SMARTCHAIN

SMART SOLUTIONS IN SHORT FOOD SUPPLY CHAINS

Deliverable 4.4 Report on the consumer online survey results

Work Package 4

UHOH

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Executive Summary

In recent years, consumers have become more interested in the origins of their food and the conditions under which it was produced. This is reflected in an increasing demand for local and sustainably-produced products. Food from short supply chains often meets these criteria. However, this still represents a niche market, as a majority of consumers obtain most of their groceries from conventional channels. Against this background, the central objective of this study was to determine what motivates consumers from four different European countries (Germany, Greece, Hungary and Spain) to buy, or what prevents them from buying, from short food supply chains (SFSCs). Another goal was to study the attitudes and expectations of consumers towards SFSCs and identify those customers who showed a particularly strong inclination to buy from SFSCs, based on personal characteristics and general purchasing behaviour. In a broader sense, the goal is to recommend actions based on the consumer insights found that will strengthen SFSCs. In addition, in view of the current situation regarding COVID-19, another consideration was determining how the pandemic has impacted consumer reactions towards SFSCs.

For this study, a total of N = 2,020 EU citizens were surveyed online in the four target countries. Participants were recruited via a market research agency using an existing consumer panel, and the data collection took place in November 2020. After quality checks and data cleaning, a usable sample of N = 1,839 was obtained. The sample was largely representative of the population of each country with regard to age and gender, with older consumers being slightly underrepresented (as they typically are in online panels). Each respondent was the main food purchaser in the household or at least one of the main food purchasers.

The key findings showed that most consumers had a very positive attitude towards SFSCs. However, this was not reflected in everyone's purchasing behaviour. Not surprisingly, the vast majority of consumers bought their food from a supermarket. SFSCs were only rarely visited. As the three most important obstacles to buying from SFSCs, consumers reported that they are too expensive, they are more difficult to access and their offers are not sufficiently promoted. The issue of expensiveness was perceived particularly strongly in Greece and Hungary, compared to the other countries. The perception of difficult accessibility was most pronounced in Greece, and the perceived lack of promotion differed among all the countries, being most pronounced in Greece, followed in order by Hungary, Spain and then Germany.

Those who purchased from SFSCs reported that their most important motivations were to support local producers, to know the origins of their food and because of the higher naturalness of the food provided by the SFSCs. Again, there were national differences, such as a lower importance of supporting local producers reported by the Hungarian consumers. The naturalness of the food was less important for German consumers and more important for the Spanish, when compared to the consumers from other countries.

In addition to asking consumers directly about their purchase motivations, a logistic regression model was computed to identify the drivers and deterrents of purchase behaviour, which was assessed based on the consumer's retrospectively reported behaviour. Ethical benefits, consisting of a factor which summarized various aspects, such as reducing food miles, ethical employment and having a personal relationship with the producer/retailer, were identified as the major drivers for SFSC purchases. In contrast, core benefits, including overall quality, taste and freshness, and pragmatic

benefits, consisting of affordability and convenience, did not have an effect on purchase behaviour. This pattern of ethical and core benefits occurred consistently across all the countries. In addition, the fact that a limited range of products is offered was positively associated with purchases in Greece and Hungary, which was a surprising result because this was expected to be a deterrent. The idea that a limited product range may signal exclusivity and can be associated with speciality goods and unique craftsmanship could be an explanation for this finding. The impact of deterrents that negatively affected SFSC purchases differed across the countries. While in Germany and Spain, a lack of trust prevented consumers from buying, difficult accessibility was perceived to be a major obstacle in Greece and Spain. Finally, with regard to socio-demographic aspects, higher incomes were associated with more SFSC purchasing in Germany and Greece.

Based on a cluster analysis, we outlined three different customer segments that differ in terms of their propensity to support and purchase from SFSCs. The first segment *(Active Fans)* strongly supports SFSCs, which is reflected in a positive attitude and corresponding purchasing behaviour. The members of the second segment *(Passive Fans)* also have a very positive attitude towards SFSCs, but this is not evident in their behaviour. Their characteristics show an attitude-behaviour gap, which has often been described in relation to sustainable consumer behaviour. Consumers in this second segment also indicated that it was difficult for them to buy from SFSCs, which can be explained by the concept of *perceived behavioural control*. The third segment *(Uninterested)* has no particular connection to SFSCs; they only buy there rarely and can be described as uninterested.

The study also provides insights into the product categories that were predominantly purchased at SFSCs. Overall, fruits and vegetables were the top of the list, followed by eggs, honey and bread. However, the survey revealed strong differences among the countries. Greek consumers, for example, purchased more honey, and Hungarian consumers more meat products when compared to the consumers located in the other countries. Oil was bought much more often in Greece and Spain, while Germans bought more bread from SFSCs.

Regarding the question of how the COVID-19 pandemic (at the time of the survey) has impacted consumer reactions towards SFSCs, we found that almost every second consumer reported an improved opinion towards SFSCs, and 43% had an increased intention to buy from SFSCs. The awareness of SFSCs had increased or even highly increased for half of all respondents, with the strongest effects occurring with the Spanish consumers. In addition, in each of the countries studied, the COVID-19 situation had clearly increased their intentions to support local producers, and the respondents generally saw SFSCs as a way to better prepare a country for a crisis such as the COVID-19 pandemic.

This study provides several implications for practitioners and policy makers. First, consumers need to be made more aware of SFSCs and why it is worthwhile to support them, for example, with regard to ethical benefits. In this context, SFSCs should increase their marketing activities, and it would be advisable for the public sector to offer support in this area. For example, SFSCs should be further supported by governmental measures that enable them to lower their prices, such as with tax reductions. In addition, SFSCs should explain to consumers why their prices tend to be higher (for example, because of low-scale production) in order to convince those consumers who are able and willing to pay a premium. Finally, measures must be undertaken to increase the accessibility of food from SFSCs.

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1. Introduction

The food sector has a high impact and strongly depends on human and physical resources. It is linked to several societal concerns, such as public health, energy use, or labour conditions (Hartmann 2011). In the past decades, consumers have become increasingly disengaged by the industrialized form of food systems, particularly by the lack of transparency, the negative environmental effects, and food safety issues (Birch, Memery and De Silva Kanakaratne 2018). This has been exacerbated by several high-profile food safety crises, such as the bird flu, the foot-and-mouth disease, and the horsemeat scandal in the UK (FAO 2020). Not unexpectedly, alternative agri-food networks like short food supply chains (SFSCs) have emerged as a response to public concerns about the origin and handling of food as well as the negative consequences tied to the modernisation and mechanisation of the conventional agri-food system (Thomé et al. 2021).

There is widespread agreement on the rise in the significance of SFSCs over the past decade. On top of their market penetration, SFSCs have gained a prominent public policy foothold and become a major research topic. This is evidenced through a number of studies that have identified the growth of the sector and the growing awareness of consumers, retailers, and policymakers (Giampietri et al. 2018). Although there is no universally accepted definition of what constitutes a SFSC, it is undoubtedly assumed by academics and practitioners alike that SFSCs are associated with local food and fewer (if any) intermediaries than conventional supply chains (Rucabado-Palomar and Cuéllar-Padilla 2020). In reality, SFSCs habitually embody direct marketing configurations, such as farmers' markets, on-farm sales, online sales, food box schemes, pick-your-own arrangements, and community-supported agriculture. In other words, the reduced distance between the primary producer and the final consumer lies at the heart of SFSCs.

Still, the current literature on SFSCs suffers from a lack of exhaustive data to precisely describe SFSCs' breadth, let alone to document the consumer's standpoint. Even though recent studies (e.g., Migliore, Schifani and Cembalo 2015; Giampietri, Finco and Del Giudice 2016; Elghannam et al. 2018) have started to examine consumer behaviour and motives toward SFSCs, little is known about SFSCs from a consumer perspective and, thereby, what brings producers closer to consumers. Hence, to better understand the ongoing success of SFSCs, the present deliverable concentrates on various consumer aspects regarding SFSCs in Europe. To this end, we conducted a comprehensive large-scale consumer investigation in four European countries.

More specifically, the aim of this study was to understand the attitudes, preferences, value perceptions and behaviours of consumers toward SFSCs. Furthermore, the study aims to identify those consumer segments where market acceptance can be achieved first. This includes the testing of different product attributes and characteristics perceived as beneficial by various consumer groups. Demographic and socio-economic aspects, such as age, gender, household size, region, income, and education, are to be taken into consideration in understanding the consumers' perspective on SFSCs. The assessment also aims to include personal values, motivators and consumers' perceptions. Finally, a segmentation analysis and a regression model is used to describe factors that explain the consumers' tendency to purchase from SFSCs and/or to support them.

The research goals can be broken down into the following research questions[1]:

- What attitudes, preferences and values do consumers generally have when buying food?
- With regard to SFSCs, which expectations do consumers have?
- With regard to SFSCs, what attitudes, preferences and value perceptions do consumers have?
- What are the adoption motivators and barriers with regard to food provided by SFSCs?
- Which product attributes promote or hinder consumers' acceptance of products provided by SFSCs?
- Are consumers willing to pay more for SFSC products than for conventional products? How much more would they be willing to pay?
- For which consumer segments can market acceptance towards SFSCs be achieved first?
- How has the COVID-19 situation generally changed the purchasing behaviour of food?
- How has the COVID-19 situation changed the purchasing behaviour of food from SFSCs?

Before we begin to describe the details of the consumer survey and how we approached the stated research questions, we provide a brief overview of previous findings on which we build. First, we summarize some key results from prior consumer surveys regarding the consumers' perspective on SFSCs. Second, we briefly outline some relevant results that were obtained by prior qualitative studies conducted within this work package (WP4) of the SMARTCHAIN project.

2. Brief overview of prior research

2.1 Key results from previous studies

Zepeda and Deal (2009) illustrated that information seeking and knowledge had a strong influence on the formation of attitudes. Increased and deepening knowledge on food production reinforced already existing values, which can influence beliefs and norms and, importantly for our area of interest, can support alternative food purchase behaviour. In a study on the perception of sustainable food labels, Sirieix et al. (2013) also emphasized the importance of information and knowledge as a necessity in the development of attitudes and for the execution of a corresponding behaviour.

Short food supply chains often proved to be an important means of building up this embedded and secure image which is based on face-to-face interactions between consumers and producers (Leone et al. 2020). On the one hand, consumers' motivations included safety considerations: consumers increasingly would like to know where the food they buy came from. On the other hand, consumers are interested in how products are prepared (Ben Hassen, El Bilali and Allahyari 2020; Kneafsey et al. 2013). Vittersø et al. (2019) summarized that consumers' reasons for choosing SFSC products and their attitudes are manifold according to previous literature. Some studies emphasise that

[1] The research questions (RQs) have been defined in the project proposal, mainly on p. 17. and p.41. The COVID-19-pandemic-related RQs have been added based on the actual situation.

participation in SFSCs may increase the food awareness and culinary education of consumers (Torjusen, Lieblein and Vittersø 2008) and eventually strengthening their cultural and regional identity (Galli and Brunori 2013).

However, the consumer perspective is often neglected in studies on SFSCs, or just treated together with local products. This is because the foods offered in SFSCs are often local products. That is why it is difficult if not impossible to make a clear distinction between customer attitudes and motivations towards SFSCs and local products. One of the few studies dealing with the consumer's perspective and focusing explicitly on SFSCs is the study of Giampietri et al. (2018). The study explored the influence of the main determinants of consumer intention and behaviour, and provides useful information about the role of consumer trust. Comparing an extended model of the Theory of Planned Behaviour (TPB) with a classic TPB framework, it also investigated the role of consumer residential area in order to predict and explain SFSCs-related purchasing decisions. According to their results, the extended model shows better goodness-of-fit statistics compared to the original TPB framework. All the investigated variables, including attitudes, subjective norms, perceived behavioural control and trust, reveal a positive effect on intention to purchase food at SFSCs, which, in turn, predicted the actual consumer behaviour (i.e., the purchase frequency at SFSCs).

In the European H2020 project "Strength2Food", it was stated that in the prices set in SFSCs may also reflect a willingness to pay for high quality and special services by consumers (Vittersø et al. 2019). In addition to quality dimensions such as freshness and taste, products from these SFSCs are valued for credence qualities such as animal welfare, sustainability and sustenance of small-scale, diversified farms. In the consumer survey among Norwegian, Italian, British, Hungarian, Polish, and French consumers, respondents were asked to react to a stated claim that buying from this SFSC gives more value for money than in a regular grocery store. The respondents evaluating the cooperatives in Italy and Norway, and the French participants strongly agreed (with values higher than 4 on a 7-point scale), while the responses from Hungarians were only between 3 and 3.5 on average.

Another consumer study focusing on fair trade products in Italy showed that Italian consumers choose farmers' markets (45.8%) with a high frequency and buy mainly vegetables (40.8%) and fruit (20.0%) at SFSCs (Panico et al. 2017). Other sources deal generally with alternative food chains or local foods, so that is why our research can develop from practical and academic knowledge.

However, research has revealed that there are limitations related to the development of SFSCs. Despite a positive development towards increased consumer access and proper selling points, access is still a primary concern for SFSC producers. The main sale channels for SFSC producers are on-farm shops and farmers' markets. However, supermarkets and multinational retail chains (e.g., Coop, Lidl and Spar) would also like to tap into the sector and have made significant efforts to increase the availability of regional products in their shops while using their own certification schemes (Aggestam, Fleiß and Posch 2017; Feldmann and Hamm 2015).

2.2 Preliminary findings of SMARTCHAIN WP4

Besides drawing on the findings from other researchers, as illustrated above, this consumer survey also builds upon prior qualitative research conducted in this project. More specifically, this consists of results from 8 consumer focus groups (D4.1) and 32 expert stakeholder interviews (D4.2) that examine consumer attitudes, values, expectations and preferences in relation to SFSCs. The focus groups represented the views of rural and urban consumers in Germany, Hungary, Spain, and Greece, and the interviews represented the perspective of consumers, producers, and other actors who work with or within SFSC (e.g., HORECA, and certifiers) in the EU.

Across the two qualitative studies, consumers were generally perceived to be aware of the environmental impact of food production, although the focus groups revealed that there was much variation in the extent of their awareness. In terms of environmental implications, they tended to be concerned about reducing chemicals and pesticides in food production. They were generally aware of the struggles of local farmers and retailers, although rural inhabitants tended to be more aware of these issues. Younger people were thought to have a greater role in spreading awareness about the social and environmental implications about food production.

The results of the focus groups suggest that consumer understanding of SFSC is tied to the concept of local food at the regional or national level. Consumer participants felt that local food was natural, seasonal and environmentally friendly. They associated local food with small-scale production and the possibility of purchasing directly from the producer. Although consumers generally have a positive view of local food in terms of quality, health, and environmental and social impacts, they felt that buying from SFSC was not convenient nor affordable enough for it to become a regular habit. Participants felt that increasing the range of products at SFSC retail outlets and the number of point-of-sales would encourage more consumers to purchase such products. Some consumers were concerned about being able to trust the authenticity of local food, and expressed doubts about the food safety and regulation of SFSC. Certification and regulation of local products would help to address these concerns.

In both the focus groups and expert interviews, consumer demand for SFSC products appeared to depend on the region, product type, purchase context and consumer segment, although it was felt that making supply more accessible would increase demand. There was a greater willingness to pay more for organic and pesticide-free products for health reasons. Consumers also value supporting the local community through purchasing SFSC products and/or purchasing from local retailers. However, relatively few consumers actually purchase products from SFSC on a regular basis.

Next, we present our consumer survey that was conducted to increase the knowledge about how consumers react to and interact with SFSCs and to complement the existing findings.

3. Method

3.1 Study overview

The consumer survey was conducted in the four European countries Germany, Spain, Greece and Hungary based on a standardized online questionnaire developed jointly by the WP4 members. Regarding the sample, the goal was to survey 500 consumers in each country who are responsible for the purchase of food in their households. Furthermore, it was intended to achieve a sample that is representative for each country's population with regard to age, gender, and education. To realize these goals, a market research institute was contracted to conduct the survey.

The survey was conceptualized based on a review of the relevant literature, considering prior research on SFSCs, local food and organic food. In addition to existing literature, the results of the qualitative studies described above (SMARTCHAIN WP4 focus groups and stakeholder interviews) were also considered.

The questionnaire was developed in the English language and translated into the four national languages of the surveyed countries. Back-translations and corrections of the translation were made by members of the SMARTCHAIN consortium.

For the statistical analysis of the data, several methods were applied. In addition to a descriptive visualisation of means and proportions, which forms the basis of this report, *t*-Tests, ANOVAs, Chi-square tests, cluster analyses and regression analyses were carried out. The analyses were performed using the IBM SPSS Statistics 16 software. The details regarding the applied methods are reported together with the results in the corresponding section of this report. In Appendix 5, we have included a Glossary of Statistical Terms that provides short explanations of the statistical methods and terms used in this report.

3.2 Structure of the questionnaire

The questionnaire included four sections: first, respondents were asked to answer the screening questions, the second section assessed demographics, further personal characteristics and general shopping behaviour. The third section provided a short introduction to the topic of SFSCs, which was followed by questions on the shopping behaviour with regard to SFSCs. This included questions about expectations and shopping habits. We also included the central constructs of the Theory of Planned Behaviour (i.e., subjective norm, perceived behavioural control and intention) as they have been proved insightful in prior research. Finally, questions about reasons for and against the purchase of food from SFSCs were asked.

The questionnaire was structured according to the following outline. The full questionnaire showing all items and answering options including the respective coding can be inspected in Annex 4.

Informed consent procedure[2]

Participants confirmed that they…

- understood the aim of the present research and the conditions of participation,

[2] Also see Annex 3.

- were of legal age and able to give informed consent in accordance with the laws of the country in which they reside,
- were aware that no personal data or other data that may lead to their identification will be processed as part of the present research, and
- understood that their participation is voluntary and that they may withdraw from the research at any time.

Only if the participants agreed to all of these points, was their participation possible.

Screening questions

After a brief introduction the participants were asked "Are you the main food purchaser in your household?" with following answering options (1) yes, (2) one of the main food purchasers, or (3) no. Only those persons who chose (1) or (2) were selected for the survey.

Personal characteristics and general behaviour

Demographics

- Demographic data included questions on age, gender, household size, age of any children in the household, education level, and the combined net income per month of the household.
- To find out whether the participants live in a rural or urban region, they were asked to estimate how many inhabitants their community has. Individuals who reported to live in a region with less than 5,000 inhabitants were classified as rural. Participants from a region with more than 5,000 inhabitants were classified to live in an intermediate or urban region.

General grocery shopping behaviour

- Respondents stated their purchasing habits in terms of where and how often food is purchased.
- Based on previous research (Szabó 2017; Giampietri, Finco and Del Giudice 2016) and focus group interviews, respondents indicated their shopping frequency for the following stores: supermarket (physical and online store), local grocery store, discount supermarket, non-farmers market (weekly or regular), farmers market, organic store, specialist shops (e.g. butcher, fish shop), direct sales from producer (production facilities, mobile, street sale, online).
- In addition, the participants were asked how their shopping frequency changed for the different channels due to the COVID-19 pandemic.
- Based on responses of consumer focus groups carried out in task 4.1 of the SMARTCHAIN WP4, participants were asked to assess the importance of relevant factors for food purchases, such as convenience, low price and taste**.**

Personal values and attitudes

- In the next step, participants had to rate the importance of nine values as guiding principles in their life (Osburg et al. 2019): (1) authority (the right to lead or command), (2) wealth (material possessions, money), (3) influential (having an impact on people and events), (4) social justice (correcting injustice, care for the weak), (5) helpful (working for the welfare of others), (6) equality (equal opportunity for all), (7) protecting the environment (preserving

nature), (8) preventing pollution, and (9) respecting the earth (live in harmony with other species).
- Additional motivations were measured according to Birch, Memery and De Silva Kanakaratne (2018) for the following three aspects: (1) egoistic motivations, (2) ethical identity, and (3) environmental consciousness.

Short introduction to the topic of SFSC

To give respondents a short explanation on the topic of SFSCs, the term "short supply chain" was defined. Since a SFSC is a very broad concept and is neither legally nor geographically well defined, a definition was used which has been developed in collaboration with the entire consortium. For better understanding, the definition has been extended by practical examples.

A SFSC was defined as a supply chain involving a limited number of economic operators, committed to cooperation, local economic development, and close geographical and social relations between food producers, processors, and consumers. Further, short food chains have as few intermediaries as possible between the food producer and the consumer. According to this definition, examples of SFSCs were presented: farmers shops, (farmers) markets, agritourism, restaurants using local products, community supported agriculture, online shops, and local foods sold in supermarkets directly from the producer.

Shopping behaviour with regard to SFSCs

This section was introduced by questions about actual shopping behaviour regarding SFSC. After that, the (expected) shopping behaviour regarding SFSCs was assessed.

Consumer expectations

- Consumer expectations of food provided by SFSCs were assessed for expected convenience, price, quality, trust in food, freshness and general expectations.

General shopping behaviour with regard to SFSCs

- The section started with a question about which kind of food participants buy from SFSC: fresh food and processed food.
- The same question was asked more in detail for different food categories like meat, cereals-legumes, fruit, and many others (adapted from Giampietri et al. 2018).
- The last question of this section asked for the willingness to pay (WTP) for the different food categories from SFSCs.

Central constructs of the Theory of Planned Behaviour

- Concerning the Theory of Planned Behaviour, the participants specified their (dis-)agreement to several statements about buying food from SFSC.
- The statements refer to subjective norms, perceived behavioural control, and intention (Giampietri, Finco and Del Giudice 2016).

Reasons for buying from SFSCs

- The assessment of participants' attitude towards SFSCs was at the beginning of this section.

- Next, the participants specified their (dis-)agreement for nine reasons for buying from SFSCs. These items were based on preliminary findings and relevant literature (Adams and Adams 2011; Burchardi, Schröder and Thiele 2005; Megicks, Memery and Angell 2012; Reich, Beck and Price 2018).
- Additionally, participants indicated what other good reasons they could think of to buy food from SFSCs.

COVID-19 situation

- The impact of COVID-19 was measured with questions about changes in the opinion, the awareness of SFSCs, and intent of the participants to purchase from SFSCs. Furthermore, participants evaluated if SFSCs are a way for a country to be better prepared for a crisis like the COVID-19 pandemic.

Reasons against buying from SFSCs

- Questions about reasons against buying from SFSCs formed the conclusion of the questionnaire: Participants again specified their (dis-)agreement for ten reasons which were based on preliminary findings and relevant literature (Megicks, Memery and Angell 2012).

3.3 Sample

A total of *N* = 2020 questionnaires were completed in the online survey and the data collection took place from November 5, 2020 until November 16, 2020. Participants were recruited via a market research institute (*Dynata*). The institute made use of its existing consumer panels and partly expanded it by using external providers. Fixed quotas were set for each country to generate a sample to be as representative as possible regarding the specified criteria.

To assure data quality and validity of the responses, quality checks were carried out. First, questionnaires that were answered in an unrealistically fast time were removed. In addition, two control questions were included, which checked the attention of the participants (e.g., "*If you read this, please select the middle option*"). Only respondents who had a realistic time frame for answering and who also fulfilled both attention check questions were included in the final dataset used for the analysis. This procedure led to an exclusion of 181 respondents and a final sample size of *N* = 1839. The sample sizes obtained for each country were similar and are shown in Table 1.

The sample turned out to be largely representative of the population of each country with regard to age, gender and education. However, the Greek subsample has a significantly younger age. Despite purchases from other online panel providers, the data provider *Dynata* was unable to adjust the age average with the other countries. All respondents were the main food purchaser in the household or at least one of the main food purchasers. Across all countries, more than half of the respondents were the person mainly responsible for purchasing food in their household.

It seems important to note that at the time of data collection, Europe was affected by the COVID-19 pandemic. However, in all four countries it was possible to purchase groceries without major restrictions and through all common distribution channels. However, the results may have been influenced by the existing circumstances of the pandemic, although at the specific time of the survey, the shopping opportunities were the same as before the pandemic.

Table 1. Sociodemographic characteristics of the sample

		Total	Germany	Spain	Greece	Hungary
Sample size		*N* = 1839	*n* = 463	*n* = 475	*n* = 456	*n* = 445
Gender (female)		52.7%	53.3%	52.4%	50.4%	54.8%
Age (Ø in years)		46.48	49.33	47.04	42.50	47.01
Household size (Ø household members)		2.73	2.19	2.99	2.95	2.78
Households with kids		47.3%	47.7%	47.6%	41.0%	53.0%
Kids age[1] (Ø in years)		9.77	10.20	9.48	10.36	9.01
Education[2]	No graduation	2.9%	0.0%	1.1%	2.9%	7.9%
	Secondary edu.	34.9%	33.3%	27.7%	35.7%	43.4%
	Vocational edu.	20.5%	31.5%	19.6%	12.7%	18.0%
	University	41.4%	35.2%	51.6%	48.7%	29.4%
	Prefer not to answer	0.3%	0.0%	0.0%	0.0%	1.3%
Community size[3]	Up to 5,000	13.8%	17.5%	6.1%	9.6%	22.5%
	5,001-25,000	21.4%	24.0%	20.2%	19.6%	21.8%
	25,001-150,000	29.2%	26.8%	29.5%	32.2%	28.5%
	Over 150,000	35.6%	31.7%	44.2%	38.6%	27.2%
Household income[4]	Low (<900€)	23.6%	7.1%	6.3%	27.3%	55.2%
	Low-middle (901-2,000€)	38.6%	24.6%	37.8%	50.9%	41.5%
	Middle (2,001-3,200€)	22.2%	33.9%	33.5%	17.0%	3.3%
	High-middle (3,201-6,000€)	13.2%	29.3%	19.7%	3.1%	0.0%
	High (>6,000€)	2.4%	5.1%	2.7%	1.7%	0.0%

[1]Children up to 20 years old are included.
[2]Due to different education systems, education categories are not fully comparable between countries.
[3]Based on self-assessment of participants.
[4]Due to no responses the number of participants differs; Total N =1727, Germany = 434, Spain = 447, Greece = 424, Hungary = 422.

Table 1 depicts the key demographic characteristics of the sample. Regarding the average age, a one-way ANOVA indicates that there is at least one significant difference among the countries (F (3,1835) = 18.01; $p < 0.01$). Confirming what was mentioned above, the Greek subsample shows a lower average age compared to the other countries ($p < 0.01$), whereas no other differences occur among the remaining countries (based on *Scheffé* post hoc tests). According to the sampling agency, this is due to the fact that in all major online consumer panels which exist in Greece, the older population seems to be underrepresented.

Regarding the household size, almost half of all respondents live in a two-person household and 93.0% of the participants live in a household with up to four members. The average household size differs significantly among the countries (F (3,1835) = 46.60; $p < 0.01$). Compared to the other countries, household sizes are significantly lower in Germany compared to all other countries ($p <$

0.01), whereas no further differences at the 5% significance level were observed among the countries.

In total, 47.3% of the respondents have at least one child. Between the countries, differences can be observed in the proportion of households with children, with fewer households with children in Greece compared to the other countries ($\chi 2(3, N = 1715) = 34.01$; $p < 0.01$). Overall, 41.4% of the participants are academics with a university degree or higher. Looking at the European average, EUROSTAT (2020a) reports a proportion of 34.6% of the younger EU population (aged 25-54) with tertiary educational attainment and 20.9% of the older population (aged 55-74). These numbers indicate that in our sample, individuals with higher levels of education are overrepresented.

Next, we consider the sizes of the communities in which the study participants live, indicating whether the residential area is more urban or rural. Slightly more than one third of the participants live in a community with more than 150,000 inhabitants, whereas only 13.8% live in communities with up to 5,000 inhabitants. There are differences in the proportions of the reported community sizes among the different countries (*Kruskal-Wallis* test $F = 63.86$; $p < 0.01$). A more detailed inspection of the data shows that German participants tend to live more often in smaller communities with up to 5,000 inhabitants than Spanish[3] and Greek[4] participants. The same applies for Hungarian respondents compared to Spanish[5] and Greek[6] respondents. Consistently, the Spanish and Greek participants live more frequently in communities with more than 150,000 inhabitants, what leads to the conclusion that their subsamples includes more urban citizens.

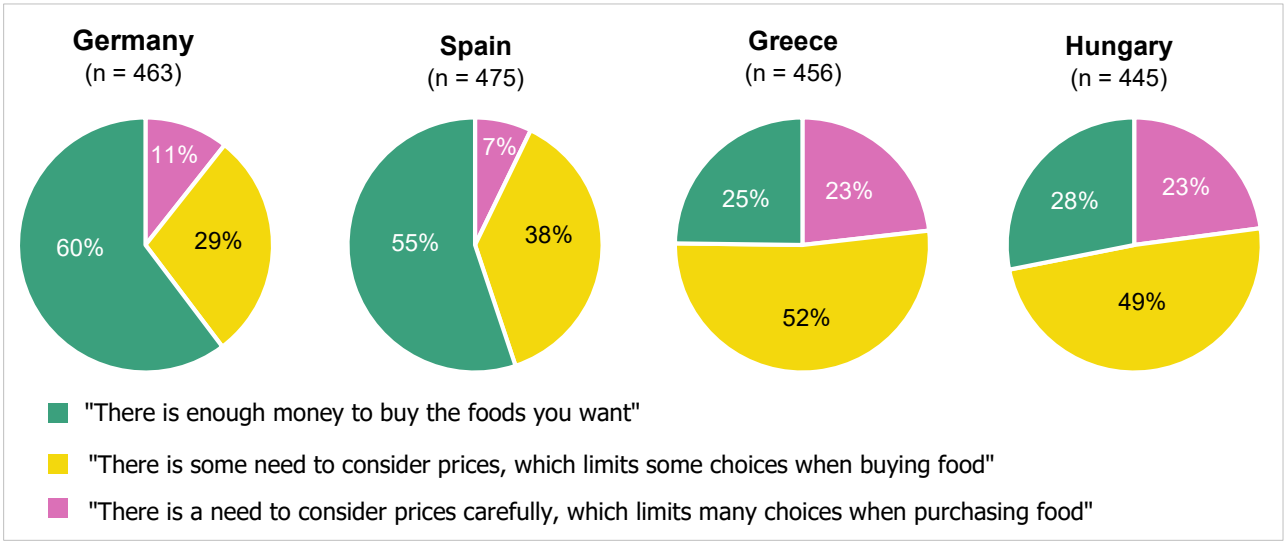
The income distribution in our sample can also be inspected in Table 1. On average, more than one-third of the households (37.8%) have an average net income of more than 2,000 Euros per month. However, there are major differences among the four countries regarding the monthly net income per household. The share of households of Hungarian participants with less than 900 Euros monthly is twice as high as the average of all countries. In contrast, the share of German and Spanish households with an income more than 3,200 Euros monthly is much higher than the overall average.

In addition to the question about the net income, we asked participants for their subjective assessment of how much money they have available for grocery shopping. Details regarding this question and its results are depicted in Figure 1. The data show that 42.4% of all participants stated that "there is enough money to buy the foods [they] want". A total of 41.8% of the participants stated that "there is some need to consider prices, which limits some choices when buying food". Whereas 15.8% stated that "there is a need to consider prices carefully, which limits many choices when purchasing food". Looking at the different countries, there are significant differences (based on *Kruskal-Wallis* test $F = 204.04$; $p < 0.01$). In Hungary and Greece, almost a quarter of all respondents reported that they have to pay attention to prices and are therefore limited in their choice when purchasing food. In Germany, this applies to only 11% of respondents and in Spain to only 7%. By contrast, 60% of Germans and 55% of Spanish stated to have enough money available to buy the food they want. Among the Greek and Hungarian respondents, this is true only for about a quarter of the respondents. A more detailed statistical analysis by a Mann-Whitney U test shows

[3] *Mann-Whitney-U* test $U = 91307.50$, $Z = -3.70$, $p < 0.01$.
[4] *Mann-Whitney-U* test $U = 88291.50$, $Z = -5.48$, $p < 0.01$.
[5] *Mann-Whitney-U* test $U = 78454.00$, $Z = -7.06$, $p < 0.01$.
[6] *Mann-Whitney-U* test $U = 81538.00$, $Z = -5.31$, $p < 0.01$.

that for the countries Hungary and Greece, the answers to the question how much money they have available for grocery shopping do not differ significantly from each other (*Mann-Whitney-U* test $U = 106223.00$, $Z = -1.03$, $p > 0.05$). The same is true for the comparison between Germany and Spain, where there are no significant differences (*Mann-Whitney-U* test $U = 98635.50$, $Z = -0.79$, $p > 0.05$). Contrarily, the responses significantly differ between all other pairs of countries.[7]

Figure 1. Perceived amount of money available for grocery shopping



"If you think about the amount available for grocery shopping in your household, which of these statements best suits you?"

The answers given by the respondents on the availability of money for grocery shopping are in line with the average income determined. In Greece and Hungary, where the proportion of low-income earners is relatively high, respondents report a higher need to check prices carefully and a higher degree of restriction in the choice of food. In contrast, German and Spanish respondents report a higher share of high-income earners, and consistently, only a small proportion of these respondents indicate that they need to pay attention to prices when buying food.

[7] Germany and Greece (*Mann-Whitney-U* test $U = 66588.00$, $Z = -10.50$, $p < 0.01$); Germany and Hungary ($U = 68162.00$, $Z = -9.57$, $p < 0.01$); Spain and Greece ($U = 71657.00$, $Z = -9.21$, $p < 0.01$); and Spain and Hungary ($U = 69943.50$, $Z = -10.19$, $p < 0.01$).

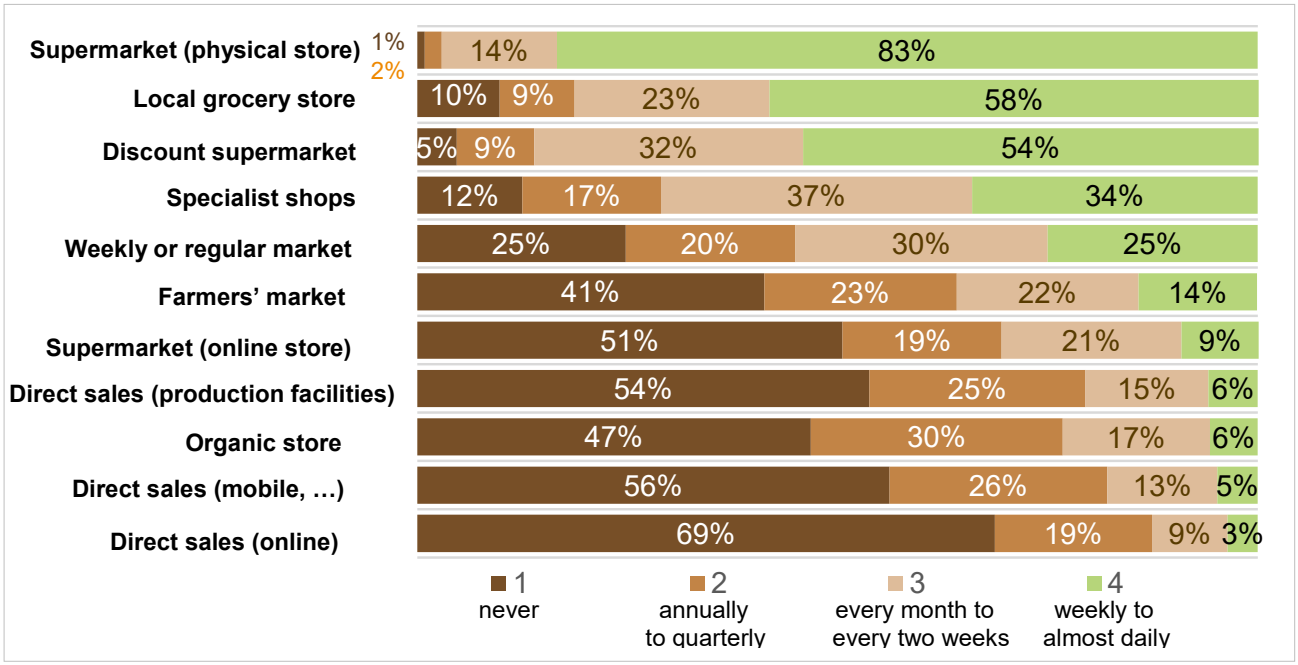
4. Results

4.1 General food shopping behaviour

Regarding the general food shopping behaviour, the following information allows insights in participants' shopping frequency for different channels. As illustrated in Figure 2, the five most frequented channels over all countries are (1) supermarkets, (2) local grocery stores, (3) discount supermarkets (4) specialist shops, and (5) weekly or regular markets (non-farmers). The specific order of the most frequently used channels is almost the same in the countries surveyed. In Annex 2 (Figures A2-1 to A2-4), a country-specific illustration is presented. Only in terms of weekly or daily use, the local grocery stores come first for Hungarians. In general, more than half of the respondents reported using supermarkets, local grocery stores and discount supermarkets at least weekly. The majority of respondents stated that they never use e-commerce for food, regardless of whether it is an online store of a supermarket or a direct marketer. There was also an "other"-category, giving participants the opportunity to add other food shopping channels they are using. Outlets which were often mentioned in this open-ended question are bakeries, kiosks, and Amazon.

When looking at SFSCs, the farmers market is one of the most frequently used SFSC channel across all countries. Particularly in Hungary (18% at least weekly) and Greece (27% at least weekly), respondents reported visiting farmers' markets frequently. In comparison, German (5% at least weekly) and Spanish (8% at least weekly) respondents reported being much less likely to visit a farmers' market. On average, the respondents indicated that they use direct sales infrequently and rather irregularly. More than half of the respondents indicated that they never use direct sales, regardless of whether it is mobile street sales or direct purchases at the place of production.

Figure 2. Percentage overview of where and how often purchases are made (total)



"Please indicate what best mirrors your shopping frequency for each channel?"

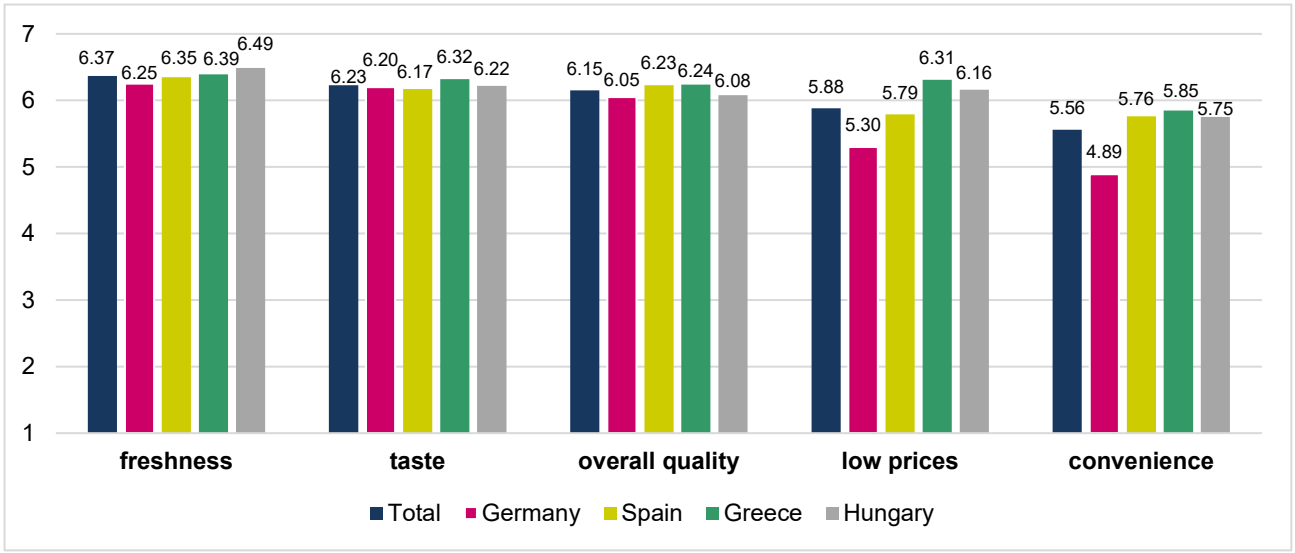
Next, we consider which attributes are generally most important to the respondents when purchasing food. Inspection of the mean values in the overall sample measured on 7-point scales ranging from 1=not at all important to 7=very important reveals the following top five most important attributes:

(1) freshness (M = 6.37, SD = .85),
(2) taste (M = 6.23, SD = .90),
(3) overall quality (M = 6.15, SD = .97),
(4) low prices (M = 5.88, SD = 1.21), and
(5) convenience (M = 5.56, SD = 1.37).

There are significant differences among the importance of these aspects, as revealed by a repeated measures ANOVA[8] (F(2.92, 5362.44) = 260.33, p <. 001). Multiple comparison post hoc tests using Bonferroni correction show that the importance between all considered attributes differ (i.e., all differences were highly significant with all ps <.001). An illustration of the frequency distributions of the answers for the five items can be found in Annex 2, Figure A2-5.

Figure 3 illustrates the most important aspects when purchasing food per country. The specific sequence of the most important factors differs slightly from country to country. Overall, however, the relevance of these factors is at a similar level for all countries. What is most striking is that, compared to all other countries, convenience is significantly less important for German respondents (based on post hoc comparisons, all ps < 0.01). The same is true for low prices, as the comparison between Germany and all other countries shows that low prices are less important for the German participants (ps < 0.01).

Figure 3. Mean values of the importance of different criteria for food shopping



"When buying food, how important are the following points to you?"
1=not at all important/ 7=very important

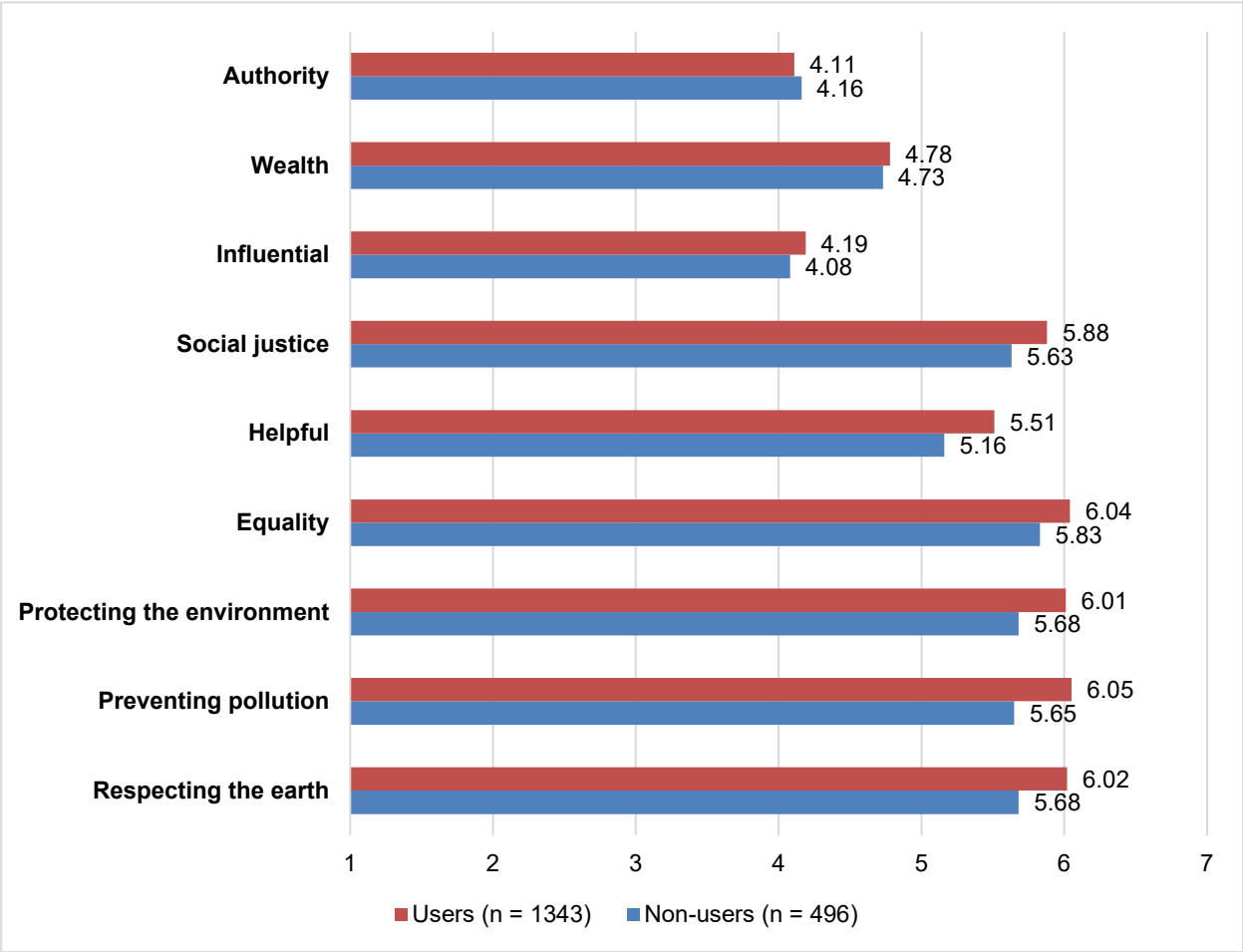
[8] The ANOVA results based on Greenhouse-Geisser corrections were used because in the data, the assumption of sphericity was violated [Mauchly-W= .22; p <.001; Greenhouse-Geisser ε = .73]. This procedure leads to an adjustment of the degrees of freedom.

Next, nine personal values, which are also guiding principles in the daily lives of the respondents (Osburg et al. 2019), were analysed. The most important aspects for the respondents are environmental aspects: protecting the environment (preserving nature) (M = 5.92), preventing pollution (M = 5.94), and respecting the earth (live in harmony with other species) (M = 5.93). These were followed by altruistic values: social justice (correcting injustice, care for the weak) (M = 5.81), being helpful (working for the welfare of others) (M = 5.52) and supporting equality (equal opportunities for all) (M = 5.98). A much lower relevance was found for egoistic values, consisting of the aspects: authority (the right to lead or command) (M = 4.12), wealth (material possessions, money) (M = 4.77) and being influential (having an impact on people and events) (M = 4.16) (Bentsen and Pedersen 2020). However, it has to be noted that especially the reporting of egoistic values is likely to be biased due to socially desired response behaviour (Zerbe and Paulhus 1987).

There are significant differences among the countries in terms of these personal values. The results of post hoc tests show that authority is significantly less prominent for the Germans (M = 3.44) than for the Spanish (M = 4.56) and Greek respondents (M = 4.74, ps < 0.01). Compared to the Hungarian respondents (M = 3.74), there are no significant differences (p > 0.05). The importance of wealth is most strongly pronounced among Hungarian respondents (M = 5.72), the average value is significantly higher compared to all other countries (ps < 0.01). Being influential is most strongly pronounced among the Spanish respondents (M = 4.37), and weakest among the Germans (M = 3.92); their mean values differ significantly (p < 0.01). There are no significant differences among the other countries. Social justice has the highest value for the Greek consumers (M = 6.22), and compared to all other countries, their mean value is significantly higher (ps < 0.01). Compared to the other countries (M_{Spain} = 5.41, $M_{Germany}$ = 4.43, $M_{Hungary}$ = 5.65), the Greeks (M = 5.18) show the significantly lowest value for the importance of "being helpful" (ps < 0.05). Equality is most pronounced among Greeks (M = 6.32). Compared to the other countries (M_{Spain} = 6.01, $M_{Germany}$ = 5.74, $M_{Hungary}$ = 5.86), their mean is significantly higher (ps < 0.01). The three attributes used to measure environmental awareness are all least pronounced in Germany (M = 5.56, M = 5.62, and M = 5.87). Their mean values for the items "protecting the environment" and "preventing pollution" are significantly lower than for all other countries (ps < 0.05).

Figure 4 shows a comparison between users (respondents who buy from SFSCs, at least sometimes) and non-users of SFSCs. It can be stated that there are no major differences between the indicated importance of authority (t = - 0.50, p = 0.62), wealth (t = 0.74, p = 0.46), or influential/egoistic values (t = 1.32, p = 0.19). In contrast, altruistic values such as social justice (t = 3.77, p < 0.01), helpfulness (t = 5.36, p < 0.01) and equality (t = 3.06, p = 0.02) as well as biospheric values such as protecting the environment (t = 4.82, p < 0.01), preventing pollution (t = 5.80, p < 0.01) and respecting the earth (t = 4.91, p < 0.01) are more important to users of SFSCs.

Figure 4. Indicated values as life guiding principles of users and non-users of SFSC

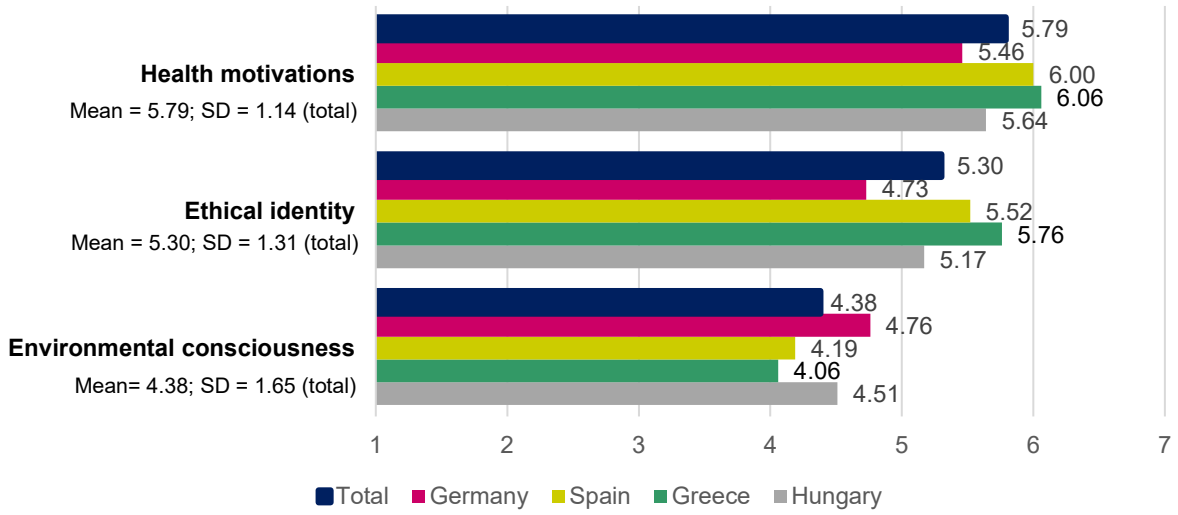


"Please rate the importance of the following values as guiding principles in your life?"
1=not at all important/ 7=very important

We also assessed personal motivators by following the recommendations of Birch, Memery and De Silva Kanakaratne (2018), who propose the three dimensions of health, ethical and environmental motivators. For each of the three dimensions, an overall indicator was formed by calculating the mean of the items. The agreement to health motivations[9] is stronger (M = 5.79) than to ethical identity[10] (M = 5.30, $p < 0.01$) or environmental consciousness[11] (M = 4.38, $p < 0.01$), while also the agreement to the latter two motivations differ significantly ($p < 0.01$).

[9] Three items: "I'm very conscious about my health and the health of others for whom I shop in the household.", "I take responsibility for the state of my health and the health of others for whom I shop in the household", and "I'm very involved with my health and the health of others for whom I shop in the household"; α = .91.
[10] Three items: "Ethics are important to me when making buying decisions", "I think of myself as someone who is concerned about ethical issues", and "I think of myself as an ethical consumer"; α = 0.91.
[11] Three items: "The balance of nature is strong enough to cope with the impacts of modern industrial nations", "The so-called ecological crisis facing human kind has been greatly exaggerated", and "Humans have the right to modify the natural environment to suit their needs"; all items recoded; α = 0.79.

Figure 5. Mean values of personal motivations by country



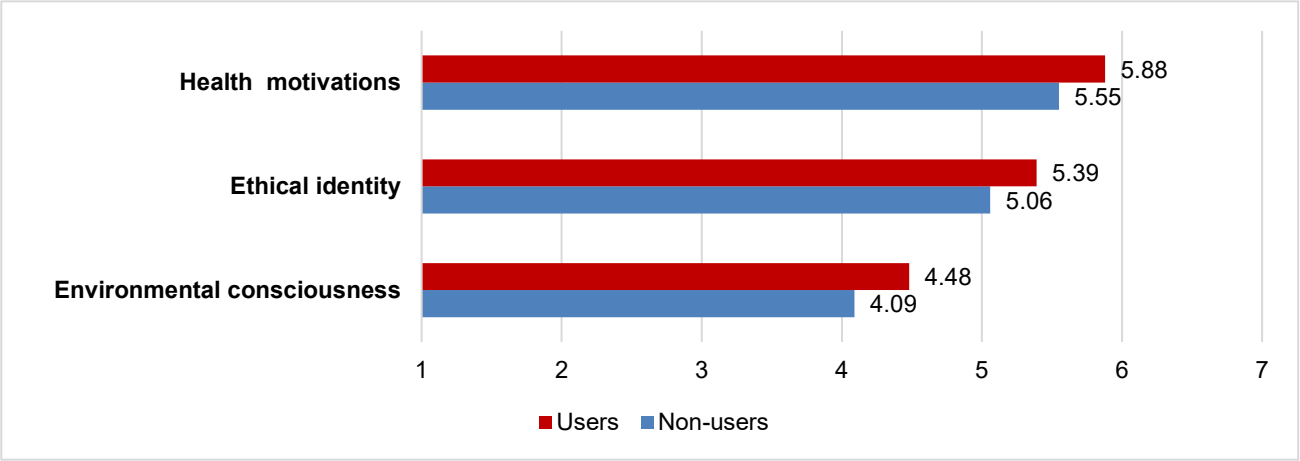
"Please state how much you agree with the following statements?"
1=strongly disagree/ 7=strongly agree

Figure 5 shows a comparison of the personal motivations across countries. In terms of health motivations (F (3,1835)= 31.52, $p < 0.01$), ethical identity (F (3,1835)= 60.16, $p < 0.01$) and environmental consciousness (F (3,1835)= 17.37, $p < 0.01$) there is at least one statistically significant difference between two countries. Post hoc comparisons reveal that health motivations are stronger among Greeks and Spanish than among German and Hungarian respondents[12]. Further post hoc tests show that with regard to ethical identity, German respondents have a significantly lower level than respondents in the other countries ($ps < 0.01$). Compared to the other countries, environmental consciousness is stronger among German respondents ($p < 0.01$). The Greek and Spanish participants, however, have a significantly lower awareness regarding this motivation.[13]

Next, we investigate whether there are differences in the personal motivations between users and non-users of SFSCs. The data show that this is the case. As illustrated in Figure 6, users of SFSCs seem to be more driven by health motivations ($t = 5.22$, $p < 0.01$) and to have a higher level of ethical identity ($t = 4.82$, $p < 0.01$) and environmental consciousness ($t = 4.66$, $p < 0.01$) compared to non-users. The agreement to egoistic motivations of users and non-users were strongest, whereas both groups are nearly neutral in their agreement to environmental consciousness.

[12] M_{Greek}= 6.06 > $M_{Germany}$= 5.46, $p < 0.01$; M_{Greek}= 6.06 > $M_{Hungary}$= 5.64, $p < 0.01$; M_{Spain}= 6.00 > $M_{Germany}$= 5.46, $p < 0.01$; M_{Spain}= 6.00 > $M_{Hungary}$= 5.64, $p < 0.01$.
[13] $M_{Germany}$= 4.76 > M_{Greek}= 4.06 p < 0.05; $M_{Germany}$= 4.76 > M_{Spain}= 4.19, $p < 0.05$; $M_{Hungary}$= 4.51 > M_{Greek}= 4.06, $p < 0.05$; $M_{Hungary}$= 4.51 > M_{Spain}= 4.19, $p < 0.05$.

Figure 6. Comparison of personal motivations between users and non-users of SFSCs



"Please state how much you agree with the following statements?"
1=strongly disagree/ 7=strongly agree

Furthermore, we assessed variables relating to the Theory of Planned Behaviour in the context of buying local food (Giampietri, Finco and Del Giudice 2016). Subjective norm, i.e., the importance of the opinion of peers when buying local food, was assessed by four items[14], which were averaged (M = 4.76). Similarly, the respondents rated their perceived behavioural control (finding enough time to shop and the ability to afford and access local food by three items[15] (M = 4.63). Concerning past buying behaviour of local food (one month ago at the time of the survey), the participants stated a medium frequency (1 = never/7 = very often; M = 4.31). Only Hungarian participants bought local food less often than participants from all other countries (M = 3.85, ps < 0.01).

The participants also answered questions related to the Theory of Planned Behaviour in the context of SFSCs. Regarding subjective norms, the participants tended to agree that people would approve buying from SFSCs (M = 4.93) and that people think that others should buy from SFSCs (M = 4.63). Furthermore, the participants reported some agreement that many people like it when they (would) buy food from SFSCs (M = 4.72). In total, the participants reported to have some degree of perceived behavioural control (M = 4.76) of buying food from SFSCs. Based on post hoc comparisons, no significant differences were identified regarding perceived behavioural control for the German (M = 4.96) and Spanish (M = 4.73) participants (p > 0.05). However, the mean values of perceived behavioural control are significantly lower for Hungarian (M = 4.44) and Greek (M = 4.47) than for German (M = 4.96) respondents (ps < 0.01). The same occurs when the Spanish respondents are compared to the Hungarians and Greeks. The Spanish (M = 4.73) respondents reported a significantly higher perceived behavioural control than the Hungarian (M = 4.44) and Greek (M = 4.47) respondents (ps < 0.01). No further significant differences were found among the countries.

In addition, the participants also agreed whether they would intend, plan, and would like to purchase more food from SFSC in the future. These three items can be averaged (M = 5.22) to form an overall indicator for future intention to purchase from SFSCs (α = .96). When comparing the means of the

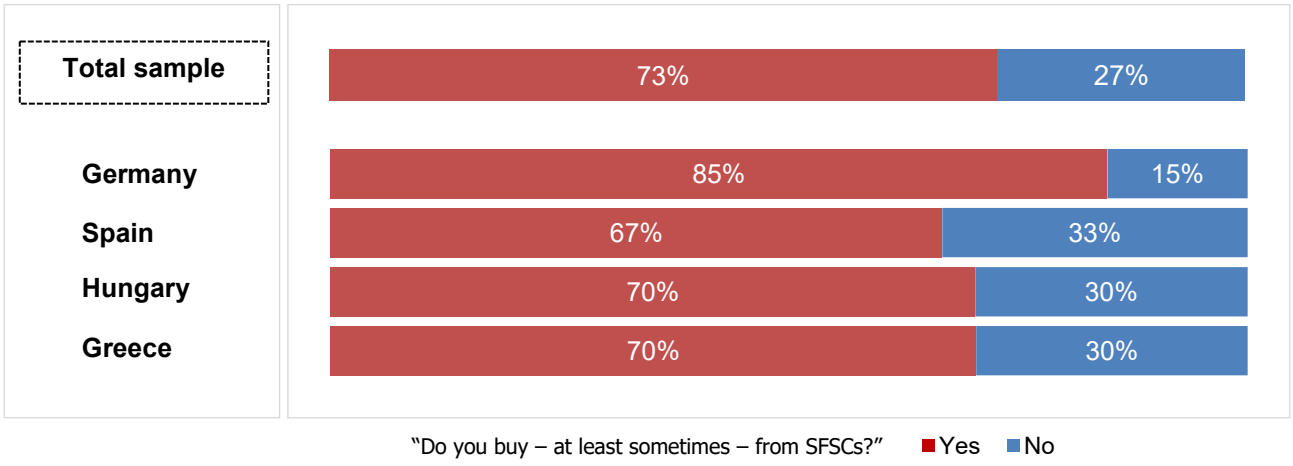
[14] "To what extent does your partner influences your decision to buy a local product?"; How important is your peers decision in purchase local food?; "How helpful are your peers decision for making your own decision to purchase local food?; and "To what extent does your partner influences your decision to buy a local product?; α = .78.
[15] "Rate perceived ease in finding enough time to shop for local food; "Rate your ability to afford local food" and "Rate your ability to access local food"; α = .81.

countries in post hoc tests, we found that those for Germany (M = 5.04) and Hungary (M = 4.95) did not differ significantly from each other ($p > 0.05$). The same is true for the comparison between Spain and Greece (M_{Spain} = 5.44 = M_{Greece} = 5.44, $p > 0.05$). However, the Spanish respondents reported significantly higher values compared to the Germans ($p < 0.01$). The value of the Greeks are also significantly higher than those of the Germans ($p < 0.01$). Finally, the values of the Spanish and Greek respondents are significantly higher than those of the Hungarians ($ps > 0.01$).

4.2 Consumer expectations with regard to SFSC

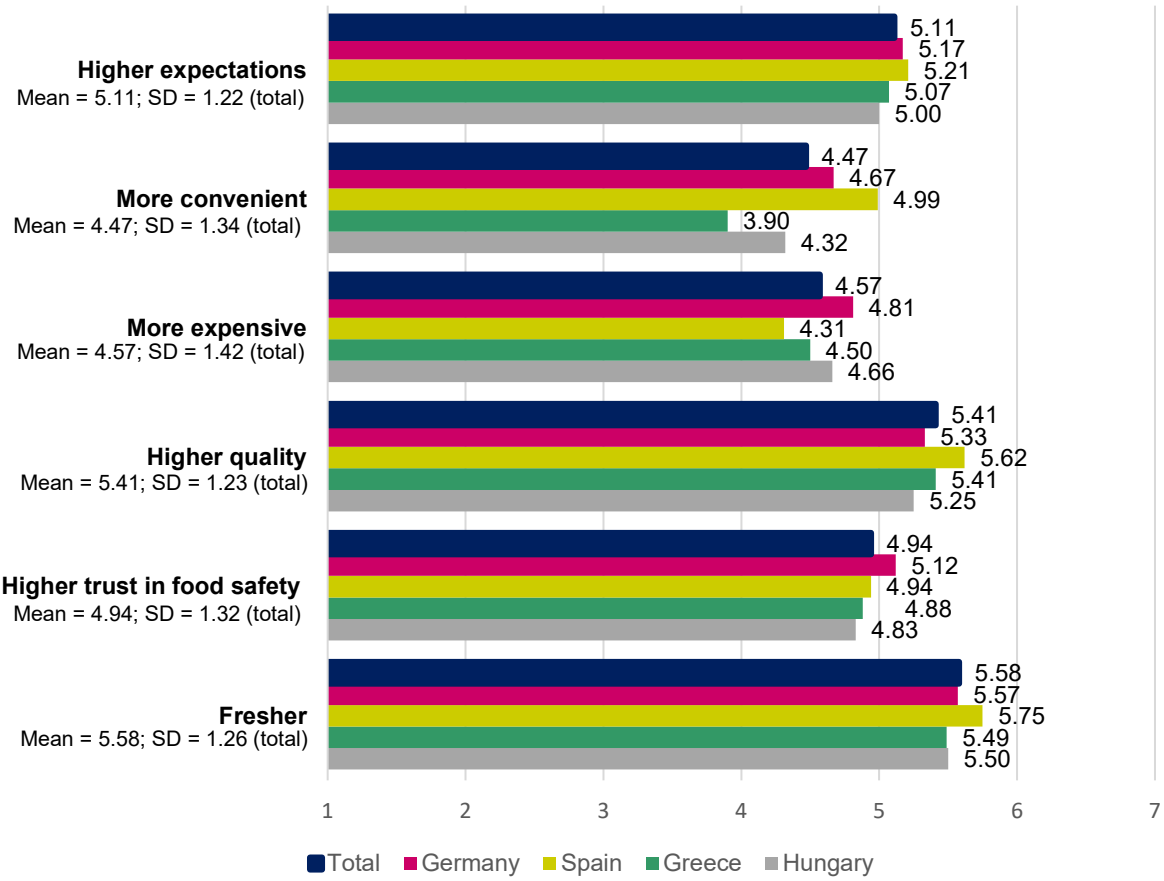
As explained in the Methods Section, the definition of what is a short food supply chain (SFSC) was given to participants before the questions regarding consumers expectations of SFCSs were asked. Figure 7 illustrates that at the time of the survey, 73% of all participants stated that they buy - at least sometimes – from SFSCs. Only the German participants show a higher agreement (85%) compared to the other participants. For the further investigation of the buying behaviour, the participants also assessed their shopping frequency from SFSCs compared to the frequency they assume for average customers. Among all respondents who shop at SFSCs at least sometimes, 38% of the participants think that they shop for food more often from SFSCs than an average customer. In addition, 37% of the participants think they buy as often as an average customer.

Figure 7. Purchasing behaviour towards SFSCs



The explicit expectations of the participants regarding SFSCs were assessed with respect to (1) convenience, (2) price, (3) quality, (4) trust in food safety, (5) freshness, and (6) general expectations. All in all, the participants expect food provided from SFSCs to be better or higher in terms of the six aspects mentioned above compared to conventional supply chains. Across all countries, respondents most likely expect that compared to conventional supply chains, SFSCs are fresher (M = 5.58), of higher quality (M = 5.41) and they expect higher general expectations (M = 5.11). An overview of the results by countries is given in Figure 8.

Figure 8. Consumer expectations of food from SFSCs (mean values by country)



"What do you expect from food purchased from SFSCs compared to conventional outlets?"
Bipolar scale from 1-7; with 4 representing the neutral option "equal"

First, people have generally higher expectations of food from SFSCs compared to the same products from conventional supply chains, while there are no differences among the countries. When comparing the expectation regarding specific aspects, there are differences. Looking at convenience, post hoc tests revealed that the mean values differ significantly among all four countries ($ps < 0.01$). Compared to the countries Germany, Hungary and Greece, the Spanish respondents have higher expectations regarding convenience ($ps < 0.01$). In contrast, participants from Greece have the lowest expectations compared to all other countries ($ps < 0.01$). Regarding expensiveness, we found that German respondents expect SFSC products to be more expensive than Spanish ($p < 0.01$) and Greek respondents ($p < 0.01$), while there is no difference in the expectation of the Hungarians ($p > 0.05$). With regard to quality, the Spanish respondents indicated the highest expectation. Their mean value is significantly higher than that of the Germans ($p < 0.01$) and the Hungarians ($p < 0.01$). The quality expectation of the Spanish and Greek subsample does not differ ($p > 0.05$).[16] When looking at the item food trust, Germany stands out the most, with a post hoc test indicating a significant difference between Germany and the lowest-scoring country Hungary ($p < 0.05$).[17] The

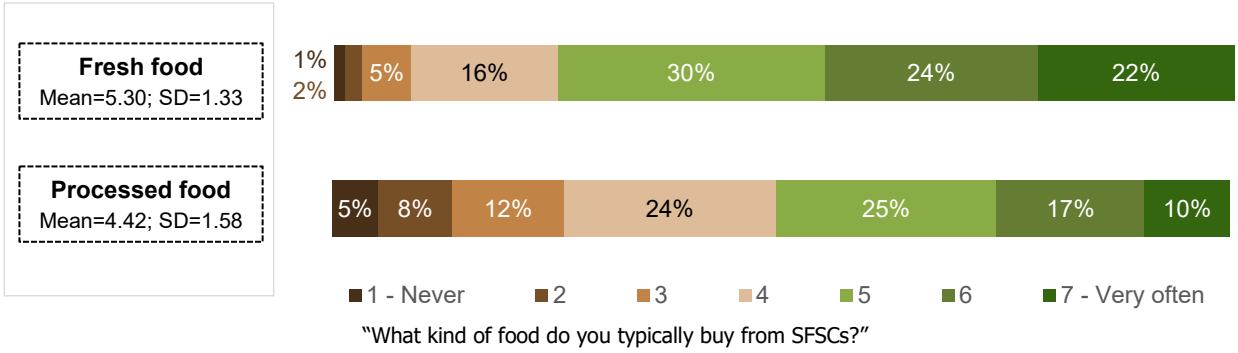
[16] All further comparisons regarding the item quality do not show any significant differences between the countries.
[17] No significant differences were found between the other countries for this item.

expectation of fresher food from SFSCs is most pronounced in Spain, with a mean value higher than that for the Greek ($p < 0.05$) and Hungarian ($p < 0.05$) respondents.[18]

4.3 General shopping behaviour with regard to SFSC

The subsequent analyses are run with the subsample of respondents (n = 1343) who reported to buy at least sometimes from SFSCs[19]. These participants report to buy fresh food much more often than processed food ($M_{fresh} = 5.30 > M_{processed} = 4.42$; $F(1,1342) = 319.30$, $p < 0.01$). As shown in Figure 9, 22% of all respondents reported buying fresh food very often, what is only true for 10% when it comes to processed food. There are only slight differences among the countries.[20] In Hungary and Greece, more processed products are purchased from SFSCs than in Spain and Germany ($M_{Hungary} = 4.61$, $M_{Greece} = 4.72 > M_{Spain} = 4.26$, $M_{Germany} = 4.16$; with ps < 0.05).

Figure 9. Overview of the different food categories bought from SFSCs (all countries)



Asking for specific categories participants (n = 1343) regularly buy from SFSCs, the top five are:

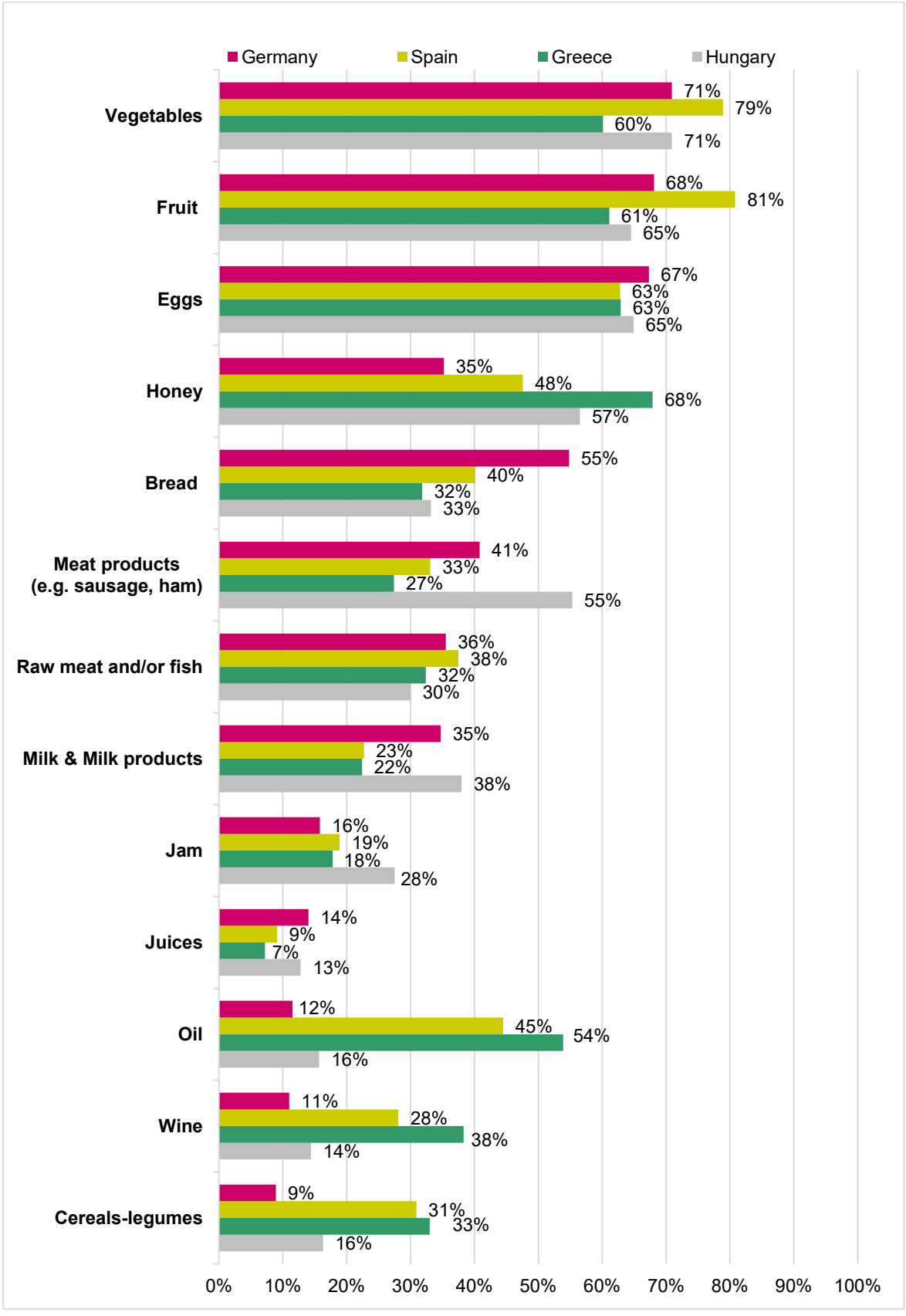
(1) vegetables (70%),
(2) fruits (69%),
(3) eggs (65%),
(4) honey (51%), and
(5) bread (41%).

Contrarily, juices (11%), jam (20%), and cereals (22%) are the least bought products from SFSCs.

Regarding food products regularly purchased at SFSCs, the responses strongly differ between countries, as illustrated in Figure 10. Compared to the overall average, Greek respondents buy more honey (68%) and Hungarians buy meat (55%) more regularly from SFSCs. Oil is bought most frequently by the Spanish (45%) and Greek (54%) respondents. An overview of the aggregated responses across the countries can be found in Annex 2, Figure A2-6.

[18] No other significant differences between the countries were found.
[19] Note that past behavior and specific experiences regarding SFSC purchases cannot be assessed by asking consumers who never shop there.
[20] On average, the Hungarian respondents ($M = 5.01$) indicated that they buy slightly less fresh food compared to all other countries with ps < 0.05, while post hoc comparisons showed no further differences between the countries.

Figure 10. Food typically purchased at SFSCs by country



"What kind of food do you regularly purchase from SFSCs? Please indicate. (Multiple answers possible)"

Next, Table 2 presents the overall results regarding consumers' willingness to pay (WTP). The detailed results for each country can be inspected in Annex 2 (Tables A2-1 to A2-4). We asked whether the participants would be willing to pay more or less for food from SFSC compared to conventional chains for several categories. It is important to note that results obtained by directly asking for WTP has to be interpreted with caution since the external validity of such an assessment tends to be low. That is, participants state something but would show a different actual behaviour. Nevertheless, the results provide some directions and this method has shown to be especially valid when the results are considered relatively, i.e., in comparison to each other (Miller et al. 2011).

Table 2. Willingness to pay for food from SFSCs compared to longer food supply chains (total)

	50% to 20% less	10% less	neither more nor less	10% more	20% more	30 to 50% more
Food for special occasion	8%	9%	17%	34%	21%	11%
Organic	11%	8%	16%	31%	21%	13%
More processed food	16%	15%	23%	29%	12%	5%
Bread	8%	8%	21%	38%	15%	10%
Dairy	9%	10%	17%	37%	18%	9%
Eggs	9%	8%	14%	37%	19%	13%
Fruit and vegetables	9%	9%	11%	37%	21%	13%
Meat/fish and meat/fish products	8%	8%	15%	35%	21%	13%

"Would you be willing to pay more or less for food from SFSC than for the same food from longer food supply chains?"

To give some examples of categories in which people tend to have a higher WTP, we can point to 71% of the respondents who indicated they would be willing to pay more (at least 10% and up to 50%) for fruit and vegetables. 69% state a higher WTP for meat and fish, and again 69% for eggs. In contrast, only 46% are willing to pay more for more processed food from SFSCs compared to longer food supply chains.

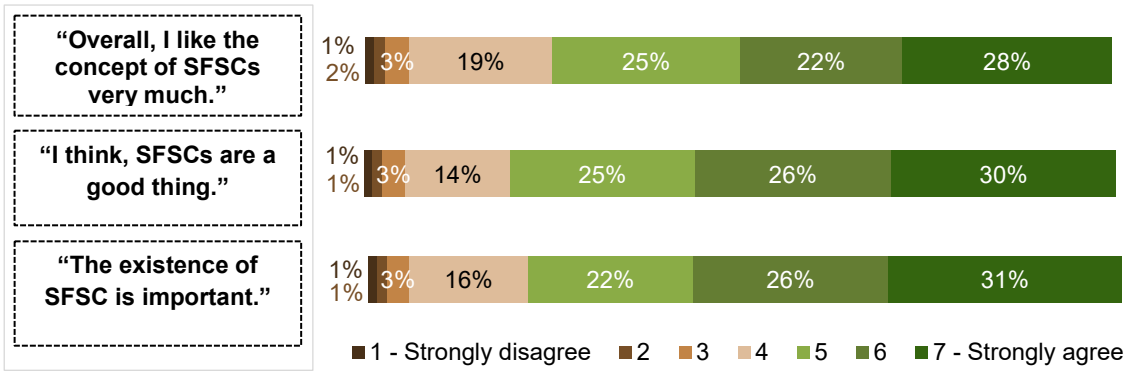
However, it has to be considered that there are also consumers who claim that they would pay less for food from SFSCs, as indicated by the first and second column of Table 2. This especially applies to processed food (31%), organic products (19%), and dairy (19%). Even for fruit and vegetables, 18% state they would pay less, for what is at the same time the category with the highest proportion of consumers who would pay more. Thus, this aspect seems to polarise consumers and must be seen in connection with their disposable income level.

In addition, and related to the aspect of income, there are significant differences between the countries with regard to the willingness to pay for food from SFSCs than for the same food from longer food supply chains (*Kruskal-Wallis H F* (1) = 41.79; $p < 0.01$). On average, Germans are willing to pay more than respondents from other countries, irrespective of the product category. In contrast, Hungarians have the lowest willingness to pay for almost all product categories. The difference between the two countries is consistent for almost all product categories, and is especially evident for organic products from SFSCs. Only 24.8% of the Hungarian respondents reported that they would pay at least 10% more for organic products from SFSCs, while 71.3% of German respondents reported that they would pay at least 10% more for organic products from SFSCs.

4.4 Attitude towards SFSCs

Overall, our survey participants show a very positive attitude towards SFSCs (M = 5.54). Figure 11 illustrates the attitude toward SFSCs across all countries. Regarding the question of the importance of the existence of SFSCs, 80% chose a value above the scale centre (i.e., the value 4 on the seven-point scale). When asked if they think SFSCs are a good thing, 81% of respondents chose a value above the scale centre, and 75% of respondents selected a value higher than 4 when asked if they like the concept of SFSCs overall.

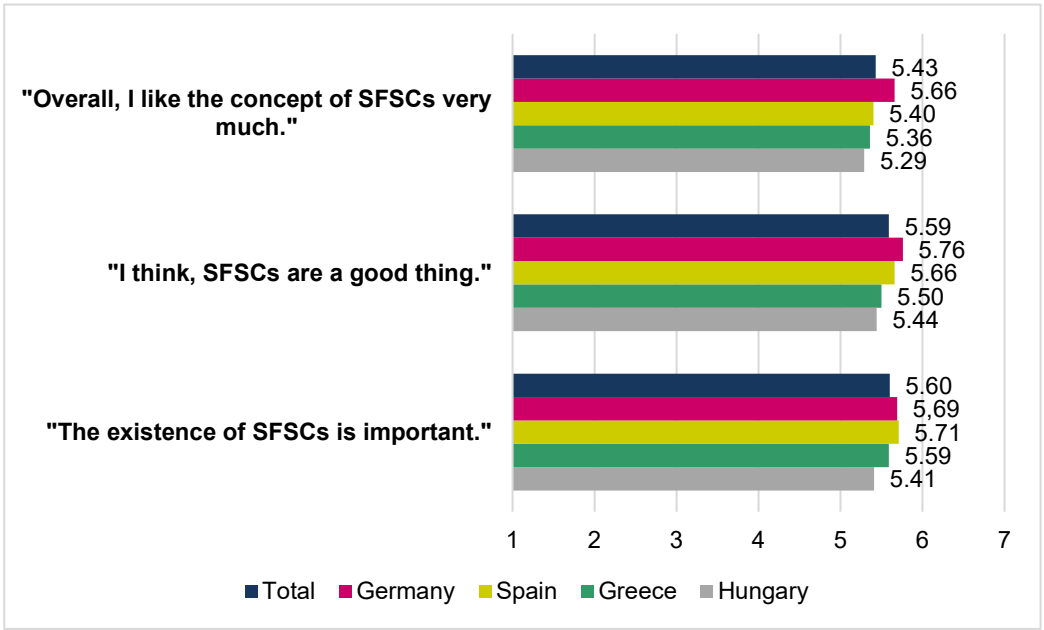
Figure 11. Respondents' attitude towards SFSC (frequencies of replies)



"To what extent do you agree or disagree to the below statements?"

Figure 12 shows the mean values of the attitude toward SFSCs for all countries. When comparing the means across all countries by using post hoc comparisons, only the German and Hungarian respondents revealed to differ significantly (p < 0.01), with the Germans being more positive.

Figure 12. Respondents' attitude towards SFSC (mean values by country)



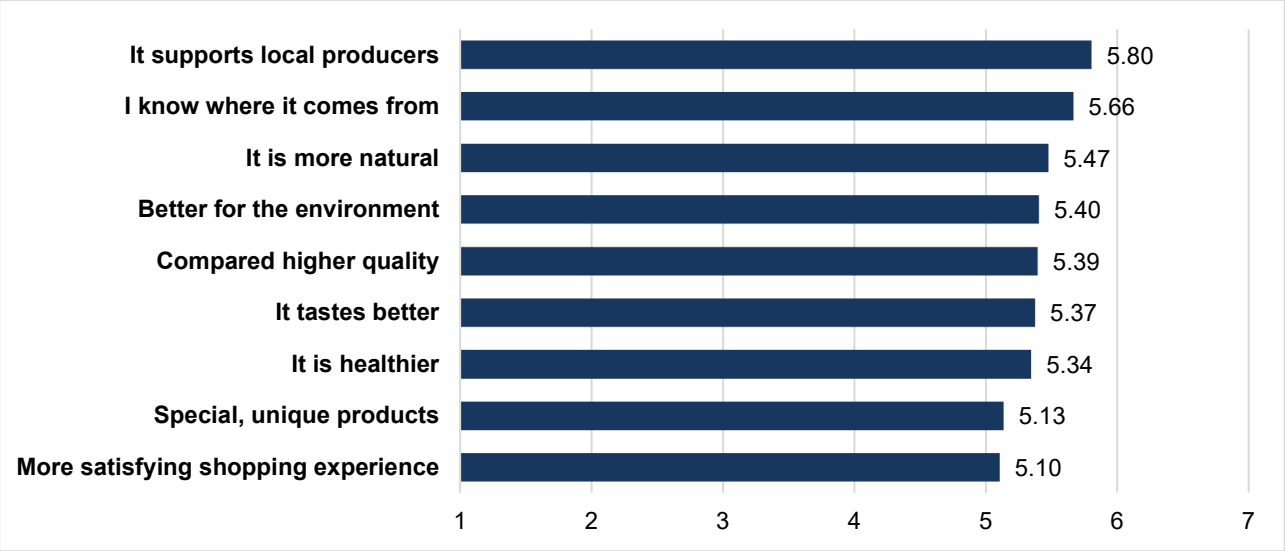
"To what extent do you agree or disagree to the below statements?"
1=strongly disagree/ 7=strongly agree

4.5 Reasons for buying from SFSCs

As illustrated in Figure 13, several reasons for buying food from SFSCs were introduced to the participants. They indicated their (dis-)agreement for every reason on rating scales (1-7). The top three reasons with highest agreement are:

(1) Support of local producers (M = 5.80; SD = 1.26),
(2) knowledge of the origin of the food (M = 5.66; SD = 1.32), and
(3) naturalness of the food (M = 5.47; SD = 1.36).[21]

Figure 13. Overview for all reasons for buying food from SFSCs (total)



"Which reasons apply to you for buying from SFSCs?" / "What would be good reasons for you to buy from SFSCs?"
1=strongly disagree/ 7=strongly agree

Next, we look at differences between the countries. For a country-specific illustration, see Annex 2, Figures A2-7 to A2-10. ANOVA results show that for the reason that buying from SFSCs supports local producers, there are significant differences between at least two countries (F(3,1835) = 7.91; p < 0.01). A post hoc test shows that the mean of the Hungarian subsample (M = 5.56) is significantly lower than the mean for Germany (M = 5.84, p < 0.05), Spanish (M = 5.93, p < 0.01) and Greeks (M = 5.88, p < 0.01). No further differences were found between the countries. Significant differences between the countries were also found with regard to the reason that products from SFSCs are more natural (F (3,1835) = 29.45; p < 0.01). Compared to all other countries, German respondents agree less about the importance of the naturalness of SFSCs products (M = 5.07; ps < 0.05). Conversely compared to all other countries, Spanish respondents tend to agree more on this statement (M = 5.84; ps < 0.05). Further post hoc analyses reveal that the values between Hungary and Greece also differ significantly (p < 0.05).

[21] Testing the top three reasons against each other using multiple comparisons post hoc tests with Bonferroni correction reveals significant differences between all of them (all ps <.001).

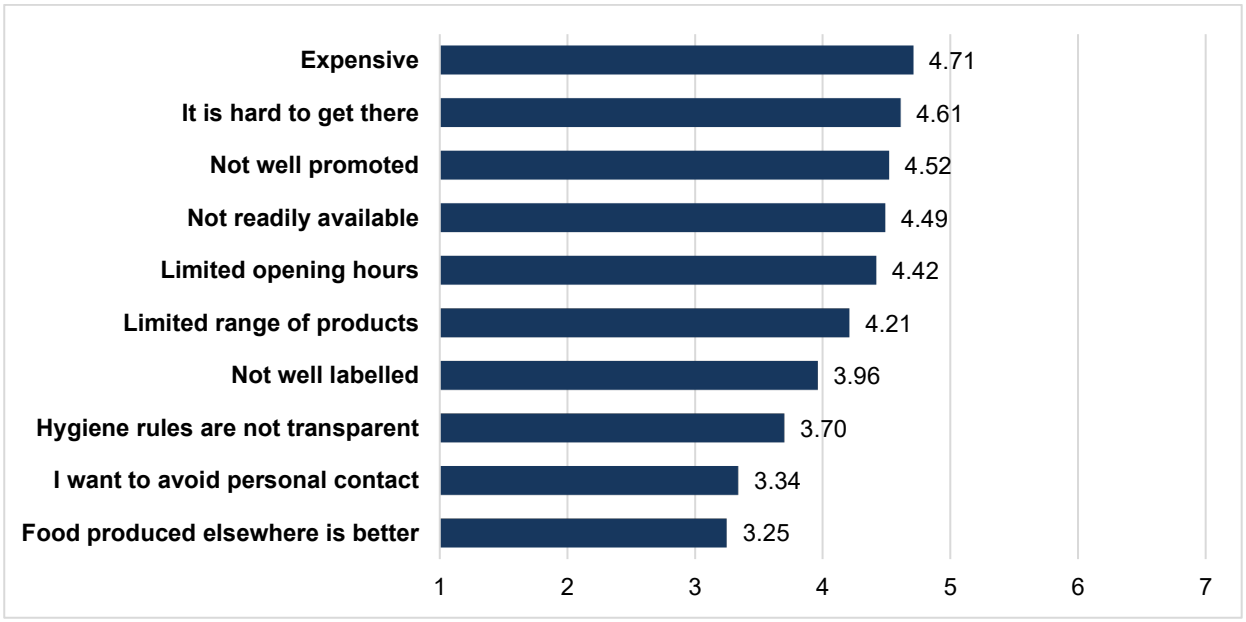
4.6 Reasons against buying from SFSCs (obstacles)

Finally, the participants indicated their (dis-)agreement to possible reasons that prevent them from buying food from SFSCs. The chosen reasons against buying from SFSCs took different aspects into account, most of which were already mentioned in the qualitative studies of SMARTCHAIN WP4. The top three reasons against buying from SFSCs are:

(1) It is expensive (*M* = 4.71*; SD* = 1.63),
(2) It is hard to get there (*M* = 4.61*; SD* = 1.63), and
(3) It is not well promoted (*M* = 4.52*; SD* = 1.75).[22]

If we look at the frequency values, we see that 58% of the surveyed consumers articulate agreement (i.e., the rated the aspect with a value > 4) to "*the food is too expensive".* 56% agreed that they do not buy food from SFSCs because it is hard to get there and 54% agreed that SFSCs are not well promoted. Information on the mean values of agreement to further obstacles that were questioned is shown in Figure 14.

Figure 14. Reasons against buying from SFSCs (total)



"When I don't buy from SFSC, this is because …?"
1=strongly disagree/ 7=strongly agree

For the three least important reasons presented, the mean values of agreement are significantly lower than the scale centre (i.e., 4) on the seven-point scale. These reasons are "hygiene rules are not transparent" (*M* = 3.70, *t* = - 7.70, *p* < 0.01[23]), "I want to avoid personal contact" (*M* = 3.34, *t* = - 15.61, *p* < 0.01) and "food produced elsewhere is better" (*M* = 3.25*, t* = - 19.94, *p* < 0.01). This means that people disagree that these aspects play an important role for not buying at SFSCs.

There are some differences between countries regarding the most pronounced reasons for not purchasing from SFSCs (see Annex 2, Figures A2-11 to A2-14). Existing differences between the

[22] Testing the top three reasons against each other using multiple comparisons post hoc tests with Bonferroni correction reveals significant differences between all of them (all *p*s <.001).
[23] The tests conducted in this and the following two cases are one-sample *t*-tests against the value 4.

countries are described below. For the reason "it is too expensive", a one-way ANOVA indicates that there is at least one statistically significant difference between two countries (F (3,1835) = 7.56; p < 0.01). Further analyses using post hoc comparisons reveal that Spanish respondents agree significantly less with this item than Greeks (M_{Spain} = 4.45 < M_{Greek} = 4.94; p < 0.01) and Hungarians (M_{Spain} = 4.45 < $M_{Hungary}$ = 4.80; p < 0.05). No other significant differences were identified between the countries.

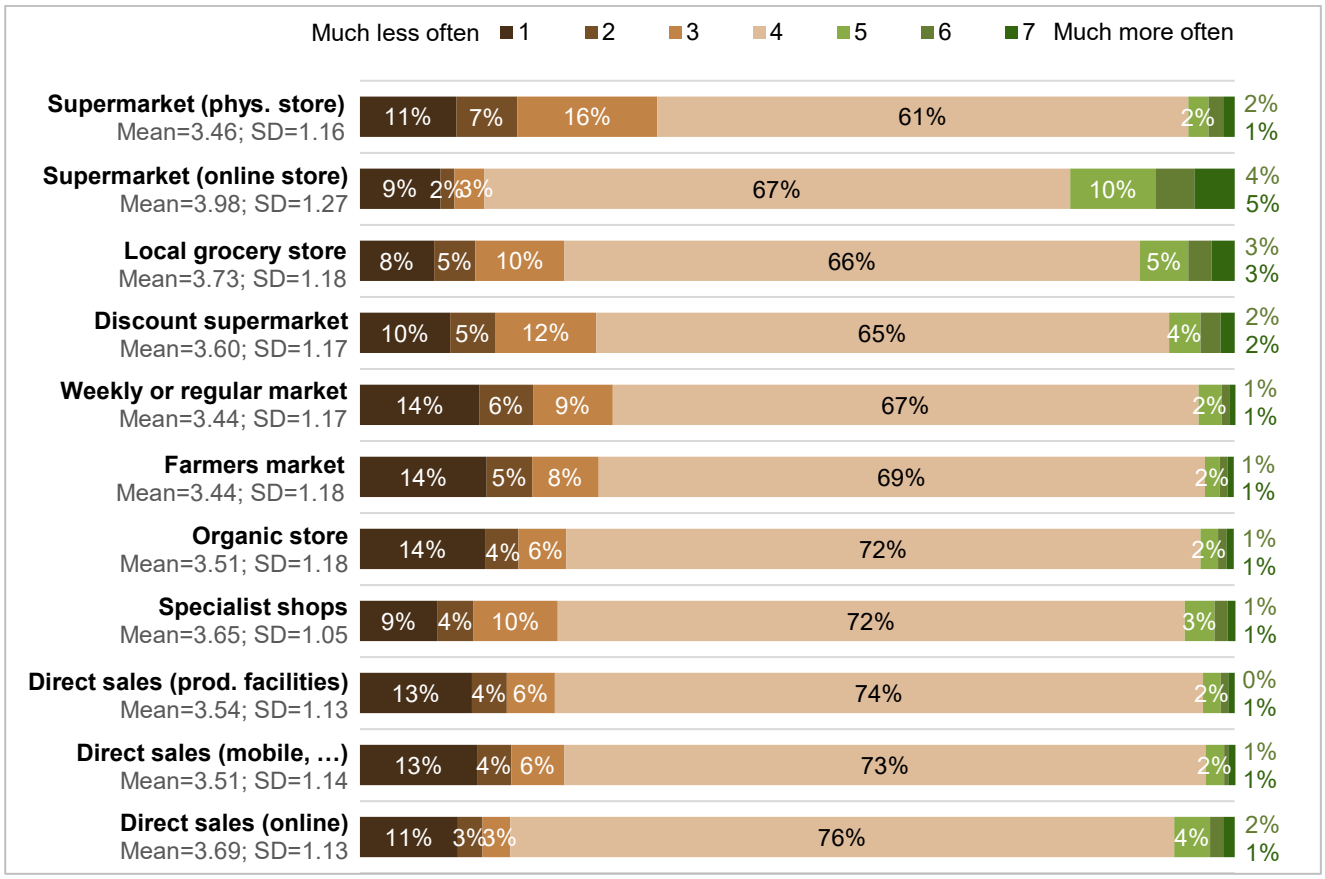
With regard to the item "it is hard to get there", there are also significant differences between at least two countries (F (3,1835) = 12.83; p < 0.01). Post hoc analyses reveal that this item is higher for Greek respondents compared to all other countries (ps < 0.01). No other significant differences were identified between the countries.

There are significant differences between at least two countries for the item "not well promoted" (F (3,1835) = 60.38; p < 0.01). The German participants agree to this at a significantly lower level compared to the Spanish (M_{Spain} = 4.71 > $M_{Germany}$ = 3.67; p < 0.01), Hungarian ($M_{Hungary}$ = 4.60 > $M_{Germany}$ = 3.67; p < 0.01) and Greek people (M_{Greece} = 5.10 > $M_{Germany}$ = 3.67; p < 0.01). The values between Spain and Greece (p < 0.01) and between Hungary and Greece (p < 0.01) also differ significantly between each other. With regard to this item, no further significant differences were determined.

4.7 Changes due to the COVID-19 situation

Because of the unusual circumstances caused by the COVID-19 pandemic during the time of the survey, participants were asked about changes in their mindset and behaviour regarding SFSCs. Figure 15 provides an overview of the changes in purchasing frequency for the various channels where consumers buy groceries. Due to the COVID-19 pandemic, although the majority of the consumers stated that they have not changed their shopping behaviour (as represented by the middle option, i.e., 4, in Figure 15), the results show that consumers have moderately reduced their overall shopping frequency. The largest decreases were observed at supermarkets (34% of consumers reported reduced shopping frequency[24]) and at markets or farmers markets (29% and 27% reported reduced frequency). However, it can be observed that online shopping is on the rise, since 19% of consumers reported that their online supermarket purchases have increased. It is surprising, though, that this hardly applies to online direct sales. Another interesting result is an increase in shopping frequency at local grocery stores, since 11% of the consumers stated that they visit these types of shops more often, but at the same time, 23% less often. Further details regarding other channels can be found in Figure 15.

Figure 15. Overview of changes in shopping frequency for the different channels (total)



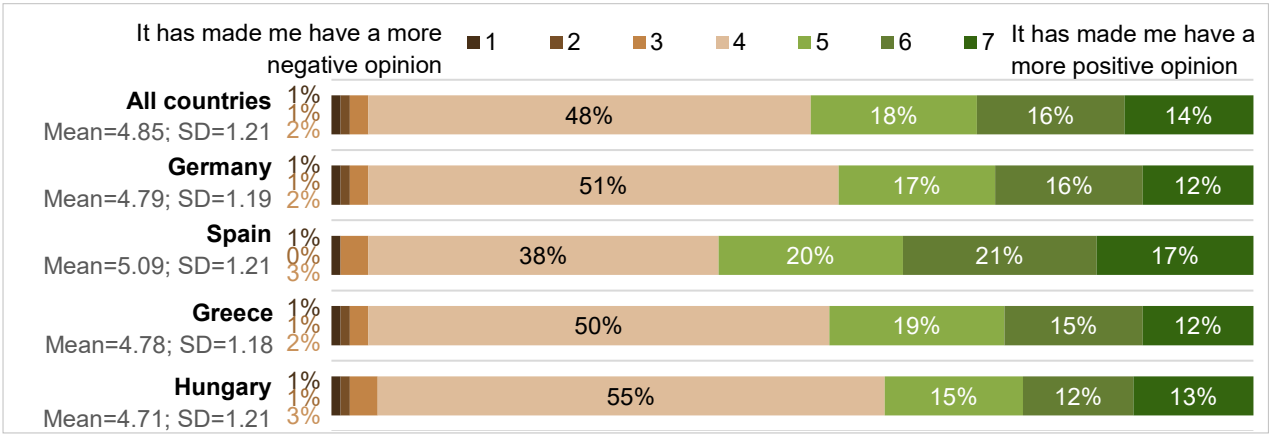
"Because of the COVID-19 situation, how has your shopping frequency changed for different channels?"
1= much less often to 7=much more often with 4 representing the neutral option "no change"

The changes in consumers' opinion about SFSC are presented in Figure 16. The COVID-19 situation positively affects the perception of SFSCs. Almost 50% of the respondents reported an improved

[24] 34% is the sum of the percentages of people selecting 1, 2 or 3 on the 7-point scale (11% + 7% + 16%).

opinion towards SFSCs. The participants stated that they have on average a slightly better opinion of SFSCs due to the COVID-19 situation ($M = 4.85$). The positive shift in the opinions is most strong for Spanish participants compared to all other countries, as post hoc comparisons between all countries revealed ($M = 5.09$; $ps < 0.01$). The opinion towards SFSCs has improved for 58% of Spanish respondents. The changes for the other countries are below the total average.

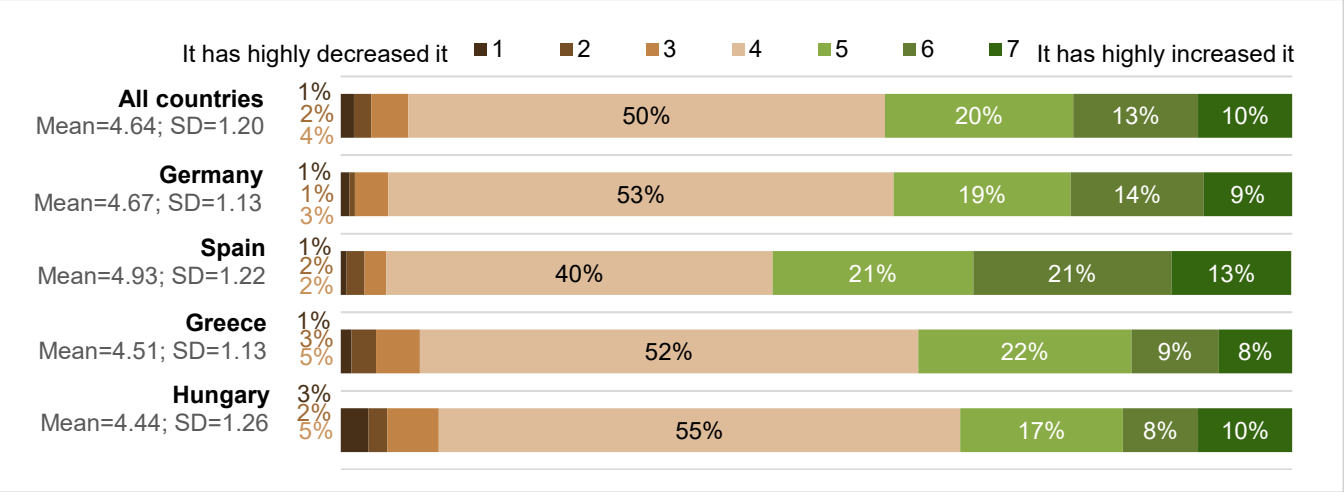
Figure 16. Overview of changes in opinion of SFSC



"Has the COVID-19 situation changed your opinion of SFSC?"

As shown in Figure 17, 50% of the consumers have stated that the changes in purchase intention from SFSC have not increased, 43% of consumers reported an increased intention to buy from SFSCs due to COVID-19. Only a small proportion of 7% would buy less from SFSCs. The participants indicated on average a slightly positive change in their intention to purchase from SFSCs ($M = 4.64$). Again, the responses of the Spanish participants stand out, as they are more positive.[25]

Figure 17. Overview of changes in purchase intention from SFSC

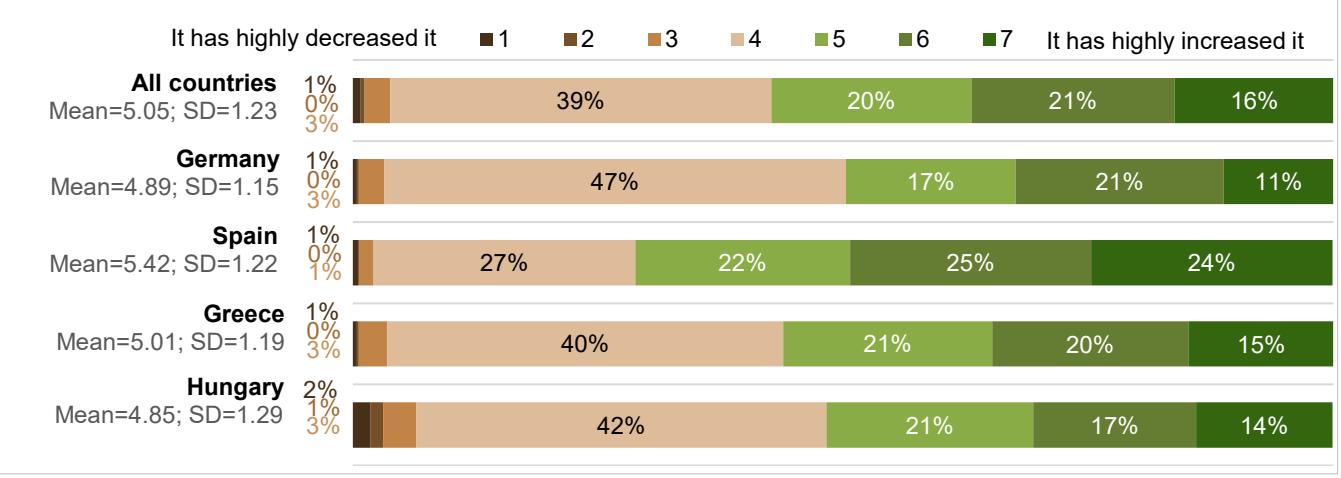


"Has the COVID-19 situation changed your intent to purchase from SFSCs?"

[25] According to post hoc tests, the positive change in opinion toward SFSCs is significantly more pronounced among participants from Spain compared to all other countries ($ps < 0.05$). Furthermore, there are significant differences between the values of the German and Hungarian participants ($p < 0.05$).

The strongest change on average caused by the COVID-19 situation indicated was participants' intention to support local producers (M = 5.05). The exact overview can be found in Figure 18. In each of the countries studied, the COVID-19 situation has clearly changed this intention and, on average, it has increased for 57% of the respondents. Considering the mean values of the individual countries, the Spanish respondents indicated a significantly higher value than in comparison to all other countries (ps < 0.01). No other significant differences between the countries were found.

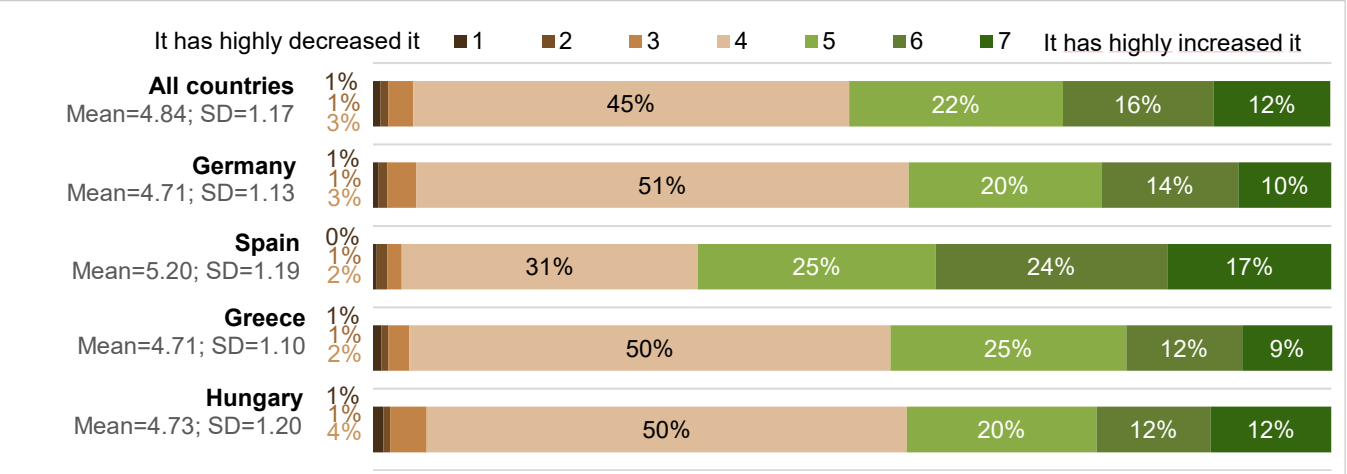
Figure 18. Overview of changes in intention to support local producers



"Has the COVID-19 situation changed your intent to support local producers?"

The results regarding consumers' awareness of SFSCs are shown in Figure 19. Overall, it has increased or even highly increased for 50% of respondents. The mean values show that, in total, the participants are a slightly more aware of SFSCs due to the COVID-19 situation (M = 4.84). The Spanish respondents again show the highest increase.[26]

Figure 19. Overview of changes in awareness of SFSC

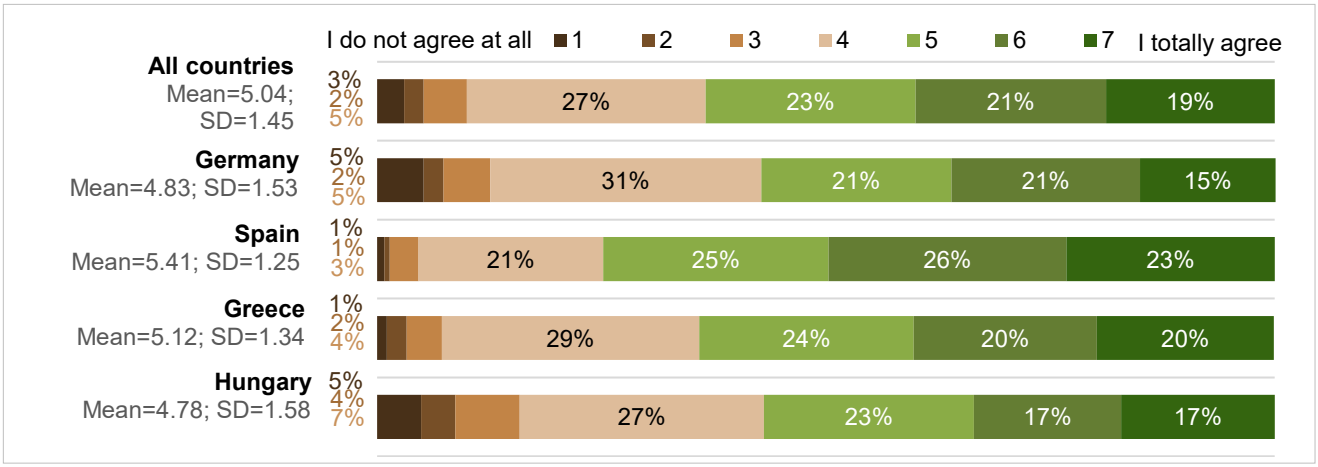


"Has the COVID-19 situation changed your awareness for SFSCs?"

[26] Post hoc tests confirm that their mean value (M_{Spain} = 5.42) is significantly higher than those of all other countries (ps < 0.05). The mean for the Greeks is significantly higher than those for Germans (p < 0.05) and Hungarians (p < 0.01). There are no further significant differences between the countries.

Lastly, the indication of (dis-)agreement of the participants whether SFSCs help countries to be better prepared for a crisis like the COVID-19 pandemic are illustrated in Figure 20. Overall, 63% of respondents agree to this statement with a mean value of *M* = 5.04. In total, almost every fifth respondent totally agrees. Respondents generally see SFSCs as a good way to better prepare a country for a crisis such as the COVID-19 situation. The highest level of agreement is found on average for Spanish respondents. [27]

Figure 20. Overview of agreement that SFSC help countries to be better prepared for a crisis



"Do you think, SFSCs are a way to make our country better prepared for a crisis like the COVID-19 situation?"

[27] Confirmed by a post hoc test, this value is the highest in comparison to all other countries (*p*s < 0.01). The average values of the countries do not significantly differ from each other in any other combination.

4.8 Consumer segmentation

To identify consumer segments which are characterized by a strong tendency to support and shop at SFSCs, cluster analysis was used. For the analysis, we chose criteria that are strongly related to this behaviour regarding SFSCs. In addition, an attempt was made to achieve a cluster solution that is meaningful for practitioners. As clustering variables, we first selected the attitude towards SFSCs, measured by three items ("Overall, I like the concept of SFSCs very much", "I think, SFSCs are a good thing", "The existence of SFSC is important"; α=0.94). This might be the variable which is most directly related to the wish to support SFSCs. Second, the past purchase behaviour of local food was used (How often did you purchase locally grown or produced food in the past month?), since the concept of local food has been shown to strongly overlap with the consumers' understanding of SFSCs (Todorovic et al. 2018); it was measured using one item. Third, the general expectations from food of SFSCs compared to conventional outlets were included (generally lower expectations / generally higher expectations).

The segmentation was conducted using a hierarchical clustering based on the Ward method. The initial result suggested the formation of two clusters. In order to gain a more differentiated picture, several cluster solutions were explored. Finally, we decided to present a three-cluster solution to derive meaningful conclusions. To analyse how the segments differ, ANOVAs were conducted. We first illustrate how the clusters differ regarding the three concepts used for clustering (i.e., attitude towards SFSCs, expectations from food of SFSCs, and past purchase behaviour of local food). The mean results are depicted in Table 3. There are differences between the clusters with respect to all cluster variables. Next, we explore the differences in more detail while referring to Figure 21.

Table 3. Mean values of the three segmentation criteria by clusters

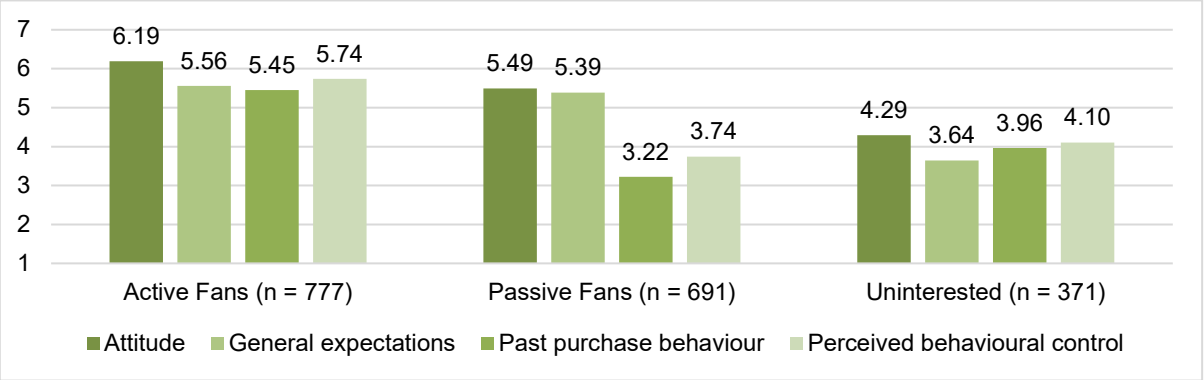
	Cluster 1 n = 777 (42.2%)	**Cluster 2** n = 691 (37.6%)	**Cluster 3** n = 371 (20.2%)	*F*	*p-value*
Attitude	6.19	5.49	4.29	436.65	<.001
General expectations	5.56	5.39	3.64	533.15	<.001
Past purchase behaviour	5.45	3.22	3.96	610.55	<.001

Note: The segmentation analysis was based on the three variables attitude towards SFSCs, general expectations and past purchase behaviour

As shown in Figure 21 und Table 3, there are significant differences in the attitude towards SFSCs between the segments examined (F (2,1836) = 436.65; p < 0.01). The average attitude of consumers of Segment 1, which can be characterized as *Active Fans*, is most positive ($M_{Active\ Fans}$ = 6.19 > $M_{Passive\ Fans}$ = 5.49, p < 0.01; $M_{Active\ Fans}$ = 6.19 > $M_{Uninterested}$ = *4.29,* < 0.01), followed by Segment 2, labelled as *Passive Fans* and the third segment, which is described as the *Uninterested* ($M_{Passive\ Fans}$ = 5.49 > $M_{Uninterested}$ = 4.29, p < 0.01). The segment of *Active Fans* scores high on attitude and expectation, but also on the dimensions that reflect the corresponding behavioural tendencies, that is, past behaviour and behavioural control. The latter construct indicates whether people perceive that they are able to perform a certain behaviour, i.e., purchasing from SFSCs in our specific case. The interesting difference to the second segment, that also scores high on attitude and expectations, is the behavioural dimension. In other words, these consumers like SFSCs and have positive expectations, but they report a lower ability to purchase from SFSCs and consistent with this, they have less often actually purchased local food in the past. Note that the lower perceived

ability to purchase at SFSCs does not necessarily mean that these consumers have no access to SFSCs. This variable can also reflect a perceived difficulty, stemming from factors such as a lack of time or money. In addition, it may even mirror to some extent an excuse people put forward. Finally, the *Uninterested* are characterized by medium levels of attitude, expectations, past behaviour and behavioural control.

Figure 21. Different characteristics of *Active Fans*, *Passive Fans* and *Uninterested*



In a next step, we describe the different segments based on socio-demographic aspects such as age, gender, household, region, income level and education. A detailed overview is provided in Table 4. In Segment 1 and 2 (i.e., *Active Fans* and *Passive Fans*), slightly more women are represented and the average age was around 47 years, while Segment 3 (i.e., the "*Uninterested*") is the only segment with a greater proportion of men and has the youngest average age of participants (45.02 years). Regardless of the different segments, more than every second household includes children. The *Uninterested* segment includes the highest percentage of people who have not finished secondary education and the lowest percentage of people holding a university degree. While the community sizes are more or less equally distributed across the segments, there are differences regarding the countries where the consumers come from. German consumers made the largest share of *Active Fans* (29.6%) and the lowest of *Passive Fans* (21.4%). In the *Uninterested* segment, Germans also constitute a lower percentage (22.9%). In contrast, Hungarians are overrepresented in the segment of *Uninterested* (31.0%) and segment of *Passive Fans* (27.5%), while being underrepresented in the segment of *Active Fans* (18.0%).

Table 4. Demographic characteristics of the different consumer segments

		Segments			Test value	*p*-value
		Active Fans	*Passive Fans*	*Un-interested*		
Sample size (N = 1839)		777 (42.2%)	691 (37.6%)	371 (20.2%)		
Gender (female)		53.9%	56.3%	43.7%	$\chi^2(2) = 16.20$	<.001
Age (Ø in years)		46.70	47.02	45.02	$F(2.1836) = 2.42$	.089
Household size (Ø household members)		2.76	2.64	2.82	$F(2.1836) = 3.20$	.041
Households with kids		52.2%	57.0%	59.7%	$\chi^2(2) = 5.73$	.057
Education[1]	No graduation	2.4%	2.9%	3.8%	Kruskal-Wallis H $F(2) = 11.46$	.003
	Secondary education	31.7%	36.2%	39.3%		
	Vocational education	21.9%	17.8%	22.6%		
	University	43.8%	42.7%	34.0%		
	Prefer not to answer	0.2 %	0.4%	0.3%		
Community size[2]	Up to 5.000	13.8%	13.5%	14.5%	Kruskal-Wallis H $F(2) = 4.01$	.135
	5.001-25.000	21.9%	20.3%	22.4%		
	25.001-150.000	31.6%	26.9%	28.6%		
	Over 150.000	32.7%	39.3%	34.5%		
Country	Germany	29.6%	21.4%	22.9%	$\chi^2(6) = 37.65$	<.001
	Spain	28.1%	24.35%	23.7%		
	Greece	24.3%	26.6%	22.4%		
	Hungary	18.0%	27.5%	31.0%		
Household income[3]	Low (<900€)	15.9%	29.8%	28.8%	Kruskal-Wallis H $F(2) = 49.85$	<.001
	Low-middle (901-2000€)	40.1%	36.3%	39.7%		
	Middle (2001-3200€)	22.9%	23.4%	18.2%		
	High-middle (3201-6000€)	17.3%	8.9%	12.4%		
	High (>6000€)	3.8%	1.6%	0.9%		

[1]Due to different education systems, education categories are not strictly comparable between countries.
[2]Based on self-assessment of participants.
[3]Due to no responses the number of participants differs; *Active Fans* = 743 , *Passive Fans* = 644 , *Uninterested* = 340.

For further investigation of differences between the consumer segments, we consider some selected aspects that may be meaningful with regard to consumer behaviour. First, the consumer segments differ in their personal values. Comparing the three groups, egoistic, altruistic, and biospheric values are more important to *Active Fans*. In particular, there are major and highly significant differences between *Active Fans* and *Uninterested* in the importance of altruistic and biospheric values. In addition, the groups differ significantly regarding important aspects when buying food. Consumers of the segment of *Active Fans* indicated the highest importance of freshness, taste and overall quality, whereas these aspects are in comparison less important to the *Uninterested*. Only regarding low prices of food, the sequence of stated importance differs, with the highest importance for the segment of *Passive Fans*.

The following paragraphs provide a summary description for each of the three consumer segments.

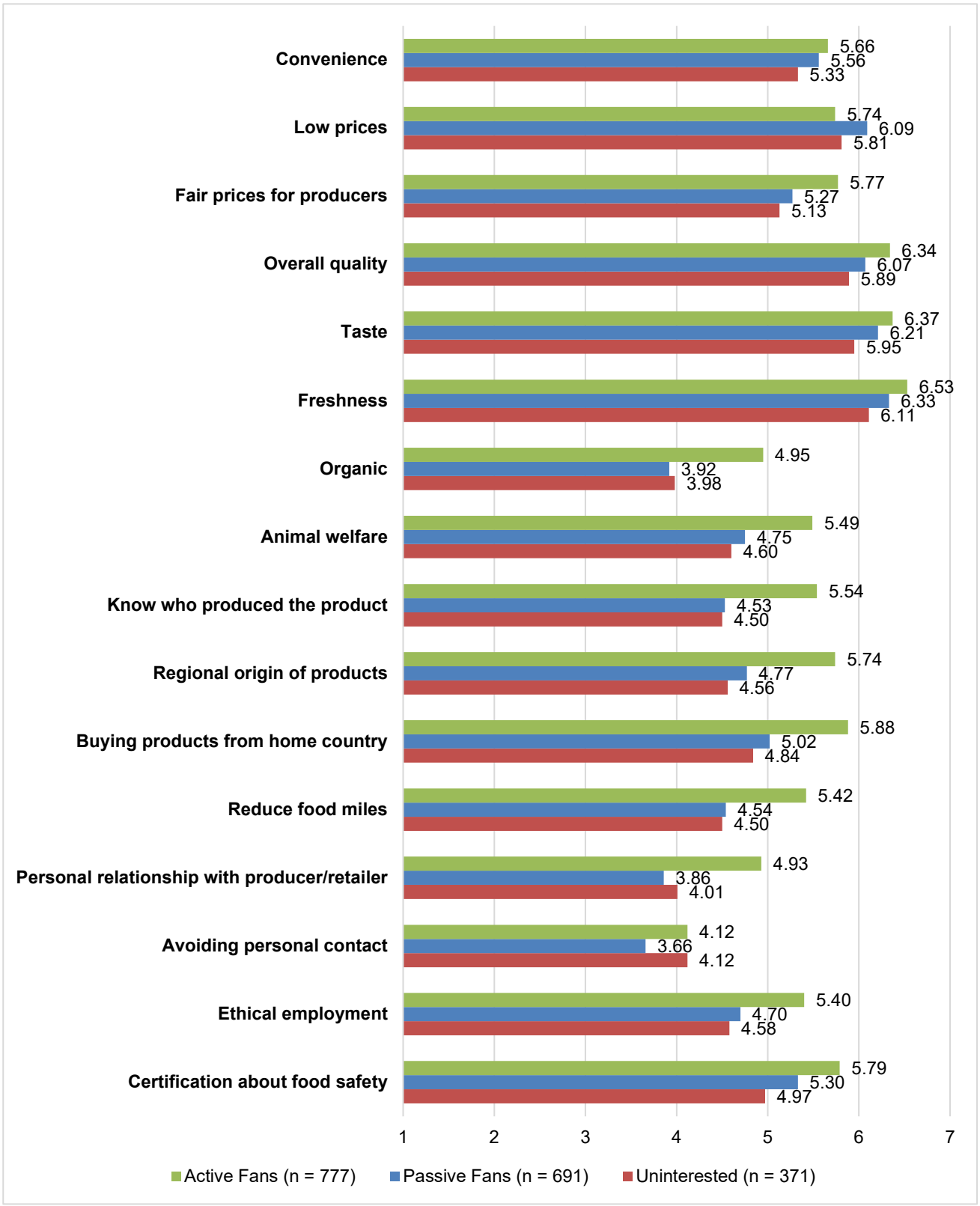
Active Fans: Consumers of the segment of *Active Fans* are on average 46.70 (*SD* = 14.56) years old. Their average household size is 2.76. Most of the consumers have a university degree and about 50% have an average monthly household net income of up to 2,000€; every fifth household has a monthly net income of more than 3,201€. This segment extensively uses SFSCs, with 89.7% being users and only 10.3% non-users. Egoistic values are important, but altruistic and biospheric values are even more important to these consumers, especially biospheric values. They have a very positive attitude towards SFSCs and report that it is easy and possible for them to buy food from SFSCs. In line with this, they buy food (much) more often from SFSCs than an average consumer. They also have very high expectations regarding the food they purchase. As illustrated in Figure 22, freshness, overall quality, and taste of food is most important to these consumers when buying food. In addition, aspects like buying food from their home country, certification of food safety, or a regional origin of products are very important. In sum, this can be interpreted as a very high overall involvement when it comes to food. In addition, they also are much more likely to buy organic food, especially in comparison to the other segments. Regarding the SFSC-specific questions, supporting local producers, the knowledge where the food comes from, and the environmentally friendlier way the food grows are considered to be the most important reasons to buy from SFSCs. If consumers of this segment do not buy from SFSCs, it is because food from SFSCs is not readily available, too expensive, or not well promoted. When we look at the distribution of the segment membership across the different countries, approximately half of German (49.7%) and Spanish participants (45.9%) are *Active Fans*, whereas only a third of the Hungarian respondents (31.5%) belong to this segment. Regarding the distribution in this segment, most consumers are German (29.6%), followed by Spanish (28.1%) and Greek consumers (24.3%). Only 18% of this segment are from Hungary.

Passive Fans: Consumers of the segment of *Passive Fans* are quite similar to the segment of *Active Fans* regarding demographic variables. They tend to be female (56.3%) and on average, are 47.02 years old (*SD* = 14.18) and thus, slightly older than consumers of the other two groups. They live in households consisting of 2.64 people. Children live in 57% of the households allocated to this segment. Most members of this segment have a university degree, followed by secondary education level. Most of the households have an average monthly net income of up to 2,000€ and only every tenth more than 3,201€. SFSCS are used relatively frequently in this segment, with 64.7% being users and only 35.3% non-users. Biospheric values are very important to these consumers, as well as altruistic values. Egoistic values are also important, but to a lesser extent. Although the ability and possibilities to buy food from SFSCs are not always sufficient for these consumers, they have a predominantly positive attitude towards SFSCs. Because of the low perceived behavioural control, consumers of this group buy (much) less often food from SFSCs than an average consumer. More than a third of them do not buy from SFSCs at all. When buying food, freshness, taste, and low prices are very important to these consumers, followed by the overall quality of the food and the convenience of buying food. Avoiding personal contact, a personal relationship with the producer or retailer, and organic quality of food are rather unimportant. Supporting local producers, the knowledge of where to food comes from, and a greater naturalness of the food are important reasons to these consumers to buy from SFSCs. In contrast, high prices, insufficient promotion and availability are obstacles. From the Hungarian participants, the highest proportion belongs to this segment (42.7%). When compared to the segment of *Active Fans*, there is an equal distribution of Greek consumers between these two segments. Overall, the segment of *Passive Fans* shows a

relatively balanced distribution of consumers from the different countries: most of them are Hungarian consumers (27.5%), followed by Greek (26.6%), Spanish (24.5%), and German (21.4%) consumers.

Uninterested: With an average age of 45.02 (*SD* = 15.61) years, consumers of the *Uninterested* segment are younger than those of the other segments. In contrast to the other segments, male consumers are overrepresented (56.3%). They are characterized by the highest household size with an average of 2.82 people. Almost 60% have at least one child living in the household. The highest proportion of the segment members has a secondary education and around every third holds a university degree. Their households earn mostly up to 2,000€ per month. This segment uses SFSCs moderately, with 53.6% being users and 47.4% non-users. Biospheric values are most important to them, followed by altruistic values. They have in general a positive attitude towards SFSCs but show a medium level of perceived behavioural control of purchasing food from SFSCs, i.e., they perceive having limited access to SFSCs. Therefore, many consumers assigned to this group do not buy from SFSCs at all. In comparison to the other groups, these consumers have relatively low expectations towards the food they purchase. Freshness, taste, and overall quality of food are the most important aspects to these consumers. In addition, low prices are very important to them. In contrast, the organic status of food, a personal relationship with the producer or retailer, and avoiding personal contact are least important to this group. Compared to other reasons, these consumers agree the most to knowing where the food comes from, the environmental friendlier production, and supporting local producers as reasons to buy from SFSCs. High prices, insufficient promotion and availability are reasons against buying from SFSCs. In contrast to the other two segments, the less comprehensive labelling of the products from SFSCs is an obstacle to purchase. This segment is the smallest among the three we identified. Most of the *Uninterested* are Hungarian consumers (31.0%), followed by Spanish (23.7%), German (22.9%), and Greek (22.4%) consumers.

Figure 22. Importance of criteria for food purchase by consumer segments



"When buying food, how important are the following points to you?"
1=not at all important/ 7=very important

4.9 Regression analysis predicting shopping from SFSCs: An examination of drivers and deterrents

For many years, food buying was predominantly regarded as a utilitarian, functional activity. The practical benefits of food (e.g., freshness, taste, availability) customarily dominated food purchasing decisions, even amongst the "issue aware" consumers (Megicks, Memery and Angell 2012). In the last several decades, there has been a shift from the self-focused consumer toward the ethical consumer, and, as a result, the notion of "ethical consumption" has entered everyday practice (Ryoo, Sung and Chechelnytska 2020). Indeed, ethical consumption involving choice based on moral beliefs and social concerns is growing across a wide range of product categories, even more so for food items (Birch, Memery and De Silva Kanakaratne 2018).

Ethical food consumption refers to the inclusion of environmental (e.g., environmental protection, animal welfare) and societal (e.g., responsible working conditions, fair trade) considerations in an individual's food purchase decision (Osburg et al. 2019). Not unexpectedly, past studies have found that consumer drivers to purchasing food from SFSCs include ethical considerations, such as support for local farmers, organic produce, food provenance, and food safety (Birch, Memery and De Silva Kanakaratne 2018). Our focus group studies also showed that consumers generally have a positive view of SFSCs in terms of such considerations.

Although many consumers are increasingly aware of the problems associated with current consumption habits, and businesses progressively spend more on ethical advertising, ethical consumption is not growing accordingly (Osburg et al. 2019). At the same time, SFSCs are not without challenges. They often maintain an exclusivism status (Vittersø et al. 2019), predominantly appealing to select types of consumers (Giampietri et al. 2018), and habitually characterized as a niche market for conscientious consumers (Aggestam, Fleiß and Posch 2017). Besides, in our focus groups studies, participants reported that buying from SFSCs was not always convenient or affordable enough for it to become a regular habit. Taken together, although ethical consumption is considered a desirable social movement and buying from SFSCs is inextricably linked with ethical considerations, the positive effects of such ethical practices do not always translate into actual behaviours.

In view of the above, in this section, we present the results of a regression model that sets to predict actual buying behaviour from SFSCs. In so doing, we pit different potential consumer drivers of food purchasing against possible deterrents of buying from SFSCs. In fact, we were careful to include as many ethical consumption drivers as possible without inducing respondent fatigue.

So, in our driver set, we included several ones related to ethical consumption, such as "fair prices for the producers", "organic produce", "animal welfare", "knowledge about who produced the product", "regional origin of products", "buying products from the home country", "reducing food miles", "direct contact/personal relationship with the producer/retailer", "ethical employment", and "certification about food safety". Of course, we had included more practical buying drivers too, such as "convenience", "low prices", "overall quality", "taste", and "freshness". In the deterrents set, we included factors relating to "insufficient labelling", "limited range", "insufficient promotion", "limited opening hours", "high price", and "non-transparent hygiene rules", among others.

Before constructing the actual regression model, we opted to reduce the data set to a more manageable size while retaining as much of the original information as possible. Hence, we ran a

series of factor analyses. We first conducted an exploratory factor analysis (EFA) that assessed the underlying factor structure of the driver and deterrent items. The results revealed five factors with eigenvalues greater than 1, which accounted for about 60% of the total variance. Further, the results of Harman's one-factor method revealed that the first factor did not account for the majority of the variance (only 24%), and there was no general factor in the unrotated factor structure. These results suggested that common method bias was not a likely threat (Podsakoff and Organ 1986). We then ran principal axis factoring (PAF) using oblique rotation for each set separately, making use of the multiple criteria method to decide upon the underlying factor structure (Conway and Huffcutt 2003; Netemeyer, Bearden and Sharma 2003; Hair et al. 1998). The total variance explained, the scree plot, the Kaiser criterion, formal testing, as well as the more elaborate procedures of parallel analysis and Velicer's minimum average partial (MAP) test were used (O'Connor 2000).

In the case of drivers, multiple criteria, including the scree plot, total variance explained, the Kaiser criterion, and parallel analysis, revealed a three-factor solution (variance explained = 50%). All the items had a loading higher than 0.5 on the respective factor and weak cross-loadings on the other two factors (< 0.2), apart from one item that had a loading lower than 0.5 but higher than 0.4, and an item that had a relatively weak loading overall (i.e., < 0.4). We, therefore, excluded the latter (i.e., "I like to avoid personal contact"), and reran the analysis, which improved the solution in terms of the overall variance explained (i.e., 52%). So, we decided to keep these three factors and label them based on the items that loaded significantly on them (see Table 6). Moreover, Cronbach's alpha for the first two factors reached a value of 0.90 and 0.84, respectively, comfortably above the "excellence" level suggested by Nunnally and Bernstein (1994) when gauging internal consistency reliability (Devlin, Kumar and Sekhon 2014). Cronbach's alpha for the third factor was merely satisfactory, but this should not be surprising as this factor only consisted of two items. The mean score of the respective items for each factor was used for further analysis.

In the case of deterrents, multiple criteria (i.e., the Kaiser criterion, scree plot, MAP, and parallel analysis) suggested that a three-factor solution was appropriate. Still, we excluded an item (i.e., "not readily available") that loaded significantly on two factors and an item that had a weak loading (i.e., "the range is limited", < 0.2) and reran the analysis. Similarly to the drivers' case, this improved the solution in terms of the overall variance explained (i.e., from 48% to 52%). Subsequently, we decided to keep these three factors and label them based on the items that loaded significantly on them (see Table 7). Apart from one case, all other items had a loading equal to or higher than 0.6 on their respective factor. Moreover, Cronbach's alpha for all three factors reached acceptable levels. Likewise, the mean score of the respective items for each factor was used for further analysis.

As we can see from Table 6, the results confirmed our expectations regarding ethical considerations. All items relating to ethical consumption reasons load on the first factor. We, therefore, decided to label this factor as "ethical benefits". The second factor consisted of items that are part and parcel of traditional shopping. We, thus, called the second factor as "core benefits". Finally, the third factor consists of the two rather pragmatic benefits, so we decided to call it accordingly (i.e., "pragmatic benefits").

Table 6. Observable items, underlying factors, factor loadings, and internal consistency reliability for the set of drivers.

Item	Underlying factor	Factor loadings	Cronbach's alpha	Variance explained (%)
	1		0.90	37.45
Regional origin of products		0.826		
Knowledge about who produced the product		0.802		
Reduce food miles		0.775		
Buying products from the home country		0.717		
Personal relationship with producer/retailer		0.705		
Organic produce		0.693		
Ethical employment		0.688		
Animal welfare		0.669		
Certification about food safety		0.531		
Fair prices for the producers		0.400		
	2		0.84	11.23
Taste		0.861		
Freshness		0.803		
Overall quality		0.748		
	3		0.51	3.35
Low prices		0.677		
Convenience		0.560		

Notes: Principal axis factoring with oblique rotation; Total variance explained = 52.03%; KMO = 0.902; Bartlett's test $\chi^2 = 12887.01$, $df = 105$, $p < 0.001$; $N = 1839$.

As far as the deterrents are concerned, as we can see from Table 7, the results are more exploratory. We labelled the first factor as "hard to access", given that it consists of items that relate to restrictions of making SFSC products accessible. The second factor consists of items that point to the "fear factor". We, thus, called the second factor "hard to trust". Finally, the third factor consists of two items that signify the difficulty of spotting SFSC goods. Hence, we decided to call it "hard to locate".

Table 7. Observable items, underlying factors, factor loadings, and internal consistency reliability for the set of deterrents.

Item	Underlying factor	Factor loadings	Cronbach's alpha	Variance explained (%)
	1		0.72	36.32
Hard to get there		0.912		
Limited opening hours		0.600		
Expensive		0.442		
	2		0.68	8.31
Avoid personal contact		0.677		
Hygiene rules not transparent		0.656		
Food produced elsewhere is better		0.596		
	3		0.76	7.16
Not well promoted		0.848		
Not well labelled		0.691		

Notes: Principal axis factoring with oblique rotation; Total variance explained = 51.79%; KMO = 0.789; Bartlett's test $\chi 2 = 4174.19$, $df = 28$, $p < 0.001$; $N = 1839$.

Right after the factor analysis, we proceeded to construct the regression model. Considering that our dependent variable was binary (i.e., 0 = not buying from SFSCs, 1 = buying at least sometimes from SFSCs), we opted for a binary logistic regression model. Apart from the focal predictors, we included all possible background variables, namely "age", "gender", "education", "living area", "household size", "children at home", "household income", and "grocery shopping responsibility". For "age", "household size", "gender", and "grocery shopping responsibility" we kept the original coding. For the rest, and in order to facilitate model interpretation, we made binary conversions. For the "living area", we distinguished between "rural" and "intermediate or urban". For "education", we made a distinction between "non-University" vs "University" education. For "children at home", we indicated whether households had a child living at home as opposed not having one at home. For "household income", we calculated the median for each country separately, and created one category for "below or equal to median" and one category for "above median". Finally, given the importance of the deterrent "limited range" in our focus group research, we decided to enter it as a separate predictor.

Then, we ran the logistic regression model for each country separately. We first tested for collinearity among the variables by calculating the variance inflation factor (VIF) for each of the regression coefficients. The VIF ranged from a low of 1.058 to a high of 2.619, well below the cut-off of 10. This showed that it was possible to separate the effects of individual predictors on the dependent variable (i.e., actual buying from SFSCs). As far as the model fit is concerned, as we can see from Table 8, the model for all countries achieved a reasonable fit (i.e., Nagelkerke R^2 was equal to 0.253, 0.189, 0.137, and 0.223, for Germany, Spain, Greece, and Hungary, respectively), and was significant at the strictest level in samples ($p < 0.001$). At this juncture, it should be stressed that the cumulative sample size (i.e., 1723) turned out to be smaller than the original (i.e., 1839), as some respondents from all countries opted not to answer the "household income" variable, and, their responses were treated as missing values.

Interestingly, across all countries, out of all background variables, and only in Germany and Greece, income turned out to have a statistically significant effect. In these countries, those with a higher income were more likely to buy from SFSCs. Strikingly, the "ethical benefits" factor emerged as the single most important predictor of actual buying behaviour in all countries. Some commonalities were also found between pairs of countries. More specifically, in Germany and Spain, the "hard to trust" factor turned out to have a negative effect, implying that consumers who indicated SFSC mistrust as a reason for not buying also have higher chances of not buying from SFSCs at all. In Spain and Greece, the accessibility issue (i.e., in physical and monetary terms) seems to be a serious concern and acts as an obstacle. Finally, in Greece and Hungary, the limited range issue seems to have an unexpected positive effect. Perhaps, actual buyers in these countries wanted to signal that if the range were not limited, they would buy more or more often from SFSCs.

Table 8. Results of the logistic regression analysis predicting actual buying behaviour.

	Germany		Spain		Greece		Hungary	
Variables	**B**	**sig.**	**B**	**sig.**	**B**	**sig.**	**B**	**sig.**
Control variables								
Age	0.01	0.412	0.01	0.763	-0.01	0.485	0.01	0.214
Gender	-0.34	0.304	-0.11	0.655	0.33	0.176	0.42	0.102
Education	0.38	0.276	0.27	0.254	0.34	0.146	-0.27	0.336
Living area	0.05	0.908	0.37	0.412	-0.30	0.452	0.18	0.551
Household size	-0.30	0.160	-0.15	0.277	0.01	0.988	0.06	0.631
Children at home	0.75	0.126	0.35	0.208	0.46	0.109	0.56	0.103
Household income	0.82	0.037	0.22	0.376	0.80	0.002	0.41	0.135
Grocery shopping responsibility	0.60	0.112	0.01	0.996	0.07	0.780	0.07	0.791
Predictors								
Core benefits	0.30	0.115	0.06	0.720	-0.10	0.594	0.02	0.895
Pragmatic benefits	-0.15	0.343	-0.12	0.394	0.04	0.798	-0.11	0.470
Ethical benefits	0.74	0.000	0.58	0.000	0.30	0.016	0.47	0.000
Hard to access	-0.03	0.841	-0.37	0.003	-0.29	0.015	-0.17	0.132
Hard to trust	-0.36	0.016	-0.22	0.045	-0.04	0.682	-0.15	0.158
Hard to locate	0.14	0.266	-0.01	0.928	-0.08	0.437	-0.18	0.066
Limited range	-0.04	0.690	0.10	0.234	0.19	0.016	0.39	0.000
N	434		447		424		418	
Nagelkerke R^2	0.253		0.189		0.137		0.223	

5. Discussion

5.1 Summary of key findings

To conclude this report, we provide a brief summary of our findings. In doing so, we will follow the chronological structure of the report.

General food shopping behaviour

Most of the participants (83%) choose the supermarket (physical store) to buy food weekly to almost daily, followed by local grocery and discount supermarket (58% and 54% respectively). Considering the short food supply channels (SFSCs), the farmers market is the channel most frequently used in all the countries (Germany, Spain, Greece, Hungary). In general, consumers identify freshness, taste and overall quality as the most important attributes for buying food, with Germans giving the least importance to low prices and convenience.

Personal values and attitudes

Regarding the personal characteristics and general behaviour of the participants, the environmental aspects (protecting the environment, preventing pollution, and respecting the earth) were identified as the most important personal characteristics followed by altruistic values (social justice, being helpful and supporting equality) and egoistic values (authority, wealth and being influential). As expected, cultural differences were found, for instance: authority is more important for Greeks as well as social justice and equality, for Hungarians wealth and helpfulness are the important ones. The results considering the motivators following the proposed measures of Birch et al. (2018) and the Theory of Planned Behaviour in the context of buying local food were also considered. If users and non-users of SFSCs are considered, the users of SFSCs are more conscious about preventing pollution.

Consumer expectations with regard to SFSCs

Results showed that 3 out of 4 participants stated that they buy - at least sometimes – from SFSCs; from them 38% believe that they shop food more often from SFSCs than an average customer. Considering the data by country, Germans showed the highest purchasing behaviour towards SFSCs.

Compared to conventional supply chains, consumers expect from SFSCs that the food may be fresher and of higher quality. In general, Hungarians seems to be the most sceptical consumers about SFSCs, as they expected the least for 4 out of 6 items studied (higher quality, higher trust in food safety, freshener and higher expectations). In contrast, Spanish participants showed higher expectations, believing that food from SFSCs may be more convenient, fresher and higher quality. Germans showed higher trust in food safety and they expect more expensive food. By contrast, participants in Greece showed much lower expectations regarding the convenience of food from SFSCs.

General shopping behaviour with regard to SFSC

In general, consumers regularly purchased fresh food form SFSCs much more often than processed food (86% vs. 52%). Above 50% of the consumers stated buying more frequently form SFSCs products such as vegetables, fruits, eggs and honey (70%, 69%, 65% and 51% respectively). Differences between countries were found: Germans buy more bread, Spanish more fruits and

vegetables, Greeks more honey, oil and wine, and finally, Hungarians buy more meat products (e.g. sausage, ham) and jam.

Regarding the relative willingness to pay for food from SFSCs in comparison to the same food from longer supply chains, the responses strongly depend on the product categories and the countries. In the overall sample, one out of 3 consumers would pay at least 20% and up to 50% more for fruit and vegetables, meat and fish, eggs, and food for a special occasion. These are the categories with the highest propensity to pay a price premium for food from SFSCs. The Germans and Hungarians are at the extremes, with the Germans showing the highest percentage of willingness to pay more and the Hungarians the lowest one.

When it comes to the attitude towards SFSCs, participants generally like the concept of SFSCs: they think that SFSCs are a good thing and they believe that the existence of SFSC is important. As it occurs with the willingness to pay, Germans in general showed a more positive attitude.

Reasons for buying from SFSCs

The main reasons to buy food from SFSCs are because they support local producers, they know the food origin and they believe that the food is more natural. Germans and Spanish differ the most about the concept of naturalness of food form SFSCs, since the Spanish support this statement more than Germans. Although convenience is a relevant point against purchasing from SFSCs, consumers care about the social and societal benefits achieved through direct marketing initiatives (Seyfang, 2008)

Reasons against buying from SFSCs (obstacles)

Higher prices, more difficult spatial access and lack of promotions are the main obstacles for not buying from SFSCS mentioned. Other reasons related to their (dis)availability or issues to get them such as they are not readily available, the limited opening hours of the shops to purchase them, or the limited range of products are also scored as main barriers, especially in Greece and Hungary. In Germany statements such as it is not well promoted, it is not well labelled, and the limited opening hours play a less important role as in other countries, such as Greece, where the labelling is very important.

Changes due to the COVID-19 situation

First and foremost, the COVID situation positively affects the perception of SFSCs. A better opinion of SFSCs due to the COVID-19 situation is showed specially for Spanish participants. A relevant 4 out of 10 of consumers reported an increased intention to buy from SFSCs due to COVID, especially in Spain. In all the countries, COVID situation has affected their intention to support local producers in a positive way specially among the Spanish participants and less among the Hungarians. There is also a positive effect of the situation on the awareness of SFSCs for half of all respondents, being again in Spain where the strongest change of the awareness is seen, due to the pandemic impact.

More generally, we found that the COVID situation has an impact on the overall shopping frequency of consumers, specially at supermarkets and at markets or farmers markets, while online shopping seems to increase. Unfortunately, this increase was not observed for SFSC's online sales.

Finally, SFSCs are seen as a good way to better prepare a country for a crisis such as the COVID situation, especially again in Spain.

Consumer segmentation

Based on a cluster analysis, we outline three customer segments that differ in terms of their propensity to support and purchase from SFSCs. They were differentiated based on their attitudes, past purchase behaviour and general expectations about SFSCs. The first segment, *Active Fans*, strongly supports SFSCs, which is reflected in a positive attitude and corresponding purchasing behaviour. They buy (much) more often food from SFSCs than an average consumer. Simply put, they like and support SFSCs and act accordingly. These consumers tend to have a higher education and income and attach great importance to ethical and sustainable aspects of consumption. In contrast to the other segments, they also show a clear preference for organic food. The members of the second segment, *Passive Fans*, also have a very positive attitude towards SFSCs, but this is not evident in their behaviour. These findings reveal an attitude-behaviour-gap, which has often been described in relation with sustainable consumer behaviour. Consumers of this second segment also indicate that it is difficult for them to buy from SFSCs, which is expressed by the concept of "perceived behavioural control". The third segment has no particular connection to SFSCs, only buys there rarely and can be described as the *Uninterested*. This last segment has the lowest average age and the highest proportion of male consumers.

Regression analysis of drivers and deterrents of SFSC purchases

Finally, a comprehensive logistic regression analysis was conducted to examine the drivers and deterrents of purchase behaviour and determine what makes a consumer a SFSCs customer. Higher order ethical consumption aspects, that go beyond utilitarian benefits of food, such as being tasty or nutritious, turned out to play the most important role for consumers' purchasing behaviour. Examples for these aspects are that consumers wanted to know who produced their food, animal welfare, reducing food miles, the regional origin of products, or ethical employment.

With regard to socio-demographic aspects, higher incomes are associated with more SFSC purchasing in Germany and Greece, what also means that lower incomes are associated with less SFSC purchasing in these countries. For German and Spanish consumers, a lack of trust prevents them from purchasing at SFSCs. In Spain and Greece, the accessibility issue (i.e., in physical and monetary terms) seems to be a serious concern and acts as an obstacle. Surprisingly, in Greece and Hungary, the limited range of products at SFSC seems to have an unexpected positive effect. It might be possible that having a limited product range is interpreted as a positive sign that a particular speciality is offered, which is associated with high quality and expertise in a particular category. What might support this assumption is the finding that especially in Greece, specialty products such as oil, wine and honey are much more often purchased from SFSCs compared to the other countries. For Hungary, such special categories are meat products, dairy and jam. On the other hand, it might be possible that actual buyers in these countries wanted to signal that if the range were not limited, they would buy more or more often from SFSCs.

Overall, the results confirm and extend previous work on the ethical consumption literature. Ethical considerations lie at the heart of motivation for those who buy from SFSCs. Hence, the findings of this special investigation might provide some useful guidance for SFSC stakeholders and what they choose to highlight. Clearly, benefits relating to ethical aspects might take precedence over other more traditional benefits (e.g., taste, price), which do form the basis for fair competition but do not seem to create a level playing field against food products from conventional outlets. Some deterrents that were also pointed out at the focus groups seem to deserve more attention, like the need to make them more accessible from a physical or financial viewpoint as well as the need to make SFSCs

equally reliable sources. Still, such deterrents do not seem to be uniform across countries but rather exemplify differential effects.

5.2 Practical implications and recommendations for policymakers, producers, and intermediaries

Next, we give a brief overview of potential implications that can be derived from our findings. We highlight some striking points as concrete calls to action without claiming this discussion to be exhaustive.

The results of this study suggest that when it comes to SFSC, consumers generally value the idea of supporting local producers and knowing the provenance of the food, however, they tend to find it easier to shop at supermarkets, local stores and discount stores. They prefer to shop via accessible platforms that offer a wide range of readily available products and other conveniences such as longer opening hours. However, ethical consumption aspects and the added value of supporting a good cause are major drivers for purchases at SFSCs. This includes aspects such as supporting the local producers, animal welfare, ethical employment and consuming in an environmentally friendly way. An implication of this finding is, that awareness should be raised for these ethical aspects when promoting SFSCs, as they are major drivers for consumers' behaviour. Especially the aspect of supporting local producers and thereby positively contributing to the development of their own region gained great approval. Based on this, we propose:

- Raise awareness for SFSCs and about why it is worthwhile to support them!

A large segment of consumers further considers that the higher cost of SFSC products compared to those from longer chains is an obstacle to their purchase. In addition, we see that consumer behaviour and willingness to pay differs according to product type, with consumers being more likely to purchase and more willing to pay more for fruits, vegetables and eggs, although there are minor country variations. While assuming that in most cases, the prices cannot be dropped in order to remain fair for the producers, the reason why they are higher as in conventional channels can be better explained to consumers. When consumers better understand how the prices are calculated and what effort is behind the production, they are more likely to accept a price premium for products from SFSCs. This may also have the effect of increasing the trust consumers have in the quality and food hygiene practices associated with SFSC products, as lack of trust appears to discourage consumers from purchasing from SFSC in Germany and Spain. This leads to the following proposition:

- Explain consumers why the prices may be higher and establish trust!

While developing further appropriate implications from the results, another step is to determine what are the needs of SFSCs actors vis-à-vis consumers, which may differ according to individual actors, region and the product being sold. For instance, if demand is insufficient, some SFSCs may need to increase their consumer base. This could be facilitated by supplying products with a greater demand and/or increasing the accessibility and convenience of purchasing their products (for example, by collaborating with other producers to offer a wider range of products through a more accessible

channel, and/or offering delivery services). Our findings suggest that accessibility is key to increasing the uptake of SFSCs as an alternative purchasing channel. It seems to be important to help the producers to enhance their accessibility. From the spatial perspective, SFSCs could try to bring their products to places that are nearer at the consumers und thus, better accessible. From a temporal perspective, producers should try to find ways to better adjust their opening hours to the consumers' needs. Another possibility to enhance accessibility could be to offer home delivery. They may also find solution how products can be sold without having personnel involved, such as vending machines, which can be accessed around the clock. Policymakers could further facilitate the accessibility of such products by regulating public procurement guidelines to support equal opportunities between SFSC chain producers (who are often smaller) and larger producers, and by giving large retailers increased incentives to stock products from SFSCs, such as providing tax breaks for such products. As a call to action, we propose:

- SFSCs must become more accessible!

Furthermore, our research identified that consumers consider that SFSC are generally not well promoted, and thus there is room for improving the marketing of these chains and their products at several levels. The consumers often seem to not know about the existence of SFSCs at all or about details of their product range. Since consumers in general, however, like the idea of supporting local producers and knowing the provenance of the food, these aspects can be further emphasised in the marketing of the products through community campaigns (e.g. local festivals), via producer communication channels (e.g. producer/market websites) or through descriptions given at the point-of-purchase or on the product packaging. Furthermore, producers could use classic channels such as local newspapers, social media, or advertising signs along the roads. At this point, we refer to the detailed results of our focus group discussions, where the helpfulness and acceptance of specific promotional activities and channels was discussed. From the public side, it would be very valuable to help producers, for example with further education courses or with providing platforms where they can promote their products. This summarizes into the following proposition:

- Increase marketing activities and/or help producers to do so!

Finally, if supply is insufficient to address the needs of producers and maintain the interest of consumers, then the aim may be to improve the supply of SFSC products, such as by investing in more efficient production methods and/or improving logistics on the part of the producer/intermediary. Such measures may also help to reduce the cost of SFSC products, which was identified in our study as a major obstacle to the purchase of SFSC products, and thus decreasing the price of such products may also increase consumer uptake. However, it is interesting to note that consumer attitude towards the price of SFSC varied by country and consumer segment, suggesting that differences in consumer uptake of such food may be due more to discrepancies in financial resources between consumer segments than discrepancies in the cost of food from long vs. short food chains.

5.3 Limitations

Like any study, this one is not without its limitations and some of our results must be interpreted with more caution than others. This will be pointed out in the following.

First, there are some limitations related to the sample composition. The sample population does not in every respect exactly represent the population of the selected countries. Overall, our study participants are better educated than the European average, especially in the Greek subsample. This is an issue that often comes along with sampling from online panels, even when quotas are used (Szolnoki and Hoffmann 2013), as they are often not representative regarding education. This sample characteristic may lead to a positive bias regarding the acceptance and evaluation of SFSCs, because we found the education level to be positively related to SFSC evaluation. Thus, in reality, the evaluation of and support for SFSCs may be somewhat weaker. Another unintended characteristic of the sample is the lower average age of the Greek sub-sample compared to the other countries. This may also bias the results and limit comparability between countries.

Second, it should be mentioned that the countries we compare differ tremendously with regard to their income level. This is a fact that obviously influences people's shopping behaviour and must be taken into account when interpreting the results. To mention some of the most striking discrepancies, 55% of Hungarian participants reported to have a monthly net household income lower than 900€, whereas this is only true for 7% of German and 6% of Spanish participants. Also in the higher income classes, the differences are pronounced. None of the Hungarian participants and only 3% of the Greek participants are in the "middle-high" income bracket with a monthly net between 3,201 and 6,000€ for the household. In contrast, this applies for 29% of German and 20% of Spanish participants.

Almost relative to the differences in net monthly income, there are also differences in the cost of food between the countries. In Hungary, the costs for food are lower compared to the other three countries, indicated by a "price level index for food and non-alcoholic beverages" of 85 (with a value of 100 representing the EU average; EUROSTAT 2020b). Germany (101) and Greece (103) are on a very similar, but higher level of food costs, whereas the value of 94 for Spain is in the middle. This seems to make it particularly difficult for the Greeks, who have a comparatively low income and yet have to cope with relatively high food prices.

Third, we like to note a methodological issue that arises when concepts, especially those that are more abstract, such as ethicality or values, are assessed in different countries and languages. The meaning and understanding of such concepts can be influenced by the specific sociocultural and also geographic background (Douglas and Craig 2006) and thus, may differ in the different countries we surveyed. Even if the translation process is carried out to the highest standards and with the utmost care, this problem still exists. To illustrate this aspect through a simple example, Spanish participants might have a different understanding of terms such as egoism or social justice than, for example, Greek participants and thus respond differently to a self-assessment scale due to this difference in meaning. This has to be considered when interpreting the results.

Finally, we would like to mention that the COVID-19 situation of course influenced the study, as we described in the procedural section. The sampling time was initially postponed so as not to fall into the very first period of the pandemic. This time in the spring of 2020 was marked by a high

degree of uncertainty and was experienced quite differently in the various countries. When sampling in autumn 2020, we could expect consumers to have adjusted to the pandemic situation to some extent. Nevertheless, the situation has certainly affected consumers, which is reflected in their answers, even though we asked to answer some questions as if it were before the pandemic. On the positive side, we were able to capture the influence of the COVID-19 pandemic on the acceptance and behaviour towards SFSCs, what has provided interesting insights.

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Annex 1: Symbols and Abbreviations

SYMBOLS

α	Cronbach's Alpha
df	Degrees of freedom
ε	Greenhouse-Geisser correction
F	F-value
H	(Kruskall-Wallis) H-value
M	Mean value
N	Total number of units in the sample
n	Number of units in a subgroup of the sample
p	p-value
R^2	Coefficient of determination
SD	Standard deviation
t	t-value
U	(Mann-Whitney-U) U-value
χ^2	Chi-square value
Z	(Mann-Whitney-U) Z-value

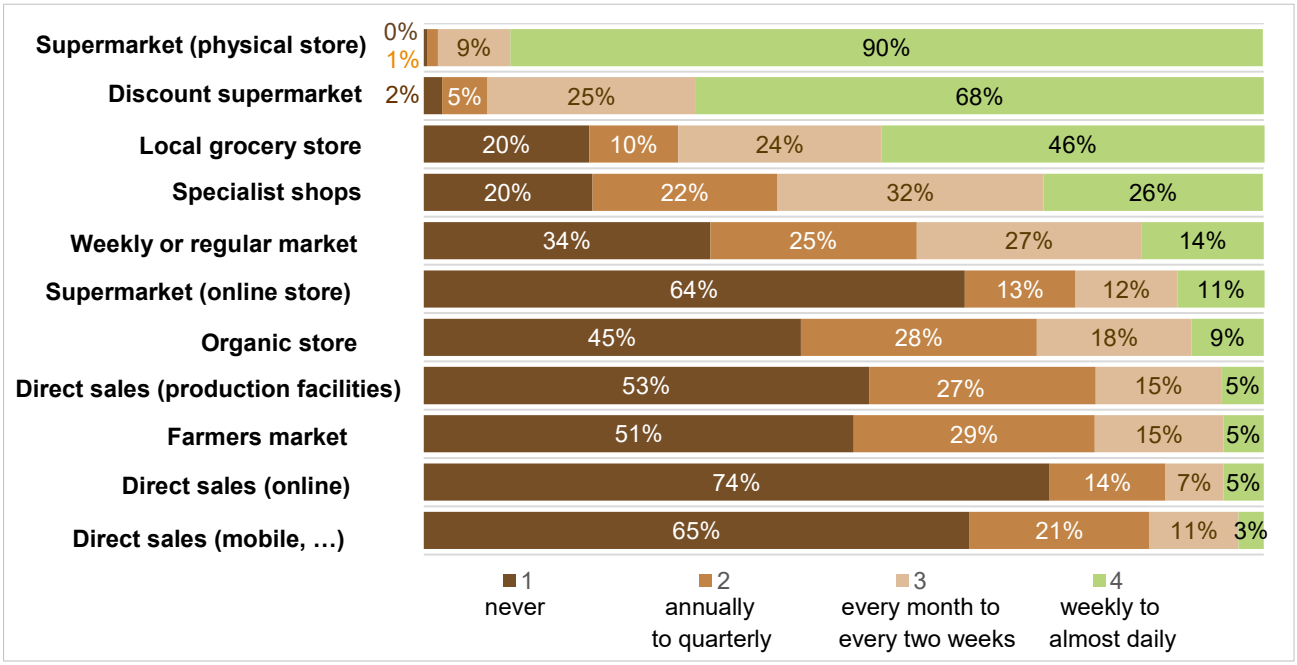
ABBREVIATIONS

ANOVA	Analysis of variance
COVID-19	Coronavirus disease 2019
EFA	Exploratory factor analysis
H2020	Horizon 2020
HORECA	Hotel-Restaurant-Café
KMO	Kaiser-Meyer-Olkin Test
MAP	Velicer's minimum average partial test
PAF	Principal axis factoring
RQ	Research question
SFSC	Short food supply chain
VIF	Variance inflation factor
WTP	Willingness to pay

Annex 2: Additional results

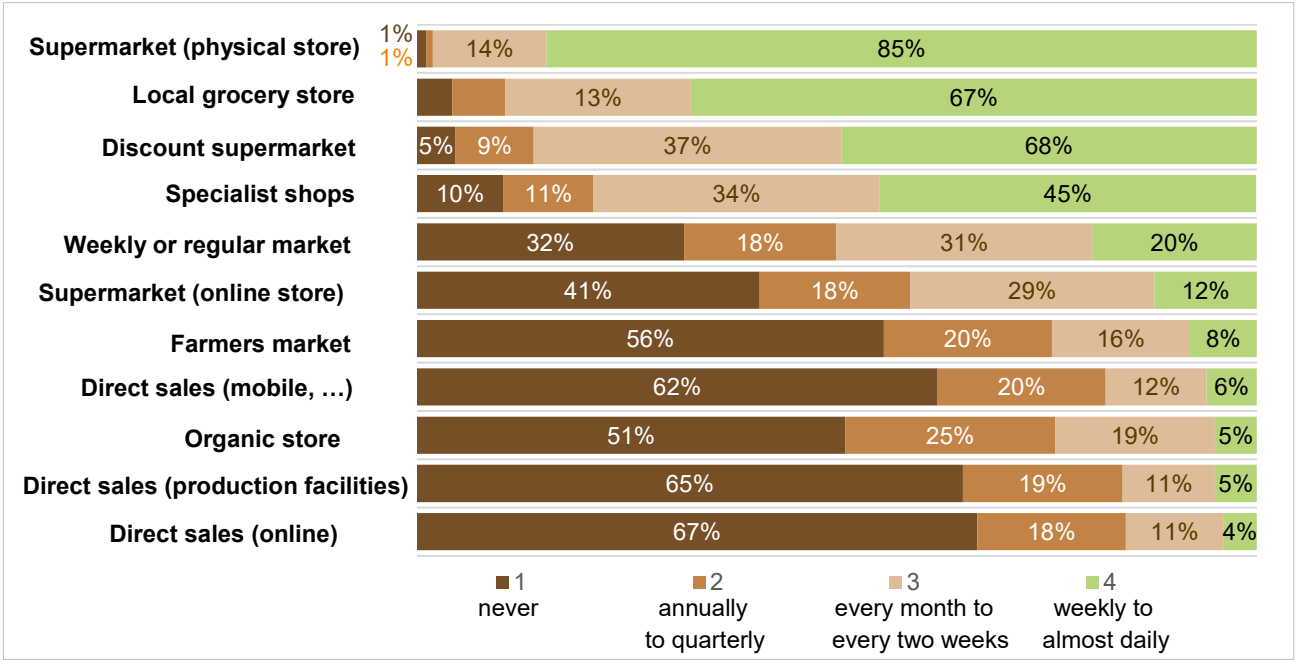
FIGURES

Figure A2-1. Percentage overview of where and how often purchases are made (Germany)



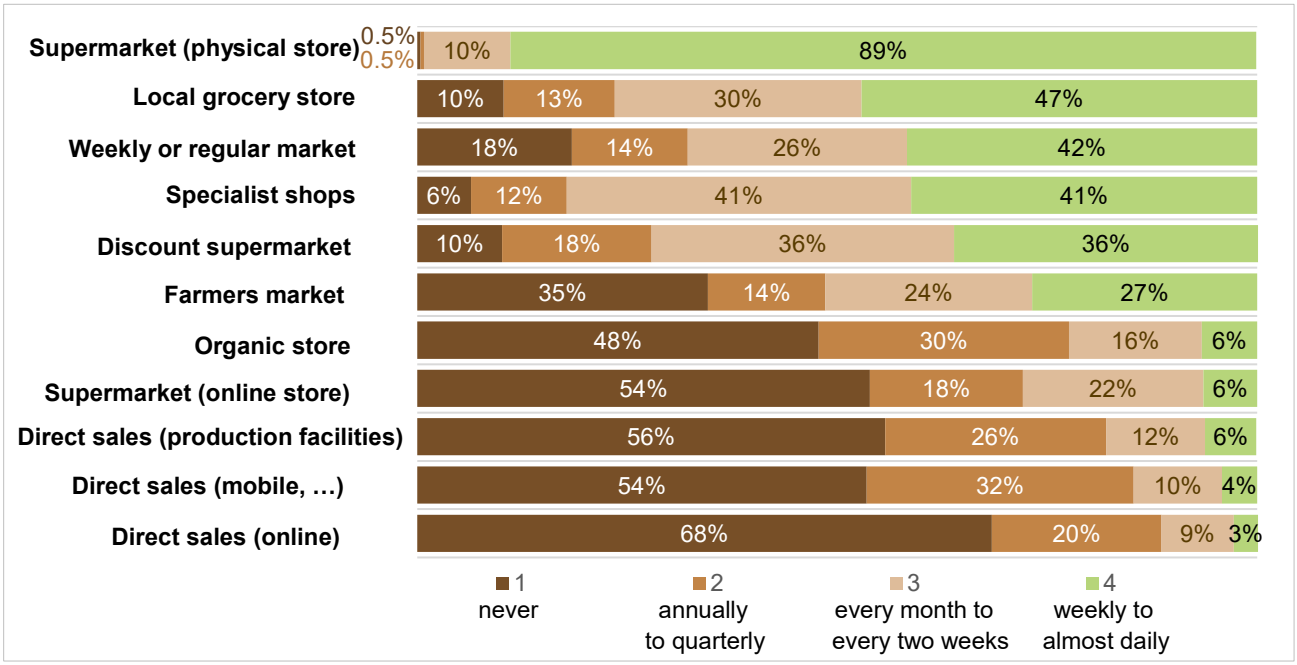
"Please indicate what best mirrors your shopping frequency for each channel?"

Figure A2-2. Percentage overview of where and how often purchases are made (Spain)



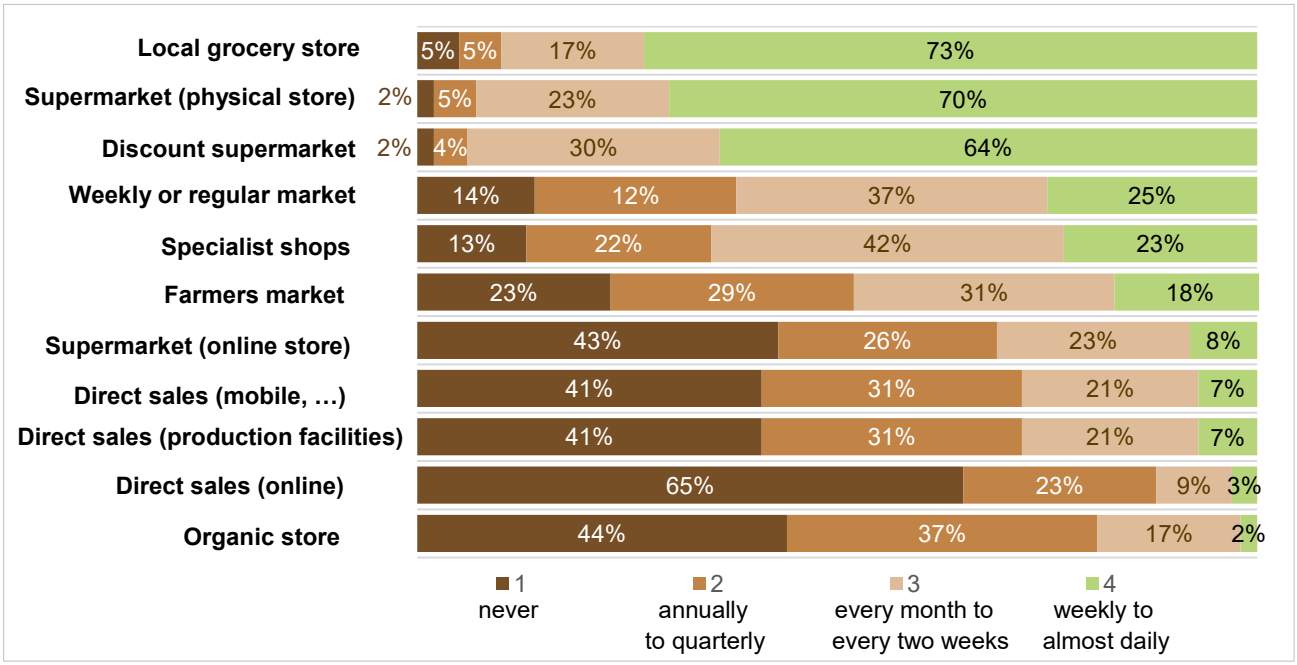
"Please indicate what best mirrors your shopping frequency for each channel?"

Figure A2-3. Percentage overview of where and how often purchases are made (Greece)



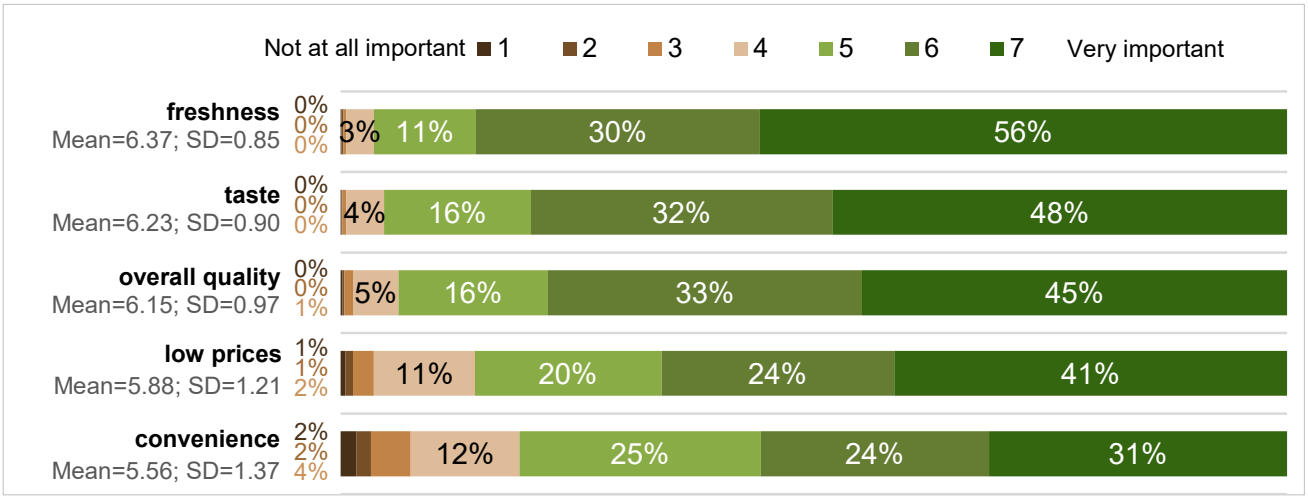
"Please indicate what best mirrors your shopping frequency for each channel?"

Figure A2-4. Percentage overview of where and how often purchases are made (Hungary)



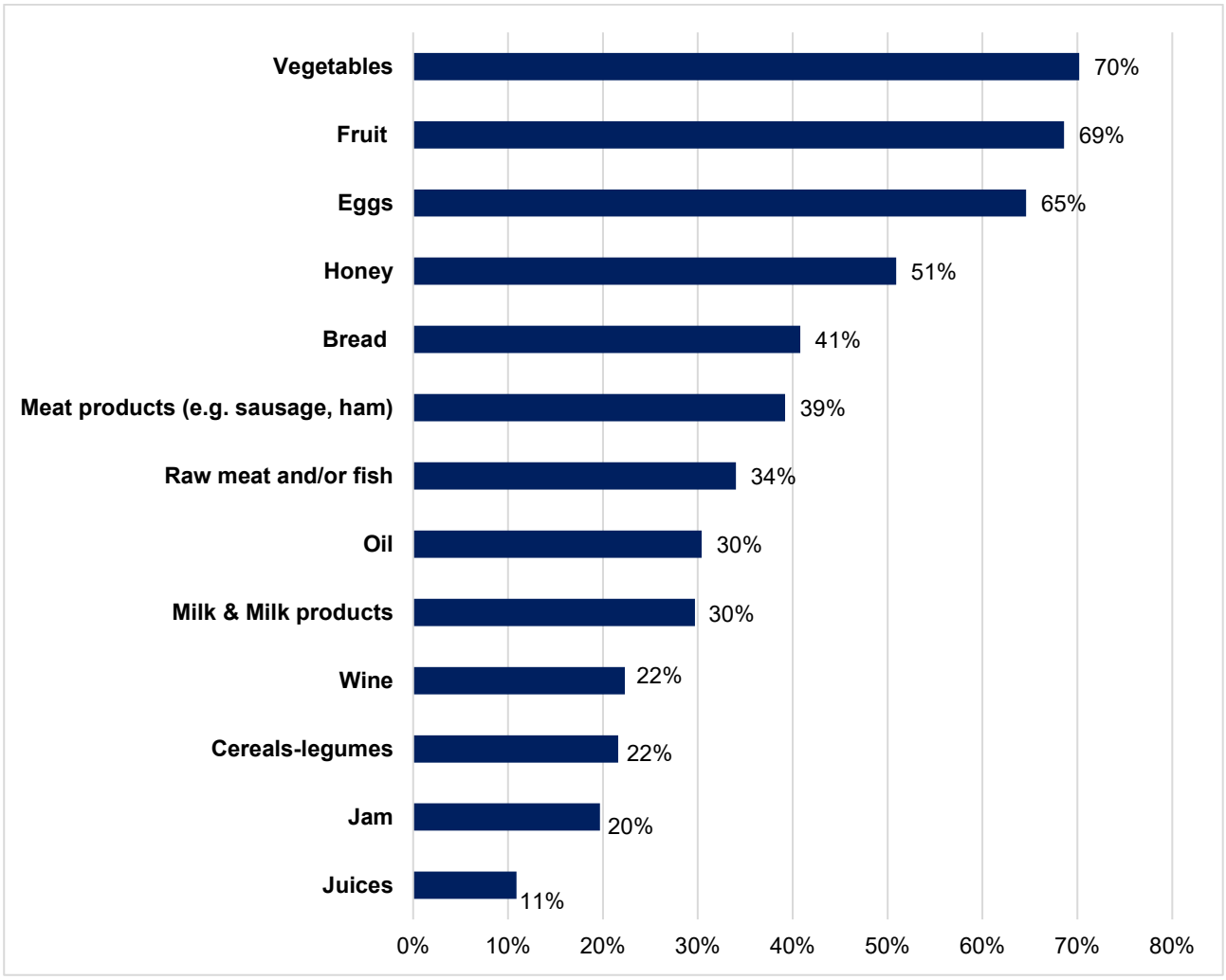
"Please indicate what best mirrors your shopping frequency for each channel?"

Figure A2-5. Importance of aspects that determine the purchase (total)



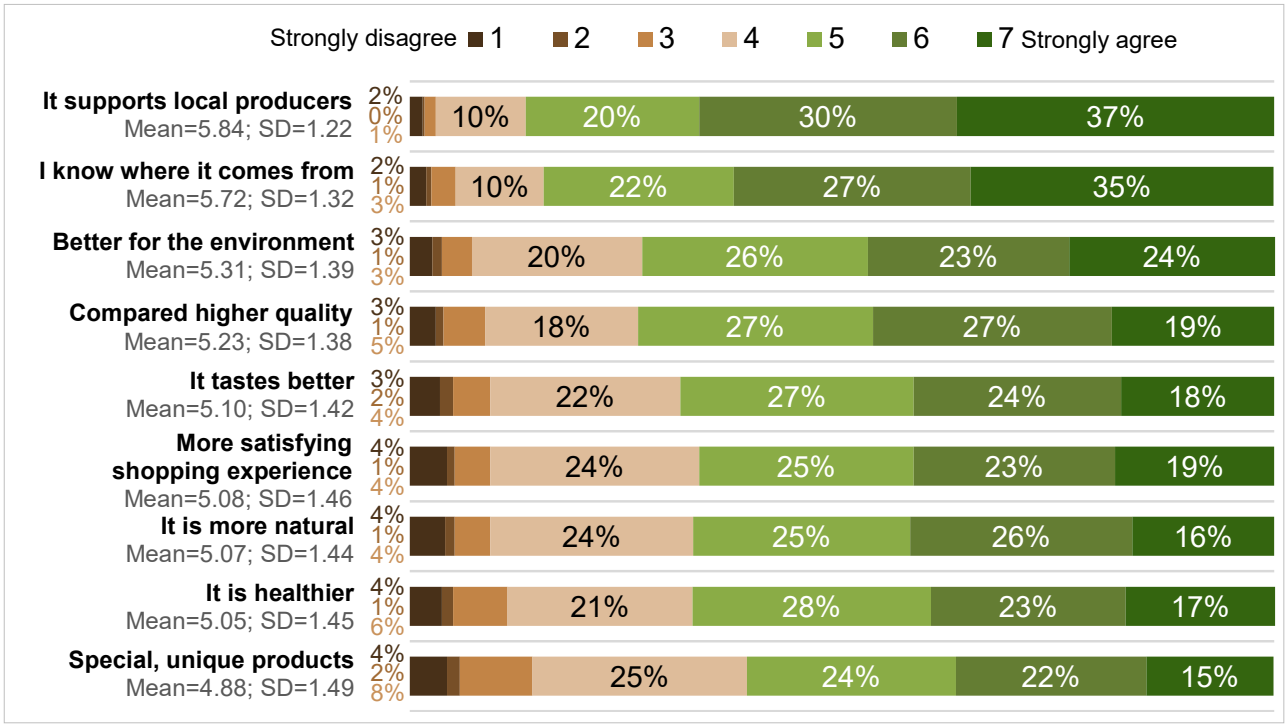
"When buying food, how important are the following points to you?"

Figure A2-6. Food typically purchased at SFSCs (overall sample)



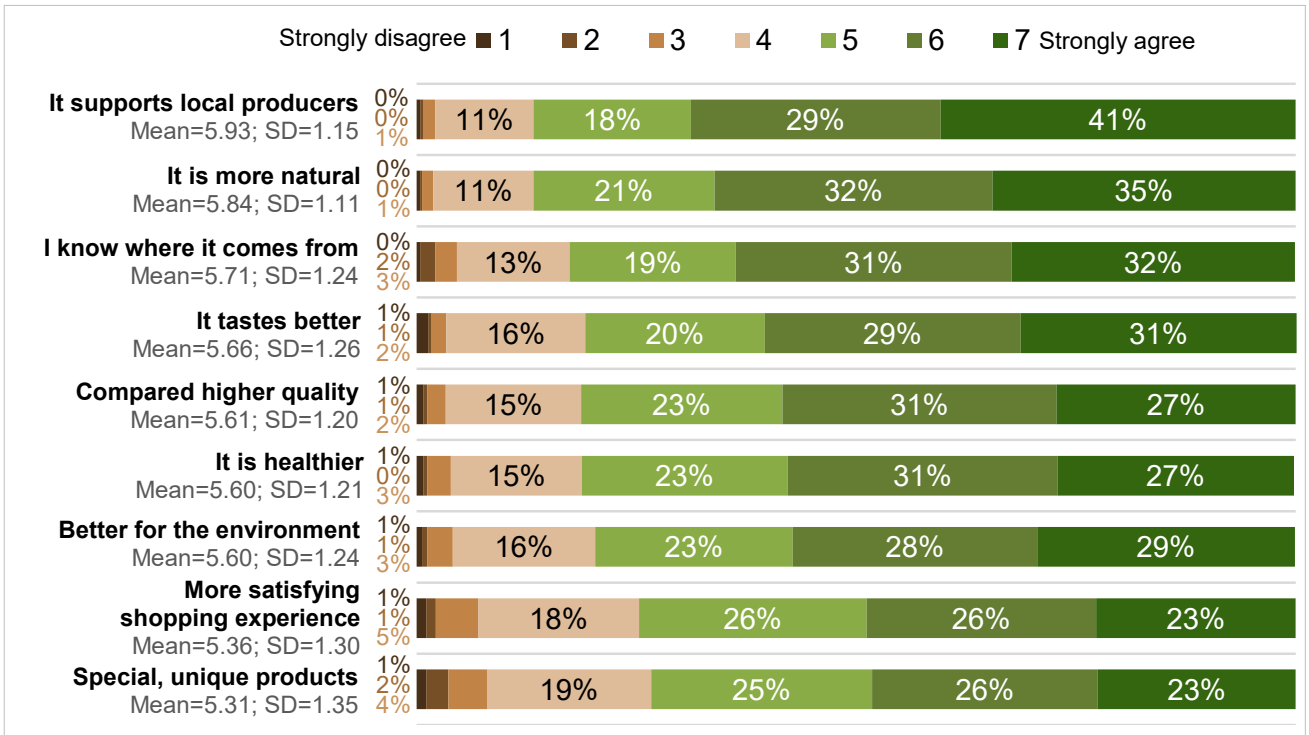
"What kind of food do you regularly purchase from SFSCs?"

Figure A2-7. Reasons for buying (Germany)



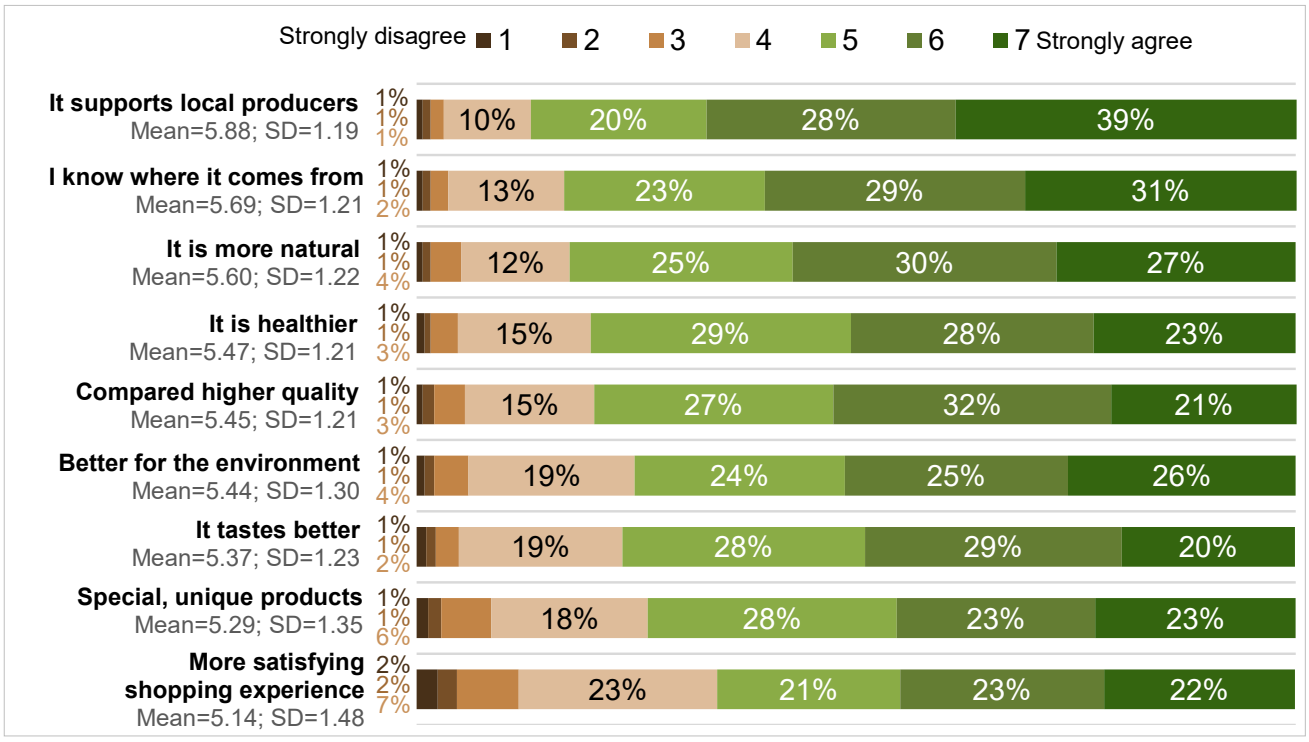
"Which reasons apply to you for buying from SFSCs?" / "What would be good reasons for you to buy from SFSCs?"

Figure A2-8. Reasons for buying (Spain)



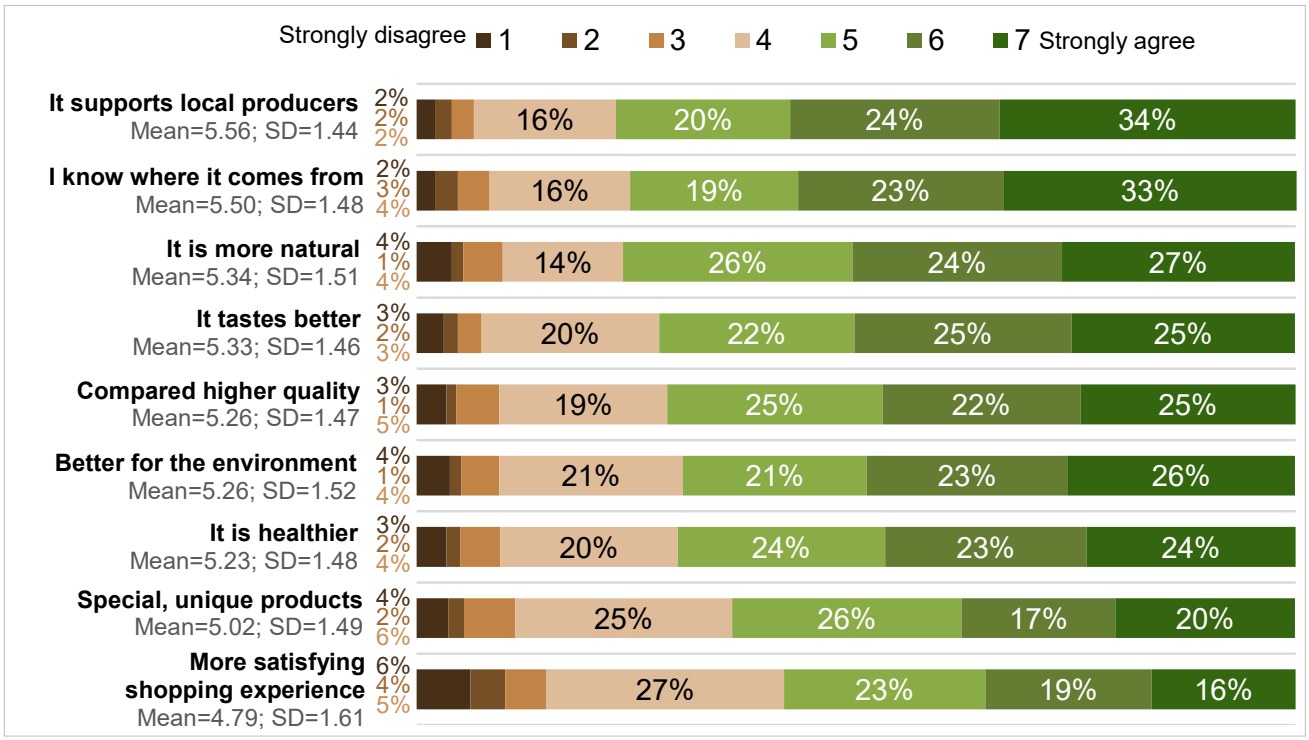
"Which reasons apply to you for buying from SFSCs?" / "What would be good reasons for you to buy from SFSCs?"

Figure A2-9. Reasons for buying (Greece)



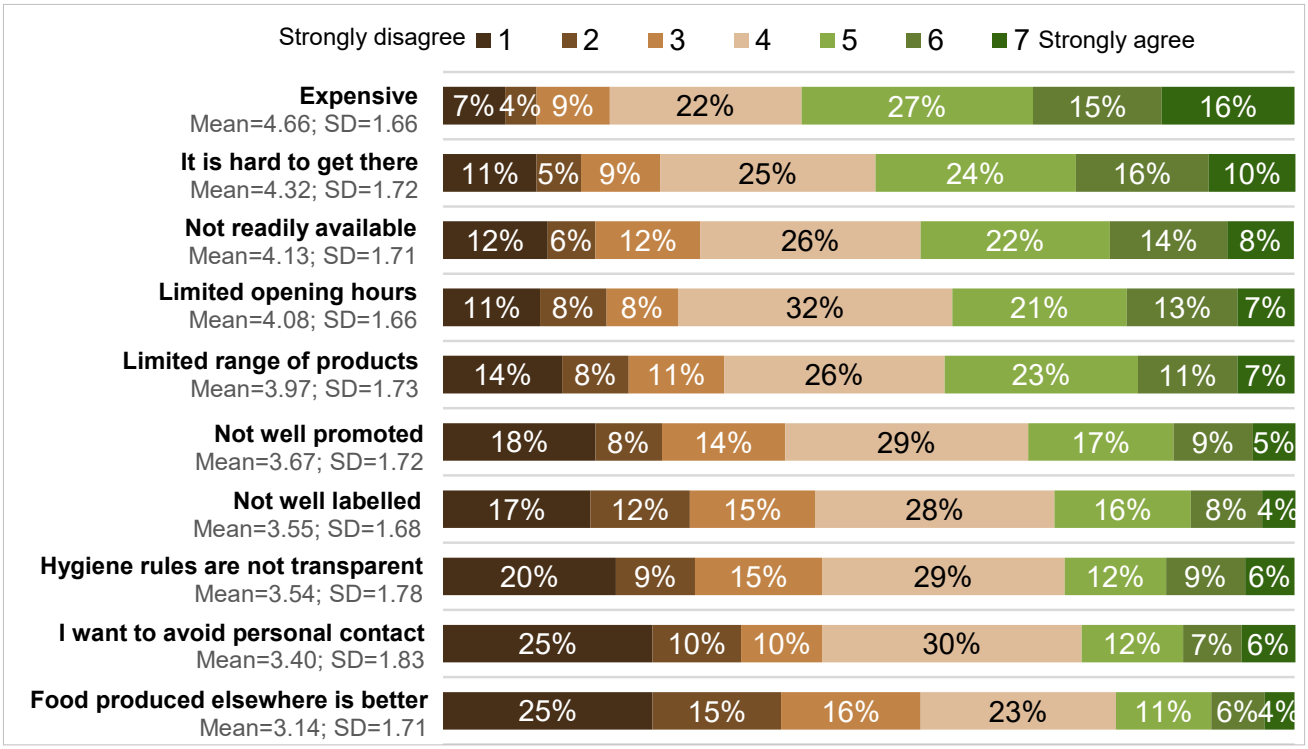
"Which reasons apply to you for buying from SFSCs?" / "What would be good reasons for you to buy from SFSCs?"

Figure A2-10. Reasons for buying (Hungary)



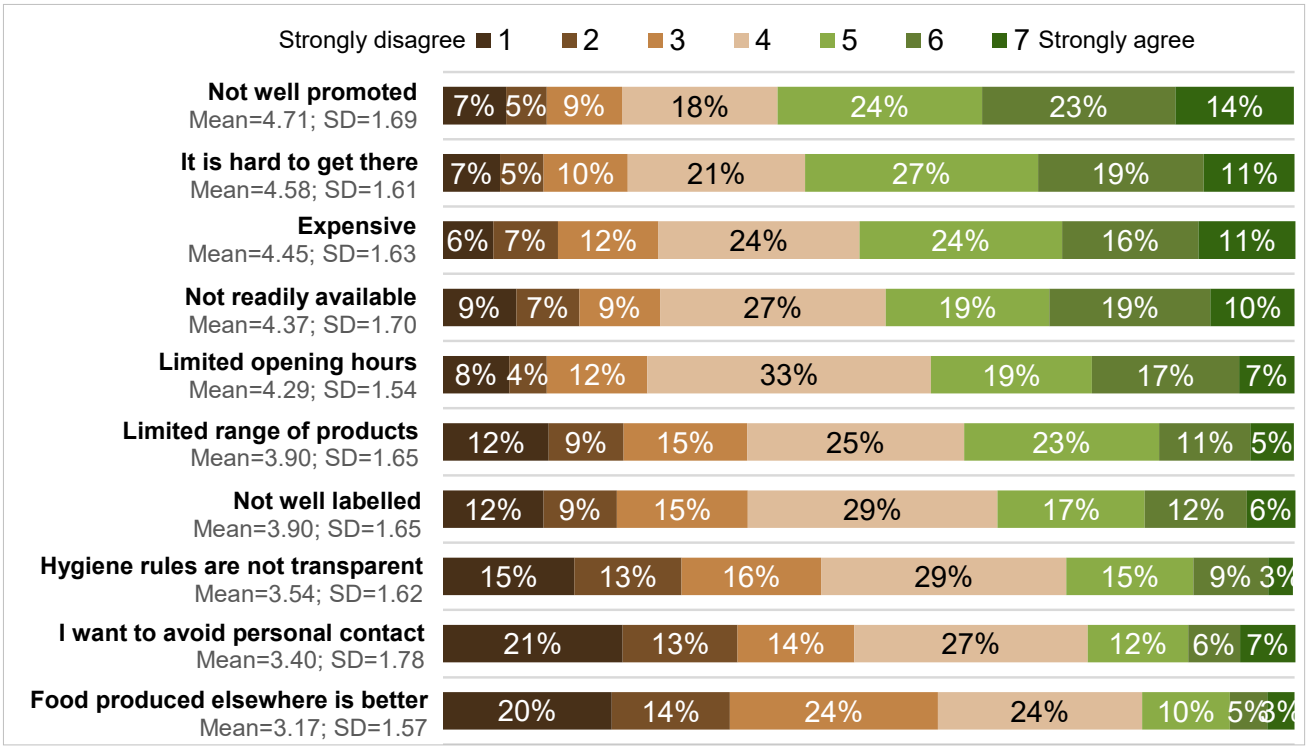
"Which reasons apply to you for buying from SFSCs?" / "What would be good reasons for you to buy from SFSCs?"

Figure A2-11. Reasons against buying (Germany)



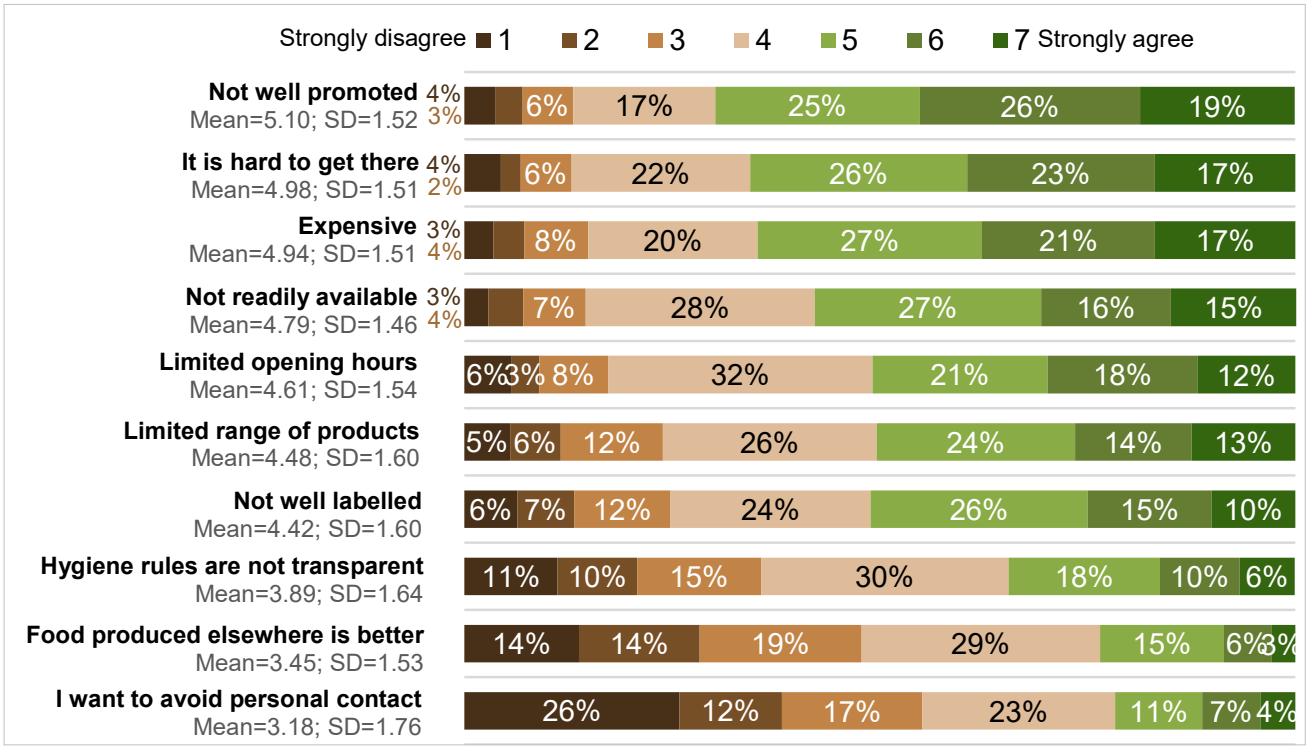
"When I don't buy from SFSC, this is because …?"

Figure A2-12. Reasons against buying (Spain)



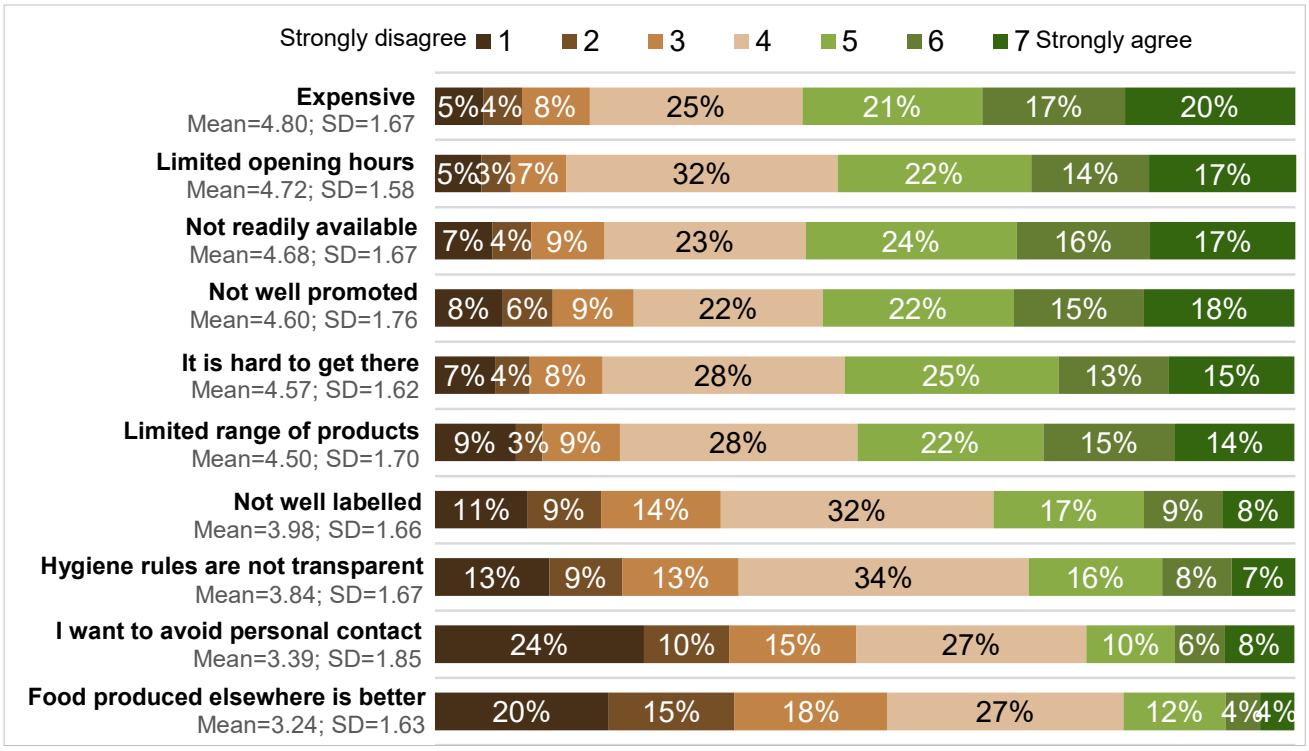
"When I don't buy from SFSC, this is because …?"

Figure A2-13. Reasons against buying (Greece)



"When I don't buy from SFSC, this is because …?"

Figure A2-14. Reasons against buying (Hungary)



"When I don't buy from SFSC, this is because …?"

TABLES

Table A2-1. Willingness to pay for food from SFSCs compared to longer food supply chains (Germany)

	50% to 20% less	10% less	neither more nor less	10% more	20% more	30 to 50% more
Food for special occasion	3%	7%	23%	34%	22%	11%
Organic	4%	6%	19%	32%	25%	14%
More processed food	11%	14%	31%	30%	10%	4%
Bread	3%	4%	26%	40%	19%	8%
Dairy	2%	7%	20%	42%	19%	10%
Eggs	4%	5%	17%	39%	22%	13%
Fruit and vegetables	2%	5%	17%	39%	26%	11%
Meat/fish and meat/fish products	3%	6%	18%	34%	25%	14%

"Would you be willing to pay more or less for food from SFSC than for the same food from longer food supply chains?"

Table A2-2. Willingness to pay for food from SFSCs compared to longer food supply chains (Spain)

	50% to 20% less	10% less	neither more nor less	10% more	20% more	30 to 50% more
Food for special occasion	7%	8%	18%	36%	20%	11%
Organic	8%	7%	20%	37%	19%	9%
More processed food	19%	17%	30%	23%	8%	3%
Bread	6%	8%	26%	37%	15%	8%
Dairy	8%	8%	26%	40%	11%	7%
Eggs	6%	8%	17%	41%	19%	9%
Fruit and vegetables	6%	8%	13%	41%	20%	12%
Meat/fish and meat/fish products	5%	8%	19%	36%	23%	9%

"Would you be willing to pay more or less for food from SFSC than for the same food from longer food supply chains?"

Table A2-3. Willingness to pay for food from SFSCs compared to longer food supply chains (Greece)

	50% to 20% less	10% less	neither more nor less	10% more	20% more	30 to 50% more
Food for special occasion	13%	11%	14%	29%	22%	11%
Organic	9%	8%	10%	27%	23%	23%
More processed food	18%	18%	14%	29%	14%	7%
Bread	14%	9%	16%	32%	13%	16%
Dairy	13%	10%	7%	31%	25%	14%
Eggs	13%	8%	6%	32%	18%	23%
Fruit and vegetables	15%	9%	7%	29%	22%	18%
Meat/fish and meat/fish products	10%	10%	8%	29%	22%	21%

"Would you be willing to pay more or less for food from SFSC than for the same food from longer food supply chains?"

Table A2-4. Willingness to pay for food from SFSCs compared to longer food supply chains (Hungary)

	50% to 20% less	10% less	neither more nor less	10% more	20% more	30 to 50% more
Food for special occasion	10%	12%	13%	35%	18%	12%
Organic	23%	10%	18%	25%	15%	9%
More processed food	15%	12%	14%	36%	15%	8%
Bread	11%	12%	16%	40%	11%	10%
Dairy	14%	14%	12%	37%	16%	7%
Eggs	13%	10%	16%	37%	15%	9%
Fruit and vegetables	12%	12%	9%	42%	14%	11%
Meat/fish and meat/fish products	12%	12%	12%	40%	15%	9%

"Would you be willing to pay more or less for food from SFSC than for the same food from longer food supply chains?"

Annex 3: Informed consent procedure

Table A2-1. Informed consent

Privacy policy*	
I understand the goal of the present research and the terms of my participation	Yes (1) No (2)
I am an adult able to give informed consent according to the laws of the country in which I reside	Yes (1) No (2)
I understand that no personal data or other data which can lead to my identification will be processed in the context of the present research	Yes (1) No (2)
I understand that my participation is voluntary and I can withdraw from the research at any point	Yes (1) No (2)

*Participation in the online survey was only possible if all questions were answered with yes.

Annex 4: Questionnaire and coding overview

Table A3-1. Survey questionnaire and coding scheme

Measure	Question & items	Levels
Main food purchaser	*Are you the main food purchaser in your household?*	1 = yes, 2 = one of the main food purchasers, 3 = no
Age	*How old are you?*	Open (18-99)
Gender	*Please indicate your sex*	1 = male, 2 = female, 3 = diverse
Region	*In which region do you live?*	<u>Germany</u> 1 = Baden-Württemberg, 2 = Bayern, 3 = Berlin, 4 = Brandenburg, 5 = Bremen, 6 = Hamburg, 7= Hessen, 8 = Mecklenburg-Vorpommern, 9 = Niedersachsen, 10 = Nordrhein-Westfalen, 11 = Rheinland-Pfalz, 12 = Saarland, 13 = Sachsen, 14 = Sachsen-Anhalt, 15 = Schleswig-Holstein, 16 = Thüringen <u>Spain</u> 1 = Andalusia, 2 = Aragon, 3 = Principality of Asturias, 4 = Balearic Islands, 5 = Canary Islands, 6 = Cantabria, 7 = Castile-La Mancha, 8 = Castile and León, 9 = Catalonia, 10 = Valencian Community, 11 = Extremadura, 12 = Galicia, 13 = La Rioja, 14 = Madrid, 15 = Murcia, 16 = Navarre, 17 = Basque Country <u>Hungary</u> 1 = Bács-Kiskun, 2 = Baranya, 3 = Békés, 4 = Borsod-Abaúj-Zemplén, 5 = Budapest,

		6 = Csongrád, 7 = Fejér, 8 = Gyor-Moson-Sopron, 9 = Hajdú-Bihar, 10 = Heves, 11 = Jász-Nagykun-Szolnok, 12 = Komárom-Esztergom, 13 = Nógrád, 14 = Pest, 15 = Somogy, 16 = Szabolcs-Szatmár-Bereg, 17 = Tolna, 18 = Vas, 19 = Veszprém, 20 = Zala <u>Greece</u> 1 = Attica, 2 = Central Greece, 3 = Central Macedonia, 4 = Crete, 5 = East Macedonia and Thrace, 6 = Epirus, 7 = Ionian Islands, 8 = Mount Athos, 9 = North Aegean, 10 = Peloponnese, 11 = South Aegean, 12 = Thessaly, 13 = West Greece, 14 = West Macedonia
Community size	*Please estimate how many inhabitants your community has.*	1 = Up to 5,000, 2 = 5,001 – 25,000, 3 = 25,001 – 150,000, 4 = over 150,000
Household size	*How many members live in your household (including yourself)?*	Open
Age of children	*Please list the ages of any children in your household:*	0-22
Education	*What is your level of education?*	<u>Germany</u> 1 = Ohne Schulabschluss, 2 = Haupt-/Volksschule, 3 = Mittlere Reife/Realschule, 4 = Abitur/Fachabitur, 5 = Berufsschule, 6 = Fachoberschule, Fachschule, 7 = Fachhochschule/ Berufsakademie, 8 = Universität (Diplom/Magister, Bachelor/Master oder höher), 9 = Möchte ich nicht beantworten <u>Spain, Hungary, or Greece</u> 1 = Incomplete Secondary Education, 2 = Secondary Education Completed, 3 = Some University or Vocational

		Certification, 4 = Vocational or Professional Certification Completed, 5 = University Education Completed, 6 = Postgraduate Education Completed, 7 = Doctorate, Post-doctorate or equivalent Completed, 8 = Prefer not to answer
Occupation	*Which, if any, of the below best describes your current occupation or job type?*	1 = Arts / Literary / Culinary, 2 = Business Owner / Self-Employed, 3 = Education Administration / Support Services, 4 = Educator (Professor, Teacher, Coach, etc.), 5 = Entertainment / Sports / Media, 6 = Farming / Ranching, 7 = Military / Law Enforcement / Fire / Emergency Services, 8 = Lawyer / Attorney, 9 = White Collar / Office Worker (includes executive management, middle management, and individual contributors), 10 = Professional / Technical / Scientific, 11 = Construction / Tradesman / Skilled Laborer (Painter, Mechanic, Plumber, etc.), 12 = Hourly Wage Worker (Waiter, Barista, Stocker, Bellhop, etc.), 13 = Professional Driver / Delivery Driver, 14 = Physician / Doctor / General Practitioner (MD, DO, etc.), 15 = Healthcare Professional (Not Physician / Doctor), 16 = None of the above
Household income	*What is the combined net income of your household (Monthly)?*	<u>Germany, Spain, or Greece</u> 1 = Up to 400€ 2= 401€-700€ 3 =701€-900€ 4 = 901€-1.300€ 5 = 1.301€-1.500€ 6 = 1.501€-2.000€ 7 = 2.001€-2.600€ 8 = 2.601€-3.200€ 9 = 3.201€-4.500€ 10 = 4.501€-6.000€ 11= More than 6.000€ <u>Hungary</u> 1 = Up to 140.000 Ft

		2 = 141.000 – 250.000 Ft 3 = 251.000 – 330.000 Ft 4 = 331.000 – 480.000 Ft 5 = 481.000 – 550.000 Ft 6 = 551000 – 740.000 Ft 7 = 741.000 – 960.000 Ft 8 = More than 961.000 Ft
Amount available for grocery shopping	*If you think about the amount available for grocery shopping in your household, which of these statements best suits you?*	1 = There is enough money to buy the foods you want, 2 = There is some need to consider prices, which limits some choices when buying food, 3 = There is a need to consider prices carefully, which limits many choices when purchasing food
Shopping frequency (Giampietri/Finco/ Del Giudice 2016; Szabó 2017)	*Please indicate what best mirrors your shopping frequency for each channel.* 1. Supermarket (physical store) 2. Supermarket (online store) 3. Local grocery store 4. Discount supermarket (Examples for each country) 5. Weekly or regular Market (Non-Farmers) 6. Farmers market 7. Organic store 8. Specialist shops (e.g., butcher, fish shop) 9. Direct sales from producer (production facilities) 10. Direct sales from producer (mobile, street sale, etc.) 11. Direct sales from producer (online) 12. Others, please specify:	8 = almost daily, 7 = weekly, 6 = every two weeks, 5 = every month, 4 = quarterly, 3 = half-yearly, 2 = annually, 1 = never
Change of shopping frequency	*Because of the COVID-19 situation, how has your shopping frequency changed for different channels?* 1. Supermarket (physical store) 2. Supermarket (online store) 3. Local grocery store 4. Discount supermarket (Examples for each country) 5. Weekly or regular Market (Non-Farmers) 6. Farmers market 7. Organic store 8. Specialist shops (e.g., butcher, fish shop) 9. Direct sales from producer (production facilities) 10. Direct sales from producer (mobile, street sale, etc.) 11. Direct sales from producer (online) 12. Others, please specify:	7-point scale (1 = "much less often", 7 = "much more often", with 4 representing the neutral option "no change")

Important aspects when buying food	*When buying food, how important are the following points to you?* 1. Convenience 2. Low prices 3. Fair prices for the producers 4. Overall quality 5. Taste 6. Freshness 7. Organic 8. Animal welfare 9. Knowledge about who produced the product 10. Regional origin of products 11. Buying products from the home country 12. Reduce food miles 13. Direct contact/personal relationship with producer/retailer *(please answer as if there was no COVID-19 pandemic.)* 14. I like to avoid personal contact *(please answer as if there was no COVID-19 pandemic.)* 15. Ethical employment 16. Certification about food safety	7-point scale (1 = "not at all important", 7 = "very important")
Personal values I (Osburg et al. 2019)	*Please rate the importance of the following values as guiding principles in your life.* <u>Egoistic values</u> 1. Authority: the right to lead or command 2. Wealth: material possessions, money 3. Influential: having an impact on people and events <u>Altruistic values</u> 4. Social justice: correcting injustice, care for the weak 5. Helpful: working for the welfare of others 6. Equality: equal opportunity for all <u>Biospheric values</u> 7. Protecting the environment: preserving nature 8. Preventing pollution 9. Respecting the earth: live in harmony with other species	7-point scale (1 = "not at all important", 7 = "very important")
Personal values II (Birch/Memery/ De Silva Kanakaratne 2018)	*Please state how much you agree with the following statements.* <u>Egoistic motivations</u> 1. I'm very conscious about my health and the health of others for whom I shop in the household. 2. I take responsibility for the state of my health and the health of others for whom I shop in the household.	7-point scale (1 = "strongly disagree", 7 = "strongly agree")

	3. I'm very involved with my health and the health of others for whom I shop in the household. <u>Ethical identity</u> 4. Ethics are important to me when making buying decisions. 5. I think of myself as someone who is concerned about ethical issues. 6. I think of myself as an ethical consumer. <u>Environmental consciousness</u> 7. The balance of nature is strong enough to cope with the impacts of modern industrial nations. 8. The so-called ecological crisis facing human kind has been greatly exaggerated. 9. Humans have the right to modify the natural environment to suit their needs.	
Theory of Planned Behaviour: Local food (Raygor 2016)	<u>Subjective Norms</u> 1. How important is your peers decision in purchase local food? 2. How helpful are your peers decision for making your own decision to purchase local food? 3. To what extent does your partner influences your decision to buy a local product? <u>Perceived Behavioral Control</u> 1. Please rate perceived ease in finding enough time to shop for local food. 2. Please rate your ability to afford local food. 3. Please rate your ability to access local food. <u>Past Behavior</u> How often did you purchase locally grown or produced food in the past month?	7-point scale (1 = "not important at all", 7 = "very important") 7-point scale (1 = "not at all helpful", 7 = "very helpful") 7-point scale (1 = "very low extent", 7 = "very high extent") 7-point scale (1 = "very difficult", 7 = "very easy") 7-point scale (1 = "very low", 7 = "very high") 7-point scale (1 = "very low", 7 = "very high") 7-point scale (1 = "never", 7 = "very often")
Shopping behaviour SFSCs I	Do you buy - at least sometimes - from SFSCs? Compared to the average customers, how often do you think you shop food from SFSC?	1 = yes, 2 = no 7-point scale (1 = "much less often", 7 = "much more often")
Consumer expectations SFSCs	*What do you expect from food purchased from SFSCs compared to conventional outlets?* 1. more inconvenient / more convenient 2. cheaper / more expensive 3. of lower quality / of higher quality	Bipolar 7-point scale from 1-7, with 4 representing the neutral option "equal"

	4. lower trust in food safety / higher trust in food safety 5. less fresh / fresher 6. generally lower expectations / generally higher expectations	
Shopping behaviour SFSCs II	*What kind of food do you typically buy from SFSCs?* 1. Fresh food 2. Processed food (such as oil, jam, sausage, etc.) *What kind of food do you regularly purchase from SFSCs?* 1. Raw meat and/or fish 2. Meat products (e.g. sausage, ham) 3. Cereals-legumes 4. Fruit 5. Vegetables 6. Honey 7. Oil 8. Eggs 9. Wine 10. Jam 11. Juices 12. Bread 13. Milk and milk products 14. Others, please specify:	7-point scale (1 = "never", 7 = "very often")
Willingness-to-pay	*Would you be willing to pay more or less for food from SFSC than for the same food from longer food supply chains?* 1. Meat/fish and meat/fish products 2. Fruit and vegetables 3. Eggs 4. Dairy 5. Bread 6. More processed food 7. Organic 8. Food for a special occasion (holidays, gift, etc.)	Slider-scale 50% less to 50% more in discrete steps of 10%
Theory of Planned Behaviour: SFSCs (Giampietri/Finco/ Del Giudice 2016)	*To what extent do you agree or disagree to the below statements?* <u>Subjective norms</u> 1. Most people who are important to me approve it when I (would) buy in short food supply chains (SFSCs) when shopping for groceries. 2. Most people who are important to me think that I should buy in short food supply chains (SFSCs). 3. Many people like it when I (would) buy in short food supply chains (SFSCs).	7-point scale (1 = "strongly disagree", 7 = "strongly agree")

	<u>Perceived behavioural control</u> 4. Buying in short food supply chains (SFSCs) is possible for me. 5. If I wanted to, I could go grocery shopping in short food supply chains (SFSCs). 6. I think it would be easy for me to buy from SFSC.	
Attitude SFSCs	*To what extent do you agree or disagree to the below statements?* 1. Overall, I like the concept of SFSCs very much. 2. I think, SFSCs are a good thing. 3. The existence of SFSC is important.	7-point scale (1 = "strongly disagree", 7 = "strongly agree")
Reasons for buying from SFSCs	*Which reasons apply to you for buying from SFSCs?* 1. Because it is more natural. 2. Because products have a higher quality compared to non-SFSC products. 3. Produce that comes from SFSC sources is healthier for me. 4. Taste better. 5. Because it supports local producers. 6. Because I know where it comes from. 7. Because fruits and vegetables are grown in a way that is better for the environment. 8. Because the shopping experience is more satisfying than shopping from a conventional supply chain. 9. In SFSC there are special, unique products available.	7-point scale (1 = "strongly disagree", 7 = "strongly agree"); *Note:* for participants who indicated to never purchase from SFSCs, the question was phrased hypothetically, so that it could be included for all participants
Theory of Planned Behaviour: SFSCs (Giampietri/Finco/ Del Giudice 2016)	<u>Intention</u> 1. I strongly intend to purchase more food from SFSC in the future. 2. I plan to purchase more food from SFSC in the future. 3. I would like to purchase more food from SFSC in the future.	7-point scale (1 = "strongly disagree", 7 = "strongly agree")
COVID-19 situation	Has the COVID-19 situation changed your opinion of SFSC?	7-point scale (1 = "It has made me have a more negative opinion of SFSC", 7 = "It has made me have a more positive opinion of SFSC")
	Has the COVID-19 situation changed your intent to purchase from SFSCs?	7-point scale (1 = "It has highly decreased it", 7 = "It has highly increased it")
	Has the COVID-19 situation changed your intent to support local producers?	7-point scale (1= "It has highly decreased it", 7 = "It has highly increased it")

	Do you think, SFSCs are a way to make our country better prepared for a crisis like the COVID-19 situation?	7-point scale (1 = "I do not at all agree", 7 = "I totally agree")
	Has the COVID-19 situation changed your awareness for SFSCs?	7-point scale (1 = "It has highly decreased it", 7 = "It has highly increased it")
Reasons against buying from SFSCs	*When I don't buy from SFSC, this is because …* 1. the range of products is limited 2. food produced elsewhere is better 3. it is not well promoted 4. it is not well labelled 5. it is not readily available 6. it is expensive 7. it is hard to get there 8. limited opening hours 9. hygiene rules are not transparent 10. I want to avoid personal contact (please answer as if there were no COVID-19-pandemic)	7-point scale (1 = "strongly disagree", 7 = "strongly agree")

Annex 5: Glossary of Statistical Terms

ANOVA:
The purpose of a one-way ANOVA (analysis of variance) test is to determine the existence of a statistically significant difference among several group means. The test uses measured variances to check whether the mean values of the groups differ not only randomly. A repeated measures ANOVA is the equivalent of the one-way ANOVA, but for related instead of independent groups.

Bartlett's test:
The Bartlett's test of sphericity tests the hypothesis that the correlation matrix is an identity matrix, which would indicate that the variables are not related and therefore unsuitable for structure detection. Small values (less than 0.05) of the significance level indicate that it is appropriate to perform data reduction as there is sufficient correlation in the data.

Binary logistic regression:
Binary logistic regression is a type of regression analysis where the dependent variable is a dummy variable (i.e., binary variable, see explanation below). Unlike ordinary linear regression, logistic regression does not assume that the relationship between the independent variables and the dependent variable is linear.

Binary variable:
Binary variables are two-valued variables expressed as 1's or 0's in algebraic form.

Bonferroni Test:
The Bonferroni test is a type of multiple comparison test. When performing a hypothesis test with multiple comparisons, a result could occur that appears to demonstrate statistical significance in the dependent (i.e., explained) variables, even when there is none. If a particular test yields correct results 99% of the time, running the same regression on 100 different samples would lead to at least one false positive result. The Bonferroni test attempts to prevent this by making an adjustment during comparison testing.

Cluster analysis:
Cluster analysis or clustering is the task of grouping a set of objects in such a way that objects in the same cluster are more similar to each other than to those in other clusters. This can be done based on various clustering algorithms. The goal is to divide a population into groups in such a way that the members within the groups are as similar as possible to each other and the persons or objects between the groups are as dissimilar as possible. In doing so, one specifies on the basis of which information or variables the (dis)similarity is to be determined.

Cronbach’s alpha:
Cronbach’s alpha is a measure of internal consistency, that is, how closely related a set of variables are as a group. Therefore, it checks whether these variables can be combined into a scale. The general rule is that if Cronbach’s alpha is >0.7, the scale is reliable.

Degrees of freedom:
Degrees of freedom is the number of values that are free to vary when the value of some statistics is known. In other words, it is the number of values that need to be known in order to know all of the values. By that degrees of freedom are defined as the number of observations in the data that are free to vary when estimating statistical parameters.

Eigenvalues:
Eigenvalues measure the amount of variation in the total sample accounted for by each factor. If a factor has a low eigenvalue, then it is contributing little to the explanation of variances in the variables and may be ignored as less important than the factors with higher eigenvalues.

Factor analysis:
A factor analysis aims to find "similarities" between a set of items and uncover hidden patterns in the data. By that, it leads to a reduction of dimensions as multiple items/variables are taken together in a factor. Two types of factor analysis are distinguished, exploratory and confirmatory. Exploratory factor analysis is used to investigate the possible underlying factor structure of a set of observed variables without imposing a preconceived structure on the outcome. Confirmatory factor analysis allows the researcher to test the hypothesis that a relationship exists between the observed variables and their underlying latent constructs.

Factor loading:
The factor loading describes the strength of the linear relationship between an item and its respective factor. Loadings close to 1 indicate a strong relationship.

F - Test:
F-tests are named after its test-statistic (F-statistic) which is a ratio of two variances. The test is used in an ANOVA to determine whether group means are equal or differ between groups.

Greenhouse-Geisser Correction:
The Greenhouse–Geisser Correction ε is a statistical method of adjusting for lack of sphericity in a repeated measures ANOVA. If sphericity is not given, Type I error rate is high, which means effects in a model could falsely become significant (false positive results). Values below 1 indicate deviations.

Harman's One-Factor Method:
Harman's One-Factor Method indicates problematic common method variance if an exploratory factor analysis with all study variables produces eigenvalues that suggest the first factor accounts for more than 50% of the variance among variables.

Hierarchical Clustering:
Hierarchical clustering, as method of cluster analysis (see above), initially treats each observation as a separate cluster. Then, an algorithm repeatedly identifies two clusters that are closest together and merges them into one cluster. This iterative process continues until all clusters are merged together. The process can also be the other way round initially grouping all the observations into one cluster, and then, successively splitting these clusters.

Internal consistency reliability:
Internal consistency assesses the correlation between multiple items that are intended to measure the same construct. Usually, it is measured by using Cronbach's alpha (see above).

Item:
An item is a general formulation of a unit in a questionnaire such as a question or a statement.

Kaiser criterion:
The Kaiser criterion is a method for determining the number of factors in a factor analysis. The rule is to drop all components with eigenvalues under 1.0 – this being the eigenvalue equal to the information accounted for by an average single item.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO):
The Kaiser-Meyer-Olkin Measure of Sampling Adequacy is a statistic that indicates the proportion of variance in the variables that might be caused by underlying factors. The KMO-test can be used to measure how appropriate the data is for factor analysis. If the value is less than 0.50, the data is not suitable for factor analysis.

Kruskal-Wallis test:
The Kruskal-Wallis test is a non-parametric statistical test used to test whether independent samples (groups or series of measurements) originate from a common population with respect to an ordinally scaled variable. It is similar to a Mann-Whitney U test and, like the latter, is based on rank sums, with the difference that it can be used for the comparison of more than two groups.

Mann-Whitney-U test:
The Mann-Whitney-U test is a non-parametric statistical test for rank data (ordinal scaled data). It tests whether, when considering two populations, it is equally likely that a value randomly selected from one population is larger or smaller than a randomly selected value from the other population.

Mauchly's test:
Sphericity can be assessed using Mauchly's test, which tests the hypothesis that the variances of the differences between conditions are equal. Therefore, if Mauchly's test statistic is significant, we can conclude that there are significant differences between the variances of differences, and therefore, the condition of sphericity is not met.

Mean Value:
The mean, also known as arithmetic mean, is the most widely used average and is defined as the sum of the observations divided by the number of observations.

Nagelkerke R^2:
Nagelkerke R^2 is a measure of goodness for logistic regression models. It tests whether the fit of the estimated model matches that of the observed sample values. The Nagelkerke R^2 can vary between 0 and 1, with higher values indicating a better fit.

Oblique rotation:
After determining the factors in a factor analysis, a better delimitation between the factors is achieved with the help of the rotation. If the rotation is oblique, the individual factors can correlate with each other. In social science studies this is usually appropriate, since the individual factors usually depend on each other.

Parallel analysis:
The parallel analysis is a method for determining the number of factors retaining from a factor analysis. It is a simulation method that compares the observed eigenvalues with those obtained from uncorrelated normal variables. A factor or component is retained if the associated eigenvalue is bigger than the 95th percentile of the distribution of eigenvalues derived from the random data.

Post hoc tests:
Post hoc tests are used to uncover specific differences between three or more group means when an ANOVA *F*-test is significant. The *F*-test merely indicates that a difference does exist between the groups, but not between which groups specifically. Post hoc tests allow to locate those specific differences.

Predictor variable:
Predictor variables are also known as independent variables or input variables. A predictor variable is the variable that is manipulated or changed in a scientific experiment to test the effects on the dependent variable.

Principal axis factoring:
Principal axis factoring is a type of factor extraction in factor analysis. It seeks the fewest factors which can account for the common variance (correlation) of a set of variables.

p-value:
The p-value is a primary value used to quantify the statistical significance of the results of a hypothesis test. A common interpretation of p-values is as follows: $p<0.05$ → statistically significant; $p<0.01$ → highly statistically significant.

Regression Analysis:
Regression analysis is a statistical tool that aims to model relationships between a dependent variable and one or more predictor variables. Performing a regression is used to quantitatively describe a relationship between the variables or to predict the values of the dependent variable.

Regression Coefficients:
They describe the influence of a predictor variable on the dependent variable. The sign of each coefficient indicates the direction of the relationship between a predictor variable and the dependent variable.

Scheffé post hoc test:
This statistical test is a post hoc test used in statistical analysis. The Scheffé Test is used to make unplanned comparisons, rather than pre-planned comparisons, among group means in an analysis of variance (ANOVA).

Scree plot:
In multivariate statistics, a scree plot is a line of the eigenvalues of factors or principal components in an analysis. The scree plot is used to determine the number of factors to retain in an exploratory factor analysis (FA) or principal components to keep in a principal component analysis (PCA).

Significance Level:
The significance level is the probability of rejecting the null hypothesis when it is true. The commonly used 5% significance level indicates a 5% risk of concluding that a difference exists when there is no actual difference.

Sphericity assumption:
The assumption of sphericity refers to the equality of variances of the differences between treatment levels. In repeated measures ANOVA, it is a measure of the homogeneity of the variances of the differences between levels. The violation of sphericity may cause the ANOVA significance test to become too "liberal" which increases the likelihood of a Type I error (incorrectly rejecting a true null hypothesis).

Standard deviation:
The standard deviation is a measure of the amount of variation or dispersion of a set of values. A low standard deviation indicates that the values tend to be close to the mean of the set, while a high standard deviation indicates that the values are spread out over a wider range.

Total Variance Explained:
In factor analysis, the Total Variance Explained represents the ratio, expressed as a percentage, of the variance accounted for by each component to the total variance in all of the variables.

t-Test:
A t-test is a type of inferential statistic used to determine if there is a significant difference between the means of two groups.

Velicer's minimum average partial (MAP) test:
Velicer's MAP is a method for determining the number of factors in a factor analysis. The test involves a complete principal components analysis followed by the examination of a series of matrices of partial correlations.

VIF:
The Variance inflation factor (VIF) is a measure of the amount of multicollinearity in a set of multiple regression variables. Collinearity exists when independent variables are linearly dependent on other independent variables. Interpreting the VIF: 1 → not correlated, 1-5 → moderately correlated, >5 → highly correlated.

Ward-Method:

The Ward-Method is a hierarchical clustering method. It says that the distance between two clusters, A and B, is how much the sum of squares will increase when they are merged.

χ^2/Chi-square Test:

A chi-square (χ^2) statistic is commonly used for testing relationships between categorical variables. The null hypothesis of the chi-square test is that no relationship exists on the categorical variables in the population; they are independent.