol style="list-style-type: none"> <li>1. P3, lines 49-50. The remark in the conclusions about reducing inequalities comes completely out of the blue. I would suggest that this either needs to be explained more clearly in the abstract, or removed from the abstract.</li> <li>2. P4, lines 10-11 'whereas the benefits accruing as climate change mitigation apply to anonymous populations distant in time.' I just don't understand this sentence. Perhaps it should be re-phrased.</li> <li>3. P5, lines 20-24. The process for correcting 7 day diary data for habitual intake needs further explanation. At present I am not sure what has actually been done. But this clearly has a big impact on the results, since figure 1 shows that this adjustment results in a large increase in meat consumption in F1, and a decrease in consumption in F5. This warrants a bit more explanation in the text.</li> <li>4. P8, lines 25-27. 'This is a deliberately heuristic exercise, intended to inform policy over the decadal timeframes familiar in climate change deliberations'. I have no idea what this means!</li> <li>5. P9, lines 6-17. This calculation relies on the additional assumption that the results based on the diets of 19-64 year olds are equally</li> </ol>

	<p>applicable to the over 65 population where the majority of the disease burden lies.</p> <p>6. P9, lines 19-33. It would be useful to compare these results to those found in the 4th carbon budget by the Committee on Climate Change. Here, three different dietary scenarios are proposed (all based on reduction of meat consumption), and reduction of GHG emissions is calculated. One of the CCC scenarios would predict considerably higher impact on GHG emissions than is the case for the counterfactuals used in this paper, but the modelled reduction in meat consumption may also be considerably higher.</p>
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<b>REVIEWER</b>	An Pan, Research Associate, Harvard School of Public Health, USA. No conflict of interest was declared.
<b>REVIEW RETURNED</b>	21-May-2012

<b>THE STUDY</b>	A statistician might be needed to review the statistical methods. The manuscript does not have a CONSORT checklist. Some sentences are not clearly written and not easily understood.
<b>RESULTS &amp; CONCLUSIONS</b>	The authors should compare and contrast their results versus previous evidence in this area, in both sides of public health and environmental health.
<b>REPORTING &amp; ETHICS</b>	The authors did not provide a statement or checklist. Whether the study was approved by an ethics committee was not mentioned.
<b>GENERAL COMMENTS</b>	<p>The authors should be applauded for conducting this interesting analysis to investigate both public health and environment health related to reduction of red meat consumption. Certainly, the non-communicable metabolic diseases and greenhouse gas emissions have become two major public health crises nowadays. The results provide more evidence for both public and individuals to reduce red meat consumption.</p> <p>I have the following comments:</p> <ol style="list-style-type: none"> <li>1. Abstract. In the "Results" section of Abstract, the second sentence "Risks of coronary heart disease, ..... with intakes of unprocessed red meat" was conclusions from other studies, not the results from this particular analysis. Therefore, I would prefer to mention this sentence in the background, or as a rationale of conducting the present analysis. The three disease outcomes (coronary heart disease, diabetes, and colorectal cancer) should be first mentioned at "Objectives".</li> <li>2. Introduction. The last sentence of the second paragraph is not clear to me, and may not be relevant to this study: "However the distribution of GHG emissions between the UK and overseas differs substantially from these figures due to major imports of cereals and soy for animal feed."</li> <li>3. Introduction. The second sentence of the last paragraph, "We predict reduced incidence of coronary heart disease, diabetes mellitus and colorectal cancer." Again, this conclusion is from other studies, not "predicted" by your estimation. You have described the GHG emissions associated with livestock products in the first and second paragraph; I think you also need to briefly (not just one sentence) describe the disease risk associated with red meat intakes in a separate paragraph.</li> <li>4. Methods. Please use "Q1", "Q5" etc to represent the lowest and</li> </ol>

	<p>highest quintile.</p> <p>5. The reference 13 was a work currently under review by the same authors. Please confirm with the journal that it is allowed to use the under-reviewed manuscript as reference.</p> <p>6. Methods section. Please be accurate to one decimal for 2% and 7% of the percentages of vegetarians in men and women, to be consistent with your reports in the Results section.</p> <p>7. The authors used the relative risk of several chronic diseases associated with red meat consumption from some meta-analysis. Therefore, the results of the current analysis are highly dependent on conclusions from those meta-analyses.</p> <p>8. The calculation of population aggregate risks was not clear to me. In the Methods section, you described potential impact fractions, but not population aggregate risks.</p> <p>9. A recent meta-analysis suggested that 100 g/d unprocessed red meat was associated with 19% increased risk of type 2 diabetes (Pan A et al., Am J Clin Nutr. 2011 Oct;94(4):1088-96), 50 g/d processed red meat was associated with 51% increased risk. You may conduct a sensitivity analysis to update the calculations.</p> <p>10. In Table 3 and 4, you need to provide the results even they were not statistically significant!</p> <p>11. In the Discussion section, you mentioned that “When considering both health and environmental effects of reducing RPM consumption, substitute foods are important, and clear advice should be given regarding these in order that benefits are maximised.” I agree that it is very important to consider what we exclude from our diet and at the same time, what we include in our diet. Is it possible to calculate the results of substitution of red meat by different food groups, for example, vegetables, whole grain, poultry, fish, legumes, dairy products etc.?</p> <p>12. The authors should compare and contrast their results versus previous evidence in this area, in both sides of public health and environmental health.</p>
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### VERSION 1 – AUTHOR RESPONSE

We have made the suggested revisions, and feel that the manuscript is much improved as a result. Changes made are highlighted in the text, and one point addressed with a comment in red text within the main body.

Very best wishes  
Louise Aston

On behalf of all authors

### VERSION 2 – REVIEW

<b>REVIEWER</b>	An Pan, Research Associate, Harvard School of Public Health, USA. No conflict of interest was declared.
<b>REVIEW RETURNED</b>	02-Jul-2012

<b>GENERAL COMMENTS</b>	Thank you for addressing my concerns. I do not have any further questions.
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