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A cross-cultural perspective on feeling good in the context of foods and beverages

Claire Sulmont-Rossé^{1*}, Rafal Drabek², Valérie L. Almli³, Hannelize van Zyl⁴, Ana Patricia Silva⁵, Martin Kern⁶, Jean A McEwan⁷, Gastón Ares⁸

¹ *Centre des Sciences du Goût et de l'Alimentation, AgroSup Dijon, CNRS, INRA, Université Bourgogne Franche-Comté, F-21000 Dijon, France*

² *ACCE International, 2575 Dunwin Drive, Mississauga, Ontario L5L 3N9, Canada*

³ *Nofima AS, PO Box 210, 1431 Ås, Norway*

⁴ *HEINEKEN Global Innovation and Research, Burg. Smeetsweg 1, 2382 PH Zoeterwoude, The Netherlands,*

⁵ *Universidade Católica Portuguesa, CBQF - Centro de Biotecnologia e Química Fina – Laboratório Associado, Escola Superior de Biotecnologia, Rua Arquiteto Lobão Vital, apartado 2511, 4202-401 Porto, Portugal. [Current Address: Eurofins SAM Sensory and Marketing, Spain]*

⁶ *Eurofins SAM Sensory and Marketing International GmbH, Germany*

⁷ *Jean A McEwan Consulting Ltd, UK*

⁸ *Sensometrics & Consumer Science, Instituto Polo Tecnológico de Pando, Facultad de Química, Universidad de la República, Uruguay*

* Corresponding author: Claire Sulmont-Rossé, CSGA-INRA, 17 rue Sully, BP 86510, 21065 Dijon Cedex, France; claire.sulmont-rosse@inrae.fr

Abstract

The aim of the present research was to explore consumers' conceptualization of feeling good in relation to food and beverages from a cross-cultural perspective. Participants from 14 countries across 5 continents and covering 10 languages (N=8,325) responded to an online survey including word association and free listing tasks related to feeling good in the context of food and beverages. Results were analyzed using inductive coding: a list of main codes was generated in English for each of the tasks, after which native speakers for each language coded the responses. Codes were grouped into categories reflecting common themes from which eight dimensions were identified. Results showed that in the context of foods and beverages, feeling good was mainly associated with specific foods and sensory and hedonic properties. Across the 14 countries, 'Sweet and fat food', 'Fruit and vegetables', and 'Protein food' were the three food categories most associated with feeling good. Emotional aspects of food consumption ('Taste good' and emotions) were also relevant. Health and nutrition-related aspects were more relevant for consumers when they were asked to think about how foods and beverages would make them feel good in the future. In other words, food-related feeling good seems to be mainly driven by sensory pleasure at present, but it is also related to nutrition and health in the future. Differences in the strength of the associations between feeling good and the identified categories were found between countries, in line with the existence of cultural differences in food habits, as well as in the importance people attach to the characteristics of foods and beverages. Results from the present work provide insights on the impact of eating and drinking on feeling good in terms of emotional, physical and social aspects, and increase knowledge about the way food and drink can contribute to general well-being.

Keywords

Feeling good; Food; Eating; Word association; Emotion; Cross-cultural comparison; Well-being;

Highlights

- In a food-related context, feeling good is a multi-dimensional construct.
- Feeling good is strongly associated with hedonic aspects of food consumption.
- Health and nutrition gain in salience when thinking of feeling good in the future.
- There are cultural differences in the conceptualization of feeling good.

1. Introduction

Interest in understanding how food and beverages contribute to perceived well-being has increased rapidly in recent years (Meiselman, 2016). Well-being has been identified as a key construct for obtaining a more in-depth understanding of consumers' food choices and has been increasingly recognized in the development of more effective public policies and interventions for encouraging healthy eating (Bock *et al.*, 2014; EU, 2014; FAO, 2015; WHO, 2018). Well-being is also increasingly used in the marketing strategies of the food and beverage industry, as several companies promote the merits of their products on well-being. Despite this growing interest, well-being still lacks a clear definition (Dodge *et al.*, 2012), and has been conceptualized as:

- A positive construct (Aubert, 2017). Well-being has been associated with positive feelings and the absence of negative feelings.
- A subjective construct (Diener *et al.*, 2009). Well-being has been strongly associated to subjective evaluation of how each person evaluates his/her own life.
- A multi-dimensional construct (Meiselman, 2016). Well-being has been conceptualized as the balance of five (sometimes more) dimensions, including physical, emotional, social, intellectual and spiritual dimensions (Hettler, 1984; Veenhoven, 2000; Diener *et al.*, 2003; King *et al.*, 2015).

Several questionnaires have been designed to define and measure well-being. In their systematic literature review, Lindert *et al.* (2015) identified 60 unique measurement tools. These authors reported that “*measurement scales were either multidimensional ($n = 33$) or unidimensional ($n = 14$) and assessed multiple domains. The most frequently encountered domains were affects (39 scales), social relations (17 scales), life satisfaction (13 scales), physical health (13 scales), meaning/achievement (9 scales) and spirituality (6 scales).*” It is interesting to note that these methods seldom use the specific term “well-being” (WHO Regional Office for Europe, 2012). Instead, they include subjective items related to “feeling good” (Bech, 1993) and “satisfaction with life” (Diener *et al.*, 1985; EuroQol Group, 1990), or objective items related to economic, social and environmental characteristics (Mezzich, 2011; WHO, 1997). For instance, the WHO Well-being Index (Bech, 1993) includes five items all related to positive feelings (“I have felt cheerful and in good spirits”; “I have felt calm and relaxed”; “I have felt active and vigorous”; “I woke up feeling fresh and rested”; “My daily life has been filled with things that interest me”).

As evidence by the review of Lindert *et al.* (2015), positive feelings are an important dimension of well-being. Emotions have been recognized as a key determinant of well-being by Diener *et al.* (2009), who conceptualized this construct as the extent to which people feel positive emotions and do not feel unpleasant emotions. Recent studies suggest that this is even true when investigating well-being in relation to food and beverages. Ares *et al.* (2015) reported that affects (pleasure, happiness, enthusiasm, satisfaction and peace/calm) were the most relevant associations when consumers in five countries (Brazil, France, Portugal, Spain and Uruguay) were asked to write down the first words that came to their mind when thinking of well-being. Guillemin *et al.* (2016) conducted several discussion groups with healthy and non-healthy French participants to explore the experience of well-being in the context of food and diet. Results highlighted that well-being was associated with two main dimensions: well-

being related to pleasure (e.g., tasting good, having the choice, sharing, new flavors) and well-being related to health (e.g., varied diet, organic produce, healthy diet, eating in moderation). In the context of product development, King *et al.* (2015) have developed the WellSense profile to measure food-induced wellness. This profile includes 45 emotions among which 35 were positive (e.g., clam, happy, satisfied, grateful, energetic, fulfilled). In developing The Eating Motivation Survey (TEMS), Renner and collaborators (Renner *et al.*, 2012) identified 15 motivations for eating what we eat, including physical (need & hunger, health, weight control), sensory and hedonic (liking, pleasure, visual appearance), emotional (affect regulation), social (sociability, social norms and social image), habitual (habits, traditional eating), practical (price, convenience) and natural (natural concern) aspects, all of which have the potential to trigger positive feelings if satisfying our expectations and needs.

In this context, the aim of the present experiment was to investigate the concept of “feeling good” in a food-related context. In fact, eating and drinking are frequent daily events that have the potential of making us feel good in terms of satiation, sensory satisfaction, emotions (Macht & Simons, 2000; Spinelli *et al.*, 2014) and sociability (Danesi, 2012). Consequently, on a longer-term perspective, eating and drinking habits may contribute to feeling good in life in terms of physical, emotional and social aspects, thus contributing to general well-being (Diener *et al.*, 2003; Lindert *et al.*, 2015). The conceptualization of feeling good was investigated in a larger number of countries covering Africa, Asia, Australia, North and South America as well as Northern, Southern and Eastern Europe. To the best of our knowledge, no studies have previously investigated the dimensions that underlie the concept of feeling good in relation to food. In particular, the present study aimed to explore (i) consumer’s associations with foods and feeling good, (ii) which foods and beverages are associated with feeling good, and (iii) cultural differences in those associations.

2. Materials and Methods

2.1 Study Design

2.1.1 Consumers

A total of 8,325 consumers from fourteen countries on five continents, speaking ten different languages, took part in this study: France, Germany, Italy, Norway, Poland, Spain, United Kingdom, Australia, Brazil, China, India, Russia, South Africa and the USA. Between 550 and 600 consumers were recruited in each country by an independent consumer research agency.

Sample size was intentionally predefined with quotas for age and gender. The gender distribution was set up at 300 males and 300 females in each country. Each gender was broken down into three subgroups based on age with a similar number of participants in each gender subgroup (*i.e.*, 100): 18 to 25 years old, 26 to 45 years old and 46 to 65 years old. The characterization of participants is presented in Table 1. These quotas were achieved for all countries except Australia, Norway and South Africa. In these three countries, the quotas for younger males were below target (87, 50 and 89 instead of 100, respectively).

Consumers who worked in or had an immediate family working in, market research, advertising, cosmetic and personal care industry, home care industry, food and beverages industry, public relations and media, were excluded from participating in this study. Additionally, to ensure culturally representative answers, only those who declared that they had lived in their country for their whole life were selected. Participants were not told what the aim of the study was and were paid to participate.

<insert Table 1 about here>

2.1.2 Data Collection

A qualitative approach based on a combination of free association and free listing was used for data collection. Free association is a projective technique that encourages respondents to project their underlying motivations, beliefs, attitudes or feelings regarding a specific topic (Malhotra, 1993). Free listing is a qualitative technique extensively used in anthropology, which consists of asking participants to list all the items that fit into a specific criterion (Bernard, 2005; Hough and Ferraris, 2010).

The questionnaire comprised five main tasks: three free association tasks and two free listing tasks. The three free association tasks were used to explore consumers' general associations with feeling good (T1), feeling good related to food and beverage products (T2) and feeling bad related to food and beverage products (T5). Two free listing tasks were used to explore specific aspects of feeling good in the context of food and beverages. Task 3 (T3) aimed at exploring specific food and beverage products associated to feeling good at present and task 4 (T4) aimed at exploring ways in which food and beverages could make participants feel good in future situations. In each task, participants were asked to write down the first four words that came into their mind when thinking about each of the concepts. The specific wording of the tasks is presented in Table 2. Due to the extensive amount of data, this paper will only focus on tasks T2, T3 and T4.

<insert Table 2 about here>

The questionnaire was developed in English and translated into each language by two independent native speaking researchers. A final check was performed by a third native speaking researcher. Data were collected using a web-based questionnaire in all countries during February 2016. All consumers answered all the questions one at a time and once completed participants could not go back to previously answered questions. The order of the questions was fixed for all participants to minimize any potential bias by going from general to specific aspects of feeling good, followed by feeling bad. Duration of the questionnaire was on average 10 minutes.

2.2 Data Analysis

The data were analyzed using inductive coding based on the whole data set (Krippendorff, 2004). A coding frame was set up by a data analysis team consisting of three multilingual researchers of the project team, fluent in eight of the ten languages involved (all except Chinese and German). Native-speakers were recruited for each language (*i.e.*, Chinese, English, French, German, Italian, Norwegian, Polish, Portuguese, Russian, Spanish) from among the European Sensory Network members to assign each individual word to a unique code according to the established coding

frame (Table 3). All coders were fluent in English, securing a good understanding of the code frame categories. Coding was first performed individually by two native speakers and then discussed to reach a consensus. The coding was then thoroughly revised by the data analysis team to ensure that similar words or expressions were coded the same way across languages and all possible erroneous coding was corrected. As China results stood out from the other countries in the initial data analyses, a third Chinese native speaker was asked to review Chinese coding before running the data analysis displayed in the present paper. Non-answers, undecipherable or meaningless characters were coded as 'blank answer'. Codes were then sorted into categories and dimensions by the data analysis team with the input of native-speaker coders (Table 3). In the present paper, data analyses were restrained to category and dimension levels.

<Insert Table 3 about here>

For each category or dimension, the percentage of respondents who gave at least one answer assigned to this category or dimension was calculated. For a given respondent, duplicate answers, namely unique words that belong to the same category (or dimension) were counted only once. See below two examples:

- **Example 1 – category score.** A respondent answered: “apple, pear, grapes, green beans” to T3. The unique words ‘apple’, ‘pear’ and ‘grapes’ were assigned to the code ‘Fruit’. The unique word ‘Green beans’ was assigned to the code ‘Vegetables’. The codes ‘Fruit’ and ‘Vegetables’ were assigned to the category ‘Fruits and vegetables’. The category ‘fruits and vegetables’ was assigned to the dimension ‘Specific food & beverages’. Therefore, this respondent scored 1 in the category ‘Fruit and vegetables’ and 1 in the dimension ‘Specific food & beverages’.
- **Example 2 – percentage of mentions of the dimensions.** Respondent A answered “chocolate, strawberry, candy, Coca-Cola”; all these words belong to the dimension ‘Specific food & beverages’, which gets a score of 1 for this respondent. Respondent B answered “cheese, wine, happy, relaxed”, *i.e.* two words belong to the dimension ‘Specific foods & beverages’ and two words to the dimension ‘Emotion’; this leads to a score of 1 for each of these two categories. Respondent C answered “cake, happy, feast, romantic”, *i.e.* one word belongs to the dimension ‘Specific food & beverages’, two words to the dimension ‘Emotion’ and one word to the dimension ‘Context’. Consequently, the percentage of mentions over these three respondents were 100% for ‘Specific food & beverages’, 66% for ‘Emotion’ and 33% for ‘Context’.

According to this strategy, the percentage of mentions for a given category (or dimension) corresponds to the percentage of respondents who associated this category (or dimension) to feeling good rather than the percentage of answers associated with this category (or dimension). The percentage of ‘no-answer’ corresponds to the percentage of participants who provided 4 blank answers for a task.

Chi-squared tests were run at the 95% confidence level on all contingency tables created. Only dimensions for which at least one country had a frequency count of at least 15% were included.

3. Results

Overall the countries, 31,662, 31,799 and 29,183 valid (*i.e.* not blank) answers were collected for T2, T3 and T4, respectively. These answers were assigned to 150 unique codes which were themselves sorted in 81 categories and 8 dimensions (Body & health: 10 categories; Context: 7 categories; Cooking & eating: 5 categories; Emotion: 11 categories; Specific food & beverages: 19 categories; Nutrition: 9 categories; Non-sensory properties: 13 categories; Sensory & hedonic properties: 7 categories) (Annex 1).

3.1 Association between food & beverages and feeling good (Task 2)

When participants were asked to write down the first four words that came to their mind when thinking about food/beverages and feeling good, 62% named at least one *specific food or beverage* (Table 4). The most frequently mentioned foods within this dimension were *sweet and fat food* (20% of citations overall the countries), *alcohol* (19%), *fruit and vegetables* (16%), *soft drink* (15%) or *protein food* (15%) (Table 5).

The other most frequently used dimensions were *sensory & hedonic properties*, mentioned by 34% of the participants, *emotion* (22%), *non-sensory properties* (20%), *body & health* (19%), *nutrition* (13%) and *context* (11%).

<insert Table 4 about here>

The most relevant category within the dimension *sensory & hedonic properties* of foods was *tastes good* (*e.g.*, delicious, appetizing, yummy). This category was mentioned by 24% of the participants across the countries. It was particularly relevant in China with 72% of citations, but also in Russia (30%), India (29%) and United-Kingdom (29%). Interestingly, *tastes good* was also the most frequently first-mentioned category in these four countries (China: 25% of the first-mentioned words belong to the category *tastes good*; Russia: 22%; India: 18%; UK: 16%). The other categories within the dimension *sensory & hedonic properties* were mentioned by less than 10% of the participants across countries. *Flavor* (*e.g.*, flavor, taste) and *temperature* (*e.g.*, hot, warm, cold) were the most frequent categories (mentioned by 8% and 7% of the participants respectively).

Non-sensory properties were also salient in consumers' conceptualization of feeling good in the context of foods and beverages. This dimension comprised a large number of product characteristics with frequency of mention lower than 5%. The most frequently mentioned categories within this dimension were *natural* (5%), *unspoiled* (4%), *inexpensive* (3%), *good quality* (3%), *foreign food* (2%), *home-made* (2%).

Participants mentioned effects of consuming foods and beverages, highlighting both emotional and health-related aspects. As shown in Table 4, the dimension *emotion* was more frequently mentioned than the dimensions *body and health*. Within the *emotion* dimension, participants mostly referred to positive emotions and feelings, including *happy* (12%), *enthusiastic* (6%), *satisfied* (4%), *peaceful* (3%) and *entertained* (2%).

The dimension *body and health* included all references to the effect of foods and beverages on health and body functioning. The most frequent response within this

dimension was related to general references to health, grouped in the category *general health* (e.g., healthy, health, preventing disease), which was mentioned by 8% of the participants. The other most frequent categories within this dimension were *satiated* (6%), *thirst* (4%), *hungry* (3%), and *active* (3%). In addition, participants also mentioned nutritional aspects of foods (dimension *nutrition*), mainly referring to the concept of healthy diet (7%).

Contextual aspects of food and beverage consumption were also mentioned by participants in the word association task. The *context* dimension of food consumption was referred to through the category *social* (e.g., family, friends, social gathering; 6%), as well as through specific situations where foods and beverages are consumed (eating out, 2%; parties, 2%; holiday, 1%), or specific moments of the day (time, 2%).

When looking at the difference between the countries, China stands out with few citations related to a specific food or beverage item and higher citations related to *tastes good*, *happy* and *enthusiastic* (Table 5) (e.g., filled with happiness and joy). Interestingly, several countries (Brazil, Germany, Norway, Poland, Spain, and to a lesser extent France) strongly associated feeling good with beverages such as *alcohol*, *soft drink*, *water*, *hot drink*, and/or *fruit juice* while others seldom made such an association (Australia, China, India). Seven countries (Brazil, France, Germany, Italy, Norway, Poland and Spain) strongly associated feeling good with water (percentage of mentions > 22% except for Poland: 17%) while such an association was scarcely observed in the other countries (percentage of mentions ranging from 1 to 7%). Six countries out of the former seven (Brazil, France, Germany, Italy, Norway and Spain) also strongly associated feeling good with *fruit & vegetables* (percentage of mentions > 22%). Among country peculiarities, we can note that Norway strongly associated feeling good with *protein food* (29%); Brazil strongly associated feeling good with *fruit juice* (26%); South Africa strongly associated feeling good with *protein food* and *fast and street food*; Poland and France associated feeling good with *sweet & fat food* more than the other countries.

<insert Table 5 about here>

3.2 Foods & beverages that make you feel good (Task 3)

As expected, 96% of respondents mentioned specific food or beverage items when asked to write down 'four foods or beverages that make you feel good' (Table 4). A small share of the responses was related to specific characteristics of foods and beverages instead of specific products.

Across the 14 countries, three food categories were associated with the highest percentage of mention: *sweet & fat food* (e.g., cake, chocolate, ice cream; 34% of citations), *fruit & vegetables* (e.g., fruit, vegetables, salad; 32%) and *protein food* (e.g., red meat, white meat, fish, seafood, egg; 32%). They were followed by three beverage categories: *alcohol* (e.g., wine, beer, alcohol, spirits; 28%), *hot drink* (e.g., coffee, tea, hot chocolate; 26%) and *soft drink* (e.g., soda, lemonade, iced tea; 24%) (Table 6).

When looking at the country level (Table 6), the categories *sweet & fat food* and *hot drink* were markedly salient in Poland (53% and 41% of overall citations; 24% and 20% of first-mentioned citations) as well as in Russia (50% and 45% of overall citations; 21% and 21% of first-mentioned citations). In Norway and in South Africa, a strong

association between feeling good and *protein food* was observed, with 55% of the Norwegian respondents mentioning at least one protein food in their answers (18% for the first-mentioned word), and 53% of South African mentioning at least one protein food in their answers (16% for the first mentioned word). A similar result was already observed for Task 2: 29% of the Norwegian and 28% of the South African already mentioned a protein food when thinking about food/beverages and feeling good (Table 6). The category *starchy food* was quite salient in Italy (41% of the citations), India (36%), Brazil (36%) and Spain (35%). The Brazilian consumers mainly associated feeling good with *fruit and vegetables* (37%) and *fruit juice* (36%) – 22% of the Brazilian first-mentioned a fruit (including fruit juice) or a vegetable when answering task 3. This was also observed for task 2, with 50% of Brazilian respondents mentioning a fruit (including fruit juice) or a vegetable first when thinking about food/beverages and feeling good (Table 6).

Looking at water and alcohol, it is interesting to note that France, Germany, Italy and Norway associated feeling good with *water* more than the other countries, while Australia, Poland, Russia and the United-Kingdom associated feeling good with *alcohol* more than the other countries. In line with these results, 18% of French, 15% of German, 19% of Italian and 15% of Norwegian respondents first mentioned water when answering Task 2, while 15% of Australian respondents first mentioned a product with alcohol.

<insert Table 6 about here>

3.3 Association between food & beverages and feeling good in the future (task 4)

When asking the participants to list ‘four ways in which foods and beverages will make you feel good in the future’, 34% of them mentioned at least one specific food or beverage item and 30% mentioned at least one term related to *non-sensory properties*. Participants most frequently mentioned foods and beverages positively associated with health (*fruit & vegetables* 13%, *protidic food* 8%) than those generally negatively associated with health (*sweet & fat food* 8%, *fast and street food* 4%). Regarding *non-sensory properties of foods*, participants mentioned a wide range of characteristics with similar frequency. The most relevant categories within this dimension were: natural (9%), inexpensive (6%), home-made (5%), good quality (5%), unspoiled (4%) and convenient (3%).

The dimensions *body & health*, *nutrition*, *sensory & hedonic properties* and *emotion* were also associated with feeling good in the future by 28%, 25%, 24% and 20% of the respondents, respectively (Table 4). The most relevant categories within these dimensions were similar to those reported in Section 3.1.

The association between *healthy diet* and feeling good in the future was higher in Australia (25%), South Africa (26%), the USA (22%) and the United Kingdom (21%) than in the other countries. This category was also the most frequent first-mentioned category in these four countries (Australia: 12% of the first mentioned words belong to the category *healthy diet*; South Africa: 12%; USA: 10%; UK: 10%). The association between *fruit & vegetables* and feeling good in the future was higher in China (35%), Brazil (33%) and Germany (26%). However, this category was the most frequently first mentioned category only in Germany with 10% of the first mentioned.

By looking more closely at each country, a few peculiarities could be observed. In China, a quite strong association between feeling good in the future and the category *protein food* was observed, with 31% of the Chinese respondents mentioning at least one protein food in their answer (12% for the first mentioned word). In Italy, a salient association between feeling good in the future and the category *natural* was observed, with 23% of the Italian respondents mentioning at least one word related to naturalness in their responses to the task (11% for the first mentioned word). Finally, a noticeable association between feeling good in the future and the category *social* was observed in Norway (24%) and with the category *water* in Germany (20%).

<insert Table 7 about here>

4. Discussion

4.1. Conceptualization of feeling good in the context of foods and beverages across the countries

Participants reported a wide range of associations when thinking about food and beverages and feeling good, which suggests the multi-dimensional nature of the construct. Interestingly, the most frequent associations with feeling good in the context of foods were related to specific foods or beverages (55% to 77% of the participants in the 14 countries), rather than to an “abstract” concept. This suggests that the experience of consuming products makes consumers feel good and not necessarily their specific properties (sensory, hedonic, non-sensory, nutritional).

The importance of product experiences on consumers’ conceptualization of feeling good was evidenced by the frequency of mention of categories related to hedonic experiences and emotional reactions to foods, such as *tastes good* and *emotion*. Interestingly, the most relevant emotional reported by Ares *et al.* (2015) when exploring consumers’ conceptualization of well-being were similar to those referred to in the present work: pleasure, happiness, enthusiasm, satisfaction and peace/calm. Physical aspects were also relevant for participants’ conceptualization of feeling good in the context of food and beverages. Participants referred to both the effects of foods on body functioning, as well as their general contribution to health and disease prevention.

However, it should be noted that health and nutrition-related aspects were more salient for consumers when they were asked to think about how foods and beverages would make them feel good in the future. Participants gave more relevance to physical and nutritional dimensions and less relevance to sensory and hedonic properties in Task 4 compared to Task 2. Looking at categories, 24% of the respondents mentioned a word related to “Tastes good” in task 2 against only 12% in task 4. Conversely, 15% of the respondents mentioned a word related to “Healthy diet” in task 4 against 7% in task 2. In other words, food-related feeling good seems to be mainly driven by sensorial pleasure at present, but by nutrition and health in the future. This result is in line with the fact that time perspectives have been reported to influence food choices. People who consider the future consequences of their decisions tend to select healthier products than those who are oriented towards obtaining immediate consequences (Dassen *et al.*, 2015; De Marchi *et al.*, 2016; Tórtora & Ares, 2018).

In the present work, health-related aspects were less frequently mentioned than emotional aspects of food consumption. This contradicts findings reported by Ares *et al.* (2015) in a similar word-association study on food and well-being. According to these authors, 76% of all citations were related to physical health, whereas only 22% of the citations were related to psychological aspects of well-being. Therefore, it can be concluded that people may give more relevance to physical health and healthy food when asked about food-related associations with *well-being* (Ares *et al.*, 2015) than when asked about food-related associations with *feeling good* (present experiment). In fact, the increasing use of the term “well-being” in a medical context (Dodge *et al.*, 2012; WHO, 2018) may lead the term “well-being” to prime health concepts (and in turn healthy food concepts).

The relevance of emotional over health-related aspects for consumers’ conceptualization of feeling good has implications for the design of strategies for promoting healthy diets. Most interventions and communication campaigns have heavily relied on the concept of health and have not taken into account emotional and pleasurable aspects of food consumption, as stressed by Pettigrew (2016). Results from the present work suggest that using the concept of “feeling good” or making emphasis on positive feelings and emotions may be successful for encouraging changes in dietary patterns. Further research in this respect should be conducted.

4.2. Foods and beverages associated with feeling good across the countries

When participants were asked to list foods or beverages that made them feel good (task 3), almost all food dietary groups were represented through the categories associated with a percentage of mention higher than 10% overall the countries: protein food (meat, fish, seafood, eggs), fruit & vegetables, starchy food (potatoes, rice, pasta, noodles), dairy product (milk, yogurt) and sweet & fat food. Similarly, beverage categories associated with a percentage of mention higher than 10% included water, fruit juice, soft drink, hot drink and alcohol. In fact, there are no salient food or drink groups associated with feeling good, but it seems that each food or drink group may be related to feeling good. Interestingly, specific items associated with “feeling good” included both products recommended for a healthy diet (*i.e.*, fruit and vegetables, water) as well as products for which consumption should be limited according to dietary guidelines (*i.e.*, sweet & fat food, soft drink). However, when consumers were asked to think about feeling good in the future, health-related aspects of food consumption were more salient, as evidenced by the increase in the frequency of mention of the category fruit & vegetables.

4.3. Differences between countries in the conceptualization of feeling good

Although the general conceptualization of feeling good was similar across the countries, some differences were identified. This result agrees with the fact that culture is one of the main variables influencing our food choices, as well as attitudes and beliefs about food (Rozin, 1998). Differences between countries can also be related to language (Helms, 1992), as the way the expression “feeling good” is used by people in their everyday life may differ across languages.

In the present work, some of the differences between countries in the associations with feeling good in the context of food and beverages can be linked to the food habits

and/or food surroundings of the countries. For instance, feeling good was strongly associated to fruit juice in Brazil (26%), to rice in India (21%), to pasta in Italy (33%) and to fish & seafood in Norway (29%). However, it is worth stressing that differences between countries in food habits were not always evident in consumers' responses. For examples, some associations that could have been expected were not observed: feeling good was associated to tea by only 16% of the respondents in United Kingdom and to rice by only 7% of Chinese participants.

When looking at the associations elicited by participants when thinking of food and beverages and feeling good, it is interesting to note that European countries did not show a unique concept of feeling good, not even from the geographical poles usually considered in Europe (Northern *versus* Southern; Western *versus* Eastern). This result is in line with results from previous studies that stress the heterogeneity in food culture across Europe (e.g. Ares *et al.*, 2016; Askegaard & Madsen, 1998; Guerrero *et al.*, 2010). United Kingdom stood somewhere apart from Europe by associating feeling good with "tastes good" more than participants in other European countries. By looking at Table 5, Spain displayed a "feeling good profile" somewhat closer to the one of Norway than to the one of Italy. In fact, both Spanish and Norwegian respondents strongly associated feeling good with alcohol, fruit & vegetables, soft drinks, protein food and water, while Italian respondents associated feeling food with fruit & vegetables and water, but not with soft drinks and protein food.

Finally, a striking result of the present experiment is that China clearly stood out from the other countries when participants wrote down the first four words that came to their mind when thinking of food and beverages and feeling good (task 2). This can be explained using the framework proposed by Hofstede (1980). The Asian culture, unlike the Western culture, is characterized by collectivism, *i.e.* people tend to view things in the larger context, to respect the opinion of the majority and to avoid confrontations (Hofstede, 2001). Previous research has reported differences in the value attached to food and eating between China and Western countries. Foods in China have a deeper meaning and are more strongly associated with social status, accomplishment and relationships than in Western countries (Ma, 2015). In the present work, Chinese people strongly associated feeling good with positive affects such as "tastes good", "happy" and "enthusiastic" rather than to specific foods or beverages item. In particular, the highest frequency of mention of the category "happy" was observed in China (Table 5). On the contrary, references to nutrition and healthy diet tended to be more frequent in Western countries. This difference can be related to the implementation of public policies and public campaigns to promote healthy diet, which are mainly based on nutrients (Pettigrew, 2016). For instance, the French National Nutrition Programme launched in 2007 requires health promotion messages to be included on all advertisements for food products (e.g. "Eat five fruit and vegetables per day" or "For your health, avoid eating too fatty, too sweet or too salty").

Despite differences in the ways foods are shared in China and Europe (Pearcey & Zhan, 2018), in the present work the social dimension of foods was similarly mentioned in all countries. In China (as in India), a dish is placed in the middle of the table and everyone draws directly into the dish with his/her own cutlery (Ma, 2015). On the contrary, Western countries have a more individualistic approach to food and a dish is placed in the middle of the table and everyone takes a portion of the dish to put it on his/her own plate (Monin & Szczurek, 2014). Further research is needed to investigate the possible relationship between feeling good and food environment (including public

policy) as well as food practices and attitudes. To succeed, such research should involve sociologists in addition to food and consumers scientists. Such research should also sample the countries according to explicit variables related to food environment and/or food habits. Even if the present experiment was the very first one to explore food-related feeling good by encompassing a larger number of countries covering all the continents, European countries were overrepresented.

5. Conclusions

The present work aimed at presenting a cross-cultural perspective on feeling good in the context of foods and beverages in 14 countries across the globe. Results showed that feeling good is a multi-dimensional construct related to three main dimensions: emotional, physical (health-related aspects) and social. Clearly, sensory and hedonic aspects of food consumption were the most salient associations when people were asked to think about food and beverages and feeling good. However, results also showed that in the perspective of feeling good in the future, health gained salience in consumers' responses, thus increasing similarities to well-being. These results stress the importance of hedonic aspects of food consumption and stress the need to take them into account in the development of healthful products, as well as in the design of communication campaigns and interventions targeted at encouraging people to adopt healthier eating patterns.

Although general conclusions were similar across countries, cultural differences in the conceptualization of feeling good were found, as evidenced by differences in the frequency of mention of the categories. These differences were both related to food habits and to the value attached to foods. Further studies should aim at better understanding cultural differences in the conceptualization of feeling good in relation to food and beverages, which will be key to the development of successful global initiatives aimed at encouraging healthy dietary choices and contributing to well-being in the population.

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Tables

Table 1. Socio-demographic characteristics of participants in the fourteen countries (n=8,325)

		Australia	Brazil	China	France	Germany	India	Italy	Norway	Poland	Russia	South Africa	Spain	United Kingdom	USA
Number of participants		587	600	600	600	600	600	600	550	600	600	588	600	600	600
Male	18-25 yo	87	100	100	100	100	100	100	50	100	100	89	100	100	100
	26-45 yo	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	46-65 yo	100	100	100	100	100	100	100	100	100	100	99	100	100	100
Female	18-25 yo	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	26-45 yo	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	46-65 yo	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Partner / spouse	Yes	52%	62%	72%	63%	59%	64%	53%	53%	59%	62%	59%	57%	57%	61%
Children	Yes	46%	57%	61%	50%	42%	55%	44%	48%	56%	61%	60%	41%	45%	54%
Daily activity	Working full time	35%	60%	78%	52%	52%	54%	43%	47%	52%	58%	56%	45%	48%	47%
	Working part time	21%	11%	3%	10%	13%	13%	14%	9%	9%	11%	10%	11%	13%	11%
	Unpaid work	11%	5%	1%	5%	6%	10%	8%	2%	4%	8%	7%	4%	10%	11%
	Unemployed	8%	8%	1%	9%	6%	6%	12%	7%	10%	5%	7%	15%	8%	9%
	Retired	12%	5%	8%	8%	8%	3%	3%	8%	9%	6%	5%	4%	10%	8%
	Full time student	12%	8%	8%	15%	13%	12%	18%	19%	14%	10%	14%	18%	9%	12%
	Other / prefer not to state	2%	3%	1%	2%	4%	3%	4%	9%	2%	2%	1%	3%	2%	3%
Highest education level	Elementary school	1%	0%	0%	1%	10%	0%	2%	1%	1%	0%	0%	1%	4%	0%
	High school	42%	3%	6%	6%	40%	5%	8%	10%	2%	7%	38%	11%	27%	35%
	College	19%	40%	26%	37%	29%	10%	57%	40%	51%	23%	29%	41%	32%	33%
	University, undergraduate degree	29%	45%	60%	41%	12%	46%	27%	38%	17%	13%	27%	36%	31%	23%
	University, graduate degree	8%	12%	8%	16%	9%	39%	6%	12%	29%	57%	5%	12%	8%	9%

Table 2. Wording of the tasks of the online questionnaire related to feeling good in general and in the context of food and beverages.

Task	Wording	Results
T1	Write down the first four words that come to mind when thinking about feeling good.	Not reported in the present paper
T2	Write down the first four words that come to mind when thinking about food and beverages and feeling good.	Tables 4 and 5
T3	List four foods or beverages that make you feel good.	Tables 4 and 6
T4	List four ways in which foods and beverages will make you feel good in the future.	Tables 4 and 7
T5	Write down the first four words that come to mind when thinking about food and beverages and feeling bad.	Not reported in the present paper
Additional questions	Sociodemographic questions: marital status and children, daily activity and education level.	Table 1

Table 3. Extract from the code frame used in the content analysis, illustrating an example of categories, codes and words within one of the dimensions.

Dimension	Category	Code	Words
Specific food & beverages	Sweet & fat food	Chocolate	Chocolate, Cadbury®, Kit Kat®, Snickers®...
		Pastry & biscuits	Cookies, cake, apple pie, donuts, muffin...
		Sweet spreads	Honey, jam, Nutella®...
		Sweets	Candy, jellybeans, caramel, Smarties®...
		Ice-cream	Ice-cream, sorbet...
	Fruit & vegetables	Fruit	Fruit, apple, bananas, cherries, mango...
		Vegetables	Vegetables, tomatoes, carrots, cauliflower...
		Soup	Soup, home-made soup, vegetables soup...
	Protein food	Red meat	Beef, lamb, roast beef, steak...
		Fish & seafood	Fish, seafood, lobster, salmon, prawns...
		Eggs	Egg, omelet, boiled egg, scrambled egg...

Table 4. Percentage of mentions for each dimension when participants were asked to write down the first four words that come to their mind when thinking about food and beverages and feeling good (Task 2), to list four foods or beverages that made them feel good (Task 3), and to list four ways in which foods and beverages will make them feel good in the future (Task 4), across the 14 countries.

Dimension	Task 2	Task 3	Task 4
Specific foods and beverages	62%	96%	34%
Sensory & hedonic properties	34%	2%	24%
Emotion	22%	1%	20%
Non-sensory properties	20%	8%	30%
Body and health	19%	0%	28%
Nutrition	13%	2%	25%
Context	11%	1%	15%
Cooking and eating	8%	5%	12%
Other	6%	2%	9%
No answer	3%	3%	9%

Table 5. Results of the word association task about food and beverages and feeling good (Task 2). For each category, percentage of mentions per country and overall the countries (last column). Only the categories associated with a percentage $\geq 15\%$ in at least one country are displayed on the table. Percentage associated with a plus sign (+ in green) or a minus sign (- in orange) are respectively higher and lower than the overall percentage according to chi-square tests ($p < 0.05$).

Dimension	Category	Australia	Brazil	China	France	Germany	India	Italy	Norway	Poland	Russia	South Africa	Spain	United Kingdom	USA	Overall countries
Sensory & hedonic properties	Tastes good	26	10 (-)	72 (+)	14 (-)	16 (-)	29 (+)	13 (-)	19 (-)	14 (-)	30 (+)	24	11 (-)	29 (+)	25	24%
Specific foods & beverages	Sweet & fat food	19	22	10 (-)	24 (+)	21	18	17	17 (-)	28 (+)	21	18	23	21	18	20%
Specific foods & beverages	Alcohol	18	23	1 (-)	21	29 (+)	6 (-)	19	27 (+)	25 (+)	18	21	26 (+)	23 (+)	16	19%
Specific foods & beverages	Fruit & vegetables	12 (-)	24 (+)	3 (-)	25 (+)	22 (+)	14	23 (+)	23 (+)	13 (-)	18	11 (-)	23 (+)	11 (-)	9 (-)	16%
Specific foods & beverages	Soft drink	9 (-)	20 (+)	4 (-)	14	21 (+)	12	10 (-)	23 (+)	21 (+)	9 (-)	17	26 (+)	7 (-)	16	15%
Specific foods & beverages	Protein food	14	14	2 (-)	9 (-)	14	8 (-)	14	29 (+)	6 (-)	19 (+)	28 (+)	23 (+)	15	15	15%
Specific foods & beverages	Water	7 (-)	23 (+)	1 (-)	23 (+)	24 (+)	2 (-)	22 (+)	25 (+)	17 (+)	3 (-)	4 (-)	25 (+)	3 (-)	7 (-)	13%
Specific foods & beverages	Fast and street food	13	13	1 (-)	5 (-)	10 (-)	19 (+)	12	15	9 (-)	10 (-)	22 (+)	12	13	19 (+)	12%
Specific foods & beverages	Hot drink	11	9 (-)	1 (-)	16 (+)	23 (+)	11	15	10 (-)	24 (+)	15	7 (-)	8 (-)	13	9 (-)	12%
Emotion	Happy	14 (+)	6 (-)	23 (+)	11	6 (-)	8 (-)	9 (-)	9 (-)	10	17 (+)	12	7 (-)	14 (+)	11	11%
Specific foods & beverages	Starchy food	5 (-)	19 (+)	2 (-)	6 (-)	13 (+)	12	19 (+)	11	5 (-)	8 (-)	9	20 (+)	5 (-)	8	10%
Specific foods & beverages	Fruit juice	2 (-)	26 (+)	2 (-)	11 (+)	9	10	7	6 (-)	16 (+)	10	6 (-)	10	3 (-)	5 (-)	9%
Nutrition	Healthy diet	5 (-)	16 (+)	6	9 (+)	3 (-)	7	11 (+)	10 (+)	5 (-)	7	3 (-)	11 (+)	3 (-)	3 (-)	7%
Emotion	Enthusiastic	7 (+)	2 (-)	17 (+)	2 (-)	2 (-)	11 (+)	2 (-)	1 (-)	2 (-)	3 (-)	6	3 (-)	9 (+)	12 (+)	6%

Table 6. Results of the free listing task in which participants mentioned food and beverages that make them feel good (Task 3). For each category, percentage of mentions per country and overall the countries (last column). Only the categories associated with a percentage $\geq 15\%$ in at least one country are displayed on the table. Percentage associated with a plus sign (+ in green) or a minus sign (- in orange) are respectively higher and lower than the overall percentage according to chi-square tests ($p < 0.05$).

Dimensions	Category	Australia	Brazil	China	France	Germany	India	Italy	Norway	Poland	Russia	South Africa	Spain	United Kingdom	USA	Overall countries
Specific foods & beverages	Sweet & fat food	36	33	20 (-)	39 (+)	31	30	34	19 (-)	53 (+)	50 (+)	30 (-)	30 (-)	39 (+)	29	34%
Specific foods & beverages	Fruit & vegetables	32	37	35 (+)	40 (+)	44 (+)	23 (-)	35	38	20 (-)	33	29 (-)	37	25 (-)	23 (-)	32%
Specific foods & beverages	Protein food	35	29 (-)	39 (+)	23 (-)	24 (-)	19 (-)	23 (-)	55 (+)	9 (-)	32	53 (+)	36	32	36 (+)	32%
Specific foods & beverages	Alcohol	37 (+)	26	11 (-)	23 (-)	28	12 (-)	32	31	35 (+)	37 (+)	31	36 (+)	35 (+)	24	28%
Specific foods & beverages	Hot drink	29	15 (-)	16 (-)	30 (+)	33 (+)	25	28	18 (-)	41 (+)	45 (+)	19 (-)	13 (-)	28	21	26%
Specific foods & beverages	Soft drink	20	22 (-)	30 (+)	21	23	18 (-)	20 (-)	26	32 (+)	14 (-)	31 (+)	27	18 (-)	35 (+)	24%
Specific foods & beverages	Starchy food	18 (-)	36 (+)	18	15 (-)	21	36 (+)	41 (+)	18 (-)	5 (-)	8 (-)	23	35 (+)	17 (-)	23	22%
Specific foods & beverages	Water	18	25	5 (-)	33 (+)	33 (+)	4 (-)	36 (+)	33 (+)	21	8 (-)	13 (-)	34 (+)	7 (-)	16 (-)	20%
Specific foods & beverages	Fast and street food	20	16 (-)	12 (-)	8 (-)	15 (-)	31 (+)	26 (+)	18	12 (-)	13 (-)	36 (+)	16 (-)	25 (+)	32 (+)	20%
Specific foods & beverages	Fruit juice	10 (-)	36 (+)	16	16	13 (-)	26 (+)	18	13 (-)	24 (+)	25 (+)	16	16	8 (-)	9 (-)	17%
Specific foods & beverages	Dairy	12	16	17 (+)	15	18 (+)	16 (+)	8 (-)	13	11 (-)	17 (+)	10 (-)	13	10	11	13%
Specific foods & beverages	Salt & fat food	9 (+)	3 (-)	7	6	6	6	3 (-)	6	4 (-)	6	9	4 (-)	18 (+)	8	7%

Table 7. Results of the free listing task in which participants mentioned the ways food and beverages will make them feel good in the future (Task 4). For each category, percentage of mentions per country and overall the countries (last column). Only the categories associated with a percentage $\geq 15\%$ in at least one country are displayed on the table. Percentage associated with a plus sign (+ in green) or a minus sign (- in orange) are respectively higher and lower than the overall percentage according to chi-square tests ($p < 0.05$).

Dimensions	Category	Australia	Brazil	China	France	Germany	India	Italy	Norway	Poland	Russia	South Africa	Spain	United Kingdom	USA	Overall countries
Nutrition	Healthy diet	25 (+)	13	2 (-)	15	9 (-)	19	17 (+)	11 (-)	7 (-)	11 (-)	26 (+)	9 (-)	21 (+)	22 (+)	15%
Specific foods & beverages	Fruit & vegetables	6 (-)	33 (+)	35 (+)	9 (-)	26 (+)	13	6 (-)	14	5 (-)	4 (-)	5 (-)	14	6 (-)	4 (-)	13%
Sensory & hedonic properties	Tastes good	16 (+)	2 (-)	2 (-)	13	6 (-)	17 (+)	16 (+)	11	14	17 (+)	15	9 (-)	19 (+)	14	12%
Body & health	General health	10	26 (+)	1 (-)	14 (+)	6 (-)	6 (-)	19 (+)	7 (-)	3 (-)	1 (-)	11	13 (+)	11	12	10%
Emotion	Happy	14 (+)	8	0 (-)	11 (+)	4 (-)	9	11	7 (-)	6 (-)	7 (-)	16 (+)	5 (-)	18 (+)	18 (+)	10%
Body & health	Satiated	16 (+)	3 (-)	0 (-)	9	2 (-)	5 (-)	9	8	4 (-)	12 (+)	17 (+)	3 (-)	15 (+)	24 (+)	9%
Non-sensory properties	Natural	4 (-)	18 (+)	4 (-)	17 (+)	7 (-)	11	23 (+)	5 (-)	8	4 (-)	7 (-)	11 (+)	2 (-)	6 (-)	9%
Context	Social	12	2 (-)	1 (-)	7	6 (-)	6 (-)	6 (-)	24 (+)	7	18 (+)	15 (+)	9	11	8	9%
Body & health	Active	16 (+)	12 (+)	0 (-)	8	5 (-)	8	5 (-)	9	10	6 (-)	14 (+)	7	13 (+)	15 (+)	9%
Specific foods & beverages	Protein food	4 (-)	8	31 (+)	2 (-)	10 (+)	7	3 (-)	16 (+)	1 (-)	3 (-)	7	10 (+)	4 (-)	5 (-)	8%
Specific foods & beverages	Sweet & fat food	5 (-)	5 (-)	18 (+)	3 (-)	14 (+)	10	6	4 (-)	14 (+)	5 (-)	6 (-)	6	5	6	8%
Specific foods & beverages	Water	3 (-)	15 (+)	4 (-)	9 (+)	20 (+)	2 (-)	7	15 (+)	5	0 (-)	3 (-)	7	2 (-)	4 (-)	7%
Specific foods & beverages	Alcohol	4 (-)	6	13 (+)	5	15 (+)	4 (-)	5	9	10 (+)	6	6 (-)	8	5	4 (-)	7%
Specific foods & beverages	Hot drink	3 (-)	6	15 (+)	4 (-)	17 (+)	6	4 (-)	5	12 (+)	5	3 (-)	2 (-)	4 (-)	3 (-)	6%
Nutrition	Light product	6	11 (+)	2 (-)	8 (+)	4	6	17 (+)	3 (-)	4 (-)	2 (-)	5 (-)	9 (+)	5	5	6%
Non sensory & hedonic properties	Unexpansive	8	2 (-)	1 (-)	4	4 (-)	8	3 (-)	3 (-)	15 (+)	10 (+)	16 (+)	5	7	5 (-)	6%
Cooking & eating	Food / eating	5	2 (-)	2 (-)	2 (-)	3 (-)	3 (-)	4	5	7 (+)	18 (+)	4	6	5	5	5%
Specific foods & beverages	Soft drink	2 (-)	4	15 (+)	3	11 (+)	4	2 (-)	7 (+)	6 (+)	1 (-)	3 (-)	3	2 (-)	3 (-)	5%

Specific foods & beverages	Dairy	1 (-)	8 (+)	15 (+)	2 (-)	8 (+)	6	1 (-)	5	2 (-)	1 (-)	2 (-)	3	3	2 (-)	4%
Specific foods & beverages	Fruit juice	1 (-)	2 (-)	15 (+)	3	6 (+)	10 (+)	4	3	4	1 (-)	2 (-)	4	1 (-)	2 (-)	4%

Annex 1. List of dimensions, categories and codes

Dimension	Category	Example of codes
Specific food & drink	Fruit & vegetables	Fruit, vegetables, salad
	Protein food	Red meat, white meat, fish & seafood, egg
	Starchy food	Bread, past, rice, potatoes
	Dairy product	Milk, yoghurt, cheese, cream
	Sweet & fat food	Cake, chocolate, ice cream, sweet spreads
	Salt & fat food	Chips, French fries, peanuts
	Fast & street food	Sandwiches, kebab, burger, hot dog
	Snacks	Snacks
	Breakfast cereal	Muesli, cereals, corn-flakes, oat, porridge
	Seasoning	Herbs, spice, curry
	Soy products	Soy, soy products
	Water	Water, mineral water
	Fruit juice	Fruit juice, orange juice, apple juice
	Hot drink	Coffee, tea, hot chocolate
	Soft drink	Soda, lemonade, iced tea
	Alcohol	Wine, beer, alcohol, spirits
	Energy drink	Energy drink, sport drink
	No alcohol	No alcohol
	Other food	Butter, gravy, sauce, finger food, chutney
Cooking & eating	Food & eating	Food, meal, eating
	Drink & drinking	Drink, drinking
	Shopping	Shopping, food shop, supermarket
	Cooking process	Barbecue, roasted, fried, steamed
	Well-cooked	Well-cooked
Context	Social	Family, friends, social gathering, sharing...
	Eating out	Eating out, restaurant, bar
	Parties	Festivity, parties, celebration
	Leisure	Movies, playing
	Holiday	Vacations, travel, on the road, off-days
	Summer	Summer, sunshine, beach
	Time	Time, breakfast, lunch, dinner
Emotion	Happy	Happy, enjoying, joy, glad, contentment
	Enthusiastic	Enthusiastic, awesome, great
	Entertained	Entertained, fun, interesting
	Peaceful	Peaceful, relaxed, calm, tranquility
	Love	Love
	Craving & reward	Craving, addition, reward
	Satisfied	Satisfied, satisfaction
	Comforted	Comfort, comfortable
	Grateful	Grateful, thankful, blessed
	Not guilty	Not guilty
	Guilty	Guilty

Dimension	Category	Example of answers
Sensory & hedonic properties	Taste good	Taste good, yummy, delicious, eating good food
	Flavor	Flavor, taste
	Aroma	Aroma, scent, smell
	Texture	Texture, soft, crispy, crunchy
	Appearance	Appearance, colorful, presentation, looks good
	Temperature	Hot, warm, cold, chilled
	Spicy	Spicy, adequately spiced
Non-sensory properties	Natural	Natural, without additives, no GMO, organic
	Price	Price, cost, money, cheap, expensive
	Unspoiled	Unspoiled, fresh
	Clean	Clean, hygienic
	Quality	Quality, good quality
	Home-made	Home-made, home-cooked
	Convenient	Convenient, easy to prepare, ready-to-eat
	New	New, innovative, adventurous
	Raw	Raw
	Foreign food	Exotic food, Asian, Italian, Chinese
	Local	Local, authentic, regional products
	Available	Available
	Brand	Heinz©, Nestlé©, Knorr©
Nutrition	Healthy diet	Healthy diet, healthy food, healthy eating, balanced
	Unhealthy diet	Unhealthy diet
	Quantity	Moderation, restraint, abundance, portion
	Variety	Variety, eating different food
	Light	Low calorie, fat free, less calorie, sugar free
	Protein	Protein, rich in proteins
	Sugar	Sugar
	Vitamin	Vitamins, rich in vitamins
	Vegetarian	Vegetarian, plant-based
Body & health	General health	Health, healthy, preventing disease
	Systemic health	Immunity, skin, bones
	Mental health	Mental health
	Hungry	Hungry, hunger
	Thirst	Thirst, quenching thirst
	Satiated	Full, filling
	Digestion	Digestion, digesting
	Need	Need, necessary, needed
	Active	Energy, vital, active
	Alcohol abuse	Being drunk

Contributions by Author

Claire Sulmont-Rossé – study design, data analysis, interpretation and publication.

Rafal Drabek – data analysis, interpretation and publication.

Valérie L. Almli – study design, data analysis, interpretation and publication.

Hannelize van Zyl – study design and interpretation.

Ana Patricia Silva – study design and publication.

Martin Kern – study design and publication.

Jean A McEwan – publication.

Gastón Ares – study design, data analysis, interpretation and publication.