Author’s response to reviews

Title: Habitual food consumption of the Belgian population in 2014-2015 and adherence to food-based dietary guidelines

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Author’s response to reviews:

Dear reviewers,

Thank you for the efforts made to read our manuscript with great care! We have tried to address all your comments. These comments were very useful and we hope that our changes increased the readability and clarified even better the used methods and their eventual impact on bias issues. Also the discussion has been revised in the light of results recently published.

Kind regards,

Reviewer reports:

Reviewer #1: This paper describes food consumption in the Belgian population in 2014-2015 and compares it with the Flemish food based dietary guidelines and with consumption levels of 10 years earlier.
Main comment. In the method section I miss specific information on the food based dietary guidelines, and on the definition of food groups.

Can you explain in the method section or Table 1 how the recommendations should be interpreted. Are these all optimal amounts or are some minimum/maximum amounts to be consumed. What if ranges are given, is this related to the age differences within an age group, or should the consumption level be higher than the lower bound and lower than the higher bound? (Later in the manuscript it becomes clear that maximum recommended amounts are indicated for meat and substitutes, cheese, spreadable and cooking fat; this should be explained earlier).

Response: Yes, in the method section “Collection of food consumption data” the following part was added:

“For the following food groups the daily recommendation is the minimum amount to reach: water and sugar free drinks, vegetables, fruit, bread and cereals, potatoes/rice/pasta, and dairy products and calcium enriched soya products. In case of a range, the lowest value has been set as the cut-off value. For the other food groups, meat/fish/eggs/substitutes, cheese, spreadable and cooking fat, and nutrient-poor foods, the recommended daily intake should not exceed the maximum value. The foods included in each category in the analyses are described in table 1. A detailed description of this food selection can be found in the extensive web-based report (https://fcs.wiv-isp.be) [4]. Since the amount of spreadable fat in the recommendations was described as 5 gram per bread slice, the amount was recalculated into an age specific amount depending on the number of recommended slices of bread for that age group. This amount was added to the standard amount of cooking fat and the total was used as a maximum value.”

Can you include the definitions of the various food groups for which consumption is described? E.g. What was the definition of sugar-free drinks. Did this also include tea and coffee when no sugar was added? What is the definition of wholemeal bread (now stated in the result section)

Response: Yes, in table 1 a column was added with the foods that were included in the various analyzed food groups.

Minor comments

Throughout the manuscript. The numbering of the tables is not consistent with the references to the tables in the text. Most logical to me is to list the guidelines in table 1 (as part of the method section), followed by the age/sex specific consumption in table 2, and the comparison with the previous survey in table 3, etc.
Response: Ok, the tables are, as suggested, put in a more logical order and the references to the tables have been thoroughly revised throughout the whole manuscript.

L56-57. The first sentence: '…. the global burden of diseases in Belgium' is confusing. Is it global or in Belgium?

Response: The sentence is reformulated and also updated to 2017 results, as it refers to an estimation for Belgium by the GBD enterprise.

“Dietary behaviours were ranked by the Global Burden of Disease as the third most important risk factor for death and disability in Belgium in 2017”.

L73. Can you explain better, why guidelines that are expressed as weights or volumes are preferred as reference over guidelines expressed as portions? Was this the only difference between both types of guidelines? Or do they also include other/different food groups.

Response: The active food triangle was selected because it describes the guidelines quantifiable in terms of weights or volumes, while the food pyramid does not (e.g. ‘consume with each meal’, ‘2-3 times a day’ or ‘in moderation’). Therefore, the sentence was adapted to: “The active food triangle was selected because, contrary to the food pyramid, it describes the guidelines quantifiable in terms of weights or volumes.”

There were also differences in the position of the food groups in the triangle or pyramid (e.g. the food groups of vegetables and fruit are placed lower in the food pyramid, while the group of bread, cereals, potatoes, pasta and rice have a higher and smaller place in the food pyramid). The content of some food groups were also different (e.g. nuts are placed higher together with spreadable and cooking fats), but this was not the reason for not choosing the food pyramid.

Clarify in the method section if data collection and the sampling was exactly the same in both surveys; and if different how?

Response: A clarification for the comparability between both surveys (2004 and 2014) is added in the beginning of the method section. Further, the references to a published extensive protocol for both surveys was already present.
“The BNFCS2004 had the same study design as the BNFCS2014, i.e. a multistage stratified sampling procedure with matched substitution in case of non-response or refusals, two non-consecutive face-to-face interviews (24-hour recall) by dieticians with an earlier version of the GloboDiet® software and linkage to the NUBEL food composition database. As such, there is a high comparability between both surveys.”

L 111-112. Interviews. How were these conducted in the older children? i.e. those aged 10-15 y. Was this the combination of parents and children or only the children?

Response: The interviews in older children (above 10 years) were conducted only with the children (like adults). This is explained in lines 130-145. However, if needed some guidance of the parents was certainly allowed, which is the same for adults (e.g. the cook of the family was allowed to explain their used recipe).

L124. Do you mean 'consumed amounts' by Food portion sizes? And were all amounts expressed as 'amounts as consumed' or as 'raw weight’?

Response: The following clarification was added in the method section “Collection of food consumption data”:

“The habitual consumption was based on the edible part of the food and the portion size quantified as consumed weight (i.e.: cooked if it was cooked). Food recipes were disaggregated into ingredients which could be registered as 1) ‘consumed’ or 2) with their ‘raw’ weight (before cooking the recipe). In case of the latter, raw weights were recalculated into consumed weights by using conversion factors.”

L125. What do you mean with 'food portions' provided by manufacturer information. Are these the weights of apples, chocolate bars etc?

Response: We meant food portions of specific foods of a certain brand (e.g. a can of coke zero, one snicker bar), but we also used the standard units of certain food products (e.g. one apple). Another reviewer brought to our attention that we also forgot to mention other quantification methods. Therefore the whole sentence has been rephrased to:
“Food portion sizes were quantified using weights, volumes, shapes, thicknesses (e.g. spreads), household measures (e.g. glasses, cups, spoons, etc.), standard food portions (e.g. apples, packages) and a picture book including a selection of country-specific dishes in different portion sizes.”

L151-152. How were the nutrient-poor foods treated? Was % of kcal intake calculated for the person/day-specific kcal intake, or was it calculated as % of the group-level recommended kcal intake?

Response: The kcal/day consumption of nutrient-poor foods were calculated based on the individual day specific kcal intake. The presented contribution of this food group to the total energy intake is calculated based the age groups estimated total energy intake (i.e. 744 kcal from nutrient-poor foods /1927 kcal total energy intake among 14-17 years old persons).

The following clarification is added in the method section, Collection of food consumption data:

“For nutrient-poor foods, the contribution (in %) to the total energy intake is calculated as the ratio between the estimated intake of nutrient-poor foods in kcal/day and the estimated total energy intake in kcal/day for the specific age group.”

L164. Here reference is made to Table 2 that should list the dietary recommendations; however these recommendations are provided in Table 1.

Response: Indeed, this was a mistake and has been adapted. All the references to tables have also been thoroughly revised throughout the whole paper.

L180-181. Is this approach really conservative? Especially since many comparisons were made?

Response: First of all, SPADE generates usual intake distributions with confidence intervals along the distribution, based on 1000 Monte Carlo simulations, but it does not generate p-values from statistical tests. Our sample sizes (strata) are about 500 persons, and the results presented are means – the accuracy of SPADE in these settings is high. See:


The discussion about additional correction in case of multiple testing is a long standing one. The arguments AGAINST Bonferroni (or other methods) formulated in 1998 are still relevant:

https://www.bmj.com/content/316/7139/1236.full What's wrong with Bonferroni adjustments. Perneger T V. BMJ 1998; 316 doi: ◊ Basically, our goal is not to test a general null hypothesis (that all null hypotheses are true simultaneously).

In practice, SPADE does not provide a statistical test « p-values » as each stratum is analyzed separately and it does not allow the integration of a Bonferroni correction (or other method). As such, we are left with only the confidence intervals. We are conservative in this way, that we only formulate a statement of “statistical significant different” if there is no overlap. If there is an overlap, the results can hypothetically still be “statistical significant” different, but we don’t know. We can’t state that they are not “statistical significant” different.


So, the risk of a type II error is existing and real when only comparing CI overlap. In general, in nutritional epidemiology, type II errors are a larger problem than type 1 errors—because of the many sources of bias in the data…. Hypothetical introducing a Bonferroni correction would increase this problem even more…

Results. I miss information on the study population and a comparison with how the general Belgium population. This will give insight in the representativeness of the study population. For example regarding education level, occupation, or % smokers?

Response: In the results a section “study population” is added: “The demographic characteristics of our sample show that about 60% obtained a diploma of short- or long-type higher education, while this was only about 30% in the general Belgian population in 2014-2015 [23]. As weighting factors were used during the analysis, the results are representative for age, gender and province. The percentage of smokers in the current study population above 10 years old (24%) is similar to the percentage observed in the Belgian Health Interview Survey of 2013 (23% of the population 15 years and older).”
Table 2. Include information on the number of persons the data refer to.

Response: Table 2, which is now changed into Table 1, are recommendations for specific food groups and do not refer to specific data or number of persons.

Line 186. I cannot find the mentioned number 1168 ml for the whole population in any table.

Response: Indeed, this was a total for the whole population and was not included in the table before. However, the consumption for the whole population (All) has now been included in table 2.

L189-190. Rephrase the sentence. The majority of the population was below….; consumption level should be included in the sentence

Response: Ok, this sentence has been rephrased to: “The consumption level of the majority of the Belgian population (73%) was below this recommendation.”

Table 3 gives different number of persons for the different bread types. How does this work? Are non-consumers excluded? Explain in the header that 95% confidence intervals of the mean are included. Similar remarks apply to table 4.

Response: The different number of persons is due to the fact that information on the FFQ was used to take into account never-users of this type of bread in the model, but the FFQ information is not available for each person. The following footnote was added to table 4 and 5: “n = number of persons with two 24-hour recall interviews and valid FFQ information”. The header of tables 3-5 have been adapted to explain that the mean and 95% confidence intervals are included.

L307-308. Rephrase 'the less often' in the sentence 'Adolescents complied the less often with this recommendation (9-10%), while adults the most (16%).'

Response: Ok, done. This sentence was rephrased to “Adolescents complied less often with this recommendation (9-10%), while adults the most (16%).”

L351-354. Can you better explain the sentences? 'Concerning spreadable and cooking fat, compliance with the national guidelines was observed for a large part of the population. This is strongly related to the computation of the recommendation which results in quite high amounts (i.e., 5 g of spreadable fat per bread slice multiplied with the number bread slices recommended). I do not understand the link between how the recommendation was derived, and that a large part of the population meets the recommendation. Wasn't the person-specific amount of spreadable fat consumed considered?

Response: For spreadable fat there is no age-specific recommendation, only a recommendation of 5 g per slice of bread. There is however an age-specific recommendation for slices of bread, which was then used to calculate a total age-specific recommendation. For cooking fat a fixed
recommendation of 15 g is used. Because these derived recommended amounts are quite high, a large part of the population complies with them.

The following sentence was added in the method section “Since the amount of spreadable fat in the recommendations was described as 5 gram per bread slice, the amount was recalculated into an age specific amount depending on the number of recommended slices of bread for that age group. This amount was added to the standard amount of cooking fat and the total was used as a maximum value.“

L 372-373 Please add to the following sentence what happened with fruit consumption after the age of adolescence. Did it remain stable or did it increase again? 'The consumption of fruit decreased by age and reached its minimum in adolescence.'

Response: Ok, we added the following: “The consumption of fruit decreased by age, reached its minimum in adolescence and increased again in adults.”

L385. Why is the word 'However' used at the beginning of this sentence; what is the contrast here?

Response: Because after mentioning the two positive changes in the sentence before, the change that could be considered as ‘negative’ (since the consumption of cereals is below the recommendations and declining further) is discussed in this sentence.

L400-407. Recently the results of the full Dutch survey were published; see www.wateetnederland.nl; so this information can be updated

Response: Thanks for bringing this to our attention. We consulted the results and updated the comparisons with this study in the discussion: “In the Netherlands a Food Consumption Survey was organised between 2012 and 2016 among 1-79 years old (n=4313) [28]. The mean habitual consumption of vegetables, fruit, cheese, fats and oils in the Dutch population (131, 113, 33 and 22 g/day respectively) is quite comparable with the consumption in the Belgian population. However, in the Netherlands the population consumes about double the amount of dairy products (about 319 g/day excluding cheese) than the population in Belgium [28]. The consumption of potatoes and fats and oils in 9-69 years old decreased in comparison with the previous Dutch survey of 2007-2010, which is in line with our results. However, in contrary to our study, the Dutch Food Consumption survey also revealed a significant decrease in the consumption of dairy products and meat(products), an increase in the consumption of fruit (especially by children) and no change in the consumption of bread and cereals and rice or pasta [28].”

L393-426. Comparison with other studies. Why were the data compared with these few studies? Also Germany and France (other neighbouring countries of Belgium) used GloboDiet data collection for their national surveys.
Response: We did consult the French results of the INCA3 study and the German results of NEMONIT (presented separate by gender) before, but only a very limited number of food groups seemed comparable with the food groups in our study. However, we did try our best to include some comparisons now:

“Some comparisons can be made with the national food surveys of other European countries involved in the EU Menu Project (Netherlands, France and Germany) using a comparable methodology, i.e., collecting dietary intake data with two 24-hour recalls using GloboDiet® [6].

The individual and national study on food consumption (INCA3) conducted in France between 2014 and 2015 among individuals between 0 and 79 years old (n=5855) observed in comparable age groups (4-6, 7-10, 11-14, 15-17, 18-44 and 45-64 years old) a lower average consumption of vegetables (range from 65 to 154 g/d) [29]. The French children (4-10 years), adolescents (11-17 years) and youngest adults (18-44 years) have a very similar average consumption of fruit (excluding fruit juices and olives) (range from 135 to 81 g/d). The older adults (45-64 years) have a higher consumption of fruit (average 170 g/d) [29].

Results of the last German National Nutrition Monitoring in 2012/2013 in 14-80 years old (n=1840) reveal, separately in men and women, comparable average consumption amounts of vegetables (136 g/d and 140 g/d respectively) and dairy products including cheese (195 g/d and 187g/d respectively), but a higher consumption of fruit (144 g/d and 179 g/d respectively), fats and oils (29 g/d and 20 g/d respectively) and water and sugar-free drinks (i.e. coffee and tea) (1826 g/d and 1903 g/d respectively) [30]. In line with the present study, an increase in consumption of water and coffee/tea was observed in comparison with 2005-2007. However, in contrast to this study, a decrease in fruit (products) and increase in animal fat was observed [30].”

L430-431. You can clarify the strength of applying the usual intake modelling, by explaining that this is important to assess the % below a cut-off such as recommendations.

Response: Ok, this was added in the sentence (line 507) “and to assess the percentage of the population below a certain recommended cut-off value.”

Reviewer #2: This study describes the habitual consumption of the Belgian population. Despite of having essentially a descriptive nature, uses a robust methodology strategy following harmonized procedures for national dietary surveys at European level.

The paper is well written but some minor changes and clarifications need to be done.

Abstract: it would be useful in the abstract to introduce at least some estimates in the results section.
Response: Ok, some estimates were included in the results section of the abstract, but as the abstract is limited to only 350 words, confidence intervals were not provided.

Methods section:

a) In line 112 the authors referred that "The data collection was distributed equally over the four seasons and all days of the week in order to incorporate seasonal effects and day-to-day variation in food intake". Please include the distribution of the days of the week and the proportion of interviews by season in the current study and improve the discussion of the possible implications in the results.

Response: We added in the method section, study design:

“Since the data collection was extended with one trimester, relatively more interviews were performed in the winter (winter 43%, spring 18%, summer 15% and autumn 24%). 35% of the recall days were on Friday, Saturday or Sunday.”

Season and weekday were integrated in the weighting factor to reduce potential bias from these factors (like e.g. potentially less fresh fruit or ice cream eating in the winter). As such it is not further discussed in the discussion (a little correction was made at the end of the limitations: added “and weekday”).

b) Please clarify the criteria for calculate food groups consumption: have you used the information on food items crude or edible (and) raw or cooked? What was the procedure with food recipes? They were considered aggregated or disaggregated?

Response: The following clarification was added in the method section, Collection Food Consumption Data:

“The habitual consumption was based on the edible part of the food and the portion size quantified as consumed weight (i.e.: cooked if it was cooked). Food recipes were disaggregated into ingredients which could be registered as 1) ‘consumed’ or 2) with their ‘raw’ weight (before cooking the recipe). In case of the latter, raw weights were recalculated into consumed weights by using conversion factors.”
Results Section:

a) Please revise all the text of results in order to correct the correspondent tables to the respective text. Example: Line 195 put table 5 instead of 3 (the same in lines 221, 253, 264, 272, 292,…). Line 223 is not table 3

Response: Ok, the references to the tables have been thoroughly revised throughout the whole manuscript.

b) It would be useful in the figures to introduce percentages in order to be easier to identify the deviation from the recommended guideline.

Response: Thank you for the suggestion, but since these figures are an approved adaptation of a copyright figure and we also no longer have access to the person who did this graphic design work, we are unable to further adapt these figures.

Discussion:

a) In line 361 the authors mentioned that the complying of recommendations in men is higher than in females. However, they also said that probably is because energy intake in men is higher than in women, as expected. Could the authors at least try to do sensitive analyses presenting the results in percentage of kcal to remove this effect?

Response: We performed a sensitivity analysis by comparing the contribution of “bread and cereals” to the total energy intake (see habitual intake results provided by SPADE in table 1 below). We observed no significant differences.

In the Results, section ‘bread and cereals’, the following was added:

“As a sensitivity analysis, the contribution of bread and cereals to the total energy intake was calculated by age and gender subgroups and no significant differences were observed.”

In the Discussion we referred to this observation:

“Because the required energy intake in men is on average higher and the FBDG were not gender-specific, the proportion of the population complying with the recommendations was expected to be higher in males than in females for the group of cereal-based products, as well as for potatoes, rice and pasta. This hypothesis was confirmed by a sensitivity analysis showing that the energy contribution by bread and cereals was similar for all ages and gender. Further, the proportion of the population exceeding the maximum recommended amounts of meat and substitutes, cheese, spreadable and cooking fat, and nutrient-poor foods was higher in males than in females.
Table 1 – Habitual Intake (mean and 95 %CI) of bread and cereal (% of total energy intake) in 3 to 64-year old Belgian population, 2014-2015

<table>
<thead>
<tr>
<th>Age (years old)</th>
<th>Male Mean</th>
<th>95%CI</th>
<th>Female Mean</th>
<th>95%CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL (3-64 years old)</td>
<td>20.16313</td>
<td>19.51534</td>
<td>21.0124</td>
<td>19.68035</td>
</tr>
</tbody>
</table>

b) The comparison with other studies is quite limited, since authors use only a few other national studies to compare results. Although, the comparisons are not always valid due to methodological constrains, since authors use the same methodology used by other countries involved in EU-menu, at least with some of them it could be possible this comparison.

Response: We did consult the French results of the INCA3 study and the German results of NEMONIT (presented separate by gender) before, but only a very limited number of food groups seemed comparable with the food groups in our study. However, we did try our best to include some comparisons now. In addition, we have rewritten and updated the comparisons with the Food Consumption Survey in the Netherlands as the full results were only recently published online after submitting this manuscript:

“Some comparisons can be made with the national food surveys of other European countries involved in the EU Menu Project (Netherlands, France and Germany) using a comparable methodology, i.e., collecting dietary intake data with two 24-hour recalls using GloboDiet® [6].

In the Netherlands a Food Consumption Survey was organised between 2012 and 2016 among 1-79 years old (n=4313) [28]. The mean habitual consumption of vegetables, fruit, cheese, fats and
oils in the Dutch population (131, 113, 33 and 22 g/day respectively) is quite comparable with the consumption in the Belgian population. However, in the Netherlands the population consumes about double the amount of dairy products (about 319 g/day excluding cheese) than the population in Belgium [28]. The consumption of potatoes and fats and oils in 9-69 years old decreased in comparison with the previous Dutch survey of 2007-2010, which is in line with our results. However, in contrary to our study, the Dutch Food Consumption survey also revealed a significant decrease in the consumption of dairy products and meat(products), an increase in the consumption of fruit (especially by children) and no change in the consumption of bread and cereals and rice or pasta [28].

The individual and national study on food consumption (INCA3) conducted in France between 2014 and 2015 among individuals between 0 and 79 years old (n=5855) observed in comparable age groups (4-6, 7-10, 11-14, 15-17, 18-44 and 45-64 years old) a lower average consumption of vegetables (range from 65 to 154 g/d) [29]. The French children (4-10 years), adolescents (11-17 years) and youngest adults (18-44 years) have a very similar average consumption of fruit (excluding fruit juices and olives) (range from 135 to 81 g/d). The older adults (45-64 years) have a higher consumption of fruit (average 170 g/d) [29].

Results of the last German National Nutrition Monitoring in 2012/2013 in 14-80 years old (n=1840) reveal, separately in men and women, comparable average consumption amounts of vegetables (136 g/d and 140 g/d respectively) and dairy products including cheese (195 g/d and 187 g/d respectively), but a higher consumption of fruit (144 g/d and 179 g/d respectively), fats and oils (29 g/d and 20 g/d respectively) and water and sugar-free drinks (i.e. coffee and tea) (1826 g/d and 1903 g/d respectively) [30]. In line with the present study, an increase in consumption of water and coffee/tea was observed in comparison with 2005-2007. However, in contrast to this study, a decrease in fruit (products) and increase in animal fat was observed [30].

c) Please discuss better the possible limitation by the fact of using two different methods of assessing food consumption in the same participant (telephone and face-to-face). Why the second by interview and not the first?

Response: These are not two different methods of assessing food consumption, but two different methods of performing the completion interview using GloboDiet Software in children (3-9 years old). In children the food consumption was assessed by using a self-administered food diary which was followed by a completion interview (in which more details were asked concerning the consumed foods and drinks that were noted in the food diary), indeed once by
telephone and once face-to-face during the second home visit. This was done to avoid the need for a third home visit to reduce the transport burden of the interviewers. However, in practice this completion interview was sometimes also done face-to-face during an extra home visit. In all adults and adolescents both interviews were performed face-to-face.

d) Lines 436-442. Please discuss better the prevalence of under reporters, namely compared with other national dietary surveys and discuss the possible consequences in the results.

Response: The following was added in the discussion:

“The degree of under-reporting by adults in this study is much higher than found in the adult population (18-79 years) of the French national food consumption survey (18%) [38] and the German national dietary surveys between 2005 and 2013 (ranged from 11 to 17%) (14-80 years) [37]. However, the under-reporting by adolescents and children in this study is comparable to that of the French adolescents between 15 and 17 years (40%) and children between 7 and 10 years old (5%). Under-reporting could be explained by the under-reporting of unhealthy and energy-dense foods or by inaccurate portion size estimates. The presence of under-reporting can lead to an underestimation of the intake of certain foods and to underestimation of the proportion of the population with an adequate or excess intake of certain foods.”

e) Please discuss better the possible limitation of the low participation rate. The authors justify with weighting factors but no information about refusals' characteristics. Have you any information on refusals to add? Please discuss the possible consequences in results.

Response: Ok, the following was added to the discussion:

“The differences in characteristics between individuals that participated and those entering the study as a replacement, because the earlier contacted participant refused participation, was investigated. Adults were more likely to enter the study as a replacement (60%) than adolescents (51%) or children (44%). The age of persons that entered the study as a replacement was significantly higher (24 years, 95%CI 23-25 years) then those that did not (20 years, 95%CI 19-21 years). Persons that lived in the Brussels-Capital region (61%), West Flanders (60%) and Limburg (58%) were most likely to be a replacement while persons that lived in Namur (46%), Flemish Brabant (46%) and Luxembourg (37%) the least. There was no significant difference in participation by gender.”
Minor suggestions:

- In the abstract, line 31, please insert "Globodiet software". Some people don't know what is "Globodiet"

Response: Ok, done.

- Please don't use abbreviations in scientific English: line 300, line 388

Response: Ok, these two abbreviations ("didn’t") were replaced by full words ("did not").

Reviewer #3: General comments

About foods groups:

- use the same order of the food groups in the results section and in the different tables 1,2,5

- harmonize the group names in tables 1,2,5 and paragraph titles; ex: dairy products in table 1 and dairy products and calcium enriched soya products in table 5 and text; use « potatoes, rice, pasta » rather than « potatoes and substitutes »

Response: Ok, done.

- choose if you leave the 2 different groups « fruit » and « fruit (including fruit juice and olives) » or if you keep only one in accordance with the recommendation; rename in « total fruit (including fruit juice and olives) » and « fresh fruit » to better distinguish both groups

Response: Both groups are kept in the text, as the “including fruit juices and olives” are needed to cover the whole diet – although the “excluding fruit juices and olives” are more relevant for the (preferred=without juices) fruit consumption. It is not possible to call the last group, the “fresh fruit” group, as it also contained non-fresh fruit items. Therefore, the “excluding fruit juices and olives” is taken into the table with an “indentation” as it is a subgroup of the fruit (including fruit juice and olives) group.

Additionally, in the results, an extra line of attention is given to the fruit (excluding fruit juices and olives group):

“When fruit juices and olives are not taken into account, a more U-form shaped age trend is observed: the youngest children (3-5 years old) have a mean consumption of 136 g/d, the
adolescents of 14-17 years old have the lowest consumption of 85 g/d and the consumption increases to 128 g/d for the adults of 40-64 years old (Table 2). “

o why don't you present the nutrient-poor food in g/day as the other food groups ?

Response: The nutrient-poor food group exists of both beverages and solid foods. Especially the amount (in grams) of the beverages could be very high (up to 2.5-3 liter alcohol or soft drinks) for certain persons – amounts that were never reached for the solid foods. Therefore, the “grams” for solid food and beverages were not directly comparable. The amount of energy intake by the different products were better comparable and could be better used in this group where these food were summed up.

• in total, do all the food groups cover the entire diet ?

Response: Yes, this has been clarified in the method section:

“All consumed foods were assigned to the appropriate food group of the Flemish active food triangle and the sum of the food groups cover the entire diet [2].”

About age groups stratification : it would be better to present all results (tables 3,4,5 and figures) with the same age groups used to define the daily recomendations of the Flemish active food triangle (table 1)

Response: This issue has been considered before the start of the analyses, but it posed a practical problem for the 60+ years old group: The number of 60-64 years would have been too low to perform the analyses with SPADE. Therefore, a (partly) pragmatic solution was made:

- there were chosen 2 subgroups for each stratum of the originally selected EFSA-based age groups (3-9 years old, 10-17 years old, and 18-64 years old) in order to have similar sized subgroups in EFSA-aged based stratum. It guaranteed for the best practical success when analyzing with SPADE.

- the models are age-modelled and an age-specific cut off was applied for each age-year when calculating the percentage that fulfilled (or not) the guidelines.

Therefore, in the statistical paragraph of the method section, “age-specific” is added:

“The distribution of habitual consumption was modelled as a function of age and this distribution was directly compared with the recommended age-specific consumption amount to estimate the proportion of individuals that did not comply with this cut-off value.”

Comparison of habitual consumption with recommandations : explain which cut-off is used when there is a range ? ex : 100-200g for fruit in 3 to 5- years old

Response: this is added in the method section as:
“For the following food groups the daily recommendation is the minimum amount to reach: water and sugar free drinks, vegetables, fruit, bread and cereals, potatoes/rice/pasta, and dairy products and calcium enriched soya products. In case of a range, the lowest value has been set as the cut off value. For the other food groups, meat/fish/eggs/substitutes, cheese, spreadable and cooking fat, and nutrient-poor foods, the recommended daily intake should not exceed the maximum value.”

check GloboDiet's writing all over the article with a capital D
Response: OK

check tables numbering and references to tables in text; see more details for each table below.
Response: OK

Details comments
Words underlined are suggestion to add.
Page 2, L31: add « software » after Globodiet
Response: OK
Page 4, L66: including children above 3 years old;
Response: OK
Page 4, L75: when were the nutrient reference updated? add a reference;
Response: These were updated in 2009, reference was added.
Page 4, L79: could you define exactly what you mean by « nutrient-poor food »? give some examples
Response: OK, some examples of nutrient-poor foods were added “(e.g. sugared soft drinks, alcoholic drinks, chocolate and salty snacks).”
Page 4, L79: last sentence is not clear; it seems a verb is lacking;
Response: OK, two verbs were added to make this sentence more clear. “The larger the surface of the food group in the triangle is, the larger the recommended daily consumption of this food group is.”
Page 5, L93: you could also add the pilot Paneu study as another reference: Ambrus A., Horvath Z., Farkas Z. et al. Pilot Study in the view of a Pan-european Dietary Survey - Adolescents, Adults and Elderly, Report n° EN-508

Response: OK, this reference was also added

Page 5, L98: 3297 persons is number of the final sample of participants; I suppose much more individuals were randomly selected because not everyone participate to the survey.

Response: That is correct, and this is added in the text (method section, study design):

“In total, 9196 persons were invited to participate and ultimately 3461 persons participated. The final sample of this study contained data of 3146 participants because two 24-hour recall days were needed to calculate food consumption with SPADE.”

Page 5, L99: Which is the reference year for the use of the National population register?

Response: The reference year is 2014 and added in the Method section, study design.

Page 6, L114: I presume that there are other questionnaires in addition to the FFQ; you can briefly mention them also.

Response: Ok we mentioned it in the Method section, Study Design. “Between the two visits, participants were asked to complete a food frequency questionnaire (FFQ) and a questionnaire about health. Children and adolescents were also asked to wear an accelerometer and fill in a logbook on physical activity.”

Page 6, L117: please check all the sample size of the population mentioned in the paper and the coherence with the tables. Here, we understand that there are 3146 participants among adolescents and adults (10 to 64). In table 5, n=3146 for 3-64 years old ??

Response: This line is deleted as the information (N=3146) is provided in the previous section. The N for “adolescents and adults” and “children” is provided instead.

Page 6, L121: Add precision before the reference like following « Globodiet… was used as recommended by EFSA [5] »

Response: OK, this was added

Page 6, L123: quantification instead of quantities

Response: Ok, this was adapted

Page 6, L126: did you make all the photographs of your picture book or did you use photographs from previous picture books such as PANCAKE and EPIC-Soft picture books? If so, mention it.
Response: This was mentioned in detail in the methodology article, but we also added it in this manuscript: “These pictures were adapted from the EPIC-Soft picture book [12], the PANCAKE study picture book [13], the Swiss picture book [14] and the French picture book for the national survey of food consumption (INCA3) [15]. The picture book also included drawings of bread, representing the actual shape and size of bread slices, which were developed and used in the BNFCS2004 [16].”

Page 6, L124-127: Did you also use the other quantification methods proposed in Globodiet such as shapes and thickness, weight, volumes?

Response: Yes, indeed we also used shapes, thicknesses, weights and volumes in GloboDiet. This has been adapted in the manuscript:

“Food portion sizes were quantified using weights, volumes, shapes, thicknesses (e.g. spreads), household measures (e.g. glasses, cups, spoons, etc.), standard food portions (e.g. apples, packages) and a picture book including a selection of country-specific dishes in different portion sizes.”

Page 7, L128: Specify the sample size of the 3 to 9 years old children sample

Response: Ok, n=992, this is mentioned in text.

Page 7, L129: How were the day for completing the one-day food diary chosen?

Response: The day of completion was chosen by the interviewer. The interviewers received a “spreading card” which included an overview of all the days of the week which could be used to note the day of each new interview (the second interview was not allowed to be on the same day of the week as the first interview). The interviewers were instructed to spread all their interviews equally over all days of the week. The distribution of recall days was also regularly monitored and if certain days were underrepresented this was communicated to all interviewers in order for them to pay attention to.

Page 7, L130-131: I suggest to add precision in the sentence: the first registration was made by telephone … and the second registration was conducted face-to-face …

Response: OK added

Page 7, L146: Which is the reference year for the belgian Food Composition Database?

Response: The reference year of the Belgian Food Composition database is 2015 (as is presented in the reference itself, this is not an access date).

Page 8, L157-161: If you only used the 2-part model option with the data, it won’t be necessary to mention the 1-part model. You can maybe reformulate this paragraph.
Response: We used both models depending on the availability of FFQ information or consumption of foods on a daily base or episodically.

Page 8, L161 : remove parenthesis « from the FFQ » ok

Page 8, L165 : complete the sentence as following : Table 1 summarizes all dietary recommendations considered in this paper for the different food groups and age classes. ok

Page 8, L165-167 : deplace the sentence « 95% CI … FBGD » after the next sentence (analyses were weighted …); For tables 2 to 5, 95% confidence intervals were provided …ok

Page 8, L168-170 : you mention « day of week » twice. Simplify.

Response: Indeed, this sentence has been adapted to “The analyses were weighted for age, gender, season and day of the week (i.e., week versus weekend) to ensure the results to be representative for the total Belgian population.”

Page 9, L186 : mean habitual consumption=1168 ml/day in the global 3-64 years old population. In table 5 last column, result for 3-64 males is 1165 and result for 3-64 females is 1155. I don't understand how the average of 1165 and 1155 can result in 1168 ?

Response: The numbers are correct, this is because the model is calculated once done for whole population and once for separate genders, you cannot just take the average of both genders.

In the text, Statistical analyses, following is added:

“The 2-part habitual intake is derived as the probability of consumption multiplied by the habitual intake amount on a consumption day, which are obtained by a Monte Carlo simulation and it takes into account total residual variance and within- and between person variances. Since these parameters might vary between subgroups of a group and the total group, the mean of the total group is not necessarily similar to the mean of the modelled means of its subgroups.”

Page 9, L188 : add « in individuals over 6 years old » at the end of the line ok

Page 9, L191-193 : add « especially the girls » at the end of the sentence ok

Page 9, L193 : but still remains higher than … ok

Page 12, L217 : change the beginning of the sentence as following : after the age of 6, a large majority of … ok

Page 13, L239-241 : add « especially the girls » at the end of the sentence ok

Page 13, L245 : between both BNFCS2004 and BNFCS2014 …ok

Page 14, L249 : add « and did not differ according to gender » at the end of the sentence. ok
Page 14, L250: « above 6 yrs old » rather than between 6-64 years old ok

Page 14, L251-252: simplify as following: there were no significant differences between 2004 and 2014 in the consumption of vegetables. The result concerning the gender is added line 249. ok

Page 14, L261: children (37% in 3-6 years old) ok this is (37% in 6-9 years old)

Page 14, L263-264: separate the 2 informations (gender and evolution 2004/2014) in 2 sentences since they refer to 2 different tables ok

Page 14, L267: check value 301 g/day in 3-5 years old and M=295 F=279 in table 5. Not possible that the average is higher than the mean in males and females …

Response: Please see similar comment as above.

“The 2-part habitual intake is derived as the probability of consumption multiplied by the habitual intake amount on a consumption day, which are obtained by a Monte Carlo simulation and it takes into account total residual variance and within- and between person variances. Since these parameters might vary between subgroups of a group and the total group, the mean of the total group is not necessarily similar to the mean of the modelled means of its subgroups.”

Page 14, L268: no significance differences between males and females not true in the table 5 for the 6-9, 10-13 and 14-17 years old children (95%CI were not overlapping in these age groups)

Response: Ok, this was adapted into “Between the age 6 and 17, boys consumed more dairy products than girls.”

Page 14, L270: children complied more often with the recommendation I don't think it is important to insist on this since the difference is only few percentages.

Response: Ok, we agree and the sentence is removed.

Page 15, L274-75: was higher in males than in females the sentence suggests that there are differences for every age groups but there is no significance difference in table 5 except for 18-39 years old; reformulate the sentence.

Response: Ok, reformulated to:

“The mean habitual consumption of cheese increased with age (Table 2), but was not significantly different by gender, except between the ages of 18 and 39 years old where males consumed more cheese than females, respectively 37 and 27 g/day.”

Page 16, L297-300: add « data not shown »
Response: The information is now supplied in table 3, and the numbers are removed from the text.

Page 17, L327-329: you mention the contribution of the group to the total energy intake. We don't see it in table 5.

Response: This information is presented in the Figures. Therefore (Figure1) and (Figure3) is added in the text.

Page 20, L388-389: as you underline this result for red meat, it would be good to present the result in detail in table 4. It is maybye more interesting to present the habitual consumption in the different types of meat between 2004 and 2014 instead of habitual consumption in the different types of meat in 2014 by age groups.

Response: The results are added in table 3.

Page 21, L413: the HELENA study conducted in xxx …

Response: Ok, we specified the study in the text.

Page 22, L438-439: Golberg cut-off method [29], revised by Black [27-28]

Response: Ok we adapted the place of reference of Goldberg in this sentence

Page 22, L449-450: why don't you add the education level in your weighting factors?

Response: Our reference data set for calculation of the weighting factors for the population of 2014 comes from (national) Belgium Statistics & the Belgian National Registry. It contains information on province, gender and sex, but not on education. Education is not a national competence, but a regional competence and is therefore not available in the national database.

References

Update the accessed dates for internet links, especially for 11 and 12 accessed in 2015

Response: As these two references are not internet links, the presented dates are not access dates. For NUBEL this is the date (12-8-2015) on which we received the extraction from the large database. However, for the reference to the NEVO data (which is a database we received and not an internet link) apparently a mistake has happened during the creation of the reference list by Reference Manager this access date is wrong and seem to have been copied from the reference above. The reference list has been updated.
Tables

I suggest some precisions in table's titles and re-numbering the tables as following:

Table 1 - Daily recommendation of the Flemish active food triangle, by age groups

Do values for the line « Fruit » refer to « fruits including fruit juices and olives » or only « fresh fruit »? be more precise ok

Is it important to distinguish spreadable and cooking fat in recommendations while the results relate to all fats together? ok

You should precise that the daily recommendation are sometimes the minimum amount to reach and sometimes the maximum value to reach. ok

Response: Table 2 is renumbered to table 1. There is added a short description of the food items belonging to each category (column “food included in analyses). For a detailed description of the food selection, we referred to the major report on internet and the interpretation of the cut off values is better described in the method section “Collection of food consumption data”.

“For the following food groups the daily recommendation is the minimum amount to reach: water and sugar free drinks, vegetables, fruit, bread and cereals, potatoes/rice/pasta, and dairy products and calcium enriched soya products. In case of a range, the lowest value has been set as the cut off value. For the other food groups, meat/fish/eggs/substitutes, cheese, spreadable and cooking fat, and nutrient-poor foods, the recommended daily intake should not exceed the maximum value. The foods included in each category in the analyses is described in table 1. A detailed description of this food selection can be found in the extensive web-based report (https://fcs.wiv-isp.be) [4]. Since the amount of spreadable fat in the recommendations was described as 5 gram per bread slice, the amount was recalculated into an age specific amount depending on the number of recommended slices of bread for that age group. This amount was added to the standard amount of cooking fat and the total was used as a maximum value.”

Table 2 - Mean habitual consumption of major groups (g/day) in the 15 to 64-years old Belgian population, 2004 versus 2014-2015 --> renumbering in Table 3
Add a general warning in a footnote for reading the « % below recommandation » because it has not always the same signification: 100% of individuals below recommandation for spreadable and cooking fat in 2014-15 means that the guidelines is welle respected but 99% of individuals below recommandation for dairy products in 2014-15 means that a large proportion of population is not reaching the guidelines.

Response: The numbering isn’t changed as it was already table 3.

A similar footnote as in table 2 is added:

“* % below the cut-off point value: based on a recommendation defined as “a minimum amount to reach” an to be understood as a % not meeting the recommendations

** % below the cut-off point value: based on a recommendation defined as a “a maximum amount not to exceed” and to be understood as a % meeting the recommendations”

Table 3 - Mean habitual consumption of different types of bread (g/day) in the 3 to 64-years old belgium population, by age groups -- renumbering in Table 4

Indicate « years old » in the first column for each line ok

Change line « total » into « All (3-64 years old) » ok

Change title in « Habitual consumption (mean and 95% CI) of different… » ok

What are the numbers for each types of bread?

The sum of white breads+brown breads+wholegrain in all 3-64 years old represent all bread consumed? ok

I wonder if it is necessary to add the footnote? You have already specified it in the methods section. ok, deleted.

Response:

We made the proposed changes in the tables/footnote. White, brown and wholegrain bread together represents all bread consumed. The different numbers are numbers of persons and is due to the fact that information on the FFQ was used to take into account never-users of a certain type of bread in the model, but the FFQ information is not available for each person. The following footnote was added to table 4 and 5: “n = number of persons with two 24-hour recall interviews and valid FFQ information”. 
Table 4 - Mean habitual consumption of different types of meat (g/day) in the 3 to 64-years old belgium population, 2014-2015, by age groups --> renumbering in Table 5

Indicate « years old » in the first column for each line ok

Change line « total » into « All (3-64 years old) » ok

Change title in « Habitual consumption (mean and 95% CI) of different… » ok

What are the numbers for each types of meat ?

I wonder if it is necessary to add the footnote ? You have already specified it in the methods section. ok, deleted

Response: We made the proposed changes in the tables/footnote. The different numbers are numbers of persons and is due to the fact that information on the FFQ was used to take into account never-users of meat in the model, but the FFQ information is not available for each person. The following footnote was added to table 4 and 5: “n = number of persons with two 24-hour recall interviews and valid FFQ information”.

Table 5 - Mean habitual consumption of major groups (g/day) in the 3 to 64-year old Belgian population by age groups and gender, 2014-2015 --> renumbering in Table 2 ok

Add a line « All » (i.e. Male and Female together) for each food group ok

Be careful, the sum of the numbers of all age groups (3160) does not correspond to the grand total (3146) : check the « n » for each age group ok, typo for age group 40-64 yrs (606 instead of 620)

the footnotes ** and *** are a bit confusing ; ** means not meeting the guidelines *** means meeting the guidelines ; Can you explain ? Maybye precise that on one hand some guidelines are a « minimum to reach » and on the other hand « a maximum not to exceed ». ok

Indicate M=male F= female on a separate line in the footnotes ok

Indicate « % above cut off point » rather than « % below cut off point » since you often comments this one in the text ? not done

Response: We renumbered the table as table 2, added results for “all” in the table, corrected the N in age group 40-64 (n=606) (typo mistake), and changed the footnotes into:

“M=Male; F=Female

% below the cut-off point value: based on a recommendation defined as “a minimum amount to reach” an to be understood as a % not meeting the recommendations
% below the cut-off point value: based on a recommendation defined as a “a maximum amount not to exceed” and to be understood as a % meeting the recommendations”

We decided not to change the % below the cut off value into a % above the cut off value as it would cause also changes through the results text and increase the risk on writing errors.

Figures

Why don't you present a figure for the 6-13 years old children ?

Response: We have 2 additional figures, earlier created by a graphic designer, for children of 6-9 years old and 10-13 years old. We considered that it probably were too many figures for the publication and therefore we choose the youngest (with the best compliance to the guidelines), the age group with the worst compliance (oldest adolescents) and finally the adults (some improvement in the compliance). We have added this evolution in the text in section “Graphic representation of adherence to FBDG”:

“The compliance to the guidelines was at its best among the youngest children of 3 to 5 years old (Figure 1), but was worst for the adolescents between 14 to 17 years old (Figure 2) and had again some improvement among the adults (Figure 3).”

Is it necessary to represent the base of the triangle with physical activity in the figures since you do absolutely not mention it in the article ?

Response: The figure is adapted from a copyright figure of ViGEZ, with their permission. We have no rights to change this figure.