Reviewer’s report

Title: Popcorn is more satiating than potato chips in normal-weight adults

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Reviewer: Susan Barr

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This manuscript describes the effects of 1 cup popcorn, 6 cups popcorn, and 1 cup potato chips on satiety and ad-libitum intake at a subsequent meal consumed 30 minutes later. The methods are clearly described and overall, the manuscript is well-written. Issues that require attention include the rationale for providing the test snack in very close proximity to the ad-libitum meal, the absence of data on palatability, the need to address the potential impact of increased thirst with the snacks, and the need to differentiate the effects of one cup versus six cups of popcorn (in many instances, the word “popcorn” is used without clarification).

Major Compulsory Revisions

1. Page 5, Design: What was the rationale for providing the test foods 30 minutes before an ad-libitum meal (which could commence as shortly as 15 minutes after participants finished the test food)? To my knowledge, snacks are not generally consumed in such close proximity to a meal. It almost seems that you were testing the effect of an “appetizer” rather than a snack. Do you have data to indicate that this is a normal time for a snack? If so, it should be provided. In any case, this needs to be addressed in the discussion section.

2. Page 8, para 2. Data on the extent of caloric compensation should be added to Table 3, along with measures of variability (i.e., mean +/- SD) and the significance of comparisons among the three test food conditions.

3. Page 8, results. The results section does not include information on the palatability ratings, so these should be added. Also, it should be explicitly stated that all 3 test foods increased thirst.

4. Discussion is needed regarding the potential implications of the increased thirst with all 3 test foods on your findings. Did you obtain data on water consumption at the ad-libitum test meal? If so these data should be presented in the results section. If you can demonstrate that water intake at the ad-libitum meal did not differ among the test foods and the water control, your findings would be strengthened. However, if it did differ, then how the findings might be altered in the context of a meal with a caloric beverage needs to be discussed: If a caloric beverage had been available instead of water, and if the higher thirst rating translated to increased beverage consumption, the caloric compensation results might differ from what you observed with water. If data on water consumption at the ad-libitum meal were not collected, the issue should still be
addressed.

Minor Essential Revisions

5. Title – I appreciate the challenge of providing a concise yet informative title. Your title refers to “satiety” and this might be interpreted as referring to the VAS ratings. While it is true that 6 cups of popcorn was more ‘satiating’ than 1 cup of potato chips, there were no differences in VAS satiety ratings between 1 cup of popcorn and 1 cup of potato chips. The title should reflect this if possible. Also, because of the unusual interval between the snack and the ad-libitum meal, it would be appropriate if the title indicated “when consumed within 30 minutes of a meal”.

6. Abstract: In the results section, there is a typographical error in “satisfaction”. Please provide measures of variability for energy compensation (220% +/- XX%, etc.). In the conclusion section, it’s not strictly true that “popcorn exerted a stronger effect on short-term satiety than did potato chips as measured by subjective ratings...”. Six cups of popcorn exerted a stronger effect on subjective ratings than potato chips; one cup of popcorn did not.

7. Page 4, Introduction, para 2, line 3: Reference 14 appears twice. Also, in your statement of purpose you indicate that popcorn and potato chips are “two commonly consumed snacks”. It would be useful to readers if you provided data on the frequency of consumption of these two snack foods – particularly among the age group you studied.

8. Page 5, line 2-3: Please provide a brief statement about what the newspaper advertisement told potential participants about the study (i.e., because they provided informed consent, presumably they were aware that the study’s purpose was to compare the effect of popcorn and potato chips on satiety ratings and on intake at a meal – but it is useful to readers to know what they were told as cognitions have the potential to impact behavior, even on a subconscious level).

9. Page 5, line 6-8: Scores for dietary restraint, disinhibition and perceived hunger occur on continuous scales, and there are not well-established cut-points for exclusion. What criteria did you use when screening participants?

10. Page 7, paragraph 1, middle – Please change “after the first bite of the test meal” to “after the first bite of the test food”. Otherwise, it’s easy to confuse this with the ad-libitum meal.

11. Discussion. As indicated earlier, I think it’s important to be very precise with your terminology. There are differences in findings between 6 cups of popcorn and 1 cup of popcorn; accordingly, “popcorn” should not be used generically. Similarly, there are also differences in findings for “satiety” between the VAS ratings and as interpreted from energy intake at the subsequent meal. For this reason, it would be helpful to readers if you clearly made these distinctions. So (for example) – 6 cups of popcorn resulted in greater subjective satiety ratings than 1 cup of potato chips; 1 cup of popcorn did not. And although both 6 cups of
popcorn and 1 cup of popcorn were associated with lower combined energy intakes than 1 cup of potato chips, none of the snacks actually reduced combined energy intake relative to the water control.

12. Page 12 – I assume that “JM” should be “JR” in the description of the authors’ contributions.

13. References – these appear to be complete and correctly formatted, except that lower case should be used for the title of the article by Zizza and Xu. This reference also needs a complete citation.

14. Table 2: So that table can “stand alone”, footnotes should be used to describe the VAS scale (i.e., that it was 100 mm, and that ratings were anchored by….). This table could also be modified to include the data on palatability.

Discretionary Revisions

15. The discussion does a good job of addressing many of the potential issues and limitations. In addition, other issues include:

- Although the manuscript does not overstate its findings, inferences about potential impact on body weight should recognize that the data collected don’t actually allow any conclusions could be drawn (it’s not known whether the observed 1-day findings would persist chronically, and the effect on total energy balance was not assessed).

- A small additional consideration is that further research should consider assessing the impact of popcorn that is not 94% fat free, particularly if 94% fat free popcorn does not dominate the marketplace.

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

**Quality of written English:** Acceptable

**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.