



# Change towards sustainable animal food systems; Impact of consumer choices

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Olivia Barth

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Swedish University of Agricultural Sciences, SLU  
Department of Applied Animal Science and Welfare  
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# Change towards sustainable animal food systems; Impact of consumer choices

*Vägen mot hållbara livsmedelssystem i animalieproduktionen; Inverkan av konsumenternas val*

Olivia Barth

**Supervisor:** Katarina Arvidsson Segerkvist, Swedish University of Agricultural Sciences, SLU, Department of Applied Animal Science and Welfare

**Assistant supervisor:** Anna Jamieson, Naturbete I Sverige

**Assistant supervisor:** Hanna Stolz, Research Institute of Organic Agriculture (FiBL)

**Examiner:** Anders H Karlsson, Swedish University of Agricultural Sciences, Department of Applied Animal Science and Welfare

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**Swedish University of Agricultural Sciences**  
Faculty of Veterinary Medicine and Animal Science  
Department of Applied Animal Science and Welfare

## Abstract

Climate crisis, war, and, famine are some of society's most popular debate topics. Food production is one of the most important issues in the world but also one of the most debated. Being able to produce food is one of man's most basic needs for survival, especially in times of crisis. Agriculture is often criticized because the production of food emits greenhouse gases and thus harms the environment. Farmers work to reduce their environmental impact daily, but so must the rest of the food chain. The food chain also includes consumers, food companies, and the public sector. All participants in the food chain have a responsibility and must work together for sustainable development in food production. As world hunger worsens and the population continues to grow, more food must be produced. The path to sustainable food production and consumption, as well as who bears the responsibility, will be discussed in this study.

This study was a collaboration with the EU project PATHWAYS. The purpose of the project was to investigate how to reduce the environmental impact while meeting society's demands for safe, nutritious, and affordable meat and dairy products. The project aimed to identify and increase sustainable practices along the supply and production chains in the European livestock sector. Part of PATHWAYS was a ten-part consumer survey. Consumers' eating habits, attitudes towards sustainable solutions, and how socio-democratic characteristics affect consumer motivation have been examined, among other things. These data will be analyzed and discussed in the study. The study also includes a literature review that is used to compare and analyze the results.

The results of the study show that the Swedish consumer is concerned about sustainable food production and generally has a high level of motivation in several situations. The economy has a major impact on food consumption and sustainable food products must be affordable for consumers to choose them. The consumer was considered to have the least responsibility in the food chain compared to other actors. The respondents had little knowledge of agriculture and food production which might be an issue in the path to sustainable development. To achieve sustainable food consumption, consumers need education in food production and an increased awareness of their impact on the market. No significant differences were found between socio-democratic characteristics and level of motivation, except for gender. Women were shown to be more motivated to make sustainable choices than men.

*Keywords:* consumer behavior, consumer surveys, food chain, food production and consumption, food security, labeling, sustainable development, retail sector

## Sammanfattning

Klimatkris, krig och hungersnöd är några av samhällets idag mest populära debattämnen. Matproduktion är en av de viktigaste frågorna i världen men också en av de mest debatterade. Att kunna producera mat är en av människans mest basala behov för överlevnad, framförallt i kristider. Lantbruket kritiserar ofta på grund av att produktionen av livsmedel släpper ut växthusgaser och därmed har en negativ effekt på miljön. Lantbrukare arbetar med att minska dess miljöpåverkan dagligen, men det måste även resten av livsmedelskedjan göra. I livsmedelskedjan ingår också konsumenter, livsmedelsföretag samt offentlig sektor. Alla medverkande i livsmedelskedjan har ett ansvar och måste tillsammans arbeta för en hållbar utveckling i livsmedelsproduktionen. I takt med att hungersnöden i världen blir värre samt en ständig ökning av populationen, måste mer mat produceras. Vägen till hållbar livsmedelsproduktion och konsumtion, samt vem som bär ansvaret, kommer diskuteras i denna studie.

Denna studie har skett i samarbete med EU-projektet PATHWAYS. Syftet med projektet var att undersöka hur man kan minska miljöpåverkan samtidigt som samhällets krav på säkra, näringsrika och prisvärda kött- och mejeriprodukter tillgodoses. Syftet med projektet var att identifiera och öka hållbara metoder längs leverans- och produktionskedjorna i den europeiska boskapssektorn. En del av PATHWAYS var en konsumentundersökning bestående av tio delar. Man har undersökt bland annat konsumenternas matvanor, inställning till hållbara lösningar, samt hur sociodemokratiska egenskaper påverkar motivationen hos konsumenten. Dessa uppgifter kommer att analyseras och diskuteras i studien. Studien innehåller även en litteraturgenomgång som används för att jämföra och analysera resultaten.

Resultaten från studien visar att den svenska konsumenten är mån om hållbar livsmedelsproduktion och har generellt en hög motivationsnivå i flertalet situationer. Ekonomi har en stor inverkan på livsmedelskonsumtionen och hållbara livsmedelsprodukter måste ha ett överkomligt pris för att konsumenten ska köpa dem. Konsumenten ansågs ha minst ansvar i livsmedelskedjan jämfört med övriga aktörer. Respondenterna hade generellt en låg kunskapsnivå gällande matproduktion vilket kan vara problematiskt i vägen mot hållbar utveckling. För att uppnå en hållbar livsmedelskonsumtion behöver konsumenterna utbildas i livsmedelsproduktion samt en ökad medvetenhet om deras påverkan på marknaden. Inga signifikanta skillnader hittades mellan sociodemokratiska egenskaper och motivationsnivå, förutom gällande kön. Kvinnor påvisades vara mer motiverade att göra hållbara val än män.

*Keywords:* konsumentbeteende, konsumentundersökningar, livsmedelskedja, livsmedelsproduktion och konsumtion, livsmedelssäkerhet, märkning, hållbar utveckling, detaljhandeln

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# 1. Introduction

Since 1950, the world population has increased from 2,4 billion to 8,1 billion in 2024. If the world population continues to grow at the current rate, there will be 9,7 billion people in the world in 2050 (World of Meter, 2024). In 2022 the global prevalence of undernourishment was 9,2% (FAOSTAT, 2024) meaning 735 million people suffering from famine daily.

To feed a growing population, larger quantities of food production are required (Foley et. al., 2011; Godfray et. al., 2010; Nellesmann et. al., 2009; Schneider et. al., 2011). A growing population has a big impact on the environmental effects of the food industry, a sustainable supply chain is therefore necessary. How we consume, produce, process, and transport food affects the supply chain's sustainability (Govindan, 2018). Food production has a major impact on sustainable development; climate change, livestock epidemiology, the environment, animal welfare, and economics are all part of socio-ecological sustainability. Looking at all these parts with a broad approach is necessary to develop a sustainable food chain (Tälle et. al., 2019).

Today there are 140 developing countries in the world trying to fulfill their development needs. Climate change is a big threat and the development can not harm future generations (United Nations, 2024a). In 1987, the Brundtland Commission defined sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Brundtland & Khalid, 1987). Referring to the UN’s Sustainable Development Goals (SDGs), the aim of the 2030 agenda is, among many things, to end all forms of undernourishment. One goal in the 2030 agenda is “By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding, and other disasters and that progressively improve land and soil quality.” (United Nations, 2024b).

Society's interest in sustainable animal food production has increased in the last decade. Mainly because of environmental challenges, decreased farm income, and animal welfare concerns (van Calker et. al., 2005). A damaged environment hurts production, making the environment an important part of sustainability (Tilman et. al., 2002). Since agriculture is often performed by private businesses, economic



viability is also important to ensure agriculture proceeds (Filson et. al., 2003). As well as environmental and economic sustainability, social sustainability also plays an important role in farm businesses. Farmers' quality of life, society acceptance, and animal welfare are examples of important aspects of social sustainability (European Commission, 2015; Ingenbleek & Immink, 2011).

Another important part of sustainability is food security. A functioning food supply during longer crises or war is crucial for people's survival (Eriksson, 2018; Hanjra et. al., 2010; Kemmerling et. al., 2022). Therefore, domestic food production is considered an important defense and security policy issue in most countries. Food preparedness has therefore been widely discussed in the media in recent years. The media discussion has often focused on the fact that Sweden has a low degree of self-sufficiency. A low self-sufficient rate might be seen as a problem since it affects the national defence capability. Creating more resilient production systems with greater self-sufficiency already in peace can be profitable compared to maintaining the existing production system during a crisis (Eriksson, 2018).

## 2. Literature review

### 2.1.1 Sustainable food systems in Sweden

Sweden is considered to have favorable conditions regarding a transformation towards sustainable food systems. (Kuylenstierna et. al., 2019). Sweden is one of the countries in the world with the lowest use of antibiotics in livestock production (Mulchandani et. al., 2023; Rajala-Schultz et. al., 2021; Wierup, 2021), and is often defined as one of the world's leading countries regarding animal welfare standards, (Animal Protection Index, 2024). The prevalence of malnourishment is also low (FAOSTAT, 2024). However, to achieve the SDGs it is necessary to make transformative changes in food systems (Campbell et. al., 2018; Willett et. al., 2019). In Sweden, changes such as increasing the social and environmental sustainability for farmers, are examples of improvements needed to achieve sustainable development (Källström & Ljung, 2005). This will be discussed further in this thesis.

Despite Sweden's considerably high level of sustainability standards, the high amount of imported food harms the environment globally (Moberg et. al., 2020; Sandström et. al., 2018). According to Sandström et. al., (2018), due to the average Swedish diet, the greenhouse gas emissions (GHG) per person and year are high. Mainly because a large portion of the food consumed is produced in other countries with higher climate impacts than the Swedish food production systems. Since Sweden depends on imported fertilizers, feed, food, etc. it has been discussed that the food system might be too vulnerable (Sandström et. al., 2018). Through investments in alternative fuels, alternative fertilizers, and biological plant protection products, food production can become less dependent on imports while at the same time becoming more sustainable and receiving increased environmental benefits (Eriksson, 2018).

Greenhouse gas emissions are often discussed concerning livestock production since ruminants emit much methane. Methane is the most common GHG produced by ruminants, due to their fermentation process in the rumen (Crosson et. al., 2011). Since ruminants can eat grass and leaves, etc., and transform them into milk and meat, this can be seen as a contribution to the better use of the world's resources since humans can not eat these components. Land that is not appropriate for food

production for humans, can be used for grazing or feed production and therefore limit the competition regarding land use (Broom, 2019).

### 2.1.2 Consumer surveys

Climate change is a threat to ecosystems, biodiversity, and our current way of living (O'Neill et. al., 2017). Therefore, facing the challenge of changing people's eating habits is more important than ever (Hartmann & Siegrist, 2017; Hedin et. al., 2019; Magrini et. al., 2018; Springmann et. al., 2016). Since GHG emissions are very dependent on food consumption, changing people's diets can have a great impact on reducing GHG emissions globally (Leire & Thidell, 2005). However, convincing people to change their eating habits towards more environmentally sustainable food consumption is not an easy task. Mostly because eating habits and food preferences are part of people's sociocultural environment (Cairns, 2019; Carrus et. al., 2018; Wright et. al., 2001) and lifestyles (Flaherty et. al., 2018; Sonestedt et. al., 2005). Many consumers experience concern regarding the environment. However, there is still a gap between attitude and actual purchasing i.e., the attitude-behavior gap (Aschemann-Witzel & Zielke, 2017; van Dam & van Trijp, 2013; Vermeir & Verbeke, 2006).

There is a need for better communication about the environmental impact of food production to enable consumers to make better choices (Öhlund et. al., 2017). However, since retailers are interested in sustainability improvements only if there are financial and commercial benefits this might be challenging. Labels are one kind of communication and consumers have been positive towards the idea of climate labeling in the past (Ekelund & Spendrup, 2016; Elofsson et. al., 2016). There has also been a positive attitude towards locally produced food as well as climate, environmental, and animal welfare-friendly produced food (Carlsson et. al., 2007; Liljenstolpe, 2011; Niva et. al., 2014)

In a study made by Eklund & Spendrup (2015), 85% of the correspondents answered that climate labeling is a good idea and the attitude towards labeling was generally positive. A study made by Elofsson et. al., (2016) showed that it is clear that climate labeling could increase the demand for climate-friendly food. In the study, climate-labeled milk sold for a higher price. Studies have shown that how well labeling works depends on label design, how and when the product is marketed, and what type of product it is (Cohen & Vandenberg, 2012; Hainmueller & Hiscox, 2012; Hallstein & Villas-Boas, 2013; Onozaka et. al., 2010; Vlaeminck et. al., 2014). It also depended on voluntary or mandatory labeling systems, as well as private or public labels (Cohen & Vandenberg, 2012; Sedjo & Swallow, 2002).

In the questionnaire made by Ekelund & Spendrup (2015) about reducing the climate impact from food, consumers answered that they think climate impact is an important problem. More than 75% were open to the idea of changing their eating

habits to limit the environmental impact. As many as 90% were positive towards eating according to season, buying locally produced food, and limiting food waste. Further, 80% preferred organic food, and 57% thought that reduced meat consumption had a positive effect on climate change. Almost 54% thought that vegetarian protein sources were a better choice than meat.

A study by Carlsson et. al., (2007) showed that Swedish consumers are willing to pay more for a higher level of animal welfare. For example, there was a higher motivation to pay more money for animals slaughtered by a mobile slaughterhouse. Further, according to Martin & Brandão (2017), Swedish consumers are willing to pay more for domestic products and 69% answered that they look for Swedish labels when grocery shopping. As many as 61% answered that they look for products that are produced locally. The perception was that locally produced products taste better, have better quality, and are better for the environment. Consumers also care for local enterprises and want to support them by buying their products (Martin & Brandão, 2017).

In the study by Ekelund & Spendrup (2015), 30 grocery stores were visited and the results showed that retailers usually promoted price discounts and encouraged bulk purchases. Stores preferred advertising local, seasonal, and organic food. However, only 13% used some kind of climate communication. Advertising local, seasonal, and organic food were therefore not connected with climate change. During interviews with the retailers, they seemed reluctant to the idea of guiding consumers towards limiting their meat consumption.

### 2.1.3 Socio-demographic variables

Sustainable food consumers can not be defined based on socio-demographic variables only (Dagevos, 2005; Diamantopoulos et. al., 2003), some examples of sociodemographic variables are for example age, gender, region, and education level. Verein et. al., (2012) argue that personality characteristics, behavioral variables, and food-related lifestyle (FRL) variables should be considered as well. However, there are findings;

It has been noticed in previous research that there is a difference in general consumption due to age. There was a difference in consumption patterns in consumers under 30 years of age and over 30 years of age. The younger group tended to be of more modern and materialistic values, (eg. “exciting life” and “successful”) while the older group preferred more traditional values such as “tradition” and “wisdom” (Kihlberg & Risvik, 2007).

Concerning gender, the differences between males and females were significant in several studies (Gil et. al., 2000; Honkanen & Olsen, 2009; Jain & Kaur, 2006; Kihlberg & Risvik, 2007; Tivadar & Luthar, 2005; Yue et. al., 2010). Women tended to have a more “green consumer” segment than males (Gil et. al., 2000; Jain & Kaur, 2006). Males seemed to care less about the environment than females

(Honkanen & Olsen, 2009; Yue et. al., 2010), and women were more likely to buy organic foods than men (Azzurra et. al., 2019; Bravo et. al., 2013; Kottala & Singh, 2015; Van Loo et. al., 2013).

Jain & Kaur (2006) and Al-Nuaimi & Al-Ghamdi (2022) showed that customers who preferred organic options were most likely to have higher education. Other studies revealed that people with higher education, or who are married and/or have young children, were more associated with buying organic food products (Dimitri & Dettmann, 2012; Vecchio et. al., 2016).

Some studies have analyzed the relationship between income and food consumption patterns. Having a higher income might lead to a higher consumption of food, but it might also lead to healthier lifestyles due to higher consumption of fruit and vegetables (Csutora, 2014). In a study made by Mackenzie et. al., (2008), the higher the household income level, the bigger the ecological footprint based on food products. This was also confirmed by Csurora & Móznér (2014). A study made by Abdallah et. al., (2011) showed that households with higher incomes spent more money on expensive food products.

#### 2.1.4 Consumer behavior and responsibility

When discussing sustainable production and consumption, the consumer represents a central point. Often consumers that take responsible actions are pointed out to be the answer to achieving sustainability. Individual activities have an impact on business which is the base of a democratic system (Schwarzkopf, 2011). It is assumed that consumer behavior affects environmental impact, animal welfare, and social justice. By paying money for chosen products in the supermarket, the purchasing act can be seen as a vote. A choice has been made, sustainable or not (Sassatelli, 2007; Trentmann, 2006). Studies have been performed to evaluate the effect of campaigns, knowledge transfer, and labeling on consumer behavior. Results show that it can guide consumers to more sustainable choices (Southerton & Evans, 2017).

Warde (2005) suggests consumption occurs "often entirely without mind" but "within and for the sake of practices". Therefore there is the idea that consumption is more habitual and less thought through than we tend to say it is (Spaargaren, 2011). When consumers make a repeat purchase, there are two possible options: repeated problem-solving and habit decision-making (Blackwell et. al., 2001). Repeated problem-solving mainly occurs when the consumer is dissatisfied with a previous purchase or when a product is out of stock, which in turn often leads to the consumer buying a similar product from another brand. Decision-making based on habit is the most common in repeated purchases. It means that the consumer chooses to buy the same brand that he has previously bought out of routine as it simplifies the purchase for the consumer (Axelsson & Agndal, 2012; Biel et. al., 2005; Blackwell et. al., 2001; Piacentini & Szmigin, 2015). To get a consumer to

buy another product, it is therefore important to change the current habit and replace it with a new habit, which is difficult as habits require time to change (Blackwell et. al., 2001; Solomon et. al., 2006).

The purchase of daily goods is characterized by low-involvement decision-making, where the consumer rarely exercises any extensive search process before a decision is made, in other words, the consumer puts little thought into the purchases (Axelsson & Agndal, 2012; Terlau & Hirsch, 2015). Food is categorized as a daily commodity, which means that its consumption is driven by convenience and well-established consumption habits that require low commitment (Vermeir & Verbeke, 2006). Habits can be another reason for the attitude-behavior gap, which is a term used to describe how actions do not always agree with attitude (Vermeir & Verbeke, 2006). The consumer therefore needs to know the problem, which thus aims for the individual to be aware of the environmental problems and their consequences. Information is thus an important part of increasing consumer knowledge, which in turn can increase the consumption of sustainable foods and overcome the attitude-behavior gap (Kollmuss & Agyeman, 2002).

However, consumer demand has been debated. According to Spurling et. al., (2018), the focus shall be on the entire food supply chain and not only on the consumer. Research that has been performed on sustainable food consumption has included consumer behavior, diets, green communication, and impact on health (e.g. Grunert et. al., 2014; Martin & Brandão, 2017; Rööös et. al., 2018; Sirieix et. al., 2013; Spendrup et. al., 2019). However, instead of focusing on single dimensions of sustainability (e.g. consumer behavior), scholars argued that future research must focus on why systems are unsustainable and how to promote development (Abson et. al., 2017; Campbell et. al., 2018; Tälle et. al., 2019; Weitz et. al., 2018; Wiréhn et. al., 2020). Some also mean that by appointing the consumer as the responsible one, the focus is no longer on infrastructure, institutes, etc, which play maybe a bigger role in sustainability (Spaargaren, 2011).

### 2.1.5 Retailers' responsibility

Similar to consumers, retailers play a big role in the change toward sustainable food systems (CIAA, 2009; Jones et. al., 2005; Ytterhus et. al., 1999). Retailers are powerful due to their ability to promote and encourage consumers to purchase sustainable food products. Retailers can influence consumers and consumer demand because of their partnership with suppliers, and daily contact with consumers, allowing them the possibility to influence and promote sustainably produced food products (Tjärnemo & Sövdahl, 2015).

There is a global trend that the food chain is getting more concentrated with a smaller number of retailers, but to a larger extent (European Commission, 2016). The concentration of retailers in Sweden is the highest in Europe, with one of the

biggest retailers in Sweden, ICA, controlling over 50% of the market. Together with Coop, Axfood (Hemköp and Willys), and Bergendahls (City Gross), retailers control a big part of the market. Whatever foods these retailers choose to provide, have a major impact on what kind of foods Swedish consumers purchase (Tjärnemo & Sövdahl, 2015).

There is an anticipation that retailers should help consumers make sustainable choices; “It [marketing] can help consumers to find, choose and use sustainable products and services, by providing information, ensuring availability and affordability, and setting the appropriate tone through marketing communications” (World Business Council for Sustainable Development, 2008). When asking retailers about their strategy regarding consumer guidance, answers like “We make it possible for the customer to choose” and “We will provide the products that the consumers demand” were common (Tjärnemo & Sövdahl, 2015). The general attitude is that the responsibility lies on the consumer and not on retailers. Two studies showed that retailers were positive about promoting sustainable food products if there were financial benefits in doing so (Fischer and Rööös, 2018; Tjärnemo & Sövdahl, 2015).

According to Jones et. al., (2011), the willingness to improve social and environmental sustainability among retailers is increasing. However, it has been discussed whether they “are, at best, engaging in a weak model of sustainable consumption which fits well together with common business goals”. Jones et. al., (2013) are skeptical of retailers' contribution, meaning they are too focused on business models and continuing growth.

### 2.1.6 Drivers and barriers in the retail sector

When analyzing drivers and barriers towards sustainability, according to retailers, many factors mattered. Resource factors, market factors, regulatory factors, and social factors were all part of retailers' chosen strategies (Chkanikova & Mont, 2015).

Pressure from governments; legislations and directives, is one of the main drivers according to retailers (BIOIntelligence Service, 2009; Hall, 2001). Stakeholders, supplier, and inventor pressure is motivating, as well as increasing financial returns and decreasing costs (BIO Intelligence Service, 2009; Danish EPA, 2010; Jones et. al., 2005; Ytterhus et. al., 1999). Consumer demand, as discussed earlier, has a big impact on the retail sector (Tjärnemo & Sövdahl, 2015).

One identified obstacle according to retailers is a lack of government leadership (Jones et. al., 2008), a clear vision of sustainability and clear messages from policymakers are necessary for achieving positive results (Danish EPA, 2010). One of the most indicated barriers for retailers to promote sustainable options is costs (BIO Intelligence Service, 2009), therefore financial benefits are necessary. Retailers might be reluctant towards sustainable strategies if too big of an

investment is needed (Dijk, 2000; Danish EPA, 2010, Smith, 2007). It might be challenging for supermarkets to promote sustainable improvements in the production chain when consumers demand cheap food and are not willing to pay for, for example, eco-labeled products. Consumers who only care about price and lack interest and awareness are a big barrier for retailers (Smith, 2007). Some retailers also pointed out that "not all consumers are interested or aware of the environmental and social impacts of food" (Chkanikova & Mont, 2015).

One way to get consumers to consume more sustainably is for retailers to take the lead and act as "choice editors" for consumers (Sadowski & Buckingham, 2007 according to Tullsten & de Silva, 2020). Given the limited time and many distractions facing today's consumers, consumers do not have the time or capacity to absorb label information - they want to walk into a store, choose any product, and trust that the retailer has taken care of all sustainability issues throughout the product's value chain, preferably without the consumer having to pay extra for these goods (Sadowski & Buckingham, 2007, according to Tullsten & de Silva (2020).

### 2.1.7 Farmers' responsibility

The farmer is the very core of sustainable development in the food systems (Källström & Ljung, 2005) Unfortunately, many farmers experience a stressed financial situation, in part due to the increasing power of the retail sector. In the past decades, retailers have increased both in financial and structural power (European Commission 2016; Richards et. al. 2013; Sonnino, 2013; Thompson & Lockie 2013; Van der Ploeg, 2010).

Many farmers have announced that they experience financial difficulties due to low prices and high costs. The trust in the Swedish government is low, mostly due to ever-changing legislation and lack of support. Swedish farmers answer to legislations and regulations on a higher level than the EU's minimum requirements, making it more expensive for farmers to produce food in Sweden than in other countries (Fischer & Rööös, 2018). It is, for example, labor-intensive to keep animals on semi-natural pastures (costs differ depending on payments in EU subsidies). It might be more profitable to raise cattle inside than on pasture (Hessle & Kumm, 2011). Responses like "It's impossible for me to be more environmentally friendly if I am to have any financial profit" in a study made by Fischer and Rööös (2018), indicated that reconstruction (improving the financial situation, etc.) of the food system is needed to achieve strong sustainability on farms. According to Källström & Ljung (2005), it will be challenging to reach today's environmental goals if farmers are not satisfied with their situation, meaning that there is a need for better support from authorities and organizations to improve the situation farmers experience.

The number of farmers is decreasing every year and the size of farms is increasing. This leads to bigger distances within the farmer's community. Farmers'



average age is relatively high as well. These changes, according to Källström & Ljung (2005) lead to unsustainable social development and therefore further challenges to achieve animal welfare and environmental goals. Källström & Ljung (2005) propose changes like limiting loneliness and promoting collaboration among farmers, allowing the sharing of knowledge. The authors also suggest more public education, telling consumers about farm practices.

Farmers are usually positioned far from the consumers. Some farmers have expressed frustration that consumers do not always appreciate their work (Fischer & Röö, 2018). According to Källström & Ljung (2005), farmers have experienced “the gap between society's demand for high environmental and quality standards and the actual political and consumer actions taken is an expression of society's lack of recognition.” This has led to farmers communicating with consumers directly through entrepreneurial activities. They argue that “people who know more about what farmers are striving for and doing, and the reason for this, and with whom they have a personal relationship, are less negative than others.”

REKO-Rings is one example of alternative food networks (AFNs) that have, in the last decade, increased a lot in Sweden, especially after COVID-19. This method allows the consumer to buy locally produced food directly from the producer. According to Hunter et. al., (2022) AFNs “are often characterized by their ‘sustainability promise’ – or the idea that their networks foster social, ecological or environmental improvements over conventional food networks”. This type of Short Food Supply Chain (SFSC) is more flexible than the long food chain (Michel-Villarreal et al., 2021; Smith et al., 2015) since the producer obtains feedback directly from the consumer allowing them to respond to the market demand immediately (Wang & Zhang, 2022).

One way for farmers to share their everyday lives is by using social media. Many citizens are interested in agriculture and by seeing agricultural content they develop knowledge and understanding of the hard work farmers put in. Social media counteracts the gap between consumers and producers (Land Lantbruk, 2020; Landsbygdensfolk, 2018; LRF, 2023).

### 2.1.8 Policy makers

The Swedish government has in the last year developed a plan to invest more money in food production. The deteriorating security policy situation has actualized the need to strengthen food production in Sweden, where primary production is a critical part of the chain (Regeringskansliet, 2023).

Sweden’s national food strategy aiming for 2030 (Regeringskansliet, 2024) is the first food strategy that includes the entire food chain. The long-term goal is to make sure the full potential of the food chain is used. This means, for example, having an increasing and sustainable food production leading to more jobs and sustainable growth in the whole country. It also aims to help consumers, despite

background, make more conscious choices. During 2023 the government started working on a food strategy 2.0. This will continue previous work and keep bringing progress and development making sure to strengthen Swedish competitiveness (Regeringskansliet, 2024). The government's target is also that 30% of Swedish agricultural land should consist of certified organic agricultural land in 2030 and 60% of public food consumption should consist of certified organic products in 2030 (Regeringskansliet, 2019).

Since Sweden is part of the EU they are also part of the EU's common agricultural policy (CAP). What CAP aims for, in the short term, is to support farmers making sure future food production is secured. CAP also wants to make sure everyone can afford food and help maintain rural areas (European Commission, 2024).

As for the local authorities, it is suggested that they be responsible for making sure the food that is served is sustainably produced. This counts for schools, hospitals, retirement homes, etc. Since the EU prohibits geographical discrimination, a change in procurement practices is needed to be able to serve locally produced (Swedish) meat without limitations (Granvik, 2012; Öhlund et. al., 2017). The different regions in Sweden have developed their food strategies (Tillväxtverket, 2024). In 2024, statistics regarding purchased food in the public sector were published for the first time (Mattanken, 2024). These statistics showed several regions serve only Swedish meat, and several regions serve the majority of domestic food in general (Livsmedelsstatistik, 2024).

## 3. Methods

Databases such as Google Scholar, Scopus, and Web of Science were used to find literature for the literature review.

The second part of this study has been a consumer survey. This master thesis has been a part of the EU project called “PATHWAYS” (<https://pathways-project.com/>). Since a lot of data was analyzed in the PATHWAYS project, only chosen parts will be presented in this study due to the limitation of the master thesis.

Firstly, the data collection and analysis concerning the online survey will be described, followed by the description of the data analysis and quota sampling. The questionnaire can be seen in Appendix 1.

### 3.1 Online survey and choice experiment

In the next section, the data collection procedure, survey structure, and content are presented.

#### 3.1.1 Data collection procedure

The online survey and choice experiment were conducted in five countries, Germany, France, Italy, Sweden, and Romania. These countries were selected to cover the different geographical regions in the EU, taking into account the different cultural backgrounds and eating habits within the EU. The data from the online survey was collected in autumn 2023. The data collection was organized by Bilendi, an internationally operating marketing agency. Bilendi provided the consumer panels, invited the participants, and steered the quota sampling. Quota sampling was employed to draw samples that represent the total population in Sweden.

#### 3.1.2 Survey structure

The online survey consisted of 10 sections. Two sections were excluded: Dietary patterns and Choice Experiment, to meet the scope of the thesis. The presented 8 sections are analyzed in this thesis.

1. Introduction: the survey started with an introduction including information about the survey topic, the ethical guidelines the survey is based on, data protection, and the rights of the respondents.

2. Socio-demographics part 1: this section included questions about age, gender, and region. The data was collected by the marketing agency for the quota sampling
3. Motivation: this section measured the level of motivation for sustainable food consumption, focusing on the three sustainability dimensions environment and climate, and animal welfare using three items for each dimension using an s4-point-scale from 1 = not motivated at all to 4 = doing so already.
4. Attitudes: attitudes both towards and against sustainable food consumption were addressed in several sets of questions, measured on a five-point scale from 5 = I fully agree to 1 = I fully disagree
5. Role of sustainability labels in daily life: this section included a set of (generic) labels and respondents were asked to report the frequency with which they choose food labels in daily life, measured on a 5-point scale from regularly to I don't know the label.
6. Transition towards sustainable food consumption (the role of actors and acceptance of different interventions/measures to achieve a higher sustainability in the food system).
7. Demographics part 2: education level, household size, number and age of children, living environment (urban, rural), net monthly household income.

## 3.2 Quota sampling in Sweden

The quota sampling aimed for the best representation of respondents. The sampling in Sweden was controlled based on three variables; region, gender, and age. The sample size was 495.

Samples were collected from three different statistical regions in Sweden according to the NUTS distribution (see Appendix 2). East, South, and North are the Swedish regions used for reporting statistics within the EU (SCB, 2008). The gender distribution was equal between males and females. Three different age groups were used in the data analysis, 18-34 years, 35-54 years, and 55-75 years. Further, sociodemographic characteristics can be seen in Table 1.

## 3.3 Data analysis

Data was analyzed using the statistical program SPSS.

To analyze the motivation levels between different groups, a reliability test was made to see if it was possible to group environmental, climate, and animal welfare motivation. Since the result was  $>0,7$  these three variables were correlated and

could be used as one. The variable motivation level is therefore a combination of environmental, climate, and animal welfare motivation when used in this study.

To test the correlation between different motivation levels and sociodemographic values, several tests were made. The Kruskal-Wallis test was used for all of the following tests except for the correlation between gender and motivation level, where the Mann-Whitney U test was used.

When testing the correlation between gender and motivation level the Mann-Whitney U test was used. Mann-Whitney U-test is, like the Kruskal-Wallis test, used when the underlying data is not normally distributed. Mann-Whitney U test is used when there are two groups, in this case, male and female. The null hypothesis is, that there is no difference between groups and the mean rank is the same (DATAtab, 2024).

The Kruskal-Wallis test is a nonparametric method suitable for testing samples originating from the same distribution. Kruskal-Wallis extends the Mann-Whitney test, making it ideal for testing several groups. The null hypothesis of the Kruskal-Wallis test is that there is no difference between groups and the mean rank is the same, on this test as well. This test does not assume a normal distribution of the data (Laerd Statistics, 2024). Since the consumer perspective is much discussed in this thesis, there was also an interest in the correlation between age and consumer responsibility, the Kruskal-Wallis test was used for this test as well.

## 4. Result

The following section presents the results of the consumer survey. The sociodemographics part comes first and further follows the results from the different parts; motivation, attitudes, role of sustainability labels in daily life, the transition towards sustainable food consumption, and knowledge of agriculture. Further follows an analysis of sociodemographic values and behavior patterns. The total number of correspondents was 495 throughout the survey. All questions had a response rate of 100% since unimplemented forms were deleted by Bilendi.

### 4.1.1 Sociodemographic profile

The aim was to get an even number of women and men and a good distribution among ages and geographic locations. This was succeeded and the result is shown in Table 1.

*Table 1. The sociodemographic sample characteristics.*

Variable	Definition	Frequency (%)	Value
Age (years)	18–34	36,4	180
	35–54	43,0	213
	55–75	20,6	102
Gender	0=male	49,9	247
	1=female	50,1	248
Region	1=east	32,1	159
	2=south	38,4	190
	3=north	29,5	146
Highest level of education	1=no education	4,6	23
	2=apprenticeship	3,6	18
	3=high school	43,0	212
	4=applied sciences	10,0	50
	5=bachelor	28,0	139
	6=masters/doctors	11,0	53
Monthly income (after taxes)	1=less than 10 000 kr	4,2	21
	2=10 000–17 999 kr	11,9	59
	3=18 000–27 999 kr	15,0	74

	4=28 000–37 999 kr	28,5	141
	5=38 000–49 999 kr	16,3	81
	6=50 000–74 999 kr	9,0	45
	7=75 000 kr or more	3,2	16
	8=no answer	11,7	58
Diet	1=mixed diet	67,5	334
	2=flexitarian	12,1	60
	3=vegetarian	4,2	21
	4=vegan	3,2	16
	5=paleo	5,9	29
	6=low carb	7,1	35
Household size*	1	25,1	124
	2	32,1	159
	3	15,2	75
	4	18,6	92
	5	5,5	27
	more than 5	3,0	15
Children	0=do not have children	62,0	307
	1=have children	38,0	188

\*Three people answered household size was 0. These were excluded from the data.

## 4.2 Online survey results

### 4.2.1 Motivation

In the motivation section, the questions were related to how motivated the correspondents were to accept inconvenience in nine different situations related to sustainable development. Inconvenience could mean, for example, looking for sustainable products in the supermarket or changing consumption patterns.

The different options are presented and numbered in Table 2 and the result is presented in Figure 1. Options 1-3 were related to environmentally-friendly questions, 4-6 to climate-friendly questions, and 7-9 to animal-friendly questions.

Table 2. Level of motivation, options.

1	To harm the environment as little as possible through conscious food consumption
2	When shopping, choose food that is as environmentally friendly as possible
3	Accept inconveniences to consume products that are more environmentally friendly
4	To harm the climate as little as possible through conscious food consumption
5	When shopping, choose food that is as climate-friendly as possible
6	Accept inconveniences to consume products that are more climate-friendly
7	To harm the farm animal welfare as little as possible through conscious food consumption
8	When shopping, choose food that is as animal-friendly as possible
9	Accept inconveniences to consuming products that are more animal-friendly and produced

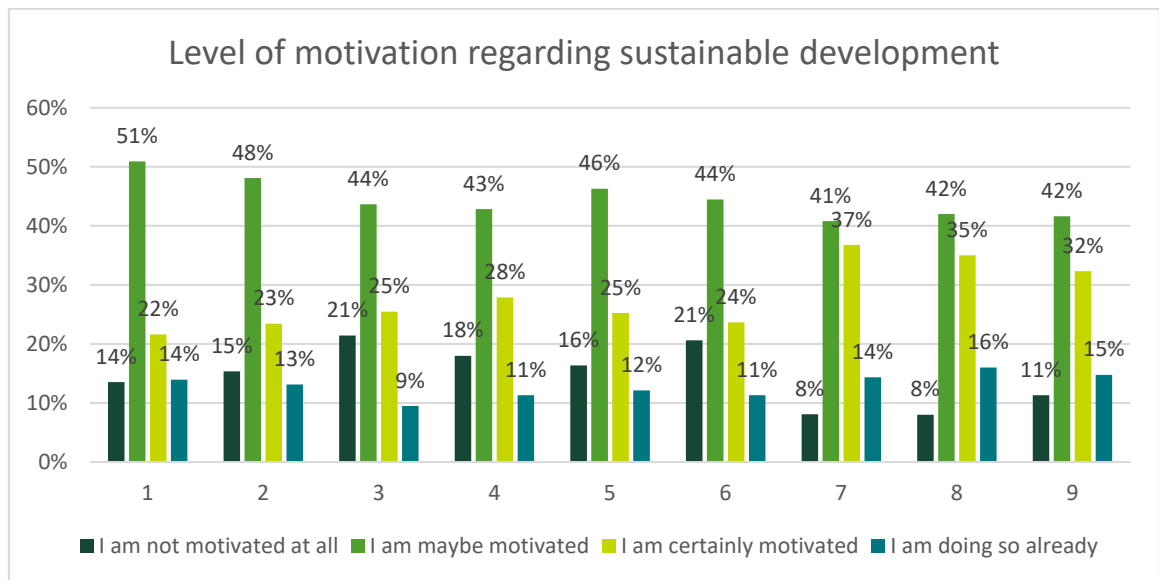


Figure 1. Level of motivation regarding sustainable development.

The most popular answers were "I am maybe motivated" and "I am certainly motivated". "I am doing so already" and "I am not motivated at all" were less popular, meaning that people tended to stick to the moderate options but had a generally positive attitude towards sustainability. The correspondents tended to be less motivated in the situations regarding their inconvenience.

By adding "I am maybe motivated" and "I am certainly motivated" together, the correspondents had a higher level of motivation regarding the animal welfare questions than the environment and climate questions (76,3% compared to 70,3% for the environment and 64,3% for the climate).



## 4.2.2 Attitudes

In the part regarding attitudes, the correspondents were first asked how they rated fourteen possible sustainable development solutions. The different solutions varied a lot, from different types of labels to increasing lab meat or vegetative substitutes. The result is shown in Figure 2.

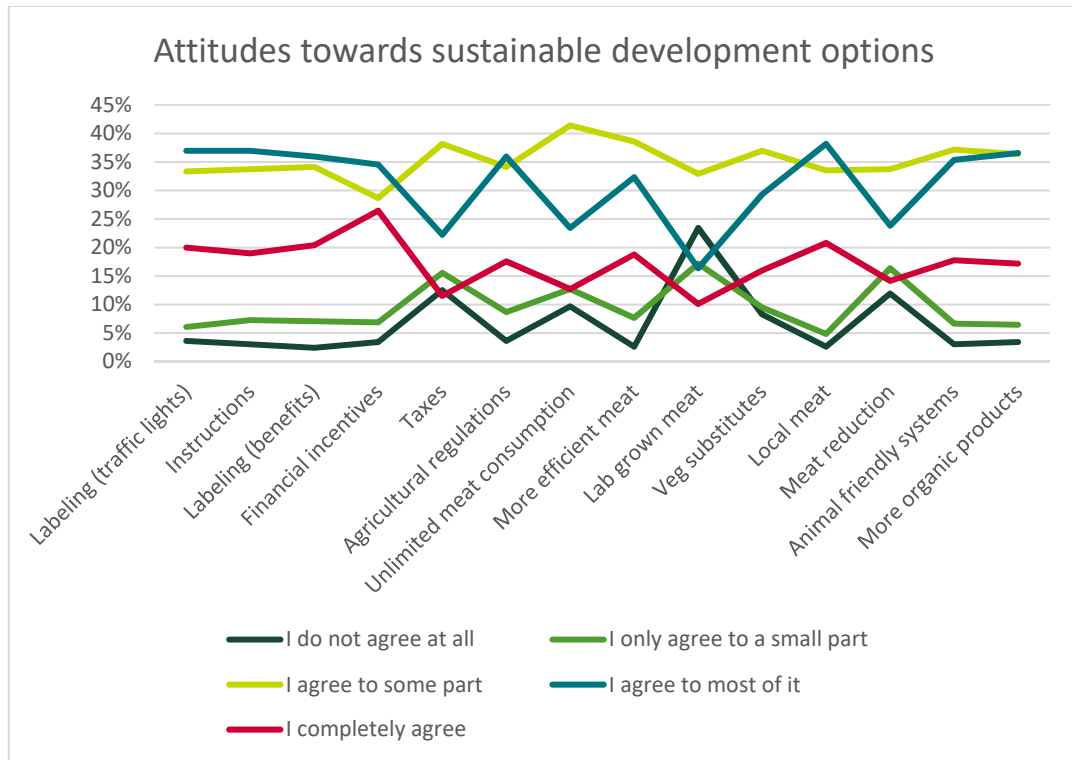


Figure 2. Attitudes towards sustainable development options.

The correspondents answered that labeling, offering instructions to consumers, financial incentives, increased production of local meat, more efficiently produced meat, animal-friendly production systems, and increased organic food production were good options to increase sustainable development.

Lab-grown meat was the least popular option with only 23% who thought it was a good idea, and only 10% that completely agreed. Taxes were the second least popular, followed by unlimited meat consumption, meat reduction, and increased consumption of vegetarian substitutes.

The correspondents were then asked how they rated twenty different statements regarding sustainability at the same level as Figure 2 -between “I do not agree at all” to “I completely agree”. The result is shown in Figure 3, where the different statements are rated from the most popular to the least popular.

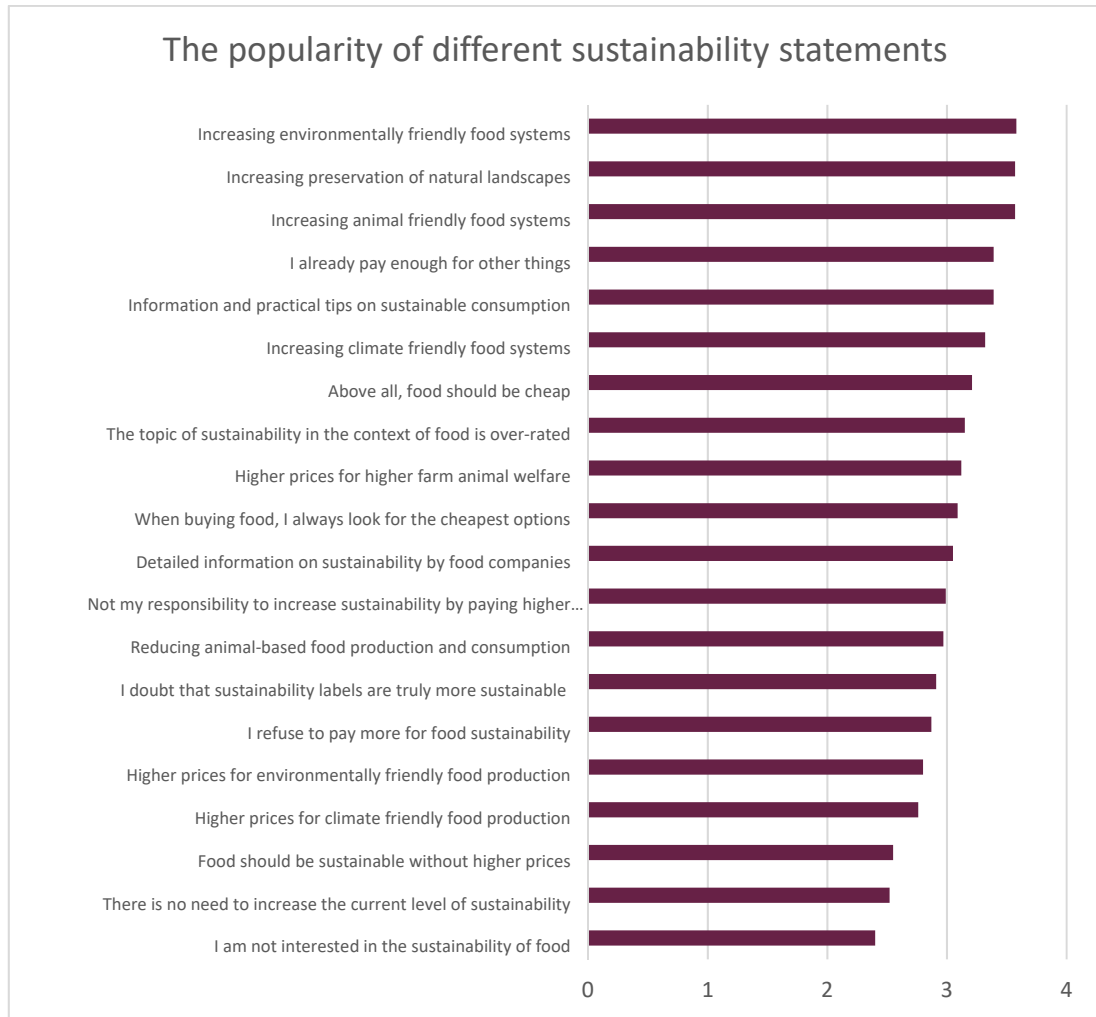


Figure 3. The popularity of different sustainability statements.

The most popular statements were; increasing environmentally friendly food systems, more support should be given to the preservation of natural landscapes, increasing animal-friendly food systems, and I already pay enough for other things.

The least popular statements were; I am not interested in the sustainability of food, there is no need to increase the current level of sustainability, and food should be sustainable without having to pay higher prices.

#### 4.2.3 Role of sustainability labels in daily life

The role of sustainability labels in a daily life section included a set of (generic) labels, respondents were asked to report the frequency they choose food labels in daily life. Even though some labels do exist, this part aimed to evaluate which (invented) labels were most popular. The result is shown in Figure 4.

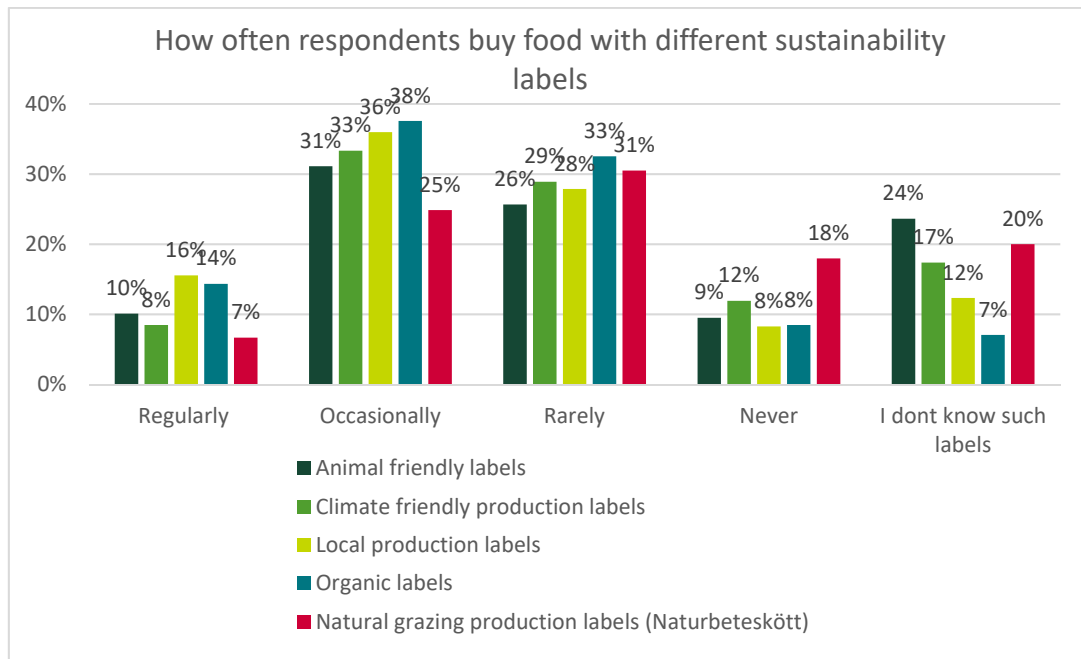


Figure 4. How often respondents buy food with different sustainability labels.

Organic and locally produced were the most popular labels in general. Animal-friendly labels and natural grazing production labels were the labels that the correspondents had the least experience with.

Occasionally and Rarely were the most popular alternatives regarding how often they bought different labels.

#### 4.2.4 Transition toward sustainable food consumption

The correspondents were asked how much responsibility they thought every sector (retailers, consumers, policy makers, and farmers) in the food chain has. The questions involved the role of actors, and acceptance of different interventions/measures to achieve a higher sustainability in the food system. The result is shown in Figure 5.

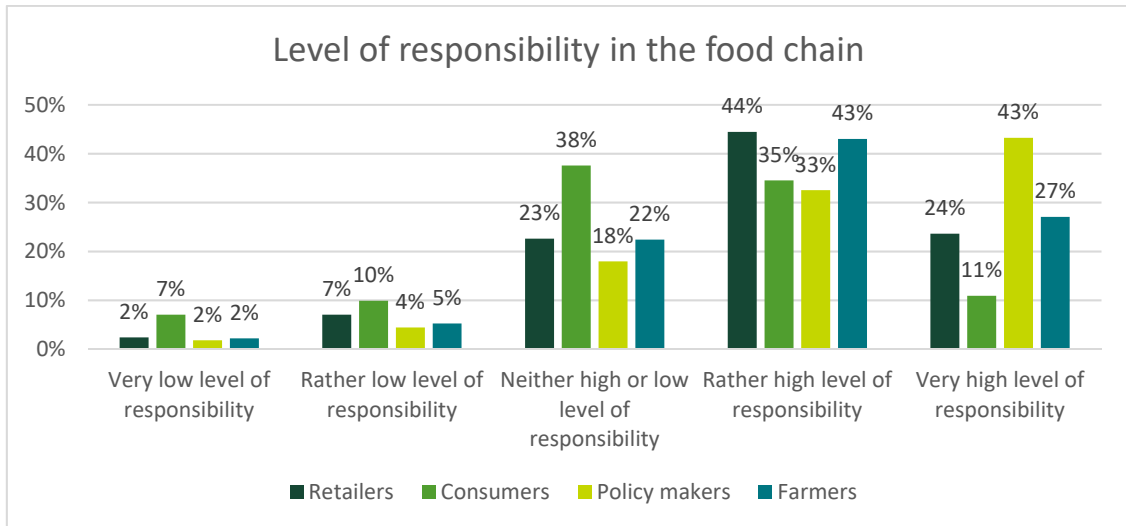


Figure 5. Level of responsibility in the food chain.

The respondents were united answering that all, consumers, farmers, retailers, and policymakers are responsible for sustainable development. Few thought that the different sectors had a low level of responsibility. In the lowest level of responsibility, consumers excelled with 7% compared to the other sectors that had only 2%. Compared to the other sectors, they answered that consumers had the lowest level of responsibility in total. Retailers were perceived to have a rather high level of responsibility.

By adding "Rather high level of responsibility" and "Very high level of responsibility" together, the consumers had a lower level of responsibility (46% compared to 68% for retailers, 76% for policy makers, and 70% for farmers).

#### 4.2.5 Knowledge of agriculture

To get a better perception of how much agriculture knowledge the correspondents had, they were encouraged to answer true or false in seven different statements. These statements were based on EU legislation in general. The result is shown in Figure 6.

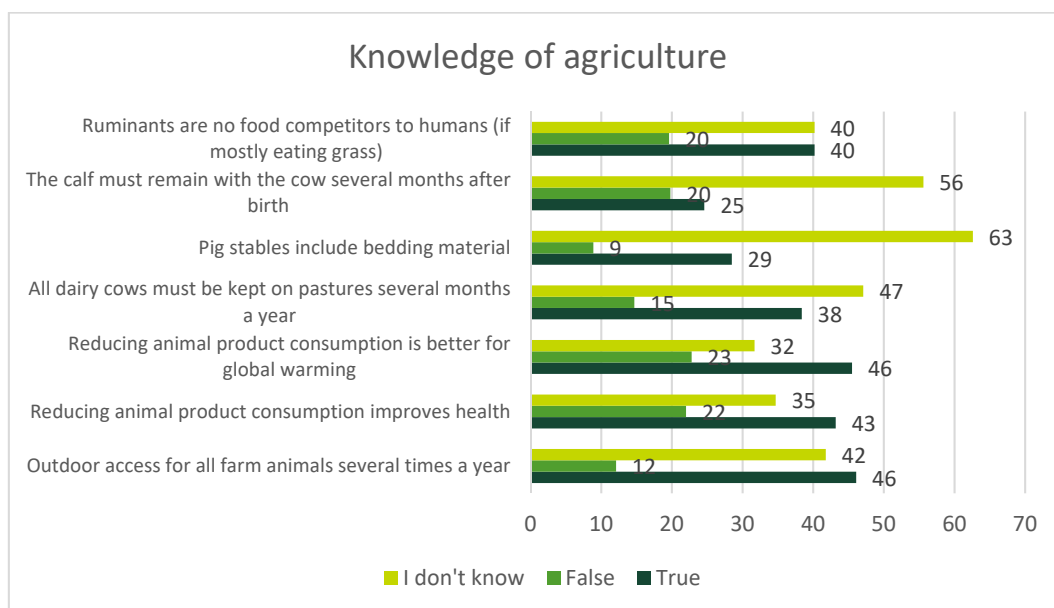


Figure 6. Knowledge of agriculture.

The answer “I don’t know” was in general the most popular answer in this section. In the question “the calf must remain with the cow for several months after birth” 25% answered that it is true, which it is not. Regarding this question, 56% answered “I don’t know”. Regarding the question about bedding material for pigs, an even higher amount (63%) answered that they do not know, and 9% answered that it is false (which is incorrect).

Further, 47% answered that they did not know if dairy cows are kept on pasture for several months, and 15% believed they are not which is incorrect. In the question “Outdoor access for all farm animals several times a year” 42% answered that they do not know and 46% answered that it is true. The correct answer to this question is false, since eg. pigs and chickens rarely have outdoor access several times a year. The answers to these questions show that the respondents had a low level of agricultural knowledge.

### 4.3 The sociodemographic characteristics analysis

To analyze the correlation between different motivation levels and sociodemographic values, several tests were made.

The correlation between gender and motivation level was -3.746 ( $p=0.001$ ). The mean rank was 223.93 for men and 271.98 for women, meaning women have a higher level of motivation than men.

The correlation between level of education and level of motivation was 0.013 ( $p=0.05$ ). The correlation between income and motivation level was 0.297 ( $p=0.05$ ). Regarding the correlation between age and level of motivation, the test result was 0.945 ( $p=0.05$ ). As for region and level of motivation, the result was 0.341 ( $p=0.05$ ) and there is no correlation as well.

Since the consumer perspective is much discussed in this thesis, there was also an interest in the correlation between age and consumer responsibility. Using the Kruskal-Wallis test here as well, the test result was 0.283 ( $p=0.05$ ). This means that if the current trend continues, people will assume the consumer has little responsibility in the future as well.

## 4.4 Behavior patterns

Looking at the results, the respondents tended to stick to the alternatives in the middle. For example in the part about motivation level where "I am maybe motivated" and "I am certainly motivated" were the most popular options. The part with the different statements, "I neither agree nor disagree" was the most chosen alternative. In the section with different solutions "I only agree to a small part" and "I agree to some parts" were the most chosen alternatives.

The data also shows that the respondents prefer cheap food. In Figure 3, "I already pay enough for other things" and "above all, food should be cheap" were popular options. In Figure 2, taxes were one of the least popular options. Considering the presented data, the respondents seem positive toward increasing sustainability in their everyday lives. However, they are more positive toward options that do not include/require financial expenses.

Looking at Figure 1, options 3, 6, and 9 regarding inconvenience, have a higher response rate than the other options. This indicates that consumers are interested in sustainability, as long as they do not need to put in extra effort. Looking at Figure 2, the most popular sustainable solutions were labeling, instructions, and financial incentives. These are all options that other sectors are responsible for, rather than the consumer. Some of the least popular options were, except for lab meat, taxes, meat reduction, and increased consumption of vegetarian substitutes. These are options that immediately affect the consumer, some might say negatively. This also supports the resistance towards inconvenience.

## 5. Discussion

Having presented the results and highlighted the most relevant parts, this will further be analyzed in the discussion that follows. The presented data will also be compared to the literature part.

### 5.1 Responsibility

In the literature review, the consumers' responsibility and how consumers' demand affect the market, were highlighted (Sassatelli, 2007, Trentmann, 2006). The retail sector also tended to blame the consumer, arguing that they sell what consumers buy and not the opposite (Tjärnemo & Sövdahl, 2015). However, the results of this study show that the respondents believe that the other sectors have a higher responsibility than the consumers. This conflict of responsibility might harm sustainable development since no one is willing to take full responsibility.

As mentioned in the literature part the entire food chain must work to achieve sustainable food systems (Govindan, 2018). Therefore, putting the responsibility on other sectors will not have the positive effect needed for future food production. The consumers must be able to make sustainable decisions, but they are not the only sector responsible. Since the retail industry is very concentrated in Sweden with four companies that control most of the market (Tjärnemo & Sövdahl, 2015) they have a big opportunity to take a stand and improve their sustainability standards. Since they have an impact on consumer choices, they can choose to work for the increase of Swedish self-sufficiency, by choosing to sell only domestic meat and dairy products for example. By raising the consumers' awareness, together with labels and marketing strategies organized by the retail sector, sales can increase. Increased consumption of climate-labeled milk is one example that we saw work in the study by Elofsson et. al., (2016). The retail sector also has the option of refraining from purchasing unsustainable food products.

The Swedish government has made improvements to secure Swedens' food security (Regeringskansliet, 2023). Since Sweden is only about 50 % self-sufficient (LRF, 2024; Svenska Dagbladet, 2022) there is a need for big actions to ensure citizens survival in case of crisis. Since farmers experience difficulties in achieving

sustainability in their business (Fischer & Rööös, 2018) actions are needed if we want to have domestic food production in the future. Since Swedish' agriculture has high standards, especially regarding animal welfare (Animal Protection Index, 2024) and low use of antibiotics in livestock production (Mulchandani et. al., 2023; Rajala-Schultz et. al., 2021; Wierup, 2021) it should be able to bring added value to animal foods.

## 5.2 Food prices and consumer behavior

In 2019 when Russia invaded Ukraine, the farmers' expenses raised four million Swedish crowns in just a few months. This led to higher food prices than people were used to. Since Russia and Ukraine are two of the biggest producers of fertilizers, this has also led to Sweden importing lower amounts. Using fewer fertilizers, field production decreases and less food is produced (Svenska Dagbladet, 2024).

In times of war, high food prices, and inflation, the trust for domestic food products increases. Swedish consumers tend to buy more Swedish meat when the world faces difficult times. In a consumer survey from Svenskt Kött (2023), 87% said they look for Swedish meat when grocery shopping. In Svenskt Kött's survey, the correspondents answered that they gladly paid more money for domestic products. This was also shown in the literature review. It is concerning though, that the results in this study, the options regarding cheap food prices were popular. Since Sweden has higher production costs than other countries, the domestic meat is often more expensive than the imported options.

Another difference that can be discussed is that the results showed that the correspondents tended to have a positive attitude toward both increasing organic consumption and production, but also bought organic labels more often than others. Sweden is one of the five countries in the world with the highest consumption of organic products (KRAV, 2024). However, since 2020 the consumption of organic products has been decreasing mostly due to higher prices than conventional products (SVT, 2022). The amount of organic registered animals has decreased as well in the last couple of years (Jordbruksverket, 2022).

These examples above might all be examples of the attitude-behavior gap mentioned in the literature review. Correspondents answer "correctly" in the surveys saying they are motivated to buy sustainable foods, but once in the grocery store, they pick cheaper options. Since it is easy to answer that they like organic food, for example, we can assume that the statistics in this study will not agree with reality.

This might support several studies mentioned in the literature review; Axelsson & Agndal (2012) and Terlau & Hirsch (2015) meant that consumers put little



thought into their purchases. Vermeir & Verbeke (2006) said grocery shopping is mostly habitual. This way of thinking is also supported by Sadowski & Buckingham (2007) (according to Tullsten & de Silva (2020)), they want to walk into a store, choose any product, and trust that the retailer has taken care of all sustainability issues throughout the product's value chain, preferably without the consumer having to pay extra for these goods (Sadowski & Buckingham, 2007, according to Tullsten & de Silva (2020)).

This situation is also an opportunity for the retail sector to make improvements, such as information and placing products in a special way in the store. Regarding the results from this study, the respondents answered that they were less fond of options regarding their inconvenience. This might mean that if the consumer needs to put an effort while in the supermarket (for example ask where to find food products that are hard to find), they might choose a less sustainable option. Leading consumers to make better choices in the grocery store, seems like a viable option for the retail sector.

The increasing popularity of REKO-rings might indicate that consumers are willing to pay more money for food if they know that it goes directly to the farmer. Since REKO-rings usually do not offer the same range of products as supermarkets, people accept some inconvenience for less amount of products. This might be an indication that the retail industry takes too big a profit in the food chain.

### 5.3 Value of food

Another opinion that was noticed in the study by Fischer & Rööös (2018) was that farmers expressed that consumers have a lack of knowledge about food production. The gap between producer and consumer is, according to farmers, too big.

During the last decade, people have become used to low food prices, mostly due to the high amount of imported food (Svenskt Kött, 2024). When Russia invaded Ukraine and food prices increased, consumers started complaining about food being too expensive. However, we have never spent less money on food than in the last decade. Compared to 1950 when as much as 40% of the household income was spent on food, today these expenses are only 12,5%. It is therefore relevant to question the current value of food and consider improving the appreciation for food. The expenses that no longer is spent on food are usually spent on accommodation, hobbies, and recreation (Svenskt Kött, 2024).

Returning to the gap between the farmers and the consumers- these results support the results from Fischer & Rööös (2018). The results from this study show that the correspondents have little knowledge of agriculture, see Figure 6. Since 47% answered that they did not know if cows are kept on pasture, it is a little concerning. “Kosläpp” is a popular event at the beginning of summer when farmers

allow the cows to attend pastures for the first time in the season. This event usually attracts thousands of people, so the lack of knowledge about grazing cows in Sweden is surprising. There have also been projects in Sweden regarding pigs and their tails staying intact eg. “Svenska grisar har knorren kvar (Swedish pigs have intact tails)”. Tail biting is seen as a welfare problem and providing straw is one possible solution to the problem. Since the majority of the respondents in this study answered that they did not know if pigs have access to straw, it is clear that the message from these projects has not reached the consumers in general.

This knowledge gap might be the reason consumers complain about food prices—they do not know how food is produced and how much work is needed for the finished product.

## 5.4 Survey evaluation

### 5.4.1 Was the survey too comprehensive?

As mentioned in the result, many respondents tended to stick to the middle options throughout the survey. For example in Figure 1 where “I am maybe motivated” and “I am certainly motivated” were the most popular options. The part with the different statements, “I neither agree nor disagree” was the most chosen alternative. In the section with different solutions “I only agree to a small part” and “I agree to some parts” were the most chosen alternatives.

This can either mean that, (1) as mentioned in by Chkanikova & Mont (2015), consumers do not care about the sustainability of food, or (2) it can mean that Swedish consumers are typical “lagom” (moderate). A third option (3) is that since the survey was quite comprehensive, the correspondents put little effort into answering the questions.

The survey had 10 different parts with many questions in each section, the total number of questions was 76. The estimated time for completing the survey was 20 minutes. Since the survey was this comprehensive, it might hurt the correspondents' motivation to answer the questions accurately.

### 5.4.2 Potential errors

Since the survey was sent out to five different countries, translation into different languages was necessary. During this process, there was a problem with the translation of the question regarding income level. The question aimed to find out the household income. However, it was formulated in a way that most respondents

probably answered what their income level was. When analyzing the data, it was not clear whether they answered on an individual or household level. This might have had an effect on the result regarding motivation level based on income.

It would have been a better idea to ask the respondents to fill in their actual income rather than having different income groups. This way the result would have been more accurate and it would have eased the data analysis. There were 58 respondents who did not answer the question about income, the majority were women (41).

The majority of the studies discussed in the literature review were written before the inflation that came with COVID-19 and Russia invading Ukraine. A lot has happened in the world economy but also on an individual level. Therefore, comparing old research with the results from this study, might not be accurate on some levels.

## 6. Conclusions

- To achieve sustainable food systems the entire food chain must improve their actions toward sustainable development.
- Consumer choices have a major impact on sustainable development, but consumers are not the only sector that needs to take responsibility. However, consumers need to be aware of their impact on the market.
- Consumers have little knowledge about agriculture which increases the gap between farmers and consumers. Consumer education is needed to secure future food production.
- There was no correlation between sociodemographic values and motivation level except between males and females.
- A higher level of self-sufficiency rate is needed to ensure the citizen's survival in case of a crisis.

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## Popular science summary

Climate crisis, war, and, famine are some of society's most popular debate topics. Food production is one of the most important issues in the world but also one of the most debated. Being able to produce food is one of man's most basic needs for survival, especially in times of crisis. Agriculture is often criticized because the production of food emits greenhouse gases and thus harms the environment. Farmers work to reduce their environmental impact daily, but so must the rest of the food chain. The food chain also includes consumers, food companies, and the public sector. All participants in the food chain have a responsibility and must work together for sustainable development in food production. As world hunger worsens and the population continues to grow, more food must be produced. The path to sustainable food production and consumption, as well as who bears the responsibility, will be discussed in this study.

This study was a collaboration with the EU project PATHWAYS. The purpose of the project was to investigate how to reduce the environmental impact while meeting society's demands for safe, nutritious, and affordable meat and dairy products. The project aimed to identify and increase sustainable practices along the supply and production chains in the European livestock sector. Part of PATHWAYS was a ten-part consumer survey. Consumers' eating habits, attitudes towards sustainable solutions, and how socio-democratic characteristics affect consumer motivation have been examined, among other things. These data will be analyzed and discussed in the study. The study also includes a literature review that is used to compare and analyze the results.

The results of the study show that the Swedish consumer is concerned about sustainable food production and generally has a high level of motivation in several situations. The economy has a major impact on food consumption. The consumer was considered to have the least responsibility in the food chain compared to other sectors. No significant differences were found between socio-democratic characteristics and level of motivation, except for gender. Women were shown to be more motivated to make sustainable choices than men.

## Acknowledgements

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Finally I want to acknowledge my appreciation to the PATHWAYS team for giving me the opportunity to be part of this journey.



# Appendix 1

## **Pathways - Hållbar produktion och konsumtion av livsmedel**

Välkommen till vår undersökning!

I denna undersökning tittar vi på hållbar livsmedelsproduktion och konsumtion i Europa. Undersökningen är en del av forskningsprojektet Pathways (<https://pathways-project.com>) som är finansierat av EU-kommissionen. Projektets konsumentundersökningar organiseras av Forskningsinstitutet för Ekologiskt Jordbruk (FiBL) i Schweiz

Undersökningen tar ungefär 20 minuter att genomföra. Ditt deltagande är frivilligt. Om du deltar med din mobiltelefon kan du tänka på att vrida skärmen horisontellt för vissa frågor, eftersom det kan göra det lättare att se vissa frågor. Det är möjligt att lämna undersökningen och fortsätta senare.

Uppgifterna kommer att vara helt anonymiserade och användas uteslutande för vetenskapliga ändamål. Du har rätt att dra dig ur undersökningen efter att den har slutförts. Om du har några frågor om undersökningen, vänligen kontakta Hanna Stolz ([hanna.stolz@fibl.org](mailto:hanna.stolz@fibl.org)) eller Olivia Barth [oaba0001@stud.slu.se](mailto:oaba0001@stud.slu.se)

Denna undersökning följer reglerna i den internationella ICC / ESOMAR International Code of Market and Social Research som kan laddas ner via följande länk: <https://esomar.org/code-and-guidelines/icc-esomar-code>

Det finns 76 frågor i denna enkät.

**Vilken av de alternativ som listas nedan associerar du dig närmast med när det gäller kosthållning? \***

Välj ett av följande svar  
Välj **bara en** av följande:

- Blandad kost: Denna diet består av växt- och animaliska produkter och inkluderar alla livsmedel.
- Flexitarianism: Denna diet innehåller mindre kött och fisk och är mer växtbaserad, även om kött och fisk konsumeras ibland.
- Vegetarism: Denna diet eliminerar kött. Vissa vegetariska dieter innehåller dock fisk och/eller ägg.
- Veganism: I en vegansk kost äter man bara vegetabiliska livsmedel: frukt och grönsaker, spannmål, baljväxter, nötter, frön och oljor. Honung, ägg, mjölk och andra produkter från djur undviks.
- Paleo: Begreppet Paleo står för att äta som på stenåldern (paleolitiskt). Det innebär att allt som våra förfäder kunde fiska, jaga, plocka och samla in läggs på tallriken. Det handlar om frukt och grönsaker, bär, frön och nötter, fisk, kött och fågel, ägg, vegetabiliska oljor och honung. Socker, kaffe och alkohol undviks, liksom spannmål, baljväxter, mjölk och mejeriprodukter, tillsatser och bearbetade livsmedel - dessa var okända på den tiden.
- LCHF: har som mål att äta så lite kolhydratrika livsmedel som möjligt och ersätta dem med protein- och fettrika produkter. På menyn finns främst fisk, kött, grönsaker och

mejeriprodukter, medan bröd, spannmålsprodukter och potatis sällan serveras. Många människor vill ha en sådan diet för att gå ner i vikt. Det finns olika typer av dieter där kolhydratinnehållet är lågt, tex är keto en av dem.

### **Grad av motivation för hållbar livsmedelskonsumtion**

Följande frågor är relaterade till miljö-, klimat- och djurvänlig livsmedelskonsumtion. De första påståendena handlar om miljövänlig livsmedelskonsumtion. Miljövänlig innebär så liten påverkan som möjligt på mark, vatten och luft. Ange hur motiverad du är att följa följande påståenden. \*

Välj det korrekta svaret för varje punkt:

	<b>Jag är inte motiverad alls.</b>	<b>Jag är lite motiverad.</b>	<b>Jag är verkligen motiverad.</b>	<b>Jag gör det redan.</b>
<b>Att skada miljön så lite som möjligt genom medveten livsmedelskonsumtion.</b>				
<b>Att när jag handlar välja livsmedel som är så miljövänliga som möjligt.</b>				
<b>Acceptera ett visst besvär för att konsumera produkter som är mer miljövänliga.</b>				

Nästa fråga handlar om klimatvänlig livsmedelskonsumtion. Klimatvänlig innebär att minska, undvika eller kompensera för utsläpp av växthusgaser genom produktion/konsumtion. Ange hur motiverad du är att följa följande påståenden. \*

Välj det korrekta svaret för varje punkt:

	<b>Jag är inte motiverad alls.</b>	<b>Jag är lite motiverad.</b>	<b>Jag är verkligen motiverad.</b>	<b>Jag gör det redan.</b>
<b>Att skada klimatet så lite som möjligt genom medveten matkonsumtion.</b>				
<b>Att när jag handlar välja livsmedel som är så klimatvänliga som möjligt.</b>				
<b>Acceptera ett visst besvär för att konsumera produkter som är mer klimatvänliga.</b>				

### **Attityder till hållbar livsmedelsproduktion och konsumtion**

Följande påståenden handlar om hållbar (med avseende på miljö, klimat och djurskydd) livsmedelsproduktion och konsumtion i allmänhet. Hur mycket håller du med eller inte med om följande påståenden? Vänligen svara spontant. \*

Välj det korrekta svaret för varje punkt:

<b>1 = Jag instämmer inte alls</b>	<b>2 = Jag instämmer bara till en liten del</b>	<b>3 = Jag instämmer till viss del</b>	<b>4 = Jag instämmer med det mesta</b>	<b>5 = Jag instämmer helt</b>
--	---	--	--	---------------------------------------

**Jag skulle vilja få mer information och praktiska tips om hållbar konsumtion av livsmedel.**

**Livsmedelsföretagen bör förse konsumenterna med detaljerad information om livsmedels hållbarhet.**

**Mer stöttning bör ges till djurvänliga livsmedelssystem.**

**Mer stöttning bör ges till miljövänliga livsmedelssystem.**

**Mer stöttning bör ges till klimatvänliga livsmedelssystem.**

**Mer stöttning bör ges till bevarandet av naturliga landskap.**

**Mer stöttning bör ges för att minska produktionen och konsumtionen av animaliska livsmedel.**

**Jag är villig att betala högre priser för bättre djurskydd i livsmedelsproduktionen.**

**Jag är beredd att betala högre priser för klimatvänlig livsmedelsproduktion.**

**Jag är beredd att betala högre priser för miljövänlig livsmedelsproduktion.**

**Följande påståenden är kritiska till hållbar (med avseende på miljö, klimat och djurskydd) livsmedelsproduktion och konsumtion och livsmedelspriser i allmänhet. I vilken utsträckning håller du med eller inte med om följande påståenden? Vänligen svara spontant. \***

Välj det korrekta svaret för varje punkt:

<b>1 = Jag instämmer inte alls</b>	<b>2 = Jag instämmer bara till en liten del</b>	<b>3 = Jag instämmer till viss del</b>	<b>4 = Jag instämmer med det mesta</b>	<b>5 = Jag instämmer helt</b>
--	---	--	--	---------------------------------------

**Jag är inte intresserad av hållbarheten i livsmedel.**

**Jag betalar redan tillräckligt för andra saker.**

1 = Jag instämmer inte alls      2 = Jag instämmer bara till en liten del      3 = Jag instämmer till viss del      4 = Jag instämmer med det mesta      5 = Jag instämmer helt

**Jag tvivlar på att livsmedelsprodukter med hållbarhetsmärkning verkligen är mer hållbara än andra livsmedelsprodukter.**

**Jag vägrar att betala mer för hållbara livsmedel.**

**Det är inte mitt ansvar att öka hållbarheten i livsmedelssystemen genom att betala högre priser.**

**Framför allt ska maten vara billig.**

**När jag köper mat letar jag alltid efter de billigaste alternativen.**

**Frågan om hållbarhet i samband med livsmedel är överskattad.**

**Det är min rättighet att ha en hög nivå av hållbarhet i maten och inte något jag ska behöva betala extra för.**

**Den nuvarande nivån av hållbarhet inom livsmedelsproduktion och konsumtion är tillräcklig. Det finns ingen anledning att öka hållbarheten.**

#### **Kunskapsnivå om metoder för animalieproduktion**

**I vilken utsträckning anser du att följande påståenden om djurskydd, klimat- och miljöaspekter av animalieproduktion och hållbar livsmedelskonsumtion är korrekta/icke korrekta? \***

Välj det korrekta svaret för varje punkt:

**Sant**

**Falskt**

**Jag vet inte**

**Enligt EU-lagstiftningen ska alla lantbruksdjur i Europa ha tillgång till utevistelse flera gånger per år.**

**Att minska en hög konsumtion av animaliska produkter minskar avsevärt de negativa effekterna på människors hälsa.**

	Sant	Falskt	Jag vet inte
<b>En minskad konsumtion av animaliska produkter minskar avsevärt de negativa effekterna på den globala uppvärmningen.</b>			
<b>Enligt EU-lagstiftningen måste alla mjölkkor hållas på bete flera månader om året.</b>			
<b>Enligt EU-lagstiftningen ska svinstallar innehålla strömedel.</b>			
<b>Att hålla betesdjur på naturbetesmark bidrar till att bevara kulturlandskapet och den biologiska mångfalden.</b>			
<b>Nötkreatur, som tillhör gruppen idisslare, vars diet kan vara uteslutande gräsbaserad, konkurrerar inte om livsmedel till människor.</b>			

Nästa fråga handlar om djurens välbefinnande i lantbruket. Djurvälfärd är en term för god djurhälsa och välbefinnande, särskilt för lantbruksdjur. Djurens välbefinnande omfattar aspekter som fysisk hälsa, förmåga att utföra naturliga beteenden samt djurens känslomässiga välbefinnande. Ange hur motiverad du är att följa följande påståenden. \*

Välj det korrekta svaret för varje punkt:

	Jag är inte motiverad alls.	Jag är lite motiverad.	Jag är verkligen motiverad.	Jag gör det redan.
<b>Att skada lantbruksdjurens välbefinnande så lite som möjligt genom medveten livsmedelskonsumtion.</b>				
<b>När du handlar, välj livsmedel som är så djurvänligt producerade som möjligt.</b>				
<b>Acceptera ett visst besvär för att konsumera produkter som är mer djurvänligt producerade.</b>				

#### Hållbarhetens roll i livsmedelskonsumtionen

Följande frågor handlar om vilken roll vissa livsmedelsmärkningar spelar för dina livsmedelsval. Hur ofta väljer du livsmedel med följande märkningar? \*

Välj det korrekta svaret för varje punkt:

<b>Regelbundet (flera gånger i veckan)</b>	<b>Ibland (flera gånger i månaden till en gång i veckan)</b>	<b>Sällan (en gång i månaden eller mer sällan)</b>	<b>Aldrig</b>	<b>Jag känner inte till sådana livsmedelsmärkningar/attribut</b>
--	--	--	---------------	--

**Ekologiska märkningar**  
(Ekologiskt avser en form av jordbruk som inte använder kemiska bekämpningsmedel och därför värnar om miljön och bevarar jordens resurser. Gårdar som producerar ekologiska produkter arbetar enligt principerna och specifikationerna för ekologiskt jordbruk.)

**Djurskyddsmärkning**  
(Djurskydd avser hälsa och välbefinnande hos lantbruksdjur.)

**Djurens välbefinnande**  
omfattar aspekter som fysisk hälsa, förmågan att utföra naturliga beteenden och djurens känslomässiga välbefinnande.)

**Klimatvänlig produktionsmärkning**  
(Klimatvänlig produktion baseras på att minska, undvika eller kompensera för utsläpp av växthusgaser.)

**Lokal produktionsmärkning**  
(En regional produkt har producerats, bearbetats och marknadsförs inom

		Ibland	Sällan		
	Regelbundet (flera gånger i veckan)	d (flera gånger i månaden till en gång i veckan)	n (en gång i månaden eller mer sällan)	Aldrig	Jag känner inte till sådana livsmedelsmärkningar/attribut

en avgränsad region, varvid region kan betyda det större området av bostadsorten, till exempel stadsdelen eller vissa naturområden.)

Naturbeteskött (Naturbeteskött kommer från djur som minst halva betesperioden går på naturbetesmarker och därmed bevarar biologisk mångfald och kulturella värden i odlingslandskapet.)

### Övergång till hållbar livsmedelskonsumtion

När det gäller förbättringar av hållbarheten (avseende miljö, klimat och djurskydd) i livsmedelssystemen, vem bör enligt din åsikt ta ansvar? Vänligen rangordna efter ansvarsnivå. \*

Välj det korrekta svaret för varje punkt:

1 =	2 =	3 =	4 =	5 =
mycket litet ansvar	ganska litet ansvar	varken litet eller stort ansvar	ganska stort ansvar	mycket stort ansvar

Konsumenterna (t.ex. genom att göra ansvarsfulla livsmedelsval och betala högre priser, etc.)

Återförsäljare/distributörer/butiksägare  
Lantbrukare  
Beslutsfattare

I följande fråga visas en lista över möjliga framtida politiska åtgärder relaterade till köttkonsumtion. Vi skulle vilja fråga dig hur mycket du är för eller emot de enskilda policyerna. \*

Välj det korrekta svaret för varje punkt:

				5 =
	1 = Jag	2 = Jag	3 = Jag	Jag
	är helt emot	är ganska	är varken	tycker
	idén	emot idén	för eller	det är
			emot idén	en
				väldigt
			4 = Jag	bra
			tycker det är	idé
			en ganska	
			bra idé	

**Märkning av hållbara produkter (trafikljus)**

**Ge konkreta instruktioner för hållbara livsmedelsval och kommunicera dem till hela befolkningen**

**Märkning av fördelarna med hållbara livsmedel**

**Pengabaserade stimulansmetoder för hållbara livsmedel (tex sänkt moms på hållbara alternativ)**

**Införa skatter/monetär ersättning för ej hållbara produkter**

**Införande av obligatorisk jordbruksregler för att främja större hållbarhet i livsmedelssystemen**

I det följande visas en lista över möjliga framtida politiska åtgärder relaterade till köttkonsumtion. Vi skulle vilja fråga dig hur mycket du är för eller emot de enskilda policyerna. \*

Välj det korrekta svaret för varje punkt:

				5 =
	1 = Jag	2 = Jag	3 = Jag	Jag
	är helt emot	är ganska	är varken	tycker
	idén	emot idén	för eller	det är
			emot idén	en
				väldigt
			4 = Jag	bra
			tycker det	idé
			är en	
			ganska bra	
			idé	

**Fortsatt konsumtion av kött (och andra animaliska produkter):**

**Köttkonsumtionsmönster kan inte och bör inte styras**

**Effektivare produktion av kött (och andra animaliska produkter) genom förbättrade djurhållningssystem och avel**

**Mer artificiellt laboratorieodlat kött som ett alternativ till kött**



				5 =
1 = Jag	2 = Jag	3 = Jag	4 = Jag	Jag
är helt emot	är ganska	är varken	tycker det	tycker
idén	emot idén	för eller	är en	det är
		emot idén	ganska bra	en
			idé	väldigt
				bra idé

**Mer proteinrika livsmedel från växter och alger som alternativ till kött (och andra animaliska produkter)**

**Övergång till konsumtion av lokalt producerat kött (och andra animaliska produkter)**

**Betydande minskning av konsumtionen av kött (och andra animaliska produkter)**

**Övergång till konsumtion av kött (och andra animaliska produkter) från djurvänliga uppfödningssystem**

**Mer kött och andra animaliska produkter från ekologisk produktion.**

## **Sociodemografiska egenskaper del 2**

**Hushållsstorlek: Hur många personer bor permanent i ditt hushåll (inklusive dig själv)? \***

Endast siffror kan skrivas i detta fält.  
Skriv ditt svar här:

•

**Antal barn: Hur många barn (personer under 18 år) bor permanent i ditt hushåll? \***

Endast siffror kan skrivas i detta fält.  
Skriv ditt svar här:

•

**Vilka åldersgrupper representeras av de barn som bor i hushållet? \***

Svara bara på denna fråga om följande villkor är uppfyllda:

Svaret var större än '0' vid fråga '73 [Q15]' (Antal barn: Hur många barn (personer under 18 år) bor permanent i ditt hushåll?)

Välj de alternativ som stämmer

Välj **alla** som stämmer:

- 0 till 2 år
- 3 till 5 år
- 6 till 10 år
- 11 till 17 år

**Utbildningsnivå: Vilken är den högsta utbildningsnivå du har uppnått? \***

Välj ett av följande svar

Välj **bara en** av följande:

- Ingen utbildning utöver grundskola
- Yrkesbevis eller lärlingsutbildning
- Gymnasiebetyg
- Yrkeshögskola
- Kandidatexamen från högskola/universitet
- Masterexamen eller doktorexamen från högskola/universitet

**Inkomst: Vad är din totala månatliga bruttoinkomst före skatteavdrag? \***

Välj ett av följande svar

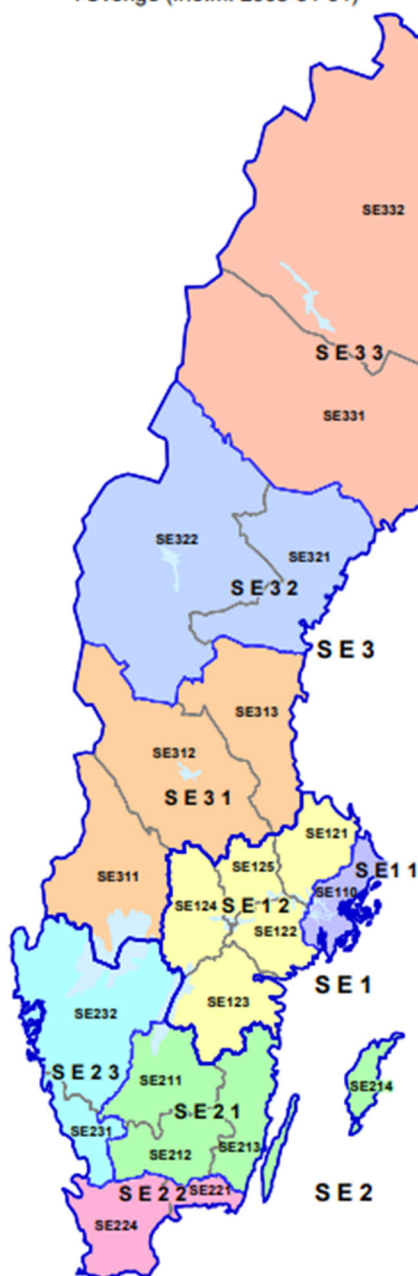
Välj **bara en** av följande:

- mindre än 10 000 SEK
- 10 000-17 999 SEK
- 18 000-27 999 SEK
- 28 000-37 999 SEK
- 38 000-49 999 SEK
- 50 000 SEK-74 999 SEK
- 75 000 eller mer
- inget svar

Tack så mycket för ditt deltagande i denna undersökning. Vi uppskattar verkligen din tid och ansträngning för att slutföra undersökningen!

## Appendix 2

### Karta över NUTS-indelningen i Sverige (fr.o.m. 2008-01-01)



NUTS är den regionala indelning som används inom EU för statistikredovisning. I Sverige utgörs NUTS 1 av tre landsdelar, NUTS 2 av riksområden och NUTS 3 av län.

Koden för NUTS 3 består av 5 positioner: den inleds med bokstavsförkortning för landet, därefter följer en position för varje nivå.

NUTS 1	NUTS 2	NUTS 3	Län	Länskod
SE1 Östra Sverige	SE11 Stockholm	SE110	Stockholms	01
		SE121	Uppsala	03
	SE12 Östra Mellansverige	SE122	Södermanlands	04
		SE123	Östergötlands	05
		SE124	Örebro	18
SE2 Södra Sverige	SE21 Småland med öarna	SE211	Jönköpings	06
		SE212	Kronobergs	07
		SE213	Kalmar	08
		SE214	Gotlands	09
	SE22 Sydsverige	SE221	Blekinge	10
SE23 Västsverige	SE231	Hallands	13	
	SE232	Västra Götalands	14	
SE3 Norra Sverige	SE31 Norra Mellansverige	SE311	Värmlands	17
		SE312	Dalarnas	20
		SE313	Gävleborgs	21
	SE32 Mellersta Norrland	SE321	Västernorrlands	22
		SE322	Jämtlands	23
SE33 Övre Norrland	SE331	Västerbottens	24	
SE332	Norbottens	25		

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