Reviewer’s report

Title: Lutein and zeaxanthin isomers modulates lipid metabolism and the inflammatory state of retina in obesity-induced high fat diet rodent model

Version: 0 Date: 31 Mar 2017

Reviewer: Kumari Neelam

Reviewer’s report:

The authors conducted an experimental study to investigate the possible effectiveness of lutein (L) and zeaxanthin (Z) administration on lipid profile, protein genes involved in oxidative stress and inflammation pathways in the obesity induced high fat diet. The study is well conducted and results are interesting.

The following are my concerns:

1. The sample size in each group is very small (n = 7) although the authors have done the sample size calculations. Better to have a bit more detail about it. Also, duration of the study is very short (8 weeks).

2. Abstract, subsection on Conclusion: L and Z may be considered as an antioxidant to improve visual health… However, the study has no data in relation to improvement in visual health. Similarly, the study has no data in support of risk reduction for AMD.

3. Discussion section: some of the sentences are very long and will benefit from rephrasing (e.g. sentence spanning from line 19 to 36).

4. Discussion section: this section merely elaborated the past studies related to inflammatory and oxidative stress related factors. In my opinion, the genes related with oxidative and inflammatory pathways should be the focus of discussion since it is the main aim of the study.

5. Lutein and zeaxanthin can be abbreviated as L and Z, respectively throughout the article.

6. Table 1: Why the starch and sucrose levels were different in regular diet and HFD? Please clarify.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.
Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

Yes

**Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?**
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I recommend additional statistical review

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

Acceptable

**Declaration of competing interests**
Please complete a declaration of competing interests, considering the following questions:

1. Have you in the past five years received reimbursements, fees, funding, or salary from an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

2. Do you hold any stocks or shares in an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

3. Do you hold or are you currently applying for any patents relating to the content of the manuscript?

4. Have you received reimbursements, fees, funding, or salary from an organization that holds or has applied for patents relating to the content of the manuscript?

5. Do you have any other financial competing interests?

6. Do you have any non-financial competing interests in relation to this paper?

If you can answer no to all of the above, write 'I declare that I have no competing interests' below. If your reply is yes to any, please give details below.

I declare that I have no competing interests
I agree to the open peer review policy of the journal. I understand that my name will be included on my report to the authors and, if the manuscript is accepted for publication, my named report including any attachments I upload will be posted on the website along with the authors' responses. I agree for my report to be made available under an Open Access Creative Commons CC-BY license (http://creativecommons.org/licenses/by/4.0/). I understand that any comments which I do not wish to be included in my named report can be included as confidential comments to the editors, which will not be published.

I agree to the open peer review policy of the journal