



# COMFOCUS

Community on Food Consumer Science



## D4.2 Guideline for harmonisation of measures and protocols for psycho-social consumer characteristics



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## Glossary

| Abbreviation | Full form                   |
|--------------|-----------------------------|
| <b>FCS</b>   | Food Consumer Science       |
| <b>WP4</b>   | Work package 4              |
| <b>TPB</b>   | Theory of Planned Behaviour |

## Executive Summary

The overall objective of WP4 is to harmonise the self-report measures for the most commonly used concepts in surveys studying factors related to food choices in order to enable creation of comparable data across different studies. The specific object of Deliverable 4.2 is to select the most relevant psycho-social consumer characteristics and develop guidelines for harmonised measures for twenty most used concepts and descriptors.

The deliverable consists of three chapters. The first chapter gives an overall picture of the purpose and considerations that have guided the work behind the decisions made during the process of selecting concepts and assessing the used measurement instruments. The second chapter describes the process of selecting the twenty concepts considered as the most relevant in FCS surveys and the criteria used in selecting harmonised measures for these concepts. The concepts were selected based on previous consumer behaviour frameworks and food choice models and the use of them in FCS studies when explaining food choices. The criteria for selecting the harmonised measures was the frequency of use in food consumer science (FCS) studies, reliability and validity of the measures together with assessment of feasibility and cross-cultural stability.

The selected concepts and harmonised measures are described in subsections of Chapter 3. The front-page in each section gives the basic information about the concept and harmonised measure followed by a detailed description. The detailed description defines the concept and its theoretical background, but the main focus is in how the concept has been operationalised and justification for selecting a measure as the COMFOCUS harmonised measure. The selected measure for each concept is described together with information relevant to its use in questionnaire studies.

The document contains recommendations for COMFOCUS harmonised measures for concepts: 1) Attitudes, 2) Subjective norm, 3) Moral norm, 4) Self-identity, 5) Personal values, 6) Self-efficacy, 7) General Interest towards healthy eating, 8) Environmental concern, 9) Food choice motives, 10) Food neophobia, 11) Food disgust sensitivity, 12) Impulse buying tendency, 13) Food involvement, 14) Restraint eating, 15) Emotional eating, 16) Mindful eating, 17) Diet style, 18) Subjective health, 19) Subjective well-being, and 20) Self-evaluated healthiness of the diet.



# CHAPTER 1

## Introduction

## 1. Introduction

### 1.1 Background

Food choice is a complex process, which is influenced by several diverse but interrelated factors. For this reason, food choice has been integrated into several extensive frameworks or models (Chen & Antonelli, 2020). Most of these models distinguish between three main factors that influence food choice: the food, the consumer and the context. In order to understand food choices, we need to find answers to questions related to “who” (=consumer), “what” (=food), “when”, “where”, “with whom” (= context) and “why”, which is the crucial last question that can be explained by understanding how all the other factors are interrelated and influence the behaviour of consumers (Rozin, 2007). Psycho-social concepts can characterise individual consumers and help us to understand what drives consumers in their food choices. Psycho-social consumer characteristics also interact with product and context, which explains why the simple choices we make on the daily basis result in complex and difficult to predict behaviours. In many studies, however, psycho-social consumer characteristics have been the best ones to explain the variance in food choices and other food-related behaviours.

Food consumer science (FCS) is a multidisciplinary discipline requiring an understanding of both the consumer and the product. Scientists working in FCS come from various scientific backgrounds, such as psychology, sociology, sensory food science, marketing, and agricultural economics, and the concepts used in FCS are similarly derived from various disciplines that differ in their definitions and basic assumptions behind the concepts. This diversity has made FCS a rich discipline with several possible approaches and paradigms that can be adopted when trying to find answers to research questions. At the same time this illustrates that the FCS field is fragmented. The large number of studies carried out in different countries give a snapshots of certain food choices by consumers from one geographical area at a specific time based on varying theoretical and methodological approaches. This makes it impossible to generalise over studies or to compare findings. By harmonising the used methods and approaches, we are one step closer to starting to get a more holistic picture of factors that influence food choices and other food-related behaviours.

In this deliverable, we focus mainly on concepts that have a background in social psychology but also include some from marketing and health sciences. The deliverable is aimed at all researchers who work in FCS by making the descriptions of concepts and harmonised measures easily approachable. The concept descriptions are not deep-going reviews on concepts, but they gather the most important information required to apply the different concepts in FCS studies. The concept documents in Chapter 3 concentrate on introducing measures and operationalisations. These will help the food consumer scientists to learn the basic features of the concepts as well as to adopt the most appropriate measurement instruments to fit their research questions. The selected harmonised measures are recommendations of valid and reliable measures that, in

our assessment, are among the best ones. However, we have also considered feasibility as a criterion: often the length of the measurement scale can be an issue and evidence of cross-cultural functioning is an important benefit in many food-related studies. In FCS the use of these concepts is typically related to describing the consumers participating in the study, however, if the relationships between concepts are the main focus, then choosing more extensive versions should be considered. The same applies when the concept is the main dependent variable: for example using self-evaluated healthiness of diet as an additional independent variable can be justified, but if the main outcome variable is the nutritional healthiness of diet, then more extensive measures are recommendable. The same approach applies to motivational and attitudinal measures that have both short and extensive versions of measurement instruments available.

The deliverable is designed to work as a FCS handbook of concepts and their harmonised measures based on the current knowledge. Still, research in FCS evolves and we expect these background documents to evolve over time as well when new versions are added to the COMFOCUS knowledge library.

## 1.2 Objective

The overall objective of WP4 is to harmonise the self-report measures for the most commonly used concepts in surveys studying factors related to food choices in order to enable creation of comparable data across different studies and build a base of protocols that will be applied in different survey methods with special emphasis on questionnaire-based studies.

The specific object of Deliverable 4.2 is to select the most relevant psycho-social consumer characteristics for harmonisation and develop guidelines for at least 20 frequently used psycho-social constructs and their measurement.

## 1.3 Structure of the document

The deliverable consists of three chapters. This first chapter gives an overall picture of the purpose and considerations that have guided the work and are behind the decisions made during the process of selecting concepts and assessing the used measurement instruments. Chapter 2 describes the process of how the twenty concepts and their harmonised measures were selected, and Chapter 3 describes these concepts and measures in detail. Each concept is described in its own section as an independent concept so that the reader can use the subsections of Chapter 3 independently. This means that there will be considerable overlap between the different subsections, but writing them as independent units has the aim to make them more user-friendly to those who use the documents as guidelines when making decisions about which methods to use. These background documents will be added also to the COMFOCUS knowledge platform as independent units as well.

*(for **References** check end of Chapter 2)*



## CHAPTER 2

### Method

## 2. Method

### 2.1 Process description for selecting COMFOCUS self-report concepts and deciding on harmonised measures

The process of harmonising psycho-social self-report measures in COMFOCUS community has been done in two steps. First, the commonly recognised and used concepts were mapped and then the most relevant concepts were selected and included in the harmonising process. Second, the literature on the selected twenty concepts was reviewed with the emphasis on how they have been operationalised and measured. The second step has resulted in a background paper for each concept that contains the rationale for selecting the harmonised measure and how to apply this measure (subsections of Chapter 3).

Harmonising in this context means defining concepts and selecting measures so that in the COMFOCUS community these same recommended measures will be considered as priority options in different food consumer science (FCS) studies. This will allow combining several different data sets in the future. Yet, keeping them as recommendations concedes necessary adaptations of these measures when specific needs arise from differences in cultural context, needs of the research question or other such issues. Recommended measures provide a reference point for these adaptations and future developments.

### 2.2 Mapping and selecting the concepts to include

The concepts used in consumer food science were mapped by using existing frameworks (e.g. DONE network: Stok et al., 2017; Stok et al., 2018), scoping literature on food choice models (e.g. Chen & Antonelli, 2020; Köster, 2009; Randall & Sanjur, 1981; Rozin, 2007; Sobal, Bisogni, & Jastran, 2014) and direct input and discussions among the members of COMFOCUS community.

DONE network<sup>1</sup> (Stok et al., 2017 and online framework) gives an extensive framework on concepts that are relevant to healthy eating with food choices as one of the outcomes. The other two outcomes in the framework are eating behaviour, which has a minor role in FCS and dietary food intake, which is an outcome as the nutritional quality of food and quantity eaten. From the FCS perspective, the health focus in food choices is challenging as it contains a direct goal, whereas FCS has focus on the consumer and understanding of consumer behaviour regardless of what the food choices are, although the majority of the concepts are the same in the two approaches. Health is an important reason behind for food choices, but the interest in FCS is also in other factors that influence product acceptability, such as production methods, sensory properties of foods and how the different motivations and goals behind choices support or conflict with each other. Lately sustainability and its role in food choices has received increasing attention as well. Therefore, the DONE

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<sup>1</sup> <https://www.uni-konstanz.de/DONE/>

network has been used as a basic inspiration, but could not be adopted as such as a basis for defining the psycho-social concepts that are relevant in food choice.

In the work process, the various concepts from DONE framework and food choice models were gathered to an excel file and discussed internally in the frequent, approximately bi-weekly WP4 work group meetings (N=20) in relation to how central the concepts are in relation to the FCS and understanding consumers' food-related behaviours. The first criterion used in assessing the concepts has been how central they are to consumers' food choices and frequent use in FCS studies. Based on the first mapping, we had 37 concepts that were related to individuals' psycho-social characteristics. Some of these concepts were generic and some were tailored to food context, such as general interest in healthy eating or food disgust.

The first screening of concepts was done within the WP4 work group resulting in a priority list of ten psycho-social concepts, which were entered into the harmonising process to find the best methods for the concepts. The wider selection of concepts together with the priority list was presented to the wider COMFOCUS community in the first project meeting in June 2021 (Month 4 in the project) to get feedback on selected concepts and input to further selection of the concepts. Based on the input and further discussions in the WP4 work group, another 10 concept candidates were added. In January 2022 (M11 in the project) the final selection of concepts and concept candidates were presented to the whole COMFOCUS community in an online workshop and the feedback was used to confirm the selection of the final concepts, adding up to 20 concepts altogether. As the literature and existing framework-based work looks backwards on what has been found relevant and important, the input from current research interests of the COMFOCUS community was deemed valuable in providing a perspective to the future and giving input to include concepts that will be central in the future studies.

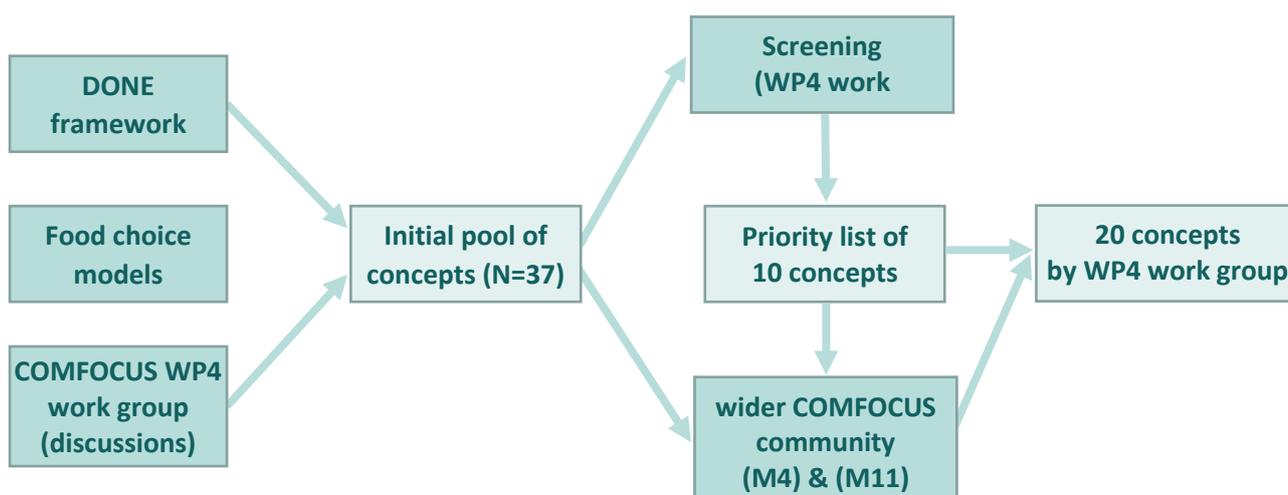


Figure 2.2-1. Harmonisation process overview

The discussions around the concepts in the WP4 work group revealed several challenges in defining the unit of the concept that we use in our harmonising activities. Several domain-specific concepts are multidimensional and dividing them into several concepts is counterproductive (e.g., food choice motives vs. the different components of food choice motives; Steptoe, Pollard, & Wardle, 1995), whereas psychological eating styles or attitudes of emotional eating and restraint eating may be relevant in different studies depending on the research question. Concepts when applied in the food domain often have specific measurement instruments developed for the purpose. This makes it hard to distinguish and keep apart the concept and its measurement. For example, in food choice motives: are we talking about the general concept of motivation or the motivations that are specific in food choices? In these types of concepts we have made a compromise of using domain-specific concepts when they are adequately defined, but have made a link to the more general concept as well when describing the background of the selected concepts.

The antecedents of behavioural intention and behaviour of the Theory of Planned Behaviour (TPB; Ajzen, 1991) (attitudes and subjective norms) are included in these psycho-social concepts, because TPB is the most used model in predicting behaviour in consumer and health behaviour (Armitage & Conner, 2000). However, the behavioural components of intentions and behaviour, together with perceived behavioural control are part of another deliverable (D4.4; forthcoming) that concentrates on behaviour and other outcome measures.

Due to the nature of social and behavioural sciences and multidisciplinary approaches applied in FCS, the same concepts can be defined in different ways that go beyond the fine-tuning of verbal expressions. The main approach in psycho-social concepts is, as the name suggests, based on the social psychology paradigm and the literature and definitions used to describe the concepts are chosen accordingly. There are also some concepts that have been adopted from marketing (e.g. involvement, impulse buying) and from the health domain (e.g. subjective healthiness, diet quality).

The goal in the selection of the concepts has been to have a selection of concepts that widely cover the psycho-social aspects of food choices complemented by a small number of other individual factors that are highly relevant in food choices.

### 2.3 Selecting the harmonised measures for the concepts

To develop a background document for each concept, the core literature was searched with the emphasis on how it has been applied in FCS studies. The databases used to search literature were Scopus, Google Scholar, PsychInfo, and possibly PubMed, Business Complete and Web of Science depending on how well the studies on the concepts are covered in different databases. As the concepts have different origins, the best combination of databases varies, but the most used ones were Scopus and Google Scholar. Depending on the concept and how much there was literature on applying it in food domain, the scoping literature review could be based mainly on review articles on the topic. The aim was not to do systematic reviews on the concept per

se, but to gather enough background on the concept, find the best definition to the FCS and concentrate on the measures used to operationalise the concept. Based on this material the COMFOCUS harmonised measure was selected as the recommendation to be applied in the future FCS studies in COMFOCUS community.

The criteria for selecting the harmonised measurement for the concepts included how the concept has been applied in food consumer science (FCS) studies, what measures are and have been most commonly used in FCS, what are their strengths and weaknesses, and whether their reliability and validity have been confirmed. The feasibility of the measure was also considered (length of the measure, previous use offering reference points, cultural issues etc.). The last point is highly relevant in FCS studies that use these variables to describe the participants in the study and how the participant characteristics are linked to choices or intentions. In most of these studies there is limited space for measuring these consumer characteristics.

The decisions were made as judgement call without trying to implement any systematic scoring system. Although a clear-cut scoring system would have been more transparent, creating such a score would have been a major task in itself due to the many types of concepts included in the harmonisation process and the variety of measurement operationalisations used per concept. This also implies that the concepts and measures have different roles in studies and therefore in some cases feasibility (short measure with few items) has more weight in justifying the selection, if the concept is useful in giving additional information, but not important enough to qualify to take major space in the study. There are also clear cases where one of the measures is the commonly used one, having good reliability and validity records. In cases where validated scales are not developed, either general scales for consumer behaviour measures or specific scales within FCS, measures with good reliability and validity that have been used in several studies were selected. Although the decisions on selecting the harmonised measures were judgement calls, they are justified in the background documents to make the selections transparent.

A background document for each concept suggests and describes a measurement instrument that is recommended as the harmonised COMFOCUS measure. The document contains a brief concept definition, background on the concept, a description of used measures and detailed description of the selected instrument with reference to the original source. There are also specific notions on the use of the measure when relevant; these can relate to some limitations in the use of the measure. The information in each background document in itself should be adequate for applying the measure in future FCS studies, but it also gives a skeleton to look for more detailed information on the concept and measures, if that is desired. The background documents have undergone peer review with in COMFOCUS WP4 working group. A guide for this process can be seen in Appendix 2.3-2. An overview of the quality check responsibilities is outlined in Appendix 2.3-3.

In addition to harmonising the measures, the most commonly used response scale, namely the Likert scale has been harmonised to a 7-point scale verbally anchored on both ends. The studies have commonly been used either as a 5 or 7-point “disagree-agree” scales with varying qualifiers before anchors, which has produced additional variance in studies and made comparisons between studies difficult. Our suggestion is to use “strongly disagree – strongly agree” scale in all measures that use Likert scale as the response scale and overall recommend the use of 7-point rating scales as response scales, unless there is a clearly defined response scale in the measures. All harmonised COMFOCUS measures include a response scale recommendation.

The aim of the COMFOCUS community is to promote the use of these harmonised measures in FCS studies. However, these measures for different concepts evolve and there will be other better and more feasible measures to replace the now selected ones. The background documents in Chapter 3 have a front page giving the essential information about the concept and the recommended harmonised measure followed by a detailed description. The guidelines for describing concepts and harmonised measures are in Appendix 2.3-1.

## References

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## Appendix 2.3-1 Guidelines for background documents

### Concept name

#### Harmonised measure used in COMFOCUS community:

### Background information

This section should include the concept definition, preferably sourced from the original research, where the concept was first introduced and conceptualised or from succeeding research if considered necessary (e.g. due to better conceptualisation / clarity). The link and relevance to consumer food science should be part of the background as well.

The background information should also include the context in which this concept is relevant and any limitations in the use of the concept, if necessary, with regards to research, theory or relation to other food-related (determinants and/ or behavioural) concepts.

### Used measures

Short introduction to the types of measures and scales used to measure the concept in food consumer science and justification for selecting the one that was chosen.

### Description of chosen measurement scale

This section should list the scale items, response scale including definition of the scale (verbal anchors used/ each point or only the scale endpoints) and including potential remarks related to the structure of the items (e.g. reversed items).

If relevant, a brief description on the scale development process should be provided (including information about studies and development sample).

Please add information on the different versions of the scale (e.g. translations)

### Information on scale characteristics

This section should include brief information to describe the reliability and validity of the measurement scale (when reported and applicable please provide information on face validity / predictive validity / convergent validity / discriminant validity based on literature).

### Any remarks or observations:

If necessary, add any remarks or potential issues in using the selected scale to measure the concept (e.g. potential issues with specific items due to language differences; not suitable for selected target groups).

### References

### Appendix 2.3-2 Guidelines for peer quality review process

The background papers should cover the sections described in the template for the background paper and the template can act as a basis for the peer review as well. The background papers cover the basics on the concepts, but they are not expected to be systematic reviews on concepts or measures used to operationalise the concepts.

Most background papers should follow the template in their main headings, but exceptions are acceptable, if following the headings does not fit well to the concept and measures in question.

*Below are some additional points to the template.*

As described in the template, the background information should define the concepts and give a frame/context in which the concept is relevant. The background does not need to be long, but it should give the reader a good understanding of what the concept is, where it comes from and why it is relevant in food consumer science (e.g. where it has been/can be used).

Used measures should cover the most commonly used measures in food consumer science and justification for choosing the measure to be harmonised.

Description of the chosen scale should give necessary information on how to use the scale. The note related to different versions (e.g. translations) is not necessary at this stage. It refers to later use, when there will be different translations from the COMFOCUS partners, as these documents are expected to be updated in the COMFOCUS library to an extent.

Note that the information of scale characteristics is a subheading of the Description of chosen measurement scale. Any remarks and observations is a subheading giving an opportunity to add relevant information about the measurement scale, but this may be relevant only in some cases.

In addition to content, pay attention to the readability of the document. The text should be at the level that early career scientists and those whose core expertise is not in behavioural sciences understand the content.

**Table 2.3-1. Check list for peer quality review**

|   | Yes | Partly | No | Comment |
|---|-----|--------|----|---------|
| Is the concept defined?   |     |        |    |         |
| Is the background of the concept described sufficiently?                |     |        |    |         |
| Do the used measures section cover the most relevant ones?              |     |        |    |         |
| Is the choice of the harmonised measure justified?                      |     |        |    |         |
| Is the chosen measure described in necessary detail in order to use it? |     |        |    |         |
| Is the reliability of the measure addressed?*                           |     |        |    |         |
| Is the validity of the measure addressed?*                              |     |        |    |         |
| In general, is the document easy to read?                               |     |        |    |         |

\* addressed can also be a statement saying that reliability/validity has not been established.

## Appendix 2.3-3 Authors of background papers and peer quality reviews

Table 2.3-2. Overview of peer quality review responsibilities

| Nr. | Concept                                 | Author responsible*  | Quality check by*                    |
|-----|---|--|--------------------------------------|
| 1.  | Attitudes                               | Machiel Reinders & Liisa Lähteenmäki (WR & AU)                     | Morten Heide (Nofima)                |
| 2.  | Subjective norm                         | Catalin Stancu (AU)  | Morten Heide (Nofima)                |
| 3.  | Personal norm                           | Catalin Stancu (AU)  | Morten Heide (Nofima)                |
| 4.  | Self-identity                           | Catalin Stancu & Liisa Lähteenmäki (AU)                            | Machiel Reinders (WR)                |
| 5.  | Personal values                         | Catalin Stancu & Liisa Lähteenmäki (AU)                            | Anna Claret (IRTA)                   |
| 6.  | Self-efficacy                           | Catalin Stancu & Liisa Lähteenmäki (AU)                            | Machiel Reinders (WR)                |
| 7.  | General interest towards healthy eating | Catalin Stancu & Liisa Lähteenmäki (AU)                            | Monique Raats (UoS)                  |
| 8.  | Environmental concern                   | Catalin Stancu (AU)  | Roberta Raffaelli (UNITN)            |
| 9.  | Food choice motives                     | Catalin Stancu & Liisa Lähteenmäki (AU)                            | Mari Sandell (UTU)                   |
| 10. | Food neophobia                          | Catalin Stancu & Liisa Lähteenmäki (AU)                            | Machiel Reinders (WR)                |
| 11. | Food disgust sensitivity                | Catalin Stancu & Liisa Lähteenmäki (AU)                            | Machiel Reinders (WR)                |
| 12. | Impulse buying tendency                 | Catalin Stancu & Liisa Lähteenmäki (AU)                            | Lada, Timotijevic (UoS)              |
| 13. | Food involvement                        | Catalin Stancu & Liisa Lähteenmäki (AU)                            | Machiel Reinders (WR)                |
| 14. | Restraint eating                        | Catalin Stancu & Liisa Lähteenmäki (AU)                            | Lisa Mohebati & Charo Hodgkins (UoS) |
| 15. | Emotional eating                        | Catalin Stancu & Liisa Lähteenmäki (AU)                            | Lisa Mohebati & Charo Hodgkins (UoS) |
| 16. | Mindful eating                          | Catalin Stancu & Liisa Lähteenmäki (AU)                            | Lisa Mohebati & Charo Hodgkins (UoS) |
| 17. | Diet Style                              | Catalin Stancu & Liisa Lähteenmäki (AU)                            | Lisa Mohebati & Charo Hodgkins (UoS) |
| 18. | Subjective health                       | Catalin Stancu & Liisa Lähteenmäki (AU)                            | Monique Raats (UoS)                  |
| 19. | Subjective wellbeing                    | Catalin Stancu & Liisa Lähteenmäki (AU)                            | Anna Claret (IRTA)                   |
| 20. | Self-evaluated healthiness of diet      | Lisa Mohebati, Liisa Lähteenmäki & Morten Heide (UoS, AU & Nofima) | Lluis Guerrero (IRTA)                |

\* in brackets is the institute to which the researcher is affiliated to; Aarhus University (AU), Institute of Agrifood Research and Technology (IRTA), Nofima (Nofima), University of Surrey (UoS), University of Trento (UNITN), University of Turku (UTU), Wageningen Research (WR)



## CHAPTER 3

Concepts and harmonised measures

### 3. Concepts and harmonised measures

In this chapter each of the 20 selected concepts and recommended harmonised measures for them will be described in separate subsections. Each concept will have a short background including the definition and reference to the theoretical background, overview of the instruments used to measure the concept, and description of the harmonised COMFOCUS measure for the concept.

The descriptions of the concepts has the focus on how the concepts have been operationalised, and based on this overview the selection of the recommended harmonised measure is justified. The measure is described in detail together with possible factors that need to be taken into account when adopting the measure. The aim of these concept and harmonised measure descriptions is to give the reader a practical guide to using the harmonised measures in their studies, but also give an understanding of their strengths and weaknesses.

### 3.1 Attitudes

#### Definition

The definition and operationalisation of attitudes, in this document, follows the theoretical approach of the Theory of Planned Behaviour (TPB, Ajzen, 1991). TPB posits the attitude as an antecedent of behaviour and defines it as a summary evaluation of an object or behaviour, which can be positively (favourable) or negatively valued (unfavourable) (Ajzen, 1991).

#### Harmonised measure

Engaging in behaviour (OR Product/Food/Meal) is

Cognitive attitude (7-point bipolar scale)

bad : \_\_1\_\_ : \_\_2\_\_ : \_\_3\_\_ : \_\_4\_\_ : \_\_5\_\_ : \_\_6\_\_ : \_\_7\_\_ : good

harmful : \_\_1\_\_ : \_\_2\_\_ : \_\_3\_\_ : \_\_4\_\_ : \_\_5\_\_ : \_\_6\_\_ : \_\_7\_\_ : beneficial

foolish : \_\_1\_\_ : \_\_2\_\_ : \_\_3\_\_ : \_\_4\_\_ : \_\_5\_\_ : \_\_6\_\_ : \_\_7\_\_ : wise

Affective attitude (7-point bipolar scale)

unpleasant : \_\_1\_\_ : \_\_2\_\_ : \_\_3\_\_ : \_\_4\_\_ : \_\_5\_\_ : \_\_6\_\_ : \_\_7\_\_ : pleasant

unenjoyable : \_\_1\_\_ : \_\_2\_\_ : \_\_3\_\_ : \_\_4\_\_ : \_\_5\_\_ : \_\_6\_\_ : \_\_7\_\_ : enjoyable

boring : \_\_1\_\_ : \_\_2\_\_ : \_\_3\_\_ : \_\_4\_\_ : \_\_5\_\_ : \_\_6\_\_ : \_\_7\_\_ : interesting

**Reliability** – some evidence provided

**Validity** – some evidence provided

#### References

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179-211.

## 3.2 Subjective norm

### Definition

Subjective norm refers to “the perceived social pressure to perform or not to perform a behaviour” (Ajzen, 1991, p. 188). Ajzen (1991) proposes that a favourable attitude and subjective norm for a specific behaviour in addition to a high perceived behavioural control would lead to high intentions to perform that behaviour.

### Harmonised measure

Subjective norm (Carfora et al., 2019)

1. People who are important to me think I should ... (purchase organic milk) over the next month
2. People who are important to me approve of ... (my organic milk purchase) over the next month
3. People who are important to me want me to ... (purchase organic milk) over the next month
4. I feel under social pressure to ... (purchase organic milk) over the next month

Response scale: 7-point Likert scale ranging from 1) “strongly disagree” to 7) “strongly agree”

Note: in brackets is the behaviour in focus in the original study that should be replaced with the target behaviour in future studies

**Reliability** – evidence provided

**Validity** – evidence provided

### References

Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes*, 50(2), 179-211.

Carfora, V., Cavallo, C., Caso, D., Del Giudice, T., De Devitiis, B., Viscecchia, R., . . . Cicia, G. (2019). Explaining consumer purchase behavior for organic milk: Including trust and green self-identity within the theory of planned behavior. *Food Quality and Preference*, 76, 1-9. doi:<https://doi.org/10.1016/j.foodqual.2019.03.006>

### 3.3 Personal norm

#### Definition

Personal norms refer to the individual's perception of the moral correctness or incorrectness of engaging in a particular behaviour (Ajzen, 1991) and include "feelings of (...) responsibility to perform, or refuse to perform, a certain behavior" (Ajzen, 1991, p. 199). Personal norms are also known as perceived moral obligation or moral norms (Rivis, Sheeran, & Armitage, 2009). Schwartz (1973) defines personal norm as one's conviction, which stems from the intensity of moral obligation feelings, to follow the line of behaviour that is perceived as either right or wrong.

#### Harmonised measure

Personal norm (PN) (Onwezen, Antonides, & Bartels, 2013) (adapted from Gärling, Fujii, Gärling, & Jakobsson, 2003)

1. I feel a moral obligation to (protect the environment)
2. I feel that I should (protect the environment)
3. I feel it is important that (people in general protect the environment)
4. Because of my own values/principles, I feel an obligation to (behave in an environmentally-friendly way)

Rating scale: 1) "strongly disagree" to 7) "strongly agree"

Note: The behaviour in brackets should be replaced with the target behaviour

**Reliability** – evidence provided

**Validity** – some evidence provided

#### References

Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes*, 50(2), 179-211.

Gärling, T., Fujii, S., Gärling, A., & Jakobsson, C. (2003). Moderating effects of social value orientation on determinants of proenvironmental behavior intention. *Journal of Environmental Psychology*, 23(1), 1-9. doi:[https://doi.org/10.1016/S0272-4944\(02\)00081-6](https://doi.org/10.1016/S0272-4944(02)00081-6)

Onwezen, M. C., Antonides, G., & Bartels, J. (2013). The Norm Activation Model: An exploration of the functions of anticipated pride and guilt in pro-environmental behaviour. *Journal of Economic Psychology*, 39, 141-153.

Rivis, A., Sheeran, P., & Armitage, C. J. (2009). Expanding the affective and normative components of the theory of planned behavior: A meta-analysis of anticipated affect and moral norms. *Journal of Applied Social Psychology*, 39(12), 2985-3019.

Schwartz, S. H. (1973). Normative explanations of helping behavior: A critique, proposal, and empirical test. *Journal of Experimental Social Psychology*, 9(4), 349-364.

### 3.4 Self-identity

#### Definition

Generally, in consumer science identity can be defined as “any category label to which a consumer self-associates either by choice or endowment” (Reed II, Forehand, Puntoni, & Warlop, 2012, pp. 312). In the context of healthy and /or sustainable food choice, here we focus on healthy eater and/ or pro-environmental self-identity, that is the extent to which one identifies with being a healthy eater, respectively a pro-environmental person.

#### Harmonised measure(s)

Healthy eater self-identity (Carfora, Caso, & Conner, 2016)

1. I think of myself as a healthy eater.
2. I think of myself as a person who is interested in eating healthy.
3. I think of myself as someone who is concerned about the health consequences of what I eat.

Rating scale: 1) “strongly disagree” to 7) “strongly agree”

Scale score: Mean score of the three items.

Environmental self-identity (Van der Werff, Steg, & Keizer, 2013)

1. Acting environmentally friendly is an important part of who I am.
2. I am the type of person who acts environmentally friendly.
3. I see myself as an environmentally friendly person.

Rating scale: 1) “strongly disagree” to 7) “strongly agree”

Scale score: Mean score of the three items.

**Reliability** – evidence provided for both self-identity measures

**Validity** – some evidence provided for both self-identity measures

#### References

- Carfora, Caso, D., & Conner, M. (2016). The role of self-identity in predicting fruit and vegetable intake. *Appetite*, 106, 23-29.
- Reed II, A., Forehand, M. R., Puntoni, S., & Warlop, L. (2012). Identity-based consumer behavior. *International Journal of Research in Marketing*, 29(4), 310-321.
- Van der Werff, E., Steg, L., & Keizer, K. (2013). The value of environmental self-identity: The relationship between biospheric values, environmental self-identity and environmental preferences, intentions and behaviour. *Journal of Environmental Psychology*, 34, 55-63.

### 3.5 Personal values

#### Definition

Several definitions have attempted to capture the meanings behind the concept of personal value. Rokeach (1973, p. 5, as cited in Peng, Nisbett, & Wong, 1997) define value as “an enduring belief”, Schwartz (1994, p. 20) defines it as “a belief, pertaining to desirable end states or modes of conduct”, while Kluckhohn (1951, p. 395) views it as a conception of the desirable “modes, means, and ends of action”. Moreover, Schwartz argues that values differ in terms of the motivational goal they represent. Values are “conscious goals, responses to three universal requirements with which all individuals and societies must cope: needs of individuals as biological organisms, requisites of coordinated social interaction, and requirements for the smooth functioning and survival of groups” (Schwartz, 1994, p. 21).

#### Harmonised measure

Portrait Values Questionnaire (PVQ-21) (Schwartz, 2003, European Social Survey (ESS))

“How much like you is this person?”

1. Thinking up new ideas and being creative is important to him. He likes to do things in his own original way.
2. It is important to him to be rich. He wants to have a lot of money and expensive things.
3. He thinks it is important that every person in the world be treated equally. He believes everyone should have equal opportunities in life.
4. It's important to him to show his abilities. He wants people to admire what he does.
5. It is important to him to live in secure surroundings. He avoids anything that might endanger his safety.
6. He likes surprises and is always looking for new things to do. He thinks it is important to do lots of different things in life.
7. He believes that people should do what they're told. He thinks people should follow rules at all times, even when no-one is watching.
8. It is important to him to listen to people who are different from him. Even when he disagrees with them, he still wants to understand them.
9. It is important to him to be humble and modest. He tries not to draw attention to himself.
10. Having a good time is important to him. He likes to “spoil” himself
11. It is important to him to make his own decisions about what he does. He likes to be free to plan and not depend on others.
12. It's very important to him to help the people around him. He wants to care for their well-being.
13. Being very successful is important to him. He hopes people will recognize his achievements.
14. It is important to him that the government insures his safety against all threats. He wants the state to be strong so it can defend its citizens.
15. He looks for adventures and likes to take risks. He wants to have an exciting life.
16. It is important to him always to behave properly. He wants to avoid doing anything people would say is wrong.
17. It is important to him to get respect from others. He wants people to do what he says.
18. It is important to him to be loyal to his friends. He wants to devote himself to people close to him.
19. He strongly believes that people should care for nature. Looking after the environment is important to him.
20. Tradition is important to him. He tries to follow the customs handed down by his religion or his family.

21. He seeks every chance he can to have fun. It is important to him to do things that give him pleasure.

Response format: 6-point scale 1) “not like me at all”, 2) “not like me”, 3) “a little like me”, 4) “somewhat like me”, 5) “like me”, 6) “very much like me”

PVQ-21 scale scoring “Self-Direction” (SD): 1, 11; “Benevolence” (BE):12, 18; “Stimulation” (ST): 6, 15; “Tradition” (TR): 9, 20; “Achievement” (AC): 4, 13; “Universalism” (UN): 3, 8, 19; “Security” (SEC): 5, 14; “Power” (PO): 2, 17; “Conformity” (CO): 7, 16; “Hedonism” (HE): 10, 21.

Value scores: As noted by Schwartz (2003) when examining associations of the ten values with any other variable, it is necessary to correct for response tendencies in using the response scale. That implies centring the scores for each value. This can be achieved by subtracting the overall individual mean for the values from the score of each value item. Centred scores are recommended for correlational analysis and comparisons between groups, however, for structural analysis such as confirmatory factor analysis or MDS the raw values are recommended (see Bilsky et al., 2015)

Note: When Personal values are a central part of the study, the full scale PVQ-21 is recommended. However, single value categories can be used as background variables to describe or segment respondents (e.g. “universalism” or “hedonism”).

**Reliability** – evidence provided

**Validity** – evidence provided

## References

Bilsky, W., Gollan, T., Roccas, S., Grad, H., Teixeira, M. L. M., Rodriguez, M., ... & Segal-Caspi, L. (2015). On the relative importance of personal values: Validating Schwartz’s theory of value structures by computerized paired comparisons. *Journal of Individual Differences*, 36(2), 119.

Kluckhohn, C. (1951 ). Values and value-orientations in the theory of action. . In a. E. A. S. e. T. Parsons (Ed.), *Toward a General Theory of Action* (pp. 388-433). Cambridge, MA: Harvard University Press.

Peng, K., Nisbett, R. E., & Wong, N. Y. (1997). Validity problems comparing values across cultures and possible solutions. *Psychological Methods*, 2(4), 329.

Rokeach, M. (1973). *The nature of human values*: Free press.

Schwartz, S. (1994). Are there universal aspects in the structure and contents of human values? *Journal of social issues*, 50(4), 19-45.

Schwartz, S. (2003). A proposal for measuring value orientations across nations. *Questionnaire package of the european social survey*, 259(290), 261.

### 3.6 Self-efficacy

#### Definition

Self-efficacy refers to the “beliefs in one’s capabilities to organize and execute the courses of action required to produce given levels of attainment” (Bandura, 1998, p. 624).

#### Harmonised measure

Healthy eating and weight self-efficacy scales (HEWSE; Wilson-Barlow, Hollins & Clopton, 2014)

##### Factor 1. Consumption of healthy foods

1. I am able to consume fruits and vegetables in most of my meals.
2. I am able to eat a variety of healthy foods to keep my diet balanced.
3. Based on my knowledge of nutrition, I am able to choose healthy foods at restaurants and from stores.
4. I am able to modify recipes to make them healthier.
5. I am able to choose recipes based on nutritional value.
6. If I choose to indulge in unhealthy food, I am able to appropriately compensate later.
7. When I feel hungry, I am able to easily choose healthy food over less healthy options.

##### Factor 2. Healthy weight

1. If I gain weight, I am able to lose that weight in a timely manner.
2. I am able to control my body weight.
3. I am able to keep my body weight changes within 10 pounds.
4. I have confidence that I can attain and maintain my ideal weight.

Response scale: 1) “strongly disagree” to 5) “strongly agree”

**Reliability** – evidence provided

**Validity** – some evidence provided

#### References

Bandura, A. (1998). Health promotion from the perspective of social cognitive theory. *Psychology and health*, 13(4), 623-649.

Wilson-Barlow, L., Hollins, T. R., & Clopton, J. R. (2014). Construction and validation of the healthy eating and weight self-efficacy (HEWSE) scale. *Eating Behaviors*, 15(3), 490-492.

### 3.7 General Interest towards healthy eating

#### Definition

General interest towards healthy eating can be defined similarly to an attitude as a learnt predisposition to behave in a consistently favourably or unfavourably with respect to an object (Eagly & Chaiken, 1993; Schiffman, Kanuk, & Hansen, 2011). Therefore, we conceptualise general health interest towards healthy eating as a summary evaluation of how individuals positively or negatively value the object healthy eating or behaviours related healthy eating as an aggregated domain based on nutritionally healthy eating.

#### Harmonised measure

The General Health Interest Scale (Roininen, Lähteenmäki & Tuorila, 1999)

1. The healthiness of food has little impact on my food choices. (Reversed score)
2. I am very particular about the healthiness of food I eat.
3. I eat what I like and I do not worry much about the healthiness of food. (Reversed score)
4. It is important for me that my diet is low in fat.
5. I always follow a healthy and balanced diet.
6. It is important for me that my daily diet contains a lot of vitamins and minerals.
7. The healthiness of snacks makes no difference to me. (Reversed score)
8. I do not avoid foods, even if they may raise my cholesterol. (Reversed score)

Response scale: 7-point Likert scale ranging from 1) “strongly disagree” to 7) “strongly agree”

Scale score: GHI score by computing the mean of the individual items in each factor.

**Reliability** – evidence provided

**Validity** – evidence provided

#### References

Eagly, A. H., & Chaiken, S. (1993). *The psychology of attitudes*. Harcourt Brace Jovanovich, Fortworth, TX (1993).

Roininen, K., Lähteenmäki, L., & Tuorila, H. (1999). Quantification of consumer attitudes to health and hedonic characteristics of foods. *Appetite*, 33(1), 71-88.

Schiffman, L., Kanuk, L., & Hansen, H. (2011). *Consumer behaviour: A European adaptation*. London, UK: Pearson Education.

### 3.8 Environmental concern

#### Definition

Environmental concern is defined as “the degree to which people are aware of problems regarding the environment and support efforts to solve them and/or indicate a willingness to contribute personally to their solution” (Dunlap and Jones, 2002, p. 485)

#### Harmonised measure

New Ecological Paradigm (Dunlap, et al., 2000)

Introduction text: “Listed below are statements about the relationship between humans and the environment. Please indicate the extent to which you disagree or agree with each statement.

1. We are approaching the limit of the number of people the earth can support
2. Humans have the right to modify the natural environment to suit their needs (R)
3. When humans interfere with nature it often produces disastrous consequences
4. Human ingenuity will insure that we do NOT make the earth unlivable (R)
5. Humans are severely abusing the environment
6. The earth has plenty of natural resources if we just learn how to develop them (R)
7. Plants and animals have as much right as humans to exist
8. The balance of nature is strong enough to cope with the impacts of modern industrial nations (R)
9. Despite our special abilities humans are still subject to the laws of nature
10. The so-called “ecological crisis” facing humankind has been greatly exaggerated (R)
11. The earth is like a spaceship with very limited room and resources
12. Humans were meant to rule over the rest of nature (R)
13. The balance of nature is very delicate and easily upset
14. Humans will eventually learn enough about how nature works to be able to control it (R)
15. If things continue on their present course, we will soon experience a major ecological catastrophe

Response scale: 7-point Likert scale ranging from 1) “strongly disagree” to 7) “strongly agree”

Scale score: Agreement with the eight odd-numbered items and disagreement with the seven even-numbered items marked with an “R” indicate pro-NEP responses

**Reliability** – evidence provided

**Validity** – evidence provided

#### References

- Dunlap, R., & Jones, R. E. (2002). Environmental concern: Conceptual and measurement issues. *Handbook of environmental sociology*, 3(6), 482-524.
- Dunlap, R., Liere, K. V., Mertig, A., & Jones, R. E. (2000). Measuring endorsement of the new ecological paradigm: A revised NEP scale. *Journal of Social Issues*, 56(3), 425-442.

### 3.9 Food choice motives

#### Definition

The concept of motivation refers to the process that determines individuals to act in the way they do, which is triggered by a need that the individual wishes to satisfy (Solomon, Russell-Bennett, & Previte, 2012). Food choice motives refer to “consumers’ motives, reasons or motivations for choosing or eating food” (Onwezen, Reinders, Verain, & Snoek, 2019, p. 34).

#### Harmonised measure

Food Choice Questionnaire (Steptoe, Pollard, & Wardle, 1995)

It is important to me that the food I eat on a typical day

#### Factor 1. Health

- 22. Contains a lot of vitamins and minerals
- 29. Keeps me healthy
- 10. Is nutritious
- 27. Is high in protein
- 30. Is good for my skin/teeth/hair/nails etc
- 9. Is high in fibre and roughage

#### Factor 2. Mood

- 16. Helps me cope with stress
- 34. Helps me to cope with life
- 26. Helps me relax
- 24. Keeps me awake/alert
- 13. Cheers me up
- 31. Makes me feel good

#### Factor 3. Convenience

- 1. Is easy to prepare
- 15. Can be cooked very simply
- 28. Takes no time to prepare
- 35. Can be bought in shops close to where I live or work
- 11. Is easily available in shops and supermarkets

#### Factor 4. Sensory Appeal

- 14. Smells nice
- 25. Looks nice
- 18. Has a pleasant texture
- 4. Tastes good

#### Factor 5. Natural Content

- 2. Contains no additives
- 5. Contains natural ingredients
- 23. Contains no artificial ingredients

#### Factor 6. Price

- 6. Is not expensive
- 36. Is cheap
- 12. Is good value for money

**Factor 7. Weight Control**

- 3. Is low in calories
- 17. Helps me control my weight
- 7. Is low in fat

**Factor 8. Familiarity**

- 33. Is what I usually eat
- 8. Is familiar
- 21. Is like the food I ate when I was a child

**Factor 9. Ethical Concern**

- 20. Comes from countries I approve of politically
- 32. Has the country of origin clearly marked
- 19. Is packaged in an environmentally friendly way

Original response scale: 4-point Likert scale 1) “not at all important”, 2) “a little important”, 3) “moderately important”, 4) “very important”

Recommended response scale: 7-point Likert scale ranging from 1) “not at all important” to 7) “very important”

Scale score: Score for each motive is calculated by computing the average of the items in each factor.

Note: the item numbering guides the randomisation of items when applying the scale

Ethical motives (Lindeman & Väänänen, 2000)

It is important that the food I eat on a typical day

**Factor 1. Ecological Welfare**

- 1. Has been produced in a way that animals have not experienced pain
- 2. Has been produced in a way that animals' rights have been respected
- 3. Has been prepared in an environmentally friendly way
- 4. Has been produced in a way which has not shaken the balance of nature
- 5. Is packaged in an environmentally friendly way a

**Factor 2. Political Values**

- 6. Comes from a country I approve of politically a
- 7. Comes from a country in which human rights are not violated
- 8. Has the country of origin clearly marked a
- 9. Has been prepared in a way that does not conflict with my political values

**Factor 3. Religion**

- 10. Is not forbidden in my religion
- 11. Is in harmony with my religious views

Remarks: \* Items marked with a are part of the original FCQ

Original response scale: 4-point Likert scale 1) “not at all important”, 2) “a little important”, 3) “moderately important”, 4) “very important”

Recommended response scale: 7-point Likert scale ranging from 1) “not at all important” to 7) “very important”

Note: When Food choice motives are a central part of the study, the use of full scale is recommended. However, single motive categories can be used as background variables to describe or segment respondents (e.g. “sensory appeal” or “price”).

**Reliability** – evidence provided

**Validity** – evidence provided

**References**

- Lindeman, M., & Väänänen, M. (2000). Measurement of ethical food choice motives. *Appetite*, 34(1), 55-59.
- Onwezen, M., Reinders, M., Verain, M., & Snoek, H. (2019). The development of a single-item Food Choice Questionnaire. *Food Quality and Preference*, 71, 34-45.
- Solomon, M., Russell-Bennett, R., & Previte, J. (2012). *Consumer behaviour*: Pearson Higher Education AU.
- Step toe, A., Pollard, T. M., & Wardle, J. (1995). Development of a measure of the motives underlying the selection of food: the food choice questionnaire. *Appetite*, 25(3), 267-284.

### 3.10 Food neophobia

#### Definition

Food neophobia is conceptualised as a trait, which refers to “the reluctance to eat and/or avoidance of novel foods” (Pliner & Hobden, 1992, p. 105).

#### Harmonised measure

Food Neophobia scale (FNS; Pliner & Hobden, 1992)

1. I am constantly sampling new and different foods. (R)
2. I don't trust new foods.
3. If I don't know what is in a food, I won't try it.
4. I like foods from different countries. (R)
5. Ethnic food looks too weird to eat.
6. At dinner parties, I will try a new food. (R)
7. I am afraid to eat things I have never had before.
8. I am very particular about the foods I will eat.
9. I will eat almost anything. (R)
10. I like to try new ethnic restaurants. (R)

Note: Items marked with (R) have reversed scoring

Response scale: 1) “disagree strongly” to 7) “agree strongly”

**Reliability** – evidence provided

**Validity** – evidence provided

#### References

Pliner, P., & Hobden, K. (1992). Development of a scale to measure the trait of food neophobia in humans. *Appetite*, 19(2), 105-120.

### 3.11 Food disgust sensitivity

#### Definition

Food Disgust Sensitivity can be defined as a trait that reflects individual differences in the “emotional predisposition to be more or less easily disgusted by certain food-related cues” (Hartmann & Siegrist, 2018).

#### Harmonised measure

Food Disgust scale short (FDS short; Hartmann & Siegrist, 2018)

Instruction for participants: “Please indicate how disgusting you perceive the following products or situations to be.”

1. To put animal cartilage into my mouth
2. To eat with dirty silverware in a restaurant
3. Food donated from a neighbour whom I barely know
4. To eat hard cheese from which mould was cut off
5. To eat apple slices that turned brown when exposed to air
6. The texture of some kinds of fish in the mouth
7. To eat brown-coloured avocado pulp
8. There is a little snail in the salad that I wanted to eat

Response scale: 1) “not disgusting at all” to 6) “totally disgusting”

Scale score: Mean values are calculated by averaging all eight items.

Note: the short FDS version is preferred when there are space and time constraints, else the full FDS containing 32 items is recommended for use, especially when Food disgust sensitivity has a central role in the research study (e.g. is the dependent variable)

**Reliability** – evidence provided

**Validity** – evidence provided

#### References

Hartmann, C., & Siegrist, M. (2018). Development and validation of the Food Disgust Scale. *Food Quality and Preference*, 63, 38-50.

### 3.12 Impulse buying tendency

#### Definition

The most comprehensive definition of impulsive buying depicts it as the situation in which a “consumer experiences a sudden, often powerful and persistent urge to buy something immediately” (Rook, 1987, p. 191).

#### Harmonised measure

The Impulse buying tendency scale (Weun, Jones, & Beatty, 1998)

1. When I go shopping, I buy things that I had not intended to purchase.
2. I am a person who makes unplanned purchases.

Response scale: 1) “very rarely” to 4) “sometimes” to 7) “very often”

3. When I see something that really interests me, I buy it without considering the consequences.
4. It is fun to buy spontaneously.
5. I avoid buying things that are not on my shopping list. (R)

Response scale: 1) “strongly disagree” to 7) “strongly agree”

Note: Items marked with (R) are reversed scored

Score: sum of items was used in the original article

**Reliability** – evidence provided

**Validity** – evidence provided

#### References

Rook, D. W. (1987). The buying impulse. *Journal of Consumer Research*, 14(2), 189-199.

Weun, S., Jones, M. A., & Beatty, S. E. (1998). Development and validation of the impulse buying tendency scale. *Psychological Reports*, 82(3\_suppl), 1123-1133.

### 3.13 Food involvement

#### Definition

In relation to food, Bell and Marshall (2003) have conceptualised food involvement as an individual trait as opposed to interest towards a certain product or brand. Food involvement as individual trait captures “the level of importance of food in a person’s life” (Bell & Marshall, 2003, p. 236) and varies across people.

#### Harmonised measure

Food involvement scale (FIS) (Bell & Marshall, 2003)

1. I don’t think much about food each day. (R)
2. Cooking or barbequing is not much fun. (R)
3. Talking about what I ate or am going to eat is something I like to do.
4. Compared with other daily decisions, my food choices are not very important. (R)
5. When I travel, one of the things I anticipate most is eating the food there.
6. I do most or all of the clean up after eating. (S&D)
7. I enjoy cooking for others and myself.
8. When I eat out, I don’t think or talk much about how the food tastes. (R)
9. I do not like to mix or chop food. (R)
10. I do most or all of my own food shopping.
11. I do not wash dishes or clean the table. (R) (S&D)
12. I care whether or not a table is nicely set. (S&D)

Rating scale: 1) “disagree strongly” to 7) “agree strongly”

Note: items marked with (R) are reverse scored

Scale score: A composite total FIS score is computed by summing each item (after reversing the score of items marked above with R)

Factor composition: Items marked with (S&D) for the subfactor Set and Disposal; All the other items form the subfactor Preparation and Eating (P&E)

**Reliability** – evidence provided

**Validity** – evidence provided

#### References

Bell, R., & Marshall, D. W. (2003). The construct of food involvement in behavioral research: scale development and validation. *Appetite*, 40(3), 235-244.

### 3.14 Restraint eating

#### Definition

Restraint eating refers to people's tendency of restricting food intake in order to lose or control their weight (Herman & Mack, 1975; Herman & Polivy, 1980). People might limit their food intake for various reasons (e.g. food allergies, ethical considerations, religion, weight concerns, social image), however, the literature on restraint eating (chronic dieting) focuses on weight loss dieting with the purpose of maintaining an "ideal weight" (Herman & Mack, 1975). Restraint eating differs from dieting as it refers to eating less than one would like to eat, although not necessarily less than needed to maintain energy balance (Stice, Cooper, Schoeller, Tappe, & Lowe, 2007).

#### Harmonised measure

TFEQ-18 Cognitive restraint sub-scale Karlsson and colleagues (Karlsson, Persson, Sjöström, & Sullivan, 2000)

1. I deliberately take small helpings as a means of controlling my weight.

Response scale: definitely true/mostly true/mostly false/definitely false

2. I consciously hold back at meals in order not to gain weight.

Response scale: definitely true/mostly true/mostly false/definitely false

3. I do not eat some foods because they make me fat.

Response scale: definitely true/mostly true/mostly false/definitely false

4. How frequently do you avoid 'stocking up' on tempting foods?

Response scale: almost never/seldom/usually/almost always

5. How likely are you to consciously eat less than you want?

Response scale: unlikely/slightly likely/moderately likely/very likely

6. On a scale of 1 to 8, where 1 means no restraint in eating (eating whatever you want, whenever you want it) and 8 means total restraint (constantly limiting food intake and never 'giving in'), what number would you give yourself?

Response scale: 1) "eat whatever I want, whenever I want it" to 8) "constantly limiting food intake, never 'giving in'"

Coding instruction for item 6: 1–2 scores were coded 1; 3–4 scores were coded 2; 5–6 scores were coded 3; 7–8 scores were coded 4

Karlsson and colleagues (2000) recommend a change of the response format from the original true-false format (Stunkard & Messick, 1985) to a four-point response scale.

Scale score: The authors suggest that the items under the Cognitive restraint sub-scale should be summed to form a scale score and subsequently converted to form a scale ranging from 0-100 following equation:  $[(\text{raw score} - \text{lowest possible raw score}) / \text{possible raw score range}] \times 100$ . The converted scores represent the

relative proportion (%) of highest possible raw scores. The theoretical possible raw score range of the scores for the cognitive restraint scale is 18 (i.e. with a minimum of 6 and maximum of 24).

The converted scores are used to facilitate comparison between the three eating styles measured by the full TFEQ (i.e. restraint, uncontrolled and emotional eating styles), as the 18 items are not evenly distributed across the three domains. In research where comparison between eating styles is not relevant the scores on restraint eating scale can be summated and interpreted as the higher the score the more one is characterized by restraint eating style.

**Reliability** – evidence provided

**Validity** – evidence provided

### References

Herman, C., & Mack, D. (1975). Restrained and unrestrained eating. *Journal of personality*, 43, 647-660.

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### 3.15 Emotional eating

#### Definition

Emotional eating has been commonly defined as a tendency to overeat in response to negative emotions (Arnow, Kenardy, & Agras, 1995; Van Strien, Frijters, Bergers, & Defares, 1986; van Strien et al., 2007).

#### Harmonised measure

Emotional eating (TFEQ-18; Karlsson, Persson, Sjöström, & Sullivan, 2000)

1. When I feel anxious, I find myself eating.
2. When I feel blue, I often overeat.
3. When I feel lonely, I console myself by eating.

Response scale: definitely true; mostly true; mostly false; definitely false

Karlsson and colleagues (2000) recommend a change of the response format from the original true-false format (Stunkard & Messick, 1985) to a four-point response scale.

Scale score: The authors suggest that the items under the sub-scales should be summed to form a scale score and subsequently converted to form a scale ranging from 0-100 following equation:  $[(\text{raw score} - \text{lowest possible raw score}) / \text{possible raw score range}] \times 100$ . The converted scores represent the relative proportion (%) of highest possible raw scores. The theoretical possible raw score range of the scores for the emotional eating scale is 9 (i.e. with a minimum of 3 and maximum of 12).

The *converted scores* are used to facilitate comparison between the three eating styles measured by the full TFEQ-18 (i.e. restraint, uncontrolled and emotional eating styles), as the 18 items are not evenly distributed across the three eating styles. In research where comparison between eating styles is not relevant, the scores on emotional eating scale can be summated and interpreted as the higher the score the more one is characterised by emotional eating style.

**Reliability** – evidence provided

**Validity** – evidence provided

#### References

Arnow, B., Kenardy, J., & Agras, W. S. (1995). The Emotional Eating Scale: The development of a measure to assess coping with negative affect by eating. *International Journal of Eating Disorders*, 18(1), 79-90.

Karlsson, J., Persson, L.-O., Sjöström, L., & Sullivan, M. (2000). Psychometric properties and factor structure of the Three-Factor Eating Questionnaire (TFEQ) in obese men and women. Results from the Swedish Obese Subjects (SOS) study. *International Journal of Obesity*, 24(12), 1715-1725.

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### 3.16 Mindful eating

#### Definition

Mindful eating is defined as the “nonjudgmental awareness of physical and emotional sensations while eating or in a food-related environment” (Framson et al., 2009, p. 1439).

#### Harmonised measure

Mindful Eating Behavior Scale (MEBS; Winkens et al., 2018)

##### Factor 1. Focused Eating

1. I notice flavors and textures when I’m eating my food.
2. I stay aware of my food while eating.
3. I notice how my food looks.
4. I notice the smells and aromas of food.
5. It is easy for me to concentrate on what I eat.

##### Factor 2. Hunger and Satiety Cues

6. I trust my body to tell me when to eat.
7. I trust my body to tell me what to eat.
8. I trust my body to tell me how much to eat.
9. I rely on my hunger signals to tell me when to eat.
10. I rely on my fullness signals to tell me when to stop eating.

##### Factor 3. Eating with Awareness

11. I snack without being aware that I am eating. (R)
12. I eat automatically without being aware of what I eat. (R)
13. I eat something without really being aware of it. (R)

##### Factor 4. Eating without Distraction

14. My thoughts tend to wander while I am eating. (R)
15. I think about things I need to do while I am eating. (R)
16. I multi-task while I am eating. (R)
17. I read while I am eating. (R)

Response scale: 1) “never” to 5) “very often”

Scale score: While not explicitly stated in the original paper, sum of scores of the items pertaining to each factor seem to be used as factor measure. As inter-factor correlations were low, it is not recommended to compute a total score combining all four facets of the scale.

**Reliability** – evidence provided

**Validity** – some evidence provided

#### References

Framson, C., Kristal, A. R., Schenk, J. M., Littman, A. J., Zeliadt, S., & Benitez, D. (2009). Development and validation of the mindful eating questionnaire. *Journal of the American Dietetic Association*, 109(8), 1439-1444.

Winkens, L., van Strien, T., Barrada, J. R., Brouwer, I. A., Penninx, B. W., & Visser, M. (2018). The Mindful Eating Behavior Scale: Development and psychometric properties in a sample of Dutch adults aged 55 years and older. *Journal of the Academy of Nutrition and Dietetics*, 118(7), 1277-1290. e1274.

### 3.17 Diet style

#### Definition

People differ in their dietary preferences with self-declared diet styles ranging from meat eaters to vegans (Allès et al., 2017; Hagmann, Siegrist, & Hartmann, 2019). The main diet styles are the omnivore (i.e. eating all foods, including meat) versus vegetarian (Ipsos, 2018), however, the latter entails a spectrum of food selection or avoidance patterns (Rosenfeld & Burrow, 2017; Ruby, 2012).

A vegetarian diet is a mainly plant-based diet that excludes meat and can be further divided into sub-sets of diets differing in the extent to which different animal-based foods are included/excluded. In line with the WHO Europe (2021) the vegetarian diet styles are lacto-vegetarian, lacto-ovo vegetarian, ovo-vegetarian, pescatarian (or Pesco-vegetarian), flexitarian (semi-vegetarian) and vegan. Following a lacto-vegetarian diet excludes any consumption of meat, poultry, fish or eggs, however, it includes dairy products such as milk or cheese. Lacto-ovo vegetarian also includes eggs along dairy products as allowed foods. Ovo-vegetarian is a diet that includes consumption of eggs, but excludes any types of dairy products. Pesco-vegetarian diets includes fish, dairy and eggs but not any type of meat. The most permissive type of vegetarian diets is the semi-vegetarian, also called flexitarian diet that means eating mainly vegetarian food, but can include occasional consumption of meat, dairy, eggs, poultry or fish on occasion. Finally, the vegan diet omits all animal products.

#### Harmonised measure

Diet style (World Health Organization, 2021)

Which of the following categories best describe your current dietary style?

1. Omnivore (does not exclude any food groups),
2. Semi-vegetarian / flexitarian (primarily vegetarian-based diets but occasionally includes meat, dairy, eggs, poultry or fish)
3. Vegetarian (no meat, fish or seafood, but other animal-based foods such as dairy products or eggs)
4. Lacto-vegetarian (no meat, fish or eggs but includes dairy-based products such as milk or cheese)
5. Lacto-ovo vegetarian (no meat or fish but includes eggs and dairy-based products such as milk or cheese)
6. Ovo-vegetarian (no meat, fish or dairy-based products but includes eggs)
7. Vegan (no animal-based foods)

**Reliability** – evidence provided

**Validity** – evidence provided

## References

Allès, B., Baudry, J., Méjean, C., Touvier, M., Péneau, S., Hercberg, S., & Kesse-Guyot, E. (2017). Comparison of sociodemographic and nutritional characteristics between self-reported vegetarians, vegans, and meat-eaters from the NutriNet-Santé study. *Nutrients*, 9(9), 1023.

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Ipsos. (2018). An exploration into diets around the world. Retrieved from [https://www.ipsos.com/sites/default/files/ct/news/documents/2018-09/an\\_exploration\\_into\\_diets\\_around\\_the\\_world.pdf](https://www.ipsos.com/sites/default/files/ct/news/documents/2018-09/an_exploration_into_diets_around_the_world.pdf)

Rosenfeld, D. L., & Burrow, A. L. (2017). The unified model of vegetarian identity: A conceptual framework for understanding plant-based food choices. *Appetite*, 112, 78-95.

Ruby, M. B. (2012). Vegetarianism. A blossoming field of study. *Appetite*, 58(1), 141-150.

World Health Organization. (2021). Plant-based diets and their impact on health, sustainability and the environment: a review of the evidence: WHO European Office for the Prevention and Control of Noncommunicable Diseases.

### 3.18 Subjective health

#### Definition

Subjective general health refers to people's "assessment or self-rating of their health in general" (Baron-Epel & Kaplan, 2001).

#### Harmonised measure

Subjective general health (ESS, 2020)

How is your health<sup>a</sup> in general? Would you say it is ...

Response scale: 1) "Very good", 2) "Good", 3) "Fair", 4) "Bad", 5) "Very bad", 6) "Refusal", 7) "Don't know" 8) "No answer"

<sup>a</sup> Physical and mental health (used as a footnote when relevant to remind about both aspects of health)

**Validity** – some evidence provided

#### References

Baron-Epel, O., & Kaplan, G. (2001). General subjective health status or age-related subjective health status: does it make a difference? *Social Science & Medicine*, 53(10), 1373-1381.

ESS. (2020). European Social Survey Round 10 Source Questionnaire. London: ESS ERIC Headquarters c/o City, University of London (Publication no. [http://www.europeansocialsurvey.org/docs/round10/questionnaire/ESS-Round-10-Source-Questionnaire\\_FINAL\\_Alert-06.pdf](http://www.europeansocialsurvey.org/docs/round10/questionnaire/ESS-Round-10-Source-Questionnaire_FINAL_Alert-06.pdf)).

### 3.19 Subjective wellbeing

#### Definition

Well-being as a concept still lacks an agreed upon definition. Many terms have been used interchangeably to address it, such as quality of life, welfare, life satisfaction or happiness (for an overview about wellbeing see McGillivray & Clarke, 2006). Well-being is commonly seen as a multidimensional concept consisting of an affect dimension and a cognitive one (Meiselman, 2016). In the food domain, the cognitive component of subjective well-being has been conceptualised as satisfaction with food-related life and defined as “an overall evaluative assessment of that part of a person’s life comprising procurement, preparation and consumption of food and meals according to his/her chosen criteria” (Grunert, Dean, Raats, Nielsen, & Lumbers, 2007, p. 487).

#### Harmonised measure

Satisfaction with food related life (SFRL; Grunert et al., 2007)

Instructions for participants: Please think of all the things you do and experience in relation to food and meals (e.g., planning meals, shopping, preparing meals, eating meals) and then, using the 1–7 scale below, indicate your agreement with each item.

1. My life in relation to food and meals is close to my ideal.
2. With regard to food, the conditions of my life are excellent.
3. I am generally pleased with my food.
4. Food and meals give me satisfaction in daily life.
5. Food and meals are positive elements in my life.

Response scale: 1) “completely disagree” to 7) “completely agree”

Scale score: should be calculated as the mean value of the five items

**Reliability** – evidence provided

**Validity** – evidence provided

#### References

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McGillivray, M., & Clarke, M. (2006). Human well-being: Concepts and measures. In *Understanding human well-being* (pp. 3-16). New York, NY: United Nations University Press.

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### 3.20 Self-evaluated healthiness of diet

#### Definition

Self-evaluated healthiness of diet refers to people's assessment or self-rating of the healthiness of their own diet.

#### Harmonised measure

Self-rated healthiness of diet Loftfield et al. (2015)

"In general, how healthy is your diet? Would you say it is:

1) "excellent"; 2) "very good"; 3) "good"; 4) "fair", or 5) "poor" or 6) "refuse to say" or 7) "don't know"

Note: The measure can be used as an additional background variable to give an indication of diet quality, but if the diet quality is the main dependent variable or a core concepts in a study, more elaborate measures are needed.

**Validity** – evidence provided

#### References

Loftfield, E., Yi, S., Immerwahr, S., & Eisenhower, D. (2015). Construct validity of a single-item, self-rated question of diet quality. *Journal of Nutrition Education and Behavior*, 47(2), 181-187.



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