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Sweden's Meat Consumption and the Implementation of EUDR in the Food Retail Sector

Master's thesis in Industrial Ecology

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Abstract

Meat production and consumption are well known to have significant environmental impacts. An increasingly discussed issue is deforestation, driven by expanding pastures for cattle and soy cultivation for animal feed. To address this, the European Union has adopted the EU Deforestation Regulation (EUDR), applicable from December 31, 2025. It targets seven commodities, including cattle meat and soy, and requires supply chain actors to ensure that their products are deforestation-free. This thesis focuses on food retailers, since it is conducted in collaboration with the ecolabel Bra Miljöval (Good Environmental Choice), which certifies products and services in twelve areas, including food retailers. As part of a revision of the criteria, Bra Miljöval is exploring the possibility to include requirements for meat sales to promote more sustainable practices.

This thesis examines the sustainability ambitions of food retailers and explores feasible requirements for meat sales. Given the relevance of the EUDR, its potential impact on meat production and consumption is also considered. The study includes interviews with sustainability professionals at Axfood, Lidl and Coop and with a store owner at ICA. To determine how close current practices are to meeting EUDR requirements, the thesis investigates the percentage of soy embedded in meat consumed in Sweden that is currently deforestation-free.

The results show that all the soy meal used for Swedish meat production is currently certified deforestation-free. However, 59% of the meat consumed in Sweden (including imported meat) is produced with deforestation-free soy. Deforestation driven by pasture expansion for cattle meat is generally low in Europe, where most imported meat comes from. Many things remain unclear about the implementation of the EUDR, including challenges in data collection and transmission, the level of effort to ascertain and verify information, and the shift from mass balance to segregated soy supply chains. Food retailers aim to increase sales of more sustainable meat products, and strategies such as customer information, nudging, and promotions could be effective measures to achieve this. Other possible strategies include banning large meat packages or having restrictions on promotions of meat from, for example, South America.

Keywords: meat, soy, EU Deforestation Regulation, EUDR, food retailers, Bra Miljöval, deforestation

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1

Introduction

Since the 1960s, meat consumption has quadrupled worldwide (Whitton et al., 2021) and increased by 72% in Sweden (Konsumentverket, 2019). This is particularly problematic since meat production is associated with many negative environmental impacts and now represents about half of the total greenhouse gas (GHG) emissions generated by food consumption in Sweden (Konsumentverket, 2019). It is also a major contributor to global deforestation, both through the indirect use of soy in animal feed and through direct clearing of land for grazing. With the upcoming implementation of the EU deforestation regulation (EUDR), which addresses this issue, a closer look at how this regulation could impact Swedish meat consumption and Swedish food retailers is of interest.

Food retailers have a central position in the food value chain with considerable influence on both supply and consumer behaviour. This report is conducted in collaboration with the environmental certification organisation Bra Miljöval (Good Environmental Choice), which has the aim of helping consumers make more sustainable choices through their certification of food retailers. In this thesis, the potential for implementing requirements concerning meat in stores certified with Bra Miljöval is investigated.

1.1 Background

This section outlines Bra Miljöval and their current criteria for food retailers, provides an overview of the Swedish food retailer sector, and introduces key aspects on meat consumption in Sweden. It also gives an introduction to the EU deforestation regulation as a policy framework relevant to the study.

1.1.1 Bra Miljöval

Bra Miljöval is the Naturskyddsföreningens (The Swedish Society for Nature Conservation) environmental certification system founded in 1990 (Bra Miljöval, n.d.-a). Naturskyddsföreningen works to protect biodiversity, stop climate change, eutrophication, acidification, and the spread of harmful substances, and much more. Bra Miljöval is described as a tool to drive the development towards a more sustainable society (Naturskyddsföreningen, 2019).

It is an independent environmental label awarded by a third-party certification system according to ISO 14024 (Bra Miljöval, n.d.-a), which means that it is voluntary (TCO Certified, n.d.). Bra Miljöval labels both products and services in 12 areas, including, for example, cosmetics, chemical products, electricity, and grocery stores. The two fundamental ideas of the environmental label are that natural resources must be saved and that human health and biodiversity should not be threatened. An example of a successful impact made by Bra Miljöval is its contribution to the phase-out of environmentally hazardous surfactant LAS from Swedish laundry detergents (Bra Miljöval, n.d.-c).

The certification of food retailers has the aim of providing tools for food retailers to be on the forefront of sustainability issues prioritised by Bra Miljöval. However, according to Bra Miljöval, the label is not supposed to be a guarantee that all relevant regulations are fulfilled. Currently, more than 200 shops are certified in Sweden (Bra Miljöval, n.d.-b), including all Willys stores and one ICA store.

Current Criteria

If licensed food retailers have a sales share of organic food less than 5%, Bra Miljöval has criteria for a minimum amount of organic products for different food categories that must be available in stores (Naturskyddsföreningen, 2019). Organic products are defined as EU-organic or KRAV-certified products, and there is a minimum amount of KRAV-certified products for each category. In the case of meat, the food retailer should offer at least 11 organic meat products in total, 4 of which should be KRAV certified. Of these, there should be at least one item in the following categories: toppings, sausages and provisions, sausages, and patties. Meat from three types of animal should also be available, for example, pork, beef, poultry, or lamb. For fish and shellfish, there must be a minimum amount of certified MSC or KRAV products if the store sells less than 5% organic products. In addition, license holders are only allowed to sell fish and shellfish with a green light, corresponding to "Best choice", in the WWF Fish Guide, or fish with KRAV, MSC or ASC certification after 5 years as a license holder (with some exceptions for products containing small amounts of fish and manual fish counters).

A connecting criterion is that stores should increase their share of organic products in total food sales over a three-year period. An action plan with measures such as campaigns, events, tastings, and endcap display should also be developed each year, as well as an accounting of the share of organic food sales. There is also a ban on some products with a particularly negative environmental impact according to Bra Miljöval, such as king prawns. There should also be at least 23 Fairtrade certified products available in the store.

Licence holders should also promote a protein swap by striving to increase the sales of vegetarian proteins by setting a sales increase target for each year, as well as an annual action plan to achieve this target (Naturskyddsföreningen, 2019). The definition of vegetarian proteins are defined when applying to become a license holder. At least once a month, the store should also highlight a vegetarian protein

in advertising, tasting, or digital promotions.

If there is a shop or café in the grocery store, it should offer organic and Fairtrade coffee and tea, KRAV-certified milk, and organic and/or Fairtrade sugar (Naturskyddsforeningen, 2019). If they offer ready meals, they should also offer a vegetarian option. The same rules apply to tea and coffee offered to staff. Staff should also use food that is nearing its expiration date or has broken packaging to reduce food waste. If 75% of the stores in a chain are certified by Bra Miljöval, the same rules should apply at the company's head office.

In addition to the requirements for food, there are requirements for chemicals in products and packaging (Naturskyddsforeningen, 2019). Licence holders must also reduce their own environmental impact by using eco-labelled cleaning products and consumables, the electricity used in the store must be certified by Bra Miljöval, alternatively 100% solar energy, and there are also requirements for waste sorting. Since these criteria are not highly relevant for this study, they will not be described in further detail.

Revision of Criteria

The current criteria for food retailers were established in 2019 and in 2025, Bra Miljöval has started a process to review these criteria, with the aim of finalising work in 2026 (Bra Miljöval employee, Personal communication, 23 May 2025). Revision is necessary since the current criteria were developed under different conditions. Some criteria have not worked well in practice, some need to be tightened, while others are unnecessary (Bra Miljöval, 2025). An example of a criterion that has been effective and achievable for license holders is the protein shift requirement (Bra Miljöval employee, personal communication, 5 March 2025). However, since Bra Miljöval does not follow meat sales, it is unclear whether the criteria affect meat sales or only lead to an increase in vegetarian protein sales.

In recent years, no licence takers have increased their sales of organic products due to the current emphasis on price (Bra Miljöval employee, Personal Communication, 21 May 2025). Compensatory measures in the form of organic campaigns and more detailed action plans have been requested, but this is not fixed in the criteria. The criterion does not specify what will happen after the three years have passed and it is not clear what is expected from the action plan. To keep this criterion, the consequences for non-compliance need to be specified, as well as the concrete measure that must be taken by the stores. However, because of the current circumstances, Bra Miljöval may not want to keep this type of criteria. Instead, they may choose to promote organic sales in another way.

Regulations, public opinion, and knowledge have also changed since the last revision, and new criteria need to be added (Bra Miljöval, 2025). Meat is one category of foods that is not covered by any specific requirements today. However, in the new version, Bra Miljöval wants to explore the possibilities to include requirements concerning meat. The regulation that is particularly relevant for this topic is the new

EU Deforestation Regulation (EUDR), which aims to reduce the EU's impact on deforestation by regulating the export and import of seven commodities, including meat and soy.

1.1.2 Food Retailers in Sweden

In a report by Sveriges Konsumenter (n.d.), the Swedish food supply chain is depicted as an hourglass, with thousands of food producers at one end, millions of consumers at the other and a very concentrated group of food retailers between. The changes these food retailers make have the potential to make a big difference. Although the food value chain is complex, involves many actors, and is influenced by what is happening in the world around us, food retailers have the opportunity to set standards and lead the way for environmental, health, and climate benefits.

Since there are a few food retailers that dominate the Swedish market, the structure of the market could be described as oligopolistic (Mont et al., n.d.). In 2023 the market shares were as shown in Figure 1.1; ICA 49,9%, Axfood 21,9%, Coop 17,0%, Lidl 6,4%, City gross 3,2%, and others 1.6%. (DLF & DELFI, 2024). Since then, City Gross has become part of the Axfood group, which also includes, for example, the food retailers Willys, Hemköp, Tempo, and Handlar'n (Axfood, n.d.-d).

Market shares for food retailers in Sweden

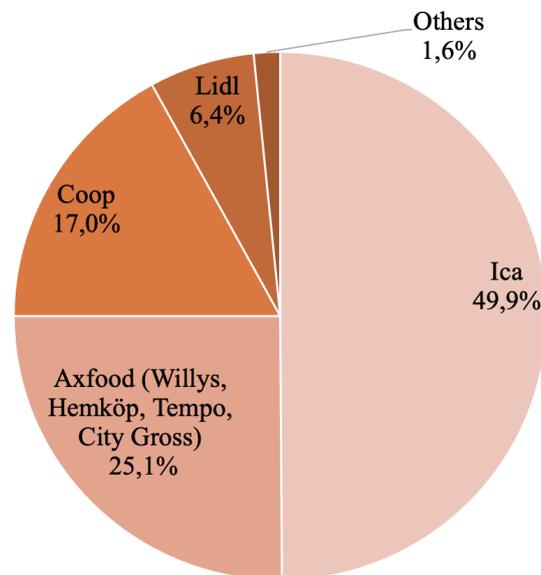


Figure 1.1: Market shares for food retailers in Sweden in 2023. The market share of City Gross is included as a part of Axfood.

The different retailers have different organisational structures. ICA consists of 1300 stores where independent retailers own and run their own grocery stores and have offers and concepts adjusted locally (ICA Gruppen, n.d.-a). The retailers have the ability to select the assortment themselves (ICA Gruppen, n.d.-b). At the same

time, there is cooperation among logistics, IT, purchase, store establishment, and market communication (ICA Gruppen, n.d.-a).

Coop, on the other hand, is a consumer cooperative owned by its 4 million members, and the 800 stores belong to the 26 consumer organisations that run the stores (Coop, n.d.-f). Lidl is an international food retailer with about 200 stores in Sweden (Lidl, n.d.-b). What makes Lidl different from other food retailers is that they buy food directly from the producers, and the majority of products go directly from the producer to a central warehouse and on to the stores, without intermediaries.

The Axfood group owns both wholesalers and retailers. Dagab is the wholesaler for all retailers (Axfood, n.d.-b). They create the assortment, negotiate contracts with suppliers, and coordinate all purchases. The retailers are organised in different ways. Willys, which has almost 250 stores in Sweden (Willys, n.d.), is group-owned, while Hemköp has 66 group-owned stores and 136 retailer-owned ones (Axfood, n.d.-c). Tempo has only stores owned by retailers, about 130 in Sweden (Axfood, n.d.-e). City Gross has around 40 shops in Sweden (Axfood, n.d.-a).

1.1.3 Meat Consumption in Sweden

When considering Swedish meat consumption and associated production, two different types of meat, red and white meat, will be discussed and considered. Red meat includes ruminants such as cattle, sheep, goats, and game, as well as non-ruminants such as pigs (Blomhoff et al., 2023; World Health Organisation, 2023). White meat includes poultry, such as chicken, hens, turkey, and duck (Blomhoff et al., 2023; World Health Organisation, 2023). Of the red meat, cattle and pork will be examined as these represent the majority of the market. White meat will not be separated into subcategories, instead it will be considered as a unit.

Swedish meat consumption can be defined in three different ways, total consumption, direct consumption, and cooked meat consumption (Jordbruksverket, 2024a). The total consumption, which is the amount of meat directly after slaughter which includes bones, tendons etc., amounted to 79 kg per person and year in 2023 (Jordbruksverket, 2024a). The total consumption is presented, together with the direct consumption in Figure 1.2.

The total consumption can be separated, which is shown in Figure 1.2, into 55.6 kg of red meat, the largest portions beef 22.8 kg and pork 28.0 kg, as well as white meat (poultry) with 23.5 kg. The second is direct consumption, which is, as the name suggests, products consumed directly, which include 49.2 kg of cold and frozen meat, 18.1 kg of processed meat and preserves and 8.6 kg of frozen products that include meat. The third way to define Swedish meat consumption is through the consumption of cooked meat, which is shown in Figure 1.3.

Figure 1.3 shows that the consumption of cooked meat amounts to 775 g total per week per person, divided into 475 g of red meat, 150 g of sausage, and 150 g of white meat Jordbruksverket (2024a). The numbers for cooked meat consumption

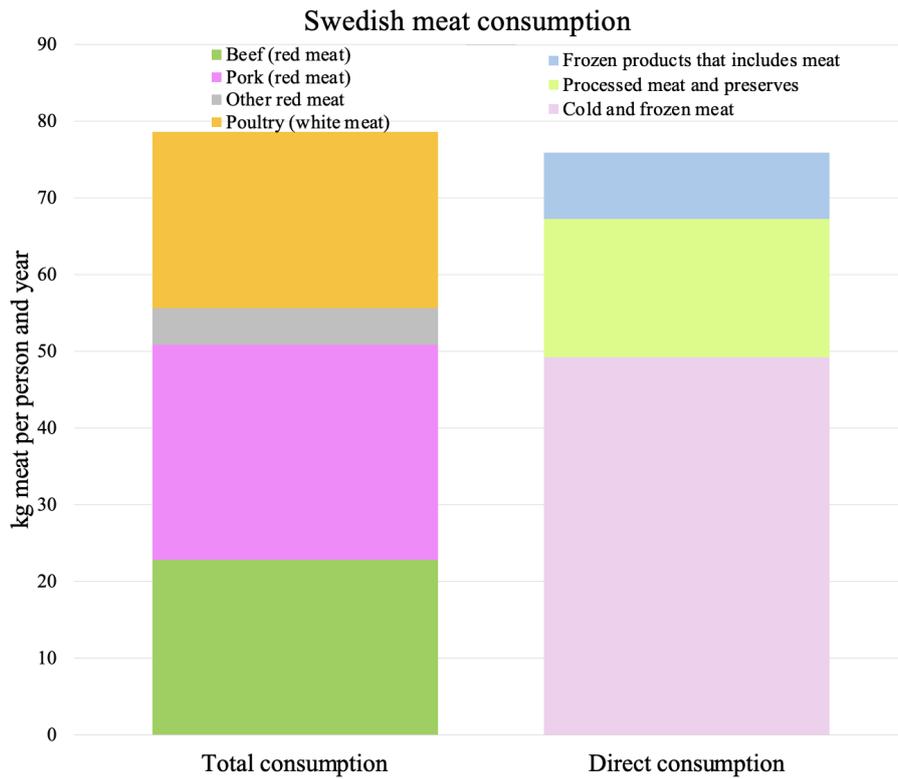


Figure 1.2: Total consumption and Direct consumption in kg per person and year for Sweden.

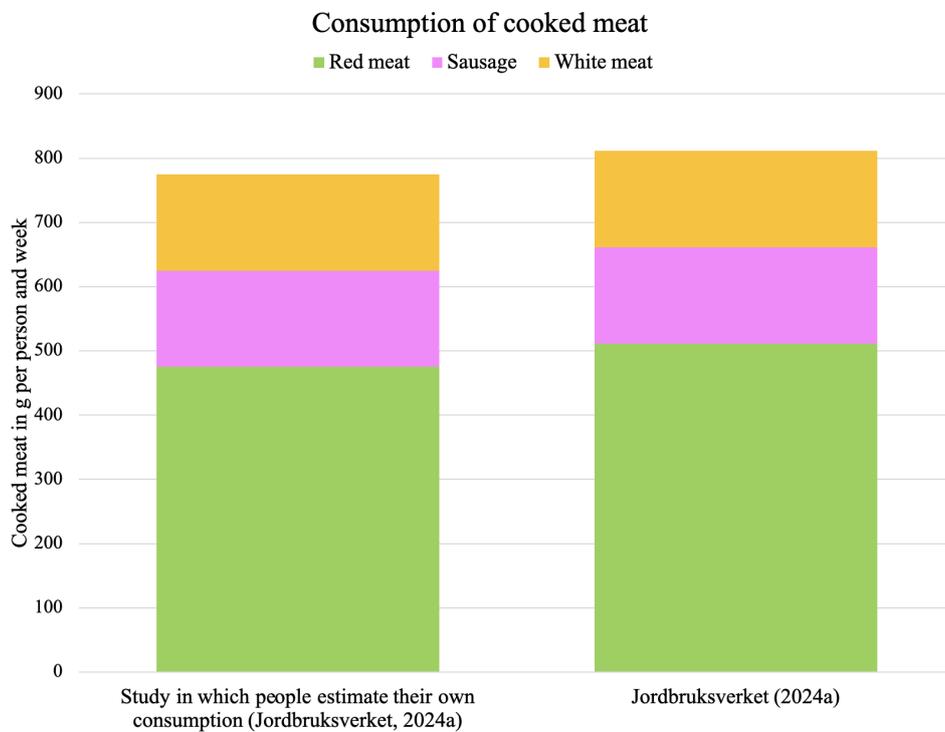


Figure 1.3: Consumption of cooked meat in g per person and week for Sweden.

are from a study in which people estimate their weekly consumption. The results show that the consumption of red meat and sausages differed between sexes, with men consuming more than women. In contrast, white meat consumption was similar for both groups. Jordbruksverket (2024a) however estimates that the average consumption of red meat in Sweden is 511 g per week because there are no official numbers on meat consumption within Sweden; it is an estimation between total consumption and eating habit surveys.

World Health Organisation (2023) recommend a maximum weekly intake of 500 g of red meat per person, while the Nordic Nutrition Recommendations 2023, authored by Blomhoff et al. (2023), updated the recommended intake to 350 g. In line with this Livsmedelsverket (2025) has updated their recommended intake of red meat to 350 g per week as of 28 April 2025. They also emphasised that this reduction should not be replaced with white meat but with other sources of protein, such as legumes and vegetables.

Health Effects Linked to Meat Consumption

Meat consumption is associated with several negative impacts on human health. For example, there is no safe consumption level of processed meat (this includes both red and white meat) and processed meat is currently classified as carcinogenic (Blomhoff et al., 2023). According to International Agency for Research on Cancer (2018), the consumption of processed meat is carcinogenic to humans and can cause colorectal cancer, and there are connections between the consumption of processed meat and stomach cancer. International Agency for Research on Cancer (2018) also states that red meat consumption is most likely carcinogenic and there are connections between red meat consumption and colorectal, pancreatic, and prostate cancer. Consumption of red meat is also highly related to dementia and subjective cognitive decline (Li et al., 2025). Consumption of red meat increases the risk of cardiovascular disease and was found to be the second highest dietary risk factor for Disability Adjusted Life Years (DALYs) in Denmark and Iceland, and the third highest in Norway, Sweden, and Finland (Blomhoff et al., 2023).

Meat consumption also has, in addition to health effects, a large impact on the environment, and it is well established that the current level of consumption in high-income countries such as Sweden is not considered environmentally sustainable (Konsumentverket, 2019).

Production and Import of Meat

Sweden is no longer self-sufficient in the production of red and white meat, which means that a significant share of the meat consumed in the country is imported (Jordbruksverket, 2024b). Beef production remained self-sufficient until 1986, while pork and poultry production were last self-sufficient in 1999 and 1998, respectively.

The main countries of origin for imported beef, pork, and poultry vary depending on the type of meat. Table 1.1 presents the main import countries for each category, along with the corresponding import volumes in tonnes. These countries were

1. Introduction

selected to represent approximately 90% of Sweden’s total meat imports. Brazil is also included due to its strong association with deforestation, land-use change, and soy production (Stockholm Environment Institute, 2023).

Table 1.1: Amount of beef, pork, and poultry imported from the six largest import countries in retail weight for beef, pork and poultry (Jordbruksverket, 2024b). The total import of each meat type is shown at the bottom, along with the proportion of the total import covered by this selection. RW = Retail weight.

Country	Beef (1000 ton RW)	Pork (1000 ton RW)	Poultry (1000 ton RW)
Poland	8.1	9.5	7.5
Netherlands	12.0	4.4	15.8
Germany	15.7	29.0	8.2
Denmark	12.1	19.1	60.8
Ireland	24.8		
Italy	8.1	4.2	
Spain		4.5	
Latvia			4.9
Brazil	1.4		
Total imported	93.7	77.7	104.0
of which from countries above	82.1	70.7	97.2
Study covers import to $X\%$	87.6%	90.9%	93.4%

In addition, the total amount of meat consumed in Sweden is presented in Table 1.2 together with the amount imported of each type of meat. Also included is the meat produced in Sweden and the amount exported (Jordbruksverket, 2024b). The total amount is presented again but in carcass weight, while the amounts in Table 1.1 are in retail weight. Carcass weight equivalents include bones, tendons, etc. The carcass weights are calculated on the basis of the trade amounts via weighted numbers in order to be able to compare them. The degree to which Sweden is currently self-sufficient is also included for each type of meat.

Table 1.2: Total amount of meat consumed in Sweden, Swedish production of beef, pork and poultry, export of Swedish meat, imported amount of each type of meat in carcass weight equivalents, and self-sufficiency degree (Jordbruksverket, 2024b). CW = Carcass weight

	Beef (1000 ton CW)	Pork (1000 ton CW)	Poultry (1000 ton CW)
Total consumption	239.8	295.0	247.1
Swedish production	138.2	243.4	175.9
Export	16.1	30.9	41.6
Import	116.3	81.2	112.8
Self-sufficiency degree	57.6%	82.5%	71.2%

1.1.4 European Union Deforestation Regulation

Deforestation is mainly driven by the expansion of agricultural land, and the consumption of the European Union (EU) is a major contributor at the global level (European Commission, 2023). Between 1990 and 2008, the EU consumed one third of agricultural products linked to deforestation worldwide. Deforestation is problematic from several perspectives, as it leads to loss of biodiversity, loss of ecosystem services, and accounts for a large share of GHG emissions, in 2019 it represented 11% of global GHG emissions. Combating deforestation and forest degradation is therefore important to reduce GHG emissions and meet the Union's commitments under the Paris Agreement and the European Green Deal, as well as commitments to combat biodiversity loss.

On 22 October 2020, the European Parliament adopted a resolution calling on the European Commission to prepare a proposal for an EU legal framework to stop global deforestation driven by the EU on the basis of due diligence (European Commission, 2023). On 29 June 2023, the *Regulation (EU) 2023/1115 of the European Parliament and of the Council of 31 May 2023 on the making available on the Union market and the export from the Union of certain commodities and products associated with deforestation and forest degradation and repealing Regulation (EU) No 995/2010* (hereinafter referred to as the EU Deforestation Regulation or the EUDR), entered into force (European Commission, n.d.-c). The EUDR aims to promote deforestation-free products, focusing on the following products: cattle, soy, palm oil, coffee, timber, and rubber. The definition of deforestation-free is that the products do not contain, have been produced with, or have been fed raw material produced on land that has been subject to deforestation after 31 December 2020 (European Commission, 2023). For wood products, wood has not been inducing forest degradation after the same date. The law will apply to large and medium-sized companies from 30 December 2025, and to micro and small companies from 30 June 2026.

1.2 Aim

This study is carried out to investigate the potential implementation of criteria for food retailers concerning meat. This is done to examine potential reductions in environmental impacts associated with meat consumption. The thesis also examines to what extent food retailers have the capacity and willingness to change their current practices, in order to potentially mitigate environmental impacts, including deforestation associated with meat consumption. The aim is to explore how this can be achieved through measures such as consumer guidance, product restrictions, and encouraging changes in consumption patterns.

The aim is also to investigate how the implementation of the EU Deforestation Regulation can affect Swedish meat consumption, as cattle and soy, which are a key ingredient in animal feed, are both relevant commodities. In addition, the thesis explores how the implementation may affect food retailers in Sweden. The

thesis aimed to map the direct and indirect use of soy associated with Swedish meat consumption and calculate how much of this is currently deforestation-free.

1.3 Research Questions

1. What is the current understanding regarding the environmental aspects of meat production and consumption and how does this relate to Swedish meat consumption?
2. Could the implementation of the EU deforestation regulation, EUDR, affect meat consumption in Sweden?
 - (a) How much soy is used to produce meat for Swedish consumption and is it possible to ensure that this soy is deforestation-free?
 - (b) How much cattle consumed in Sweden can be ensured as deforestation-free?
3. What are food retailers willing and able to do to reduce environmental impacts, including deforestation, associated with Swedish meat consumption?
4. How can Bra Miljöval's criteria for food retailers' meat sales be developed to address environmental concerns such as deforestation?

1.4 Delimitations

The report will look at Swedish meat consumption, without specifying where the meat is consumed, whether it is in restaurants, at home, in workplaces, or at school. There is an over-representation of imported meat in restaurants, but meat import statistics will not be separated for restaurants and food retailers (Naturskyddsföreningen, n.d.-a). The main focus of the study is on grocery stores and not wholesalers although they are sometimes mentioned and discussed. Meat production will be considered outside of Sweden as a lot of meat is imported. It will cover beef and pork, which are the largest red meats consumed in Sweden, and poultry, which is white meat.

Not all imports were covered due to the size and time constraint of the study. The goal was to at least cover around 90% of the import. Environmental aspects have mainly been considered on a global average and not separated for individual countries, with the only exception being freshwater ecotoxicity, since the study included in this was specifically for Sweden. Agriculture affects six of the nine defined planetary boundaries, climate, land system change, freshwater use, nitrogen and phosphorus flows, biodiversity, and novel entities such as pesticides and antibiotics. Antibiotics are outside the scope of this thesis, but the others are considered in the thesis.

Soy availability statistics are from two different years due to statistical availability. For all countries except two, the year is 2022, and for Ireland and Latvia, the year is 2023. The slaughter statistics are also from two different years, 2020 for cattle and 2023 for pork and poultry. Due to time constraints, calculations of where soy ends up in the chosen import countries are based on an European average instead of country-specific percentages. Brazil is included as an import country for beef, but soy used in the production for this beef import is not considered or included in the mapping, as this import is small compared to other countries included.

Since the EU Deforestation Regulation has not yet entered into force, more information is continuously being published on how it should or should not be interpreted by the European Commission. The updated guidelines on the EU Deforestation Regulation were published in April 2025, during the later stages of the thesis, and due to this they have only briefly been touched upon (European Commission, 2025). Furthermore, the risk classification of countries was published towards the very end of the thesis process and therefore there was no time to analyse these classifications.

2

Methods

This section explains the methodology behind the study, how the review of the literature and the current state analysis were performed, and interviews with food retailer experts.

2.1 Literature Review

The literature review included a current situation analysis looking at Bra Miljöval as well as their current criteria, food retailers and their work related to sustainability, the current understanding of environmental aspects of meat production and the EU Deforestation Regulation, among other things. The main sources used in the review were scientific literature, government reports, food retailers' sustainability reports, and statistics from, for example, the Swedish Board of Agriculture and Eurostat.

Bra Miljöval's Current Criteria

A review of Bra Miljöval and how it functions, as well as the current criteria for food retailers certified by Bra Miljöval was carried out. Furthermore, the study looked at how the requirements have worked in practice, which was done together with insights from the employees of Bra Miljöval.

Food Retailers Sustainability Programme

To analyse how food retailers currently deal with meat sales and what their policies, market sales and goals look like in relation to meat and soy, sustainability reports and websites of relevant food retailers were examined. Industry collaboration initiatives related to the topic were also investigated, as well as existing certifications related to both meat and soy.

Overview of Environmental Aspects of Meat

Another important part of the literature study included compiling an overview of current knowledge on environmental aspects of beef, pork, and poultry consumption and production. To provide a broad understanding of the environmental aspects of meat production, the literature study primarily included LCA-based review articles.

Therefore, the included data were often global averages or averages based on studies from several countries.

The environmental aspects included in this review were chosen based on the study by Ran et al. (2024), who recommend that environmental evaluations of food diets should include indicators for the following five areas: climate change, biosphere integrity, blue water consumption, novel entities, and impacts on natural resources. Ran et al. (2024) also recommend the use of impact indicators in the first place and pressure indicators in the second. Pressure indicators represent measures of an environmental load caused by human-induced emissions or the use of natural resources that cause damage to the environment, such as land use or nitrogen emissions. Impact indicators represent the actual consequences of the pressure, which could be climate change or freshwater ecotoxicity.

The study by Ran et al. (2024) is a Personal View in which an international research group with expertise in food and agriculture environmental analysis summarises and makes recommendations on indicators used and less used in evaluations of environmental aspects related to food diets. Ran et al. (2024) assessed studies on environmental performance of diets, and the environmental impacts included in the studies were categorised after the planetary boundaries. Climate change was dominant and occurred in more than 80 studies, corresponding to twice as many studies as the second most common aspect, which was land system change. Novel entities occurred in the fewest number of studies, which were fewer than 5. Biosphere integrity occurred in the third least with under 10 studies. Based on this, Ran et al. (2024) recommends indicators depending on the level of ambition of the study for the environmental assessment of diets.

Due to limitations in the availability of studies, the conducted review included both pressure indicators consisting of land use and freshwater withdrawal, and impact indicators consisting of climate change, freshwater ecotoxicity, eutrophication potential, and water scarcity. Biodiversity is also discussed. The available average or range was summarised for each environmental aspect and presented in diagrams.

Analysis of Soy Use in Meat Production

An analysis of meat consumption in Sweden and the use of soy in meat consumed in Sweden was also carried out. To limit the study, only the countries from which Sweden imports the majority of meat, in addition to Sweden, were included. Brazil was added as an additional due to its strong association with deforestation-related issues. The countries selected were:

- Poland
- Netherlands
- Germany
- Denmark
- Ireland
- Italy
- Spain

- Latvia
- Brazil

This covered 87.6% imported beef, 90.9% pork, and 93.4% poultry.

Specific data on the shares of whole soybean and soybean meal used for different types of livestock were available for Sweden and have been used to estimate where soy imported into Sweden ends up. For import countries, a European average has been used to determine the share of soy used for different types of livestock due to time constraints and lack of data. Therefore, there is no country-specific use of soy, even if it would have been preferable to analyse where soy is used in each import country. However, country-specific data on meat production and soy imports were available. The data on soy available in each country were from 2022 (IDH et al., 2023) or 2023 (WITS, 2023). The cattle slaughter statistics were from 2020 (Danish Agriculture and Food Council, 2021), and for Sweden both cattle, pork and poultry, the data are from 2023 (Jordbruksverket, 2024b). The pork and poultry slaughter statistics for all other countries are also from 2023 (EUROSTAT, 2023a; (EUROSTAT, 2023b)). The amount of soy used and slaughtered animals after 2020 has not differed significantly. According to Kuepper and Stravens (2022), about 90% of soy imported to Europe is used for animal feed, therefore, it has been used to calculate the soy available in the included countries.

EU Deforestation Regulation

The EUDR (European Commission, 2023) was analysed together with the guidance documents published by the European Commission European Commission (n.d.-a) and European Commission (2024b). This was done to understand what the potential obligations and implications of the regulation will be for both food retailers in Sweden and meat consumed in Sweden. A report published by Statens offentliga utredningar (translates into public investigations of the government) regarding the adaptation of Swedish law to the EU Deforestation Regulation was also used to assess the risk of deforestation associated with soy and meat in Sweden. Since the EUDR is a new regulation that has not yet entered into force, there is not a wide range of scientific articles available on the topic.

2.2 Interview Study

On the basis of the literature review, semi-structured interviews were conducted with representatives of food retailers. The aim was to include representatives from all major food retailers and from different positions such as sustainability professionals, purchasers, and store owners, to whom Bra Miljöval helped provide contacts. Four interviews were conducted with sustainability professionals at Lidl and Axfood, a former Head of Sustainability at Coop who had recently left the position, and an ICA store owner currently certified with Bra Miljöval. Several additional people, such as purchasers, were contacted, but either they did not respond or were unavailable for an interview.

2. Methods

The interview questions were based on the literature review which looked at the current sustainability goals and efforts of retailers, as well as the current understanding of environmental aspects associated with meat production and the EU deforestation regulation. All interviews covered the same topics, examining their sustainability ambitions, prerequisites, and practical possibilities to affect the assortment, potential meat requirements, and how they work with the EUDR. However, the questions were adjusted to fit the work position and the company. For example, some questions were only relevant to specific retailers. The questions were sent in advance to the interviewees. The interviews lasted between 35 and 45 minutes, were performed digitally and held in Swedish. Before conducting the interview, the interviewee was asked permission to record the conversation. Notes were taken during the interview and were later supplemented by listening to the recordings. After the interview, the notes were shared with the interviewee, who was given the opportunity to make corrections and provide their approval. The questions can be found in the Appendix B, the translations from Swedish to English were done using OpenAi's language model ChatGPT and then manually reviewed for accuracy.

An additional interview was also conducted with a person working for the international organisation Preferred by Nature. The interviewee works, among other things, with helping companies comply with the EUDR, and the questions focused specifically on the EUDR and challenges associated with the regulation. The procedure followed the same format as the other interviews, except that different questions were asked and the interview was conducted in English. All questions can be found in the Appendix B.

3

Literature Review

This part of the thesis presents the environmental aspects associated with meat production, and the regulatory framework relevant to this study, the EU deforestation regulation. It also outlines global soy production and available certification schemes related to both soy and meat and provides an overview of how the largest Swedish food retailers currently work with sustainability in stores.

3.1 Meat Production

Production of meat or animal husbandry refers to agriculture in which livestock are kept for the production of meat. There are several environmental labels within this field that provide certificates for livestock farms and meat producers. Depending on the environmental label, these criteria have different areas of focus. This report will discuss conventional animal husbandry (not labelled), as well as the environmental labels EU-organic, KRAV, and Svenskt Sigill Natural Pasture. The differences in the process and the criteria are briefly explained for each.

Europe has a traceability system in place for all food-producing animals, which means that all animals in Europe have a "tag" that contains the details of their origin (European Commission, 2007). This information will then follow the animal through the slaughter process, making it possible to trace all meat produced and slaughtered in Europe back to its origin. This traceability legislation was implemented in order to ensure that the food is safe and in the case of, for example, a disease outbreak, it is possible to trace the meat back to its origin.

Conventional Animal Husbandry Conventional animal husbandry is the general term for the most widely used method of meat production today (Konsumentverket, 2019). Conventional animal husbandry can be separated into intensive and non-intensive production. There is no generally accepted definition of what intensive agriculture is, since it looks different depending on the conditions in the local area, but can overall be summed up as agriculture where productivity is higher and the livestock reaches carcass weight earlier. Production is often carried out in smaller areas and uses larger amounts of energy-rich concentrate such as cereals and soy. In extensive livestock production, larger areas of land are generally used since the animals are grazed to a higher extent and the livestock reaches carcass weight later

in life. More roughage is used, but it does not exclude concentrates. Conventional animal husbandry uses both synthetic fertilisers and chemical pesticides.

EU-Organic EU-organic livestock production is a standard for farming with rules determined by the European Parliament (European Commission, n.d.-b). A definition of EU-organic production is "organic production means a sustainable agricultural system respecting the environment and animal welfare, but also includes all other stages of the food supply chain." (European Parliament, 2018). Organic farming takes into account all aspects of livestock production, from farm to fork.

The key principles of EU-organic agriculture include (European Parliament, 2018; European Commission, n.d.-b):

- Chemical pesticides and synthetic fertilisers are banned and instead natural fertilisers and animal feed are used on-site.
- Restriction of antibiotic use.
- Genetically modified organisms (GMO) are banned.
- Rotation of crops are implemented to better utilise resources.
- Special consideration to animal welfare including the fact that livestock should be raised on organic feed and in a free-range, open-air environment.

KRAV The most recognisable sustainability label for Swedish food is KRAV (KRAV, n.d.-b). All KRAV-labelled foods are EU-organic, but have additional criteria for biodiversity, animal welfare, climate impacts, and working conditions, with more regular check-ups of certified producers.

Examples of some extended requirements for KRAV producers compared to only EU-organic (KRAV, n.d.-a):

- Maximising outdoor stay, without damaging animals or soil.
- Pasture serves as both a source of feed and a space for animal occupation, and all animals should have access to grazing during appropriate times of the year.
- The outdoor area should not leach plant nutrients and should provide the animal with a dry and firm surface.
- The fish meal should come from sustainable fisheries.
- The animals should be kept clean. Animals that receive slaughter notes that show a lack of animal welfare are not allowed to be sold with a KRAV label.

Svenskt Sigill Naturbeteskött Svenskt Sigill Naturbeteskött (translates to semi-natural pastures) is a label that indicates that the animals have grazed on semi-natural pastures and is guaranteed from Sweden, however, it is not organic (Svenskt Sigill, n.d.). Semi-natural pastures are permanent grasslands that have high biodiversity and a good species richness. In order to maintain the biodiversity and species richness found in natural pastures, they need to be grazed extensively by ruminants such as cattle and sheep, or horses. Natural pasture land is home to many of the most endangered plants, insects, and birds.

3.1.1 Meat Production and Deforestation

In the Nordic and Baltic countries, land-use change from forest to agricultural land generally does not occur (Harwatt et al., 2024). However, in some areas of the world, ruminants, such as cattle, are associated with deforestation and the conversion of natural ecosystems. Land use in Europe is generally stable and there are few areas where forests are converted to agricultural land, with a few where the change is opposite, agricultural being planted with forest instead (Potapov et al., 2021). South American cattle rearing requires large portions of land for grazing and is heavily associated with ongoing deforestation (Stockholm Environment Institute, 2023).

In a study by Potapov et al. (2021) the change in global cropland area was estimated between 2000 and 2019. In Europe and North Asia, 3% of the cropland gains represented conversion from natural vegetation or tree plantation. This can be compared with South America, where the equivalent figure was 39%. The remaining cropland expansion in both regions was represented by replaced pastures and re-cultivation of abandoned agricultural lands.

Persson and Singh (n.d.) has made country-specific estimates of deforestation between 2001 and 2021. Of the 51.1 million hectares of global deforestation driven by pasture expansion for cattle meat and leather production, Europe accounts for 0.4%, while South America is by far the largest contributor, responsible for 82%.

3.2 Organic Meat Production and Its Promotion

According to (Världsnaturfonden WWF, n.d.-a) WWF's Köttguide is an easy overview of sustainable meat choices. The guide includes aspects such as biodiversity, climate impact, chemical pesticides, animal welfare, and antibiotics used in production, when considering whether a specific type of meat can be considered a sustainable choice or not. It looks at certifications such as the previously mentioned EU-organic, KRAV and Svenskt Sigill as well as meat imported from other countries and it is updated every year. The guide is divided into three different levels: green, eat occasionally, yellow, avoid, and red, warning. The meat recommended to be eaten occasionally should be certified by KRAV or Svenskt Sigill Naturbeteskött for beef, KRAV-certified or Swedish organic meat for pork, and KRAV-certified for chicken.

According to Sveriges Konsumenter (n.d.), at least 30% of agricultural land should be organic by 2030, and this number is nearly 20% today. In recent years, organic food sales have been decreasing and in 2022, 18,000 hectares of organic land were lost in Sweden. In 2024, 3.9% of the total food sales was organic, which can be compared with 6.3% in 2020. The food category with the lowest organic sales share in 2024 was meat corresponding to 1.5% (Svensk Dagligvaruhandel, 2025).

In a report by Sveriges Konsumenter (n.d.), an independent and non-profit organisation, they investigate why organic campaigns are declining. The number of organic campaigns peaked in 2017 and has been declining each year since, dropping by half by 2022. A correlation has been observed between the decline in organic food sales

and the reduction in organic campaigns. However, campaigns for Swedish products have been increasing during the same period. In the report, they summarise some actions they think food retailers should do:

- Setting targets for organic sales
- Having more organic campaigns
- Redistribute marginals between sustainable and unsustainable food
- Make it easy to find organic products and use clear labels
- Place organic products where it best benefits the organic selection

In a study by Willem van Engen-Cocquyt et al. (2022) in collaboration with WWF, meat promotion was investigated for the four largest food retailers in Sweden. The report found that 63% of the meat promotions were multi-buy promotions. Coop had the highest share of multibuy offers followed by Hemköp, ICA, and Willys. 30% of the promotions was assessed to have a red light in the Swedish WWF meat guide, 38% had a yellow light, and only 3% had a green light. For about a third of the products, the impact was unknown. The report also gave some recommendations for supermarkets, some examples were to limit the frequency of meat promotions, to ban multibuy promotions, ban promotions for meat that has red light by Swedish meat guide, and make certifications visible.

3.3 Environmental Aspects of Meat Production

Food production is strongly associated with six of the nine planetary boundaries defined by Rockström et al. (2009) and Steffen et al. (2015) (Richardson et al., 2023). The planetary boundaries reflect the boundaries within which human influence on the planet should be limited in order to minimise severe and irreversible consequences for humanity. Agriculture affects six defined boundaries, climate change, land-system change, freshwater use, nitrogen and phosphorus flows, biodiversity, and novel entities such as pesticides and antibiotics.

Climate Change Globally, the livestock sector accounts for 14.5% of greenhouse gas (GHG) emissions caused by humans, making it a key contributor to climate change (Gerber, 2013).

Climate change is one of the most investigated environmental impacts in Life Cycle Analysis (LCA) assessments on diets (Ran et al., 2024). The global warming potential, GWP, measured as CO_2 – *equivalents*, is used to aggregate greenhouse gas (GHG) emissions. GWP is defined as an integrated change in radiative forcing in a certain time period after emission of a greenhouse gas relative to the same amount of CO_2 . A time period of 100 years is used in most LCAs and international climate reporting. However, the choice of time frame is debatable and can considerably affect results for products such as beef, which has high methane emissions. Methane has a stronger GWP than CO_2 but is short-lived, making it more sensitive to a shorter time frame.

In the total global livestock sector, methane accounts for 44% of GHG emissions, nitrous oxide represents 29% and carbon dioxide 27% (Gerber, 2013). Enteric fermentation, which is part of the digestive process of ruminants such as cattle, is the main source of greenhouse gas emission from beef production worldwide, corresponding to 43%. This is followed by feed emissions, accounting for 36%. If emissions from pasture expansion are added, feed represents about half of the emissions in specialised beef systems. However, dairy systems are usually not associated with pasture expansion. Land use change due to soybean expansion represents less than 1% of GHG emissions and carbon dioxide emissions from energy about 10%.

For pork, feed production represents 48% of emissions and additionally 12.7% is related to land-use change due to soybean expansion (Gerber, 2013). Manure storage and processing represent 27.4% of the emissions, which consists mainly of CH_4 and N_2O . Post-farm emissions contribute to 5.7% of GHG emissions. The emission differences between different production systems are not significant at the global level. Looking at chickens and poultry, about 57% of the emission can be traced to feed production and 21.1% to the expansion of soybean cultivation. Manure emissions represent 6%, post-farm CO_2 emissions 6.9%, and direct energy 7.6%.

Water Use Three different types of water are considered in the context of the water footprint, green, blue, and grey water (Mekonnen & Hoekstra, 2012). Green water represents rain water, blue water represents the surface and groundwater consumed, and grey water represents the amount of water required to dilute pollutants so that the water satisfies the existing ambient water quality standards. Grey water is therefore rather an indicator of pollution than water consumption (Ran et al., 2024) .

Local prerequisites for meat or feed production determine whether freshwater use is problematic from a resource perspective (Konsumentverket, 2019). In Sweden, the freshwater supply is generally good, with exceptions for some regions. Almost no feed crops are irrigated and agricultural freshwater use represents only about 3% of total use. The main problems with water use come from imported foods from other regions than the Nordic countries (Harwatt et al., 2024).

Indicators of water stress can be used to account for environmental impacts associated with water use (Ran et al., 2024). Water stress is very local, and data on where different foods have been produced might be missing. Country averages may be available, but differences in water stress within the country will not be displayed if these are used. Ran et al., 2024 are problematising only looking at the total water footprint. For example, if cattle are kept on grasslands that are not suitable for human food production and are not irrigated, rainwater has not many other uses and does not contribute to human water shortage.

Land Use Agricultural land is a finite natural resource (Ran et al., 2024) and meat requires in total large land areas for the cultivation of feed and grazing, particularly for cows and other ruminants (Konsumentverket, 2019). However, the type of land needed is important, and ruminants can often be fed grains or cereals that are rich

in cellulose, as well as grass that humans cannot eat. This means that they are not competing on land with human food. The food consumed in Sweden uses a total of 4,4 million hectares every year, 3 million of which are arable land, with 1,4 million dedicated to pasture (Steinbach et al., 2018). Only 40% of this land use is in Sweden, with a large portion in Europe and a not insignificant amount in developing countries (Steinbach et al., 2018). Arable land is separated between many different food resources, while pasture is mainly due to the consumption of beef (Steinbach et al., 2018).

Meat production is also a cause of deforestation, and Swedish meat consumption causes the deforestation of tropical forests mainly due to expansion of agricultural land for the production of soy crops. In general, the conversion of forest land to cropland or pastures is not in accordance with sustainable development (Lööv et al., 2013). The croplands used today must be taken care of and managed with a long-term perspective, especially in Sweden, where natural pastures are among the most species rich environments (WWF, n.d.).

In LCAs, land use measures the total amount of agricultural land required for a specific food product over a certain period of time, the unit often being $m^2 \times year$ or $hectare \times year$ (Ran et al., 2024). Land use is often an indicator of biodiversity loss or ecosystem damage because human appropriation of land often drives biodiversity loss. However, this indicator is quantitative and does not say anything about the qualitative effects of land use.

In a literature review published by The Swedish National Food Agency, the environmental impacts of conventional and organic food production were compared (Landquist et al., 2016). One of the impacts considered was land use, which was examined for different kinds of meat. The conclusion of the review was that land use related to beef, chicken, and pork production was lower for conventional production than for organic in relation to kg of product. This may be due to EU-organic requirements of extended grazing periods and restrictions on what types of feed are allowed in production. Organic feed production often has lower yields since synthetic fertilisers and pesticides are not allowed, meaning that a larger area of land is needed to produce the same amount of feed.

Biodiversity The expansion of crops and pastures is the main cause of biodiversity loss worldwide and 70% of the loss can be sourced from 13 crops, soybeans being one of them (Konsumentverket, 2019). Chicken is the animal with the highest share of soy in their feed and does not contribute to biodiversity in any positive way (Världsnaturfonden WWF, n.d.-b), while grazing animals, such as cattle, can help to maintain biodiversity. At least in northern Europe, where there is a tradition of managed semi-natural grasslands that has a very high level of biodiversity (Eriksson, 2021). The richness of biodiversity is promoted by low nutrient levels, achieved through grazing and haying, which removes biomass and reduces the effects of competitive dominants. Grazing animals also contribute to seed dispersal and create heterogeneity through their choice of feed, dung deposition, and disturbance of the landscape. However, these grasslands have declined by 95% during the last hundred

years. Eriksson (2021) states that supporting traditional farming methods is crucial to prevent biodiversity loss.

However, globally, an increasing amount of cattle is seen as a threat to biodiversity, as it leads to the conversion of savannas and rainforests to cropland for feed crops or pastures (Lööv et al., 2013). Cattle farming is the single largest direct cause of deforestation and in important biodiverse areas, cattle farming is the largest cause of biodiversity loss (Harwatt et al., 2024).

In product-orientated LCAs, impacts on biodiversity are rarely included (Landquist et al., 2016). This is in part because there is a lack of methodology and because the effects on biodiversity are difficult to trace and not always meaningful to relate to a single cause or food type. The aspects of biodiversity might be indirect and complex (Ran et al., 2024). Biodiversity is an endpoint indicator, affected by all other pressures, and gives highly uncertain results since it includes complex cause-effect chains (Ran et al., 2024). Usually, it only covers one level of biodiversity, the species diversity, even if the concept also includes genetic and ecosystem diversity.

Eutrophication Potential Eutrophication is caused by excessive amounts of phosphorus and nitrogen in water and soil (Naturvårdsverket, n.d.). In rivers and oceans, the breakdown of large amounts of organic matter on the seabed creates oxygen depletion, which can lead to changes in the composition of species (Nationallencyklopedin, n.d.) and dead zones (Harwatt et al., 2024). Farm animals are the main source of nitrogen pollution.

The impacts associated with N and P emissions can have large variations depending on local and regional conditions (Ran et al., 2024). To be able to assess the impacts, detailed data on where the products come from and the local conditions are required, but this is often lacking. Crop production represents the largest eutrophication burden for dairy beef herds, pig meat, and poultry (Harwatt et al., 2024).

In the literature review published by the Swedish National Food Agency, which compared the environmental impacts of conventionally and organically produced foods, eutrophication was also considered (Landquist et al., 2016). The study found that, per kg of product, the eutrophication associated with conventional beef and chicken production was lower than that associated with organic production. However, for pork, no significant differences in eutrophication were observed between the two production methods. However, when comparing methods based on land use area, organic farming resulted in lower eutrophication for chicken and pork, while no clear distinction could be made for beef.

Ecotoxicity In modern food production, chemical pesticides are an integral part of the system, and agricultural chemicals have been linked to negative impacts on bird populations, biodiversity, and ecosystem functions (Nordborg et al., 2017). However, few environmental assessments of food include ecotoxicity impacts, often due to a lack of good quality inventory data. If included, simplified assumptions have often been made for the emissions inventory, and site-specific data have not

been used. Ran et al. (2024) share this opinion and point out that calculating the ecotoxicity factors for all novel entities used in the global food production system is both complex and data intensive.

Pressure data for pesticide application can also be used, but this consists only of the total amount of pesticides used, which does not reveal what kind of pesticide it is and the level of toxicity (Ran et al., 2024). For beef, pork and chicken, organic production contributes to ecotoxicity to a lesser extent than conventional production, both in relation to kg of product and the area of land use according to Landquist et al. (2016).

3.4 Soy in Animal Feed

The global production of soy has increased tenfold in the last 50 years (Svenska plattformen för riskgrödor, n.d.-c). In a report by the Food Climate Research Network, they present an estimate of the global use of soy, see Figure 3.1 (Fraanje et al., 2020).

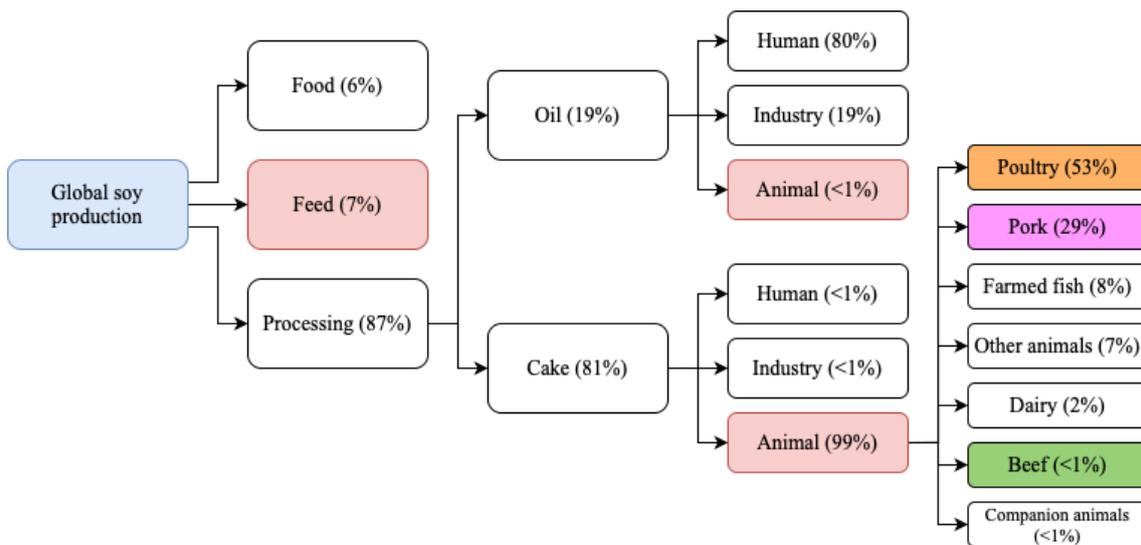


Figure 3.1: World soy usage (Fraanje et al., 2020).

In total, approximately 75% of the global soy production is used for animal feed, see Figure 3.1. About 7% of the world’s soy production goes directly to animal feed and 6% goes directly to human food. 87% is processed yielding (81%) cake and (19%) oil. Of the oil, less than 1% is used as feed, 80% is used for human consumption, and 20% is used in industry. Of the cake, 99% is used as animal feed. 53% is used as feed for poultry, 29% for pigs, 8% for aquaculture, 7% for other animals, 2% for dairy, and less than 1% for companion animals.

In a report commissioned by WWF, they concluded that the average EU citizen consumes about 60.6 kg of soy a year, most of which is consumed indirectly in animal products such as meat, dairy, eggs, and farmed fish (Kuepper & Stravens, 2022). So-called embedded soy consumption varies for different products and in the

report, figures are given for some of them. This refers to the indirect consumption of soy through animal products, where soy is used as feed. For example, 100 g of beef contains 21 g of embedded soy, 100 g of pork contains 41 g of embedded soy, and 100 g of chicken breast contains 96 g of embedded soy.

More than 80% of the world's soy comes from the USA, Brazil, and Argentina (Kuepper and Stravens, 2022; IDH et al., 2023). China is the largest importer of soy, accounting for around 60% of soybeans and 41% of all soy products, while the EU and the UK account for around 15% of all imported soy products. Of the soy imported into the EU and the UK, 48% comes from Brazil, 22% from Argentina, and 16% from the United States, together representing 86%.

3.4.1 Soy and Deforestation

Soy is, among protein crops, the most efficient source of protein per hectare, making it a staple crop and a commodity traded in agriculture. It is grown mainly in South and North America, with a small portion grown in Europe (IDH & IUCN NL, 2019). The growing demand for products such as beef, pork, poultry, eggs, and milk has simultaneously increased the demand for soy as a protein feed. For countries such as Argentina, Brazil, and Paraguay, it has helped to grow local economies since its rise in popularity over the last 50 years. There are clear links not only between direct sales of soy and increased incomes but also developments in local socioeconomic systems. In Brazil, soybean production can be related to better schools, lower poverty rates, and higher human development indices. In Argentina and Paraguay, soybean production contributes to the country's GDP growth, among others.

However, soybean production is also a key driver behind deforestation in mainly South America and the decimation of grasslands in North America (IDH & IUCN NL, 2019). The conversion of natural ecosystems has long been associated with the expansion of landmass dedicated to soy in South America, in general, and in the Brazilian Amazon in particular. The deforestation and conversion for soy expansion have since the introduction of the Amazon Soy Moratorium in 2006 reduced somewhat, but it is still an issue. In the Cerrado biome, which is a highly diverse Savannah region in Brazil, the issue of change in land use due to soy expansion remains very large. Another heavily deforested area is the Gran Chaco region, which spans several countries, including Brazil, Argentina, Paraguay, and Bolivia. Soy production is also a key driver here, together with the rearing of cattle. Approximately 10% of the natural ecosystem in the Upper Parana Atlantic Forest in Paraguay remains intact, mainly as a result of agricultural expansion for, among other things, soybeans.

According to The Sustainable Trade Initiative and the National Committee of the Netherlands (IDH & IUCN NL, 2019), and acknowledging that there were limited data available, calculations by the Joint Research Centre of the European Union (JRC) estimate that 14% of the expansion related to soybean production occurred on previously forested land. It is estimated that the deforestation and conversion of natural ecosystems will continue as the demand for soybeans increases. The study

of Persson and Singh (n.d.) performed, as previously mentioned, country-specific estimates of deforestation between 2001 and 2021. This was done not only for cattle meat and leather production, but also for global deforestation driven by expansion of soy production. Persson and Singh (n.d.) estimates that between 2001 and 2021 6.2 million hectares of land have been deforested due to the expansion of soybean production, of which 89.7% occur in South America, 3.9% in Central and North America and 0.2% in Europe.

3.4.2 Certification of Soy

There exists many different certifications for soy, depending on the area of focus, the certification labels might include criteria regarding sustainability, deforestation, or working conditions. The European Feed Manufacturers' Federation (FEFAC) is an organisation founded in 1959 that works with feed industry associations in Europe, among them the Swedish Foder & Spannmål (Feed & grain) association (FEFAC, n.d.-b). In 2015, FEFAC introduced a benchmarking tool called the FEFAC Soy Sourcing Guidelines (SSG), which helps to facilitate the task of sorting through certifications for the feed industry (FEFAC, n.d.-a).

According to Lantmännen et al. (2024), all soy meal used as animal feed in Sweden is certified by ProTerra, Round Table for Responsible Soy (RTRS), or similar, which means that it originates from agricultural land that has been used for a long time and not land that has recently been harvested. In Sweden, this is based on an industry agreement under Svenska Plattformen för Riskgrödor (Lantmännen et al., 2024). However, globally only about 2% of soy production is certified by RTRS, ProTerra, Donau Soja/Europe Soya, or the like (Svenska plattformen för riskgrödor, n.d.-c).

RTRS, ProTerra, and Donau Soja are all included in the FEFAC SSG, which means that they have met the 55 mandatory criteria and at least 8 of the 18 desired (The European Feed Manufacturers' Federation, 2023). According to Foder och Spannmål (n.d.), the majority of the soy used in Sweden is ProTerra certified and more than 60% of all the soy used is from Brazil. Some are organic, a small portion is RTRS and some are non-certified but verified from Canada.

ProTerra ProTerra certifies responsible soy according to the Basel Criteria for Responsible Soy which has four main goals: promote good agricultural practices; reliable supply chain of sustainably produced, traceable, non-GMO ingredients for feed; protect the environment and worker and community welfare (ProTerra Foundation, 2023). In terms of deforestation, the Basel Criteria for Responsible Soy deem that no farm should produce soy on land that was deforested after 1994, if it was deforested after that, the farmer must prove that they have compensated for the loss of natural ecosystems (Ismail & Rossi, 2010).

Round Table for Responsible Soy Round Table for Responsible Soy (RTRS) introduced their standard for responsible production of soy in 2010 (Round table on responsible soy, n.d.-b). Their criteria include protection of rain forests, working

conditions, and pesticides. RTRS is a non-profit organisation that promotes cooperation within the soy value chain to achieve growth in the production, trade, and use of responsible soy.

RTRS certification ensures responsible labour conditions and community relations, good agricultural practices, environmental responsibility, and no deforestation during production (Round table on responsible soy, n.d.-a). It also includes a chain of custody standard for the operator that is available in three different systems, segregation, mass balance, and country mass balance. Segregation ensures that the certified soy has been separated from non-certified soy during the whole supply chain, mass balance ensures that the delivered volumes of soy correspond to the volumes certified soy produced. The third system, which is the country mass balance, can be used for organisations that operate several farms with different facilities within a country, and they can then centralise the accounting system.

3.4.3 Svenska Plattformen för Riskgrödor

An organisation that brings together not only feed manufacturers, but any Swedish organisation and company that wants to accelerate the transition to more sustainable palm oil and soy production is Svenska Plattformen för Riskgrödor (The Swedish Platform on Risk Commodities), which was founded in 2022 (Svenska plattformen för riskgrödor, n.d.-b). The initiative is coordinated by the Ethical Trading Initiative (ETI) Sweden and is an extension of an earlier collaboration on palm oil and soy that started in 2014. Members include all of Sweden's largest food retailers: Axfood, Coop Sverige, ICA Sverige, and Lidl Sverige (Svenska plattformen för riskgrödor, n.d.-a). Poultry producers such as Guldfågeln, Kronfågel, and Ingelsta kalkon are also members, as are Orkla Foods Sverige, Scan, Lantmännen, Dafgårds, and Fontana.

The commitment includes following a "roadmap" consisting of four different stages (Svenska plattformen för riskgrödor, 2024a). At the time of joining, the company should meet some basic requirements. The soy used should be certified by one of the following certification schemes: RTRS, ProTerra, Donau Soja, Europe Soya, EU-organic, International Federation of Organic Agriculture Movements (IFOAM) such as KRAV or QS-Soy plus. Non-certified but verified soya meal from Canada imported from Norway will also be accepted. Mass balance or credit certifications are allowed to use. Certification covers soy meal and soybeans for imported soy, own-label products that use soy directly or indirectly, and other products that use soy directly or indirectly for which the company has producer responsibility. For composite products, only products containing more than 50% by weight of direct or indirect soy are covered. The requirements apply to the Swedish market.

The second stage, called "base level plus", is a way to help companies move in the right direction (Svenska plattformen för riskgrödor, 2024a). By 31 December 2025 at the latest, members must meet the requirements of the third level, which are more stringent. The requirements will be extended to cover soybeans, soy meal, soy press cake, soy husks, soy oil, lecithin, and other derivatives. It should also cover

all markets and the use of soy, directly or indirectly, in all products handled by the company. The company should set supplier requirements for verified more sustainable soy in commercial contracts for all commodities involving direct or indirect use of soy and handled in all markets, both own-label and external. Certified soy should be used, and credits should only be used in exceptional cases for indirect soy use, combined with a dialogue with suppliers on more sustainable soy requirements. In addition, the company should have a risk-based monitoring system in place.

The fourth stage is called the "leader", and it is about moving beyond those requirements in step three and continuously working toward more sustainable soy through engaging in strategic projects and investing in increased ambitions and initiatives from the industry and certification bodies.

3.5 Food Retailers Current Sustainability Programme

In this section, the current work of food retailers in relation to meat, goals related to meat sales, and meat requirements will be presented. The information is derived from sustainability reports from food retailers and their own websites. The information presented is based on the scope of this study and requirements on, for instance, the use of antibiotics or animal welfare are excluded since it is outside of the scope. In Table 3.1 a short summary of current sustainability work of food retailers is presented.

Table 3.1: Overview of food retailers current sustainability programmes.

	ICA	Axfood	Coop	Lidl
Targets		Quantified sales share target for certified meat, 5% by 2030		Quantified sales share target for plant-based proteins, 20% by 2030
EUDR		Mentions strategies		Policy on deforestation from 2024
Meat of Swedish origin			98% fresh meat (own brand), 100% fresh chicken (own brand)	80% meat, 100% fresh chicken (permanent assortment)
Retail specific initiatives	AI service called "The climate nudge"	Projects on replacing soy with more sustainable feed	Sustainability declaration tool	
Member of Svenska Plattformen för Riskgrödor	Yes	Yes	Yes	Yes
Member of Hållbar Livsmedelskedja	Yes	No	Yes	Yes

3.5.1 Axfood

According to the Sustainability Report by Axfood (2023a), Hemköp has the highest share of KRAV and Svenskt Sigill certified meat, and the goal is to increase the share. Organic meat products within their own brands should be KRAV certified in the first place and EU organic in the second. For other organic products, KRAV should be preferred. In Axfood's 2024 sustainability report, the company states that 2.7% of their meat sales consist of KRAV-certified meat and that the goal is to increase the share of KRAV or Svenskt Sigill-certified meat. In 2030, the goal is to reach a sales share of 5% (Axfood, 2024).

Axfood aims to reduce their climate impact per kg of product each year by changing the mix of products sold, but has not done so in 2023 compared to 2022 (Axfood, 2023a). According to Axfood, meat has the highest climate impact among all food categories, so reducing meat compared to other products would make the biggest difference. To reduce deforestation and preserve biodiversity, Axfood aims to replace soy with sustainable crops in the production of its own branded products. A minimum of three projects replacing soy with more sustainable feed should be completed by 2026. Soy used direct or indirect in their own-label products should be certified by RTRS or ProTerra or be organic (Dagab Inköp & Logistik, 2021).

In a document from Axfood regarding product guidelines, they state that they do not sell prime veal, foie gras, or duck liver from force-fed animals. Beef, pork and poultry meat should always be marked with its origin (Dagab Inköp & Logistik, 2021). All own-brand meat products sold by retailers should meet animal welfare certification or equivalent requirements by 2025 at the latest. The meat should also be labelled with the country of production and origin and symbols such as "Från Sverige" (From Sweden) (Dagab Inköp & Logistik, 2021).

In Axfood's 2024 sustainability report, the company states that they will enhance their risk assessments and traceability within the value chains of meat, soy and other products covered by the EUDR to ensure compliance with the regulation (Axfood, 2024). All products can be traced back to the supplier, who in turn can verify the origin of the commodities.

Hemköp has some criteria that are not found in the rest of Axfood. They state that since 1993, they have only been selling Swedish meat (Hemköp, n.d.-a). Within their own brands, meat from the Belgian Blue breed is not accepted. Hemköp also has the goal of increasing the market sale of KRAV and/or Svenskt Sigill certified meat and achieving a market share of at least 10%, (Hemköp, n.d.-b), which is higher than Axfood's general goal.

In 2023, Axfood launched a report called Mat 2030 (translates to Food 2030), which presents more than a hundred different proposed actions for industry and policy makers to achieve a more sustainable food industry (Axfood, 2023b). Two of the mentioned actions are to reduce the use of soy in food and feed and to develop more sustainability concepts than organic. They state that Axfood is already working to develop animal-based food without soy-based feed, such as eggs from chickens not

fed soy, salmon fed with insects that have eaten food residues instead of soy, and curd from cows not fed soy. Another suggestion is to inform consumers whether the meat comes from animals that have had access to outdoor grazing. Axfood themselves says they have considered this issue but have not yet changed the information.

3.5.2 COOP

From 2015, all soy needed for feed in Coop's own brands is covered by a RTRS, Pro-Terra, or KRAV certification that favours more sustainable soy cultivation (Coop, n.d.-d). From their own brands, 98% of fresh meat is of Swedish origin and 100% of fresh chicken is of Swedish origin (Coop, n.d.-c). Regarding products from their own brand, they also write the country of origin in all products containing more than 10% meat. Coop prioritises Swedish pig meat, but to be competitive and because of the demand, they also sell meat originating from other countries. They have established criteria that go beyond the EU-regulation regarding pig welfare.

Coop also has a sustainability declaration tool that evaluates the following ten aspects of products: biodiversity, climate, soil condition, water, pesticides, eutrophication, animal welfare and antibiotics, working conditions, local population, and legal compliance and traceability (Coop, 2024). It is based on the risk of negative impact for all aspects, except the climate impact. Each category has a five-point scale marked in green, orange, or red representing low, medium, or high risk (Coop, n.d.-e). The declaration is often rough and based on information generalised to the country or region where the products come from and potential certifications. The declaration was created with the intention of being used as a purchase tool, but the information is also available to consumers since 2021 (Coop, n.d.-a).

3.5.3 ICA

Swedish meat from ICA can be traced back to the time and place of slaughter and rearing (ICA, n.d.). They have stricter animal welfare rules than EU legislation for both fresh and frozen meat and strive to ensure that imported meat meets the same standard as Swedish animal welfare legislation. GMO products (genetically modified organisms) may not be included in the assortment. ICA has for several years required certified soy in both feed and food (ICA Gruppen, 2024). To help consumers reduce their carbon footprint, ICA launched an AI service called "The Climate Nudge" in 2024, used in online retail (ICA Gruppen, 2025). The service offers consumers personalised tips on what items to swap to reduce the carbon footprint. The service will initially focus on meat and dairy.

In the sustainability report, ICA Gruppen (2025) states that they have initiated several initiatives with the aim of stimulating and inspiring more climate-friendly choices. They prioritise developing an assortment with a lower climate footprint through plant-based options, hybrid products combining plant-based and animal-based proteins, and increasing the sales of fruits and vegetables. Different ways of influencing consumers to make more climate-friendly choices are also regularly tested through communication and product placement.

3.5.4 Lidl

In Lidl's permanent assortment, all fresh chicken is Swedish. The feed must be GMO-free, sustainably produced, or certified (Lidl, n.d.-a). Of the meat assortment, 80% is of Swedish origin (Lidl Sverige, n.d.). Until 2030, Lidl Sweden plans to increase the share of plant-based proteins in their assortment to 20%, and Lidl plans to increase the amount of plant-based foods with 20% to 2030, compared to 2023 (Johansson, 2025).

Lidl has a purchasing policy on deforestation from 2024 (Lidl Sverige, 2024). For both certified and non-certified products, Lidl will not use any raw materials produced on land that has been deforested or converted after 31 December 2020; for certifications, this may be even earlier depending on the standard. This is the same date as the EUDR. Lidl's strategy for deforestation-free supply chains is said to go even further than the EUDR since it covers more product groups, but this is not specified further.

Lidl describes South American meat as a minor part of their assortment, as the majority of their meat comes from Europe (Lidl Sverige, 2024). From 2025, Lidl will require that meat from high-risk countries be from deforestation-free sources, recognised by the Global Round Table on Sustainable Beef (GRSB), or produced according to the Accountability Framework initiative (AFi).

With regard to soy, Lidl already assesses the indirect amount of soy used in animal feed within the supply chain on an annual basis (Lidl Sverige, 2024). They also look at the country of origin and the certification of soy used in feed to identify sustainability risks. Non-certified soy used in feed is already required to be deforestation-free for meat products. The certification system used to verify this could be, for example, the Earthworm Foundations ZDC methodology or ProTerra MRV.

3.5.5 Hållbar Livsmedelskedja

The Hållbar Livsmedelskedja (Sustainable supply chain for food) is a collaborative initiative between food retailers, food producers, restaurant wholesalers and WWF Sweden. Among Swedish food retailers, ICA, Coop, Lidl, and Axfood are part of the initiative. In 2023, a roadmap was launched that presents a common agenda with eight goal areas and 45 subgoals (Hållbar Livsmedelskedja, 2024). Some relevant sub-goals included are that their value chains should be free of soy and palm oil in feed that is not sustainably produced and should not include any commodities from deforested areas (converted after 2020) by 2025 (Hållbar Livsmedelskedja, 2023). By 2030, value chains must be free of animal products from farms with insufficient manure application area, corresponding to Swedish levels of 22 kg of phosphorus per year and hectare.

Members of the initiative should also continue to work to reduce methane emissions from dairy and meat, increase the area of natural pastures, and thus contribute

to increased biodiversity and open landscapes, develop new market concepts for animal products verified with more sustainable production, and increase the use of fossil-free fertilisers (Hållbar Livsmedelskedja, 2023). Another sub-goal to reach a more sustainable supply of food by 2030, is to increase the share of plant-based food, organic products and meat from natural pasture (Svenskt Sigill naturbete) (Hållbar Livsmedelskedja, 2023). Members of the initiative should also take action and set requirements by 2025 to increase biodiversity along their value chain, in close collaboration with their suppliers.

3.6 Key Aspects of the EU Deforestation Regulation, EUDR

In this section, relevant parts of the EU Deforestation Regulation will be presented together with information from the guidance documents published by the EU Commission.

3.6.1 Definitions in the EUDR Framework

In Article 2 of the EU regulation on the making available on the Union market and the export from the Union of certain commodities and products associated with deforestation and forest degradation and repealing Regulation (EU) No 995/2010 (hereafter referred to as EUDR), some important definitions are presented to understand the rest of the regulation.

Relevant commodities mean cattle, cocoa, coffee, oil palm, rubber, soya, and wood according to Article 2(1).

Relevant products mean products defined in an appendix "that contain, have been fed with, or have been made using relevant commodities" according to Article 2(2).

Deforestation free is defined as "the relevant products contain, have been fed with, or have been made using relevant commodities that were produced on land that has not been subjected to deforestation after 31 December 2020 and, in the case of relevant products that contain or have been made using wood, that the wood has been harvested from the forest without inducing forest degradation after 31 December 2020." according to Article 2(13).

An operator is defined as a natural or legal person who places relevant products on the market or exports them in the course of a commercial activity according to Article 2(15). Place on the market means the first to make products or commodities available on the Union market according to Article 2(16).

A trader is defined in Article 2(17) as any person in the supply chain who is not the operator and who makes relevant products available on the market in the course of commercial activity. Making available on the market means supplying relevant

products for consumption, distribution, or use on the Union market in the course of commercial activity, either free of charge or in return for payment according to Article 2(18). In the course of commercial activity, it is defined as with the aim of processing, distribution to commercial or noncommercial consumers, or for the use of in the business of the operator itself according to Article 2(19).

Interpretation: food retailers are traders and not operators.

In the regulation, different rules apply if you are a micro-, small- or medium-sized company, referred to as SME, or not. The definition is not presented in the EUDR regulation, but can be found in Article 3 of Directive 2013/34/eu points 1-3 (European Parliament, n.d.). Micro-, small- and medium-sized companies are defined as companies that do not exceed the limits of at least two of the three criteria defined in Table 3.2 on their balance sheet dates. To know if Swedish food retailers fall under the SME definition, one has to look at their economic data, which is presented in Table 3.3.

Table 3.2: Definitions of micro-, small- and medium-sized companies according to Article 3 of Directive 2013/34/eu § 1-3 (European Parliament, n.d.).

	Balance sheet total (EUR)	Net turnover (EUR)	Employees
Micro companies	350 000	700 000	10
Small companies	4 000 000	8 000 000	50
Medium companies	20 000 000	40 000 000	250

Table 3.3: Net turnover in SEK and EUR (DLF & DELFI, 2024), together with amount of employees for ICA Sverige (ICA Gruppen, 2025), Axfood (Axfood, 2024), Coop (Coop, n.d.-b) and Lidl (Lidl, n.d.-b) In the conversion from SEK to Euro, 1 Euro is assumed to be equal to 10.9 SEK, based on the exchange rates as of May 7 2025.

	Net turnover (SEK)	Net turnover (EUR)	Employees
ICA Sverige	168 300 000 000	15 440 000 000	8 817
Axfood	73 900 000 000	6 780 000 000	18 472
Coop	57 500 000 000	5 275 000 000	17 208
Lidl	21 600 000 000	1 982 000 000	15 000

Interpretation: Since all major food retailers are well above the limits, this means that food retailers in Sweden are not small or medium sized companies.

According to Recital 53, the responsibility of traders includes collecting and keeping information on relevant products they make available on the market to ensure transparency in the supply chain. It is highlighted that non-SME traders have an important influence on supply chains and the assurance that these are deforestation free. Therefore, traders should have the same obligations as operators and exercise due diligence and ensure that there is no or negligible risk that products do not comply with this regulation.

In Article 5(1) the obligations for traders are defined: "Traders that are not SMEs ('non-SME traders') shall be considered non-SME operators and shall be subject to obligations and provisions in Articles 3, 4 and 6, Articles 8 to 13, Article 16(8) to (11) and Article 18 with regard to relevant commodities and relevant products that they make available on the market."

Interpretation: In other words, non-SME traders such as food retailers will have the same obligations as operators and exercise due diligence.

In Article 3 the essence of the regulation is stated: "Relevant commodities and relevant products shall not be placed or made available on the market or exported, unless all the following conditions are fulfilled: (a) they are deforestation-free; (b) they have been produced in accordance with the relevant legislation of the country of production; and (c) they are covered by a due diligence statement."

3.6.2 Understanding Due Diligence in the EUDR Framework

According to Recital 49, **Due diligence** include three elements: information requirements, risk assessment and risk mitigation measures, as well as reporting obligations. Due diligence should give information on the sources and suppliers of commodities and products, information proving that no deforestation or forest degradation has occurred and that legal requirements are met. This should be done by identifying the country where it was produced and including the geolocation coordinates of the relevant land plots. Operators should conduct a risk assessment on the basis of this information. If a risk is identified, that risk should be minimised to no or negligible risk. In Recital 54 it is stated that operators that are not SMEs should report their due diligence and the steps taken to fulfil their obligation publicly on an annual basis.

Due diligence is based on three aspects defined in Article 8(2): "The due diligence shall include: (a) the collection of information, data, and documents needed to fulfil the requirements set out in Article 9; (b) risk assessment measures as referred to in Article 10; (c) risk mitigation measures as referred to in Article 11."

Information Requirement

In Article 9(1) in Regulation Nr 995/201, there is a list of required information that operators must collect, organise and keep for five years from the date of placement on the market. This includes, for example, the description and quantity of relevant products, country of production and name, email, and postal address of businesses or persons that have delivered the products or the operator or trader to whom they have been delivered. Another required information is geolocation of all plots of land where the relevant commodities included in the relevant product, or which had been made using, were produced. If a product contains or has been made using different plots, all of them should be included. Considering cattle, the geolocation should cover all the establishments where the cattle have been kept. If deforestation

or forest degradation has occurred in the plots, the products cannot be exported, placed, or made available on the market. The date of production or time range should also be included.

According to the document published by European Commission (2024b) with frequently asked questions, point 8.3, the date of production of cattle is defined as the day they were born, which means that cattle born before this regulation enters into force are not covered by this regulation. The operator is responsible for the burden of proof in verifying this exception. Another requirement is to include "Adequately conclusive and verifiable information" showing that the relevant commodities meet the relevant legislation in the country and that they are free from deforestation.

In Recital 39 in the EUDR, it is highlighted that the feed used for livestock under this regulation, in other words, feed used for cattle, should not lead to deforestation and must not include relevant products or commodities. As part of due diligence, operators should, therefore, ensure that the feed is deforestation-free. However, the geolocation is not requested for the feed, it should be limited to the establishments of the cattle. If the competent authority suspects that there is a risk that the feed is not in compliance with the regulation, they could request information about the feed.

Risk Assessment

Article 10 states that the operator must perform a risk assessment to verify and analyse the information collected according to Article 9 and this should include a number of aspects, for example, the risk classification of the Commission, the presence of forest and indigenous people in the country, the complexity of the supply chain, the risk of mixing with relevant products of unknown origin or products that have been produced in areas where deforestation occurs. It can also be information from, for example, certification system controlled by a third part or information about concerns in the country such as corruption and lack of law enforcement.

The risk assessment should be documented and reviewed on an annual basis and, on request from the competent authorities, operators should be able to demonstrate how the risk assessment was performed and the degree of risk was determined according to the criteria.

Risk Mitigation

If the risk assessment in Article 10 has not proven that there is no or negligible risk that the relevant products do not meet the requirements, further risk reduction measures must be taken according to Article 11(1). This could require additional information, data, documents, independent surveys, audits, or other measures concerning the information requirement in Article 9. According to Article 9(2), the operators should have policies, controls, and procedures in place to mitigate the risk and handle non-compliant products.

Simplified Due Diligence

In Article 13 it is stated that a simplified due diligence can be allowed if the operator can ensure that the relevant products have been produced in low-risk countries. To do this, they need to conduct an assessment of the complexity of the supply chain and the risk of circumventing the Regulation or of mixing with products of unknown or high risk origin. In that case, operators are not required to fulfil the obligations outlined in Articles 10 and 11, meaning that they are not obligated to conduct a risk assessment or implement risk mitigation measures.

Registration of Due Diligence

According to Recital 62, the Commission should establish and manage an information system through which due diligence statements must be submitted by the operators. The information system should be accessible to competent authorities and custom authorities and facilitate the fulfilment of their obligations and information transfer between these parties, as well as between the member states.

Use of Existing Due Diligence Statements

According to Article 4(7), operators should communicate the necessary information to traders and operators further down the supply chain demonstrating that due diligence and relevant products were found to have no or negligible risk.

According to Article 4(9) non-SMEs operators can refer to due diligence statements which have already been submitted. However, first they have to determine that the relevant products comply with Article 3, that is, are deforestation-free, comply with relevant legislation of the country, and have a due diligence statement. Due diligence should have been done in accordance with Article 9, 10 and 11, explained in a previous paragraph. In the guidance document they clarify that this does not mean that every due diligence statement should be checked (European Commission, n.d.-a). It could be enough to ascertain that upstream operators have a due diligence system that is updated and operational and effectively manage and mitigate risk of non-compliant products.

3.6.3 Risk Classification of Countries

According to Article 29, a three-tier system based on three risk categories: high, standard, and low will be established to assess the risk level of all countries (European Commission, 2023). The classification of a country into high or low risk should be based on a transparent and objective assessment made by the Commission based on the rate of deforestation, forest degradation, expansion of agricultural land for relevant commodities and products and production trends of relevant commodities and products. If the assessment does not conclude that the country or part thereof has a high or low risk, it has a standard risk. The European Commission will publish the risk classification of each country no later than 30 June 2025 (SCA, n.d.).

3.6.3.1 Risk Classification of Sweden

On 14 February, Statens offentliga utredningar (Public investigations of the government) published a study with a title that translates to *Adaptation of Swedish law to the EU Deforestation Regulation* SOU 2025:17 (Anna Tiberg, 2025) . One of the objectives of the inquiry was to examine whether Sweden needs more regulation to combat deforestation and forest degradation to be classified as a low-risk country. Current Swedish regulations do not prohibit the conversion of forest land to agricultural land, but there are different regulations on land conversion. For example, if you want to convert forest to agricultural land and grow one of the relevant crops, you have to notify the municipality.

In the investigation, they also looked at statistics relevant to risk classification (Anna Tiberg, 2025). In Sweden, more agricultural land is converted to forest than vice versa. Between 1985 and 2010, 0.2 percent of the total land area was converted from forest to agricultural land, while 0.7 percent of the total land area was converted in the opposite direction. During the period 2010-2023, Skogsstyrelsen (the Forestry Agency) recorded about 800 conversions of almost 2500 ha per year. 80% of these were transitions from forest to pasture. The investigation emphasises that there does not appear to be systematic deforestation in Sweden when it comes to the relevant objective of the regulation, which is to grow relevant crops and breed cattle.

With regard to soy, there are attempts to grow soy in Sweden, but this does not appear to be linked to deforestation. The inquiry judgment is that there is no reason for further regulation of deforestation in Sweden. However, in terms of forest degradation, the inquiry states that a new regulation is necessary if Sweden is to be considered a low-risk country. This part of the EUDR is not covered in this report, but may affect the overall risk judgement of Sweden.

3.6.4 The Role of Certifications in EUDR

According to Recital 52 of the EU Regulation 995/2010, certifications and third-party verification could be used to assess risks, but cannot replace the operator's responsibility when it comes to due diligence (European Commission, 2023). In a document with frequently asked questions published by European Commission (2024b), they state that the role of certification is limited by the information provided by the certification, whether it covers the information needed to comply with the regulations obligations. Operators and traders are still responsible if any breach occurs.

In a guidance document from the EU commission they acknowledge that certification can be used to support information about products being deforestation free and legal as part of their due diligence (European Commission, n.d.-a) . However, the EUDR does not oblige operators to follow certification schemes or that producers must join them. To assess the certification system, they also present three main elements to consider. The first one being "the relevant standards" concerning aspects like inclusion of relevant legal requirements, traceability, and the possibility to use mass

balance. The second is called "the implementation by schemes", which includes, for example, controls for verification of volumes throughout the supply chain and transparent checks on compliance of certifications standards. The third is "on the governance of schemes" including compliance with EU or international legislation such as ISO standards and control of corruption and fraud.

According to European Commission (2024b), it is stated that the use of mass balance chains of custody is not allowed because deforestation-free commodities are then mixed with non-deforestation-free commodities. Then, all products are not traceable to the plot of land and cannot be guaranteed to be deforestation-free.

The requirements of the Swedish platform for risk crops, mentioned in Section 3.4.3, were established before the EUDR was confirmed. The Swedish platform for risk crops and EUDR overlap in part, but also focus on different aspects (Thunborg, 2025). The Swedish platform for risk crops is of the opinion that their requirements are needed as a complement to the legislation to achieve long-term sustainability.

According to an analysis conducted by Svenska Plattformen för Riskgrödor, certifications are not a shortcut to complying with EUDR legislation, but they can be used as a tool to obtain information for the risk assessment that needs to be performed, as well as to minimise risks (Svenska plattformen för riskgrödor, 2024b). Looking at the different certification owners, they are now making updates and adjustments in their standards to be in line with EUDR. ProTerra and Donau Soya has, for example, decided to do an update that adds essential information such as geolocation points.

4

Results

Here, the results of the literature review are presented. The mapping of certified soy used for the production of meat consumed in Sweden and the estimation of how much of this soy is currently deforestation-free are also described. In addition, this section presents the findings of the five interviews conducted.

4.1 Current Understanding of the Environmental Aspects of Meat Production

A literature review study was conducted to assess current understanding of the environmental aspects of meat production. Some, such as climate change and greenhouse gas emissions, are often included, while others, such as biodiversity, are rarely or never included due to previously stated difficulties in data collection; see Section 3.3. In total, eight different studies were included. Of these, four are review studies, two used database models, one was a water footprint assessment, and one an LCA study. These have used different methods, which will be presented in Table 4.1, for further information on the number of studies and the origin of the data for each article, see Appendix A.

Climate Change and Greenhouse Gas Emissions

Climate change is the most prevalent environmental aspect in the included studies; six studies cover this aspect. They differ in amount $CO_2 eq/kg RW$ (retail weight) as presented in Figure 4.1, but the general emission trends between beef, pork, and poultry are similar across studies.

According to the results, beef had the highest climate change impact and also the widest range, compared to pork and poultry. The averages ranged from 19.3 to 96.6 $kg CO_2 eq/kg RW$, and estimates of beef from suckler cow systems (beef herd) show higher GHG emissions than from dairy systems. This can be explained by the fact that the emissions from beef from dairy cattle are also allocated to milk, not only to meat (Gerber, 2013; Poore and Nemecek, 2018).

The production of pork meat had averages ranging from 3.1 to 11.4 $kg CO_2 eq/kg RW$ and the average for poultry ranged from 3.5 to 11.0 $kg CO_2 eq/kg RW$. The study

4. Results

Table 4.1: Overview of articles included in the analysis of environmental aspects of meat production.

Article	Summary of type of study, system boundaries and included environmental aspects
Clune et al. (2017)	Review study of LCAs assessing carbon footprint. Covers cradle to regional distribution centre. The system boundaries varied for different LCAs included. For studies with a system boundary that finished at the farm gate a transport and packaging median figure was added.
Pishgar-Komleh and Beldman (2022)	Review study of LCAs assessing carbon footprint. Covers cradle to farm gate. Studies that covered post farm activities were adopted to farm gate.
Gerber (2013)	Global assessment of GHG-emissions. Uses The Global Livestock Environmental Assessment Model (GLEAM) which is a GIS framework with a life cycle assessment approach simulating the bio-physical processes and activities along livestock supply chains. Covers cradle to retail. Feed production, non feed production, livestock production and post farm gate is all included.
Weiss and Leip (2012)	A life cycle assessment of GHG-emissions carried out with the Common Agricultural Policy Regionalised Impact (CAPRI) model, which is a database and simulation model for the agriculture sector. The data base is derived from different sources such as national statistics on land use, crop production, herd sizes and slaughtering. Covers cradle to farm gate and slaughtering. Includes carbon footprint. Emissions on the farm and emissions related to the production of inputs are included as well as land use, land use change (LULUC). It does not include emissions from transport, processing, packaging, retail, consumption or waste.
Nijdam et al. (2012)	Review study of LCAs assessing carbon footprint and land use. Covers cradle to retail. Since most LCAs included in the study covered cradle to farm gate the following assumptions were made to cover the farm gate to retail portion: emission of $0.2 \text{ kg CO}_2/\text{kg meat}$ for slaughterhouse and $0.1 \text{ kg CO}_2/\text{kg meat}$ for the transportation of meat.
Poore and Nemecek (2018)	Review study of LCAs. Covers cradle to retail and assesses carbon footprint, land use, eutrophication, freshwater withdrawal and water scarcity. Land use change (LUC) is included as well as food processing, transportation from farm to retail, and packaging.
Mekonnen and Hoekstra (2012)	Water footprint assessment that presents blue water use as a weighted global average. Water use includes both indirect water from feed production and direct water (drinking and service water). To calculate the water use for each crop used for feed, a high-resolution water balance model was used. It simulates rainfall, evaporation, soil water, and irrigation in small geographic grid cells and estimate the crop water footprints. Estimates of the use of direct water were based on earlier studies from the literature.
Nordborg et al. (2017)	LCA study of freshwater ecotoxicity that covers primary production of feed.

by Poore and Nemecek (2018) had the highest average values for both beef, pork, and poultry, as well as the widest range for beef herds, pork, and poultry. This is likely due to their inclusion of the largest number of studies from the largest number

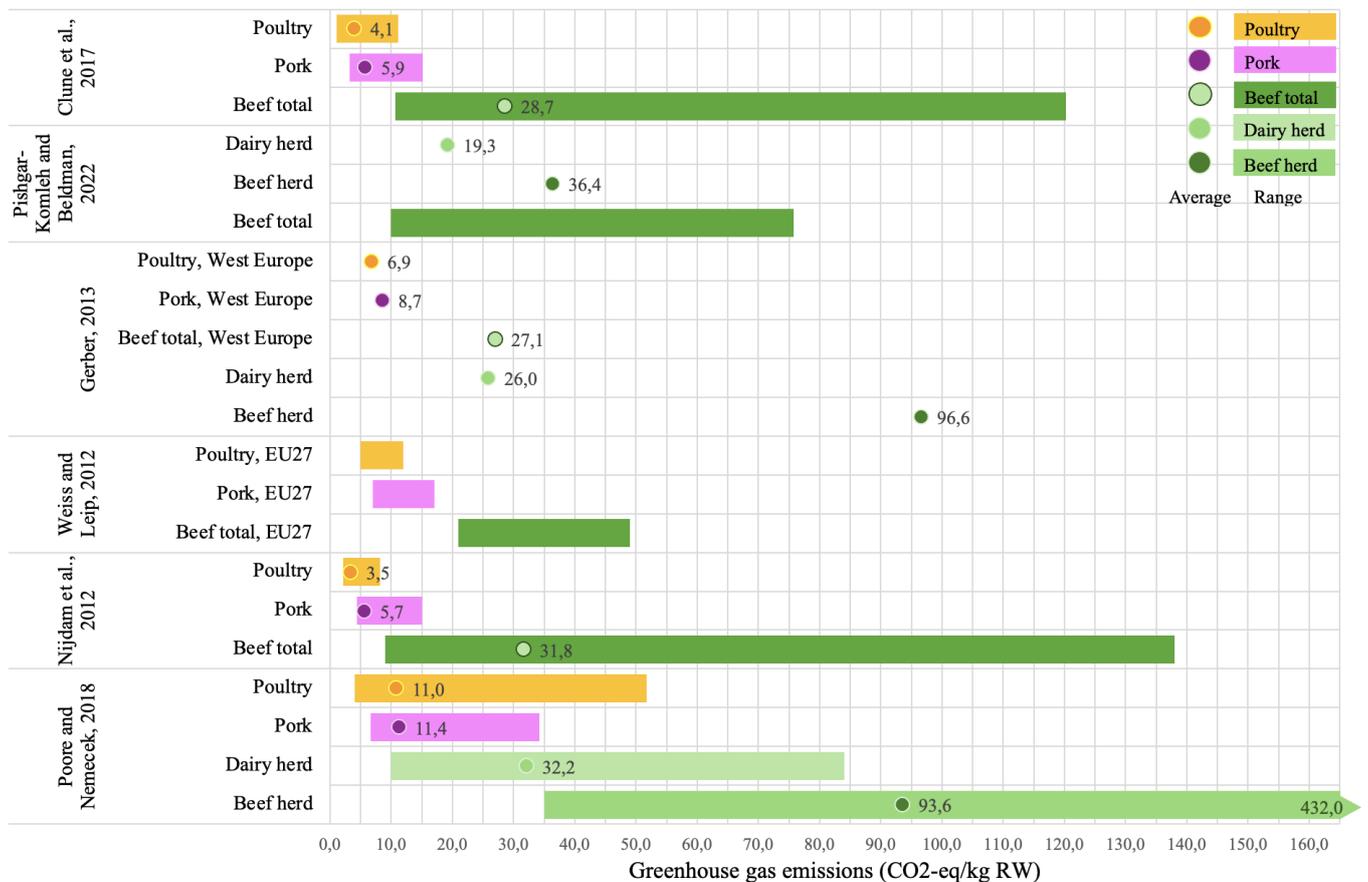
Greenhouse gas emissions for poultry, pork and beef (CO₂-eq/kg RW)

Figure 4.1: Greenhouse gas emissions from production of poultry, pork and beef. Beef is separated into beef total, dairy herd, and beef herd. The figure shows average and range from seven different studies.

of countries. The lowest average value for pork and poultry comes from the study by Nijdam et al. (2012), but this is not far from the average of Clune et al. (2017). This is not surprising since both of these studies are a cradle to the retail or distribution centre and in cases where the included studies were only to the farm gate, they both made assumptions about the last steps. However, only Nijdam et al. (2012) states that it includes land use.

The results of the studies vary, partly due to differences in what they include, for example, the system boundaries applied and whether they include GHG emissions due to land use change or not. However, the overall trend is that beef has the highest average and range of GHG emissions, followed by pork and poultry. Poore and Nemecek (2018) is a slight outlier with the range for poultry production, which is significantly larger than the range for pork production.

Water Use

Two of the eight studies cover freshwater withdrawal as seen in Figure 4.2. The evaluation of the water footprint by Mekonnen and Hoekstra (2012) presents a weighted global average for the use of blue water, where the water footprint of the feed was based on a high-resolution water balance model simulating different parameters in grid cells. The results from Poore and Nemecek (2018), on the other hand, are based on a collection of LCAs.

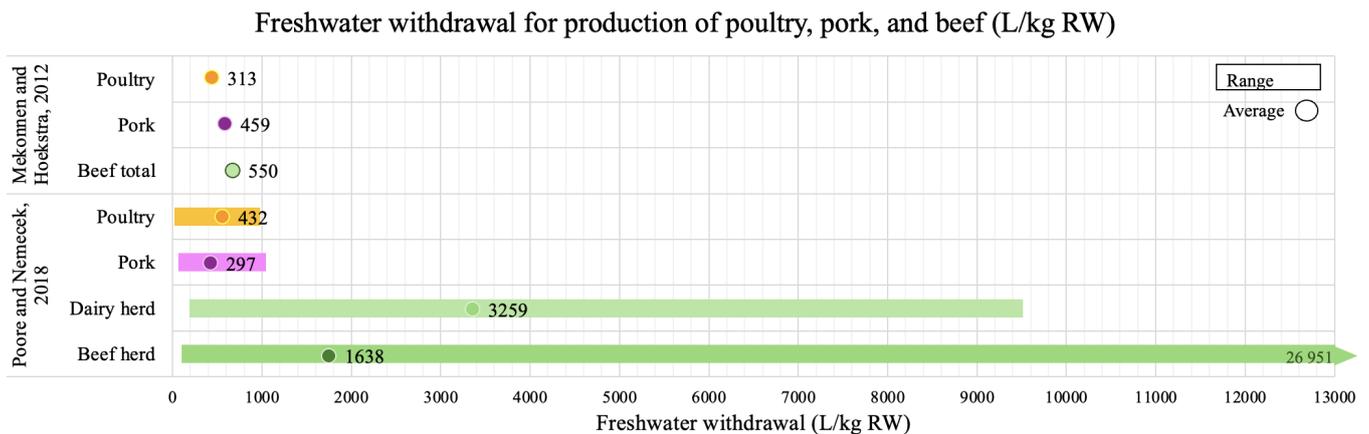


Figure 4.2: Freshwater withdrawal for production of poultry, pork and beef. Beef is separated into beef total, dairy herd, and beef herd. The figure shows average and range from two different studies.

The average freshwater withdrawal for poultry was 313 and 432 $L/kg RW$, depending on the source and 459 and 297 $L/kg RW$ for pork. In other words, the results are ambiguous as to whether pork or poultry has the highest use of freshwater. Mekonnen and Hoekstra (2012) present a number of 550 $L/kg RW$ for beef while Poore and Nemecek (2018) present higher values of 3259 $L/kg RW$ for dairy herd and 1638 $L/kg RW$ for beef herd, their range is also very wide. Poore and Nemecek (2018) is based on separate studies, some reporting high freshwater withdrawals compared to Mekonnen and Hoekstra (2012) who uses a global average, which might explain some of the outliers seen.

However, freshwater withdrawal does not say anything about the possible impact that withdrawal might have on the local environment; see Figure 4.3. Poore and Nemecek (2018) calculates the water scarcity potential of the withdrawal depending on the location of the withdrawal and the local environment.

The average water scarcity was lowest for poultry, accounting for 190 $L eq/kg RW$, and pork had an average of 240 $L eq/kg RW$. Beef from dairy herd and beef herd had a much higher average of 117 743 $L eq/kg RW$ and 67 205 $L eq/kg RW$, respectively. The range for beef was also very wide, the lowest value being 170 $L eq/kg RW$ for the beef herd and 267 $L eq/kg RW$ for dairy herd.

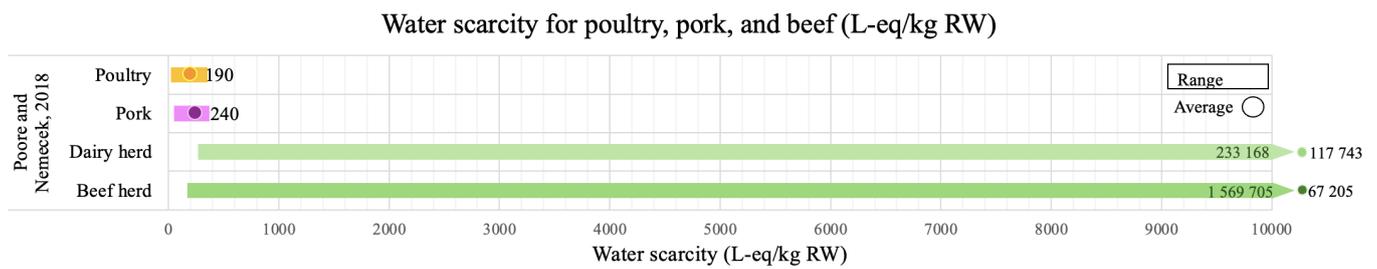


Figure 4.3: Water scarcity from production of poultry, pork and beef. Beef is separated into beef total, dairy herd, and beef herd. The figure shows average and range from one study.

Land Use

Two studies, Nijdam et al. (2012) and Poore and Nemecek (2018) included the land use associated with beef, pork, and poultry, see Figure 4.4.

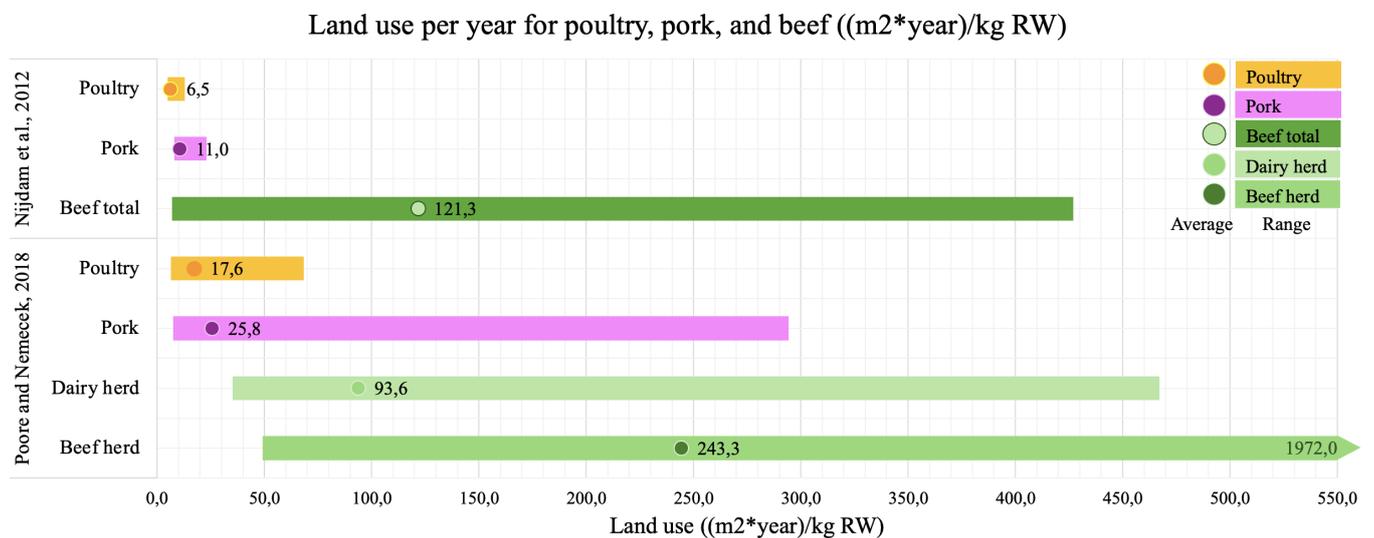


Figure 4.4: Land use for production of poultry, pork, and beef. Beef is separated into beef total, dairy herd, and beef herd. The figure shows average and range from two different studies.

In common for both studies was that beef had the highest average, followed by pork and then poultry. In the study by Poore and Nemecek (2018) beef herd had a higher average of $243.3 \text{ m}^2 \times \text{year}/\text{kg RW}$ compared to the dairy herd with an average of $93.6 \text{ m}^2 \times \text{year}/\text{kg RW}$. The beef herd also had a wider range of values, ranging from 50 to $1972.0 \text{ m}^2 \times \text{year}/\text{kg RW}$ for Poore and Nemecek (2018).

The average land use for pork was 25.8 and $11.0 \text{ m}^2 \times \text{year}/\text{kg RW}$, respectively. The range between the lowest and the highest value is wider for Poore and Nemecek (2018) than for Nijdam et al. (2012), which may be due to the fact that Poore and Nemecek (2018) includes more studies, which can contribute to a wider range. The same can be said for land uses for poultry production, Poore and Nemecek (2018) has a wider range and a higher average at $17.6 \text{ m}^2 \times \text{year}/\text{kg RW}$ than Nijdam et al. (2012), which averages at $6.5 \text{ m}^2 \times \text{year}/\text{kg RW}$.

Biodiversity

None of the eight included studies covers biodiversity as an aspect. Poore and Nemecek (2018) does state that some eutrophication and acidification emissions may reduce biodiversity and ecological resilience, which is also agreed on by Nordborg et al. (2017). Poore and Nemecek (2018) also discuss the fact that the effect of emissions can vary depending on the local climate and the resilience of the local environment. In addition, they discuss issues related to the assessment of on-farm biodiversity but ultimately conclude that limiting global warming and other environmental impacts associated with food production is necessary in order to prevent future irreversible biodiversity loss.

Gerber (2013), directly links current agriculture and food production with, among other things, the loss of biodiversity, and says that future agricultural growth must adapt to a changing environment and reduce associated emissions. Nijdam et al. (2012) touches on the methodological issues associated with effects such as loss of biodiversity. However, they also state that greenhouse gas emissions and land occupation are directly related to loss of biodiversity. Nijdam et al. (2012) also points out that not all land use negatively affects biodiversity, and extensive grazing systems are often associated with a positive impact on local biodiversity.

Eutrophication Potential

Only one review study was found that covered the eutrophication potential of meat production, see Figure 4.5.

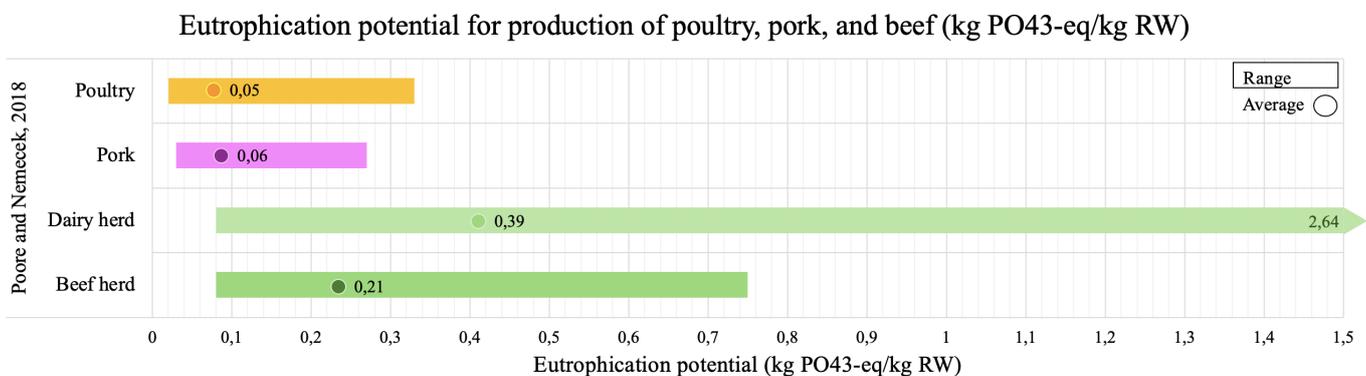


Figure 4.5: Eutrophication potential for production of poultry, pork, and beef. Beef is separated into beef total, dairy herd, and beef herd. The figure shows average and range from one study.

Cattle from dairy herds had the highest eutrophication potential with an average of $0.39 PO_4^{3-} eq/kg RW$, followed by cattle from beef herds, pork, and poultry. The cattle in the dairy herd also had the widest range, from $0.08 PO_4^{3-} eq/kg RW$ to $2.64 PO_4^{3-} eq/kg RW$. The pork had an average of $0.06 PO_4^{3-} eq/kg RW$ and the poultry $0.05 PO_4^{3-} eq/kg RW$. Poore and Nemecek (2018) is the study that also covered the potential for eutrophication and is the most comprehensive of the reviews that were examined. Eutrophication is mainly associated with manure, which all animal proteins contribute to.

Freshwater Ecotoxicity

There was also only one of the eight studies that included ecotoxicity, and in this case freshwater ecotoxicity, see Figure 4.6.

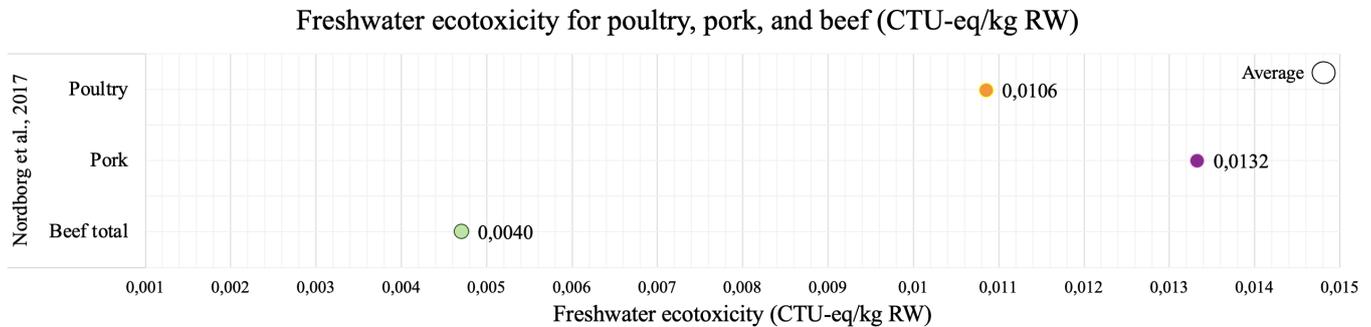


Figure 4.6: Freshwater ecotoxicity from production of poultry, pork and beef. In this study, beef represents minced beef, pork represents minced pork and poultry represents chicken fillet. Beef is separated into beef total, dairy herd, and beef herd. The figure shows average and range from one study.

The study by Nordborg et al. (2017) revealed that the product with the highest freshwater ecotoxicity impact is pork with $0.0132 \text{ CTU eq/kg RW}$ (in the study this is called minced pork) followed by poultry $0.0106 \text{ CTU eq/kg RW}$ (illustrated with chicken fillet in the study) and beef $0.0040 \text{ CTU eq/kg RW}$ (minced beef in the study). Nordborg et al. (2017) examined five different functional units that all showed the same ranking of food products. For chicken fillet and minced pork, pesticides used in soybean production was the dominant impact potential.

4.2 Soy Use in Animal Feed for Meat Consumed in Sweden

Here, the results of the mapping of both direct and indirect soy use associated with the meat consumed in Sweden are presented, taking into account the meat produced in Sweden and the meat imported from other countries. The amount of soy available in each country has been mapped and calculated, as well as slaughtered beef, pork, and poultry. The amount of available soy certified as deforestation-free is presented, as well as the total amount of direct and indirect soy used for the production of meat consumed in Sweden certified as deforestation-free is presented.

4.2.1 Certified Soy Use in Import Countries

The percentage of soy that enters the European market that is FEFAC SSG compliant is 40.1%, a statistic that has been decreasing. In 2019 the number was 42.2%, and in 2020 it was 43.8% (IDH et al., 2023). Of this, 24% is deforestation-free and conversion-free (IDH et al., 2023). The use of certified or uncertified soy differs depending on the country according to IDH et al. (2023). Some countries already have laws and regulations in place to mitigate the risks associated with the direct

and indirect use of soy in meat production. Table 4.2 shows the domestically used soy that is certified as FEFAC SSG compliant or deforestation-free according to IDH et al. (2023) for the largest import countries, including Sweden. The table also shows the share of the total soy volume across all included countries that is certified as FEFAC SSG-compliant or deforestation-free.

Table 4.2: Percentage of soy covered by responsible or deforestation free certifications in 2021 for Sweden’s largest meat import countries (IDH et al., 2023)

Country	FEFAC SSG compliant (%)	Deforestation-free (%)
Sweden	>100	>100
Poland (no data)	0	0
Netherlands	>100	>100
Germany	86	61
Denmark	55	33
Ireland ^a	96	96
Italy	30	0
Spain	24	0
Latvia (no data)	0	0
Import countries	43	24

^a EFECA Report (2022)

The percentages presented in Table 4.2 are for whole soybeans and soybean meal used in each country. They are based on the study done by IDH et al. (2023). The percentages are derived by dividing the amount of soy bought that is directly certified or where certification credits have been purchased separately, by the total amount of whole soybeans and soybean meal available in the country. IDH et al. (2023) states that no data were available on whether Poland buys FEFAC SSG compliant or deforestation-free soy. Regarding Latvia, no data on FEFAC SSG compliance or deforestation-free soy requirements were found. In terms of Ireland, the report by EFECA Report (2022) states that only 4% of the soy used came from areas with a higher risk of deforestation, and this soy is assumed to also be FEFAC SSG compliant.

4.2.2 Soy Availability and Meat Production

Figure 4.7 presents the amount of soy available for animal feed together with the volumes of beef, pork, and poultry production in Sweden, as well as the included import countries Poland, Netherlands, Germany, Denmark, Ireland, Italy, Spain, and Latvia. Data on the amount of soy available for all countries, except Ireland and Latvia, are from the report by IDH and IUCN NL (2019). Data on soy available in Ireland and Latvia are from the statistical tool WITS (2023).

Kuepper and Stravens (2022) estimate that of the soy imported into each relevant country 90% is used for animal feed. The soy presented here is soy that is available for animal feed.

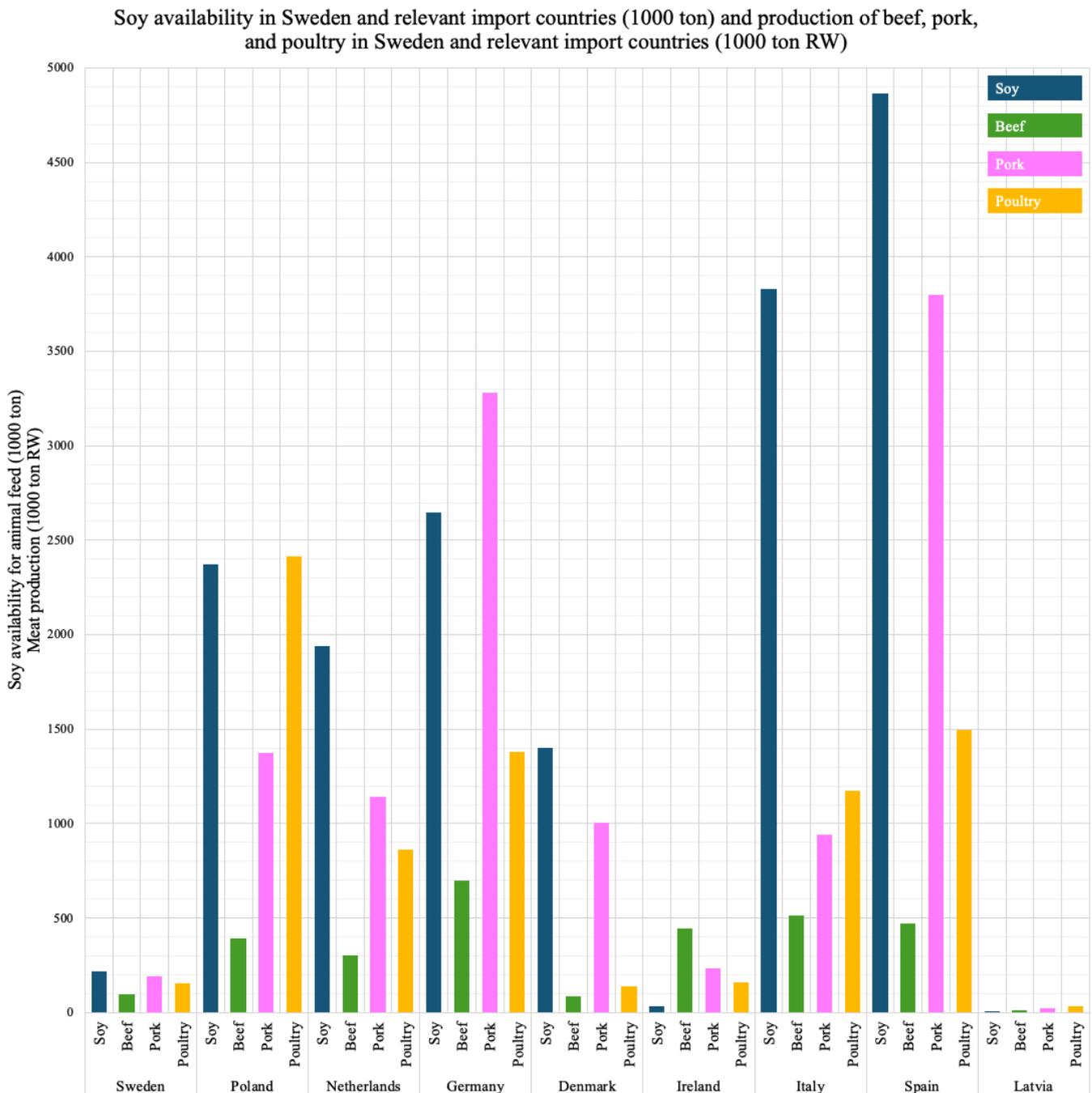


Figure 4.7: Available soy for animal feed in Sweden (IDH et al., 2023) and relevant import countries (IDH et al., 2023; WITS, 2023) in 1000 ton, and production of beef, pork, and poultry in Sweden (Jordbruksverket, 2024b) and relevant countries (Danish Agriculture and Food Council, 2021; EUROSTAT, 2023a; EUROSTAT, 2023b) in 1000 ton RW.

As seen in Figure 4.7, the availability of soy for meat production differs between countries. Italy and Spain emerge as outliers with substantially higher volumes of available soy. This is particularly notable in the case of Italy, where soy availability appears to be elevated even when comparing the national production volumes of beef, pork, and poultry. In contrast, Sweden, Ireland, and Latvia have a comparatively

low availability of soy. For Ireland and Latvia in particular, the available soy appears to be very small relative to their meat production levels.

4.2.3 Soy Distribution in Europe and Sweden

Besides how much soy is used in different countries, it is also interesting to see where that soy ends up and what it is used for. Here, whole soybeans and soybean meal are included, while other products such as soybean oil are not included. The distribution of available soy in Sweden is shown in Figure 4.8b, and the distribution for Europe is shown in Figure 4.8a. Data for the Swedish soy distribution are based on the study by Einarsson et al. (2022) and are sourced from statistics from the Swedish Board of Agriculture. The distribution for Europe is from Kuepper and Stravens (2022).

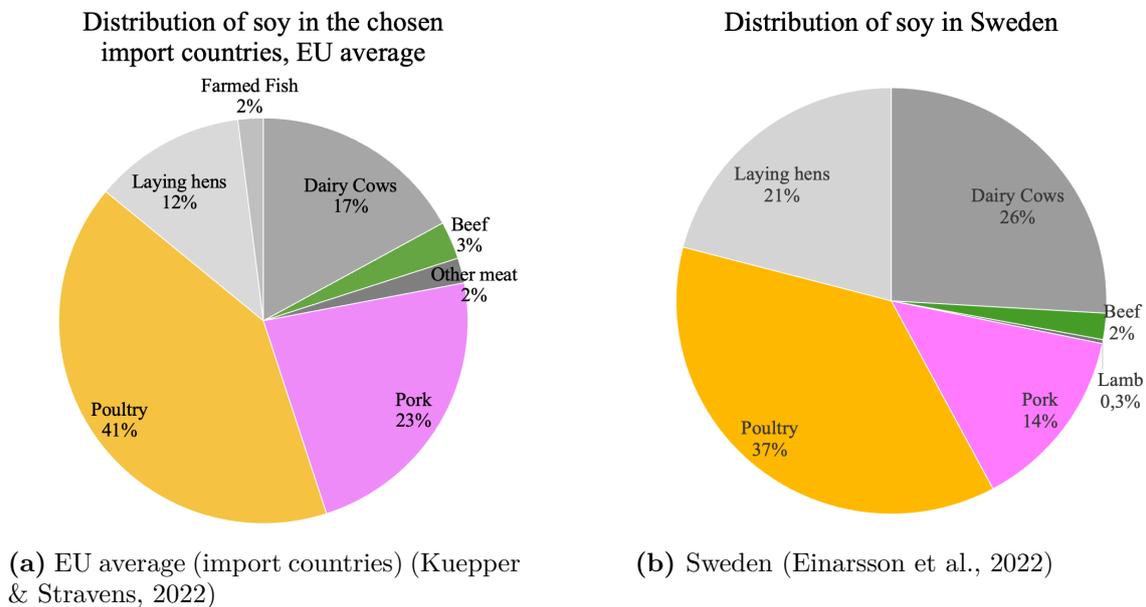


Figure 4.8: Distribution of soy for animal feed.

As shown in Figure 4.8, the way available soy is distributed does not differ much between Sweden and Europe as a whole. There are, of course, some differences, soy for farmed fish in Sweden is not included as can be seen and can be assumed to be covered by 10% of soy imports that are assumed not to be used for animal feed (Kuepper & Stravens, 2022). Sweden uses 14% of its available soy for pork, while Europe uses 23%. 21% of available soy is used for laying hens in Sweden, while 12% is used in Europe. In Sweden 26% of the available soy is used for dairy cows and in Europe 17% of the available soy is used. The distribution of soy depends on both the total production volumes and the types of animal products being produced.

4.2.4 Soy Used in Feed for Meat Consumed in Sweden

The amount of soy used for the production of a kg of meat in Sweden and the import countries differs; the total amount of soy needed to produce beef, pork and poultry

is shown in Table 4.9. However, if import countries were separated, this would likely look very different depending on the country of origin. As shown in Figure 4.7, the amount of soy available for animal feed is very different depending on the production country.

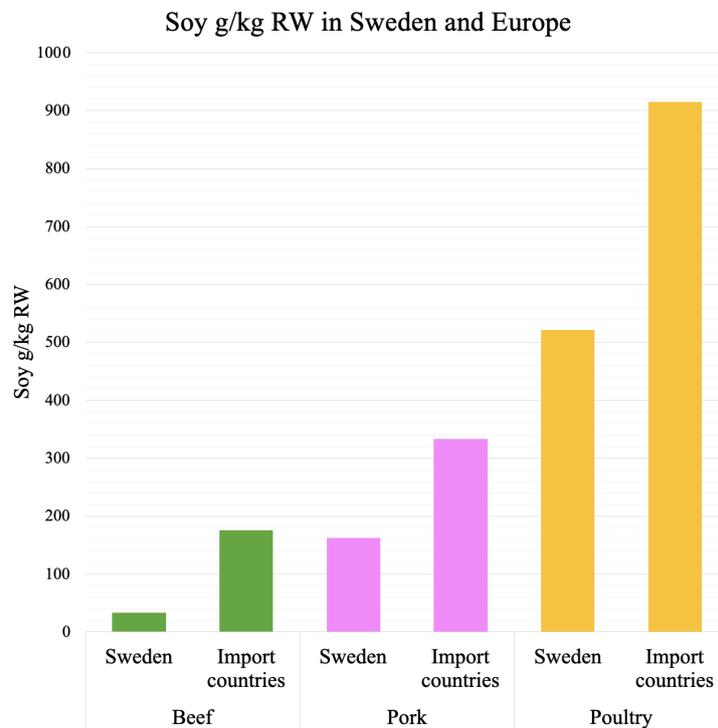


Figure 4.9: Soy use per kg RW of produced meat for Sweden and chosen import countries.

The differences in amount of soy used per kg meat are large between Sweden and the import countries, Sweden uses significantly less soy for all categories. For beef Sweden uses 33.1 g/kg RW , compared to 175.8 g/kg RW in import countries, for pork Sweden uses 162.2 g/kg RW compared to 333.0 g/kg RW , and finally for poultry Sweden uses on average 521.1 g/kg RW and import countries uses 915.3 g/kg RW .

Table 4.3 shows that imported beef and poultry contain more embedded soy than beef and poultry produced in Sweden, although Sweden produced more beef and poultry than it imports. For pork, more soy is used for Swedish production, however, more pork is also produced in Sweden than imported to Sweden.

All soy used in Sweden for meat production is certified, both FEFAC SSG compliant and deforestation-free. However, not all the soy used in the countries from which Sweden imports meat is certified, which, by extension, means that not all the embedded soy consumed in Sweden through meat is certified. Figure 4.10 shows both the percentage of embedded soy that is FEFAC SSG compliant and the percentage that is certified deforestation-free. Due to the fact that this study had to compile all import countries on a European average, this could have looked different if the soy distribution had been different.

In general, the amount of embedded soy consumed in Sweden through meat that

4. Results

Table 4.3: Amount of soy used in Swedish meat production and embedded soy in meat imports. RW = Retail Weight.

		Swedish	Import
Beef	Amount (1000 ton RW)	138.2	93.7
	Embedded soy (1000 ton)	4.6	16.5
	Share of total embedded soy	21.8%	78.2%
Pork	Amount (1000 ton RW)	212.5	77.7
	Embedded soy (1000 ton)	30.8	25.9
	Share of total embedded soy	54.3%	45.7%
Poultry	Amount (1000 ton RW)	134.3	104.0
	Embedded soy (1000 ton)	80.7	95.2
	Share of total embedded soy	45.9%	54.1%

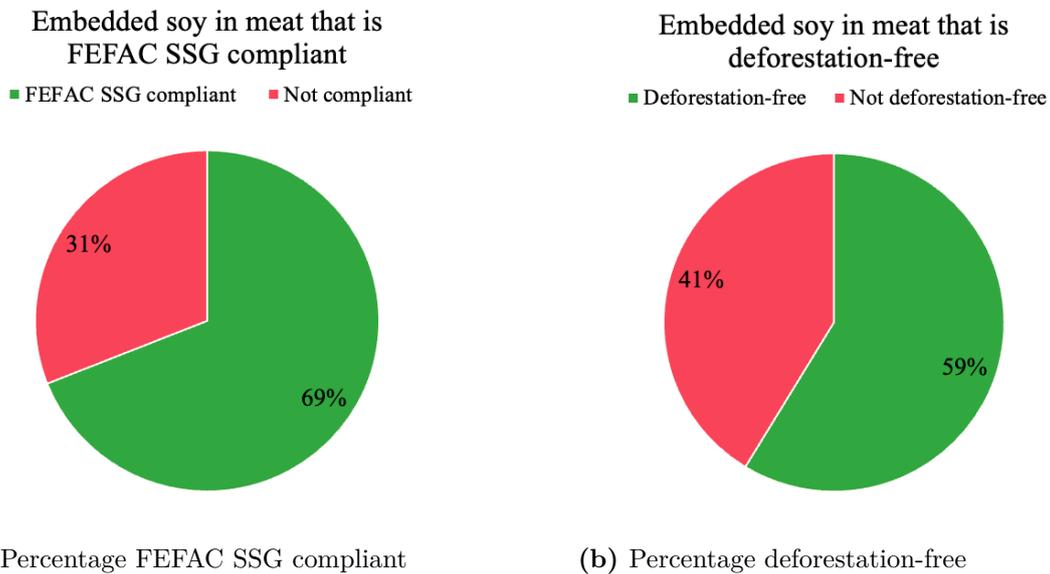


Figure 4.10: Percentage of embedded soy in meat consumed in Sweden that is FEFAC SSG compliant and deforestation-free.

is FEFAC SSG compliant is 69% and the amount that is deforestation free is 59%. This means that 31% of the embedded soy consumed in Sweden is not FEFAC SSG compliant and 41% is not deforestation-free.

4.3 Findings From the Interviews

Five interviews with relevant industry representatives were conducted: four working for food retailers and one EUDR expert. The four interviewees from the food retail side were asked questions in the following areas; What they think sustainable food is (with special consideration to meat), general information about their role and current sustainability work at the company they work for; What they know about the EUDR; Potential ways of decreasing the environmental aspects of meat production.

The questions were structured differently for the Preferred by Nature employee and only revolved around the EUDR. All questions can be found in the appendix B. The interviewees were the following:

- ICA store owner
- Sustainability innovator at Axfood
- Sustainability professional at Lidl Sverige
- Former head of sustainability at Coop
- Sustainability advisory and cattle commodity lead at Preferred by Nature

4.3.1 Food Retailer Employees

The interviewees were initially asked to explain their role in the company and their general view on what sustainable food is, with special consideration to meat. The owner of the ICA store stated that sustainability is a broad subject, could be about local or certified products, or the change of protein source, and it includes topics such as production methods as well. The sustainability professional from Lidl Sverige believed that food that had been produced, distributed, and consumed in a way that is good from an environmental, nutritional, and ethical perspective is sustainable.

The owner of the ICA store was of the opinion that every food retail owner has the option to choose what they sell, both when offering a different product and when considering the placement of products in the store. Some products do not have to be on the shelves, the ICA interviewee gave examples of products such as king prawns, imported meat, and red-listed fish. The sustainability innovator at Axfood was also of the opinion that food retailers have a great responsibility when it comes to affecting customers' choices, even though they cannot directly control what they select. To this end, the interviewee stated that product placement, pricing, campaigns, and information in store are ways that could be utilised to affect customers' choices, which falls in line with what the interviewee from ICA spoke of. The sustainability professional at Lidl Sverige expressed their concurring opinion that food retailers have some responsibility for taking care of the natural resources that exist, but also added that a part of the responsibility should be placed on customers to inform themselves and take responsibility for their choices when making purchases.

In addition, the interviewees were asked how their companies functioned. Answers that are supplementary to the information found during the literature review are presented below.

- For ICA retailers, ICA Sweden is their wholesaler, but retailers can also buy products from elsewhere and have great opportunities to make local adjustments to the assortment.
- For Axfood, a sustainability assessment is performed for all new suppliers to obtain the necessary documentation on, for example, certifications showing that legal requirements or more extensive requirements have been met.
- Lidl primarily offers private label products, with a few exceptions for items that are in high demand from customers. All Lidl stores in Sweden have the same

assortment, consisting of a permanent assortment and weekly promotional products that vary. In Sweden, Lidl is responsible for the procurement process involving Swedish suppliers, while, for instance, Lidl Italy manages suppliers from Italy. Most of Lidl's sustainability efforts are managed centrally from Germany.

- To operate as a Coop store, a certain Coop assortment is required to ensure that customers recognise the appearance and product range of the store. However, a certain percentage of the assortment may be supplied from wholesalers other than Coop. This allows the retailer to sell locally produced products, for instance.

Current Industry Wide Collaborations

During the literature review, two industry-wide collaboration initiatives for food retailers were found, the Swedish platform for risk commodities; see Section 3.4.3. and Hållbar Livsmedelskedja; see section 3.5.5. These initiatives were also discussed during the interviews.

The Swedish platform for risk commodities initiative, which all retailers and other food actors are part of, implies that they have certified soy direct and indirect in all products at the end of December this year. The interviewee from Axfood explained that they have started a dialogue with their retailers, beginning with the large suppliers with the largest volumes and demanding that they use certified soy. They also do follow-ups and look at how they should comply with this requirement going forward. The interviewee also expressed that it is likely that there will be quantities that are not possible to reach.

According to the interviewee from Axfood, there are uncertainties in what the consequences will be if the suppliers do not comply with the requirement, if they would have to exclude suppliers or compensate in some way. Earlier they have bought credits for volumes that were unclear whether the soy was certified or not, but this should not be allowed next year. However, there are discussions on whether credits should be possible to use anyway according to the interviewee from Axfood, and they think that this depends on what challenges the participating companies will face. The interviewee from Lidl said that since several large suppliers are part of the initiative, that facilitates the process and dialogue between them. The former sustainability professional at Coop saw the initiative as a good way to collaborate on a complex issue and to obtain important knowledge from the organiser of ETI Sweden.

Another initiative that came up during the literature review was Hållbar Livsmedelskedja. The former sustainability professional at Coop found it very positive that 15 of the largest food actors in Sweden had agreed on a common direction and roadmap in this initiative. Although the goals are strategic and do not include quantitative targets, all participating companies are using them as part of their operations. The initiative has also led to a more constructive discussion on these issues and to meetings between people who do not normally meet, such as CEOs and purchasers from

different food actors. The interviewee gave examples of two different collaborations that Coop had with Arla and Scan, respectively, that only came about because they were part of the initiative and needed to work together. Axfood recently left the Hållbar Livsmedelskedja initiative.

Interviewees Understanding of the EUDR

According to the interviewees, many things remain unclear when it comes to EUDR. Both Axfood and Coop interviewees said that the postponement of the regulation was greatly appreciated, as they were not adequately prepared for it last year. Axfood had still not finalised their preparations for the legislation.

At Axfood they have a working team working on the EUDR and they have also hired one person who will only work with the EUDR. For Lidl, most of the work with EUDR is taking place in their head office in Germany, and therefore the interviewee did not know about the details of it. What the interviewee knew was that they have started a supply chain mapping to see where more help will be needed. They also mentioned that there is a risk that small suppliers have less resources to make these adjustments.

Some big challenges that the interviewee from Axfood mentioned were that there are no supporting systems in place such as data systems to keep track of coordinates and other data connected to the purchases. This must occur automatically upon purchase. The interviewee who works for Axfood highlighted that food retailers will rely on information such as coordinates from their suppliers and other actors upstream in the supply chain. Certifications will also be able to provide information. Since there is a wide range of products covered by the legislation, the sustainability professional at Coop thought that some of them might be questioned as to whether they should be sold in the long term.

Potential Ways of Decreasing Environmental Impact From Meat

An overall challenge when restricting meat is that meat is a traffic builder, meaning it attracts customers to the store, and therefore is of great economic importance, according to the interviewees from Coop and Axfood. The interviewees were given examples of potential criteria and ways to decrease the environmental aspects associated with meat, and in some cases the interviewees themselves had examples that could work as well. These are here summarised into categories; Restricting meat by country; Nudging; Restrictions on campaigns; Information and dinner inspiration; certified and organic meat.

Restricting Meat by Country Based on the interviews, it is difficult for a food retailer to ban meat from certain countries, such as Brazil. The interviewee from Axfood meant that it would only be possible to prohibit selling meat from a certain country or continent if all large food retailers agreed on it and did it together. Several of the interviewees pointed out that the consequence of prohibiting meat from certain countries would be that the store could run out of popular cuts of meat

on holidays such as New Year when the demand is high. If only one food retailer would do this, they run the risk of losing customers to their competitors and miss out on revenue. Axfood approached this issue by having restrictions on how they promote South American meat in leaflets and in stores, which is an alternative way to do it.

The former sustainability professional at Coop agreed that restricting meat from certain countries would be challenging, since not all Brazilian meat is considered equally bad. However, to be able to offer the better alternatives, information about the production is required. If meat from certain countries were to be removed from the assortment, that would also require an explanation to retail owners of why they are not allowed to sell these products. If this type of meat is profitable and is demanded by consumers, the retail owners might get them from elsewhere since they are allowed to buy products from brands other than Coop.

At the store level, there were examples that show that it is possible to implement restrictions. In the ICA store operated by the interviewee, which had a strong environmental profile, the general policy was not to sell imported meat. However, exceptions were made for processed meat where the origin is difficult to determine and where individual products might contain meat from several countries. If ICA had promotions on imported meat, the store would typically try to substitute it with Swedish meat. If substitution was not possible, which could occur during holidays, they might still sell some imported meat. The owner also explained that there is a lack of Swedish meat right now and they chose to mostly not replace it with imported meat, which might lead to a smaller selection of meat products in their store.

Nudging and Other Proposed Methods Several interviewees mentioned strategies such as nudging as a more efficient way to help consumers make sustainable choices, rather than simply banning certain products. The interviewee from Axfood also mentioned alternatives such as placing products at eye level and placing vegetarian options right next to meat as ways to nudge consumers.

Reducing the size of meat packages was another proposed strategy to reduce meat consumption that emerged during the interviews. For example, Axfood had removed its 2 kg minced beef packages. The Coop interviewee also considered smaller package sizes an effective measure and suggested that Bra Miljöval could prohibit promotions on minced meat packages larger than 1.5 or 2 kg.

At Coop, their sustainability declaration, described in Section 3.5.2, could be used as a tool for consumers to give a clear view of the performance of a product according to different sustainability parameters. The interviewee mentioned that it clarified the poor performance of Brazilian meat, for example, compared to Swedish meat. The idea was that it could be used as a nudging tool, as customers could see sustainability parameters for their purchases. However, according to the interviewee, the tool was not used by customers to a large extent, as customers make fast decisions when shopping and act by habit in the store and do not put the time and effort into

scanning each product to verify the declaration.

Restriction on Campaigns Lidl's interviewee suggested using loyalty programmes and promotions to reach customers with certain products that are considered more sustainable. The interviewee from Axfood mentioned having a lower price for more sustainable meat products or fruits and vegetables, to encourage consumers to allocate a larger share of their spending toward these items rather than meat. The interviewee also said that they worked a lot with organic meat campaigns. According to the ICA store owner, they always promote an organic product of the week and a vegetarian product of the week in store for customers.

Regarding the practical possibilities of using promotions, for ICA, the campaigns occurring in the TV-commercial must be available in all ICA stores. However, since the interviewee's store is certified with both Bra Miljöval and Svanen, they can substitute campaigns that conflict with these certifications. The owner of the ICA store also explained that central campaigns that apply to all ICA stores in Sweden are planned well in advance; this could be about six months, due to the large volume of product involved. Other campaigns can be decided just a few days to a week in advance. The Lidl interviewee also stated that campaigns are planned well in advance. At Lidl, all stores in Sweden have the same assortment, and thus the same campaigns.

Information and Inspiration The former Coop employee highlighted that food retailers can play an important role in inspiring consumers through recipes, for example, by replacing animal protein with vegetarian protein, and moving away from always having meat as the main component of a dish. The interviewee's perception was that seafood, both animal and vegetarian seafood, such as algae, is up-and-coming, and here food retailers can inspire with dishes. Another aspect is to inform consumers about what the different types of meat products imply, for example, highlighting that Swedish beef from natural pastures contributes to biodiversity.

In Axfood's report Food 2030, one of the proposals was to inform consumers about whether meat comes from animals that have had access to outdoor grazing. The interviewee from Axfood had further looked at this and concluded that it is very difficult to implement as an individual food retailer, since all retailers buy their meat from all available slaughterhouses. Information about whether or not an animal has had access to outdoor grazing could be retained in the slaughterhouse, but demanding the slaughterhouse to keep this meat separate and label it would be very expensive. However, if all major food retailers were to demand it collectively, it could become feasible. A similar challenge applies to providing information on whether the beef comes from dairy or beef herds.

Certified and EU-Organic Meat Regarding certified and organic meat, Axfood has the goal of increasing the sales of meat certified by either KRAV or Svenskt Sigill to 5% by 2030. Under the initiative Hållbar Livsmedelskedja, which Lidl, Coop, and ICA are currently a part of, the goal is to increase the share of organic products,

plant-based food, and meat from natural pastures.

When discussing efforts to achieve the above-mentioned goals and increase sales of certified and organic meat, several challenges were highlighted. The sustainability professional at Axfood explained that they would like to sell meat certified with Svenskt Sigill natural pasture but current supply volumes are insufficient, so they need to wait for the production to scale up. Another challenge is the price. The threshold for buying organic beef instead of conventional beef is not that high, as the price difference is relatively small. However, for pork and especially poultry, the price difference is much greater due to the different production methods, and it is difficult for both customers to buy them as well as producers to produce them. The owner of the ICA store also highlighted that the main focus of customers right now is price, making it more difficult to direct attention to sustainability aspects when food shopping.

Sales of organic products have also been declining in the last few years. However, by having the targets mentioned above, that sends a signal to producers that there will be a demand for it, which might encourage a switch from conventional to organic production. The ICA retail owner also mentioned that ICA as a wholesaler has reduced their supply of organic products.

In Axfood's report Mat 2030, two of the proposals were to reduce the use of soy in feed and food and to develop more sustainability concepts than organic. The interviewee from Axfood also states that they work with different soy-free products, such as eggs. To do this, they contact a supplier for their own labelled products and ask if they want to collaborate. The former Head of Sustainability at Coop gave an example of a project that Coop had worked on together with Arla, where retired dairy cows were allowed to graze for three years before being slaughtered for meat of higher quality and an added value for the animals.

4.3.2 The Advisor on the EUDR

The following section presents the results obtained from the interview with the interviewee from Preferred by Nature. Preferred by Nature is a global non-profit organisation supporting sustainable land management and business practices for the benefit of climate, people, and nature, focusing on the agricultural, forestry, and travel sector (Preferred by Nature, n.d.-a). Preferred by Nature offers certification services for certification such as FSC. In addition, they have their own certification that they call the Sustainability Framework that is aligned with the requirements of the EUDR (Preferred by Nature, n.d.-b).

Key Challenges When Implementing the EUDR

The interview revolved mainly around the challenges associated with the EUDR implementation. One of the main challenges highlighted by the interviewee was the collection and transmission of information. The interviewee described that companies are trying to map their supply chains backward and contacting their suppliers

and sub-suppliers, a process that quickly gets messy. Another issue is if suppliers do not respond to requests for information. Throughout the supply chain, there is little harmonisation of solutions, which also remains a challenge.

Moving information about EUDR and what is required upstream in the supply chain is also a difficulty. The interviewee described how the organisation is receiving many inquiries for support from actors that are not operators under the regulation, but their customers are. These actors, sometimes based in the US, often have very little or no knowledge about the regulation.

With regard to soy, a great challenge is how the system should be able to go from mass balanced to segregated volumes of soy. Today, the majority of certified soy is mass balance, the interviewee thought that only 2% of the certified schemes under ProTerra are segregated. Volumes are also often aggregated into silos at an early stage, and moving to a segregated system would require a system change.

Another challenge mentioned by the interviewee was to determine whether soy used as cattle feed had not contributed to deforestation. The interviewee explained that the geolocation information for soy, which the cattle have been fed, will not need to be collected. However, you still have to perform due diligence and ensure that it has not contributed to deforestation, which means that you need to know where it originates from. Furthermore, attaching that piece of data to the meat and passing it down the supply chain is a challenge.

An obstacle that the interviewee sees when working with companies is the uncertainty in the level of effort required to ascertain, validate, and verify the information. It is very unclear how thoroughly companies have to assess the data. It is also a question of what level of risk companies are willing to accept. Because it is a new regulation, there is no precedent that could provide guidance on when fines or penalties were issued or not.

Challenges with the Due Diligence

The opinion of the interviewee was that many companies do not realise that EUDR is a due diligence regulation and not just a traceability regulation. They also try to get companies to see that the EUDR is an opportunity to implement a robust due diligence system and to be prepared for future due diligence regulations. There are several basic components of due diligence that are outlined in the EUDR. The interviewee explained that it varies whether companies are in the due diligence process and system, and they think it is a question of capacity and willingness to change. However, it also relies on upstream actors. Sub-suppliers can get stuck if those from which they rely on data are not collaborating or are willing to provide the information. Then companies might even have to find different suppliers. The willingness to collaborate also depends on whether the company sells a large share of their products to the EU or just a minor share; then it might not be worth it for them to invest in these customers.

The simplified due diligence that can be applied when products are produced in

a low-risk country was not seen by the interviewee as a significant relief since all information under Article 9 still has to be collected, which the interviewee considered as the most difficult part. Conducting a risk assessment or risk mitigation is not required; only assessing the risk of mixing and the risk of circumventing the regulation is needed.

In terms of risk classifications of countries, the interviewee did not know whether the risk classification of countries that will be published by the commission in June 2025 will only be generalised by country or divided into the risk for each commodity.

The Role of Certification Schemes

Regarding the role of certification schemes with the implementation of the EUDR, the interviewee believed that certification schemes will be even more valuable, especially verified third-party schemes, as long as they keep their standards up-to-date and relevant. The interviewee often recommends that companies seek certification, as these value chains are more set up for success even if they are not perfect. These schemes provide a strong mechanism for companies to ensure traceability, act as a risk mitigation tool, and since documentation and mechanisms of passing on information already exist, the EUDR could simply require additional documentation or data.

Additional Reflections

For the beef sector specifically, the implementation of the regulation will depend on the strength of the current traceability system. The interviewee gave examples of the fact that the US has a very poor traceability system for beef cattle, while Latin America has developed a robust traceability system. A key difference between cattle and other commodities under the regulation is longer production cycles. Reaching market weight typically takes at least two years. Cattle born before the regulation came into force are not covered by it. However, since the regulation became effective in June 2023, there is uncertainty regarding how cattle will comply if data have not been collected during this intervening period.

Reflecting on the regulation, the interviewee stated that it is realistic that all the information needed for traceability will not be complete by the end of the year and that it is not clear whether it will lead to penalisation of companies or not. What the interviewee thinks and what they tell their clients is that, hopefully, it will be enough to have a due diligence system in place, to have found their suppliers and done everything within their power to obtain requested information.

5

Discussion

This section discusses both the results presented in Section 4 and the insights derived from the literature review in Section 3. The current understanding of the environmental aspects of meat production in relation to Swedish meat consumption is examined. Implications of the implementation of the EU Deforestation Regulation for food retailers are discussed in relation to both soy and meat consumption in Sweden, and the significance of the results of the current share of deforestation-free meat is also considered. Based on the findings on what food retailers may be willing and able to do to potentially change their practices involving meat sales, possible new criteria for meat sales from Bra Miljöval are discussed.

5.1 Environmental Impacts of Meat Production and Their Relevance to Swedish Consumption

In studies evaluating environmental aspects associated with food production, climate change is over-represented, as seen in Section 4.1. Climate change was included in four review studies, one global assessment of GHG emissions, and one life cycle assessment of GHG emissions. Some differences in estimated emissions could be seen between the studies, but the general trend was that beef emits more than pork followed by poultry, which is visualised in Figure 4.1. All other aspects ranged from zero to two inclusions in the considered reports. No review articles were found that evaluated biodiversity, which confirms the observations made by Ran et al. (2024) and Landquist et al. (2016) who stated that biodiversity is an indicator rarely included in environmental assessments. Water scarcity, eutrophication potential, and freshwater ecotoxicity were mentioned in one article each, and freshwater withdrawal and land use were mentioned in two each. The results show, as Ran et al. (2024) also concluded in their report, that some environmental aspects are more prevalent than others in the environmental assessments of diets. Although Ran et al. (2024) recommend the use of impact indicators, some pressure indicators were included in the absence of alternatives.

Including other environmental aspects in addition to greenhouse gas emissions is important to provide a more comprehensive assessment of environmental impacts, and it could change the current view on meat production. According to our findings,

beef has a higher impact per kg of retail weight on greenhouse gas emissions (GHG). When it comes to freshwater withdrawal and water scarcity, beef has higher averages and ranges, but since there are so few articles and these aspects are locally dependent, it is unclear whether this is actually the case, especially since water scarcity is highly dependent on the location of production. The difference in eutrophication potential is rather small, and the same applies to land use depending on the type of cattle production. Only one study covered freshwater ecotoxicity, in this pork had the highest impact followed by poultry and then beef. The cited article points to the problem with pesticides used in soy production, which may be a reason for the higher impact of freshwater ecotoxicity for both pork and poultry, since more soy is included in their feed. It should also be noted that the study on freshwater ecotoxicity was limited to Sweden.

In Europe, certain types of cattle raising, such as natural pasture grazing, are beneficial to biodiversity. In Sweden, natural pasture grazing has decreased in recent decades. The reduction of land used for natural pasture grazing has led to the loss of this type of biodiverse areas (Harwatt et al., 2024). Altering people's diets to include less beef and more pork and poultry can lead to a further breakdown of natural pasture systems, as well as increased competition between animal feed and human food, and increased use of pesticides that would be detrimental to local ecosystems (Konsumentverket, 2019).

Most food retailers have discussed their willingness to sell more natural pasture meat, but due to availability issues they cannot do so. Increasing the use of natural pasture for grazing in Sweden appears to be a promising strategy to increase biodiversity that is consistent with the objectives of the EUDR (European Commission, 2025). It is not considered converted to agricultural use if the purpose is to protect biodiversity. However, the Guidance Document for the Regulation by European Commission (2025) also clearly states that cattle grazing is considered agriculture and that all deforestation due to agriculture is prohibited. Although an expansion of natural pasture grazing in Sweden may positively affect biodiversity, it may be prohibited by the EU Deforestation Regulation. Another regulation that entered into force in August 2024 is the EU Nature Restoration Regulation, which requires that Member States restore degraded ecosystems, habitats, and species to increase biodiversity (European Commission, 2024a). For agricultural land, this regulation requires the restoration of seminatural grasslands by reintroducing grazing livestock and preventing overgrowth by clearing trees and shrubs (Naturskyddsföreningen, n.d.-b). When the expansion of natural pasture grazing on previously tree-covered land is carried out to meet the targets set by the Nature Restoration Regulation, these areas are exempted from the requirements of the EUDR according to Jordbruksverket (2025).

The Swedish population consumes, on average, large amounts of meat, as mentioned in Section 1.1.3, with up to 511 g of red meat per week and person, and approximately 150 g of white meat per week and person. Reducing meat consumption would result in a lower environmental impact and would also be in line with the recommendations of the Nordic Nutrition Recommendations 2023, authored by Blomhoff

et al. (2023), and Livsmedelsverket (2025) of 350 g of red meat a week, instead of the current recommendation of World Health Organisation (2023) of 500 g. However, if the shift would only be from beef or pork to poultry, this could have other detrimental effects. The recommendation of Blomhoff et al. (2023) is instead to switch from animal protein to vegetarian protein. A shift away from the consumption of mainly red meat would not only be beneficial from an environmental point of view but also from a health perspective which is briefly mentioned in Section 1.1.3, the health aspect is also considered in the recommendations by Blomhoff et al. (2023) and Livsmedelsverket (2025).

The result presented on the environmental aspects of meat production is very general, as the studies and data included are mainly global; it says something about Swedish consumption, but less about Swedish production. The key takeaway should be that consumption of meat, beef, pork, and poultry is coupled with significant environmental impacts. It is clear that some aspects, such as GHG emissions, are evaluated to a greater extent compared to others, such as biodiversity. Future work would benefit from including a wider range of impact indicators, as well as pressure indicators (Ran et al., 2024).

5.2 Deforestation-Free Meat Consumption in Sweden

Although all the soy used in Sweden is FEFAC SSG compliant and deforestation-free, the same does not apply to all the embedded soy used in Sweden, see Figure 4.10. According to our estimation, 59% of the embedded soy is deforestation-free and 69% is FEFAC SSG compliant. Since certified soy is currently common to buy through mass balance schemes and credits in Sweden and Europe, which will not be accepted under the EUDR (see Section 3.6.4), the implementation of the EUDR is likely to impact the production of meat that is later consumed in Sweden. The results shown in Figure 4.10 indicate that the current share of deforestation-free meat is insufficient to meet the compliance requirements of the upcoming EUDR.

However, all major food retailers are currently part of Svenska Plattformen för Riskgrödor, and are thus already required to ensure that direct or indirect use of soy is certified, both for their own-brand products and for other products for which they have a producer responsibility. This means that the meat sold in Swedish food retailers today can have a higher share of meat that has been fed with deforestation-free soy than the result implies. Since imported meat is over-represented in the restaurant sector, this can also indicate a higher percentage than the results reveal. There are lingering questions about products that are not own-brand, as no food retailers specified whether the soy used in these products is currently certified as deforestation-free or whether they have other requirements regarding meat, comparable to those for their own-brand meat.

Some simplifications were made since a European average based on the study by Kuepper and Stravens (2022) was used to estimate the shares of soy allocated to

different livestock in import countries. This gives a less accurate estimate than if data had been available for all countries. However, the results in Figure 4.9 show that a much smaller amount of soy is used in Sweden for all animals, compared to the import countries. In Section 3.4 the European averages for soy use according to Kuepper and Stravens (2022) are presented. Figure 5.1 presents a comparison between the embedded soy in import countries, as calculated in this thesis, and the embedded soy values for Europe estimated by Kuepper and Stravens (2022) for WWF.

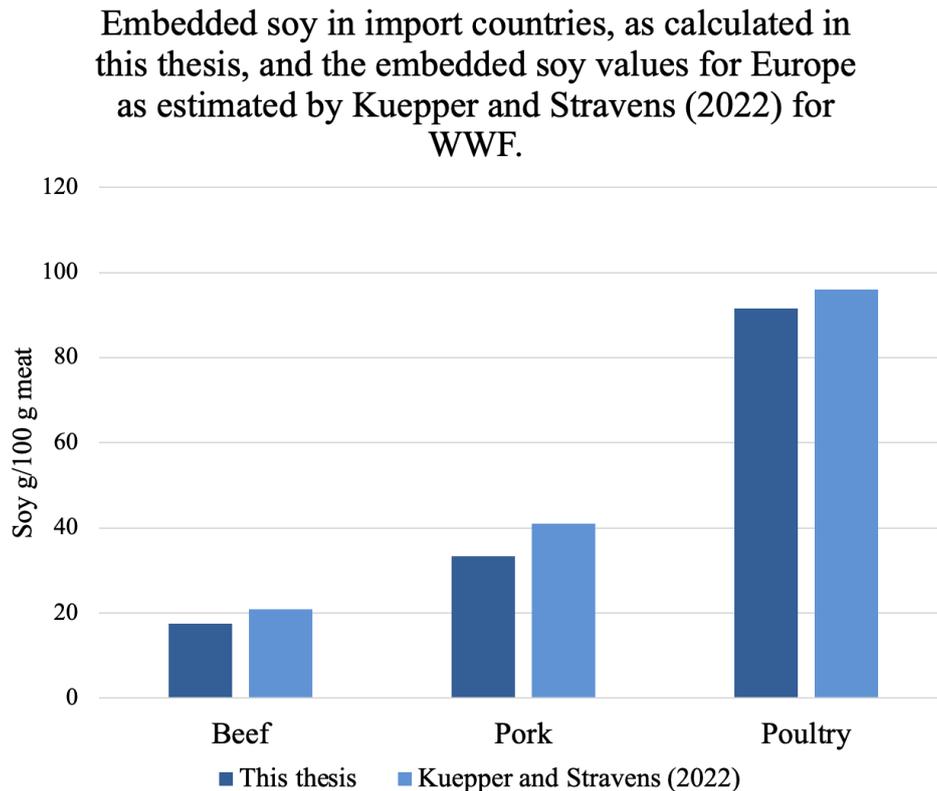


Figure 5.1: Embedded soy in import countries, as calculated in this thesis, and the embedded soy values for Europe as estimated by Kuepper and Stravens (2022) for WWF.

Figure 5.1 shows that on average 21 g of soy are used for 100 g of beef, 41 g for 100 g of pork, and 96 g of soy are used to produce 100 g of poultry. When comparing these numbers with the ones estimated in this thesis, representing 17.6 g per 100 g of beef, 33.3 g per 100 g of pork, and 91.5 g for 100 g of poultry, there are some differences for all types of meat, however, they are all rather small, which would indicate that the calculations are not too far off. Our estimate is slightly lower than that presented by Kuepper and Stravens (2022), who suggests that at least 17.6 g, 33.3 g, and 91.5 g of soy are used in the production of beef, pork, and poultry, respectively, in Europe. According to our estimates, Swedish meat production uses less soy, which is a reason to favour Swedish meat over imported meat, considering that soy contributes to deforestation and freshwater ecotoxicity. It would be very interesting to expand the soy distribution section to include country-specific data on soy distribution. Reviewing the risk classification of countries in relation to the

country-specific distribution of soy could be of interest for future studies.

Since the risk classifications for countries have not yet been published by the European Commission, this information cannot be used to evaluate the risk of deforestation and forest degradation from imported cattle meat in import countries. Since risk classification also determines whether simplified due diligence could be performed, it is also currently unclear whether the three steps, information requirement, risk assessment, and risk mitigation, will have to be performed for import countries.

In general, beef consumption in Sweden is unlikely to contribute significantly to global deforestation, since 0.4% of the deforestation caused by pasture expansion for cattle occurs in Europe. Consequently, the levels of deforestation are low in most of the import countries of Sweden. However, there is an exception: In South America, 82% of the global deforestation caused by pasture expansion occurs. As shown in Table 1.1, Sweden imports some beef from Brazil, and it is likely that a portion of this reaches the retail sector, particularly during the holiday seasons when there is increased demand for popular cuts of meat.

The investigation that Statens offentliga utredningar (Swedish Government Official Reports) conducted agrees with the above statement, they found that there is no systematic deforestation occurring when it comes to cattle meat production in Sweden. However, about 2000 ha are converted from forest to pasture every year. At the same time, the reverse conversion, from agricultural land to forest, is even greater. The same trend can be seen in the rest of Europe. The loss of biodiverse natural pastures has been discussed in the thesis, and Sweden would probably benefit from increasing the amount of natural pasture for grazing in terms of increasing biodiversity, which also is in line with the Nature Restoration Regulation mentioned previously.

5.3 Possible Ways for Bra Miljöval to Drive Positive Change

All retailers interviewed have the goal of increasing the sales of meat from natural pastures and the sales of organic products, which means that it could be appropriate for Bra Miljöval to have criteria supporting this development. At the same time, there are some challenges related to an increase in the sales of these products. Regarding meat from natural pastures, both the interviewee from Axfood and ICA mentioned that there is a lack of supply for this kind of meat. In addition, sales of organic products, as well as Swedish organic production, have been decreasing in recent years. In addition, the price difference between organic and conventional meat appears to be an obstacle, at least for pork and poultry. Currently, Bra Miljöval has some requirements on the assortment of organic meat products, which guarantee a certain supply, and they also require that the stores should increase their sales of organic products in general and have an action plan on how this should be achieved. However, no licence takers have achieved this and the criterion

has therefore been compensated with other measures. According to the results of the interviews, measures that could be effective in increasing sales of organic meat products are nudging, promotions, and information that highlights the advantages of organic meat. The criteria for food retailers could for instance be having a certain frequency on promotions or information campaigns or having guidelines on how organic meat should be placed in the store. The same strategies could be applied for meat from natural pasture.

When interviewees were asked about the type of information that can be obtained with respect to meat products, the intention was to explore whether Bra Miljöval could require retailers to provide more detailed information on production methods. However, this seems to be difficult according to the interviewee from Axfood since it would be very expensive to retain information throughout the supply chain and label products with information such as whether cattle have had access to outdoor grazing, and this would only be possible if it were a requirement from all Swedish food retailers. According to our study on the environmental aspects of meat production, the environmental performance of beef from dairy herds often differs from that of beef herds. However, specifying which type of herd the meat originates from would be just as difficult as providing information on access to grazing.

One criterion that could be in line with EUDR compliance is to ban the sale of meat originating from South America, where most deforestation occurs due to pasture expansion. However, according to our findings, this appears to be difficult for a single retailer to enforce at the national level due to economic disadvantages and supply shortage, but could be more feasible for an individual ICA store to adopt, at least for an ICA store with a strong environmental profile. Still, it might be less feasible for stores with a different focus or customer base, as prohibition could come with the cost of a smaller supply of meat products and empty shelves. A more achievable alternative to completely prohibiting meat from certain parts of the world could be to limit meat promotions in stores or brochures.

To reduce meat consumption, meat packages larger than a certain weight could be banned or the promotions of these products could be restricted. One of Bra Miljöval's current criteria is setting a sales increase target for vegetarian proteins for each year, and at least once a month, the store should highlight a vegetarian protein in advertising, tasting, or digital promotions. This is in line with the target from Hållbar Livsmedelskedja about increasing the sale of plant-based food and Lidl's target of increasing plant-based proteins.

To improve the credibility of the findings, it would have been valuable to conduct interviews with a larger number of representatives from the food retail industry, but recruiting interviewees proved to be a challenge. In particular, speaking with purchasers would have provided important insights into the meat procurement process. A sustainability representative from ICA, the largest food retailer in Sweden, would also have been valuable to include. People from these positions and fields were contacted, but they either did not respond, did not have the time, or were unable to answer questions.

5.4 The Implementation of the EUDR

As evidenced by the interviews, many things remain unclear with six months left to the implementation of the regulation. For the major food retailers in Sweden, they will be obliged to conduct due diligence and what appears to be clear is that food retailers will be dependent on information from their suppliers to be able to comply with the regulation. Concerning cattle, the implementation might depend on the current traceability system, which is well developed in Europe but might not be on other continents. Since all cattle born after the regulation entered into force, in June 2023, are covered by the regulation, it is unclear how the information about, for instance, establishments where cattle have been brought up will be derived, since no information collection has been done.

Since this is a regulation that is not yet applicable, interpretations are still changing. Due to time constraints, only a brief overview of the updated guidance document, published in mid-April, was performed. The main findings were that clarifications have been made in some areas, but in general these seem to confirm the interpretations made during the literature review of this thesis, so no updated changes have been made.

As expressed in the regulation and in the interview with the interviewee from Preferred by Nature, third-party certifications will most likely play an important role in supporting compliance with the EUDR. This indicates that even if certification does not equal compliance with the EUDR, these systems have a head start and are more set up for success than non-certified systems. However, a major difference is that a lot of certified soy is currently mass balanced, and in some cases bought through credits, which will not be allowed under the EUDR.

Considering the current soy system, being able to access and confirm that all relevant geolocation information is correct and that no deforestation has occurred in the plots of land included in each batch may prove to be a challenge. To ensure that the soy fed to cattle has not caused deforestation, geolocation information is not necessary, but there is still a requirement to prove this, and how this should be done remains unclear.

This study has mapped the use of soy in the production of pork, poultry, and beef. However, it is important to note that the requirement to ensure that soy is deforestation-free under the EUDR only applies to cattle feed. Pork and poultry are not considered relevant commodities under the regulation, it is sufficient that soy has been verified as deforestation-free when entering the European market, either as soybeans, soybean meal, or as a finished feed product containing soy. As shown in Figure 4.9, the production of pork and poultry requires larger amounts of soy compared to beef, and European cattle production is generally not associated with deforestation. Despite this, pork and poultry are not directly covered by the regulation. This raises the question of why traceability is required for cattle, but not for pork and poultry. This discrepancy may be due to the fact that the regulation targets only commodities directly related to deforestation. Indirect drivers, such as

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pork and poultry production dependent on soy feed, are not included, while cattle, especially in South America, can be directly associated with deforestation through pasture expansion.

6

Conclusion

The frequency with which environmental aspects related to meat production are assessed in studies varies. In the results of this study, greenhouse gas emissions dominated while biodiversity was not included due to the lack of studies. For the environmental aspects assessed in this thesis, beef had a higher impact than pork and poultry per kg of meat for all aspects, with the exception of freshwater ecotoxicity. This result represents a general view of a global average of environmental impacts.

The prevalence of deforestation driven by pasture expansion for cattle meat is generally low in Europe and consequently in the majority of countries from which meat is imported to Sweden. However, the same cannot be said about meat from South America, which may mean that meat imported from there could be affected by the implementation of the EUDR. The soy used in Swedish meat production is certified and therefore deforestation free, but in other countries in Europe, the share of certified soy used for livestock production varies greatly. According to our estimates, 59% of the embedded soy in meat consumed in Sweden is deforestation-free and 69% is FEFAC SSG compliant. However, most certified soy is mass balanced today or is covered by credits, which will not be permitted under the EUDR because that does not involve traceability. Still, certification schemes could be essential to comply with the EUDR, and therefore this could be seen as an indicator of the share that will have a smoother path to compliance. Industry initiatives like the Swedish Platform on Risk Commodities encourage the use of certification schemes for soy, and since at least some soy is required to be certified today, the percentage presented could be higher for meat sold in Swedish food retailers. However, it is still unclear whether soy is bought through a mass balance or is covered by credits today.

According to interviews with food retailers representatives, possible strategies suggested to achieve more sustainable meat consumption could be to inform consumers about the advantages of organic or certified meat, to use nudging or promotions, to ban meat promotions from certain countries, or to ban large packages of meat to reduce consumption. More radical adjustments such as banning meat from certain countries or requiring detailed information about production methods need to be done collectively by the industry, and this is therefore difficult to do under Bra Miljöval.

With six months remaining until the implementation of the EU deforestation reg-

6. Conclusion

ulation, many things remain uncertain when it comes to how requirements should be met and what may happen if companies cannot provide the requested information. Uncertainties include how thoroughly information needs to be assessed and how information about cattle born between the enforcement and application of the regulation should be handled. Key challenges concern the collection and transmission of information and how segregation of soy should be achieved in supply chains that are still based on mass balance.

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A

Appendix A

A summary of all articles used in the analysis of the current situation regarding the environmental aspects of meat production is presented in Table A.1. It includes a reference for the article, the environmental aspects included, what type of study it is, crucial parts that the study includes or excludes, system boundaries (when stated), number of studies included, and where the data originates. The abbreviation GWP is used in the table, which stands for Global Warming Power.

Table A.1: Review of literature

Article	Environmental aspects included	Type of study	Crucial parts it includes or excludes	System boundaries	Number of studies included	Origin of data
Clune et al. (2017)	Carbon footprint	Review study of LCAs		Cradle to regional distribution centre. The system boundaries varied for different LCAs. For studies with a system boundary finishing at farm gate, a transport and packaging median figure was added.	Beef: 49 studies, 165 GWP values. Pork: 38 studies, 130 GWP values. Poultry: 29 studies, 95 GWP values.	Origin and number of data points from the whole study (including other kinds of foods): Europe 930 studies, dominated by Spain, France, Sweden, and Netherlands. British isles 245 studies, North America 167 studies, Oceania 143 studies, Asia 77 studies, South America 74 studies and Africa 23 studies.
Pishgar-Komleh and Beldman (2022)	Carbon footprint	Review study of LCAs	Land use change out of the scope	Cradle to farm gate, which the majority of the studies included. Studies covering post farm activities were adopted to farm gate.	Beef: 21 LCA studies in total.	Switzerland, Sweden, Western/Eastern Europe, Norway, UK, Ireland, France, Denmark, Italy and Portugal.

Gerber (2013)	Carbon footprint	Uses GLEAM which is a GIS framework, life cycle assessment approach simulating the bio-physical processes and activities along livestock supply chains.	Includes feed production, non feed production, livestock production, and post farm gate.	Cradle to retail	Data derived from databases, literature, expert opinion, public and commercially available LCA inventory packages such as Ecoinvent	Global
Weiss and Leip (2012)	Carbon footprint	Uses a database and simulation model for the agriculture sector called CAPRI model. The database is derived from different sources such as national statistics on land use, crop production, herd sizes and slaughtering.	Includes emissions on the farm and emissions related to the production of inputs. Land use and land use change (LULUC) is included. Does not include emissions from transport, processing, packaging, retail, consumption, and waste.	Cradle to farm fate, including slaughtering.		EU27 countries

Nijdam et al. (2012)	Carbon footprint and land use	Review study of LCAs		Cradle to retail. Most LCAs included cradle to farm gate and the following assumptions were made to cover the retail portion: emissions of $0.2kg CO_2/kg meat$ for slaughterhouse and $0.1kg CO_2/kg meat$ for the transport of meat	Beef: 15 studies, pork: 8 studies, poultry: 4 studies.	Germany, Sweden, Denmark, UK, Netherlands, UK, Ireland, Canada, Finland, Brazil, Australia, Wales, Argentina, France
Mekonnen and Hoekstra (2012)	Blue water use	Water footprint assessment				Global
Nordborg et al. (2017)	Freshwater toxicity	LCA study		Primary production	No review study	Soy from Brazil, remaining crops from Västra Götaland in Sweden

Poore and Nemecek (2018)	Carbon footprint, use, trophication, freshwater withdrawal and water Scarcity	Review study of LCAs	Includes land change (LUC), food processing, transportation (farm to retail), packaging use	Cradle to retail	Beef: and land use: 36 beef herd, 15 dairy herd, eutrophication: 9 beef herd, 8 dairy herd, freshwater withdrawal: 25 beef herd, 7 dairy herd, water scarcity: 21 beef herd, 5 dairy herd. Pork: GHG and land use: 33, eutrophication: 25, freshwater withdrawal: 26, water scarcity: 24. Poultry: GHG and land use: 33, eutrophication: 25, freshwater withdrawal: 26, water scarcity: 24.	Beef herd: Australia, France, Brazil, Chile, Denmark, Indonesia, Ireland, Sweden, Switzerland, UK, US, Uruguay. Dairy herd: Canada, China, Denmark, France, Germany, Netherlands, Norway, Romania, Sweden, Switzerland, UK. Pork: Australia, Brazil, Canada, Cuba, Denmark, France, Germany, Italy, Mexico, Netherlands, Portugal, Spain, Sweden, Switzerland, UK, US, Vietnam. Poultry: Australia, Brazil, Canada, Finland, France, Malaysia, Netherlands, Norway, Russia, Sweden, Switzerland, UK, Vietnam
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B

Appendix B

Here, the interview questions are printed in their entirety together with interviewee and date of interview. The questions will be presented in both Swedish and English for transparency, since the first four interviews were conducted entirely in Swedish. The fifth and last interview was conducted in English, so these questions will be presented in English only. The interview questions were translated into English using OpenAi's language model ChatGPT and then manually reviewed for accuracy. The questions are first written in Swedish, with translations in italics in parentheses.

First interview, ICA grocery store owner, 24 March 2025

1. Kort, vad skulle du säga är hållbar mat och hur stort ansvar tycker du att en handlare har för att påverka kunderna till att välja mer hållbara varor? *(Briefly, what would you say sustainable food is, and how much responsibility do you think grocery retailers has in influencing customers to choose more sustainable products?)*
2. Hur stor frihet har ni att välja ert sortiment? I vilken grad är kampanjer och inköp centralt bestämt? *(How much freedom do you have to select your product assortment? To what extent are campaigns and purchasing decisions centrally determined?)*
3. Vilken information kan ni få om kött som köps in? *(What information can you access about the meat that is purchased?)*
4. Vad har ICA för krav på köttprodukter och har er butik mer specifika krav/interna policys när det gäller kött än Ica generellt? *(What requirements does ICA have for meat products, and does your store have more specific requirements or internal policies compared to ICA in general?)*
5. Avskogningsförordningen, vet du vad det är? Om du har koll på den, har du någon uppfattning om hur den kan komma att påverka er försäljning av köttprodukter? *(Are you familiar with the EU Deforestation Regulation? If so, do you have any thoughts on how it might affect your sales of meat products?)*
6. Vad tror du skulle kunna vara effektiva tillvägagångssätt eller krav för dagligvaruhandeln för att sälja mer hållbara köttvaror, som också skulle kunna vara möjliga att implementera? *(What do you think could be effective approaches or requirements for the grocery sector to promote the sale of more sustainable meat products, while still being feasible to implement?)*
7. Vilken typ av krav, hårda eller mjuka skulle du säga fungerar bäst i praktiken?

Hårda krav som minst ett antal varor som är ekologiskt märka eller ett antal procent av varor som erbjuds ska vara ekologisk. (What type of requirements (e.g., a minimum number of products with organic certification or a specific percentage of the assortment being organic) or softer guidelines?)

Second interview, sustainability innovator at Axfood, 3 April 2025

1. Kort, vad innebär din roll som hållbarhetsinnovatör på Axfood? Hur stort ansvar tycker du att dagligvaruhandeln har för att påverka kunder att välja mer hållbart i köttdisken? (*Briefly, what does your role as a sustainability innovator at Axfood entail? How much responsibility do you think the grocery retail sector has in influencing customers to make more sustainable choices when buying meat?*)
2. Vad har ni för policies/krav på det kött ni tar in? Finns det krav som gäller för hela Axfood eller varierar det mellan de olika kedjorna? Vi har t.ex. läst att Hemköp inte säljer gödkalv och gåslever vilket vi inte sett att någon annan uppgett. (*What policies or requirements do you have for the meat you source? Are there requirements that apply across all of Axfood, or do they vary between the different retail chains? We have, for example, read that Hemköp does not sell veal or foie gras, which we haven't seen other chains mention.*)
 - (a) Vad har ni för strategier för att öka andelen KRAV eller Svenskt Sigill-certifierat kött till 5% år 2030? (*What strategies do you have in place to increase the share of KRAV- or Svenskt Sigill-certified meat to 5% by 2030?*)
3. Om du har koll på avskogningsförordningen: (*If you are familiar with the EU Deforestation Regulation:*)
 - (a) Hur arbetar ni med att säkerställa att era produkter (speciellt kött) kommer leva upp till avskogningsförordningen och vad ser ni för utmaningar? Hur mycket ansvar kommer ligga på Axfood? (*How are you working to ensure that your products (especially meat) comply with the EU Deforestation Regulation, and what challenges do you foresee? How much of this responsibility will fall on Axfood?*)
 - (b) Vi har sett att Axfood är medlemmar i Svenska plattformen för riskgrödor och därmed ska ha endast certifierad soja direkt och indirekt i era produkter senast 31 december i år. Hur arbetar ni för att nå dit? (*We have seen that Axfood is a member of the Swedish Platform for Risk Crops and therefore aims to ensure that all soy, used directly and indirectly, is certified by December 31 this year. How are you working toward that goal?*)
4. I Mat 2030 har Axfood gett förslag på följande, hur ser ni på möjligheterna att kunna genomföra detta? Hur stort ansvar eller möjlighet har ni på Axfood att påverka att det kan genomföras? (*In Mat 2030, Axfood has proposed the following actions. What are your thoughts on the feasibility of these? How much responsibility and possibility do you have at Axfood to influence that it can be implemented?*)
 - (a) Utveckla animaliska produkter utan sojabaserat foder, (*Develop animal-based products that do not rely on soy-based feed,*)

- (b) Informera konsumenter om köttprodukter kommer från djur som har haft tillgång till bete utomhus, (*Inform consumers when meat products come from animals that have had access to outdoor pasture,*)
 - (c) Utveckla fler hållbarhetskoncept än ekologiskt, t.ex sojafritt. (*Develop more sustainability labels beyond organic, e.g., soy-free.*)
5. Vad tror du skulle kunna vara effektiva krav eller tillvägagångssätt för livsmedelsbutiker för att minska miljöpåverkan från kött, som också hade varit genomförbart? Exempel: ha större utbud av vegetariska alternativ och ekologiskt eller certifierat kött och marknadsföra dessa genom exempelvis kampanjer, utesluta kött från vissa länder eller produktionsmetoder etc. (*What do you think could be effective requirements or approaches for grocery retailers to reduce the environmental impact of meat, while also being feasible to implement? For example: offering a wider selection of vegetarian or certified meat products and promoting them through campaigns, excluding meat from certain countries or production systems, etc.*)

Third interview, sustainability professional at Lidl, 3 April 2025

1. Kort, vad skulle du säga är hållbar mat och hur stort ansvar tycker du att livsmedelsbutiker har för att påverka kunderna till att välja mer hållbara varor? (*Briefly, what would you say sustainable food is, and how much responsibility do you think grocery retailers have in influencing customers to choose more sustainable products?*)
2. Vad innebär din roll inom hållbarhet på Lidl Sverige? Arbetar du mer butiksspecifikt (exemplvis hur minskning av elförbrukning i butik ska genomföras) eller handlar den mer om det övergripande hållbarhetsarbetet för hela Lidl Sverige? (*What does your role in sustainability at Lidl Sweden entail? Do you work more with store-specific issues (e.g., how to reduce electricity consumption in stores), or is your focus more on overarching sustainability efforts for Lidl Sweden as a whole?*)
3. Hur centraliserat är Lidl på Sverige nivå och internationell nivå, när det gäller sortiment och kampanjer? (*How centralized is Lidl at the national level in Sweden and internationally, in terms of product assortment and campaigns?*)
4. Hur arbetar ni med hållbarhet vad gäller protein och kött (mål för försäljning av till exempel certifierat, svenskt, importerat etc.)? Vad har ni för policies vid inköp eller krav som ni följer och ställer? (*How do you work with sustainability in terms of protein and meat? For example, goals related to sales of certified, Swedish, or imported meat? What purchasing policies or requirements do you follow or set?*)
5. Om du har koll på avskogningsförordningen (EUDR): (*If you are familiar with the EU Deforestation Regulation:*)
 - (a) Hur arbetar ni med att säkerställa att era produkter (speciellt kött) kommer leva upp till avskogningsförordningen? (*How are you working to ensure that your products, especially meat, will comply with the EU Deforestation Regulation*)
 - (b) Vad ser ni för utmaningar? (*what challenges do you foresee?*)
6. Enligt avskogningsförordningen ska man säkerställa att soja i foder som ges

till nötkreatur är avskogningsfritt. Vi har sett att Lidl Sverige är medlemmar i Svenska plattformen för riskgrödor och därmed ska ha endast certifierad soja direkt och indirekt i era produkter senast 31 december i år. (*According to the regulation, it must be ensured that soy used in cattle feed is deforestation-free. We have seen that Lidl Sweden is a member of the Swedish Platform for Risk Crops and therefore aims to ensure that all soy, both direct and indirect, is certified by December 31 this year.*)

- (a) Hur arbetar ni för att nå dit? (*How are you working to achieve this goal?*)
7. Vad tror du skulle kunna vara effektiva tillvägagångssätt eller krav för dagligvaruhandeln för att sälja mer hållbara köttvaror, som också skulle kunna vara praktiskt möjliga för er att implementera? Exempel: ha större utbud av vegetariska alternativ och ekologiskt och annat certifierad kött och marknadsföra dessa genom exempelvis kampanjer, utesluta kött från vissa länder eller produktionsmetoder. (*What do you think could be effective approaches or requirements for the grocery retail sector to promote the sale of more sustainable meat products, while also being practically feasible to implement? For example: offering a wider range of vegetarian options and certified organic meat, promoting these through campaigns, excluding meat from certain countries or production systems, etc.*)

Fourth interview, former head of sustainability at Coop, 28 April 2025

1. Kort, vad innebar din roll som hållbarhetschef på Coop och vad gör du idag? (*Briefly, what did your role as Head of Sustainability at Coop involve, and what are you doing today?*)
2. Vad tror du kan vara effektiva krav eller tillvägagångssätt för livsmedelsbutiker att minska de negativa miljöeffekterna associerade med kött, som också hade varit genomförbart? (*What do you think could be effective requirements or approaches for grocery retailers to reduce the negative environmental aspects associated with meat, while still being feasible to implement?*)
 - (a) Vilka möjligheter har dagligvaruhandeln att påverka konsumenter? (*What opportunities do retailers have to influence consumers?*)
 - (b) Hur jobbade Coop med detta när du arbetade där och vad ser du att man kunde gjort mer? (*How did Coop work with this while you were there, and what more could have been done?*)
3. När du arbetade på Coop, fanns det regler inom företaget för kampanjer kring kött? Om inte, är det något som du ser att det hade varit möjligt att reglera? Exempelvis begränsa kampanjer som ger mängdrabatt på kött, eller inte ha kampanjer på kött från vissa länder. (*When you worked at Coop, were there internal company rules regarding meat promotions? If not, do you think it would have been possible to introduce such regulations? For example, limiting multi-buy discounts on meat or avoiding promotions on meat from certain countries.*)
4. Vi såg att Coop är medlemmar i Hållbar Livsmedelskedja, hur inblandad har du varit i det initiativet? Hur arbetar Coop med att inkorporera de mål som finns där i sina egna policys och strategier? Hur ser du på möjligheten för Coop och övriga samarbetspartners att uppnå målen? (*We saw that Coop is*

- a member of the Sustainable Food Chain (Hållbar Livsmedelskedja) initiative. How involved were you in that? How is Coop working to incorporate the goals of that initiative into its own policies and strategies? What is your view on Coop's and the other partners' chances of achieving these goals?)*
5. Om du har koll på avskogningsförordningen (EUDR): *(If you are familiar with the EU Deforestation Regulation:)*
 - (a) Tror du att avskogningsförordningen kommer att påverka dagligvaruhandelns tillgång till samt försäljning av kött? Och vad ser du för utmaningar för dagligvaruhandeln att uppnå de krav som kommer ställas på framförallt nötkött i och med införandet av förordningen? *(Do you think the EU Deforestation Regulation will affect the retail sector's access to and sales of meat? What challenges do you foresee for grocery retailers in meeting the requirements, particularly concerning beef, once the regulation comes into effect?)*
 - (b) Vi har sett att Coop är medlemmar i Svenska plattformen för riskgrödor och därmed ska ha endast certifierad soja direkt och indirekt i deras produkter senast 31 december i år. Vi har läst att Coop redan uppnår detta för sina egna märkesvaror, men vet du hur arbetet går för att nå samtliga varor? *(We have seen that Coop is a member of the Swedish Platform for Risk Crops and therefore must ensure that all soy, both direct and indirect, is certified by December 31 this year. We have also read that Coop already have achieved this for its own label products, do you know how the work is progressing to meet this target for all products?)*
 6. Vad tror du är de största utmaningarna för livsmedelsindustrin för att kunna möta de hållbarhetsmål angående kött som de har satt upp? *(What do you see as the biggest challenges facing the food retail sector in meeting its sustainability goals regarding meat?)*

Fifth interview, sustainability advisory at Preferred by Nature, 28 April 2025

1. Could you tell us about what Preferred by Nature does and what you work with there?
2. What are the biggest challenges or obstacles in implementing the EUDR? What are the biggest questions from an agricultural viewpoint?
3. Will it be possible to trace or ascertain that the soy has not come from an area that has been deforested?
4. What part of the supply chain do you work with?
5. Do you think the system will continue to work as it does today, or do you think there is going to be a period of time where, for example, soy or cattle will have a harder time reaching Europe?
6. Do you know if the risk classifications will be different depending on the relevant commodity or if there is one classification for each country? Using Sweden as an example: Will timber products that might be heavily associated with deforestation and forest degradation be classified differently from meat that might not be associated with deforestation and forest degradation in Sweden?
7. When it comes to soy and meat, which part of the supply chain will have

the most responsibility in due diligence? Where does the difficulty lie, in traceability or reporting?

8. Certifications for soy such as RTRS, Proterra, etc. What do you think their role will be? Will their requirements be more extensive so that a certification will be more valuable, or will the value of a certification be reduced if soy is already covered by legislation?
9. How hard will it be to go from current mass balance systems where soy from different areas are mixed to being able to trace where soy comes from - how big of a change is it? Will it be manageable?
10. Operators could refer to a due diligence already submitted (Article 4(9)) and then only need to ascertain that due diligence has been done, what does this mean, and how much work will that take?
11. The simplified due diligence for low-risk countries, how simplified is it?
12. Update from the commission last week (14 April 2025) - do you know what this will mean?
13. Would suppliers have to implement an entirely new system of tracing commodities, or is this already in place? Has it been provided by the EU?

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