Reviewers report

Title: Effect of long-term feeding of the Obudu natural honey and table sugar-sweetened diets on obesity and pro-inflammatory biomarkers in rats.

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Reviewer: Tatiana El-Bacha

Reviewers report:

The work presented by Atangwho and co-workers entitled "Effect of long-term feeding of the Obudu natural honey and table sugar-sweetened diets on obesity and pro-inflammatory biomarkers in Wistar rats (Rattus norvegicus)" compares the effects of diets enriched with table sugar and Obudu honey in insulin and glucose homeostasis and inflammation in rats. As I understood, the motivation of the study relies on the fact that obesity has reached epidemic proportions in developing countries and table sugar consumption is one part of the problem. And honey, as a sweetener, could be used as a replacement for table sugar but little is known about the metabolic effects of honey consumption. Despite the fact this is a scientifically sound study, in the way the background/introduction is presented and also how the study was designed, there must be major changes for the rationale of the study to be clear and for the conclusions to reflect the results, as explained below:

Major points:
1. English is poor and the manuscript must be carefully revised. It is very hard to follow the authors' message in several parts of the manuscript: Some examples:
   Abstract
   Line 35: …"increasingly eat less compared to the normal control (NC) and the corresponding S16%...".
   Line 49: "but sublime effects that only require..." sublime is not a technical term and, for the sake of clarity, must be replaced

   Background:
   Line 80: "sweet test to food thereby improving its palatability".

   Results (Lines 232-33): "Both honey and sugar at their highest percent incorporation increased body weight gain successively in the female rat groups compared to control (P < 0.05)

2. The motivation of the study is not clear. Why to study honey? How is the trend of honey consumption in the world and in Nigeria? What is the motivation to study Obudu honey?
   The last sentence of the Background states (Lines 130-32): "Since the chemical composition of natural honey, as noted earlier depends largely on its geographical origin, it is expected that the nutritional and hence the physiological effect may also vary, justifying the need for the current study." The chemical characterization of the Ubuntu Honey would significantly improve the data and would shed light into the biological effects of the honey diet. I understand this was not the scope of the manuscript, but the way it is written, it seemed that the motivation of this study was the potential beneficial effects of this particular honey. Therefore, the authors should address, at least in the discussion, the potential composition of the Obudu honey, accordingly to what was stated in the introduction.
3. The background should be re-written not only to provide scientifically sound evidences that it is important to investigate the metabolic effects of honey in general and Obudu honey in particular, but also to revise some paragraphs that does not provide critical information to the study, as the 3rd paragraph (Lines 91-100) - which describes what honey and table sugar is - which, in my opinion, is a textbook or Wikipedia information.

4. The experimental designed should be critically revised: There were 4 types of diets, in addition to control diet: with 8 and 16 % of sugar and 10 and 20 % of honey. To sum up 100 %, what was done was to decrease the % of the regular diet. And not only the % of glucose, dextrose or starch. There are important implications of this type of design:

a- Possible alterations in the consistency of the diet - did it change? The decrease in the intake by female rats in the 20 % honey might be due to altered consistency and, therefore, acceptance of the diet by the animals.

b- More importantly, decreasing 20 % of regular diet implicates in the reduction of essential nutrients, as protein, essential fatty acid and vitamin/mineral. Therefore, the authors cannot conclude if the differences observed between groups were due to the increase in sugar or honey consumption and/or reduction in the other dietary components

c- Did the study included pair-feeding protocol? If not, the authors cannot conclude if the differences observed between groups were due to the increase in sugar or honey consumption and/or reduction in total food intake in the case of female rats.

Due to these comments, all the results cannot be discussed as the experiments lack proper control.

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

No

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

No

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

No

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If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

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