Understanding sustainable dietary behaviours in Sweden

A cross sectional quantitative study

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Bachelor's essay 15 credits

Environmental science | 6th semester 2024

(Environment and Development)

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Abstract

Sweden has for many years now emerged as one of the leaders in the work of sustainability because of its ambitious environmental goals and policies. However, the country's reliance on imported food and the agriculture sector's significant greenhouse gas emissions (GHGe) present challenges to its sustainability efforts. The food system comprises three interconnected parts: agriculture, the improved supply chain, and consumer dietary choices. Each of these components plays a crucial role in the sustainability of the food system. The topic of consumer behaviours is becoming increasingly prominent in discussions regarding sustainable food systems. This study therefore focuses on the sustainable eating habits of Swedish adults and investigates their understanding of sustainable dietary behaviours. This study is based on Kawasaki et al. (2024), who categorised sustainable dietary behaviours into five elements: food choice, storing and preservation, cooking, eating and disposal. A survey with randomised participants was conducted, resulting in 287 respondents, to examine Swedish adults' dietary choices and behaviours as well as their knowledge of sustainable behaviours. Respondents were also asked what influenced their choices and what barriers they identified in order to be more sustainable in their everyday lives. The results indicate that respondents associate sustainable dietary behaviours with eating in a way that helps mitigate climate change and does not harm the environment. The majority of respondents indicated that taste (57%), price (59%), and health (58%) were significant factors influencing their dietary choices. Additionally, many respondents cited high grocery prices and personal preferences as potential barriers to adopting more sustainable dietary habits. This study underscores the need for more research on sustainable dietary behaviors and clear guidelines for policymakers. Prioritizing dimensions of sustainability and analyzing flaws in the food system are crucial steps toward finding solutions.

Keywords: *Food, environment, dietary choices, sustainable dietary behaviours, food consumption patterns, food systems, Sweden.*

Sammanfattning

Sverige har under många år framstått som ett av de ledande länderna i hållbarhetsarbetet tack vare sina ambitiösa miljömål och miljöpolitik. Landets beroende av importerad mat och jordbrukssektorns betydande utsläpp av växthusgaser (GHGe) utgör dock utmaningar för hållbarhetsarbetet. Livsmedelssystemet består av tre sammankopplade delar: jordbruket, den förbättrade leveranskedjan och konsumenternas kostval. Var och en av dessa komponenter spelar en avgörande roll för livsmedelssystemets hållbarhet. Ämnet konsumentbeteenden blir alltmer framträdande i diskussioner om hållbara livsmedelssystem. Denna studie fokuserar därför på hållbara matvanor hos vuxna svenskar och undersöker deras förståelse för hållbara kostvanor. Studien baseras på Kawasaki et al (2024), som kategoriserade hållbara kostvanor i fem delar: val av livsmedel, förvaring och konservering, tillagning, ätande och avfallshantering. En enkätundersökning med randomiserade deltagare genomfördes, vilket resulterade i 287 respondenter, för att undersöka svenska vuxnas kostval och beteenden samt deras kunskap om hållbara beteenden. Respondenterna tillfrågades också om vad som påverkade deras val och vilka hinder de identifierade för att bli mer hållbara i sin vardag. Resultaten visar att respondenterna förknippar hållbara kostvanor med att äta på ett sätt som bidrar till att mildra klimatförändringarna och inte skadar miljön. Majoriteten av respondenterna angav att smak (57%), pris (59%) och hälsa (58%) var viktiga faktorer som påverkade deras kostval. Dessutom angav många respondenter höga livsmedelspriser och personliga preferenser som potentiella hinder för att anta mer hållbara kostvanor. Denna studie understryker behovet av mer forskning om hållbara kostvanor och tydliga riktlinjer för beslutsfattare. Att prioritera hållbarhetsdimensioner och analysera brister i livsmedelssystemet är viktiga steg mot att hitta lösningar.

Nyckelord: *Mat, miljö, matval, hållbara kostvanor, matkonsumtionsmönster, livsmedelsystem, Sverige.*

Acknowledgements

We want to say a thank you to Madeleine Bonow for helping us realise which path we should go with this thesis when we could not see it ourselves. A big thank you to our classmates for supporting us through this process especially Alex, Moa and Ida for giving us valuable feedback and for pushing us to write more and challenge ourselves. Lastly, a thank you to the teachers at the Environment and Development programme for helping us with our various questions throughout this thesis.

1. Introduction

In the European Union (EU), the dietary preferences of consumers are progressively being influenced by considerations of sustainability and animal welfare (Ingenbleek et al., 2013; Verbeke et al., 2010). It is found that the amount of information available to an individual has a great impact on their behaviour. Having an understanding of how food is produced and in some cases how the animals are treated in the process can set bounds for what is purchased and consumed (Toma et al., 2012). It is important that food is processed and packaged properly, meaning it should be well sealed and there should be clear labels and information on the packages, for it to have success on the market. Imported food needs to be checked by the authorities to maintain the standard otherwise it remains unused and people don't trust it to be safe to consume (Toma et al., 2012).

Sweden has gained a reputation as an environmentally forward and sustainable country. Due to ambitious goals, strict environmental policies and being the first one to host the climate conference in Stockholm in 1972, the world looks at Sweden as a role model of sustainability (Lidskog & Elander, 2012; Isaksson & Rosvall, 2020; Ahmed & Nguyen, 2022). Although Sweden is often praised for its efforts in combating climate change, it is important to acknowledge that there is still room for improvement. According to Sveriges Miljömål (2023b), the evaluation of the Swedish national goals indicates that urgent action is needed to prioritise the climate in environmental politics if the goals are to be achieved in time.

One of the areas that Sweden needs to improve on is food systems (Röös et al., 2023). Agriculture significantly contributes to CO_2 emissions in many countries due to population growth. The population has increased from 3.7 to over 7 billion since 1970, resulting in increased consumption and a shift towards animal-based diets (Bennetzen et al., 2016; Fukase & Martin, 2020). In Figure 1, Sweden's CO_2 emissions are presented in a pie chart, where agriculture stands for 15% of overall emissions.

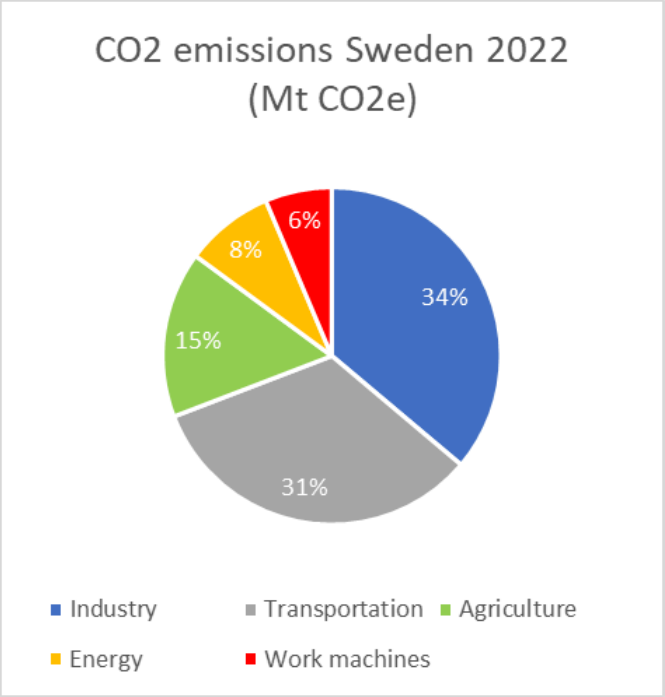

Figure. 1: Composition of Carbon Dioxide emissions in Sweden during 2022

Source: Naturvårdsverket, 2022

While improving agricultural practices is one aspect of creating a sustainable food system, there are two other parts as well. According to Röös et al. (2023), the other two are improving the supply side through new technologies, increased efficiency, and decreased food system loss and waste, as well as making dietary choices that involve reduced consumption of animal products.

The dietary choices of a nation are significantly influenced by its food system. Over the last 50 years, population growth has led to substantial changes in our diets, resulting in increased crop yields and production. This has effectively reduced hunger, lowered mortality rates, and alleviated global poverty to an extent. Unhealthy diets, characterised by the consumption of processed foods and heavy animal products, have led to a rise in obesity, non-communicable diseases, and environmental problems (Willett et al., 2019). It is imperative to transform our current unsustainable food systems (Metson et al., 2021). Food production is among the largest causes of environmental change, responsible for 30% of greenhouse gas emissions. It is a

well-established fact that agriculture occupies around 40% of global land and consumes up to 70% of freshwater (Willett et al., 2019).

This study will focus on the last part of sustainable food systems; dietary choices (Röös et al., 2023). The impact of food choices on the environment is significant and the livestock industry is a major contributor to global warming and has negative effects on freshwater and land use. This has been well-established for many years, and promoting plant-based diets has been recommended as a strategy to reduce overall environmental impact and improve human health by preventing chronic diseases. Therefore, shifting individuals' behaviour and changing food consumption patterns can help mitigate climate change (Joyce et al., 2012).

1.1 Problem statement

Sweden is seen as a leader in sustainability and is well on its way to achieving all the SDGs. However, there is a need to improve Sweden's food system, especially the last part of the food system that deals with dietary choices. Eating sustainably is becoming more relevant and there are positive trends that more people are choosing to eat more plant-based foods that can still be considered sustainable. But do the Swedish people really know what it means to eat sustainably? And what sustainable behaviours do Swedes have?

1.2 Aim of the study and research questions

The aim of the study was to investigate the Swedish population’s understanding of sustainable dietary behaviours and the type of behaviours its adults display. It also investigated Swedish adults' dietary intake as well as what influences their choices. By doing this, this study can contribute to enhanced understanding and further the improvement of the Swedish food system, ultimately improving the country's policies regarding sustainability in the food system.

Therefore, the overarching research question for this study was: How knowledgeable are Swedish adults about sustainable eating practices, and what sustainable behaviours do they exhibit in their dietary choices?

2. Background

2.1 What is a food system?

O'Brien et al. (2023) describe a food system as an interconnected system of activities and actors that influence the action of bringing food from farm to table. To put it simply, the food is produced, packed, processed, distributed, sold, eaten, and disposed of and this chain of activities repeats itself (see Figure 2). This chain is called the food value chain and can be short or long, complex, and globalised. Different dimensions of the food chain influence the system but are also influenced by the system. These factors are economics, health, politics, society, and the environment (O'Brien et al., 2023; Parsons et al., 2019).

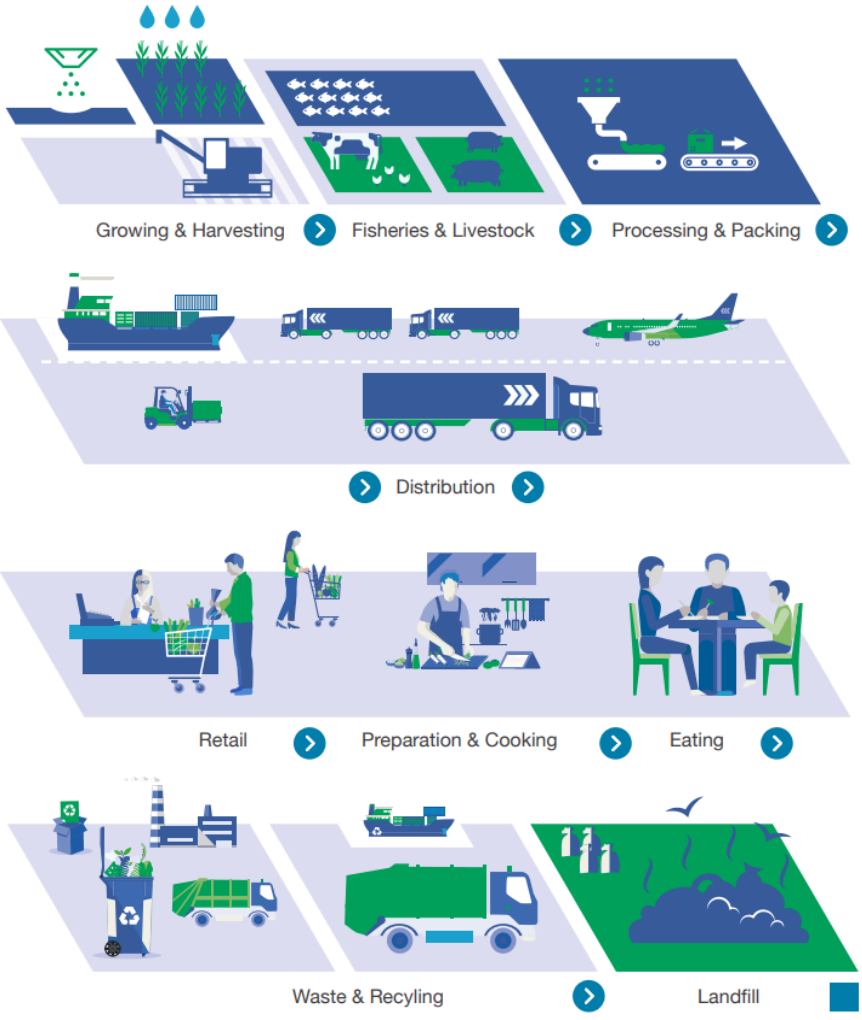

Figure 2: All stages of the food system from farm to landfill.

Source: O'Brien et al., 2023

The environment, including water, air, and soil, is impacted by this chain, as are people's livelihoods and well-being. The system interacts with various dimensions and stages continuously, making it challenging for policymakers to make decisions on food-related legislation and policies (Parson et al., 2019). Achieving a sustainable food system is, therefore, extremely difficult, as it requires consideration of numerous actors, activities, and dimensions. Different interpretations of sustainability can lead to varying narratives of the food system. This can result in different assumptions on how to achieve a sustainable food system. For instance, agriculture often views the main issue as ecological, where resources are depleted and threaten future food production. It is important to remember though that sustainability encompasses three dimensions: social, economic, and environmental. By taking a more holistic approach, we can avoid a narrow interpretation of sustainability and prevent conflicts (Béné et al., 2019).

2.2 Sweden's food system

Sweden, like many other countries, has their food systems linked to international health and sustainability goals such as the SDGs and Paris Agreement and is working towards achieving these goals. However, with the current food systems, the goals might not be met (Clark et al., 2020). Consumers consider organic eating important, and environmental issues, animal welfare, and health concerns significantly influence people's food choices (Niva et al., 2014). That being said, SDGs 2 (Zero hunger) and 3 (Good health and well-being) are under threat simply because more than half of the world’s adult population have a too high or too low body mass due to poor diets. Sweden as a high-income European country needs to change dietary patterns to healthier ones (Clark et al., 2020). The current dietary patterns in Sweden are considered poor due to the high per capita consumption of meat and dairy and is higher than the European average (Clark et al., 2020; Röös et al., 2018; Moberg et al. 2020). High consumption has also been in dairy, and eggs and low consumption of fruits and vegetables, wholegrain cereal, seeds and nuts and legumes (Clark et al., 2020). According to Röös et al., (2018), Sweden needs to introduce more grain legumes as it is a good source of protein and minerals. Grain legumes favourably complement cereal proteins because they contain higher amounts of amino acid lysine than cereal protein and provide important farming benefits like symbiotic nitrogen fixation (Röös et al., 2018).

Agriculture in Sweden only occupies 8% of the total land area with cereal and grass-clover ley being the most cultivated crops (Röös et al., 2023). Grain legumes occupy 2,2 % of the cropland which is not for human consumption instead mostly for animal feed (Röös et al., 2018). Dairy and beef production is found mainly in less favourable agricultural areas mixed with farmland and woodlands which constitute the majority of Sweden's landmass.

While Sweden is successful in producing their meat (60 %), pork and poultry (80 %), and fruits and vegetables, (20%) they mostly rely on imported food. When it comes to nutrition and health, about half of the Swedish adult population is overweight or obese with health issues. Dietary choices and food patterns are the second largest, to tobacco, behavioural issues that cause diseases and early death (Röös et al., 2023). Though most adults have increased the recommended intake of 500 g of fruits and vegetables per day, a national survey was conducted in 2010 by the national Swedish food agency where it was discovered that especially young Swedish people still ate too little fruits and vegetables and consume more foods that contain saturated fats and salts. Adults eat more traditional foods such as potatoes, porridge, fish and desserts (Amcoff et al., 2012). However, there seems to be a shift in consumers dietary intake because the average Swedish meat consumption per capita has now decreased from 88,4 kg (2016) to 78,6 kg (2020). This has led to an increase in the variety of vegetarian products available on the Swedish market. While the majority of Swedish consumers do not adopt a completely vegetarian diet since about 9% of the Swedish population consider themselves vegetarian (Axfood, 2022), many are simply increasing their intake of vegetarian food by eating a vegetarian meal a few times a week. While this represents a positive trend, there are still barriers in Sweden when it comes to transitioning to a vegetarian diet.

According to a study done by Spendrup & Hovmalm (2022), most Swedes are sceptical about reducing their meat intake, citing a lack of necessary cooking skills and the different sensory qualities of meat substitutes. Although, the primary drivers found for increased vegetarian diets are concern for the environment and climate change, as well as personal health. However, it has also been found that Swedish consumers are

showing interest in products that are labelled as produced from Swedish raw materials (Spendrup & Hovmalm, 2022).

It is often encouraged by the government of Sweden to try as much as possible to consume local food, which is locally grown food in a geographical area of circa 250 km radius (Granvik, 2012). Some reasons for encouraging the consumption of locally sourced foods is primarily driven by environmental considerations. The purchase of locally sourced products results in a reduction in the distance travelled by the food, thereby reducing energy consumption and emissions. This, in turn, has a beneficial impact on the environment, as evidenced by a reduction in the carbon footprint. Consequently, the food is fresh and there is less need to add preservatives when travelling longer distances, which is beneficial to health. The purchase of locally sourced food is regarded as the optimal choice, as it provides a means of supporting local producers and, in turn, contributes to the national economy. (Granvik, 2012). The study conducted by Niva et al. (2014) concluded that while there are benefits to consuming locally produced food, not everyone does so for environmental or animal welfare reasons. There are a number of reasons why consumers choose to consume the foods they do. The reasons for this include the perception that locally produced food has a better taste, that organic food is healthier, and that limited meat consumption is also to avoid high grocery prices and for health reasons (Niva et al., 2014).

To improve the Swedish food system and encourage people to buy and eat more locally produced, there is a need for more products that are grown in Sweden. Martin and Brandão (2017) write that about 67% of people are willing to pay more for food that is Swedish, locally grown or even regional. They continue to write that 69% of consumers actively look for food that is Swedish, and 61% are interested in buying more regionally-produced food (Martin & Brandão, 2017). Table 1 puts into perspective how different aspects of the community can be affected by having a local food system.

Table 1: A summary of the advantages and disadvantages of local food systems from a sustainability point of view (Nilsson, 2009)

	Advantages	**Disadvantages**

Economic	Direct sale to consumers, cutting out the middleman. More money stays in the local community	Can be more labour-intensive, so the cost of production can lead to an increase in cost to the consumer. Smaller systems can be more expensive to run and maintain
Social	Maintains employment in rural regions. Positive for tourism. Contributes to the social capital of a region.	***
Environmental	Small producers are often more connected to the land and therefore more active in their environmental protection work. Claims to reduce transport.	Small scale is not always environmentally the best choice. Energy inefficient transportation.

***According to Nilsson (2009), there are no disadvantages on the social part of having local food systems. Atleast not good enough to be added to the table. The only major one that was suggested was time. The farmers complained about the amount of time the whole process took. Especially since most of them had about 1-2 employees working.

The table above illustrates the numerous advantages of selecting locally sourced foods. By reducing transportation-related emissions, these foods help to protect the environment. Furthermore, they support the local economy by creating jobs. Local foods are fresher and more flavorful, and by purchasing them, consumers can help to preserve traditional farming methods and biodiversity. Additionally, they are often more nutritious and free from harmful chemicals. Furthermore, by purchasing local foods, consumers can ensure the safety and ethical standards of their food. Overall, supporting local foods benefits both individuals and communities.

2.3 Definition of sustainability

When discussing sustainability in this paper, the definition of sustainability is from the United Nations definition from the Brundtland Commission. Sustainability according to the commission, is defined as “meeting the needs of the present without compromising the ability of the future generations to meet their own needs.” (United Nations

Brundtland Commission, 1987). The report also talks about how important it is for financially stable nations to adopt an ecological lifestyle with planetary bounds, considering how they use natural resources. It is also known that growing populations put pressure on our resources and any chances of sustainable lifestyles put in order, that is why population size and growth must be kept equal (United Nations Brundtland Commission, 1987).

2.4 Sweden's environmental goals

As stated in the introduction, Sweden has its own national environmental goals (16 environmental quality objectives and 24 milestone targets), which include one generational goal. This structure is designed to provide an overall direction for Swedish society to move forwards in terms of the environment. The generational goal more specifically entails that the major environmental problems should be solved within one generation without causing harm to environment and health outside of Sweden's borders. There is a need to put more emphasis on the generational goal in the case of this study. This goal is important because it guarantees a future for those to come. According to the Swedish parliament the definition for the generational goal is as follows and roughly translated (Månsson, 2016; Sveriges miljömål, 2023a).

> "The overall objective of environmental policy is to hand over to the next generation a society in which the major environmental problems are solved, without causing increased environmental and health problems outside Sweden's borders." (Sveriges miljömål, 2023a).

Further, the 24 milestone targets define the 16 quality objectives to even more concretize and explain how to reach the objectives. These goals and objectives should act as a framework for governmental authorities and private actors and guide them in environmental policy-making (Månsson, 2016; Sveriges miljömål, 2023a).

2.5 Environmental impacts of dietary choices

In recent years, it has become more evident that individual food choices have an environmental impact, with animal based diets having a larger impact than those with plant-based diets (Scarborough et al., 2023).

However, with the increasing population, there has been a higher demand for meat, dairy and eggs and with the still unsustainable agriculture sector, the importance of shifting consumer behaviours is growing (Joyce et al., 2012).

Guy, Bray and Appleton (2024) state that populations often underestimate the impact of dietary choices. Many people may believe that changing their individual diet is pointless and will not make a difference. This, coupled with a lack of understanding about sustainable diets and the environmental impact of food choices, creates barriers to behavioural change. Research indicates that making small changes to one's diet can be the most effective way to bring about behavioural change for both health and the environment. Prioritising sustainable eating over essential needs could be considered a privilege due to the associated costs. It is important to note that not everyone has the financial means to make such dietary changes for environmental purposes (Guy, Bray & Appleton, 2024).

Westhoek et al. (2014) conducted a study on the effects of alternative diets in EU countries. They found that by replacing animal-derived food with plant-based foods in daily dietary intake led to a 40% reduction in nitrogen emissions, a 25-40% reduction in GHGe and a 23% reduction in per capita use of cropland for food production. Reducing nitrogen use would result in better air and water quality. Further, a reduction in meat and dairy consumption would lead to a reduction in livestock production and therefore feed demand and land use. This, in turn, could lead to a reduction in soy meal use and imported feed, freeing up land that could be used for alternative purposes, such as increased cereal production (Westhoek et al., 2014). It takes 7-10 kg of feed to produce 1 kg of beef and 1.7-2.5 kg of feed to produce 1 kg of chicken. By substituting beef with chicken, there is a reduction in the amount of feed and land required for animal production (Andersson et al., 2015).

3. Theoretical framework

Dietary behaviours contribute to environmental damage and health-related implications. This is why consumers need to understand how their dietary behaviours can impact the environment and in recent research, a new term called ‘sustainable dietary behaviour’ has been developed (Raghoebar et al., 2024; Kawasaki et al., 2024). Marijn Stok et al. (2018) define the term as an “overall umbrella term referring to all

phenomena related to food choice, eating behaviour, and dietary intake/nutrition" (Marijn Stok et al. 2018) which Kawasaki et al. (2024) uses in their study on 'sustainable dietary behaviours' (SDB). The term can be expanded to include more factors and sometimes goes by other names and slightly different definitions, for example, sustainable and healthy dietary behaviour (SHDB) by Kawasaki et al. (2023).
The SHDB theory is closely related to the SDB theory, as both theories examine the connection between sustainable behaviours and dietary behaviour levels. While SHDBs are not yet fully defined, it involves making choices about what to purchase and order, how to preserve food, what to cook and eat, and how to dispose of food, similar to SDBs. This statement ensures that both current and future generations can maintain a healthy and safe diet while minimizing their impact on the environment (Kawasaki et al., 2023). The definition of the theoretical framework is in this study limited to only Marijn Stok et al. (2018) definition on SDBs.

Kawasaki et al. (2024) used questionnaires as well as in-depth interviews to find out Japanese and Germans understanding of SDBs as well as identifying what type of behaviours the respondents displayed. It resulted in the identification of five food scenes, 34 categories, 64 subcategories which were based on codes (analysing the collected data and deriving codes from the answers to categorise the respondents answers into the five food scenes). The five food scenes are food choice, storing and preservation, cooking, eating and disposal. Within these five food scenes, categories of dietary behaviours were identified and are presented in Table 2.

Table 2: Summary of food scenes and identified dietary behaviours observed in consumers in a cross-cultural study by Kawasaki et al. (2024).

Food scene	**Dietary behaviours**
Food choice	● Food choice with total volume in mind ○ Choose the appropiate amount ○ Purchase food at an appropriate frequency ● Product characteristics ○ Choose non-processed foods ○ Choose organic foods ○ Choose locally produced foods

	○ Choose ingredients that are in season ○ Choose foods that allow you to have a plant-based diet ○ Choose foods that are fairly priced ○ Choose environmentally friendly foods ○ Choose safe foods (non-GMO) ○ Avoid foods from endangered plants and animals ○ Choose foods considering animal welfare ○ Choose ingredients you have sourced on your own ● Disposal in mind ○ Choose foods that minimize food waste and disposal ○ Choose foods that will allow you to minimize material waste ● Choose foods that you think are sustainable and healthy for you
Storing and preservation	● Find ways to fully consume ● Process foods to extend their shelf life ● Preserve foods to make them last longer ● Preserve in eco-friendly ways
Cooking	● Use leftovers ● Cooking the right amount of food ● Increase edible portions ● Cook at home ● Choose cooking options with low environmental impact ● Make food that you like ● Minimize disposal
Eating	● Avoid leftovers (avoid food waste) ● Avoid overeating
Disposal	● Sort and recycle waste ● Avoid contaminating sewage ● Make use of leftovers ● Reuse discarded ingredients and packaging

This study will apply the findings in Kawasaki et al. (2024) study and use the identified SDBs to ask Swedish citizens if they apply any of them to their daily lives. The exact method of Kawasaki et al. (2024) study cannot be applied due to time limitations. The same survey questions as well as additional ones will be used to identify what type of behaviours Swedish adults exhibit and see their understanding of the term SDB.

In addition, Kawasaki et al. (2024) conducted a cross-cultural analysis of Japan and Germany with the objective of identifying cultural differences in dietary behaviours. The choices made by consumers with regard to food are influenced by a number of factors, including social norms, culture and government policy. It can be posited that Western countries may exhibit greater environmental awareness as a consequence of governmental promotion, which in turn gives rise to behavioural changes. Furthermore, there is an increase in the personal impact of climate change in major economies, which gives rise to new social norms and behavioural changes (Kawasaki et al., 2024). As our study does not apply a cross-cultural analysis, the purpose is to see whether Swedish adults do exhibit these behaviours as well as seeing if there are any similarities between the findings of Kawasaki et al. (2024) on German adults and our Swedish respondents, given that they are both European countries.

4. Methodology

This research employed a quantitative approach to answer the research question of mapping dietary choices in Sweden. The main purpose of the study was to understand the dietary choices and behaviours of the Swedish population, which is why a cross-sectional survey was used to gather quantitative data on people's food choices. A cross-sectional survey was relevant because it was carried out during a short period of time with an observational study design with inclusion and exclusion criteria (Mohajan, 2020). Utilising a quantitative method offered the advantage of consistent data gathering via a questionnaire. This method facilitated a comprehensive analysis and allowed for connections to be drawn to sustainable dietary behaviours (SDBs) which is the theoretical framework for this study, aiding in understanding the various dietary preferences in Sweden.

To uphold ethical standards, the questionnaires refrained from collecting any sensitive personal information to ensure respondent anonymity.

4.1 Surveys

4.1.1 Methodological approach

For this study, surveys were better suited than interviews to answer the research question. By using surveys, a bigger set of data could be provided and more precise conclusions could be drawn.

4.1.2 Data collection method

The survey's target group were people residing in Sweden, able to read Swedish and above the age of 18. The reason for only focusing on people 18 years and older was because the study was examining what adults eat and not children and to avoid the administration of acquiring consent from legal guardians of minors.

Other aspects that were taken into consideration among the respondents were monthly income, level of education, gender and type of residential area (urban, suburban or rural). The reason for these questions was to determine whether income influences what people buy and eat and if the level of education has an effect on how deep their understanding is of what they choose to buy and eat and how it affects the environment.

The survey was made on Google Forms which is an already established and well-used tool for surveying and consisted of 19 questions (single, scale, and multiple-choice answers) and a statement with information to the respondents in the beginning. The selected platform to distribute the survey was Facebook groups. The selection process for the Facebook groups was as follows: a search term was used in Swedish (Sverige, friluftsliv, böcker, mat etc.) and was filtered on public groups with more than 1000 members. To distribute further, the survey was posted in location-specific Facebook groups across all 21 regions and 290 municipalities of Sweden. It was posted in four groups in each region and one in each municipality. However, for some municipalities, there were no public Facebook groups and due to time constraints, no effort was made to further search for one or become a member of the existing private groups. This decision was made while keeping in mind that the survey was posted in all of Sweden's regions which the missing municipalities Facebook groups are part of, therefore somewhat reaching the missing population. The survey was open from 27 March 2024 to 7 April 2024, a total of 11 days. It resulted in 287 responses.

4.1.3 Analysis method

The analysis method employed for the surveys was a basic statistical analysis conducted using Microsoft Excel to generate graphs and transform certain numerical data into percentages. The objective of the survey was to analyse the dietary choices, behaviour and reasoning of the Swedish population. The survey questions were designed to align with the research question and theoretical framework (SDBs) to ensure that the respondents' answers would contribute to the study.

4.1.4 Evaluation of the methods (method discussion)

According to Mohajan (2020), quantitative research involves the collection of numerical data within a specific time frame. This research method has been dominant in Western culture for a long time and is used to generate new knowledge. Using quantitative research methodology can help answer questions about relationships between measurable variables to explain, predict and control a phenomenon. Choosing a survey as a type of quantitative method is good because it helps us gather information from respondents to understand and predict some aspects of the behaviour of a specific group or population. This research method was invented by Paul Lazarsfeld, George Gallup, and Hadley Cantril to understand people and their beliefs, attitudes, opinions, motivations and behaviour. There are limitations to using this methodology, such as the inability to draw statistical relationships in the data, biases that may occur early in the process, and insufficient data to explain complex issues. Some positives are that the results can be used to generalise the entire population which is necessary for this study to find out the habits of the Swedish population. The results are also relatively easy to analyse and understand. The evaluation of quantitative research methodology is as follows “Quantitative evaluation criteria comprising the combination of validity, reliability and generalizability” (Mohajan, 2020). Validity can be achieved when conflicts of interest are minimised and the responses have been randomised as much as possible, reliability can be achieved when there is a sufficient amount of responses so that accurate and precise conclusions can be drawn and generalisation is important so that it can be applied to the population at large for an overview understanding of the whole population (Mohajan, 2020).

To achieve validity and reliability, the study had no conflicts of interest and the selection of responses was randomised as much as possible. Facebook groups were chosen by typing in search terms in Swedish such as Sweden, nature, movies etc. to bring up all kinds of groups. Then only those that were public and therefore open to anyone were chosen to post the survey. Only choosing the publicly open groups is not necessarily randomised. Since there's no way of knowing which kinds of people are in the groups it becomes semi-randomised responses. Despite the groups being open to the public, not all approved the request to post the survey. Some administrators approved the request after the survey was closed from receiving answers, therefore not entirely reaching everyone in those specific groups.

Reliability was achieved to some extent by acquiring a large amount of responses. This allowed the results to be diverse and for analysis and statistical tests to be made. The survey errors made in this study are coverage errors which means that a specific group of people were not included in the sampling. The survey was online which means certain population groups could not take part in the survey due to a lack of access to the Internet (Alwin, 2007). The sample must be inclusive for the generalisation of the answers to the rest of the population (Jacobsen, 2017).

The second survey error in this study is nonresponsive errors which means there was a failure to collect data from all population elements within the sample (Alwin, 2007). An example of this would be the survey not being sent to all municipalities because there were no public groups on Facebook. This is an error because the survey does not reach the people in those municipalities and might not be part of the regional groups either. It was also noticed that a large part of the sample were females and according to Smith (2008) it's not uncommon that more females participate in online surveys more than men.

Achieving full reliability is difficult when using surveys because the result can never be the same even if the same survey was sent out to the same people after a year. People change and what they answer today might not be the same next year and the situation they are in today might also not be the same next year. What adds to the difficulty is the fact that the survey is supposed to be random meaning anyone meeting the

qualifications can answer and their answers are always prone to be different (Agnafors & Levinsson, 2019).

All survey questions were based on the SDBs (see appendix 2), except for the demographic questions (1-5, see appendix 1) to enable an in-depth analysis of the results. The survey questions strategically asked the respondents if they do any of the SDBs within the five food scenes and also questions about dietary intake. In table 3, every survey question is shown and the purpose of the question is explained to further show how and why they were relevant to this study.

Table 3: All survey questions and an explanation of the purpose of each question.

No	**Question**	**Purpose**
First part - demographic questions		
1	What is your age?	Basic demographic question to determine what the sample looks like.
2	What is your gender?	–//–
3	What is your monthly income (before taxes)?	This question is asked since income can determine what type of lifestyle respondents have.
4	What is your highest attained certificate?	Connections can be drawn upon level of education and their dietary habits and behaviors.
5	Where do you live?	By asking respondents what type of residential area they live in (urban, suburban and rural), connections to sustainable dietary behaviors can be made.
Second part - dietary choices		
6	How often do you eat the following foods per week?	The purpose of this question was to map out respondents food intake.
7	Approximately how much of these foods do you eat per week?	This question is needed in order to determine environmental impacts of the respondents food intake.
8	Estimate how much of these foods you eat per week (eggs and fruits)	–//–
9	Estimate how much of these foods you eat	–//–

	per week (Berries, seeds and nuts)	
10	Based on the options below, which factor(s) influence your dietary choices? Choose a maximum of 3.	This question is asked to determine what factors influence respondents dietary choices in order to make connections to their food intake and SDBs.
11	Which one of the following dietary patterns did you know about before today?	Knowledge about different plant-based dietary patterns will enable for a further analysis on respondents dietary choices.
12	From the pervious list of dietary patterns, is there one that you are applying to your every day life?	This question acts as a clarification if some respondents are applying plant-based dietary patterns to their lives since it does not show in the previous questions.
	Third part - understanding of sustainable dietary behaviors	
13	What do you think the term “sustainable dietary behaviors” mean?	Respondents' knowledge is tested on SDBs to answer the research question of this study.
14	From the following list of “sustainable dietary behaviors” within **food choice**, pick max 3 alternatives that you do in you every day life.	Map out and identify if respondents display any SDBs within a specific food scene.
15	From the following list of “sustainable dietary behaviors” within **storing and preservation**, pick max 3 alternatives that you do in your every day life.	–//–
16	From the following list of “sustainable dietary behaviors” within **cooking**, pick max 3 alternatives that you do in your every day life.	–//–
17	From the following list of “sustainable dietary behaviors” within **eating**, pick max 3 alternatives that you do in your every day life.	–//–
18	From the following list of “sustainable dietary behaviors” within **disposal**, pick max 3 alternatives that you do in your every day life.	–//–
	How important is it for you to practice the “sustainable dietary behaviors” that you picked above? Choose the most	This question is asked after each food scene question in order to determine how important it is for

	appropriate alternative for you (1 = not important, 4 = very important).	respondents to practise SDBs.
19	From the following list, what barriers do you encounter in order to practice sustainable dietary behaviors more often or more than you do today. “Sustainable dietary behavior”: purchasing, eating, and disposing of food in consideration of “sustainability.”	Last question of the survey was to identify what barriers respondents encounter when practising SDBs. This question allows for a discussion on possible solutions on how to improve the food system in Sweden.

4.2 Sources

This study’s sources used an array of academic articles, books and official government agency reports. Search engines used were such as Google Scholar and Söderscholar (Södertörn University library search engine). Ulrichweb was used to check if journals were peer-reviewed and therefore credible. Majority of the journals used were peer-reviewed. The books used are student literature books developed for students' use.

5. Results/Analysis

The results gathered in this survey sample came to a total of 287 responses. The respondents' ages varied with the majority being older adults in the age range of 55-65+ (23% respectively). Most of the responses came from female respondents (83%). The majority of the respondents had their studies finalised at a university level with either bachelor, master's or PhD degrees (53%).

The results from the survey will be presented below and analysed in accordance. The survey was structured as following: three sections dividing the questions into three different categories. The first section consisted of 5 questions about the respondents’ demographics. The second section consisted of 7 questions about their dietary choices and knowledge about plant-based patterns. The last section consisted of 7 questions about sustainable dietary behaviours to map out consumers' knowledge and understanding and what type of behaviours they exhibit. Almost all questions in the last section have all individual follow-up questions asking respondents to rate the

importance of each question they answer from 1 to 4 (1 being 'not important' and 4 being 'very important'), making section three have an actual total of 12 questions.

5.1 Section 1

In the first section of the survey, basic demographic questions were asked. The first question of the survey was to determine the age of the respondents. Below are diagrams for the age distribution of the sample.

1. What is your age?

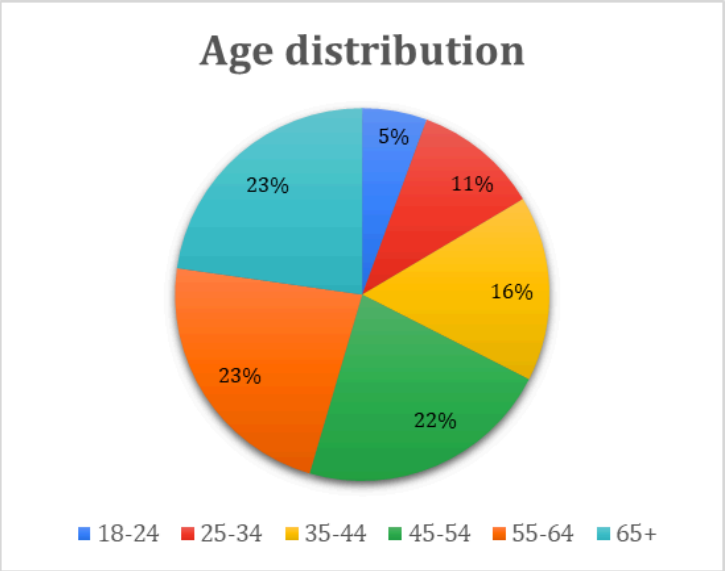

Figure 3: Results of the first survey question 1. The pie chart shows an even distribution of the ages of the respondents with 55-64 (23%) and 65+ (23%) being the majority. The 18-24 (5.6%) and 25-34 (11 %) being the minority.

This sample has a relatively even distribution amongst the age groups. However, there's a minority of younger people in this sample with only 18-24 years old making up 5% of the sample and 25-34 years old making up 11% of the sample. This can have implications on the results of the survey, since a young age can affect a monthly income and your education level which in turn affects your shopping and eating habits.

This sample also has a majority of female respondents (83%) which can affect the results with a bias. Females are more likely to respond to surveys as well as more likely to exhibit sustainable behaviours which means the results can be skewed, showing that

this population displays sustainable behaviours when in reality, not all parts of the population has answered.

Next was the monthly income question where respondents had to estimate if their income was low, average or high. The results are presented in the diagram below.

3. What is your monthly income before taxes?

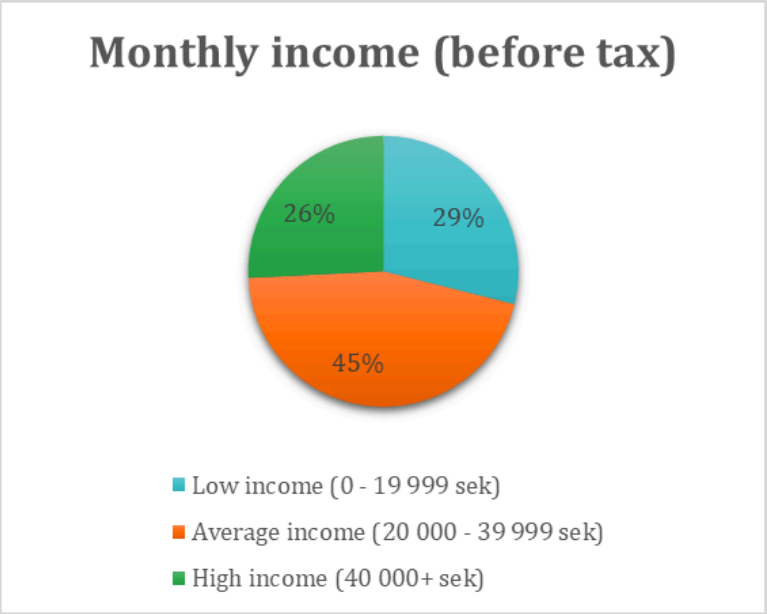

Figure 4: Results of survey question 3 "What is your monthly income (before taxes)" where the majority answered they have an average income (45%).

In this sample, the majority have an average monthly income spanning from 20 000-39 999 Swedish crowns (SEK) before taxes. The amount of low- and high-income respondents are similar with 29% respectively 26%.

Question 4 asked respondents to answer what their highest attained certificate was. A majority had finished their higher education and attained either a bachelor's, master's, or PhD degree (53%). The second largest group had high school/secondary school as their highest attained degree (31%).

Education and income have huge impacts on a person's overall behaviour and specifically in this case, their behaviour towards sustainable food choices. The

knowledge they may have when handling food from farm or shop all the way to the table and disposal has an impact on the climate. As well as if they are able to afford the foods that are better for them and ultimately better for the planet in the long run.

The last question in the first section of the survey was question 5 asking respondents where they live. The alternatives were urban, suburban, and rural.

5. Where do you live?

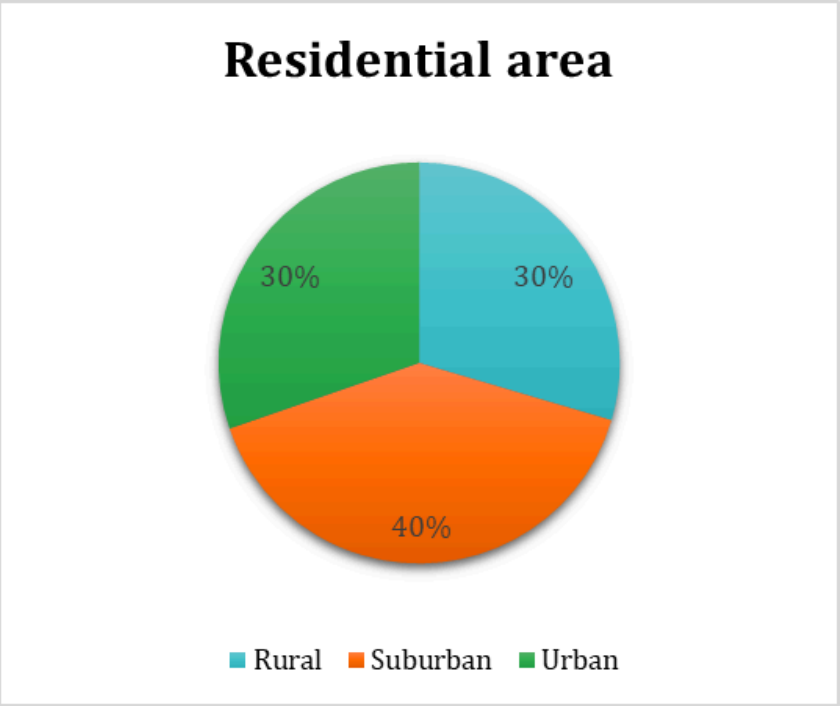

Figure 5: Results of the first survey question 5. There is almost an even distribution of where respondents live with most of them living in suburban areas (40%).

Looking at the pie chart, the distribution is even amongst the alternatives, however, there's a slight majority living in suburban residential areas (40%). Area of residence can affect how people answer the questions in the survey since sustainable behaviours often depend on accessibility and convenience of, for example, distance to grocery stores and product selection in said stores.

People in urban areas are likely are likely to buy foods found in stores and since they do not have that many choices as to where they can get their foods from. Those living in suburban areas are more likely to buy foods from stores but can also have their own

gardens where they can grow various produce like tomatoes, potatoes, herbs and other greens. Those living in rural areas have a choice of buying in stores but might experience difficulties due to long distances or they can source their own food and depend on their own produce.

5.2 Section 2

The second section aims to map out the respondents' dietary intakes and choices. This section consisted of 7 questions about food intake and the knowledge of plant-based dietary patterns.

The first question in this section, question 6, asks respondents to estimate how often they eat the following foods per week. They were provided with a list of the major food groups and had to estimate how many times per week they ate each food group.

6. How often do you eat the following foods per week?

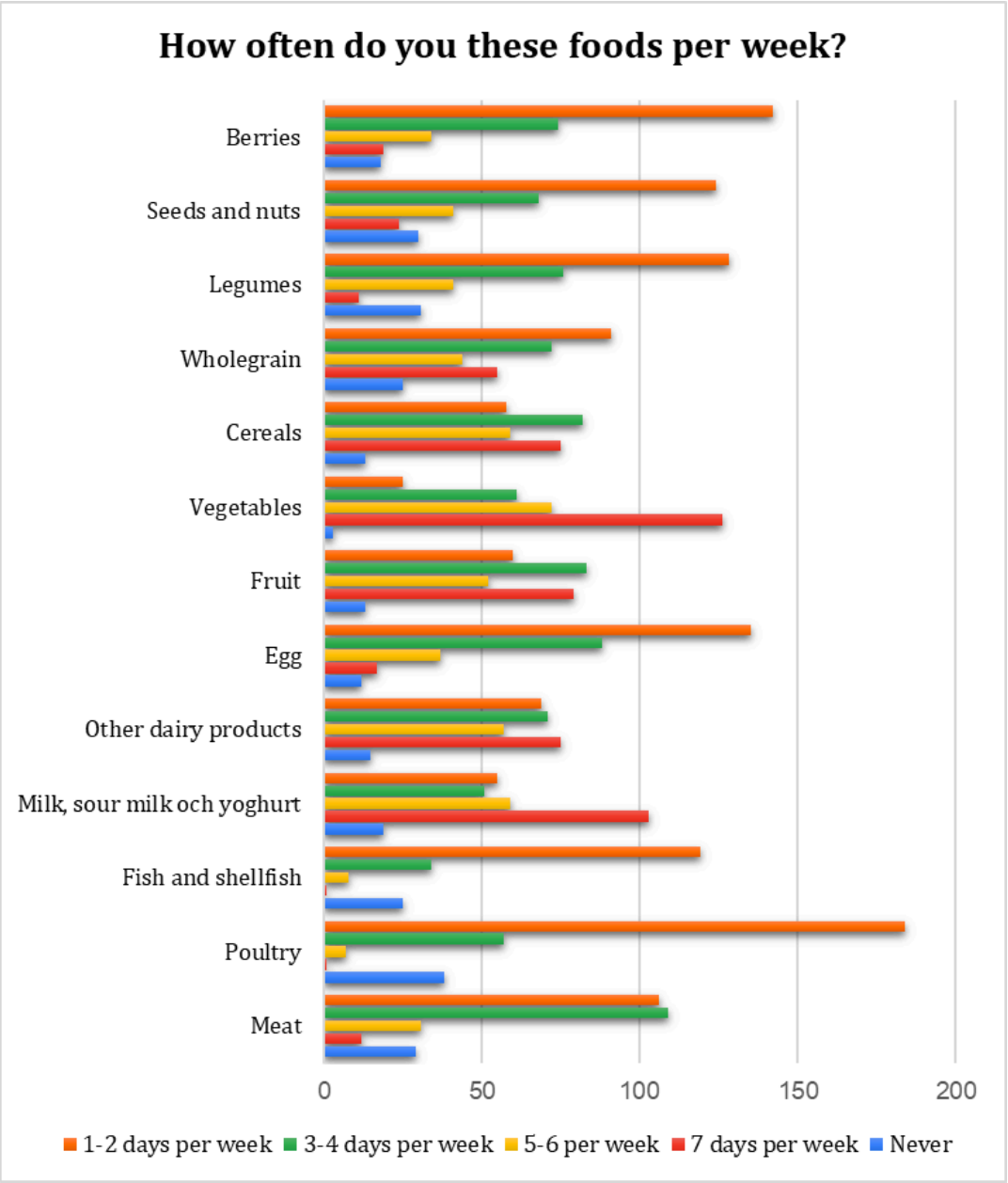

Figure 6: Bar chart showing the results of survey question 6 "How often do you eat these foods per week?". Respondents were provided with a list of food groups and could select how many days per week they eat each food group.

Looking at the diagram, the most notable results are that people eat berries, seeds and nuts, legumes, wholegrain, eggs, fish and shellfish and poultry only 1-2 days per week. The interesting food groups to look at are meat and dairy consumption since these emit the most CO_2. The majority of people in this sample consume dairy products seven days per week, while meat is only consumed three to four days per week. However, it is worth noting that many people also consume meat only 1-2 days per week.

It can be concluded that although meat is consumed on average 1-2 times per week, which is not excessive, there are other types of meat or animal-based proteins consumed in the same week. On days when meat is not consumed, poultry, fish, and shellfish may be selected as an alternative. From this perspective, it can be seen that meat is consumed on a considerable number of days per week, which leaves little room for other dietary options. Should this be the case, further information will be provided in response to question 12 below.

The next question asked respondents to estimate how much of the previous food groups they eat. This is relevant since merely stating that a certain food group is consumed on a certain number of days per week does not necessarily indicate the quantity of that food group consumed.

7. Approximately how much of these foods do you eat per week?

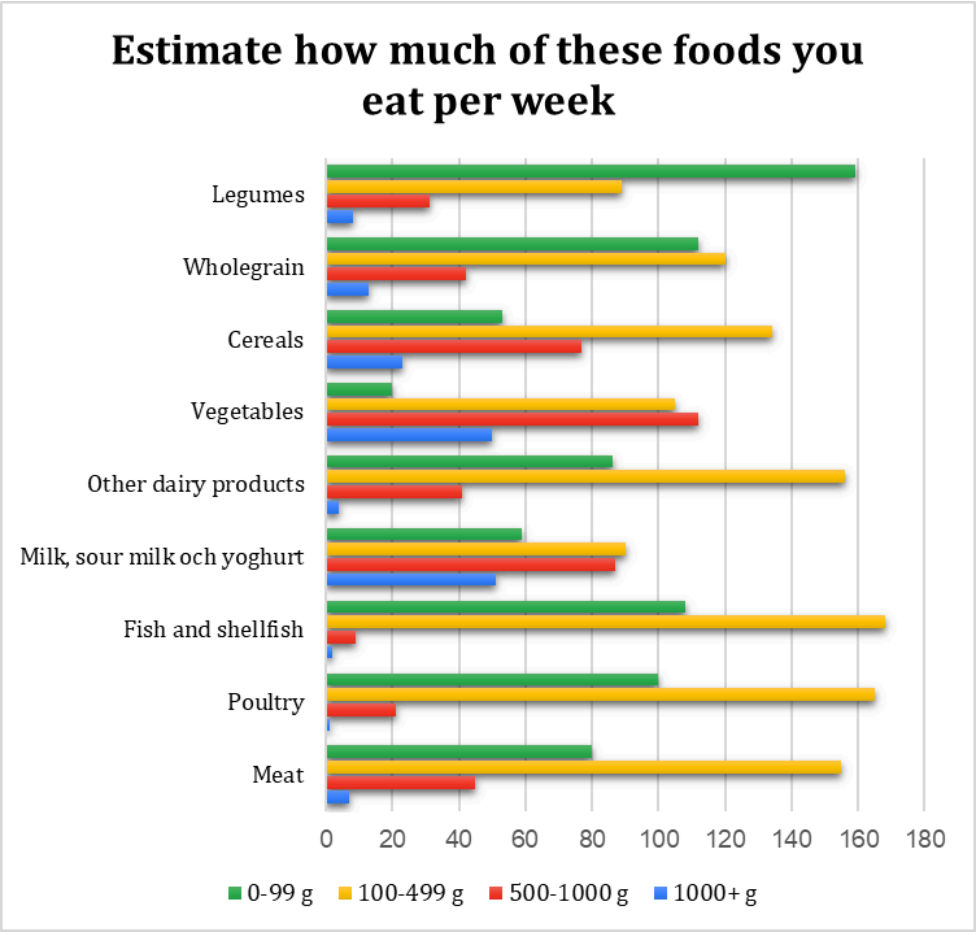

Figure 7: Bar chart showing the results of survey question 7 "Approximately how much of these foods do you eat per week?". Respondents were provided with a list of major food

groups and set quantities where they had to select an estimate how much of each food group is consumed per week.

Note that not all food groups are included in this question since berries, seeds and nuts, eggs and fruits have different measurements and were therefore made into their own questions to be analysed. The results show that the least consumed food groups were legumes with almost 160 people saying they only eat 0-99 g of it each week. There is a majority of people eating 100-499 g of wholegrain, cereals, dairy products, fish and shellfish, poultry and meat per week. Vegetables are the only food group with the majority saying they consume it 500-1000 g per week and looking at the previous question it was the only food group people ate 7 days per week. We can then assume people eat vegetables with their every meal, every day.

Once more, a considerable proportion of the population consumes dairy products, particularly milk, sour milk and yoghurt. A comparison of the current question with the previous one reveals that respondents have selected a quantity of protein options (meat, poultry and fish) that is relatively low. This is evidenced by the fact that respondents have indicated that they consume between 100 and 499 grams of protein per week. However, an analysis of the frequency of consumption of each protein group reveals that meat is consumed 3-4 days per week, poultry 1-2 days per week, and fish 1-2 days per week. This indicates that the majority of respondents consume a protein option at least once per day, with the likelihood of consuming it for two or more meals per day. Nevertheless, it is not possible to conclude from these two questions alone that the majority of respondents are not incorporating a plant-based diet. This will be further addressed in question 12.

Question 8 (Estimate how much of these foods you eat per week: eggs and fruits) was meant to follow up on how many of each item (eggs and fruits) respondents eat. However, because of an error in the survey, the results for question 8 are invalid. When asking respondents how much they consume of fruits and eggs, in the survey a ‘g’ was added indicating that we were asking for how many grams of the foods they eat when the intention was to ask how many pieces of each food item they consume. We cannot

assume that respondents understood this when answering the questions and therefore cannot be analysed.

Question 9 asked respondents how much berries, seeds and nuts they consume, using the same type of layout as in the two previous questions.

9. Estimate how much of these foods do you eat per week?

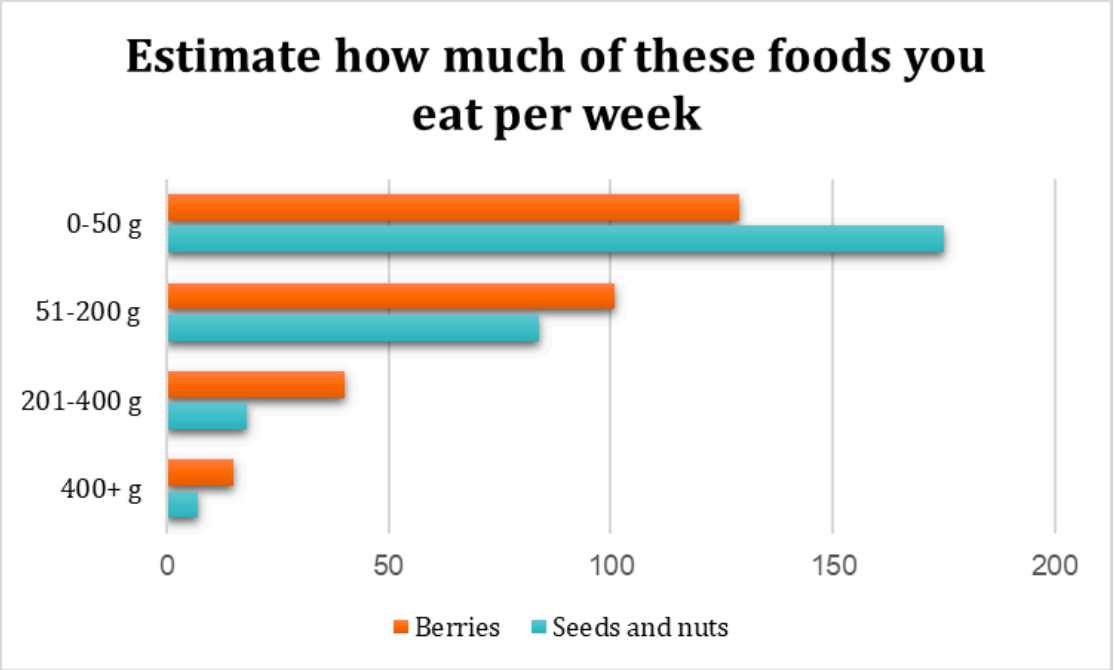

Figure 8: Bar chart showing the results of survey question 9 "Approximately how much of these foods do you eat per week? (Berries and seeds and nuts)". Respondents were provided with a list of quantities and had to select an estimate of how much they consume of each food group.

This figure is a complement to question 6 to get a better understanding of how much of the foods is consumed during the week. The majority of the respondents answered that they ate these foods 1-2 times a week which makes sense considering the amount. As can be seen in the figure above (8) the majority eat about 50g of berries, seeds and nuts.

These were all the questions regarding dietary intake. The following question aimed to identify the factors that influence respondents' dietary choices. Respondents were asked to select a maximum of three options that affect their dietary choices or provide their own answer.

10. Based on the options below, which factor(s) influence your dietary choices? Choose a maximum of 3.

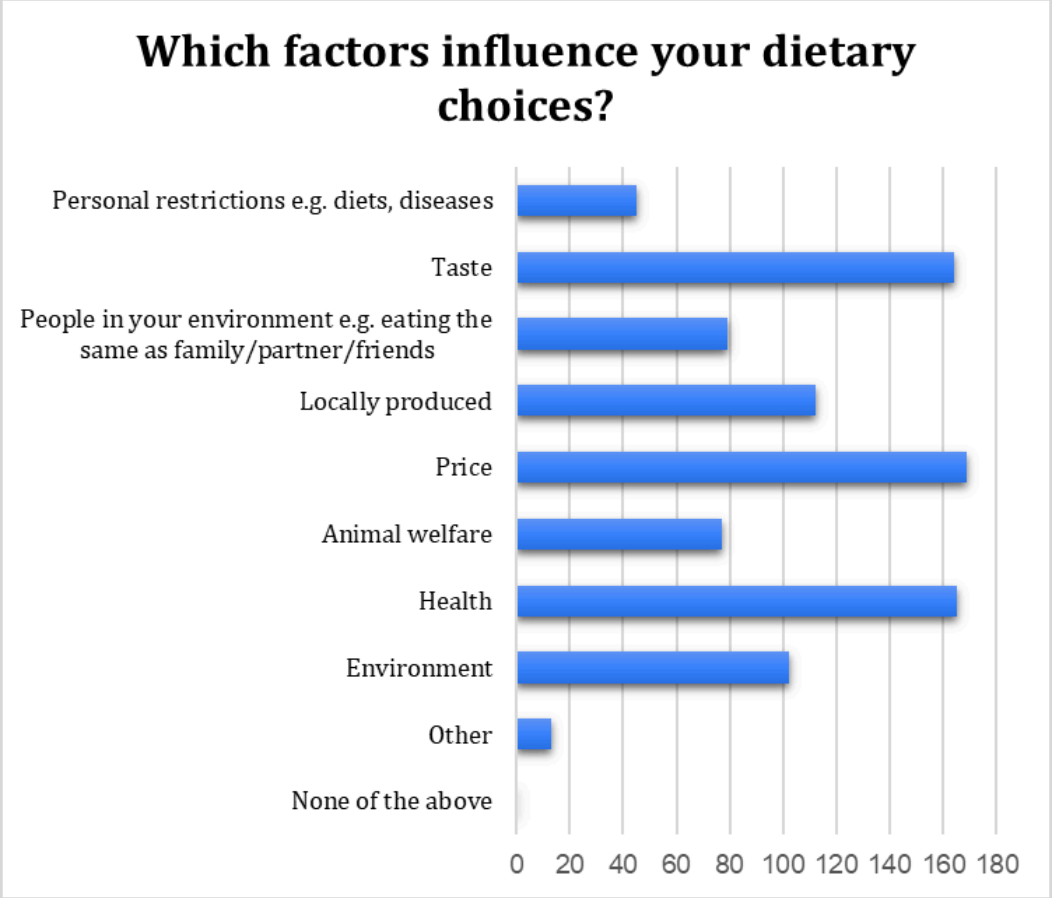

Figure 9: Bar chart showing the results of survey question 10 "Which factors influence your dietary choices?".

The results show that price (59%), taste (57%) and health (58%) are the most influencing factors since the majority of people picked these three options. The most significant factor influencing consumer choice is the price. This is because the price of a product or service is a key determinant of whether or not it is purchased and subsequently consumed. As can be seen, about 102 people picked environment which is slightly lower than the amount of people that picked locally produced (112) which is interesting to take note of.

Some of the answers in the option "Other" were: hunting, quality, habit etc. 'Hunting' was a recurring answer in the option "Other". There seems to be a small group of people

that are sourcing their own food which is logical because about 30% of respondents lived in rural residential areas which will give them access to hunting grounds.

Questions 11 asked if the respondents were aware of any plant-based diets that were listed in the question (vegetarian, vegan, pescetarian, flexitarian, lacto-ovo-vegetarian, lacto-vegetarian and ovo-vegetarian). The majority of them knew of or had heard of most of them prior to the question. It was only 2.1% of the total that had never heard of them or were not aware of them up until the point of the survey.
The majority of individuals who were previously unaware of any of these dietary patterns were those in the 55-64 age bracket. Two respondents were aged 65 and over, while one was between 45 and 54 years old. This suggests that this older generation of people are more likely to consume meat or any type of animal-based protein on a daily basis simply because of habit. Additionally, the majority of older people might be low-income individuals living independently or in care homes, where they are cooking for one or two people. As individuals age, they may experience a decline in their energy levels, which may impede their ability to prepare new and innovative meals, including those based on plant-based ingredients.

Question 12 enquired whether respondents incorporated any of the previously mentioned dietary patterns into their daily lives. The majority (53.3%) responded that they did not apply any of the diets to their daily routine. However, 19.2% of respondents reported following a vegetarian diet pattern, which is a significant proportion of the total respondents. The second most popular response was following a flexitarian diet, with 15.3% of respondents reporting this. Given the significant number of individuals who follow a vegetarian diet, it is likely that this will have an impact on the survey findings. This can be seen in the questions regarding how much meat is consumed.

5.3 Section 3

The aim of the third section of the survey was to assess respondents' knowledge and understanding of the term 'sustainable dietary behaviours'. The first question in this section asked respondents to provide their own interpretation of the term. Following this, a definition of sustainable dietary behaviour was provided before respondents could proceed to the remaining questions in section 3. This definition was written to aid

the reader in comprehending the upcoming questions. The definition provided was sourced from Kawasaki et al. (2024).

The explanation was as follows :

> "Sustainable dietary behavior refers to purchasing, eating, and disposing of food in consideration of "sustainability." In other words, "purchasing, cooking, storing, eating and disposing of food for current and future generations to have a healthy and safe diet with little impact on the environment." Sustainability is defined as the "capacity to meet long-term human needs enduring over many generations."" (Kawasaki et al., 2024)

Question 13 (What do you think the term "sustainable dietary behaviours" mean?) was an open question to find out what respondents knew about sustainable dietary behaviour. Out of all 287 responses, there were 15 people that said 'I don't know'. After analysing the answers, what we could see was that a majority of people mentioned the environment in their answers (total of 117 responses had the word 'environment'). Common answers were 'good for the environment', 'environmentally sustainable', 'environmental thinking', 'eating in a way that's good for the environment', 'health' and 'the economy'. Health was a recurring answer with 49 answers mentioning 'health' or 'health benefits'. Most responses were short answers with one or a few words but there were some answers with a longer explanation. One example is:

> "It is a very broad definition that covers many aspects. Part of the concept refers to a sustainable diet for the individual, with a focus on a nutritious diet. The concept also includes more complex issues such as climate, biodiversity, animal welfare, economic sustainability, reasonable working conditions for those who produce the food, fulfilment of basic human rights, good animal welfare, food waste, reasonable use/management of the earth's resources, water use, energy use, etc. The aforementioned examples influence whether a dietary behaviour is sustainable or not, however, the concept is very broad and not always straightforward."

This was a very detailed answer and most responses did not look like this. However, this respondent has managed to capture the meaning of sustainability very well and what it means to have sustainable dietary behaviours. However, they did not mention the part of not jeopardising future generations which is part of this paper's definition of sustainability. A few responses did mention this part and from this we can conclude that

a majority of people seem to associate the term ‘sustainable dietary behaviours’ with the environment and with health, trying to be sustainable with respect to the ecological aspects of sustainability.

The next questions asked the respondents directly if they exhibited any of the sustainable dietary behaviours mentioned in the Kawasaki et al. (2024) study. The questions were divided into the five food scenes with an additional question asking the respondents to rate the importance of exercising the behaviours. The first food scene was food choice and had 16 behaviours to choose from (as well as the options ‘Other’ and ‘None of the above’).

*14. From the list of "sustainable dietary behaviours" in **food choices**, choose a maximum of 3 options that you do in your everyday life.*

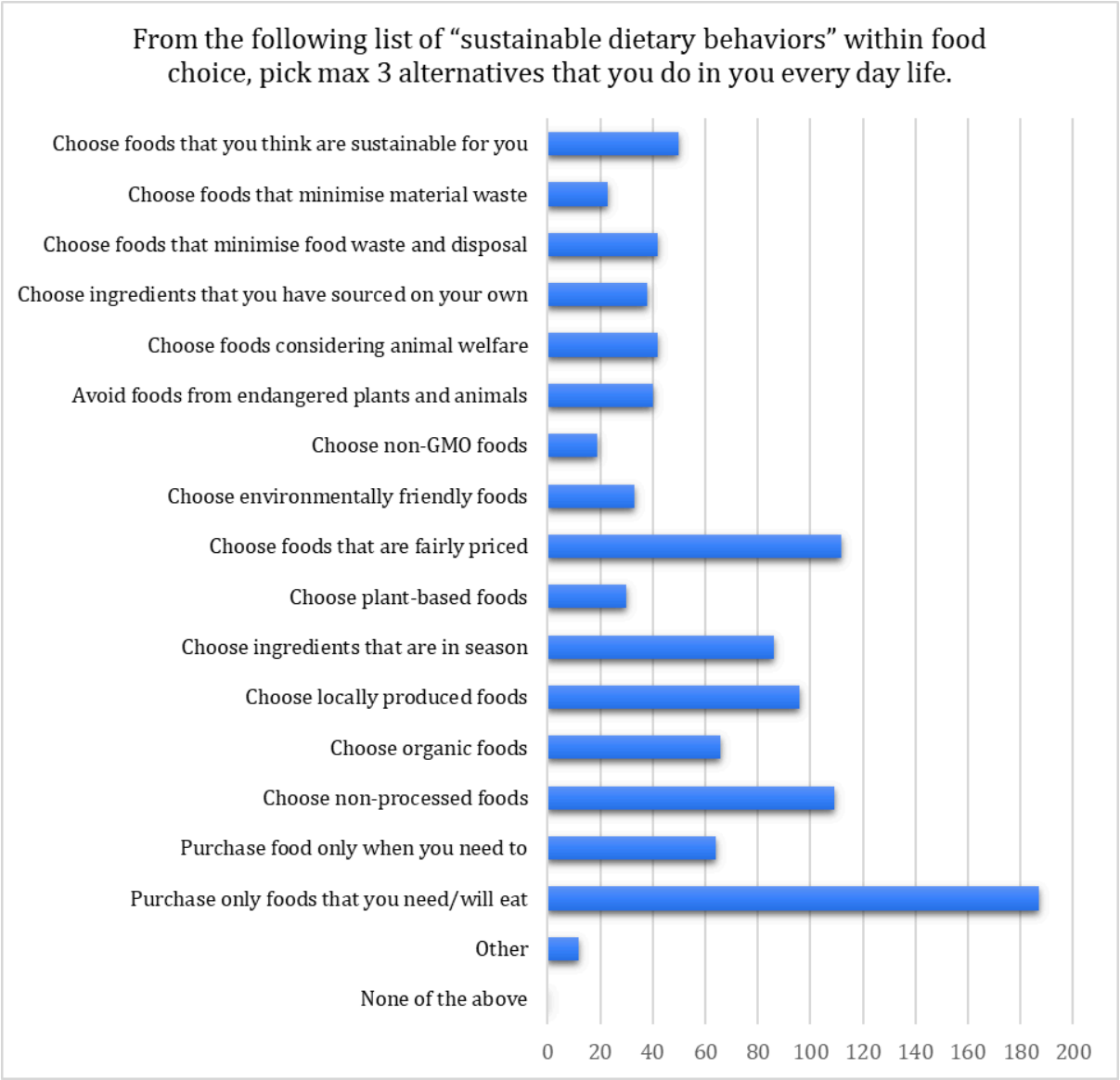

Figure 10: Bar chart showing the results from survey question 14. The results indicate that the majority only purchase foods that they know they will eat/need.

The dominating behaviour on this question within food choice was 'Purchase only foods that you need/will eat' with 187 people choosing this option. Second most popular option was 'Choosing foods that are fairly priced' (112) and third most popular was 'Choose non-processed foods' (109). If we look back to question 10 on what influences people's dietary choices, the dominating option was Price which is also reflected here. People consider price the most when making decisions on food. Only purchasing foods that they need and will eat can also be a reflection of considering price since people won't buy foods they don't eat because that's wasted money.

When asking respondents how important it is for them to exercise these behaviours, the majority answered 3 on a scale from 1-4, where 1 was not at all important and 4 very important. A total 134 people (47%) answered 3 while 110 people (38%) answered 4. The majority think it's moderately important to do these behaviours that they selected.

The next food scene was storing and preservation, which had 3 behaviours to choose from with the options Other and None of the above.

15. From the following list of "sustainable dietary behaviors" within ***storing and preservation****, pick max 1 alternative that you do in your everyday life.*

Figure 11: Bar chart showing the results of survey question 15 where majority of respondents chose the alternative "Find ways to fully consume" (231).

Looking at this diagram, the dominating behaviour was Finding ways to fully consume with 231 people picking this alternative. There are extremely small amounts of people who process and preserve their foods to store them. This means that foods that are not consumed, most likely are disposed of. This is a reasonable assumption, and a conclusion can be drawn based on the fact that the majority of people lived in suburban

areas where they can purchase their food from stores. This can also mean that the food they buy might already be processed and pre-preserved.

When asked how important it is for respondents to perform these behaviours, the majority answered 4 (very important) with 138 people (48,1%) and 116 people (40,4%) choosing 3 (moderately important).

Next, respondents were asked about their behaviours around the food scene cooking. Here, they had to pick a maximum of 3 out of 6 alternatives within cooking not counting Other and None of the above.

*16. From the following list of "sustainable dietary behaviors" within **cooking**, pick max 3 alternatives that you do in your everyday life.*

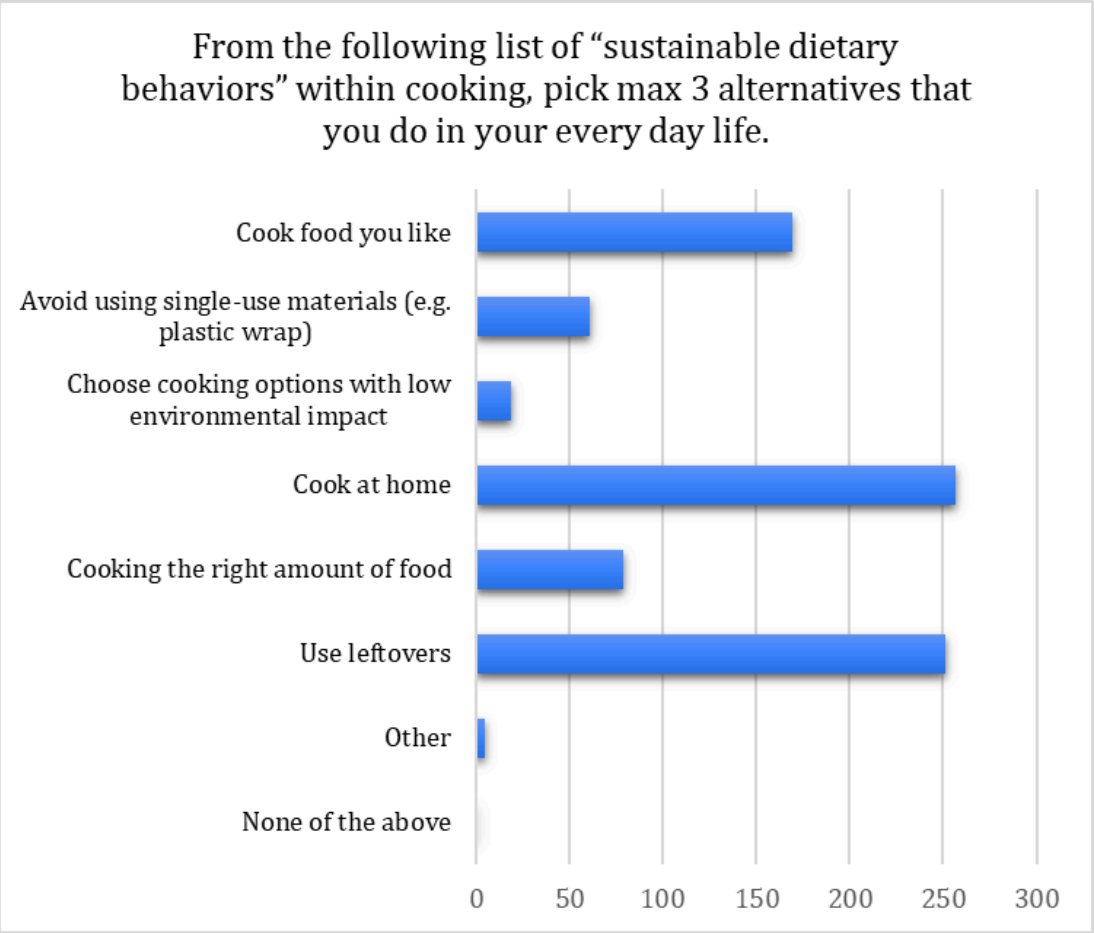

Figure 12: Bar chart showing the results of survey question 16. The results indicate that the majority cook at home (257) and use leftovers (251).

The majority seems to cook at home (257 people) as well as use leftovers when cooking (251 people). There's also a notable amount of people choosing to cook food that they like (169 people). One conclusion that can be drawn from this is that the majority of people are aware of the prices and therefore seek to be cost-effective. This leads them to eat out less frequently and to use leftovers. This represents a significant and sustainable behavioural change, as it results in a reduction in the amount of food that is ultimately discarded.

When asked how important it was to perform these behaviours, the majority with 163 people (57%) responded 4 (very important). The second most popular with 104 people (36,4%) answered 3.

Next, respondents were asked about their behaviours around the food scene eating. Here, they had to pick a maximum of 1 out of 2 alternatives within eating, not counting Other and None of the above.

*17. From the following list of "sustainable dietary behaviors" within **eating**, pick max 1 alternative that you do in your every day life.*

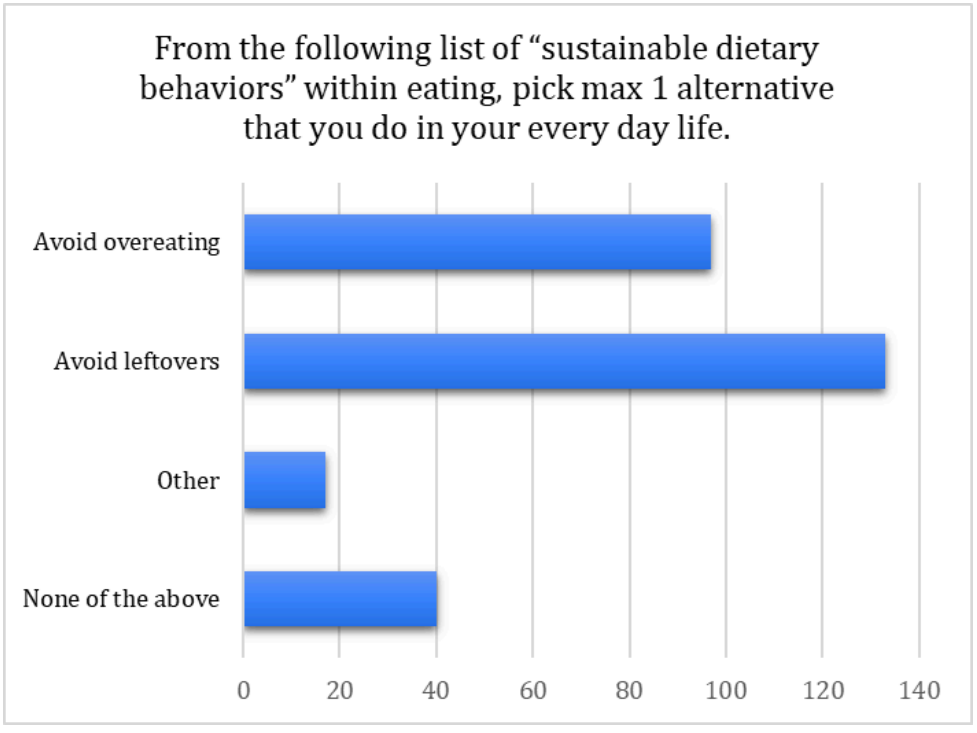

Figure 13: Bar chart showing the results of survey question 17. The results indicate that the majority avoid leftovers (133).

Looking at the results, the majority picked avoid leftovers with 133 people choosing this alternative. The close second was Avoid overeating with 97 people choosing this alternative. In this food scene, there was the largest amount of people choosing None of the above as their answer (40 people) out of all the food scenes. The only other food scene that has respondents picking None of the above is Storing and preservation.

Both these alternatives in this food scene are contradicting to each other since avoiding overeating would then leave you with leftovers. However, if you avoid leftovers it could lead to overeating. This was also noted in Kawasaki et al. (2024) study where their respondents reported both these behaviours and the authors' noted that these behaviours might be contradicting and suggest in order to solve this, implement another SDB such as choosing the right amount of food.

Some of the answers in 'Other' were only taking as much food as you eat, giving food to pets or animals such as cats, dogs or chickens. Some respondents seem to have misinterpreted the question saying they freeze their food or put it back in the refrigerator. While these are valid behaviours to perform, they do not count in the food scene of eating. Those belong to storing and preservation which was asked about beforehand.

When asked how important these behaviours were for the respondents, most people answered 4 (very important) with 117 people (41,3%) picking this option. While 103 people (36,4%) picked 3 (moderately important). This food scene had the most amount of respondents choosing 1 (not at all important) with 23 people choosing this (8,1%). While this is not a large amount of people, it's the one food scene with the most amount of respondents actively choosing 1. This means these 23 people don't see the importance of performing these behaviours or maybe that they don't perform any of the behaviours at all.

Next, respondents were asked about their behaviours around the food scene Disposal. Here, they had to pick a maximum of 2 out of 4 alternatives within Disposal not counting Other and None of the above.

18. From the following list of "sustainable dietary behaviors" within ***disposal****, pick max 2 alternatives that you do in your every day life.*

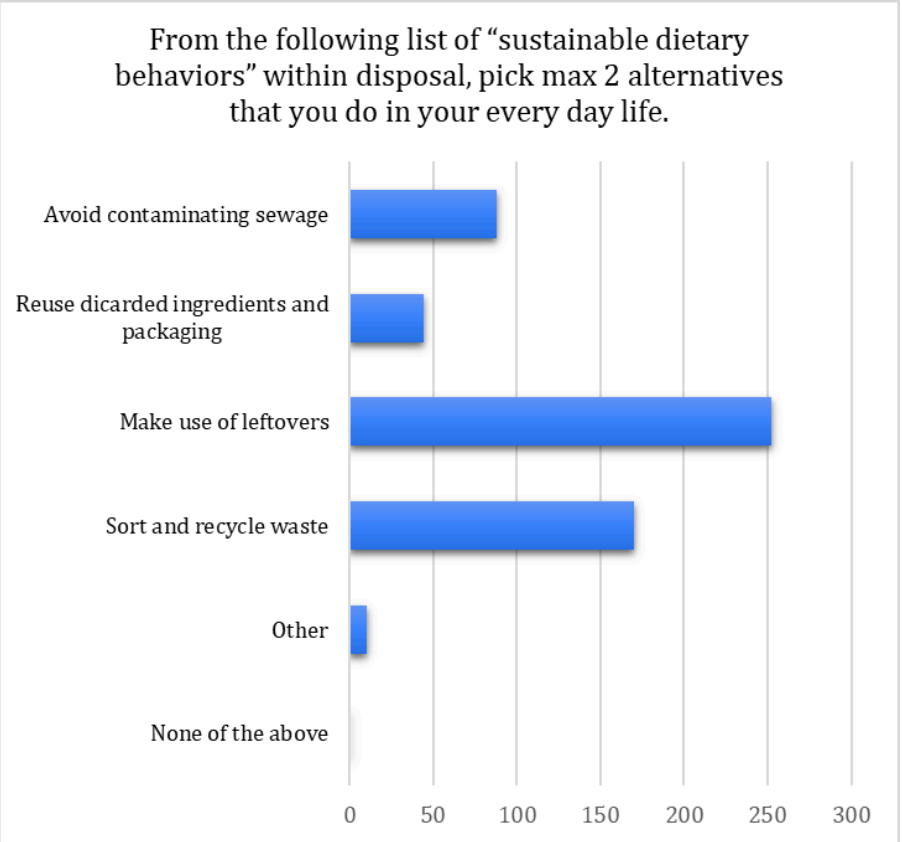

Figure 14: Bar chart showing the results of survey question 18. The results indicate that the majority make use of leftovers (252).

In the last food scene, the dominating answer was Make use of leftovers with 252 individuals selecting this option. The second most popular response was to sort and recycle, with 170 individuals selecting this option. This is noteworthy, as the majority of respondents answered "avoid leftovers" (133) in the previous question. However, when examining this question (18), it appears that respondents do in fact have leftovers that they use. This is not unexpected, given that some respondents to question 17 indicated that they freeze, compost or give their leftovers to animals such as dogs or chickens. It appears that there is a consensus among this sample to reduce food waste. This can also be observed in the first food scene, food choice, where respondents selected the option of only purchasing foods that they will eat or need. By adopting this mindset, it is possible to reduce the unnecessary overconsumption of food and food waste.

When asked how important these behaviours were for the respondents, most people answered 4 (very important) with 161 people (56,1%) picking this option. While 93 people (32,4%) picked 3 (moderately important). Again, there's a need amongst respondents to reduce their food waste as much as possible.

Going back to Kawasaki et al. (2024) who found that German adults focused on local production, plant-based diets and avoiding material waste, we can see in the Swedish sample that they have similar sentiments as the Germans. There might be different reasons for this which is mentioned in Kawasaki et al (2024). Culture and government policies can vastly affect what type of sustainable behaviours people exhibit. This survey has further proved that Sweden and Germany most likely have similar type of sustainability narrative that guide citizens in their every day lives. There's a large amount of vegetarians (19%) in this sample whereas about 9% of the Swedish population are vegetarians. This indicates that people value plant-based diets since there was also a large group of flexitarians (15%) who eat vegetarian meals a few times a week.

The last question in the survey which was modified from Kawaksaki et al. (2024) study, asked if respondents noticed any barriers in trying to perform the behaviours that were previously asked about in this last section.

19. From the following list, what barriers do you encounter in order to practice sustainable dietary behaviors more often or more than you do today.
"Sustainable dietary behavior": purchasing, eating, and disposing of food in consideration of "sustainability."

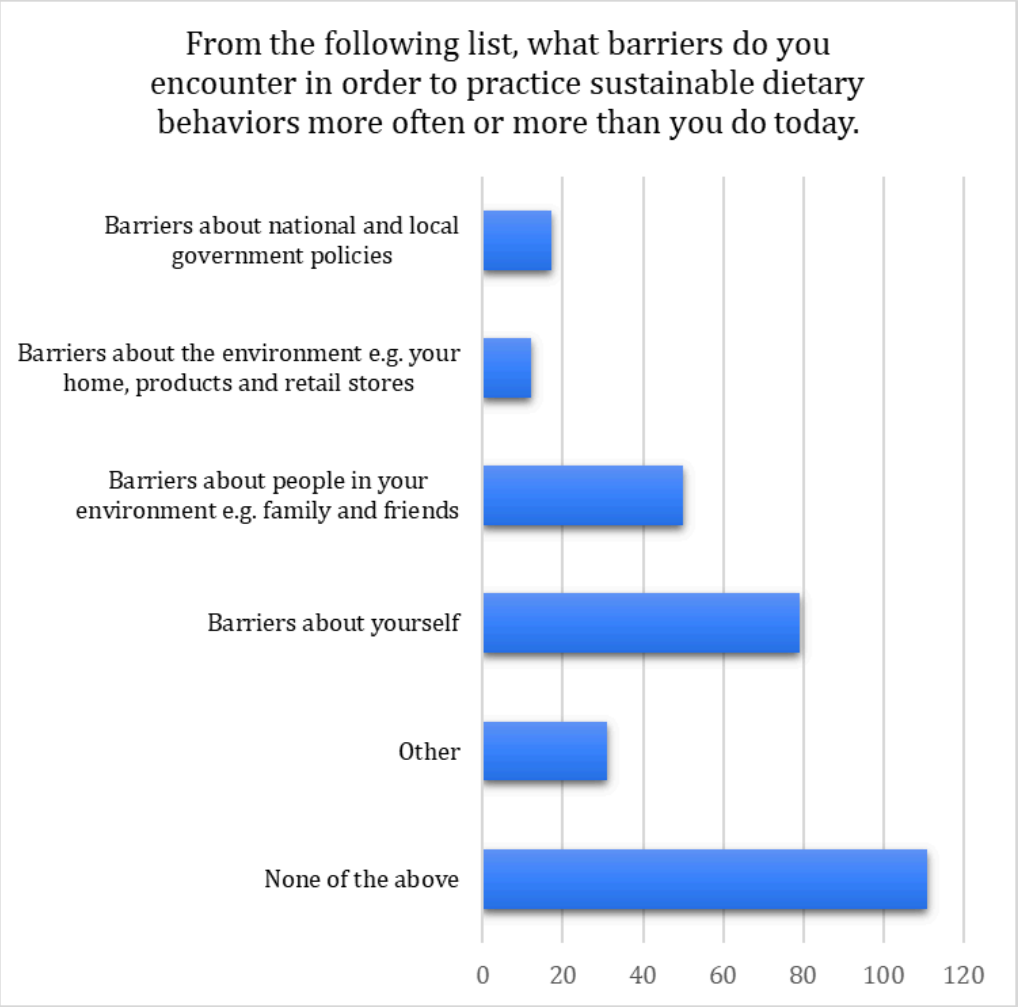

Figure 15: Bar chart showing the results of survey question 19. Most respondents didn't identify any barriers (111) but the next most popular alternative was barriers about yourself (79).

Looking at the results, the majority answered None of the above (111 people) while the second most picked option was Barriers about yourself (79 people). However, when looking at the answers in the 'Other' alternative, some respondents have misinterpreted the question and said things such as 'Bad selection in grocery stores' or 'Prices in grocery stores' etc. which counts as Barriers about the environment although some respondents might feel the need to explain themselves and that's why they pick the Other option. The majority of respondents select "None of the above" for a variety of reasons. Some may feel that they encounter no barriers, while others may lack the understanding of the question or may simply indicate that none of the alternatives align

with their expectations. However, they may be reluctant to provide further clarification in the "Other option" section.

The reason why this question is asked is to map out what type of barriers that people encounter which can help in crafting policies regarding sustainability. There's a need to understand the root of the problem in order to change people's behaviours.

To summarise the results and analysis, this sample consists of mainly females with an even age distribution (although a minority of younger people between the ages of 18-34) who live in suburban areas. They have an average monthly income before tax (20 000-39 999 SEK) and the majority have finished university studies. Looking at their dietary patterns, there's a quite large amount of vegetarians (19,2%) and flexitarians (15,3%). Most of the respondents reported they eat a lot of vegetables and dairy products every week. While berries, seeds and nuts, legumes, wholegrain, eggs, fish and shellfish and poultry were consumed less. The top three influencing factors for this sample was taste, price and health. Further, when asked about sustainable dietary behaviours, majority of respondents said they think it's connected to eating environmentally friendly and healthy. The most popular behaviours in each food scene was: Purchase only foods you eat/need, choose foods that are fairly priced, choose non-processed foods, choose foods that are locally produced (food choice). Find ways to fully consume (storing and preservation) and Cook at home, use leftovers, cook food you like (cooking). Avoid leftovers, avoid overeating (eating) and Make use of leftovers, sort and recycle waste (disposal). Respondents felt that they did not identify any of the mentioned barriers in the survey but out of the listed barriers, majority found barriers in themselves and in people in their environment (friends/family/partner).

6. Discussion

6.1 Answering the research question

The research question for this study was: *How knowledgeable are Swedish individuals about sustainable eating practices, and what sustainable behaviours do they exhibit in their dietary choices?*

In order to address this question, this study employed a survey to investigate Swedish adults' understanding and knowledge of SDBs, as well as to map out their dietary choices and behaviours. With regard to the first question of Swedish adults' understanding of 'sustainable dietary behaviours', the majority of respondents said they thought it was linked to the environment and to health. However, a small number of respondents provided responses that were almost exactly the definition of SDBs, which suggests that there may be some individuals who are educated within the field of environmental science and sustainability or who have a significant interest in the topic.
With this knowledge we can draw a conclusion that it might be easier to achieve the generational goal by both the Swedish government as well as the people. Seeing also that most people performed a number on sustainable dietary behaviours is an encouragement.

A notable proportion of respondents highlighted the significance of food choice, including the purchase of organic, in-season, vegetarian, and animal welfare-conscious products, as well as those produced locally. It is encouraging to observe that the majority of respondents provided responses to the open-ended question in the survey, rather than simply writing "I don't know." This suggests that respondents are demonstrating an environmental awareness, which may lead to more informed decisions regarding grocery shopping and dietary intake. However, this does not necessarily mean that this knowledge will translate well into actions. As stated before, most people just said that they think it’s related to the environment. This does not mean people actively look for foods that are environmentally friendly or have a low carbon footprint. As mentioned in question 10, price (59%) and health (58%) are two of the most influencing factors when it comes to dietary choices. While people may know that they should shop in a way that reduces environmental harm, they may not know how to do that. That’s why it’s important to identify the barriers consumers encounter to establish policies and a support system to reduce these barriers.

Discussing the second part of the research question: *what sustainable behaviours do they exhibit in their dietary choices?*
The results indicate that Swedish adults exhibit similar preferences to those observed in the German adults in the Kawasaki et al. (2024) study. These preferences include a focus

on food choice, with an inclination towards plant-based diets and local production. However, due to the structure of the survey, respondents were unable to self-report their actual behaviours. Instead, they were presented with a list of behaviours and asked to select those that resonated with them the most. This was done primarily to facilitate the analysis of the results and, due to time constraints, it was not possible to apply the same methodology employed by Kawasaki et al. (2024). Consequently, when addressing the second part of the research question, it is only possible to discuss the behaviours identified and the number of individuals who selected they engage in these actions. Nevertheless, this remains pertinent since the listed behaviours were derived directly from the findings of Kawasaki et al. (2024). Additionally, respondents were permitted to provide their own suggestions, which many did. Upon examination of the responses selected as 'Other,' several references to hunting were observed. This is an intriguing aspect to highlight, as it is not addressed at all in the Kawasaki et al. (2024) study. This is understandable, given that hunting for one's own food is no longer a common practice. However, in Sweden, there appears to be a community of hunters (hunting in a controlled manor), and since almost a third of the respondents lived in a rural residential area, it is logical that hunting would be mentioned.

Moving on to discussing the sustainable dietary behaviours observed in this sample, the most popular behaviours in each food scene can be seen in table 4.

Table 4: Table showing the most selected behaviours within each food scene from the survey results of this study's sample.

Food scene	**Most popular behaviours**
1. Food choice	● Purchase only foods you eat/need ● Choose foods that are fairly priced ● Choose non-processed foods ● Choose foods that are locally produced
2. Storing and preservation	● Find ways to fully consume
3. Cooking	● Cook at home ● Use leftovers

	• Cook food you like
4. Eating	• Avoid leftovers • Avoid overeating
5. Disposal	• Make use of leftovers • Sort and recycle waste

In this survey, we can see that local production is emphasised. As mentioned earlier, in Sweden there's an encouragement from the government to eat more locally-produced foods for environmental reasons (Granvik, 2012). However, some people might not consume locally produced only for environmental reasons and since our survey showed that taste, price and health were the top three influencing factors which can indicate that these respondents buy locally produced foods because the taste is better, organic and therefore healthier and can be cheaper at times (Niva et al., 2014). There are many positive factors that comes with local production which was brought up in table 1 in the background (2.2). Some of the advantages are that more money stays in the local community, it maintains employment in rural regions and small producers are more connected to the land and can then be more active in environmental protection work (Nilsson, 2009). Furthermore, there is a need to prioritise local production, given that Sweden relies heavily on imported foods, which can have detrimental effects on the environment. With a changing climate, access to food becomes limited, and since Sweden is not self-sufficient, this has led to a certain standard of living among citizens. This will make it challenging to transition to more domestic food production. Additionally, Sweden does not have the ideal climate for many of the crops that are consumed. Consequently, it is important to encourage citizens to consume more quantities of locally produced foods in order to sustain domestic agriculture and ensure the continued viability of small-scale farmers.

Continuing with sustainable dietary behaviours, the issue of leftovers is a recurring theme. There appears to be a general consensus that leftovers should be avoided, yet many respondents indicated that they do not discard any food. Instead, they either cook with the leftovers or give them to animals. This is a positive behaviour that Swedish adults appear to have adopted with great success. This may be surprising, given the

results of the Kawasaki et al. (2024) study, which indicated that respondents from Germany were more focused on avoiding material waste, while those from Japan were more focused on avoiding food waste. In our survey, only 21.3% of respondents indicated that they avoid using single-use materials when cooking, and only 15.3% said that they reuse discarded foods and packaging. The respondents demonstrated a relatively limited focus on material waste compared to the Germans in the Kawasaki et al. (2024) study. However, the second most selected option was Sort and recycle food waste in food scene five (disposal), indicating a consensus on the appropriate disposal of food waste.

6.2 Dietary intake of Swedish adults

This study did not only investigate the types of sustainable dietary behaviours amongst Swedish citizens but also the dietary intake of this sample. When looking at prior research it suggests that Sweden has a high meat and dairy intake, which this survey can confirm. Our sample responded that they eat about 100-499 g of meat, 1-4 days per week. There was also a large amount of dairy consumption with a consumption of 100-499 g of milk, sour milk and yoghurt 7 days per week. Other dairy products (such as cheese, butter etc.) were consumed 100-499 g 7 days per week.

There is a notable absence of legume consumption in this sample. The majority of respondents indicated that they consume 0-99 g of legumes on 1-2 days per week. Röös et al. (2018) also highlighted that Sweden consumes relatively small amounts of legumes and that an increased consumption should be encouraged. This observation may appear surprising, given that a significant proportion of respondents in this sample identified as vegetarians or flexitarians, which means a reduced or no consumption of meat. Legumes are a valuable source of protein and an excellent substitute for meat. However, a study by Spendrup and Hovmalm (2022) revealed that Swedes are uncertain about the rationale behind reducing their meat intake and lack the necessary cooking skills. This may be a contributing factor to the low consumption of legumes. Many individuals may be unaware of the methods for cooking with legumes and may perceive them as having a distinct taste they don’t like.

To answer the problem statement in the introduction, *do Swedes know what it means to eat sustainably and what sustainable dietary behaviours do they exhibit?*

The results of this survey indicate that Swedish people associate sustainable eating with environmental and health considerations. While the specific implications of this concept remain somewhat unclear to respondents, the prevailing view appears to be that sustainable eating involves consuming in a manner that mitigates climate change. The behaviours they exhibit are primarily related to food choice, where choosing foods that they know they will be able to consume fully, as well as choosing locally produced and non-processed foods. These types of behaviours may not be driven by environmental considerations alone, but rather by a complex interplay of factors, including the economy, health, and personal preferences. Nevertheless, these factors interact with each other in the food system and influence it. Dietary choices are, as previously stated, part of the food system, and it is crucial to address all aspects in order to create meaningful change as well as identifying the obstacles and incentives that influence different dietary behaviours in order to determine the necessary changes to create a more sustainable food system and ultimately address climate change (Parson et al., 2019). A shift in food consumption behaviour is essential for the creation of sustainable food systems. However, in order to achieve this, it is first necessary to identify the root causes of the current behaviours. The barriers that people are experiencing, as identified in this survey, were primarily economic (high prices on groceries) and internal (barriers within themselves and people in their environment). This can manifest in various ways, such as a dislike of the taste and texture of plant-based food, a lack of financial resources to purchase more plant-based food, or a reluctance to cook for oneself due to a lack of culinary skills or a preference for shared meals. The interplay between these factors is complex and multifaceted, with economic, health, political, and environmental factors all influencing each other. By attaining this information, the implementation of behavioural change and the formulation of policies that enforce it. Sweden must strive for more plant-based diets in order to lower GHGe. There are several potential actions to take, including the reduction of prices on vegetarian food options, such as meat substitutes, given that price was identified as a significant barrier. If the price of red meat is lower than that of soy-based mince, for instance, most people would opt for the former. Another potential solution is to implement information campaigns about cooking plant-based meals. Some individuals may hold preconceived

notions about plant-based foods, which may be influenced by past negative experiences. It is therefore crucial to ensure that consumers are adequately informed about the preparation and cooking techniques for these ingredients, as well as the methods for enhancing their flavor. Furthermore, it is essential to highlight the potential benefits of sustainable foods, which can be both healthier and cost-effective when purchasing produce.

6.3 Suggestions for further research

The findings of this study indicate a need for further research in this field. In the course of attempting to find prior research in this field, it became apparent that there is a lack of consensus regarding the definition of sustainable dietary behaviours and the parameters that should be considered in their measurement. The establishment of clear guidelines will assist policymakers and enable them to create more precise policies addressing these issues. The multifaceted nature of sustainable food systems presents a significant challenge for policymakers attempting to incorporate all relevant perspectives. While there is no clear solution to this problem, it is necessary to identify the most important aspects of sustainability. Given that sustainability encompasses three dimensions—economic, social, and environmental—which are all interconnected, any improvement in one dimension will inevitably affect the others, either positively or negatively. The initial step in identifying solutions to the faults of the food system is to conduct a thorough analysis of the system's flaws in order to find the root causes.

Furthermore, in order to gain a deeper understanding of the third aspect of the food system, dietary choices, it is essential to conduct further research into the attitudes and behaviours of individuals with regard to plant-based foods and sustainable practices. An understanding of the reasons behind people's aversion to plant-based foods and reluctance to engage in sustainable behaviours can inform the development of strategies to foster a shift in attitudes and, ultimately, behavioural change.

6.4 Limitations

There are certain limitations with this study. Addressing the survey first, while it was open to responses, we got a few comments from respondents. One respondent commented on the questions regarding the dietary intake. They wanted the option of

selecting that they eat certain foods a few times a month. While this is certainly a valid point to bring up, the questions were structured this way to simplify the analysis part. Having another option of 'a few times a month' doesn't say much about how much of the foods are consumed and therefore asking about weekly consumption is easier from an analytical perspective. This respondent also wanted to be able to select more behaviours in the third section asking about sustainable behaviours in the five food scenes. There were also multiple people who gave similar feedback in the survey (using the 'Other' option) and while we understand that some people do more than three behaviours, the reason for limiting it to a maximum of three answers will again from an analytical perspective simplify the analysis. Another respondent commented on the question regarding residential area and that it became up to the individual person to interpret what counts as rural, suburban and urban. This was another error in the survey. Similar to the monthly income question, there has to be a clear definition so that people know exactly what they're responding to and so that we can use their answers accordingly. The failure to define rural, suburban and urban areas has resulted in respondents interpreting these terms in their own way, which may have an impact on the results. Nevertheless, this does not significantly impact the study and was still included. Additionally, a number of respondents drew our attention to a number of spelling errors. All feedback provided by respondents was considered and respondents were informed that their input was valuable.

The survey had some other errors as well which were brought up in the method evaluation concerning the nonresponsive errors and not reaching all parts of the population for example there's a minority of younger people (18-34 years old) which means there's a slight bias in the dataset. By not having young people, we are not reaching all population groups and this can affect the results as well. However, another error was noticed when writing the results of this paper. Survey question 8 had a notable error and could not be analysed accordingly. This was brought up in the results already but will be mentioned again. Several respondents pointed it out as well that question 8 did not make sense. An accidental addition of a 'g' to the question resulted in the appearance of a quantity of grams of eggs and fruits, when in fact the intended quantity was that of pieces. It was not possible to assume that respondents had correctly interpreted this, and thus the question had to be excluded from the analysis.

6.5 Strengths

The survey not only received a significant number of responses but also ensured a diverse representation of the Swedish population in terms of age (despite a minority of young adults), income, and education levels. This balanced demographic distribution further strengthens the reliability and validity of the data and allows for more nuanced analysis and accurate conclusions to be drawn.

To ensure the credibility of the research paper, only a substantial and reliable body of peer-reviewed literature was used. This rigorous approach to selecting references adds credibility to the study's findings and supports the validity of the conclusions drawn. In addition, the paper's clarity is enhanced through the inclusion of well-designed figures, tables, and supplementary materials. These visual aids not only make it easier for readers to understand complex information but also contribute to a more engaging presentation of the research findings. By providing a visual representation of the data, the paper becomes more accessible to a wider audience. Furthermore, the extensive literature review conducted as part of the research provides a solid foundation for the study. This review ensures that the research is built upon existing knowledge and helps situate the study within the broader academic context. By incorporating relevant literature, the research paper demonstrates a comprehensive understanding of the subject matter and strengthens the overall quality of the study.

7. Conclusion

This study investigated Swedish adults' understanding and knowledge of sustainable dietary behaviours as well as identifying which behaviours they performed the most by using Kawasaki et al. (2024) study on German and Japanese adults' sustainable dietary behaviours. The applied method for this study was a survey which was sent out nationwide and gathered a total of 287 responses. The results revealed that Swedish adults link sustainable dietary behaviours with eating in a way that doesn't harm the environment and helps mitigate climate change. Most adults exhibit sustainable dietary behaviours in the food scene food choice and say that taste, price and health influence their dietary choices the most. By identifying current behaviours, barriers and most

influential factors on dietary choices and intake amongst consumers, more precise policies can be put into place in order to create behavioural shifts towards more plant-based diets.

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Appendix

Appendix 1: Survey

Hi!
We are two students from Södertörn University who are currently writing a our thesis. Our thesis is about sustainable dietary behaviours where we study adults in Sweden. To collect data, we have made a questionnaire of 19 questions that we hope you can answer. The survey takes about 10 minutes to complete and is anonymous. It consists of three parts, the first part is about your demographic background such as age and gender. The second part is about mapping your dietary choices and the last part is about your perception of what sustainable dietary behaviours are and what types of actions you engage in. In all sections, there are definitions of the concepts covered.
Do you have any questions? Contact us at xxx@gmail.com

Thank you for your participation!

Survey questions:

No	Question	Response alternatives
	First part - demographic questions	
1	What is your age?	● 18-24 ● 25-34 ● 35-44 ● 45-54 ● 55-64 ● 65+
2	What is your gender?	● Male ● Female ● Non-binary ● Don't want to specify
3	What is your monthly income (before tax)?	● Low income (0-19 999 SEK) ● Average income (20 000- 39 999 SEK) ● High income (40 000+ SEK)

4	What is your highest attained certificate?	● Elementary/Primary school ● High school/Secondary school or equivalent ● Current university studies ● Finished university studies (bachelor, master and PhD degrees) ● Folk high school/adult education center
5	Where do you reside?	● Urban ● Suburban ● Rural
	Second part - dietary habits and choices	
6	How often do you eat the following foods? (1-2 days, 3-4 days 5-6 days 7 days and never)	● Meat (red meat, pork, chark) ● Poultry (chicken, turkey, duck) ● Fish and shellfish ● Milk, sour milk and yoghurt ● Other dairy products ● Eggs ● Fruits ● Vegetables ● Cereals ● Wholegrain ● Legumes ● Nuts and seeds ● Berries
7	How much of these foods do you approximately eat per week? (0-100 g, 100-500 g, 500-1000g, >1000g)	● Meat (red meat and chark) - e.g. 2 slices of bacon ca 30 g, 1 slice beef ca 125-150 g ● Poultry (chicken, turkey etc.) - e.g. chicken fillet without skin/bones ca 100-150 g ● Fish and shellfish e.g. salmon fillet ca 125 g ● Milk, sour milk and yoghurt e.g.. 1 dl ca 100 g ● Other dairy products e.g. 2 slices of cheese ca 20-30 g ● Vegetables e.g. medium sized onion, potatoes, carrots, tomato ca 100 g ● Cereals e.g. 1 serving of pasta/rice ca 75-125 g, 1 slice of bread ca 50 g ● Wholegrain ● Legumes (beans, peas, lentils) e.g. ca 80-100 g per 1

		dl
8	How much of these foods do you approximately eat per week? (0-1, 1-10, 10-20, >20)	• Eggs • Fruits
9	How much of these foods do you approximately eat per week? (0-50g, 50-200g, 200-400g, >400g)	• Nuts and seeds • Berries
10	From the following the list, which factors influence your dietary choices?	• Environment • Health • Animal welfare • Price • Local production • People in your environment e.g. I eat the same as my family/children/partner • Taste • Restrictions because of disease, diets, etc. • None of the above • Other
11	Vilka av följande växtbaserade kostmönster kände du till innan idag? (flera svarsalternativ)	• Vegetarian • Pescetarian • Flexitarian • Vegan • Ovo-vegetarian • Lactovegetarian • Lacto-ovo-vegetarian • None of the above
12	Av föregående växtbaserade kostmönster, finns det någon som du applicerar i din vardag?	• Vegetarian • Pescetarian • Flexitarian • Vegan • Ovo-vegetarian • Lactovegetarian • Lacto-ovo-vegetarian • None of the above
	Third part - knowledge of sustainable dietary behaviours and mapping of behaviours	
13	What do you think the term “sustainable dietary behaviours” mean?	Open answer
	Definition: Sustainable dietary behavior refers to purchasing, eating, and disposing of food in consideration of “sustainability.” In other words, “purchasing, cooking, storing, eating and disposing of food for	

	current and future generations to have a healthy and safe diet with little impact on the environment." Sustainability is defined as the "capacity to meet long-term human needs enduring over many generations." Please write down as many specific "sustainable dietary behaviors" that you might be able to do in your daily life, whether or not you are actually doing them. The next 5 questions will be about the 5 food scenes that were described above: purchasing, storing, cooking, eating and disposal.	
14	From the list of "sustainable dietary behaviours" in food choices, choose a maximum of 3 options that you do in your everyday life.	● Choose foods that you can consume completely/only foods you need ● Purchase food at an appropriate frequency ● Choose non-processed foods (e.g. fruits, vegetables, nuts etc.) ● Choose organic foods ● Choose locally produced foods ● Choose ingredients that are in season ● Choose plant-based foods ● Choose foods that you think are fairly priced ● Choose environmentally friendly foods ● Choose non-GMO foods ● Avoid foods made from endangered plants and animals ● Choose foods considering animal welfare ● Choose ingredients you have sourced on your own ● Choose foods that minimise food loss and waste ● Choose foods that will allow you to minimise material waste (e.g. plastic, paper etc.) ● Choose foods that you think are sustainable for you ● None of the above ● Other
15	From the list of "sustainable dietary	● Find ways to fully consume

	behaviours" in storing and preservation, choose a maximum of 3 options that you do in your everyday life.	● Process foods to make them last longer ● Preserve foods to make them last longer ● None of the above ● Other
16	From the list of "sustainable dietary behaviours" in cooking, choose a maximum of 3 options that you do in your everyday life.	● Use leftovers ● Cook an appropriate amount ● Cook for yourself ● Choose cooking methods with low environmental impact ● Avoid using disposable materials (e.g. plasticfilm) ● Make food that I like ● None of the above ● Other
17	From the list of "sustainable dietary behaviours" in eating, choose a maximum of 1 option that you do in your everyday life.	● Avoid leaving meals partially eaten ● Avoid overeating ● None of the above ● Other
18	From the list of "sustainable dietary behaviours" in disposal, choose a maximum of 3 options that you do in your everyday life.	● Sort and recycle waste ● Make use of leftovers ● Reduce discarded ingredients and packaging (e.g. vegetables regrown from scraps, compost food waste) ● Dispose of foods in a way that will not contaminate sewage ● None of the above ● Other
19	How important is it to you to perform these sustainable dietary behaviours that you responded to above? Choose what best suits you. (Appears after every question from Q11-Q15)	1. Not at all important 2. Not very important 3. Moderately important 4. Very important
20	From the followin list, please select as many barriers you encounter to practice sustainable dietary behaviors more often or more than you do today. “Sustainable dietary behavior”: purchasing, eating, and disposing of food in consideration of “sustainability.”	● Barriers about yourself ● Barriers about people who are around you, such as family and friends ● Barriers about the environment, such as home, products, and retail stores ● Barriers about national and local government policies

		● None of the above ● Other

Appendix 2: Kawasaki et al. (2024) survey questions

List of questions regarding “sustainable dietary behaviors”

1-1. What is your impression of the term “sustainable dietary behavior” and persons who practice it?

1-2. Sustainable dietary behavior refers to purchasing, eating, and disposing of food in consideration of “sustainability.” In other words, “purchasing, cooking, storing, eating and disposing of food for current and future generations to have a healthy and safe diet with little impact on the environment.” Sustainability is defined as the “capacity to meet long-term human needs enduring over many generations.”
Please write down as many specific “sustainable dietary behaviors” that you might be able to do in your daily life, whether or not you are actually doing them. ab

1-3. How important is it for you to practice the sustainable dietary behaviors that you answered above? Please select the one that best applies to you.b

1. Not at all important
2. Not very important
3. Moderately important
4. Very important

2. Please write down as many needs you have and barriers you encounter to practice sustainable dietary behaviors more often or more than you do today.
“Sustainable dietary behavior”: purchasing, eating, and disposing of food in consideration of “sustainability.”

2-1. Needs and barriers about yourself. a

2-2. Needs and barriers about people who are around you, such as family and friends. a

2-3. Needs and barriers about the environment, such as home, products, and retail stores. a

2-4. Needs and barriers about national and local government policies. a

2-5. Needs and barriers about others you mentioned above. a

Note: Questions 2-1 to 2-5 were not used in the present study.

aFree descriptive questions.

b Questions used for analysis in the present study.