Author’s response to reviews

Title: Energy, nutrient and food content of snacks in French adults

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Author’s response to reviews:

Dear Editor in Chief,

Please find enclosed the revised version of manuscript NUTJ-D-17-00121 entitled “Energy, nutrient and food content of snacks in French adults” which has been modified in line with the reviewer comments. All the changes are highlighted in the manuscript in a red font.

You will find attached our point-to-point reply.

I confirm that all author details on the revised version are correct, that all authors have agreed to authorship and order of authorship for this manuscript and that all authors have the appropriate permissions and rights to the reported data.
Sincerely yours,

Wendy Si Hassen on behalf of the authors.

Reviewer #1:

-This is an interesting study which describes the main features of snacking behaviors among French adults. The study is relevant because snacking is a major contributor to excess weight gain and poor cardiometabolic health. The fact that the analysis was performed in a cohort of over 100,000 participants which were recruited to match the French adult of population is a major strength of the study. However, the analysis is too descriptive for my taste. Because the cohort certainly has good information on sociodemographic variables, I missed associations with those variables. The French population is far from being homogeneous and differences must exist at the food behavior level. I'd like the authors could dig deeper into those differences, which I am sure will add to the paper.

We thank the Reviewer for the constructive and helpful comments. We chose, here, to focus on an overall analysis of frequency and nutritional quality of snacking occasions because there are methodological challenges in describing meal and snack patterns of populations and we have very little information regarding the snack and eating occasion patterns of European adults. However, it is important to determine if snack patterns are related to nutrient and energy densities, in order to ascertain whether or not the patterns are markers of poor nutritional quality that is affecting health status as mentioned in some previous studies. Accurate descriptions of energy, nutrient and food content of snacks in free-living populations will help to understand both the metabolic effects of snack occasions and the associations of health-related behaviors with specific snack patterns. Therefore, the purpose of this research was to test the hypothesis that specific snack patterns according to the timing of day are associated with the nutrient content, energy density and food group intake.

This paper aimed also at investigating snacking behaviors throughout the day and characterizing if some eating occasions are related to healthy or unhealthy practices.
As a matter of fact, and because we observed some specific snacking characteristics in the present study, analysis of snacking behaviors according to sociodemographic factors is the subject of a separate publication which is currently being processed in International Journal of Nutritional Behaviors and Physical Activity, as it was not possible to put all details in one single publication. In order to provide such information to readers, we have added in the Discussion section a sentence regarding the snacking behaviors across sociodemographic groups:

Lines 256-262 “In addition, a separate analysis showed that snacking behavior varies across demographic and socioeconomic subgroups. Although snacking was less prevalent in low socioeconomic categories and young adults, their snacks had higher energy content and were of poorer nutrient density. When focusing on public strategies regarding snacking behavior, policy makers should take into account these demographic and socio-economic disparities to implement specific actions - either through professional networks or education programs for instance.”

-Abstract

Please, include range or mean age of participants along with gender distribution.

As suggested, we have added in the abstract “After weighting, 52.4% were women and mean age was 46.5 (16.3).”

-Use brackets to report mean values since you have normal parenthesis to report standard deviations.

Corrections are highlighted throughout the abstract in red. All mean values have been reported using brackets.
-Introduction

Line 16. By American study, did you mean a study conducted in the US?

This sentence is indeed unclear. We have replaced the term American by “conducted in the United States”

Lines 16-17 “In study conducted in the United States among working adults in 2010-2013 [21]”

-METHODS

I'd rearrange this section. First I'd call the first subsection 'Sample and study design'. This comprises lines 32-40 plus lines 87-93 (which is currently in the Statistical analysis subsection).

Line 31: We have replaced the first subsection title by “Sample and study design”, have moved sentences from former lines 87-93 and have modified the ‘statistical analysis” subsection.

-Next, in the second subsection I'd describe the assessment of the dietary behavior. This goes from line 48-59, only. A third subsection would be used to report the definitions of meals and eating occasions as used in the analysis. This is currently done in lines 61-85.

Line 56: We have named the second subsection “Assessment of dietary behaviors” and we have added a new subsection entitled “Definition of meals and eating occasions” (line 70)

-Estimations of energy intake, energy density and nutrient density should be reported separately from the statistical analysis subsection.
We have added a new subsection entitled “Computation of nutritional indicators of eating occasions” that includes explanations on estimations of energy intake, energy density and nutrient density.

-Statistical analysis: report how the variables were described

To be clearer for the reader, we have added the following sentence:

Lines 127-128 “We used weighted percentages of individuals to describe occurrence of eating occasions and weighted means or medians for nutritional indicators to describe their nutritional quality.”

- and how were estimated associations with sociodemographic variables, such as gender, age-group, educational level, ethnicity, migratory status, etc.

I strongly recommend performing those associations to show how those features impact or do not impact on snacking behavior. The findings would be of interest to the scientific community and also to health practitioners and policymakers.

As previously explained (see above), we chose, here, to focus on an overall analysis of the nutritional content and the occurrence of eating occasions to provide a deep and accurate characterization of eating and snacking occasions, in particular according to the timing of day. Analysis of snacking patterns according to sociodemographic factors is part of a separate work and we have added information on those results so as to improve the discussion:

Lines 256-262: “In addition, a separate analysis showed that snacking behavior varies across demographic and socioeconomic subgroups. Although snacking was less prevalent in low socioeconomic categories and young adults, their snacks had higher energy content and were of poorer nutrient density. When focusing on public strategies regarding snacking behavior, policy
makers should take into account these demographic and socio-economic disparities to implement specific actions – either through professional networks or education programs for instance.”

In addition, for a better interpretation and generalization of the results to the general population, we used a weighting procedure to fit national census data on age, educational level, employment status, marital status, area of residence and presence of any children in the household. Therefore, our study took into account the different socioeconomic and demographic profiles of the general French population.

We have added in the Methods section (subsection population and study design) explanations on how demographic and socioeconomic factors were collected:

Lines 49-54: Socioeconomic (education, occupation, household income) and demographic (age, area of residence, marital status and presence of children in the household) data were collected at baseline using a web-based self-completed questionnaire, using categories consistent with the French National Institute of Statistics definitions [28-30]. The highest attained diploma defined the educational level [28]. The reported monthly household income was then divided by the number of household units (HU) [31].

-Results

Because I'm suggesting to broaden the analysis to include associations with sociodemographic variables, this section is going to change greatly.

As mentioned above, associations between occurrence of snacking, its nutritional quality and demographic/socioeconomic factors have been investigated and are the main focus of another paper, which has been submitted to International Journal of Behavioral Nutrition and Physical Activity.
We have added sentences in the Discussion to provide such information to readers about the results of our other analysis on socio economic and demographic differences in snacking behavior and implications for public health strategies.

Lines 256-262 “In addition, a separate analysis showed that snacking behavior varies across demographic and socioeconomic subgroups. Although snacking was less prevalent in low socioeconomic categories and young adults, their snacks had higher energy content and were of poorer nutrient density. When focusing on public strategies regarding snacking behavior, policy makers should take into account these demographic and socio-economic disparities to implement specific actions – either through professional networks or education programs for instance.”

-I just have one observation. The authors excluded a subset of participants, but nothing is said about differences between the final sample and those excluded from the analysis. Did you have the chance to compare both groups?

Thank you for pointing out this missing point. We had the chance to compare excluded and included participants and have now addressed it in the manuscript.

We have therefore added in the Methods section:

Lines 120-121 “Comparisons of demographic and socioeconomic characteristics between excluded and included participants were performed using chi-square or Fischer tests as appropriate.”

And in the results section:

Lines 141-146 “Proportions of young subjects (18–30 years), individuals with primary school level, manual workers, employees and never employed persons, those belonging to the lowest income class were higher in excluded participants than those included in the sample while
proportions of older subjects, those with postgraduate education, managerial staff individuals, and those belonging to the highest income class were lower.”

-I'd also suggest including a Table to describe the sample overall or controlled by a variables (e.g. gender, age group, …).

We agree that the manuscript was lacking of these information. We have added a new table describing the sample entitled Table 1: Demographic and socioeconomic characteristics of the sample (weighted data) (n=104,265). We have referred to this new Table when describing the sample throughout the text and have consequently modified the other Table numbers.

-Discussion

I missed a subsection about implications of the findings for practice and policymaking.

We agree with the reviewer that implications for policy making and practice were not highlighted enough throughout the manuscript.

In the former manuscript we have mentioned that promoting healthy foods when snacking could be of interest since this behavior is common among French adults and since both recommended foods (fruits, for instance) and foods to limit (fatty sweet products) are consumed. (“Targeting both snacking and meal behaviors in public health messages is thus important. Since snacking appears to be a common behavior, appropriate action to promote consumption of healthy foods on these occasions is needed [1;54].’)

In the revised paper, we have modified these previous sentences and have added the following text:
Lines 249-262: “Since intakes of sugar-sweetened products, sugary drinks during snack eating occasions but also those of beneficial products such as fruits, appropriate actions are needed to promote consumption of healthy foods and limit other non-recommended items [1;52]. Since snacking occasions are common, promoting intakes consumption of certain foods such as fruit when snacking, rather than banning snacks might be worth exploring. Since snacking could help to reduce hunger and improve satiety, favoring healthy snacks could potentially help to avoid overconsumption or to reduce energy intake during the subsequent meal, balancing daily intakes [12;53-57]. In addition, a separate analysis showed that snacking behavior varies across demographic and socioeconomic subgroups. Although snacking was less prevalent in low socioeconomic categories and young adults, their snacks had higher energy content and were of poorer nutrient density. When focusing on public strategies regarding snacking behavior, policy makers should take into account these demographic and socio-economic disparities to implement specific actions – either through professional networks or education programs for instance”

-Other comments:

Numbers for eating occasion occurrence have been modified in Table 2 (Nutritional characterization of meals and snacks of weekdays (N=104,265)) because a mistake has been done and were not weighted. They have been highlighted in a red font.