Nordic Council of Ministers

Food Sustainability Understanding in the Nordic-Baltic countries

Contents

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About

About this document

This report is an outcome of the project 'Food sustainability understanding in the Nordic-Baltic region as a basis for a labelling framework in Europe' (project nr 9058, journal reference nr 2021-92-24-01178) funded by the Nordic Council of Ministers.

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Executive summary

European consumer-citizens are concerned about sustainability issues when it comes to agriculture and food. However, there is a gap between the degree of concern and the rate of choices for relatively more sustainable food products. There are many potential reasons for this, but lack of information and guidance during choice is one of them. To help consumers making more informed choices at the point of sale, a framework for sustainability labelling is discussed at the European level.

This report reports on results from a consumer-citizen survey study across eight Nordic-Baltic countries about the topic of sustainability understanding in the food context. The survey was conducted in the summer of 2022 through a representative online panel and around 600 respondents per country. The project is funded by the Nordic Council of Ministers and conducted by the MAPP Centre at Aarhus University, Denmark, with the contribution of a steering committee of representatives from each country.

The aim of the project is to provide knowledge that can support discussions on sustainability labelling from a Nordic-Baltic perspective. Research insights into consumer-citizens allow decision makers to know where consumer-citizens are in their current understanding. This serves as an important input for discussing an efficient design of and communication about a future sustainability labelling framework, that might take departure in what resonates with current understanding but also providing further learning, thus empowering consumer-citizens to make informed food choices.

The authors invite readers to delve into the details of the results provided and arrive at their own interpretations and implications. However, a few overarching conclusions across the data are provided. Firstly, we conclude that the results show that consumer-citizens in the Nordic-Baltic countries well understand the basic and most widely used definition of sustainable development as provided by the Brundtland commission. However, secondly, we conclude that even though this basic definition addresses both environmental and social aspects, results show that consumer-citizens in the Nordic-Baltic countries mostly think of environmentally-related aspects and issues overall as well as in the context of food. Thirdly, we conclude that results seem to reflect that the media and stakeholder agendas can influence which aspects and issues consumer-citizens name and point to when it comes to sustainability in the food context. Fourthly, it becomes apparent that the more concrete the level (e.g., at the product level), the more diverse is the understanding of which sustainability aspects and issues are thought to be relevant. Fifthly and lastly, while there is a pattern pointing to some differences between the Nordic versus Baltic countries across results, overall, these are small, and there is also a diversity of differences between various countries in individual aspects.

Commentary on Food Sustainability Understanding in the Nordic-Baltic countries

Understanding how different countries and communities conceptualize sustainability is a key element in the development of effective interventions that can drive us closer to achieving a sustainable food system. I am thrilled to have had the opportunity to delve into the insights presented within the report detailing the understanding of food sustainability in Nordic-Baltic countries.

Coinciding with the compilation of this comprehensive report, I was engaged in leading a study that shared a similar overarching goal: analysing the perceptions of both citizens and industries regarding food sustainability in the United Kingdom. The outcome of our research provided the UK government with evidence to understand why sustainable food is important when making food choices. Our investigation also included sustainability labelling, critically assessing the types of information these labels conveyed to the populace.

In our review, we found an intricate network of interconnected concepts within the UK's understanding of sustainability. Core concepts ranged from local and organic production, to animal welfare considerations, dietary shifts toward plant-based regimes, mitigation of meat and dairy consumption, reductions in food waste and packaging, and enhancements in overall health. Together these dimensions contribute to the multifaceted tapestry of sustainability in the UK.

This is important from a food systems perspective as each country's core understandings of Sustainability influence the actions that policy makers, industry and citizens prioritise.

We highlighted the divergence between perceptions and actual environmental impacts – in short: individuals underestimated the magnitude of certain actions, such as equating reducing packaging or increased recycling to the much larger environmental impacts of dietary change. Moreover, we found a divergence between intention and action: individuals aimed to adopt sustainable practices yet this was inconsistent in their shopping and food behaviours. Similar findings have been found in this report with each nation cultivating unique interpretations of sustainability. These different country level perceptions lead to different food choices, and different policymaking outcomes, which result in different sustainable food systems. In particular, the choices of what sustainability means as a labelling concept, can have far reaching purchasing impacts.

Our study additionally uncovered biases within UK understandings of sustainability. There was an emphasis on environmentalism while inadvertently ignoring broader dimensions such as food safety, affordability, and economic growth in relation to sustainability. These biases are mirrored within the Nordic-Baltic countries, further underscoring the importance of this report in considering these country level understandings of food sustainability.

In conclusion, this report on how food sustainability is understood in the Nordic-Baltic region provides a fascinating comparative perspective to my own research in the UK. Both investigations underscore the profound influence of cultural perspectives on sustainability, the challenges tied to perception versus actual impact, and the intricate dance between intention and action at both the personal and food system level. Collectively, they illuminate the imperative of tailoring interventions that are sensitive to local nuances while fostering wider understandings of sustainability that encompass environmental, economic, and social dimensions.

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https://www.food.gov.uk/research/a-rapid-evidence-assessment-of-uk-citizen-and-industry-understandings-of-sustainability

Chapter 1. Background and aim of study

Consumer-citizens are concerned about sustainability and perceive issues such as climate change as one of the main global problems facing the world (Eurobarometer, 2021). When it comes to the food system in general, various sustainability issues, such as use of child labour, deforestation of the rain forest, food security or use of pesticides and animal welfare, raise concerns among consumer-citizens (Grunert et al., 2014, Stancu et al., 2020). However, sustainability aspects are less of a concern when moving to more specific levels, for instance, the food product category level (Grunert et al., 2014).

The discrepancy between concern for sustainability in general and the lower concern in food choices may be explained in part by a lack of consumer understanding of what food sustainability entails (van Bussel et al., 2022). Generally, consumer-citizens are unaware of the actual impact of food production and lack knowledge about sustainability of the food system at large (van Bussel et al., 2022). Previous literature shows that consumer-citizens associate sustainability mainly with environmental-related aspects (Grunert et al., 2014, Peano et al., 2019, Simpson and Radford, 2012, Stancu et al., 2020, van Bussel et al., 2022), whereas other issues are less salient. Although sustainability in food is difficult to understand for consumer-citizens, they seem to find it less challenging to correctly interpret certain sustainability food labels (Grunert et al., 2014). Although labels seem to have an effect on consumer-citizens' perceptions and behaviour (Majer et al., 2022), the over-abundance of labels available on the market can create further confusion (Torma and Thøgersen, 2021). This also highlights that there are distinct levels of abstraction at which consumer-citizens' understanding of sustainability is relevant, starting from the general sustainability, moving to the food domain, then to product categories and finally to the level of specific food products.

How is sustainability defined?

Sustainability is often described as a complex concept and it has been defined in several ways (Reynolds et al., 2022). The original definition of sustainable development from the Brundtland report (WCED, 1987, Chapter 2) is one of the most commonly used definitions of sustainability. According to the report, "*Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs*". The concept is further explained in the report as consisting of two core concepts, the *needs* of humanity and especially the poor, and the *limitations "imposed by the state of technology and social organization on the environment's ability to meet*

present and future needs" (WCED, 1987, Chapter 2). More recently, in 2015, the United Nations *Sustainable Development Goals* (UN SDGs, https://sdgs.un.org/goals) have been agreed upon and consist of 17 goals. These goals can be seen as aligned with the definition of sustainability from the Brundtland report (WCED, 1987) as they reflect human needs and ways to live with the limitations of our planet.

Sustainability is also seen to consist of three pillars, the environment, society and economy (Elkington, 2018, van Bussel et al., 2022). Whereas the environmental and social aspects were already covered in the Brundtland report definition of sustainability, the so-called "triple bottom line" definition refers to people, planet and profit, thus making the economy dimension of sustainability explicit (Elkington, 2018). These pillars of sustainability are reflected in the UN SDGs as well.

Sustainable development is visualised in the doughnut model as a space shaped like a doughnut where the inner boundary refers to the use of resources to satisfy human needs and the outer boundary reflects the limitations of the planet (Raworth, 2017). This framework depicts sustainability as this space where the use of resources is enough to ensure that human needs are met but is not high enough to overpass the limitations of our planet. The space between the inner and outer boundaries is seen as the "safe and just operating space" (O'Neill et al., 2018), a term also used by European Union (EU) expert bodies (SCAR, 2021).

Within food, one of the more commonly used definitions is that of sustainable diets, defined as "*those diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources*" (FAO, 2012, page 7). The health and cultural dimensions of sustainability are explicitly mentioned in this definition in addition to the more generally used three dimensions of environment, society and economy.

Sustainability labelling framework at European level

The European Commission has proposed a legislative Sustainable Food System Framework (FSFS), which was announced in the Farm to Fork strategy and should be adopted by the end of 2023 (European Commission, 2023). The sustainability labelling framework is part of this legislative proposal and has the goal of empowering consumers to make more informed and sustainable food choices. The proposal is a response to the many calls for a harmonised sustainability labelling scheme across the EU to empower informed choices among consumers, and such a unified label could be the result of the upcoming sustainability labelling framework. However, the development of a unified label is complex and entails many trade-offs.

A basic prerequisite contributing to decisions related to the sustainability labelling framework is a deeper understanding of consumer-citizens' associations with and understanding of sustainability. This provides a baseline of 'where consumer-citizens are' in their current understanding and thinking, which then can allow to design efforts to efficiently support consumer-citizens' learning about and use of a future sustainability labelling framework.

Study aim

As previous insights into consumer-citizen understanding of sustainability at distinct levels of abstraction and across countries are limited, there is a need to investigate this, especially considering the upcoming sustainability labelling framework at the EU level. In order to efficiently develop a labelling scheme to empower consumers in their food choices, there is a need to know how consumer-citizens understand sustainability in food. Understanding here *refers to the interpretations and associations that people make with sustainability*, which taken together represent people's understanding of the concept of sustainability.

The concept of consumer-citizens is used in this report to refer to the different roles that people have, the consumption-related role as consumers and the role in society in general as citizens. For example, as consumers, people can influence sustainability-related aspects by the food choices that they make, whereas as citizens, people can play a role in sustainability by supporting specific policies in this area.

This study focused on the Nordic-Baltic countries and had the **aim** to answer the following research questions 1) *How do Nordic-Baltic consumer-citizens understand sustainability in a food context?* and 2) *What are the differences and commonalities between the Nordic-Baltic countries as regards this understanding?*

The structure of the remainder of this report is as follows. The next chapter consists of a brief overview of the methodology that was used. Chapters 3 to 7 present the results related to consumer-citizens' understanding of sustainability at different levels of abstraction (e.g., in general, in food, at the product category level). Chapter 8 contains the results for Iceland as the sample size and representativeness impose greater limitations on the possibility to compare the results to other countries. Finally, the last chapter contains the main conclusions of the report.

The country specific results are presented per country in Chapter 3, whereas in Chapters 4 to 6 the different country results are shown side by side in overall tables or figures. Chapter 8 contains the results from Iceland.

Chapter 2. Methodology

The data for this study was collected in the eight Nordic-Baltic countries (Denmark, Finland, Sweden, Norway, Iceland, Estonia, Latvia and Lithuania) in August - September 2022 by means of an online questionnaire. The sample of respondents was recruited in collaboration with the market agency Norstat.

The questionnaires were translated to the national languages and translations were checked by native speakers before collecting the data.

Surveys are commonly used to assess individual perceptions and behaviour. Survey answers can be affected by social desirability, people's bias in providing answers that would make them look good. Self-reported measures can be biased estimates of actual behaviour. However, for concepts that are difficult to observe such as the meanings that people attach to sustainability or their perceptions about sustainability issues, asking people directly is a commonly used way to gather such information. In surveys oftentimes, it is people's interest in an object (e.g., sustainability label) or intention to engage in a behaviour that is assessed, and these motivations might not always translate in actual behaviour due to other factors with importance for individuals.

2.1 Participants

The target sample was representative per country in terms of age, gender, region and education, except in Iceland, where it was not possible to achieve representativeness. The questionnaire was targeted towards people between 18 and 75 years of age. Overall, there were about 600 participants per country, except in Iceland where there were only 109 participants.

Due to the issues in achieving a similar sample size and representativeness in Iceland as compared to the remaining countries, the results are focusing on the Nordic-Baltic countries excluding Iceland. Selected results for Iceland can be found in Chapter 8 as the sampling issues do not allow comparison with the remaining countries.

The median time it took respondents to complete the questionnaire was between 18 and 23 minutes. Respondents who answered the questionnaire in less than 6 minutes were excluded from the study (between 2 and 8 participants per country, none in Iceland), as that was considered too little time to go through the questions.

Table 1. Socio-demographic characteristics of respondents across countries

	Denmark	Finland	Norway	Sweden	Lithuania	Latvia	Estonia
Age (%)							
18-39	37.9%	38.9%	40.7%	39.0%	36.4%	42.3%	41.7%
40-59	37.4%	35.8%	37.9%	36.1%	41.1%	36.2%	35.2%
60-75	24.8%	25.3%	21.5%	24.9%	22.5%	21.5%	23.1%
Gender (%)							
Male	49.5%	49.9%	50.9%	50.2%	47.3%	44.8%	47.2%
Female	50.5%	50.1%	49.1%	49.8%	52.7%	55.2%	52.8%
Education (%)							
Less than primary, primary and lower secondary education (levels 0-2)	25.4%	12.7%	20.5%	20.2%	6.3%	6.3%	11.4%
Upper secondary and post-secondary non-tertiary education (levels 3 and 4)	40.2%	45.2%	39.2%	40.8%	51.6%	56.9%	49.7%
Tertiary education (levels 5-8)	34.2%	40.9%	39.2%	38.0%	41.8%	36.9%	38.4%
Place of residence (%)							
Metropolitan or big city	52.3%	54.3%	47.6%	44.2%	55.7%	54.9%	45.9%
Small town or rural	47.7%	45.7%	52.4%	55.8%	44.3%	45.1%	54.1%
Perceived income level (%)							
There is enough money to buy the foods I want	50.2%	40.4%	46.2%	59.5%	44.1%	33.6%	27.5%
There is some need to consider prices, which limits some choices when buying food	36.5%	37.5%	38.5%	30.6%	44.6%	48.9%	45.9%
There is a need to consider prices carefully, which limits many choices when purchasing food	13.3%	22.1%	15.3%	9.9%	11.3%	17.5%	26.5%

	Denmark	Finland	Norway	Sweden	Lithuania	Latvia	Estonia
Number of adults in household (%)							
1 adult	33.2%	41.5%	30.1%	26.9%	23.5%	19.0%	28.3%
2 adults	54.7%	51.6%	53.3%	58.3%	56.1%	60.5%	57.5%
3 or more adults	12.1%	6.9%	16.6%	14.9%	20.5%	20.5%	14.2%
Presence of children in household (%)							
No children	77.1%	68.7%	68.3%	68.9%	62.2%	56.0%	61.1%
With children	22.9%	31.3%	31.7%	31.1%	37.8%	44.0%	38.9%
Diet style (%)							
I never eat meat, fish, dairy products or eggs	0.7%	0.5%	0.2%	1.5%	0.2%	0.2%	0.3%
I never eat meat and fish	1.0%	2.3%	0.8%	1.8%	0.5%	1.2%	0.3%
I never eat meat, but eat fish	1.3%	2.8%	1.8%	1.5%	1.3%	1.8%	1.0%
Primarily I eat plant based, and low amounts of meat and moderate amounts of fish, eggs and dairy products	7.0%	13.2%	9.1%	9.1%	18.1%	19.2%	11.7%
Basically, I do not eat meat, but it happens at special occasions	2.5%	3.4%	1.8%	3.1%	1.7%	2.6%	2.4%
I eat no meat once or more days a week	34.6%	29.5%	52.7%	39.8%	36.9%	24.1%	32.4%
As a rule, I eat meat each day	53.0%	48.2%	33.7%	43.4%	41.3%	50.9%	51.8%

2.2 Questionnaire measures

The questionnaires consisted of one open-ended question in the beginning, and then a range of closed-ended questions regarding respondents' understanding of sustainability in general and in food as well as background measures regarding motivation to process sustainability-related information and socio-demographics. The full questionnaire in English can be found in Appendix A.

Table 2. Food sustainability understanding questionnaire overview

Introduction   • Introduction to the study and informed consent
Sustainability understanding in general   • Associations with sustainability (open-ended)   • Understanding of sustainability statements
Sustainability understanding in food   • Ranking of sustainability dimensions   • Food sustainability understanding statements   • Ambiguity between sustainability dimensions   • **Sustainability understanding in product categories**   Perception of sustainability of various food product categories (i.e., meat products, dairy products, fresh fruits and vegetables, sweet and savoury snacks)   • **Sustainability understanding in food products**   Comparisons between products in terms of sustainability
Sustainability labelling and Hypothetical unified label perceptions   • Interest in sustainability labels   • Subjective knowledge regarding sustainability labelling   • Attitude towards a hypothetical unified label   • Willingness to use a hypothetical unified label
Motivation to process sustainability information
Socio-demographics   • Country   • Age   • Gender   • Education   • Place of residency   • Household size   • Dietary habits   • Economic status   • Income

Chapter 3. Associations with sustainability

Respondents were shown an open-ended question to assess their top-of-mind associations with the concept of sustainability.

The question was: *'This question is about sustainability in general. Please take a bit of time to reflect about what you think 'sustainability' means and write the first 3 to 5 words that come to mind.'*

Respondents had to write up to five answers with a minimum requirement for three answers. The answers to this open-ended question were coded into concepts that covered the types of words/sentences mentioned, and this coding was checked by native speakers. Due to the nature of the open-ended data that was coded from the native languages, the results should be interpreted per country and not compared across countries. The results in terms of the 10 most frequent associations with sustainability are presented below, per country. Visual representations of these results, per country, are shown in Appendix B.

The environment and reuse and recycling were two of the concepts most closely associated with sustainability. Durability, longevity, health and quality aspects are especially relevant in some of the countries, as highlighted by the country specific results reported below.

3.1 Denmark

In Denmark, reuse and recycling, environment and climate were among the most mentioned aspects in relation to sustainability in general. Table 3 provides an overview of example aspects covered under the main codes.

Table 3. Denmark – Top ten codes associated with sustainability (i.e., bæredygtighed)

Codes and examples of sub-codes (exemplified with raw answers in Danish)	Frequency
Reuse&Recycling	**264**
Reuse&Recycling (e.g., Genbrug, Genanvendelse) Waste separation (e.g., Affaldssortering, Sortere affald) Reusable (e.g., Genanvendeligt)	
Environment	**249**
Environment (e.g., Miljø) Environmentally friendly (e.g., Miljøvenlig, Miljøbevidst) Nature (e.g., Natur)	
Climate	**121**
Climate (e.g., Klima) Climate friendly (e.g., Klimavenlig) Climate neutral (e.g., Klimaneutral)	
Energy	**106**
Green energy (e.g., Grøn energi) Energy (e.g., Energi) Wind energy (e.g., Vind energi) Solar energy (e.g., Solenergi)	
Resources	**92**
Resources (e.g., Ressourcer) Resource consumption (e.g., Ressourceforbrug) Resource saving (e.g., Ressourcebesparende) Water (e.g., Vand)	

Organic	**80**
Organic (e.g., Økologi, Økologisk) Buy organic (e.g., Køb økologisk) Organic products (e.g., Økologiske produkter)	
Emissions	**76**
Carbon neutral (e.g., CO2 neutral) CO2 (e.g., CO2) CO2 neutral (e.g., CO2 neutralt)	
Social	**52**
Social (e.g., Social) Equality (e.g., Ligestilling) Social sustainability (e.g., Social bæredygtighed)	
Consideration	**49**
Thoughtfulness, circumspection, consideration, reflection (e.g., Omtanke) Reason, sense (e.g., Fornuft) Sound, reasonable, sensible (e.g., Fornuftigt) Consciousness (e.g., Bevidsthed)	
Future	**46**
Future (e.g., Fremtid) Future-proof (e.g., Fremtidssikret) Future generations (e.g., Fremtidige generationer)	

Note. The frequencies represent the number of distinct times the code was mentioned

3.2 Finland

In Finland, the environment is one of the core concepts associated with sustainability, however, durability is even more frequently mentioned. Strong as in strength, and quality were also mentioned frequently in relation to sustainability. Health-related aspects were commonly mentioned in Finland when people thought of sustainability as well. Table 4 provides an overview of main codes and examples of content.

Table 4. Finland – Top ten codes associated with sustainability (i.e., kestävyys)

Codes and examples of sub-codes (exemplified with raw answers in Finnish)	Frequency
Durable	**172**
Long-lived – Might refer to products or people (e.g., Pitkäikäinen) Long life, Durability (e.g., Pitkäikäisyys) Long-term, Long-lasting - Might refer to products or processes (e.g., Pitkäaikainen)	
Environment	**149**
Ecology (e.g., Ekologisuus) Environmentally friendly (e.g., Ympäristöystävällisyys, Ympäristöystävällinen) Nature (Luonto)	
Strong	**145**
Strength (e.g., Voima, Lujuus, Vahvuus) Strong (e.g., Vahva, Luja, Lujatekoinen) Strength, Firmness (e.g., Lujuutta)	
Quality	**118**
Quality (e.g., Laatu, Laatua) High quality (e.g., Laadukas, Hyvä laatu) Well made (e.g., Hyvin tehty)	
Reuse&Recycling	**99**
Recycling (e.g., Kierrätys) Reuse&Recycling (e.g., Uusiokäyttö) Recyclability (e.g., Kierrätettävyys)	

Healthy	**99**
Condition, fitness – as in health (e.g., Kunto) In good condition – as in healthy (e.g., Hyvä kunto) Health (e.g., Terveys)	
Determination	**77**
Toughness – Refers to a person being persistent (e.g., Sitkeys) Perseverance, Tenacity (e.g., Periksiantamattomuus, Sinnikkyys) Stamina, Tenacity (e.g., Sisu)	
Time	**73**
Continuity, permanence (e.g., Jatkuvuus) Time (e.g., Aika) Perseverance (e.g., Pitkäjänteisyys)	
Coping	**68**
Be able to, coping (e.g., Jaksaminen, Jaksamista) Be able (e.g., Jaksaa)	
Sport	**52**
Sports (e.g., Urheilu) Running (e.g., Juoksu) Physical exercise (e.g., Liikunta)	

Note. The frequencies represent the number of distinct times the code was mentioned

3.3 Norway

In Norway, reuse and recycling, and environment were among the most mentioned aspects in relation to sustainability in general. Aspects related to the future were also common associations with sustainability. Table 5 provides an overview of example aspects covered under the main codes.

Table 5. Norway – Top ten codes associated with sustainability (i.e., bærekraft)

Codes exemplified with raw answers in Norwegian	Frequency
Environment	**347**
Environment (e.g., Miljø) Environmentally friendly (e.g., Miljøvennlig) Nature (e.g., Natur)	
Reuse&Recycling	**186**
Reuse (e.g., Gjenbruk) Recycling (e.g., Resirkulering, Gjenvinning)	
Future	**112**
Future (e.g., Fremtid) Forward-looking (e.g., Fremtidsrettet) Next generation (e.g., Neste generasjonuture (e.g., Fremtid))	
Energy	**76**
Renewable energy (e.g., Fornybar energi) Energy (e.g., Energi) Water power (e.g., Vannkraft)	
Durable	**74**
Durable (e.g., Holdbart) Lasting (e.g., Varig) Long-term (e.g., Langsiktig)	
Economy	**73**
Economy (e.g., Økonomi) Economic (e.g., Økonomisk)	

Social	**70**
Society (e.g., Samfunn) Social conditions (e.g., Sosiale forhold) Eradicate poverty (e.g., Utrydde fattigdom)	
Resources	**61**
Resources (e.g., Ressurser) Resource saving (e.g., Ressursbesparende) Renewable resources (e.g., Fornybare ressurser)	
Climate	**56**
Climate (e.g., Klima) Climate friendly (e.g., Klimavennlig) Global warming (e.g., Global oppvarming)	
Renewable	**48**
Renewable (e.g., Fornybar, Fornybart)	

Note. The frequencies represent the number of distinct times the code was mentioned

3.4 Sweden

In Sweden, reuse and recycling, and environment were among the most mentioned aspects in relation to sustainability in general. Durability and quality-related aspects were also frequently associated with sustainability. Table 6 below provides an overview of example aspects covered under the main codes.

Table 6. Sweden – Top ten codes associated with sustainability (i.e., hållbarhet)

Codes exemplified with raw answers in Swedish	Frequency
Environment	**330**
Environment (e.g., Miljö) Environmentally friendly (e.g., Miljövänligt) Nature (e.g., Natur)	
Reuse&Recycling	**215**
Recycling (e.g., Återvinning, Återbruk) Reuse (e.g., Återanvända) Waste sorting (e.g., Sopsortering)	
Durable	**166**
Long-term (e.g., Långsiktigt, Långsiktighet) Consisting (e.g., Bestående) Life span (e.g., Livslängd) Lasting (e.g., Varaktigt, Långvarigt) Duration(e.g., Varaktighet)	
Quality	**118**
Quality (e.g., Kvalitet) Good quality (e.g., Bra kvalitet)	
Economy	**70**
Economy (e.g., Ekonomi) Economic (e.g., Ekonomiskt)	
Future	**69**
Future (e.g., Framtid) Next generation (e.g., Nästa generation, Barn)	

Social	**63**
Social (e.g., Socialt) Humane (e.g., Humant) Society (e.g., Samhälle)	
Energy	**62**
Energy (e.g., Energi) Nuclear power (e.g., Kärnkraft) Renewable energy (e.g., Förnybar energi)	
Resources	**59**
Resources (e.g., Resurser) Resource saving (e.g., Resurssparande)	
Consideration	**41**
Consideration (e.g., Omtanke) Well thought out (e.g., Genomtänkt)	

Note. The frequencies represent the number of distinct times the code was mentioned

3.5 Lithuania

In Lithuania, reuse and recycling, and environment were among the most mentioned aspects in relation to sustainability in general. Durability-related aspects were also closely related to sustainability. Table 7 provides an overview of example aspects covered under the main codes.

Table 7. Lithuania – Top ten codes associated with sustainability (i.e., tvarumas)

Codes and examples of sub-codes (exemplified with raw answers in Lithuanian)	Frequency
Environment	**232**
Ecology (e.g., Ekologija) Nature (e.g., Gamta) Nature conservation (e.g., Gamtos saugojimas, Gamtos tausojimas, Gamtosauga) Environmental protection (e.g., Aplinkosauga)	
Reuse&Recycling	**176**
Recycling (e.g., Perdirbimas, Perdirbtas) Waste separation (e.g., Rušiavimas, Atlieku rušiavimas, Rusiavimas) Reusable (e.g., Daugkartinis panaudojimas, Daugkartinio naudojimo)	
Durable	**135**
Strong material (e.g., Tvirtas, Tvirtumas) Long-term (e.g., Ilgalaikis) Durable (e.g., Patvarus, Patvarumas, Ilgalaikiškumas)	
Economy	**76**
Saving (e.g., Taupymas, Tausojantis) Economy (e.g., Ekonomika, Ekonomija)	
Reliability	**67**
Reliability (e.g., Patikimumas, Patikimas, Patikima) Assurance (e.g., Pasitikejimas) Certain (e.g., Tikra)	

Longevity	**64**
Longevity (e.g., Ilgaamžiškumas, Ilgaamžis) Long-lived (e.g., Ilgaamzis)	
Clean	**54**
Clean (e.g., Švara, Švarus)	
Balance	**48**
Stability (e.g., Pastovumas, Stabilumas) Steady (e.g., Pastovus, Stabilus)	
Security	**46**
Safety (e.g., Saugumas, Saugus, Sauga) Guarantee (e.g., Garantija)	
Energy	**46**
Green energy (e.g., Žalia energija) Renewable energy (e.g., Atsinaujinanti energija) Energy (e.g., Energija)	

Note. The frequencies represent the number of distinct times the code was mentioned

3.6 Latvia

In Latvia, durability-related aspects, the environment and longevity were among the most mentioned aspects in relation to sustainability in general. Table 8 provides an overview of example aspects covered under the main codes.

Table 8. Latvia – Top ten codes associated with sustainability (i.e., ilgtspējība)

Codes and examples of sub-codes (exemplified with raw answers in Latvian)	Frequency
Durable	**182**
Endurance (e.g., Izturiba) Long-lasting (e.g., Ilgstoši, Ilgi kalpo) Persistence (e.g., Noturiba, Noturigums) Long-term (e.g., Ilgs, Ilgtermina)	
Environment	**109**
Environment (e.g., Vide) Ecology (e.g., Ekologija) Nature (e.g., Daba) Nature friendly (e.g., Dabai draudzigs)	
Longevity	**107**
Long (e.g., Ilgi) Longevity (e.g., Ilgs mužs, Ilgmužiba) Permanent (e.g., Pastavigs) For a long time (e.g., Ilgam laikam, Uz ilgu laiku)	
Future	**97**
Future (e.g., Nakotne) Generation (e.g., Paaudze) Next generation (e.g., Nakama paaudze)	
Quality	**70**
Quality (e.g., Kvalitate, Kvalitativs, Laba kvalitate)	
Security	**69**
Safety (e.g., Drošiba, Drošums) Safe (e.g., Drošs) Guarantee (e.g., Garantija)	

Social	**69**
Work (e.g., Darbs) Cooperation, Collaboration (e.g., Sadarbiba) Family (e.g., Gimene)	
Balance	**62**
Stability (e.g., Stabilitate) Stable (e.g., Stabils) Unchanging (e.g., Nemainigs)	
Reuse&Recycling	**53**
Recycling (e.g., Parstradajams, Otrreizeja parstrade, Parstrade) Waste separation (e.g., Atkritumu škirošana, Škirošana)	
Resources	**51**
Renewable resources (e.g., Atjaunojami resursi) Resources (e.g., Resursi) Resource saving (e.g., Resursu taupišana)	

Note. The frequencies represent the number of distinct times the code was mentioned

3.7 Estonia

In Estonia, reuse and recycling, and the environment were among the most mentioned aspects in relation to sustainability in general. Economy-related aspects were also commonly associated with sustainability. Table 9 provides an overview of example aspects covered under the main codes.

Table 9. Estonia – Top ten codes associated with sustainability (i.e., jätkusuutlikkus)

Codes and examples of sub-codes (exemplified with raw answers in Estonian)	Frequency
Environment	**152**
Environment (e.g., Keskkond) Nature (e.g., Loodus) Environmentally friendly (e.g., Keskkonnasõbralik, Keskkonda hoidev)	
Reuse&Recycling	**138**
Recycle (e.g., Taaskasutus) Recycling (e.g., Taaskasutamine) Reusable (e.g., Taaskasutatav, Korduvkasutatav)	
Economy	**115**
Economical (e.g., Säästev, Säästlik) Economy (e.g., Majandus, Säästlikkus) Money (e.g., Raha) Savings (e.g., Kokkuhoid)	
Durable	**91**
Lasting (e.g., Kestev) Durability (e.g., Kestvus) Long-term (e.g., Pikaajaline) Long-lasting (e.g., Kauakestev)	
Future	**81**
The future (e.g., Tulevik) Children (e.g., Lapsed) Driving forward (e.g., Edasiviiv)	
Continuity	**77**
Continuity (e.g., Järjepidevus) Permanent, persistent (e.g., Püsiv) Continuous (e.g., Pidev)	

Development	**70**
Development (e.g., Areng) Capable of development (e.g., Arenguvõimeline) Developing (e.g., Arenev)	
Consumption	**61**
Reasonable consumption (e.g., Mõistlik tarbimine) Consumption (e.g., Tarbimine) Reducing consumption (e.g., Tarbimise vähendamine)	
Frugality	**55**
Savings (e.g., Kokkuhoid) Thrifty (e.g., Säästlik, Säästlikkus) Saving (e.g., Säästmine)	
Energy	**53**
Energy (e.g., Energia) Renewable energy (e.g., Taastuvenergia) Green energy (e.g., Roheline energia)	

Note. The frequencies represent the number of distinct times the code was mentioned

Chapter 4. Understanding of sustainability in general

Respondents' understanding of sustainability in general was assessed with four closed-ended questions with multiple choice answers. One of the answers for each question was more closely aligned with official sustainability definitions, e.g., those stemming from the Brundtland report (WCED, 1987) and UN/SDGs described in the introduction, and is, thus, highlighted in italics in the tables below.

Tables 10 to 13 below show the frequencies for each answer per question.

Most respondents per country perceived sustainability as being about '*the fair share of resources between us, other people, and the people after us*', except in Denmark where half of those asked reported that in their view sustainability is about '*achieving the circular green transition and innovating new technologies*'. This latter view of sustainability was relatively common in Finland as well. On the other hand, few stated that sustainability is about '*treating animals with respect*' (Table 10).

Table 10. Sustainability perceived meanings

Q2.1. If someone would tell you what sustainability means … to which of these explanations do you agree most?							
	Denmark	**Finland**	**Norway**	**Sweden**	**Lithuania**	**Latvia**	**Estonia**
Sustainability is about the fair share of resources between us, other people, and the people after us	46% a	**50%** a	**61%** b	**61%** b	**67%** b	**68%** b	**63%** b
Sustainability is about achieving the circular green transition and innovating new technologies	**50%** a	45% a, b	37% b, c	35% c	32% c	29% c	36% c
Sustainability is about treating animals with respect	4% a, b, c, d	5% c, d	2% a, b, c, d, e	5% b, d	2% a, e	3% a, b, c, d, e	1% e

Notes. Percentage of respondents that selected the answer. Only one answer could be selected. In **bold** the highest percentage per country. In *italics* the answer that is closest to the definitions of sustainability. Each letter denotes a Country whose column proportions do not differ significantly from each other at the .05 level (Chi-square test in Crosstabs, Pearson Chi-Square= 124.6, df=12, sig.<.001).

Across countries, most respondents associated sustainability with the pair of words *'environmentally-friendly, healthy'*. The percentage of respondents making this association was highest in Denmark and Lithuania (but similar to Sweden), whereas it was the lowest in Finland and Norway (but similar to Estonia). The second most common association overall was with *'circular, innovative'*. This was more common in Norway, Finland, Estonia and Denmark, and least common in Lithuania and Latvia. Finally, fewer respondents considered sustainability to fit best with the word pair *'safe, fair'*. This was most common in Latvia and least common in Denmark (Table 11).

Table 11. Word pairs that are perceived to fit best with sustainability

Q2.2 Which of the following words fit best to what you think sustainability is?							
	Denmark	**Finland**	**Norway**	**Sweden**	**Lithuania**	**Latvia**	**Estonia**
Environmentally-friendly, healthy	**65% a**	**45% b**	**46% b**	**62% a, c**	**68% a**	**56% c, d**	**48% b, d**
Safe, fair	5% a	17% b	16% b	12% b	17% b	26% c	15% b
Circular, innovative	30% a, b, c	38% c, d	39% d	27% b	15% e	19% e	38% a, c, d

Notes. Percentage of respondents that selected the answer. Only one answer could be selected. In **bold** the highest percentage per country. In *italics* the answer that is closest to the definitions of sustainability. Each letter denotes a Country whose column proportions do not differ significantly from each other at the .05 level (Chi-square test in Crosstabs, Pearson Chi-Square= 270.4, df=12, sig.<.001)

The majority of respondents across countries perceived that sustainability is when *'all current people´s lifestyle allows all children´s children to have a similar lifestyle'*. This was most frequent in Latvia (but similar to Estonia) and least frequent in Norway (but similar to Finland and Sweden). The perception that sustainability is when *'the way we live could be how everybody else on the planet lives'* was more common in Norway, Sweden and Finland as opposed to the other countries. Whereas the perception that sustainability is when *'we live the simple way our grandparents did'* was more common in Lithuania, Denmark and Estonia (but similar to Latvia), although overall it was the least frequent of the three answer options (Table 12).

Table 12. Sustainability description perception

Q2.3 How would you end the sentence, if you would want to find a good lay-person description of sustainability? Sustainability is when …							
	Denmark	**Finland**	**Norway**	**Sweden**	**Lithuania**	**Latvia**	**Estonia**
we live the simple way our grandparents did	18% a	8% b	9% b	7% b	18% a	12% a, b	17% a
the way we live could be how everybody else on the planet lives	13% a	29% b	37% b	31% b	14% a	9% a, c	6% c
all current people´s lifestyle allows all children´s children to have a similar lifestyle	**69% a, b**	**63% b, c**	**55% c**	**62% b, c**	**68% b**	**79% d**	**76% a, d**

Notes. Percentage of respondents that selected the answer. Only one answer could be selected. In **bold** the highest percentage per country. In *italics* the answer that is closest to the definitions of sustainability. Each letter denotes a Country whose column proportions do not differ significantly from each other at the .05 level (Chi-square test in Crosstabs, Pearson Chi-Square= 376, df=12, sig.<.001)

Most respondents in all countries except Denmark understand sustainability as being about *'Make every decision that we make relate to the welfare and well-being of the future generation to come',* whereas in Denmark this came second. This view was more prevalent in the Baltic countries as opposed to the Nordic countries. The expression *'We cannot solve our problems with the same thinking we used when we created them'* was seen by most in Denmark as reflecting sustainability, but it was also common in the other Nordic countries. In the Baltic countries it was less prevalent compared to the Nordic countries, with fewest respondents in Lithuania seeing sustainability as reflected by this expression (Table 13).

Table 13. Sustainability expressions perception

Q2.4 Which of these sayings best expresses sustainability for you?							
	Denmark	**Finland**	**Norway**	**Sweden**	**Lithuania**	**Latvia**	**Estonia**
The true secret of happiness lies in taking a genuine interest in all the details of daily life	8% a, b, c	13% c, d	5% b	8% a, b, c	18% d	11% a, c	13% a, c, d
Make every decision that we make relate to the welfare and well-being of the future generation to come	43% a	**48% a**	**51% a**	**50% a**	**73% b**	**68% b**	**70% b**
We cannot solve our problems with the same thinking we used when we created them	**49% a**	40% b	44% a, b	42% a, b	9% c	21% d	17% d

Notes. Percentage of respondents that selected the answer. Only one answer could be selected. In **bold** the highest percentage per country. In *italics* the answer that is closest to the definitions of sustainability. Each letter denotes a Country whose column proportions do not differ significantly from each other at the .05 level (Chi-square test in Crosstabs, Pearson Chi-Square= 445.4, df=12, sig.<.001)

Overall, the Nordic-Baltic respondents are familiar with elements of sustainability definitions, such as ensuring fair share of resources between us and future generations, our lifestyle should allow future generations to have a similar lifestyle or environmentally friendly and health aspects. On the other hand, few respondents emphasise the safe and fair elements of sustainability definitions. Across the Nordic countries there is a stronger belief that we cannot solve our problems with the same thinking we used when we created them, as opposed to the Baltic countries. There are some country differences in respondents' understanding of sustainability, however, the Nordic-Baltic countries are similar in respondents' understanding of several elements of sustainability definitions.

Chapter 5. Understanding of food sustainability

Respondents' understanding of sustainability in food was explored by asking people to rank sustainability dimensions according to importance, to select aspects that they associate with sustainability in food and to compare dimensions of sustainability in terms of how supportive of each other or opposing they are. After these, the focus was placed on specific product categories and respondents reported the importance of sustainability aspects in relation to their choice of products from that category. Finally, the focus was narrowed to food products and respondents were asked to compare specific product types in terms of how sustainable they are.

5.1 Ranking of sustainability dimensions in food

Respondents were asked to rank ten dimensions of sustainability in terms of importance to them. The dimension 'Pollution reduction' and 'Nature preservation' were among the top two most important dimensions across countries, whereas the dimension 'Culture' was among the least important across countries. There were differences between countries, though, in terms of the most important dimensions (Table 14). 'Climate change prevention' was ranked higher, on average, in the Nordic countries and it was in the top two most important dimensions in all countries, except Latvia and Estonia. 'Health' was ranked in the top two most important dimensions in the Baltic countries and Finland, whereas it was ranked lower in the other Nordic countries. 'Biodiversity' was one of the top two dimensions in Norway. 'Animal welfare' was ranked higher in the Nordic countries compared to the Baltic countries and it was one of the top two most important dimensions in Finland.

Table 14. Mean rank of sustainability dimensions per country

Q3. Thinking about food sustainability, please rank order the following dimensions based on how important you think they are, starting from the most important (1) to the least important (10).							
	Denmark	**Finland**	**Norway**	**Sweden**	**Lithuania**	**Latvia**	**Estonia**
Climate change prevention	3.2 (1) (a)	4.0 (1) (b)	3.5 (1) (a)	3.9 (2) (b)	4.6 (2) (c)	5.1 (3) (c)	5.2 (3) (c)
Pollution reduction	3.3 (1, 2) (a)	4.1 (1) (c)	3.2 (1) (a)	3.9 (1, 2) (c)	3.5 (1) (a, b)	4.0 (2) (c)	3.8 (2) (b, c)
Nature preservation	3.8 (2) (b)	4.7 (2) (d)	4.3 (2) (c)	3.3 (1) (a)	3.9 (1) (b)	3.7 (2) (b)	3.8 (2) (b)
Biodiversity	4.6 (3) (a)	5.7 (3) (c)	4.4 (2) (a)	4.7 (3) (a, b)	6.0 (3) (c)	5.9 (4) (c)	5.1 (3) (b)
Health	4.8 (3) (c)	3.6 (1) (b)	5.1 (3) (c)	4.7 (3) (c)	3.4 (1) (a, b)	3.2 (1) (a)	3.2 (1) (a)
Animal welfare	4.9 (3) (a)	4.9 (2) (a)	5.0 (3) (a)	5.3 (4) (a)	6.1 (3, 4) (b)	6.5 (5) (b)	6.2 (4) (b)
Equality	7.2 (4) (c, d)	5.9 (3) (a)	7.2 (4, 5) (d)	6.4 (5) (b)	7.0 (5, 6) (c, d)	6.7 (5) (b, c)	7.0 (5) (c, d)
Fair wages	7.4 (4) (c)	6.2 (3) (a)	6.8 (4) (b)	6.8 (5, 6) (b)	6.6 (4, 5) (b)	6.8 (5) (b)	6.1 (4) (a)
Economic growth	7.6 (4) (d, e)	7.7 (4) (e)	7.4 (5) (c, e)	7.2 (6) (c, d)	6.4 (3, 5) (b)	5.3 (3, 4) (a)	7.0 (5) (c)
Culture	8.3 (5) (c)	8.1 (4) (b, c)	8.2 (6) (c)	8.8 (7) (d)	7.5 (6) (a)	7.8 (6) (a, b)	7.6 (6) (a)

Note. Different numbers in brackets **within a country** denote significant differences in the ranking of the dimensions within the country in Friedman's non-parametric test, with Bonferroni correction. Different letters **across countries** denote significant differences in the ranking of the dimensions across the countries in Kruskal-Wallis non-parametric test, with Bonferroni correction. With yellow background, the most important dimensions ranked first or second per country. With grey background, the least important dimension per country.

5.2 Aspects associated with food sustainability

To assess respondents' understanding of sustainability in food, respondents were presented with several statements regarding various sustainability issues in food and asked to select all those statements that they believed had something to do with food sustainability.

There are similarities as well as several differences between countries in the frequency with which these statements were selected, for instance in terms of the top three most common and three least common aspects they perceive as being about food sustainability (Table 15). Most respondents across the countries associated food sustainability with 'less food waste'. There was also a lot of agreement regarding the 'recyclable packaging' aspect. This was one of top three statements most frequently associated with food sustainability in all countries, except Denmark, however, its prevalence in Denmark was similar to most of the other countries. The statement was less commonly selected in Latvia. Furthermore, 'local or short supply chain' was among the top three most selected statements in Finland, Sweden and Estonia, however, this was similarly prevalent in Norway as well as Denmark and much less frequently selected in Lithuania or Latvia. One of the top associations with sustainability in Denmark after 'less food waste' was 'minimising carbon emissions when producing goods'. This was also frequent in Sweden as well as Norway and Finland, but less so than in Denmark. The respondents in the Baltic countries associated food sustainability less frequently with 'minimising carbon emissions when producing goods'. Interestingly, 'reducing meat consumption' was selected by less than 50% of respondents across countries, but this was more common in the Nordic countries compared to the Baltic countries. Among the statements least frequently selected as having something to do with food sustainability were 'cultural acceptability of food' and 'lower prices for consumers', although the latter was not among the least common associations to sustainability in Lithuania and Latvia even if it had similar prevalence to most of the other countries. It is also apparent that social aspects of sustainability are less frequently associated with food sustainability, although some of these aspects are prevalent in certain countries, for example 'ensuring fair prices and working conditions for producers' was selected by more than half of the respondents in Finland.

Table 15 also shows that there were many statements selected by more than 50% (in yellow highlight) of the respondents that participated in the study in all countries, except Lithuania and Latvia. This seems to show that in most countries people have a varied understanding of sustainability in food where they associate quite strongly several issues with it, whereas in Lithuania and Latvia fewer issues were selected frequently as having something to do with sustainability, which can imply a more focused understanding of sustainability.

Table 15. Issues associated with food sustainability understanding

Q4. From this list, which of the following issues do you think have something to do with food sustainability? Please select any that you think apply.							
	Denmark	**Finland**	**Norway**	**Sweden**	**Lithuania**	**Latvia**	**Estonia**
Less food waste	**79% a, b**	**84% b**	**76% a, c**	**71% c**	**75% a, c**	**62% d**	**79% a, b**
Recyclable packaging	67% a, b	**75% b**	**65% a**	**71% a, b**	**67% a, b**	**55% c**	**68% a, b**
Local or short supply chain	57% a	**71% b**	63% a, b	**70% b**	37% c	31% c	**65% a, b**
Less packaging	59% a	69% b	63% a, b	60% a, b	**65% a, b**	40% c	**68% b**
Biodiversity preservation (richness and variety of animal and plant species and agro-ecosystems)	63% a	64% a	63% a	65% a	46% b	46% b	63% a
Reducing deforestation of the rain forest	60% a	64% a	**64% a**	63% a	46% b	37% b	59% a
Improving welfare/conditions for animals	47% a	63% b	55% a, b	56% a, b	31% c	28% c	48% a

	Denmark	Finland	Norway	Sweden	Lithuania	Latvia	Estonia
Minimising carbon emissions when producing goods	**77% a**	59% b	62% b	**67% b**	47% c	32% d	45% c
Less energy use when cooking products	62% a	59% a	55% a	56% a	46% b	36% c	59% a
Reducing the amount of pesticides used in food production	62% a, b, c, d	58% c, d, e	56% b, d, e	**67% a**	53% e	**52% e**	62% a, b, c, d
Less energy used to transport products	**70% a**	57% b	**64% a, b**	64% a, b	40% c	35% c	57% b
Ensuring fair prices and working conditions for producers	24% a	57% b	40% c, d	38% d	27% a, e	33% d, e	48% c
Minimal processing	35% a, b	53% c	19% d	31% b, e	26% d, e	20% d	43% a
Food and drink safety	27% a	49% b	36% c	37% c	23% a	24% a	50% b
Healthier food and drink products	34% a, b	46% c	28% b	36% a, b	49% c, d	41% a, c	57% d
Maximum food output with minimal use of natural resources	43% a, b, c, d, e	44% d, e	49% c, e, f	54% f	35% b	41% a, b, c, d, e	49% a, c, d, e, f
Ensuring a sufficient food supply for the increasing world population	27% a	44% b	57% c	43% b	24% a	27% a	38% b

	Denmark	Finland	Norway	Sweden	Lithuania	Latvia	Estonia
Organic production	52% a	43% b	38% b, c	57% a	52% a	30% c	54% a
Reducing meat consumption	47% a	42% a	48% a	43% a	22% b, c	15% c	26% b
Availability of food	14% a	39% b, c	34% b, c	32% c	20% a	35% b, c	42% b
Lower prices for consumers	13% a	25% b	12% a	14% a	23% b	26% b	30% b
Cultural acceptability of food	8% a, b	18% c	12% b, c	12% b, c	10% a, b	7% a	18% c
Do not know (exclusive)	1%	0%	2%	1%	1%	2%	1%

Note. Percentage of respondents that selected the answer, multiple answers could be selected. In **bold** the highest three percentages per country. Per statement, each letter denotes a country whose column proportions do not differ significantly from each other at the .05 level, comparing the percentage of those who selected the statement to those who have not selected the statement. With yellow background the percentages are above 50%, meaning that more than half the sample in the respective country selected the statement. With grey background the lowest three percentages per country are presented.

5.3 Potential conflicts between sustainability dimensions in food

Sustainability in food is a complex concept that encompasses many goals or dimensions that are not always possible to achieve at the same time. The perceived conflict between different aspects of sustainability was explored by asking respondents to what extent certain dimensions support each other or are in contradiction.

As Table 16 shows, respondents perceived in general that 'healthy eating' and 'sustainable eating' support each other. There were only minor differences between countries in this, with a tendency in Estonia towards lower perception of support. The pattern of answers for the comparison between 'environmental goals' and 'social goals' is similar. Finally, respondents lean towards seeing some level of contradiction between the achievement of 'economic growth' and 'sustainable development goals', but this is less the case in Latvia and Lithuania (which does not differ from Sweden). Generally, there were very small country differences in these respects.

Table 16. Perceived conflict between sustainability dimensions

Q5. To which extent do the following dimensions support each other or are in contradiction with each other in your opinion? (1 - support each other, 7 - contradict each other)							
	Denmark	**Finland**	**Norway**	**Sweden**	**Lithuania**	**Latvia**	**Estonia**
'Healthy eating' versus 'Sustainable eating'	2.8 b	2.5 a	2.7 a, b	2.9 b	2.7 a, b	2.9 b	3.4 c
'Economic growth goals' versus 'Sustainable Development goals'	4.2 c, d	4.4 d, e	4.5 e	4.1 b, c	3.8 a, b	3.7 a	4.5 e
'Environmental goals' versus 'Social goals (e.g., gender equality, decent work conditions)'	3.8 b	3.3 a	3.4 a	3.5 a, c	3.8 b	3.7 b, c	3.9 b

Note. Mean values shown. Per comparison, different letters **across countries** denote significant differences in the means of that dimension across the countries in one-way ANOVA, multiple comparison test with Games-Howell adjustment.

5.4 Understanding of sustainability at the product category level

The choice of products from specific product categories can be influenced by multiple attributes of the product, and such attributes can vary by category. To assess respondents' associations with sustainability when making choices within specific food categories (i.e., meat, dairy, fresh fruits and vegetables, sweet and savoury snacks), respondents were asked to select the three most important attributes for them when choosing a sustainable product within these categories. The attributes were: animal welfare (shown only for meat and dairy), antibiotics use (shown only for meat and dairy), climate impact (CO2 emissions), country of origin, degree of processing, energy use, local, mode of transportation (e.g., by plane, by truck), nutrition or health-related information, organic production method, pesticides use (shown only for fresh fruits and vegetables), seasonality (shown only for fresh fruits and vegetables), social aspects (workers' conditions; fair pay for farmers), type of energy (renewable or not) and type of packaging (recyclable or not). There was also the option to select 'I never buy products in this category' or 'none of these', and respondents could not choose another answer if any of these two was selected.

The attributes that were among the top three most selected ones in any of the countries as being important for respondents' sustainable choices within the category, and the frequency with which they were selected per country and product category are shown in Figures 1–4. Overall, there are some differences between product categories as well as between countries.

The meat and the dairy product categories are similar to each other, but they differ from fruits and vegetables and sweet and savoury snacks. The latter is most different in terms of what is important to respondents when making a sustainable choice. In terms of similarities between product categories, 'local' is one of the most important attributes, whereas 'type of energy' is among the less frequently selected attributes.

For the meat and the dairy product categories, 'animal welfare' and 'antibiotics use' are among the most important characteristics in addition to 'local', which is not surprising as these are aspects especially relevant to these categories. Respondents in the Baltic countries selected 'animal welfare' less frequently than those in the Nordic countries, whereas in Lithuania and Latvia more chose 'antibiotics use' as compared to the remaining countries. 'Local' was particularly important in Sweden and Estonia. 'Country of origin' is one of the top three considerations in Finland, whereas 'climate impact (CO2 emission)' is one of the top three considerations in Denmark. For dairy products, 'type of packaging (recyclable or not)' is one of the top three considerations in Estonia and Lithuania, whereas 'organic production' is one of the top three considerations in Denmark.

Among the least frequently selected attributes were 'mode of transportation' and 'energy use', in addition to 'type of energy'.

For fruits and vegetables, the most important attributes were 'seasonality' and 'pesticides use', in addition to 'local'. As these aspects are particularly relevant for this product category, their frequency is warranted. 'Seasonality' was more frequently selected in Latvia, followed by Denmark and Finland. 'Pesticides use' was more frequently selected in the Baltic countries as opposed to the Nordic countries. 'Country of origin' was among top three considerations in Finland similar to the meat and the dairy categories, and instead of 'pesticides use'. Among the least frequently selected attributes were 'energy use' and 'degree of processing', in addition to 'type of energy'.

For sweet and savoury snacks, 'type of packaging (recyclable or not)' and 'nutrition and health-related information' were among the most important considerations in addition to 'local'. 'Nutrition and health-related information' is particularly important in the Baltic countries and Finland. 'Local' is among the top three important aspects in the Baltic countries and Sweden. 'Climate impact (CO2 emissions)' was among top three considerations in Denmark, Norway and Sweden, with highest frequency in Denmark. 'Country of origin' was among the top three considerations in Finland similar to the other product categories. In Denmark, 'energy use' was among the top three considerations for this product category. Among the least frequently selected attributes was 'mode of transportation', in addition to 'type of energy'.
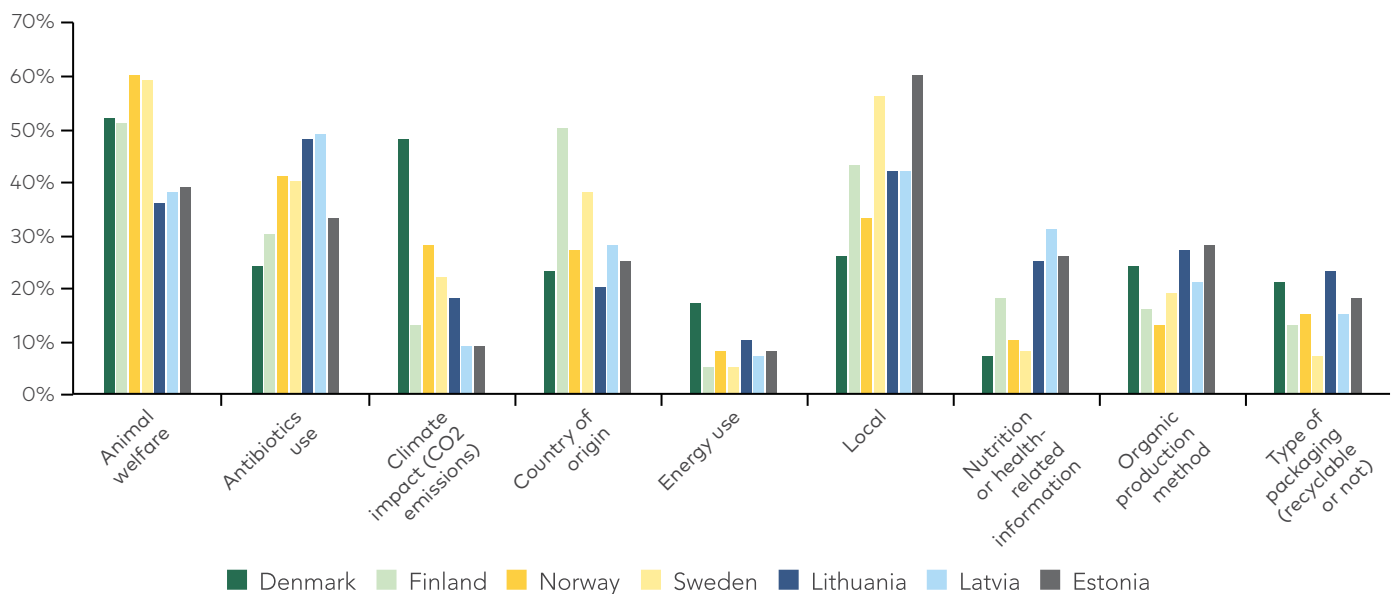

Figure 1. Most important attributes in the meat product category.

Note. Each attribute is among the top three most selected in at least one of the countries and product categories, animal welfare and antibiotics use were only asked for meat and dairy categories.
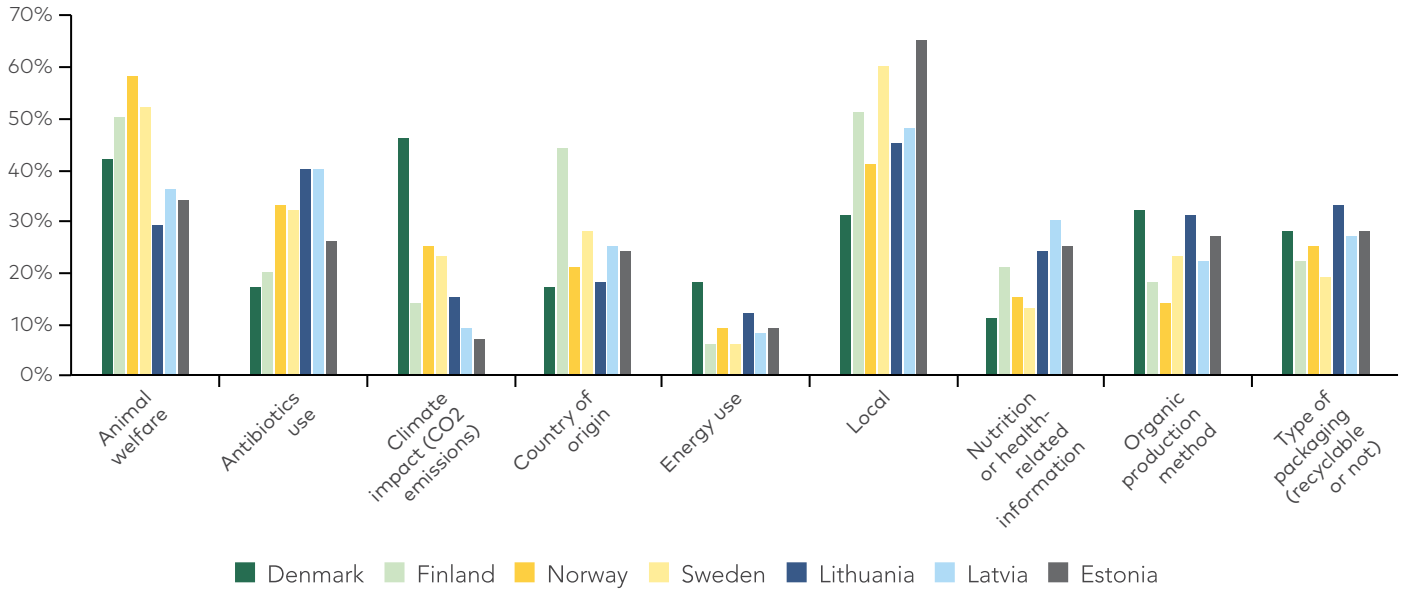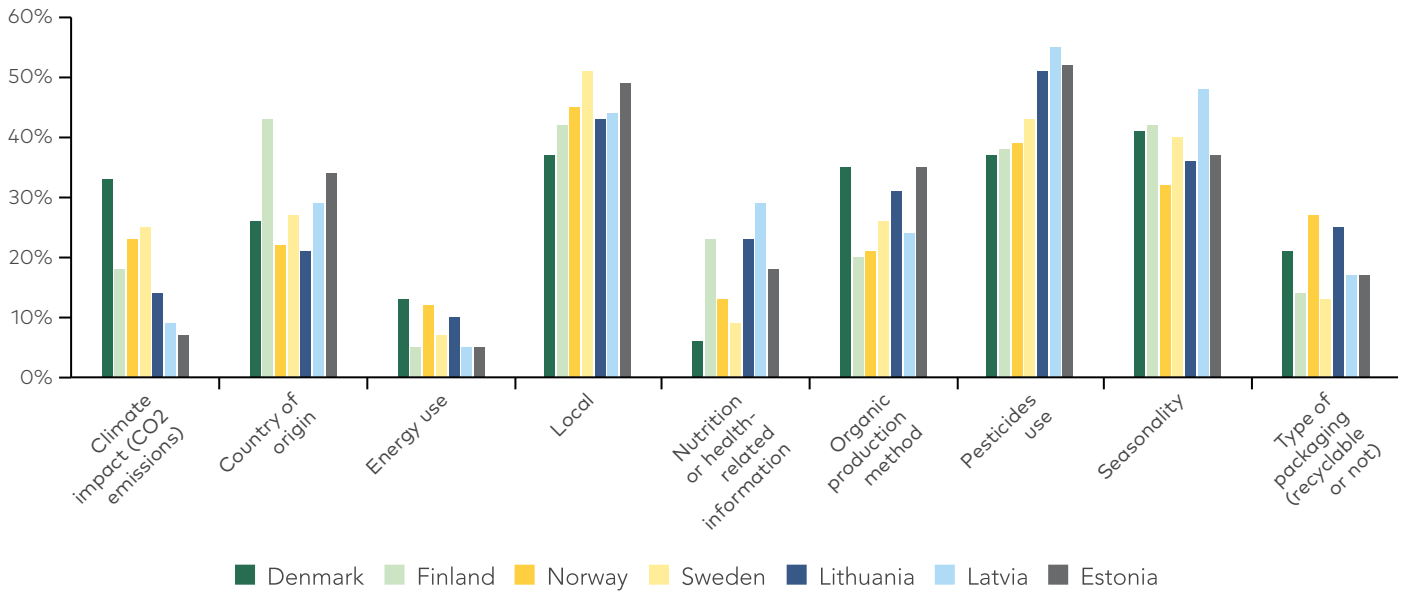
Figure 2. Most important attributes in the dairy product category.

Note. Each attribute is among the top three most selected in at least one of the countries and product categories, animal welfare and antibiotics use were only asked for meat and dairy categories.

Figure 3. Most important attributes in the fresh fruits and vegetables product category.

Note. Each attribute is among the top three most selected in at least one of the countries and product categories, pesticides use and seasonality were not asked for all other product categories.
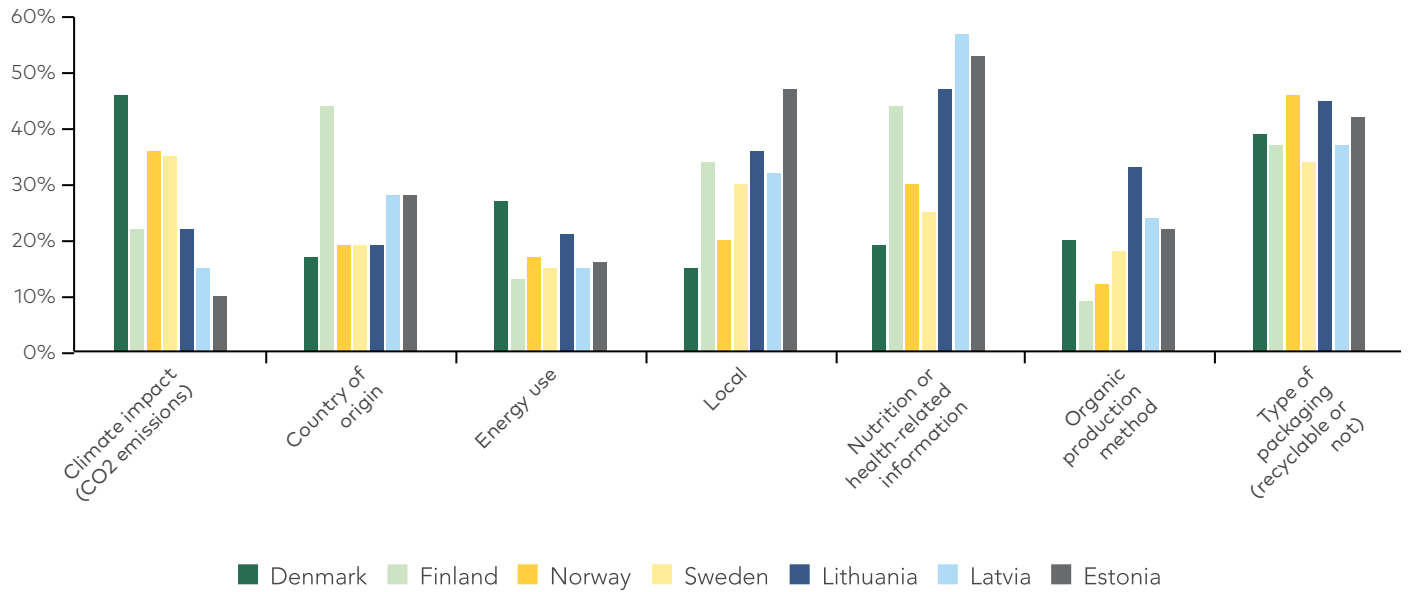
Figure 4. Most important attributes in the sweet and savoury snacks product category.

Note. Each attribute is among the top three most selected in at least one of the countries and product categories.

5.5 Understanding of sustainability at the product level

Respondents perceived sustainability somewhat differently between product categories, however, even within product categories, some products may be more sustainable than others. To uncover such perceptions of sustainability at product level, respondents were asked to compare a series of products in terms of how sustainable they think these are.

The comparisons showed that respondents had difficulty in differentiating between the products, especially in the case of 'tofu' versus 'cheese', and 'milk' versus 'soy drink'. Overall, the country differences were minor in terms of how people perceived these products (Table 17).

When comparing 'beef' with 'chicken', respondents perceive 'beef' on average as less sustainable than 'chicken', especially in Denmark and Norway. 'Plant-based alternatives to meat' were seen as more sustainable than 'meat', especially in Denmark (which did not differ from Sweden). 'Potatoes' were seen as more sustainable than 'rice' on average, but in Latvia and Lithuania respondents saw these two products as similar to some extent. Respondents across countries perceived 'apples' as more sustainable than 'mangoes'. This latter comparison was the one where respondents showed the clearest pattern of seeing a difference between the products in terms of sustainability.

After rating the comparisons, respondents were asked which aspects they considered when comparing all the products. 'Local' and 'country of origin' were among the most frequently selected aspects across all or most countries. 'Climate impact' was among the top three considerations in Denmark and Sweden. One of the top three most frequently selected attributes in Finland and Norway was 'animal welfare', whereas in the Baltic countries it was 'pesticides use'. Some attributes were selected among the three most common aspects only in one of the countries. These were 'mode of transportation' in Denmark, 'antibiotics use' in Lithuania and 'nutrition or health-related information' in Latvia.

Table 17. Product comparisons in terms of sustainability

Q7. Food products vary in the extent to which they can be seen as sustainable. Please compare the foods below in terms of how sustainable you think they are. In the next question you will be asked to specify which aspects did you consider when making the comparisons. (1 - much less sustainable, 2 - less sustainable, 3 - about the same, 4 - more sustainable, 5 - much more sustainable)							
	Denmark	**Finland**	**Norway**	**Sweden**	**Lithuania**	**Latvia**	**Estonia**
How sustainable is 'Beef' versus 'Chicken' meat?	2.1 a	2.6 c	2.3 b	2.6 c	3.0 d	2.9 d	2.6 c
How sustainable is 'Milk' versus 'Soy drink'?	2.8 a	3.1 c, e	3.3 d	3.1 c, b	3.0 b, c	2.9 a, b	3.3 d, e
How sustainable is 'Tofu' versus 'Cheese'?	3.2 a	3.0 b	2.8 b	2.9 b	2.9 b	2.9 b	2.6 c
How sustainable are 'Plant-based alternatives to meat' versus 'Meat'?	3.7 a	3.3 b	3.4 b	3.5 a, b	2.9 c	2.9 c	2.7 d
How sustainable are 'Potatoes' versus 'Rice'?	3.6 b, c	3.9 a	3.7 b, c	3.7 b	3.3 d	2.9 e	3.5 c
How sustainable are 'Apples' versus 'Mangoes'?	3.9 b, c	4.1 a, b	4.0 a, b, c	4.1 a	3.7 d	3.5 e	3.9 c

Note. Mean values shown. Per product comparison, different letters across countries denote significant differences in the means of that comparison between countries in one-way ANOVA, multiple comparison test with Games-Howell adjustment.

Chapter 6. Consumer interest in sustainability and attitudes towards a common sustainability label

Respondents were interested in sustainability and sustainability-related labels when it comes to food, with very minor differences between countries. Although interested, respondents believe that they do not know a lot about sustainability labelling in food products (Table 18). There were minor differences between countries in terms of how knowledgeable respondents felt about sustainability labelling in food products, with respondents in Sweden regarding themselves slightly more knowledgeable, and those in Latvia and Estonia reporting slightly lower levels of subjective knowledge.

Table 18. Interest in sustainability and labels and self-perceived knowledge about sustainability labelling

	Denmark	Finland	Norway	Sweden	Lithuania	Latvia	Estonia
Interest in sustain-ability and labels in food	4.6 a	4.7 a	4.2 b	4.4 b, c	4.6 a, c	4.5 a, c	4.6 a, c
Subjective knowledge of sustain-ability labelling in food products	3.3 b	3.3 b	3.1 c	3.6 a	3.2 b, c	2.8 d	2.7 d

Note. Mean values shown. Scales from 1 to 7, higher values represent higher level of the construct. Per construct, different letters across countries denote significant differences in the means of the construct between countries in one-way ANOVA, multiple comparison test with Games-Howell adjustment.

Respondents' openness towards a hypothetical common sustainability label across the EU was assessed by asking people about their attitudes and willingness to use such a food label when making food choices. The scenario given to people when asking about their attitudes and willingness to use was *'If a common sustainability label would be developed / available across the EU that informs about the overall sustainability of food products taking into account several sustainability aspects'* (for willingness to use this statement was finished with '*how likely would you be to use it when you choose food?'*)

Respondents across countries are open towards a common sustainability label for food products across the EU. They show positive attitudes as well as willingness to use such a label when making food choices. The different countries are very similar in their general openness towards such an initiative as any of the minor differences are negligible (Table 19).

Table 19. Attitude and willingness to use a hypothetical common label

	Denmark	Finland	Norway	Sweden	Lithuania	Latvia	Estonia
Attitude towards hypothetical common label	5.3 a, b	5.3 a, b, c	5.2 b, c	5.3 a, b	5.6 a	5.3 a, b	5.0 c
Willingness to use hypothetical common label	4.9 b, c	5.0 a, b, c	4.9 c	5.0 a, b, c	5.2 a, b	5.2 a	4.8 c

Note. Mean values shown. Scales from 1 to 7, higher values represent higher level of the construct. Per construct, different letters across countries denote significant differences in the means of the construct between countries in one-way ANOVA, multiple comparison test with Games-Howell adjustment.

Chapter 7. Sustainability understanding and individual characteristics

In addition to the main purpose of exploring similarities and differences between countries, the potential differences by demographics and individual characteristics were investigated. Differences were tested for age group, gender, education, residence, and perceived income as demographic characteristics (see Table 1) and environmental concern level as an individual characteristic. Median split was used on environmental concern to group people into those with high environmental concern (median value or above per country) versus low environmental concern (below median value per country).

There were some small differences in certain countries in terms of some of these background measures, however, at large these did not have important effects. Only the more noteworthy differences in terms of demographics and individual characteristics are mentioned in this chapter, given that the main focus of the report is on country differences and similarities.

7.1 Understanding of sustainability in general and individual characteristics

Respondents with higher *environmental concern* have selected more frequently the pair of words 'environmentally-friendly, healthy' as describing sustainability than those with low environmental concern in Finland, Estonia, Latvia, Lithuania and Sweden. Similarly, those with high environmental concern have selected less frequently the pair of words 'safe, fair' as describing sustainability in Finland, Latvia, Lithuania and Estonia. This difference by environmental concern was strongest in Finland followed by Estonia. There were no differences between environmental concern groups in Denmark and Norway.

7.2 Ranking of sustainability dimensions in food and individual characteristics

Age had an impact on the ranking of the 'animal welfare' sustainability dimension in the Baltic countries. The younger the group, the more important 'animal welfare' was ranked, although in Lithuania and Latvia only the youngest group differed from the older ones. In Estonia, the oldest age group ranked 'culture' as more important compared to the other age groups. In relation to the ranking of 'biodiversity', in Finland, those with the highest level of *education* have ranked 'biodiversity' as more important than the other two lower-educated groups.

Environmental concern level was associated to some extent with the ranks of some dimensions of sustainability. 'Economic growth' was ranked lower across countries by those with high environmental concern as opposed to those with low environmental concern, but the effect was weak in Lithuania. 'Climate change prevention' was ranked higher across countries by those more concerned about the environment than those less concerned about the environment, but the effect was weaker in Denmark and Lithuania.

7.3 Aspects associated with food sustainability and individual characteristics

Environmental concern level was related to some of the associations people made with sustainability in food. Those with high environmental concern selected more often 'reducing the amount of pesticides used in food production', 'less energy use when cooking products', 'improving welfare/conditions for animals' and 'biodiversity preservation' as being about food sustainability than those with low environmental concern. These associations were stronger in Finland, whereas for 'less energy use when cooking products' the difference was not significant in Denmark. Those more concerned with the environment also associated more frequently 'minimising carbon emissions when producing goods' and 'reducing deforestation of the rain forest' with food sustainability than those with low environmental concern. These associations were stronger in Finland and Estonia. 'Organic production' was seen as being related to food sustainability more frequently in the high environmental concern group. This association was stronger in Estonia. 'Reducing meat consumption' was associated to food sustainability more frequently among those with high environmental concern. This association was stronger in Finland and Norway. Overall, these associations had small to medium strength.

7.4 Product sustainability comparisons and individual characteristics

Respondents who score high on *environmental concern* perceive 'plant-based alternatives to meat' as more sustainable than 'meat' compared to those in the low environmental concern group. This effect was stronger in Finland, Norway, Sweden and Estonia, but not significant in Lithuania.

7.5 Consumer interest in sustainability and attitudes towards a common sustainability food label by individual characteristics

Gender was associated with interest in sustainability and sustainability labelling, as well as with attitudes and willingness to use a hypothetical common sustainability label across the EU. Females were more interested in sustainability and sustainability labelling of food, had a more positive attitude towards a common label and were more willing to use a common label when choosing food as opposed to males, except in Latvia where there was no difference as to gender.

Respondents with high *environmental concern* level were more interested in sustainability and sustainability labelling in food compared to those with low environmental concern. This effect was smaller in the Baltic countries compared to the Nordic ones. Similarly, those with high environmental concern had more positive attitudes towards a hypothetical common sustainability label across the EU and were more willing to use such a label when making food choices, as opposed to those with low environmental concern. This effect was smaller in Lithuania compared to the other countries.

Chapter 8. Consumer understanding of sustainability in Iceland

In Iceland, it was not possible to recruit a similar sample in terms of size and representativeness criteria as the other Nordic-Baltic countries. Selected main results from Iceland are presented in this chapter, however, caution should be taken to the limitations in terms of comparability of these results with the broader context of the other countries presented in the previous chapters due to the concerns about sample size and especially representativeness criteria.

The demographic characteristics of the Icelandic sample comprising of 109 participants can be seen in Table 20. These show that the sample was less balanced than in the other countries, therefore not close to being representative.

Table 20. Participant characteristics Iceland

	Iceland
Age (%)	
18-39	23.9%
40-59	55.0%
60-75	21.1%
Gender (%)	
Male	38.5%
Female	61.5%
Education (%)	
Less than primary, primary and lower secondary education (levels 0-2)	9.2%
Upper secondary and post-secondary non-tertiary education (levels 3 and 4)	34.9%
Tertiary education (levels 5-8)	52.3%

Place of residence (%)	
Metropolitan or big city	71.5%
Small town or rural	28.4%
Perceived income level (%)	
There is enough money to buy the foods I want	41.3%
There is some need to consider prices, which limits some choices when buying food	40.4%
There is a need to consider prices carefully, which limits many choices when purchasing food	18.3%
Number of adults in household (%)	
1 adult	27.5%
2 adults	46.8%
3 or more adults	25.8%
Presence of children in household (%)	
no children	60.6%
with children	38.6%
Diet style (%)	
I never eat meat, fish, dairy products or eggs	0%
I never eat meat and fish	0.9%
I never eat meat, but eat fish	4.6%
Primarily I eat plant based, and low amounts of meat and moderate amounts of fish, eggs and dairy products	16.5%
Basically, I do not eat meat, but it happens at special occasions	2.8%
I eat no meat once or more days a week	33.0%
As a rule, I eat meat each day	42.2%

8.1 Associations with sustainability in Iceland

In Iceland, the environment, own production and reuse and recycling were among the most mentioned aspects in relation to sustainability in general. Table 21 provides an overview of example aspects covered under the main codes.

Table 21. Iceland – Top ten codes associated with sustainability (i.e., sjálfbærni)

Codes and examples of sub-codes (exemplified with raw answers in Icelandic)	Frequency
Environment	**33**
Environment (e.g., Umhverfismál), Environmentally friendly (e.g., Umhverfisvænt), Nature (e.g., Náttúra)	
Reuse&Recycling	**28**
Recycling (e.g., Endurnýting, Endurvinnsla), Reusable (e.g., Endurnýtanlegt), Waste sorting (e.g., Flokka)	
Own production	**23**
Grow your own food (e.g., Ræktun)	
Resources	**20**
Resources (e.g., Auðlindir)	
Independent	**19**
Independent (e.g., Sjálfstæði, Óháður)	
Energy	**15**
Energy (e.g., Orka)	
Self-sufficient	**14**
Self-sufficient (e.g., Vera sjálfum sér nóg)	
Circular	**14**
Circular (e.g., Hringrás), Recircular (e.g., Endurvinna)	
Economy	**9**
Savings (e.g., Sparnaður), Economy	
Consumption	**8**
Consume less	

Note. The frequencies represent the number of distinct times the code was mentioned

8.2 Understanding of sustainability in general in Iceland

The majority of respondents in Iceland associated sustainability in general with 'achieving the circular green transition and innovating new technologies', but this was closely followed by 'fair share of resources between us, other people, and the people after us'. The pair of words 'environmentally-friendly, healthy' is the most commonly thought of as reflecting sustainability, however, 'circular, innovative' was also seen as closely linked to sustainability (Table 22). Thus, circularity and innovation are aspects that people associate with sustainability in addition to share of resources and environmental aspects. In addition, future generations are considered as reflecting sustainability by many respondents as well.

Table 22. Sustainability understanding in general in Iceland

Q2.1. If someone would tell you what sustainability means … to which of these explanations do you agree most?	
Sustainability is about the fair share of resources between us, other people, and the people after us	44.0%
Sustainability is about achieving the circular green transition and innovating new technologies	**52.3%**
Sustainability is about treating animals with respect	3.7%
Q2.2 Which of the following words fit best to what you think sustainability is?	
Environmentally-friendly, healthy	**45.0%**
Safe, fair	13.8%
Circular, innovative	41.3%
Q2.3 How would you end the sentence, if you would want to find a good lay-person description of sustainability? Sustainability is when …	
we live the simple way our grandparents did	17.4%
the way we live could be how everybody else on the planet lives	40.4%
all current people´s lifestyle allows all children´s children to have a similar lifestyle	**42.2%**
Q2.4 Which of these sayings best expresses sustainability for you?	
The true secret of happiness lies in taking a genuine interest in all the details of daily life	6.4%
Make every decision that we make relate to the welfare and well-being of the future generation to come	**64.2%**
We cannot solve our problems with the same thinking we used when we created them	29.4%

Notes. Percentage of respondents that selected the answer. Only one answer could be selected. In **bold** the highest percentage per question. In *italics* the answer that is closest to the definitions of sustainability.

8.3 Understanding of food sustainability in Iceland

When it comes to sustainability within food, the most important dimensions for respondents in Iceland were 'pollution reduction' and 'nature preservation', whereas 'culture' or 'economic growth' were least important (Table 23).

Table 23. Mean rank of sustainability dimensions in Iceland

Q3. Thinking about food sustainability, please rank order the following dimensions based on how important you think they are, starting from the most important (1) to the least important (10).	
Pollution reduction	3.48
Nature preservation	3.55
Climate change prevention	4.39
Health	4.56
Biodiversity	4.99
Animal welfare	5.51
Equality	5.80
Fair wages	6.65
Culture	7.96
Economic growth	8.11

The most common aspects associated with sustainability in the food domain by respondents in Iceland were 'less food waste', 'minimising carbon emissions when producing goods', 'less energy used to transport products' and 'recyclable packaging' (Table 24).

Table 24. Issues associated with food sustainability understanding in Iceland

Q4. From this list, which of the following issues do you think have something to do with food sustainability? Please select any that you think apply.	
Less food waste	82.6%
Minimising carbon emissions when producing goods	74.3%
Less energy used to transport products	74.3%
Recyclable packaging	72.5%
Reducing deforestation of the rain forest	67.0%
Reducing the amount of pesticides used in food production	65.1%
Biodiversity preservation (richness and variety of animal and plant species and agro-ecosystems)	62.4%
Less packaging	61.5%
Maximum food output with minimal use of natural resources	59.6%
Less energy use when cooking products	56.9%
Food and drink safety	55.0%
Ensuring a sufficient food supply for the increasing world population	55.0%
Organic production	55.0%
Improving welfare/conditions for animals	54.1%
Local or short supply chain	50.5%
Ensuring fair prices and working conditions for producers	48.6%
Healthier food and drink products	39.4%
Availability of food	35.8%
Minimal processing	30.3%
Reducing meat consumption	26.6%
Lower prices for consumers	25.7%
Cultural acceptability of food	11.0%
Do not know (exclusive)	0.0%

Note. Percentage of respondents selecting each option, multiple statements could be selected.

As in the other countries, respondents in Iceland tended to see some level of conflict between 'economic growth' and 'sustainable development goals'. On the other hand, 'healthy eating' and 'sustainable eating' are seen as supporting each other (Table 25).

Table 25. Perceived conflict between sustainability dimensions in Iceland

Q5. To which extent do the following dimensions support each other or are in contradiction with each other in your opinion? (1 - support each other, 7 - contradict each other)	
'Healthy eating' versus 'Sustainable eating'	2.40
'Economic growth goals' versus 'Sustainable Development goals'	4.27
'Environmental goals' versus 'Social goals (e.g., gender equality, decent work conditions)'	2.98

Note. Mean values shown.

In terms of perceptions of sustainability at the product category level, the attributes relevant for choosing a sustainable product in the various product categories differed (Table 26). In the meat and the dairy categories, 'animal welfare' and 'antibiotics use' are among the most important considerations, as well as 'country of origin' in meat and 'organic production method' in dairy. 'Country of origin' and 'organic production method' were among the top considerations for fresh fruits and vegetables as well, together with 'pesticides use'. This shows that aspects of relevance to specific categories play an important role for respondents, such as animal welfare in animal-based products and pesticides use in plant-based products. The most notable differences were between sweet and savoury snacks and the other categories. In the case of sweet and savoury snacks, 'nutrition or health-related information', 'type of packaging (recyclable or not)' and 'climate impact (CO_2 emissions)' were among the aspects prioritised by respondents in Iceland.

Table 26. Product category and sustainability aspects in Iceland

Q6. If you were to choose a sustainable product in the following product categories, which of the following aspects would you consider as important, if any? Please select the three most important ones for each product category.				
	Meat	**Dairy**	**Fresh fruits and vegetables**	**Sweet and savoury snacks**
Animal welfare	**55.0%**	**50.5%**		
Antibiotics use	**34.9%**	**29.4%**		
Pesticides use			**39.4%**	
Seasonality			27.5%	
Country of origin	**37.6%**	21.1%	**37.6%**	21.1%
Organic production method	33.9%	**34.9%**	**44.0%**	21.1%
Local	23.9%	23.9%	22.0%	15.6%
Climate impact (CO2 emissions)	21.1%	14.7%	17.4%	**33.0%**
Social aspects (workers' conditions; fair pay for farmers)	20.2%	18.3%	22.0%	20.2%
Nutrition or health-related information	17.4%	28.4%	22.9%	**45.0%**
Mode of transportation (e.g., by plane, by truck)	11.0%	11.0%	19.3%	19.3%
Type of energy (renewable or not)	8.3%	12.8%	15.6%	9.2%
Degree of processing	7.3%	7.3%	3.7%	15.6%
Energy use	6.4%	11.9%	11.0%	18.3%
Type of packaging (recyclable or not)	6.4%	22.0%	17.4%	**34.9%**
I never buy products in this category (Exclusive)	4.6%	3.7%	0%	11.0%
None of these (Exclusive)	0.9%	0.9%	0%	4.6%

Note. Percentages of respondents selecting each attribute shown. Multiple attributes could be selected. When an attribute does not have a value for a product category, it was not shown to respondents. In **bold** the three most frequently selected attributes per product category.

Respondents had difficulties comparing different products in terms of how sustainable they are. Even though respondents understand to some extent what sustainability refers to, they have different aspects that they look for in the different product categories and they have a hard time to assess sustainability at the product level. There was a tendency to perceive 'potatoes' as more sustainable than 'rice', but the remaining comparisons were less clear cut in their outcome (Table 27).

Table 27. Product comparisons in terms of sustainability in Iceland

Q7. Food products vary in the extent to which they can be seen as sustainable. Please compare the foods below in terms of how sustainable you think they are. In the next question you will be asked to specify which aspects did you consider when making the comparisons. (1 - much less sustainable, 2 - less sustainable, 3 - about the same, 4 - more sustainable, 5 - much more sustainable)	
How sustainable is 'Beef' versus 'Chicken' meat?	2.79
How sustainable is 'Milk' versus 'Soy drink'?	3.34
How sustainable is 'Tofu' versus 'Cheese'?	2.83
How sustainable are 'Plant-based alternatives to meat' versus 'Meat'?	3.15
How sustainable are 'Potatoes' versus 'Rice'?	3.67
How sustainable are 'Apples' versus 'Mangoes'?	3.41

Note. Mean values shown.

8.4 Consumer interest in sustainability and attitudes towards a common sustainability label in Iceland

Respondents in Iceland are generally interested in sustainability and sustainability labelling in food, however, as in the other countries they believe that they do not know a lot about sustainability labelling. When it comes to a hypothetical common sustainability labelling scheme for food in the EU, respondents in Iceland hold positive attitudes towards such a labelling scheme and are willing to use it when choosing food (Table 28).

Table 28. Attitudes and knowledge of sustainability labelling in food Iceland

Sustainability labelling in food concept	Mean value
Interest in sustainability and labels in food	4.58
Subjective knowledge of sustainability labelling in food products	3.03
Attitude towards hypothetical common label	5.50
Willingness to use hypothetical common label	5.43

Note. Scales from 1 to 7.

Chapter 9. Conclusions

Associations with sustainability in general

The open-ended questions on associations with sustainability in general revealed the top-of-mind associations that people have with sustainability. Environment was among the top two most commonly mentioned concepts in relation to sustainability in each of the countries. Another theme that was prevalent in each of the countries was reuse and recycling. In Denmark, Norway, Sweden, Lithuania and Estonia, these two aspects (i.e., environment, reuse and recycling) were most frequently associated with sustainability. In Finland, durability (i.e., long-lived, long-term, long-lasting) was a main association to sustainability in addition to the environment. In Latvia, the main association was with durability (e.g., endurance, long-lasting, persistence, long-term) in addition to the environment.

The environment and reuse/recycling appeared to be main associations related to sustainability. There are other aspects that are relevant, however, the economic and social aspects of sustainability were not among the most mentioned concepts per country. However, in some countries, social aspects were among the top ten, and in some countries, economic aspects were among the top ten most mentioned.

Understanding of sustainability in general

The closed-ended questions on the meaning of sustainability in general revealed that ***Nordic-Baltic consumer-citizens are familiar with some elements of sustainability definitions, such as ensuring fair share of resources between us and future generations, that our lifestyle should allow future generations to have a similar lifestyle, and environmentally friendly and health aspects.*** On the contrary, very few people are familiar with or emphasise the 'safe and fair' elements of sustainability definitions. This could indicate that the main idea of sustainability definitions is understood (e.g., the 'Brundtland report' definition), but not necessarily all aspects or more recent ways to express the definition of sustainability (e.g., the 'safe and just operating space').

In the Nordic countries, a higher share of consumer-citizens believe that we cannot solve our problems with the same thinking we used when we created them. This appears to imply that in the Nordic countries a change of the mind-set or technological solutions may be perceived as solutions to the current situation to a higher degree than in the Baltic countries, but it could also indicate a greater call for transformation.

Although there were some country differences, in several elements of sustainability definitions the Nordic-Baltic countries are similar. There are no big differences in terms of individual characteristics.

Understanding of food sustainability

Consistent with the open-ended associations to sustainability in general and with the understanding of sustainability, **environmental-related dimensions of sustainability (Pollution reduction, Climate change prevention, Nature preservation) were among the most important dimensions across the Nordic-Baltic countries**. In addition, **health was among the most important two sustainability dimensions in Finland and the Baltic countries.** On the other hand, culture was among the least important sustainability dimensions across countries. This could be the case because culture has only been discussed as a sustainability dimension more recently (e.g., the sustainable diets definition by FAO, 2012).

Biodiversity is a crucial planetary ecosystem aspect and highly affected by human activity (Steffen et al., 2015). However, consumer-citizens did not rank it among the top two dimensions in the Nordic-Baltic countries, except in Norway. Therefore, it appears as if consumer-citizens are less aware of this aspect of sustainability, which indicates that more information could be provided about this.

Consumer-citizens were most familiar with the issues of less food waste and recyclable packaging as relating to sustainability within food. However, reduction of meat consumption was among the aspects less frequently associated with food sustainability. Carbon emissions were more top-of-mind in the Nordic countries than the Baltic ones. Local and short supply chains were less frequently associated with food sustainability in Lithuania and Latvia. Food waste has received a lot of attention in previous years, and it appears citizens have acknowledged its importance.

The role of food waste seems to show that efforts to communicate about sustainability aspects can result in increased awareness among consumer-citizens. However, the observation that reduction of meat is less frequent appears to show that more communication on the relative impact of meat is needed.

Consumer-citizens see some conflict between achieving economic growth and sustainable development goals, but they see little conflict in achieving healthy eating and sustainable eating. There were minor country differences in this regard. This indicates that consumer-citizens perceive that sustainability goals can be achieved with small economic sacrifices, however, health and sustainability appear not to be perceived at odds.

This implies that where trade-offs need to be made, these should be communicated to consumer-citizens. This relates to labelling initiatives that could take into account various aspects of sustainability.

Understanding of sustainability at product category level

Certain aspects that consumer-citizens consider when choosing a sustainable product are important across product categories, such as local food. On the other hand, certain aspects vary in importance by product category. **For animal-based products, the most important aspects had to do with animal welfare or antibiotics use. For fruits and vegetables, seasonality and pesticides use were very important. Sweet and salty snacks was the category that differed the most from the others, in which case the type of packaging and nutrition and health information were very important.** Fresh fruits and vegetables were the category where important aspects were most similar across countries.

As opposed to what was the case for understanding of food sustainability, packaging aspects were generally (except for snacks) of lower importance at the product category level. This implies that consumer-citizens may place highest importance on different aspects depending on product category, which could be considered in communication efforts or labelling initiatives.

Understanding of sustainability at product level

Generally, **consumer-citizens had difficulties in differentiating between food products in terms of how sustainable these are.** For example, plant-based alternatives to meat were seen as more sustainable than 'meat', especially in Denmark and Sweden. On the contrary, in the Baltic countries, consumer-citizens believed these are about as sustainable as meat.

Thus, although people are familiar with some of the aspects related to sustainability, they cannot easily apply that information when comparing specific foods. A sustainability label may help to communicate product-related sustainability.

Views on sustainability labelling

Consumer-citizens across countries had positive attitudes and were willing to use a sustainability label that would be common across the EU and would inform about various aspects of sustainability. Such a label could help people differentiate between products and could take into account specific aspects of relevance per product category.

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Appendix A. Questionnaire

Food sustainability understanding Questionnaire

Introduction and consent

Dear participant,

Thank you for considering participating in this survey. Before making a final decision, please read the following consent form and click "I confirm" at the bottom of the page, provided you understand the following and voluntarily give your consent to participate in this survey.

I. Purpose of the research study

You are invited to participate in an international study conducted by the MAPP Center at Aarhus University, Denmark, and funded by the Nordic Working Group for Healthy, Safe and Sustainable Diet (HSSD) under the Nordic Council of Ministers.

With this questionnaire, we want to examine consumers' understanding of sustainability.

The research responsible is XXXX from Aarhus University in Denmark.

II. What you will be asked to do

If you decide to participate in this study, you will be asked to answer a set of questions. You will be asked to read the instructions, as well as questions, carefully, as you might otherwise not be able to complete the survey successfully.

III. Foreseeable risks or discomforts

There are no risks associated with completing this questionnaire.

IV. Benefits

The aim is to gain a greater understanding of consumer behaviour, which can benefit society in general. In addition to contributing to scientific research, you will be compensated for your participation in this survey.

V. Confidentiality

All information and / or sensitive personal information will remain confidential. We use your non-personally sensitive and anonymous data for scientific, non-commercial purposes only. They will be used in potential publications in scientific journals or presentations, but information from this study will only be reported as a group, and not individually.

You can withdraw from the survey at any time while taking it, without giving reason for this, by closing the online survey page.

Data from the questionnaire survey are stored for up to 5 years.

VI. Time

The total time estimated to fill out this survey is about 10 minutes.

VII. Contact Information

If you have questions or concerns about this study, or should problems arise, please contact the primary researcher by e-mail: XXXX.

You can also contact data protection adviser XXXX by e-mail: XXXX for further information. Aarhus University, CVR no. 31119103, is data responsible for processing your data.

VIII. Consent

By selecting "I confirm" below, you indicate that you are 18 years of age and have read and understood this consent form.

1. I hereby confirm that I have read and understood the above as a condition of my consent to the processing of my personal information for this research project.
2. I do not want to participate.

Screen out if selected answer = 2

Understanding of sustainability in general

Q1. This question is about **sustainability in general**. Please take a bit of time to reflect about what you think 'sustainability' means and write the first 3 to 5 words that come to mind.

Open text boxes, forced to write at least 3 words

Thinking about sustainability in general, please answer the following questions.

Q2.1 If someone would tell you what sustainability means … to which of these explanations do you agree most?

- Sustainability is about the fair share of resources between us, other people, and the people after us

- Sustainability is about achieving the circular green transition and innovating new technologies
- Sustainability is about treating animals with respect

Q2.2 Which of the following words fit best to what you think sustainability is?

- Environmentally-friendly, healthy
- Safe, fair
- Circular, innovative

Q2.3 How would you end the sentence, if you would want to find a good lay-person description of sustainability?

Sustainability is when …

- we live the simple way our grandparents did
- the way we live could be how everybody else on the planet lives
- all current people´s lifestyle allows all children´s children to have a similar lifestyle

Q2.4 Which of these sayings best expresses sustainability for you?

- The true secret of happiness lies in taking a genuine interest in all the details of daily life
- Make every decision that we make relate to the welfare and well-being of the future generation to come
- We cannot solve our problems with the same thinking we used when we created them

Food sustainability understanding

Now it is about sustainability in food.

 Q3. Thinking about **food sustainability**, please rank order the following dimensions based on how important you think they are, starting from the most important (1) to the least important (10).

- Equality
- Health
- Animal welfare

- Fair wages
- Economic growth
- Culture
- Biodiversity
- Pollution reduction
- Nature preservation
- Climate change prevention

Q4. From this list, which of the following issues do you think have something to do with **food sustainability**? Please **select any that you think apply**.

- Ensuring a sufficient food supply for the increasing world population
- Reducing the amount of pesticides used in food production
- Maximum food output with minimal use of natural resources
- Less food waste
- Less energy use when cooking products
- Recyclable packaging
- Minimising carbon emissions when producing goods
- Ensuring fair prices and working conditions for producers
- Reducing deforestation of the rain forest
- Lower prices for consumers
- Healthier food and drink products
- Food and drink safety
- Improving welfare/conditions for animals
- Less energy used to transport products
- Less packaging
- Minimal processing
- Organic production
- Local or short supply chain
- Biodiversity preservation (richness and variety of animal and plant species and agro-ecosystems)
- Availability of food
- Cultural acceptability of food
- Reducing meat consumption
- Do not know Exclusive

Q5. To which extent do the following dimensions support each other or are in contradiction with each other in your opinion?

1. 'Healthy eating' versus 'Sustainable eating'
2. 'Economic growth goals' versus 'Sustainable Development goals'
3. 'Environmental goals' versus 'Social goals (e.g. gender equality, decent work conditions)'

Scale: 1. support each other, 2, 3, 4, 5, 6, 7. contradict each other

Q6. If you were to choose a **sustainable product** in the following product categories, which of the following aspects would you consider as important, if any? Please select the **three most important ones** for each product category.

Show this question for each of the following categories

1. *Meat products*
2. *Dairy products*
3. *Fresh fruits and vegetables*
4. *Sweet and savoury snacks*

- Mode of transportation (e.g., by plane, by truck)
- Country of origin
- Local
- Energy use
- Type of energy (renewable or not)
- Type of packaging (recyclable or not)
- Climate impact (CO_2 emissions)
- Organic production method
- Seasonality Only show for category 3
- Degree of processing
- Social aspects (workers' conditions; fair pay for farmers)
- Antibiotics use Only show for categories 1 and 2
- Pesticides use Only show for category 3
- Animal welfare Only show for categories 1 and 2
- Nutrition or health-related information
- None of these Exclusive
- I never buy products in this category Exclusive

Q7. Food products vary in the extent to which they can be seen as sustainable. Please compare the foods below in terms of how sustainable you think they are. In the next question you will be asked to specify which aspects did you consider when making the comparisons.

1. How sustainable is 'Beef' versus 'Chicken' meat?
2. How sustainable is 'Tofu' versus 'Cheese'?
3. How sustainable are 'Plant-based alternatives to meat' versus 'Meat'?
4. How sustainable is 'Milk' versus 'Soy drink'?
5. How sustainable are 'Potatoes' versus 'Rice'?
6. How sustainable are 'Apples' versus 'Mangoes'?

Scale**:** 1 Much less sustainable, 2 less sustainable, 3 about the same, 4 more sustainable, 5 much more sustainable

Q8. Which of the following aspects did you consider when comparing the different products in terms of how sustainable they are? Please select **all that apply**.

- Mode of transportation (e.g., by plane, by truck)
- Country of origin
- Local
- Energy use
- Type of energy (renewable or not)
- Type of packaging (recyclable or not)
- Climate impact (CO_2 emissions)
- Organic production method
- Seasonality
- Degree of processing
- Social aspects (workers' conditions; fair pay for farmers)
- Antibiotics use
- Pesticides use
- Animal welfare
- Nutrition or health-related information
- Other

Individual characteristics

Q9. Listed below are statements about the relationship between humans and the environment. Please rate your disagreement or agreement with these statements.

1. When humans interfere with nature it often produces disastrous consequences
2. Humans are severely abusing the environment
3. Despite our special abilities humans are still subject to the laws of nature
4. The so-called "ecological crisis" facing humankind has been greatly exaggerated
5. The balance of nature is very delicate and easily upset
6. If things continue on their present course, we will soon experience a major ecological catastrophe
7. If you are paying attention please select the fifth point on the scale

Scale: 1 Strongly disagree, 2, 3, 4 Neutral, 5, 6, 7 Strongly agree

Q10. Please rate your disagreement or agreement with the following statements.

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
4. I think of myself as the sort of person who is concerned about the long-term health effects of my food choices
5. I think of myself as someone who generally thinks carefully about the health consequences of my food choices
6. I think of myself as a health-conscious person
7. Making good use of all resources is an important part of who I am
8. I am the type of person who is frugal (economical, not wasteful)
9. I see myself as a frugal (economical, not wasteful) person

Scale: 1 Strongly disagree, 2, 3, 4 Neutral, 5, 6, 7 Strongly agree

Q11. You are now going to see different descriptions of people. Can you please indicate for each description, to what extent this person is like you?

Gender matched to the respondent's gender

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

19. He/She strongly believes that people should care for nature. Looking after the environment is important to him/her.
20. Tradition is important to him/her. He/She tries to follow the customs handed down by his/her religion or his/her family.
21. He/She seeks every chance he/she can to have fun. It is important to him/her to do things that give him/her pleasure.

Scale: 1 not like me at all, 2, 3, 4, 5, 6 very much like me

Sustainability labelling

Q12. How interested are you in the following aspects when it comes to food?

1. Sustainability
2. Sustainability related labels

Scale: 1 not at all, 2, 3, 4, 5, 6, 7 extremely

Q13. Please rate your disagreement or agreement with the following statements.

1. I know quite a lot about sustainability labelling in food products
2. I am one of the experts on sustainability labelling in food products among my acquaintances
3. I feel well informed about sustainability labelling in food products

Scale: 1 Strongly disagree, 2, 3, 4 Neutral, 5, 6, 7 Strongly agree

Q15. If a common sustainability label would be developed / available across the EU that informs about the **overall sustainability of food products taking into account several sustainability aspects**, I would find such a label…

1 meaningless, 2, 3, 4, 5, 6, 7 meaningful

1 useless, 2, 3, 4, 5, 6, 7 useful

1 insignificant, 2, 3, 4, 5, 6, 7 valuable

Q16. If a common sustainability label would be developed / available across the EU that informs about the **overall sustainability of food products taking into account several sustainability aspects**, how likely would you be to use it when you choose food?

1 not at all likely, 2, 3, 4, 5, 6, 7 very likely

Demographics

Gender. (as used by agency)

Age. (as used by agency)

D1. Education level. Adapted per country. All recoded into:

- Less than primary, primary and lower secondary education (levels 0-2)
- Upper secondary and post-secondary non-tertiary education (levels 3 and 4)
- Tertiary education (levels 5-8)

D2. Household income. Adapted per country.

D3. Place of residence. Where do you live?

- I live in the Metropole and/or Capital city
- I live in a large city
- I live in a (minor) town/city
- I live in a countryside area/not in the city

D4. Household size.

1. **Household adult**. How many adults over 18 years old, including yourself, live in your household?
2. **Household children.** How many children under 18 years old live in your household?

D5. Perceived income level. If you think about the amount of money available for grocery shopping in your household, which of these statements best suits you?

- There is enough money to buy the foods I want.
- There is some need to consider prices, which limits some choices when buying food.
- There is a need to consider prices carefully, which limits many choices when purchasing food.

D6. Diet style. Choose the statement that fits you best:

- I never eat meat, fish, dairy products or eggs
- I never eat meat and fish
- I never eat meat, but eat fish
- Primarily I eat plant based, and low amounts of meat and moderate amounts of fish, eggs and dairy products
- Basically, I do not eat meat, but it happens at special occasions
- I eat no meat once or more days a week
- As a rule, I eat meat each day

Appendix B. Visual representations of open-ended associations per country

The word clouds below show a visual representation of the most frequent 10 words or concepts per country, based on the frequency with which the different codes were mentioned in the respective country. The bigger the text, the more frequently the concept was mentioned. Therefore, only the size of the text in the visual representation carries meaning related to the frequency of mentions. The word clouds have been made using Word It Out https://worditout.com/.

Figure 5. Word cloud of the ten most frequently mentioned codes in relation to sustainability (i.e., bæredygtighed) in Denmark.

Note. This is a visual representation where the size of the codes reflects the frequency with which they were mentioned, thus larger size reflects higher frequency.

Figure 6. Word cloud of the ten most frequently mentioned codes in relation to sustainability (i.e., kestävyys) in Finland.

Note. This is a visual representation where the size of the codes reflects the frequency with which they were mentioned, thus larger size reflects higher frequency.
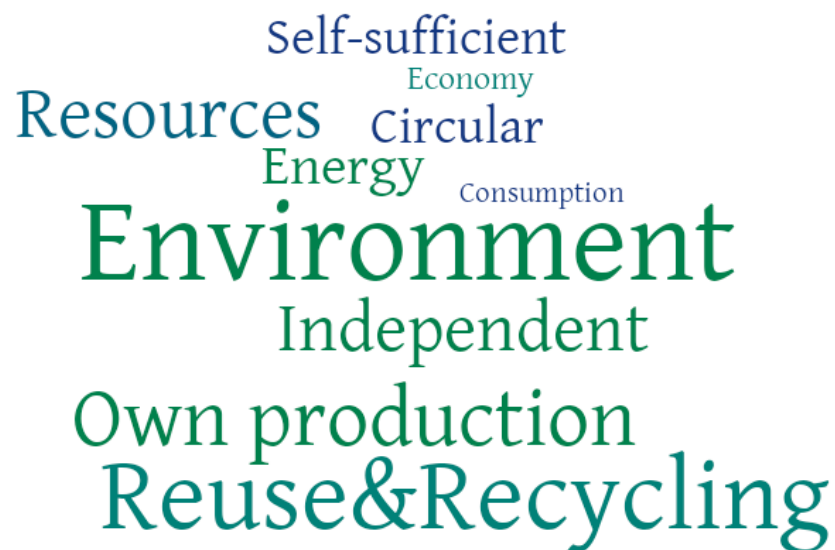

Figure 7. Word cloud of the ten most frequently mentioned codes in relation to sustainability (i.e., bærekraft) in Norway.

Note. This is a visual representation where the size of the codes reflects the frequency with which they were mentioned, thus larger size reflects higher frequency.

Figure 8. Word cloud of the ten most frequently mentioned codes in relation to sustainability (i.e., hållbarhet) in Sweden.

Note. This is a visual representation where the size of the codes reflects the frequency with which they were mentioned, thus larger size reflects higher frequency.

Figure 9. Word cloud of the ten most frequently mentioned codes in relation to sustainability (i.e., tvarumas) in Lithuania.

Note. This is a visual representation where the size of the codes reflects the frequency with which they were mentioned, thus larger size reflects higher frequency.

Figure 10. Word cloud of the ten most frequently mentioned codes in relation to sustainability (i.e., ilgtspējība) in Latvia.

Note. This is a visual representation where the size of the codes reflects the frequency with which they were mentioned, thus larger size reflects higher frequency.

Figure 11. Word cloud of the ten most frequently mentioned codes in relation to sustainability (i.e., jätkusuutlikkus) in Estonia.

Note. This is a visual representation where the size of the codes reflects the frequency with which they were mentioned, thus larger size reflects higher frequency.

Appendix C. Visual representations of open-ended associations in Iceland

The word cloud below shows a visual representation of the most frequent 10 words or concepts in Iceland, based on the frequency with which the different codes were mentioned. The bigger the text, the more frequently the concept was mentioned. Therefore, only the size of the text in the visual representation carries meaning related to the frequency of mentions. The word cloud has been made using Word It Out https://worditout.com/.

Figure 12. Word cloud of the ten most frequently mentioned codes in relation to sustainability (i.e., sjálfbærni) in Iceland.

Note. This is a visual representation where the size of the codes reflects the frequency with which they were mentioned, thus larger size reflects higher frequency.

About this publication

Food Sustainability Understanding in the Nordic-Baltic countries

Disclaimer

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Nordic co-operation is one of the world's most extensive forms of regional collaboration, involving Denmark, Finland, Iceland, Norway, Sweden, and the Faroe Islands, Greenland and Åland.

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