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Environmental implications of Swedish food consumption and dietary choices

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Summary

In recent years, a growing interest from consumers to know the origins and contents of foods has put alternative choices such as organic foods and dietary changes in the agenda. Dietary choices are important to address as many studies find that activities related to food production account for nearly 20-30% of anthropogenic greenhouse gas emissions. Nonetheless, while GHG emissions are important, often other environmental impact categories are not used to assess the sustainability of different foods, diets and choices. This study therefore aims to understand the implications of dietary choices for Swedish food consumption on a broad range of environmental impact categories to provide insight into the impacts associated with certain food products and dietary choices.

The study reviews dietary choices based on Swedish consumption statistics and assesses the implications using a number of scenarios. These include scenarios related to increasing organic and regional food consumption in addition to reducing meat, vegetarian diets and eating based on nutritional guidelines. Life cycle methodology is used to review environmental impacts of Swedish food consumption (from both domestic and imported products) in the year 2015 and 2020.

Increasing Swedish food production may lead to lower impacts for all impact categories by reducing imports, although limitations in growing season and availability of foods in Sweden allows only for minor increases. The results also indicate that large reductions in nearly all environmental impact categories are possible by reducing meat consumption, both incrementally and through vegetarian diets. Nonetheless, an increase in vegetable and fruit products may lead to a potential increase in human and ecosystem toxicity. Similar results are found for diets based on nutritional guidelines, as these guidelines call for an increase in vegetables and fruits and a reduction in meat consumption. An increase in organic foods showed only minor climate impact reductions, although toxicity potential was reduced significantly. Organic foods may also lead to a reduction in biodiversity damage potential, although they may also increase acidification, eutrophication and land use if all food was produced organically.

The report does not outline the “best” choices, but provides a broader environmental sustainability assessment of food consumption. As there is no standard to assess the sustainability of food products from a broader range of sustainability indicators, it may be up to consumers to makes choices based on their own values. The report also outlines and reflects upon the potential to increase and decrease the consumption of certain food products. In addition important improvements to life cycle assessment method and data availability are provided in order to provide more transparency in future work on consumption studies in Sweden.

Acknowledgements

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1 Introduction

There has been a growing interest in knowing the origins and contents of the foods throughout the world. This has stemmed from the intensification of agricultural production, leading to questions on technologies, ingredients and safety of food which has put pressure on conventional producers and manufacturers (Fortune, 2015; Toler et al., 2009). In recent years, consumers have also become more aware of the impact that their behavioral choices may have on the environment. Swedish supermarkets offer consumers a large array of alternatives, and consumers may be overwhelmed with making the ‘right’ choice from the number of products labeled to show the environmental, ethical and health qualities (Joosse and Hracs, 2015).

In the developed world, behavioral choices such as dietary choices, have a large influence on the environmental impacts of consumption (Heller and Keoleian, 2014). Jones and Kammen (2011) in addition to Reisch et al. (2013) also identified dietary changes as one of the most economically effective abatement options for climate change in affluent countries. There is therefore potential to address environmental impacts throughout the food chain. Activities related to food production have been found to account for roughly 20-30% of anthropogenic greenhouse gas (GHG) emissions; see e.g. (Hallström et al., 2015; Martin et al., 2015a; Naturvårdsverket, 2008; Tukker, 2006). Ivanova et al. (2015) found that food accounts for 48-70% of household impacts on land and water consumption.

Previous assessments of the sustainability of food consumption and production have placed a large focus on climate impacts. Often, an emphasis is placed on the potential climate impacts related to meat consumption, as it has been shown to be a large source of emissions from food consumption (Reisch et al., 2013; Westhoek et al., 2014). Recently, a number of studies have put a focus on the role of dietary choices, the role of farming practices and seasonal availability for reducing environmental impacts (FAO, 2012; Hempel and Hamm, 2016; Meier et al., 2015; Röös and Karlsson, 2013; Röös et al., 2015; Tuomisto et al., 2012; Vittersø and Tangeland, 2015). Portraying a larger selection of environmental impact categories is important to allow for more understanding and a comparison of the environmental implications of changes and transitions in the consumption patterns.

2 Aims and Scope

2.1 Aims

The aim of this study is to understand the implications of dietary choices for Swedish food consumption on a broad range of environmental impact categories. The study will limit the assessment to reviewing certain dietary changes, such as increasing organic and regional food consumption in addition to reducing meat, vegetarian diets and eating based on nutritional guidelines by addressing the following research questions:

- Can an increased influx of organic food reduce environmental impacts?
- Would an increase of Swedish produced foods, and reduced imports, lead to reduced environmental impacts?
- What are the implications of reducing meat consumption?
- What are the environmental tradeoffs of the different dietary choices?

The study will therefore also attempt to review if dietary choices assumed to be sustainable can reduce environmental impacts.

2.2 Scope and Limitations

The study will be limited to a review of different dietary considerations that Swedish consumers have begun to address through changing consumption patterns. These are related to the increased consumption of niche products, such as regional and organic varieties, and reductions of meat consumption. It will not review e.g. large changes such as vegetarian and vegan diets although the analysis will address differences with these diets in comparison to those chosen in this study.

The scenarios are based on total food consumption and scenarios are designed to review changes in the consumption, i.e. based on amounts in kilograms. The nutritional value of these scenarios was not reviewed as the requirements of e.g. calories, protein, vitamins and other nutrients are complex to model and compare between different diets. A review of the impact this has on the results is provided in the analysis.

A major limitation with the study is the availability of consumption and life cycle inventory data. Data for organic food consumption is based on sales of organic foods and not the amount of food, making estimates of the amount of organic food difficult. Consumption amounts are also based on country food balance data provided by the FAO, and does not take into account the diversity of diets for consumers. Nonetheless, this provides commodity flows, which alleviates the task of reviewing consumption of food in different sectors, households, cafeterias, public sector, food manufacturing industry, etc. As such the project does not model food products (processed foods, bread, etc.) but is focused only on raw commodities (e.g. corn and wheat) in order to alleviate the data collection for the life cycle assessment. More information on the assumptions and limitations are provided in section 4.

3 Background

3.1 Swedish Food Consumption

Consumers are provided with an abundance of fresh fruits, vegetables and a diversified offering of products in Swedish supermarkets; even despite the short growing season in the Nordic region (Röös and Karlsson, 2013). This increased availability is also coupled with a large increase in food consumption per capita. According to the Jordbruksverket (*Swedish Board of Agriculture*) in a recently published review of food consumption trends in Sweden in the last 50 years, there is an overall increase in food consumption in Sweden. Furthermore, an increase is also seen in higher calorie intake per day, lower consumption of milk per person, higher consumption of meat and vegetables and lower relative costs for food (Jordbruksverket, 2015).

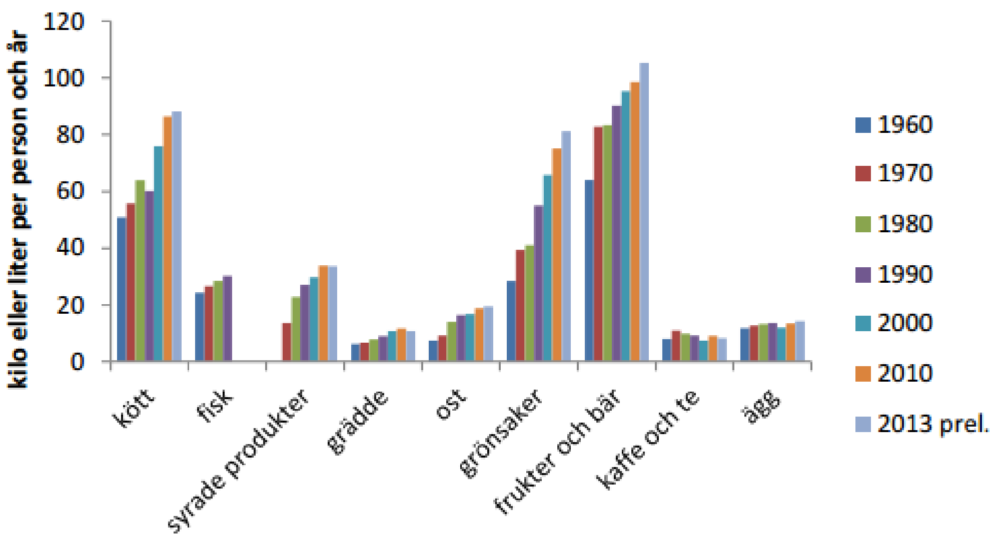

Figure 1: Products experiencing increased consumption from 1960-2013 (Jordbruksverket, 2015)

Some products have also experienced a trend of reduced consumption. These include flour, milk, fats, potatoes and sugar; see Figure 2. Nonetheless, while e.g. flour and milk consumption has a relative reduction, these products in processed forms, e.g. bread and yogurts have seen an increase.

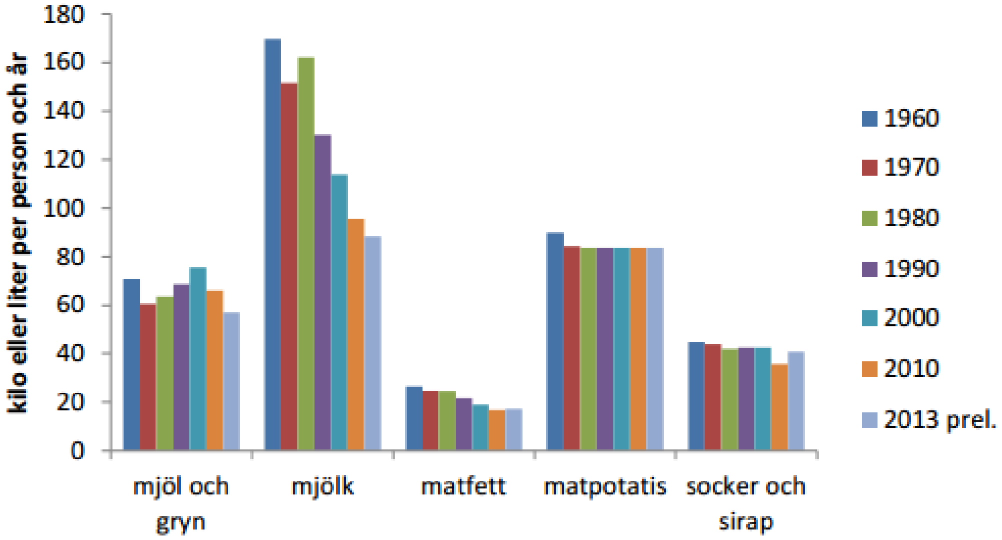

Figure 2: Products experiencing a reduced consumption (Jordbruksverket, 2015)

Food imports have also increased dramatically in the past years. Imports of animal based products, such as beef, pork and cheese, have seen large increases; see Table 1. In many instances it is important to understand how these imports affect the environmental impacts of Swedish consumption locally and abroad and to decouple the trends.

Table 1: Amount of Imports for Different Products (in percentage of total), Adapted from (Jordbruksverket, 2015)

Year	Beef	Pork	Cheese
1960	4.7 %	0.8 %	8.4 %
1970	7.8 %	8.0 %	20.4 %
1980	7.9 %	1.9 %	14.3 %
1990	8.4 %	6.2 %	16.3 %
2001	26.0 %	10.0 %	26.6 %
2010	42.1 %	24.0 %	48.9 %
2013	49.1 %	33.2 %	63.1 %

As outlined in work by Peters and Solli (2010), although emissions produced in many Nordic countries may have decreased, many studies disregard imports of products in national carbon accounting. There is a considerable share of greenhouse gas emissions related to imports of products for Swedish final consumption, which despite information provided by the Swedish EPA (Naturvårdsverket, 2014) on emissions reduction in the past years, may lead to increasing greenhouse gas emissions in Sweden in the last decade if accounted for (Peters and Solli, 2010). It is important to therefore consider the impacts of different products from both imports and domestic production on a national level as it includes a complex mixture of different foods from conventional and alternative sources in private, public and manufacturing industries.

3.2 Meat Consumption and Impacts

Meat consumption has continued to increase in Sweden since the 1990s. The total consumption of meat has increased from 60-85 kilograms per capita and year. This is largely due to an increased consumption of beef, pork and poultry. While beef and pork consumption have increased since 1990, the consumption has stagnated in the past 10 years. Poultry consumption has increased by nearly a factor of 4 since 1990. Furthermore, the consumption of other meat, e.g. goat, sheep, wild game, etc. have decreased since 1990 (Jordbruksverket, 2016). Figure 3 provides an illustration of meat consumption from 1990-2013.

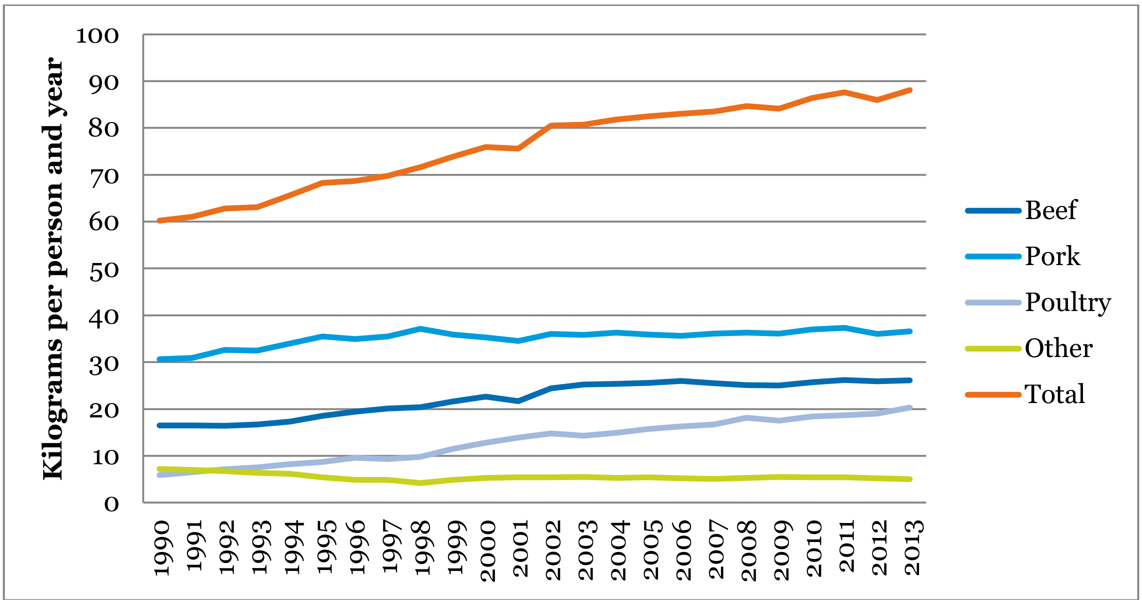

Figure 3: Total consumption of different meat products from 1990-2013 from (Jordbruksverket, 2016)

Meat consumption has often been outlined in many studies to have large environmental impacts; see e.g. (Macdiarmid et al., 2016; Röös et al., 2013; Westhoek et al., 2014; Åström et al., 2013). Campaigns worldwide have outlined the environmental benefits of reducing meat consumption. Many regions have also been promoting different methods to improve the sustainability of meals. These include vegetarian only meals, increasing regional foods and most importantly introducing one or several meat free days (Jordbruksverket, 2012, 2013). Ekvall et al. (2015) explore the use of different instruments, such as campaigns and value added tax (VAT) increases, to reduce meat consumption. This is extended in the work by Macdiarmid et al. (2016), Westhoek et al. (2014), Jordbruksverket (2013) whom discuss the potential of reducing environmental impacts through decreases in meat consumption.

Nonetheless, as Macdiarmid et al. (2016) suggest, there is a large span of consumers who understand the impacts of meat consumption to those who are skeptical of the information provided. There are also many cultural and social aspects associated with meat consumption that are not generally reviewed in research. Therefore, bans and limitations to meat consumption may not be as easy to implement as incremental changes in meat consumption. Despite this, there is a large base of consumers who have reduced their meat consumption and an increasing number of vegetarians[1] in Sweden (Larsson et al., 2001). Many schools are also improving their offerings of meat free meals (Patterson and Elinder, 2015).

3.3 Organic and Regional Food Products and Consumption

The concerns of consumers have created interest in alternative food products which promote sustainability, ethical questions and quality (Toler et al., 2009). The emergence (or re-emergence) of organic food and a larger selection of local foods have begun to play and important role in offering alternatives to conventional foods and setting the agenda for sustainable food production and consumption (Klintman and Boström, 2012; Vittersø and Tangeland, 2015).

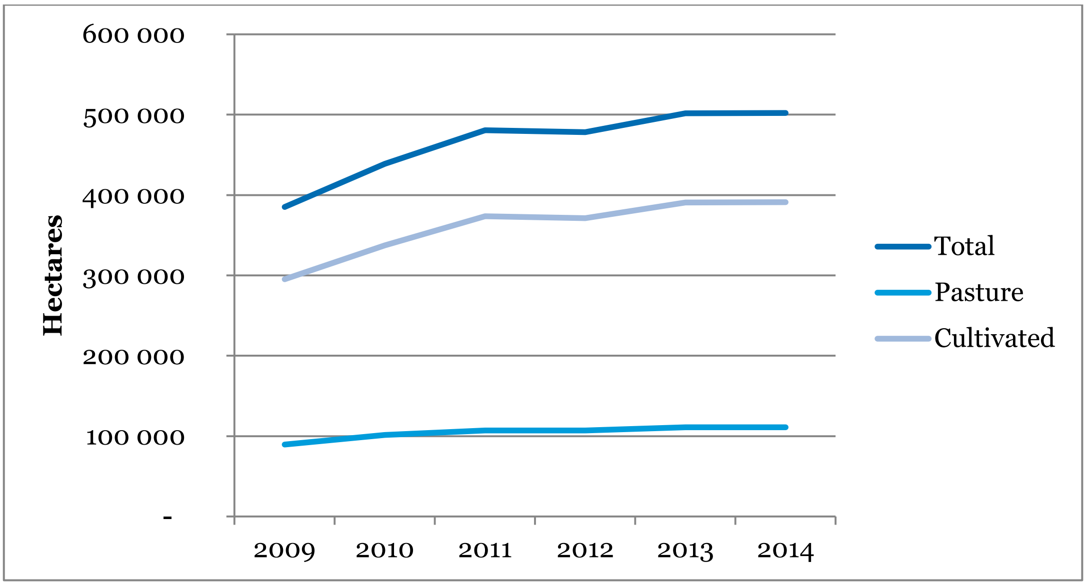

Figure 4: Hectares of Land in Sweden for Organic Food Production (Agricultural Land and Pasture Land) (Jordbruksverket, 2016)

[1] "Every tenth Swede is a vegetarian." http://www.dn.se/nyheter/sverige/var-tionde-svensk-vegetarian/

In Sweden, consumers have increased their purchases of organic foods in the last decades. In 2014, the organic food sector consisted of nearly 6% of the market (Ekoweb, 2015). Figure 4 provides a review of the expansion of land used for organic food production in Sweden. Since 2005, a roughly 125% increase in agricultural land has been converted and used for organic food production, either as agricultural land or pasture for grazing animals.

The retail sector has also increased their offerings of these foods and a wider selection of organic and regional foods has provided consumers with many alternatives; see Table 2 below. Many of the retailers have also set goals for shares of organics in the next 10 years; e.g. the Swedish Alcohol Monopoly (Systembolaget) has set a goal of 10% organic products by the year 2020. This would result in an increase in 15-20% sales of organic products each year until 2020 (Ekoweb, 2015; Systembolaget, 2014).

Table 2: Increase in Sales of Organic Products from different Retail and Catering Stakeholders. Adapted from Figures presented from (Ekoweb, 2015)

Retail/Catering	2013-14
ICA	**55%**
COOP	**40%**
AXFOOD	**40%**
Systembolaget	**83%**
Martin & Servera	**24%**

This trend is not unique to Sweden, as it is seen throughout Europe and the U.S. as consumers are becoming increasingly aware of the environmental and socio-economic effects of their food choices (Hempel and Hamm, 2016; Lang and Barling, 2013). Consumers have also begun to purchase local foods and are positive toward increased consumption of Swedish and regional foods (Jordbruksverket, 2015). In a report based on consumer analysis, Jordbruksverket (2014b) found that nearly 67 percent of consumers were willing to pay more for Swedish products. They also found that 69 percent of consumers seek Swedish products when purchasing foods and 61% were interested in buying more regionally produced foods. The study found that consumers believe that regionally produced foods have the potential to reduce environmental impacts and strengthen local economies and are even of higher quality and taste compared to imported varieties (Edwards-Jones et al., 2008; Hempel and Hamm, 2016; Joosse and Hracs, 2015; Toler et al., 2009). Despite this large increase in the last few years, organic foods and regional (or seasonal) still remain a niche market in today’s supermarkets (Vittersø and Tangeland, 2015).

3.4 Reviewing the Sustainability of Food Consumption

Dietary choices have come into focus from The Food and Agricultural Organisation (FAO), who identify the importance of "sustainable diets." The FAO defines sustainable diets as:

"...those diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources. (FAO, 2012)"

According to the FAO, sustainable diets therefore include more than climate impacts, and thus assessments should take into account a broader scope when assessing the sustainability of foods and dietary choices.

In the scientific literature, dietary scenario analysis is used by many authors to understand the impacts associated with dietary patterns and choices, with many studies reviewing changes to vegetarian diets (Hallström et al., 2015). Despite the consensus, the environmental impacts of food consumption are compared using very few environmental impact categories. Nonetheless, Röös et al. (2013) argue that carbon footprints can provide a relevant indicator of environmental impacts for food, primarily related to global warming, acidification and eutrophication. In the bioenergy scientific community, which is more mature in their use of life cycle assessments to review the sustainability of production systems, authors such as Martin et al (2015) state that disregard can lead to a sub-optimization of production systems. Thus, including a larger array of environmental impact categories is important to provide a more complete picture.

The scientific literature available has generally provided the conclusions that e.g. organic food production may produce more greenhouse gas emissions per product, due to reduced yields and productivity. Typically, these are based on comparisons organic and conventional equivalents of one food product. Venkat (2012) and Meier et al (2015), review and compare the environmental impacts of organic and conventional food products. While the study by Venkat (2012) is limited to GHG emissions, Meier et al. (2015) extend the analysis to a range of impact categories and provide recommendations for making the comparisons more transparent. Both studies indicate sensitivity to functional units used in the assessments, with organic products having larger GHG emissions per kg of product, but less per land used. In the review by Meier et al. (2015) toxicity and biodiversity damage are shown to be reduced through organic production practices, although land use may increase. Reisch et al. (2013) also suggest that conventional agricultural practices may increase biodiversity loss through monoculture practices and increased use of synthetic pesticides and fertilizers. While organic and regional food is become increasingly popular, and making up a larger share of the total food consumed, it is important to therefore address the aggregated impacts of consumption on a regional and national scale to outline the implications of dietary choices.

Röös and Karlsson (2013) suggest that many Swedish NGOs recommend eating "seasonally" to reduce the environmental impacts of food consumption. Seasonal eating, according to the authors contains a broad array of definitions, from availability to growing seasons. Nonetheless, seasonal eating is assumed to have reduced environmental impacts due to reduced transportation distances. This is not always correct to assume, due to use of modern technologies such as greenhouses to extend growing seasons (which may increase energy demands) and question the "seasonality" of foods. In this report, seasonality has not been reviewed, although regional foods are those assumed to be provided domestically whether irrespective of growing season and location as the study is related to aggregate annual consumption; see more in the section related to the methodology.

4 Methodology

4.1 Life Cycle Assessment

Life cycle assessment (LCA) is used to identify and assess the potential environmental impacts from a product or service. As the name indicates, the method is based on a life cycle perspective, meaning that environmental aspects and potential impacts are studied for all phases of a product's lifetime – from *cradle-to-grave* (ISO 14044:2006).

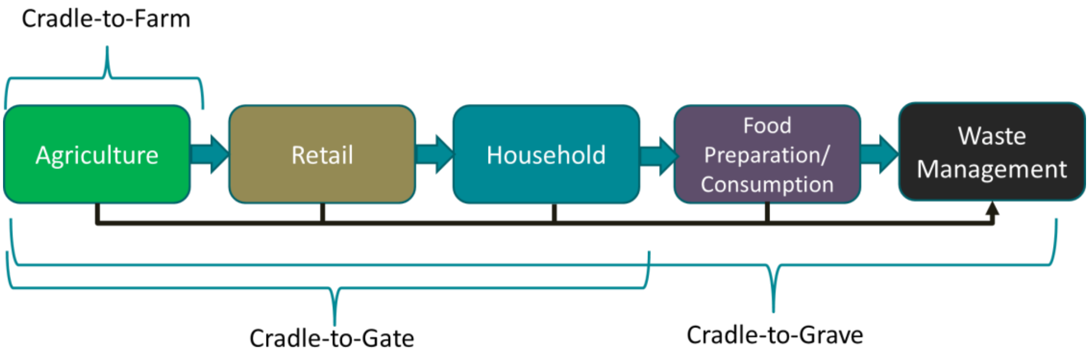

Figure 5: Illustration of Life Cycle Phases in Food Production System

Figure 5 provides a representation of the different life cycle phases in the food production system and the extent to which studies include analyses from cradle to grave. This study will be limited to a cradle-to-gate analysis[2], which includes the impacts from the life cycle including all agricultural processes, shipping and impacts from retail and thereafter final availability to the consumer. This is due to the fact that the scenarios are aimed to assess changes in consumption. Waste management practices are assumed to remain the same.

The *functional unit* for the study is set as the *annual consumption of food* in Sweden in order to compare impacts between different dietary choice scenarios. All scenarios, except those related to dietary guidelines from Livsmedelsverket have similar total consumption amounts.

[2] Generally, the largest emissions for food come from agricultural processes, however, transportation has been included to ensure that emissions up to the consumer are included to avoid the what Reisch et al. (2013) describe where many studies review only the impacts from agriculture and easily neglect the consumer impacts from transports.

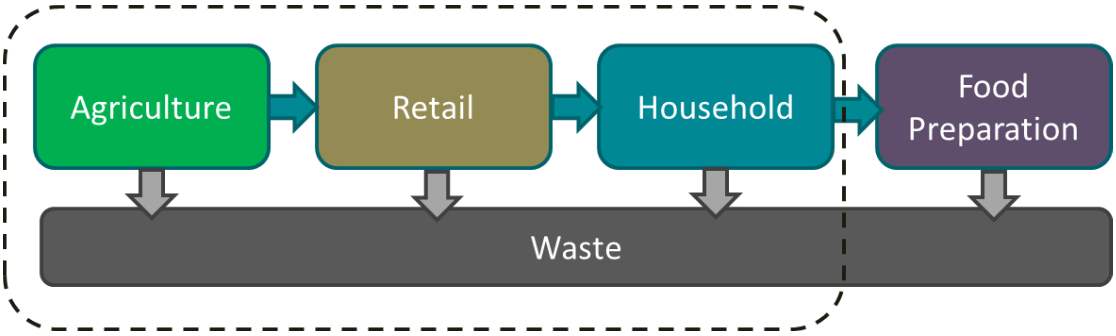

Figure 6: System Boundaries of the LCA in the study

This study is limited to food consumption and the implications of changes in dietary choices. Consequently, the study covers only the impacts from upstream processes up to the consumer and does not include the emissions from food preparation at the household. Nonetheless, food wastes are taken into consideration at the consumer level in order to allow for a review of the total food availability for consumption, as wastes at the household are significant even before consumption (Gustavsson et al., 2011; Martin et al., 2015a). Emissions from manufacturing of the representative food products to value added products (e.g. wheat to flour) are not included in the study. This was limited due to fact that the input data was related primarily to raw materials and not processed foods (although some exceptions such as beer and wine are included); see data in the Appendix and FAO (2015). As no differences in manufacturing technologies for processing and food processing at the household can be considered, changes in the origin and type of food are negligible; this is coupled by the fact that a large share of the impacts from food consumption come from agricultural processes and raw materials used for food production (Reisch et al., 2013; Scholz et al., 2014) which dominate the share of impacts.

4.2 Life Cycle Impact Assessment

As this project is focused on the impacts from food production and consumption, there are implications on a large array of impact categories. In order to portray impacts at a local and global scale, the following impact categories were chosen for this report. Further justification of their inclusion is included in section 0.

Information provided below in Box 1 provides a short review of the impact categories assessed in this report.

Box 1: Impact Categories Assessed in Report, adapted from (Guinée, 2012)

Global Warming Potential (GWP)

GWP is used to show the impact of human emissions on climate change (measured in kg CO_2-eq). The characterization model was developed by the Intergovernmental Panel on Climate Change (IPCC) for a 100-year time horizon for a range of greenhouse gases to take into account their infrared radiative forcing which causes increases in the earth's surface temperature.

Human Toxicity Potential (HTP)

HTP is an index that reflects the potential harm of a unit of chemical released. It is based on both the inherent toxicity and the potential dose of a compound. HTP covers the impacts on human health of toxic substances present in the environment and is measured in measured in kg in kg 1,4-dichlorobenzene equivalent/kg emission (this is often shortened as kg DCB-eq).

Terrestrial Ecotoxicity Potential (TETP)

TETP, similar to HTP, is measured in in kg in kg 1,4-dichlorobenzene equivalent/kg emission. TETP reveiws the impacts of toxic substances on terrestrial ecosystems.

Acidification Potential (AP)

AP is used to measure the impacts on soil, groundwater, surface waters, organisms, ecosystems and materials from acidifying pollutants such as SO_2, NO_x and NH_x. It is measured in kg SO_2-eq/ kg emission).

Eutrophication Potential (EP)

EP is used to measure the impacts of excess levels of macronutrients, such as Nitrogen and Phosphorus. Excess levels of these compounds can cause elevated biomass production in aquatic and terrestrial ecosystems leading to depressed oxygen levels. Eutrophication potential is measured in kg PO_4-eq.

Land Use

Although land use (LU) is not necessarily an impact, it has been included in the impact assessment to compare the amount of land required for the production of foods from different scenarios. These include all land occupied for crop production from life cycle inventory databases such as Agribylase and Ecoinvent.

Biodiversity Damage Potential (BDP)

BDP attempts to measure the effects on biodiversity resulting from harvesting biotic resources, or the destruction or alteration of land. Although the impact category is far from agreed upon in the LCA community, the method by De Baan et al. (2013) is used, measured in the value biodiversity damage potential/kg of food eaten.

4.3 Data Collection

4.3.1 Food Consumption Figures for Sweden

Data from Food Balance Sheets by the Food and Agriculture Organization (FAO) (2015) were used to identify the import, export, use and waste of food for Sweden with a base year of 2012; which represents the latest available data at this time. Using this data, a matrix of the different food categories was compiled for a reference system and year to compare with the different scenarios for changes in dietary choices[3].

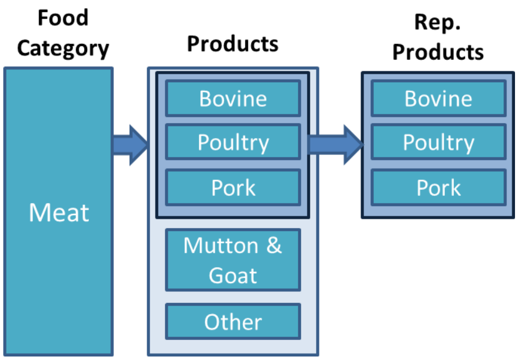

Figure 7: Method used to identify Representative Food Products (RFP), example Meat

Within each food category there are a large number of separate food products. These are outlined primarily in food product raw materials. Representative food products (RFPs) were therefore chosen from each category. RFPs were chosen to represent at least 80% of the mass of each product category. As some food products were not included in the assessment due to this cut-off, a scaling factor was employed in order to compensate for their exclusion. Figure 7 provides a representation of this process for the meat category, where only bovine, poultry and pork products represent this category. See also information in the Appendix which provides the scaling factors used for the final product outputs. The final RFPs included in each food category are provided in Table 3.

3 Data for food consumption in this study included only food for consumption and manufacturing, excluding that used for fodder and seed.

Table 3: Food Categories and Products Included in Study based on FAO Stat Food Balance Sheets

Food Category	Product	Food Category	Product
Milk- Excluding Butter	Milk	**Fish, Seafood**	Crustaceans
Sugar Crops	Sugar beet		Freshwater Fish
Cereals - Excluding Beer	Wheat and products		Demersal Fish
	Rye and products		Pelagic Fish
	Barley and products	**Animal fats**	Cream
Fruits - Excluding Wine	Oranges, Mandarines		Butter, Ghee
	Fruits, Other	**Vegetable Oils**	Palm Oil
	Apples and products		Rape and Mustard Oil
	Bananas		Sunflower Oil
Vegetables	Vegetables, Other	**Stimulants**	Coffee and products
	Tomatoes and products		Cocoa Beans and products
Meat	Pork	**Eggs**	Eggs
	Bovine	**Tree nuts**	Nuts and products
	Poultry	**Pulses**	Peas
Alcoholic Beverages	Beer		Beans
	Wine	**Spices**	Spices, Other
Starchy Roots	Potatoes and products		Pepper
Sugar & Sweeteners	Sugar (Raw Equivalent)		Pimento
Oilcrops	Rape and Mustard seed	**Offals**	Offals, Edible
	Oil crops, Other	**Miscellaneous**	Infant food
	Soya beans		

Table 4: Per Capita Consumption for different Representative Food Products in 2011, measured in kg per year (FAOStat, 2015), see Appendix for final amounts used in the reviewed scenarios.

Category	RFP	Amount per RFP [kg/yr]	Amount per Category [kg/yr]
Milk - Excluding Butter	Milk	341.07	341.07
Sugarbeet	Sugarbeet	240.98	240.98
Cereals - Excluding Beer	Wheat	108.37	131.20
	Rye	12.43	
	Barley	10.40	
Fruits - Excluding Wine	Oranges	64.43	143.88
	Fruits_Other	31.40	
	Apples	30.30	
	Bananas	17.75	
Vegetables	Vegetables_Other	68.94	93.53
	Tomatoes	24.58	
Meat	Pig	39.62	82.78
	Bovine	25.34	
	Poultry	17.82	
Alcoholic Beverages	Beer	56.87	77.52
	Wine	20.65	
Starchy Roots	Potatoes	61.22	61.22
Sugar & Sweeteners	Sugar	42.82	42.82
Oilcrops	Rapeseed	36.54	41.43
	Oilcrop_Other	2.50	
	Soyabeans	2.40	
Fish, Seafood	Crustaceans	8.03	30.70
	Freshwater	7.81	
	Demersal	7.72	
	Pelagic	7.14	
Animal fats	Cream	16.05	20.45
	Butter	4.40	
Vegetable Oils	Palm Oil	11.29	16.87
	Rapseed Oil	2.98	
	Sunflower Oil	2.61	
Stimulants	Coffee	10.57	12.97
	Cocoa	2.40	
Eggs	Eggs	12.34	12.34

Treenuts	Nuts	4.53	4.53
Pulses	Peas	1.52	1.90
	Beans	0.38	
Spices	Spices_Other	0.53	0.95
	Pepper	0.21	
	Pimento	0.21	
Offals	Offals	0.84	0.84
Miscellaneous	Infant Food	0.32	0.32

4.3.2 Waste from Production, Retail and Households

At each stage of the life cycle, there are differences in the amount of wastes assumed for each RFP. The assumptions are based on figures provided in Martin et al. (2015); see Table 5. The figures are calculated based on the amount of food wastes arising from accumulated inputs to the different life cycle stages. As an example, of the foods from produced from cereals, 16% of the food produced is destined as waste from the production phases, thereafter 2% of that entering the retail sector is destined as waste and finally 25% is destined as waste from that available to households. Although food waste and the production of food to produce this waste leads to large environmental impacts, changes in food waste handling and mitigation were not reviewed in this study.

Table 5: Waste from Different Stages of the Life Cycle Accounted for in this study based on information from (Martin et al, 2015)

	Production	Retail	Households
Cereals	16%	2%	25%
Roots and Tubers	38%	7%	17%
Oilseeds and Pulses	15%	1%	4%
Fruit & Veg	26%	10%	19%
Meat	9%	4%	11%
Fish/Seafood	15%	9%	11%
Milk	9%	0.5%	7%
Beverages, Other	16%	0.50%	7%

4.3.3 Origin and Agricultural Production Method

For each of the food products provided above in Table 3, data for different regions (i.e. imports versus Swedish) and farming system (i.e. conventional and organic) were documented. The nomenclature includes ***ECO***[4] (representing organic fraction), ***ROW*** (representing imports from abroad i.e. rest of World), ***Swedish***-Domestic Swedish production.

Table 6: Data Collection for Each Food Product, Location and Product Type, Example for Milk

Milk	Milk-ECO (ROW)
	Milk-ECO (Swedish)
	Milk-(ROW)
	Milk- Swedish

From the FAO Stat data, information on food supplies is also available to allow for dividing the flows into domestic and imports. Thereafter, data on the amount of organic food from imports and domestic supplies was triangulated from a review of available data from e.g. (Ekoweb, 2015; Jordbruksverket, 2014a, 2015; SCB, 2013, 2014; Systembolaget, 2014; Willer and Lernoud, 2015). See also information in the Appendix on the sources for organic fractions from domestic and imported sources.

[4] The notation ECO is used as organic produce in Swedish is referred to as "Ecological."

Table 7: Example of Consumption in kg/year. An extended list is available in the Appendix

Category	RFP	Origin/Type	Kg/year		
Milk	Milk	Milk-ROW	107.33		***341.07***
		Milk-ROW ECO	7.34		
		Milk-Swedish	197.59		
		Milk-Swedish ECO	28.81		
Cereals	Wheat	Wheat-ROW	26.04	108.37	***131.20***
		Wheat-ROW ECO	0.67		
		Wheat-Swedish	78.56		
		Wheat-Swedish ECO	3.10		
	Rye	Rye-ROW	1.87	12.43	
		Rye-ROW ECO	0.05		
		Rye-Swedish	10.16		
		Rye-Swedish ECO	0.35		
	Barley	Barley-ROW	0.86	10.40	
		Barley-ROW ECO	0.02		
		Barley-Swedish	9.30		
		Barley-Swedish ECO	0.21		

4.4 Life Cycle Inventory (LCI) Data Criteria and Limitations

Data used in the study originates from available research on food and food consumption. In the literature, there is a large base of studies portraying primarily GHG emissions (measured in CO_2-eq) from different foods. In order to be able to compare the results with global and local impacts different criteria were applied for the life cycle inventory data collection.

These included 1) only including data for studies portraying at least 3 impact categories (i.e. greenhouse gas emissions, eutrophication and acidification), 2) data should include cradle-to-farm emissions or cradle to gate (consumer) emissions and 3) data should represent conditions representative for typical imports and Swedish production for each respective food product, origin and type.

Box 2: Criteria for Data Collection

1) **Data including at least 3 impact categories**
   - **Greenhouse gas emissions**
   - **Eutrophication**
   - **Acidification**
2) **Cradle-to-Farm or Cradle-to-Gate Emissions**
3) **Conditions similar to Sweden for domestic data and import countries for imported food**

Once again, impact categories included in the studies should contain greenhouse gas emissions, eutrophication and acidification. In many of the studies, especially those from LCI databases, data for ozone layer depletion potential, toxicity potential (human and terrestrial), photochemical oxidation potential and land use per kg food production was also available. The analysis also included toxicity potential. There were a few RFPs that lacked toxicity potential data. For these, toxicity potential data from conventional or comparable products were used in their place; see Appendix for assumptions used and data sources. However, the number of studies portraying the other respective impacts outlined above was not thorough enough to provide meaningful results for comparisons.

The primary sources for data included data provided from LCI databases such as Ecoinvent (Ecoinvent, 2014) and Agribalyse (Colomb et al., 2015), a collection of studies in the article and supplementary material provided by Meier et al. (2015), EPD reports (Environdec, 2015) and peer-reviewed scientific articles. For a full list of data sources used in this study, see the Appendix.

From the LCI databases, data for impact categories were computed using the life cycle impact assessment (LCIA) methodology CML baseline 2011 in order to portray the results for GWP (100 years) in kg CO2-eq, acidification potential (kg SO2-eq), eutrophication potential (kg PO4-eq) and toxicity potential for both human and terrestrial toxicity potential(kg 1,4 DCB-equivalent). Land use was used to review the land occupation and requirements for the different dietary scenarios. See the Appendix for a review of the land use requirements for different organic and conventional foods.

Biodiversity damage potential was also included to provide a screening of potential reductions in biodiversity damage from organic production practices. Figures for biodiversity damage potential are based on *average figures* provided in an extensive review by Röös et al. (2015). The study is based on the methodology provided by De Baan et al. (2013) for global biodiversity damage potential although a number of limitations are included in the methodology due to its simplicity. These include 1) not allowing for the benefit of semi-natural pasture land in Sweden and Europe to be include or the benefits from organic production practices to be accounted for (Röös et al., 2015)

In order to review the figures for organic production practices, a recent review article by Tuck et al. (2014), was used. The article outlines that the majority of the studies showed an average of 30% higher biodiversity in organic production practices in comparison to conventional farming practices; see also studies such as those by e.g. (Bengtsson et al., 2005; Meier et al., 2015; Tuomisto et al., 2012). Therefore, a reduction of 30% lower biodiversity damage potential for all organic foods was included in the screening. No reduction in BDP for Swedish foods was considered as no data could be found for Swedish production although this information would be valuable for future studies.

4.5 Transportation

For datasets which do not contain cradle-to-gate emissions, i.e. those only covering cradle-to-farm emissions, transportation emissions were added in order to allow for the datasets to remain functionally equivalent. The distance from farm to retail included an assumed shipping distance of 1000 km by boat (assumed distance from Europe to Sweden) and 400 km by truck for imports. For domestic products a distance of 100 km by truck was assumed to ship products from farm to retail. Thereafter, an average distance of 24 km for retail to availability at the household was assumed (Sonesson et al., 2005). LCI data for the different transportation methods are taken from Ecoinvent v. 3.1 for transportation by boat, truck and personal vehicle respectively.

5 Scenarios

Scenarios were created to assess the environmental implications of dietary choices on the aggregated impacts of Swedish food consumption. These included increased organic food consumption, increased Swedish foods, reduced meat consumption and diets based on recommendations from Livsmedelsverket (*Swedish National Food Agency*). These scenarios are split into those considered "transition" diets requiring small changes to those requiring large changes, as described in the following sections. Table 8 provides a short review of these scenarios. See also the Appendix for a review of the amount of foods represented in each of the scenarios.

Table 8: A review of dietary scenarios reviewed

Scenario	Assumptions
Scenario 0	Consumption based on 2011 levels but adjusted to population levels in 2015 and 2020
Reduced Meat	Assumes a reduction of 25% in 2015 and 50% in 2020
ECO	Assumes an increase of 100% organic food in 2015 and 200% in 2020
ECO-Sweden	Assumes an increase of 100% organic food in 2015 and 200% in 2020 from Swedish sources only
Sweden Incr.	Assumes an increase in Swedish food consumption of 10% in 2015 and 30% in 2020
Vegetarian	Assumes a "demi-vegetarian diet" with calorie intake similar to Scenario 0. Increases in beans, soy and vegetables.
Nutrition	Uses guidelines from the Swedish Dietary Guidelines to assess the impacts from recommended diets
All ECO	The scenario reviews replacing all conventional food with organic food
All Conventional	The scenario reviews replacing all organic food with conventional food

For the study, a reference year of 2011 was used based on the latest data available from the FAO food balance data sheets. Thereafter, scenarios for different dietary choices were assessed for the years 2015 and 2020 in order to review how the impacts may change with increased population; See Table 9.

Table 9: Population for years 2012, 2015 and 2020 in thousand persons (SCB, 2015)

2011	2015	2020
9 482	9 879	10 509

5.1 Transition Diets

5.1.1 Scenario 0 –Default Scenario

In order to model consumption in 2015 and 2020 using per capita consumption figures from 2011, Scenario 0 (Default Scenario) was created to allow for comparisons with other scenarios for 2015 and 2020 respectively. Therefore, Scenario 0 (for both 2015 and 2020) does not take into account increases or decreases in per capita consumption of foods and is used to also understand how population affects the environmental impacts of food production and consumption.

5.1.2 Reduced Meat Consumption

The ***Reduced Meat*** scenarios in 2015 and 2020 will review reductions in meat consumption. These are assumed to include meat consumption reductions of 25% and 50% in 2015 and 2020 respectively per capita. While meat consumption is reduced, the consumption of vegetables and pulses are increased by 25% and 50% respectively in 2015 and 2020, to make up for this reduction in meat to allow for a protein substitute, despite current levels of high protein consumption. Final consumption of food is kept similar to Scenario 0 and other scenarios (except for the Nutritional scenario) as outlined in this section.

Table 10: Increase and Decrease of RFPs in the *Reduced Meat* scenario

RFP	2015	2020
Meat	25% reduction	50% reduction
Vegetables	25% increase	50% increase
Pulses	25% increase	50% increase

5.1.3 Increased Organic Food Consumption (Scenarios ECO and Eco-Sweden)

According to Ecoweb we can expect an increase in the sales of organic food with 2 billion SEK yearly between 2015 and 2025 (Ekoweb, 2015). Based on figures provided by Ekoweb, an increase in organic food sales of 100% can be seen from figures in 2011 to 2015. Thereafter, for 2020, a corresponding increase of 200% is outlined from 2011.

As the scenarios investigated an increase in organic food consumption, a reduction in conventional food consumption was also taken into account. In ***Scenario ECO*** a reduction in both conventional foods from imports and Swedish foods were considered. In several cases the increase in organic foods included more food than the per capita amounts for 2011. Therefore, in order for the per capita amounts to hold, the increase was reduced in only a few cases.

Scenario ECO-Sweden reviews the potential for an increase in Swedish organic food production and consumption. In this scenario, conventional food production in Sweden is replaced with the increased amount of organic food as it assumes a shift toward organic production in Sweden.

5.1.4 Increase Swedish Food Production

Scenarios were created to understand the implications of increased Swedish food production. No recommendations could be found in the literature, although a number of gray literature reports provide support for more Swedish production of foods. Therefore, in order to review the potential for Swedish food production, the scenarios included increases of 10% and 30% for each respective food product with Swedish origin, labelled as ***Swedish Increase*** (***Sweden Incr.*** in the figures) respectively for 2015 and 2020. In some cases there is no increase, as certain food products do not originate in Sweden (e.g. bananas, coffee, etc.). The increase only included conventional foods and not organic food production in Sweden as this was reviewed separately.

5.2 Profoundly Changed Diets

The following scenarios review hypothetical scenarios where the entire population ate a vegetarian diet, ate based on nutritional recommendations and diets based on only conventional and organic foods to understand how these hypothetical diets could affect the environmental performance of Swedish food consumption.

5.2.1 Vegetarian Diet

This scenario was created to understand the implications of widespread vegetarianism in Sweden. In the scenario, no meat was considered to be consumed, although eggs, fish and milk products remained in the diet[5]. Relative consumption figures take inspiration from work conducted by (Åström et al., 2013). In the aforementioned study, the consumption of root vegetables and beans were roughly 4 times greater than an average diet and vegetables were roughly the same. In order to keep the amount of calories similar to Scenario 0, the following assumptions were made:

- 4x Increase in Soy Products, Beans and Peas
- 3x Increase in Potatoes
- 1.5x Increase in Vegetable Consumption

All other representative food product amounts were kept similar to Scenario 0 for the respective years. See the Appendix for the final amounts of food in the Vegetarian scenarios for 2015 and 2020.

[5] Demi-vegetarianism refers to individual who do not eat meat or poultry, but consume fish, eggs and milk products.

5.2.2 Nutritional Recommendations

The importance of a nutritional diet has become increasingly important for many consumers. A scenario was created to take into account healthy diets and assuming that consumers roughly follow the guidelines from the Swedish Food Agency (Livsmedelsverket).

In this scenario, labelled ***Nutrition***, dietary guidelines from Livsmedelsverket were used. The guidelines are based on the "Nordic Nutritional recommendations 2012;" see Table 11 below for a summary of the recommended daily and weekly consumption figures and the Appendix for values used for yearly consumption.

The recommendations were used to calculate the total consumption (including waste) of food in 2015 and 2020 respectively. When doing so, the calorie count was below the recommended values. Therefore, in order to account for the range of nutritional intake guidelines based on age, sex and activity levels, 130% of the recommended amount was used. As such, the final consumption figures based on values from Livsmedelsverket were used to calculate wastes from production, retail and households, as considered in other scenarios. For food products where there are no guidelines, the amounts per capita and year are kept similar to amounts provided per capita as used in other scenarios. This scenario resulted in a reduced overall food consumption in comparison with that used in the other scenarios; see the Appendix.

Table 11: Recommendations from Livsmedelsverket on Food Consumption given in Amounts per day, week respectively

Foodstuff	Amount
Green vegetables, root vegetables, legumes, fruit and berries	A total of at least 500 grams vegetables and fruit per day
Nuts and seeds	A couple of tablespoons a day (30 grams)
Bread, grains, pasta, rice	about 70 grams per day for women and 90 grams for men upholds.
Dairy products	2-5 dl milk, curdled milk and yoghurt per day, or enriched plant-based drinks
Fish and shellfish	Fish 2-3 times a week, of which one a fatty fish, one portion is about 125 grams.
Meat from cows, pigs, lambs, reindeer and game, and processed meats	No more than in total 500 grams of meat from cows, pigs, lambs, reindeer and game a week

5.3 All Organic vs. All Conventional

In order to show the differences captured for comparing organic and conventional foods, scenarios were created to understand the differences between the two systems. In Scenario ***All ECO***, all outlined consumption of conventional food was replaced with an equivalent amount of organic food in each category (i.e. Swedish and imports). Scenario ***All Conv.*** replaces all organic food in each category with conventional foods.

6 Results

This chapter will outline the results of the study and compare all years and aforementioned scenarios. Section 6.1 provides a review of the implications of the scenarios for the different environmental impact categories compared to 2011 figures. Thereafter, the implications on each environmental impact category are reviewed in the subsequent sections. Further analysis is provided in subsequent sections to review and analyze the impact of the different dietary changes more in depth.

6.1 Comparison for All Scenarios

Table 12 provides a qualitative review of the implications on the environmental impacts for all scenarios. The table illustrates that diets with reduced meat, such as vegetarian diets, may lead to large potential reductions of nearly all environmental impact categories. Nonetheless, results illustrate that an increase in vegetable intake could result in higher human toxicity potential and terrestrial ecotoxicity potential. Diets with increased amounts of organic food, based on the results, provide only slightly reduced climate impacts, and an increase in land use and acidification. Increased organic food production may lead to reductions in toxicity and biodiversity damage. An increase in Swedish food production could lead to reduced acidification and eutrophication potential and slight reductions in global warming potential. Nutritional guidelines, if followed, could lead to large reductions in nearly all environmental impact categories, but an increase in toxicity potential.

Table 12: Review of Potential Impacts Compared to 2011

	GWP	AP	EP	LU	HTP	TETP	BDP
Scenario 0	Slightly Higher	Slightly Higher	Slightly Higher	Slightly Higher	Slightly Higher	Slightly Higher	Slightly Higher
Reduced Meat	Reduced	*2015*-Reduced *2020*-**Largely Reduced**	Reduced	Reduced	Slightly Higher	Slightly Higher	Slightly Lower
ECO	Slightly Higher	Slightly Higher	Slightly Higher	Slightly Higher	Slightly Higher	Slightly Higher	Slightly Higher
Eco Sweden	Slightly Higher	Slightly Higher	Slightly Higher	Slightly Higher	Slightly Higher	Slightly Higher	Slightly Higher
Sweden Increase	Slightly Higher	Reduced	Slightly Lower	Slightly Lower	Slightly Higher	Slightly Higher	Slightly Higher
Veg.	**Largely Reduced**	**Largely Reduced**	**Largely Reduced**	**Largely Reduced**	*2015*-Slightly Higher *2020*-**Largely Increased**	Slightly Higher	**Largely Reduced**
Nutrition	Reduced	**Largely Reduced**	Reduced	Reduced	Slightly Higher	Slightly Higher	*2015*-**Largely Reduced** *2020*-Reduced
All Conv	Slightly Higher	Slightly Higher	Slightly Higher	Slightly Higher	Slightly Higher	Slightly Higher	Slightly Higher
All ECO	*2015*-Slightly Reduced *2020*-Slightly Higher	**Largely Increased**	**Largely Increased**	Increased	Reduced	Reduced	**Largely Reduced**

Slightly Higher (less than 10% increase), Slightly Lower (less than 10% reduction), Increased (10-20% increase), Reduced (10-20% reduction), Largely Increased (More than 20% increase), Largely Reduced (More than 20% reduction).

6.1.1 Global Warming Potential

As illustrated in Figure 8, from Scenario 0 if no dietary change is included, the environmental impacts can increase in 2015 and 2020 due primarily to increasing population and corresponding increase in food consumption.

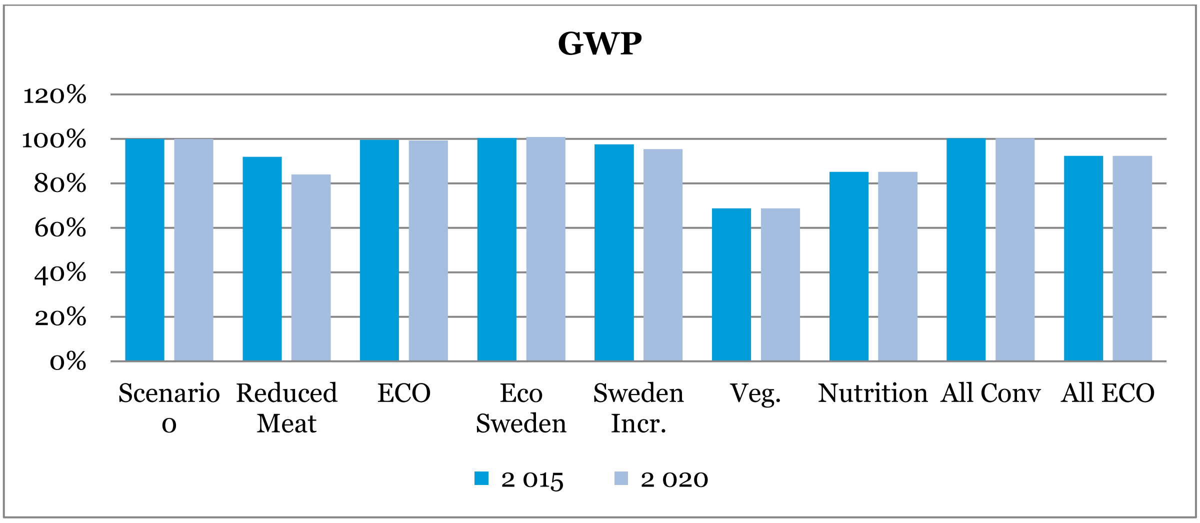

Figure 8: Global Warming Potential for All Scenarios. Normalized to 2011 Values.

Reducing meat consumption could lead to reductions in GWP in 2015 and even larger reductions in 2020. Increasing the organic portion of foods did not lead to large changes compared to Scenario 0. A slight reduction in impacts can be seen when more Swedish food is included in the diet. Vegetarian diets could greatly reduce GWP in both 2015 and 2020. If consumption followed nutritional guidelines, GWP would also be reduced. Finally, results indicate that if all food was from organic sources, this could lead to slight GWP reductions, while all conventional leads to a slight increase.

Table 13: Global Warming Potential for All Scenarios and years (measured in Million Tonnes CO_2-eq. per year)

	2 011	2 015	2 020
Scenario 0	18.8	19.6	20.8
Reduced Meat	-	18.0	17.5
ECO	-	19.5	20.7
Eco Sweden	-	19.7	21.0
Sweden Incr.	-	19.1	19.9
Veg.	-	13.5	14.3
Nutrition	-	16.7	17.8
All Conv	-	19.7	20.9
All ECO	-	18.1	19.3

6.1.2 Acidification Potential

Similar to the GWP results, the acidification potential (AP) is decreased when meat consumption is reduced in 2015 and 2020. If vegetarian diets were followed, this could lead to larger than 50% AP reductions. Increasing organic foods could result in a slight increase in AP. If more Swedish food was produced and consumed this could lead to reduced AP. If all food consumed in Sweden was produced using conventional methods, this may result in a large increase in AP (due to a large share of conventional foods in the market today), but a large increase in AP could be apparent if all food was produced from organic methods; see Figure 9.

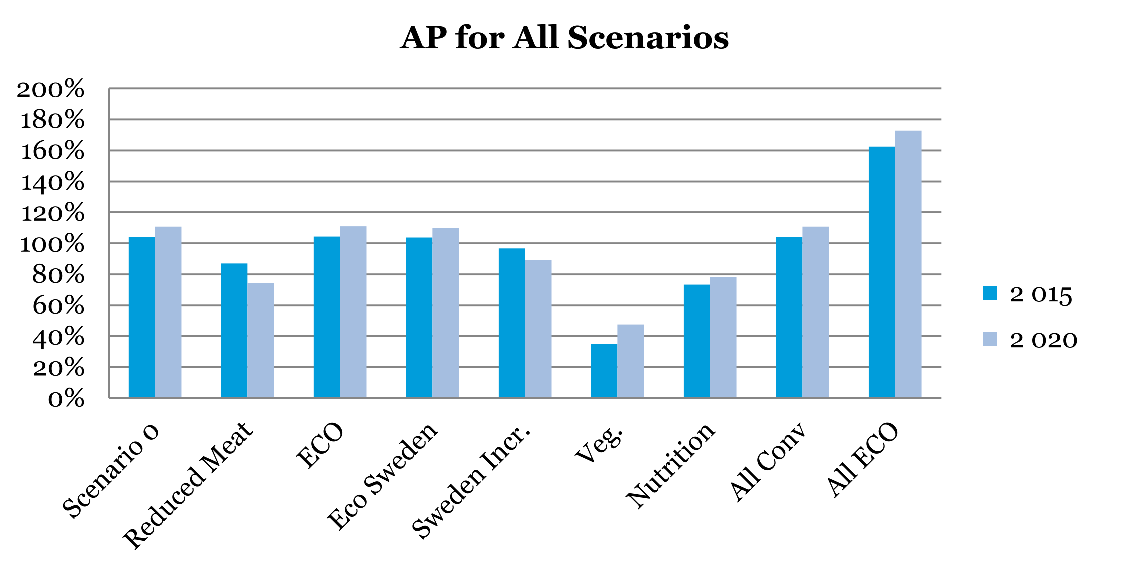

Figure 9: Acidification Potential for All Scenarios. Normalized to 2011 Values.

Table 14: AP for all Scenarios and Years (measured in Million kg SO_2-eq per year)

	2011	2015	2020
Scenario 0	351	366	389
Reduced Meat	-	305	261
ECO	-	366	390
Eco Sweden	-	364	385
Sweden Incr.	-	340	312
Veg.	-	122	130
Nutrition	-	258	274
All Conv	-	365	389
All ECO	-	570	606

6.1.3 Eutrophication Potential

For the EP, the results illustrate that reducing meat (and taking on vegetarian diets) could lead to large EP reductions. Nutritional guidelines may also lead to a reduction in EP, and a slight reduction can be observed if more Swedish food was produced and consumed. Increasing organic food consumption has a slightly higher level of EP than 2011, but lower in comparison to Scenario 0. If all food was produced from organic production methods, this would lead to large EP increases; see Figure 10.

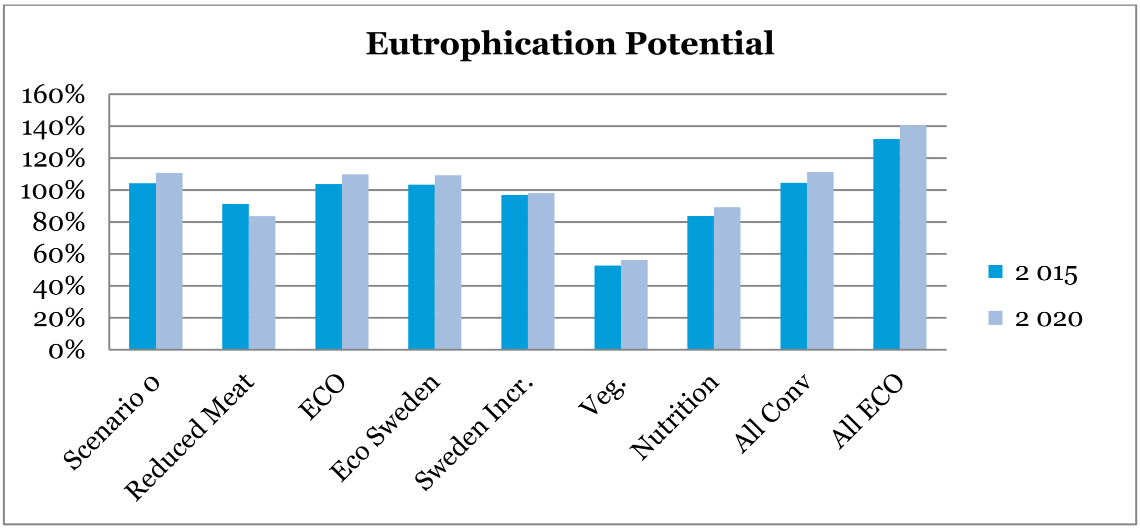

Figure 10: Eutrophication Potential for All Scenarios. Normalized to 2011 Values.

Table 15: EP for all Scenarios and Years (measured in Million kg PO4-eq per year)

	2011	2015	2020
Scenario 0	123	129	137
Reduced Meat	-	113	103
ECO	-	128	136
Eco Sweden	-	128	135
Sweden Incr.	-	120	121
Veg.	-	65	69
Nutrition	-	103	110
All Conv	-	129	137
All ECO	-	163	173

6.1.4 Land Use

The results indicate that land use is decreased if meat consumption is reduced. All scenarios with organic food production lead to increased land use. This is also apparent if all food was produced from organic sources, leading to 20-30% land use increases. Increasing the amount of food from Swedish sources has similar land use to Scenario 0, i.e. no increase.

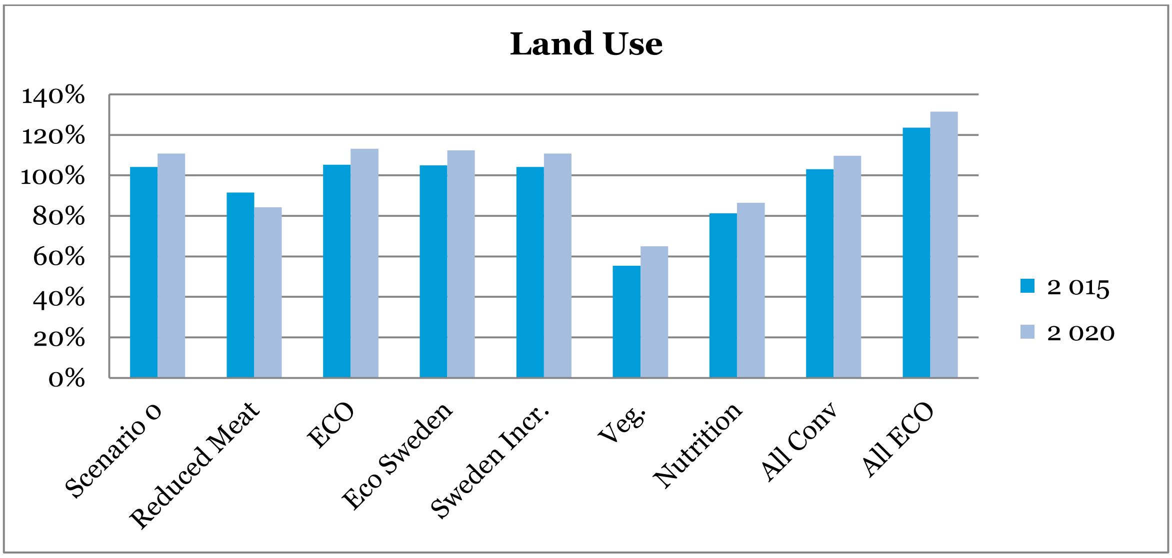

Figure 11: Land Use for All Scenarios. Normalized to 2011 Values.

If vegetarian diets and nutritional guidelines were followed, this would lead to large land use reductions, roughly 30-40% and 15-20% reductions respectively; see Figure 11.

Table 16: Land Use for all Scenarios and Years (measured in 100 thousand hectares occupied per year)

	2 011	2 015	2 020
Scenario 0	47	48	52
Reduced Meat	-	43	39
ECO	-	49	53
Eco Sweden	-	49	52
Sweden Incr.	-	48	52
Veg.	-	26	30
Nutrition	-	38	40
All Conv	-	48	51
All ECO	-	58	61

6.1.5 Toxicity

Terrestrial ecotoxicity potential is significantly reduced only if all foods are produced from organic sources. There is a slight increase in TETP when all food is produced using conventional practices and when vegetarian diets are followed. There are slight reductions if nutritional guidelines are followed. Results for other scenarios illustrated only slight reductions of TETP; see Figure 12.

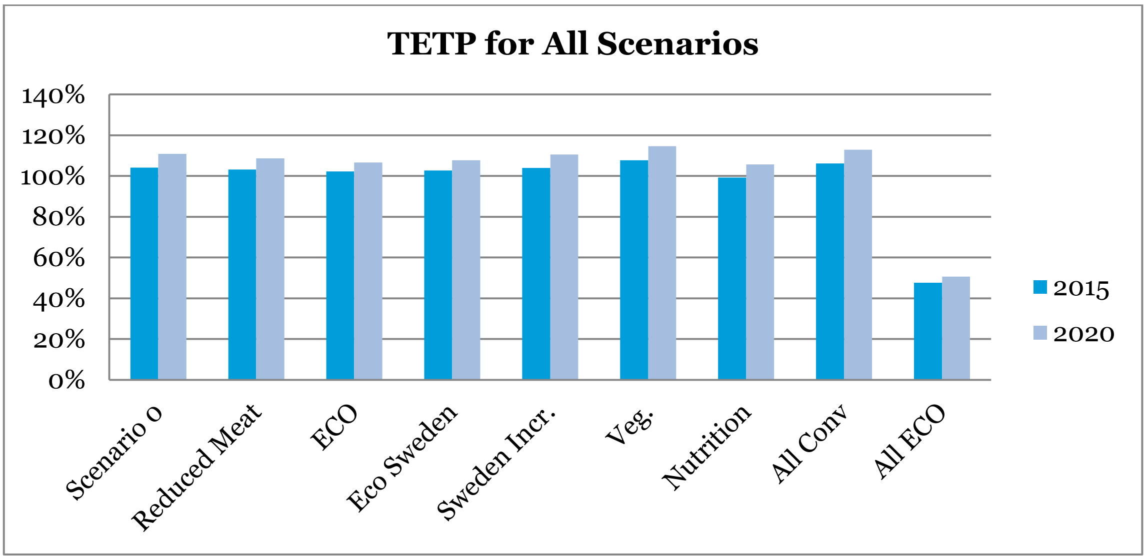

Figure 12: TETP for All Scenarios. Normalized to 2011 Values.

Table 17: TETP for all Scenarios and Years (measured in Million kg 1,4 DCB-eq per year)

	2011	2015	2020
Scenario 0	634	660	703
Reduced Meat	-	654	689
ECO	-	648	676
Eco Sweden	-	651	683
Sweden Incr.	-	659	701
Veg.	-	683	726
Nutrition	-	629	670
All Conv	-	673	716
All ECO	-	302	321

Similar to the results of TETP, human toxicity potential (HTP) shows significant reductions only in scenarios following nutritional guidelines and where all food is produced organically. An increase in HTP can be seen if vegetarian diets are followed; see Figure 13.

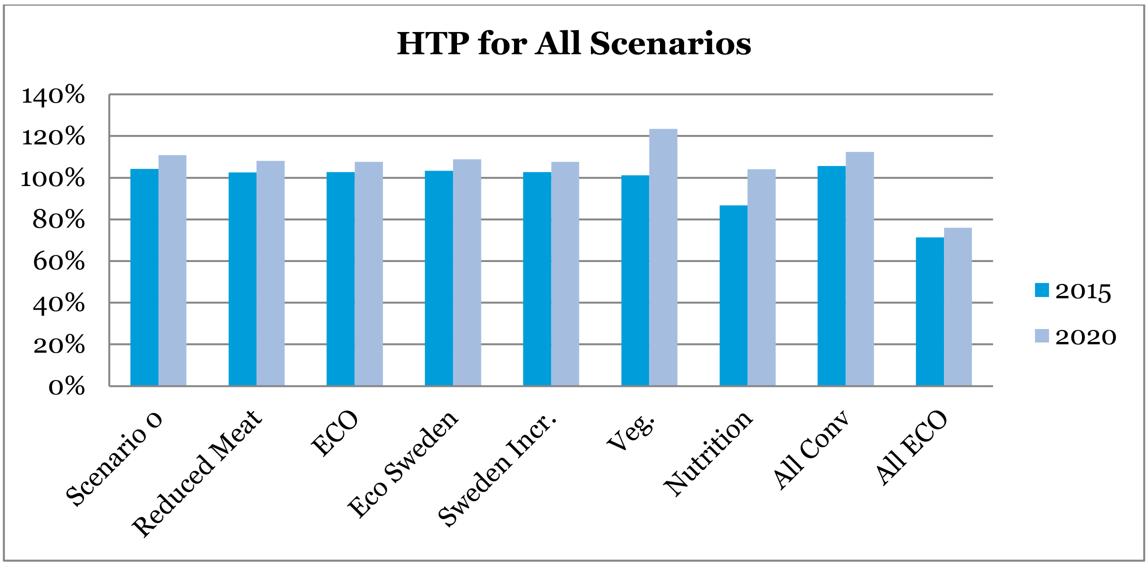

Figure 13: HTP for All Scenarios. Normalized to 2011 Values.

Table 18: HTP for all Scenarios and Years (measured in Million kg 1,4 DCB-eq per year)

	2011	2015	2020
Scenario 0	2 240	2 330	2 479
Reduced Meat	-	2 295	2 417
ECO	-	2 296	2 408
Eco Sweden	-	2 309	2 435
Sweden Incr.	-	2 298	2 408
Veg.	-	2 263	2 762
Nutrition	-	1 939	2 328
All Conv	-	2 363	2 515
All ECO	-	1 595	1 697

6.1.6 Screening of Biodiversity

Significant reductions in biodiversity damage potential (BDP) are possible if meat consumption is reduced through the scenarios on reduced meat and vegetarian diets. Similar results can be found in the Nutrition scenario and if all food consumed in Sweden is produced organically. If all food consumed in Sweden is produced using conventional methods, this would result in a slight increase in BDP. The remaining scenarios have slight reductions of BDP, but not significant; see Figure 14.

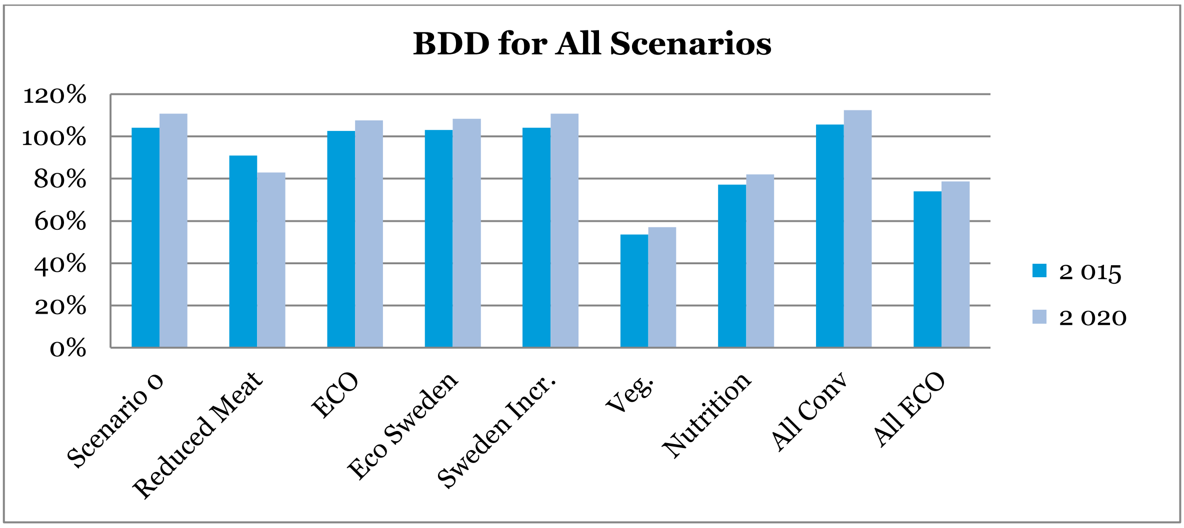

Figure 14: Biodiversity Damage Potential for All Scenarios. Normalized to 2011 Values.

Table 19: BDP for all Scenarios and Years (measured in biodiversity damage per year)

	2 011	2 015	2 020
Scenario 0	3.18E+06	3.31E+06	3.52E+06
Reduced Meat	-	2.89E+06	2.63E+06
ECO	-	3.26E+06	3.42E+06
Eco Sweden	-	3.27E+06	3.44E+06
Sweden Incr.	-	3.31E+06	3.52E+06
Veg.	-	1.70E+06	1.81E+06
Nutrition	-	2.45E+06	2.61E+06
All Conv	-	3.36E+06	3.57E+06
All ECO	-	2.35E+06	2.50E+06

7 Analysis

The following sections provide an analysis of the results for the different dietary considerations addressed in the aims of the study.

7.1.1 Increased Organic Food Consumption

When comparing the scenarios with increased organic food, a slight reduction of GWP impacts is apparent when more organic food is consumed. However, the reduction is not that large. From Figure 8, when comparing Scenario 0 with All Conventional food, a large difference in GWP is not apparent. This is due primarily to the fact that a large share of current food consumption is from conventional farming practices; see Table 20. Furthermore, the GWP data for organic and conventional foods does not vary largely. In some cases organic foods have less GWP than conventional, but in others they may have slightly higher values for GWP.

Table 20: Share of Food from Organic and Conventional Foods in 2015 and 2020

	2015		2020	
	Organic	Conventional	Organic	Conventional
Scenario 0	5%	95%	5%	95%
ECO	10%	90%	15%	85%
Eco Sweden	8%	92%	12%	88%
All Conv	0%	100%	0%	100%
All ECO	100%	0%	100%	0%

Figure 15 provides a review of all impact categories assessed for different scenarios related to organic food production for the years 2015 and 2020. It is apparent that increases of organic food consumption in 2015 and 2020 respectively may lead to reductions in all impact categories compared to Scenario 0, except for Acidification Potential and Land Use, which would result in slight increases.

In the scenarios for 2015 and 2020 with only organic food (All ECO) consumption the result would be a reduction in GWP, large increase in AP, EP and LU, and large decrease in TETP, HTP and BDP.

In general, the scenarios with increased organic food (ECO and Eco Sweden) do not lead to significant changes of environmental impact potentials. Only when all food consumption is assumed to come from organic food can we see a large change of environmental impacts as aforementioned.

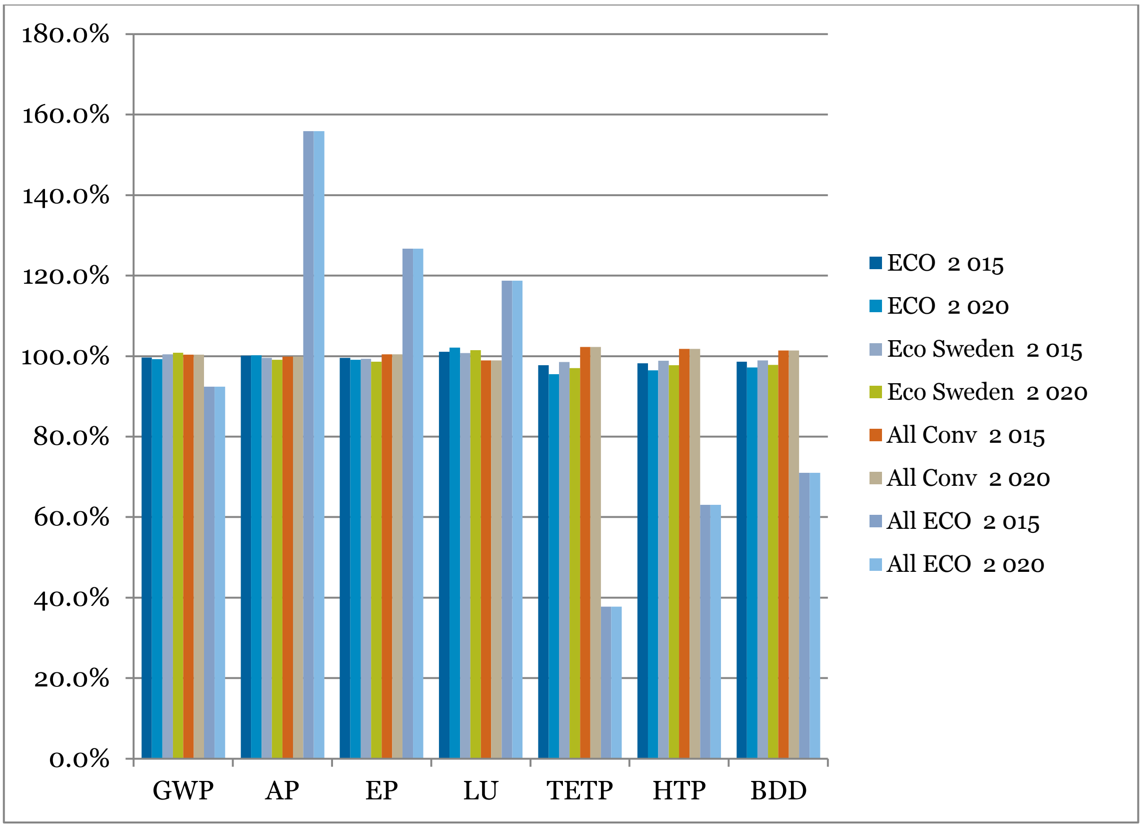

Figure 15: Comparison of the changes in potential impacts for all scenarios related to organic food production compared to each respective Scenario 0

In all scenarios with increased organic food production, land use is increased. This is plausible, as data available for organic food production generally outlines less productivity for organic methods; see for e.g. statistics on harvests for Swedish organic versus conventional crops (Jordbruksverket, 2014a). Assuming that all organic food was produced in intensive systems, the reduction of BDP would not be as great.

7.1.2 Reducing Meat Consumption

Figure 16 provides an illustration of the different impact categories reviewed in this report for the scenarios with reduced food consumption. As illustrated in Figure 16, the reduction of foods such as meat, dietary considerations and vegetarian diets may lead to large reductions of GWP. Nonetheless, the implications of the diets are not only related to climate impacts. For example, from Figure 16 vegetarian diets may lead to increased TETP and HTP. Other than toxicity, vegetarian diets lead to large reductions of other potential impacts.

Upon further analysis, the increase of toxicity potential illustrated in scenarios with reduced meat consumption was found to be a result of the prevalence of certain metals. Reviewing food products in the categories with large toxicity potential, i.e. cereals and vegetable oils, wheat and rapeseed oil were analyzed further to understand the origin of the toxicity potential. It was found that the largest impacts for toxicity, both human and terrestrial ecotoxicity, originate once again from metals such as chromium and cypermethrin (as found in insecticides). The exposure and emission of chromium adding to human toxicity potential originated primarily from machinery used for agricultural purposes and fertilizer production. For terrestrial ecotoxicity potential, as seen in both rapeseed oil and wheat, cypermethrin originated once again from agricultural production practices and fertilizer production.

In general, the impact potential for the different impact categories of the reduced meat scenario in 2020 are similar to the nutrition guideline scenarios. This is due to the fact that the reduced meat scenario in 2020 includes a 50% reduction in meat, which is similar to the reduction for dietary guidelines.

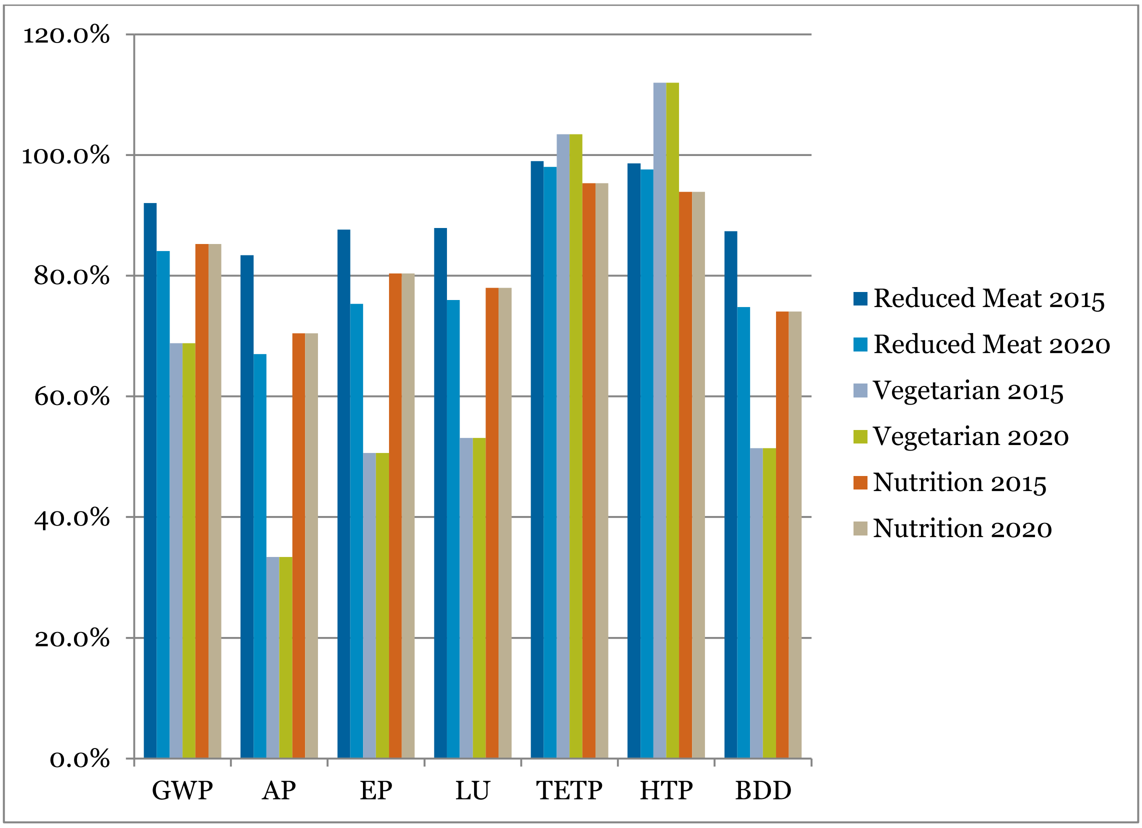

Figure 16: Comparison of the changes in potential impacts for all scenarios related to reduced food consumption (e.g. meat and other guidelines) compared to each respective Scenario 0

7.1.3 Where do the emissions occur?

As imports of food to Sweden have increased in recent years, it is interesting to also understand where the potential impacts occur. Table 21 provides a review of the origins of the foods consumed in Sweden for all scenarios. Currently around 60% of the food consumed in Sweden originates from Sweden. In order to assess and compare impacts of imported and domestic foods, the scenario focused on increasing Swedish foods was included.

Table 21: Amount of food consumed from Sweden and Abroad for different Scenarios

	2015		2020	
	Sweden	*Import*	*Sweden*	*Import*
Scenario 0	62%	38%	62%	38%
Reduced Meat	61%	39%	61%	39%
ECO	62%	38%	62%	38%
Eco Sweden	62%	38%	62%	38%
Sweden Incr.	71%	29%	73%	27%
Veg	61%	39%	61%	39%
Nutrition	53%	47%	53%	47%
All Conv	62%	38%	62%	38%

While Swedish foods made up roughly 60% of foods consumed in Sweden in many of the scenarios, they accounted for only roughly 40% of the GWP. This is due primarily to the data pointing to less impact for Swedish products compared with imported counterparts. Nonetheless, as GWP is not a local impact, it important to review the potential impacts the scenarios may have both abroad and in Sweden for the foods consumed in Sweden.

Table 22: GWP Contribution from Swedish and Imported Foods

	2 015		2 020	
	Sweden	Import	Sweden	Import
Scenario 0	41%	59%	41%	59%
Reduced Meat	41%	59%	41%	59%
ECO	42%	58%	42%	58%
Eco Sweden	42%	58%	42%	58%
Sweden Incr.	47%	53%	54%	46%
Veg	40%	60%	40%	60%
Nutrition	37%	63%	37%	63%
All Conv	41%	59%	41%	59%
All ECO	49%	51%	49%	51%

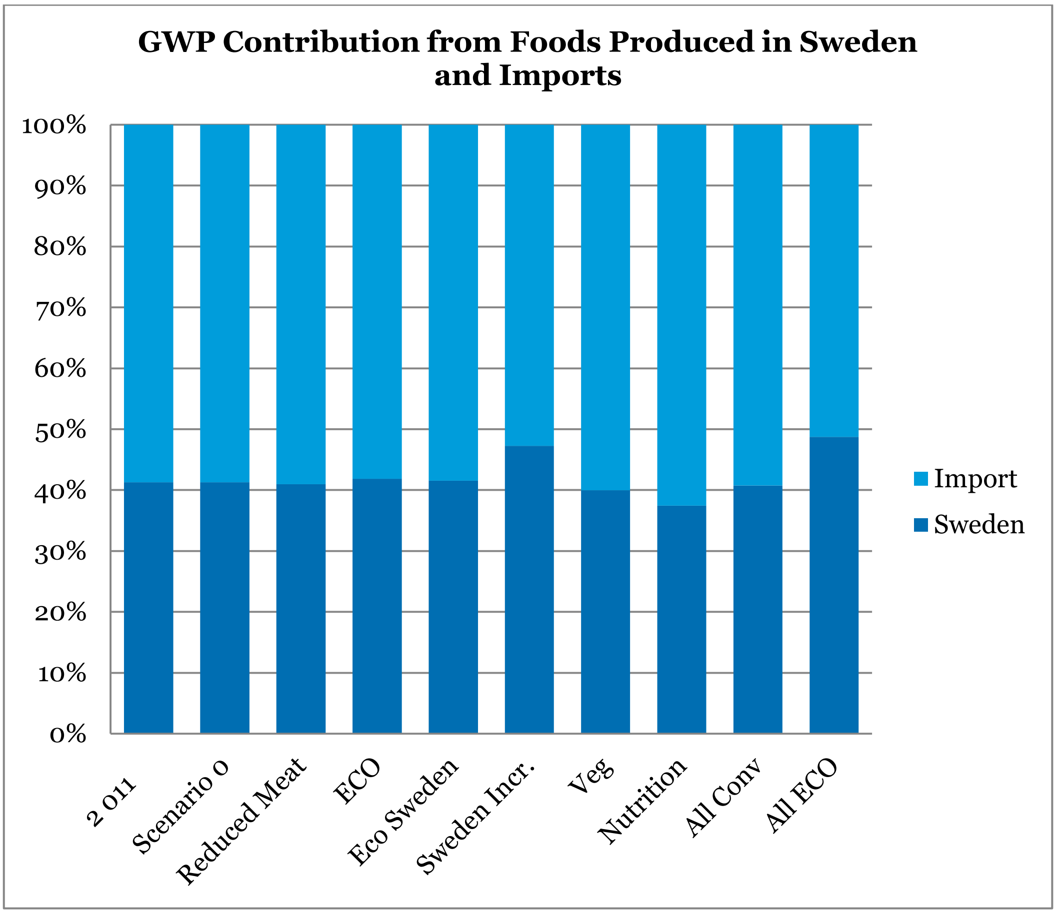

Figure 17: Contribution to GWP from Imports and Swedish Produced Food

Swedish food products contributed to roughly 40% of GWP. Similar values are found for acidification and eutrophication potential. Other impact categories showed roughly 60% of potential impacts in Sweden; see Appendix. This is much closer to the actual consumption figures, where roughly 60% of foods originate in Sweden.

7.1.4 Contribution of Different Food Products

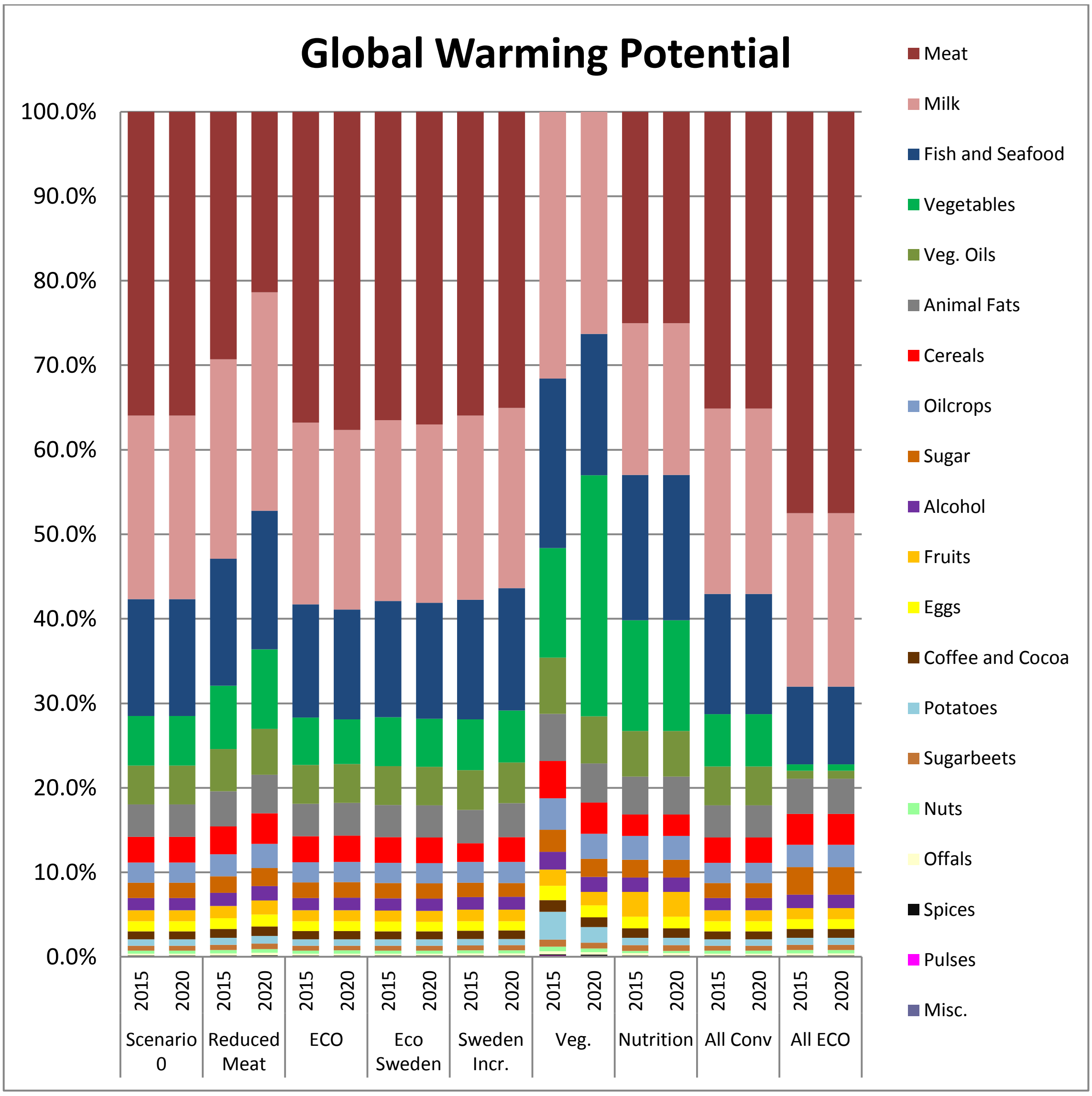

Figure 18: GWP Contribution for different foods in 2015 and 2020

Figure 19 illustrates the contributions of different RFPs to the environmental impact categories of Scenario 0 in 2015. For all scenarios, except for vegetarian scenarios, the consumption of different meats, primarily beef, has the largest share of GWP. This is followed by the production of milk, fish and seafood, vegetables and vegetable oils. Together the aforementioned RFPs account for more than 80% of the GWP.

In the Appendix, a review of the contribution of different foods to the impact categories is provided. In the figures, it is possible to see how the different diets may change the contribution of certain foods to the impact category reviewed.

Acidification potential, eutrophication potential and land use also have large impact potential from meat and dairy products, although other RFPs also contribute. For AP, meat and milk, vegetables and animal fats contribute to over 80% of the AP. The largest contribution comes once again from meat and milk for all scenarios. For EP, meat, milk and eggs, fruit and vegetables contribute to over 80% of the EP. Meat, milk and eggs make up for the largest contribution. For LU, the groups Meat, Milk, Cereals, Coffee and Cocoa contribute to over 80% of the Land use. Once again, meat and milk make up the largest contribution to land use.

Toxicity, unlike the other impact categories, is not dominated by animal based products. For the TETP, the largest potential is from Oilcrops, Vegetable Oils and Cereals which have roughly 25-28% of the TETP each. For HTP, the largest potential comes from Cereals, Animal Fats, Oilcrops, Alcoholic beverages, Vegetable Oils, Starchy Roots and Sugars. The largest HTP comes from cereals. In the vegetarian scenarios, which had a large increase in toxicity potential, as mentioned in the previous section, the contribution from vegetable sources led to this increase. For example, an increased consumption of potatoes increased the HTP contribution from potatoes from an original value of roughly 6 percent in all other scenarios to roughly 16 percent. Additionally, in the vegetarian and dietary consideration scenarios, the contribution from vegetables is larger than other scenarios. But this increase in toxicity does not necessarily mean that the impact is detrimental to humans and ecosystems. The results, compared with 2011 and 2015 levels were higher, but no guidelines on what is acceptable can be found. Figures on the contribution of different foods are available in the Appendix.

The biodiversity damage potential has over 80% contribution from Meat, Cereals, Milk, Sugar and Oilcrops. The BDP is dominated by meat production with over 50% of the contribution (i.e. in scenarios including meat consumption). In the vegetarian scenarios, the largest biodiversity damage potential comes from cereals, milk, sugar and oil crops.

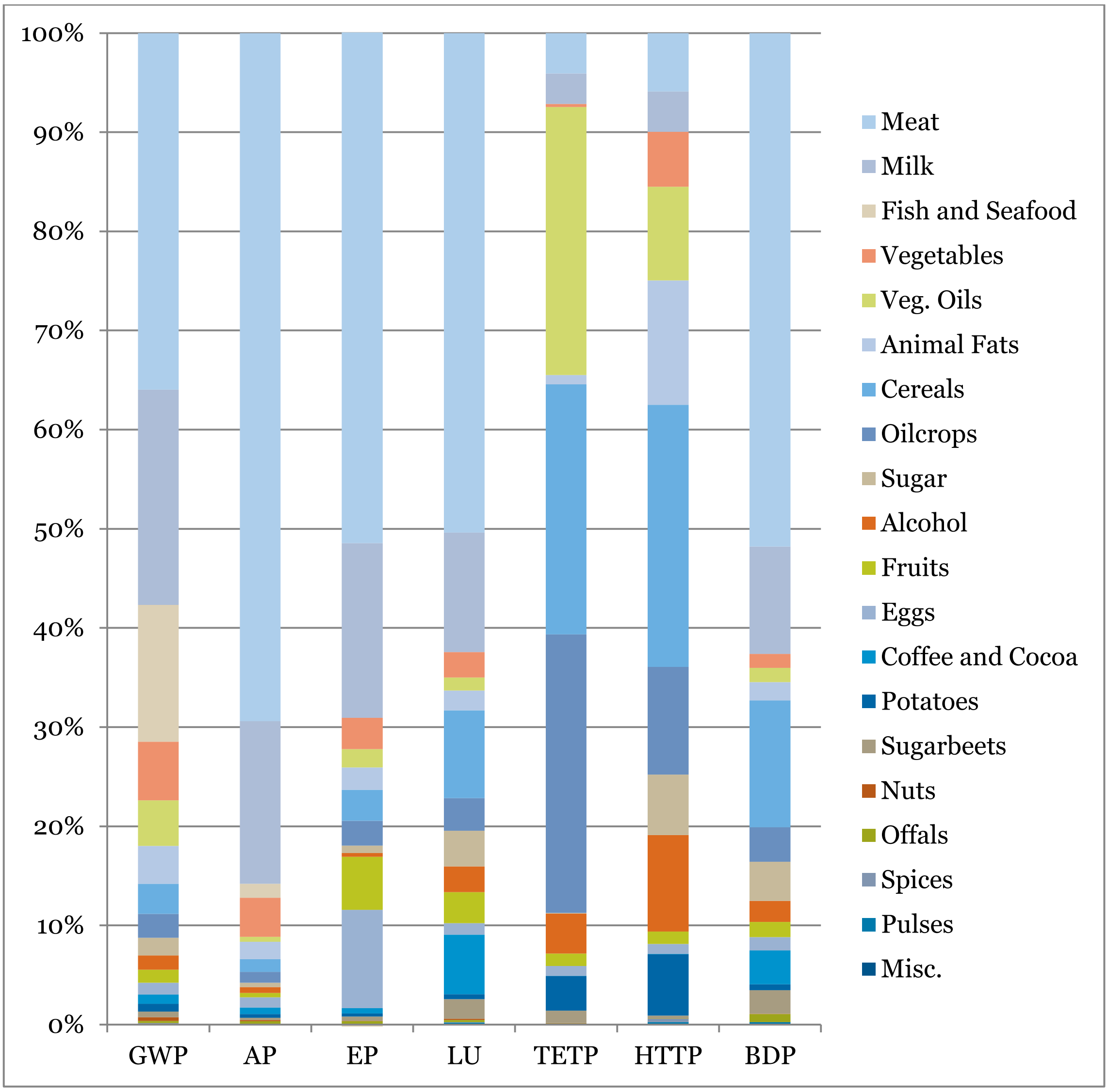

Figure 19: Contributions of different food products to potential for different environmental impact categories for Scenario 0 in 2015

8 Discussion

The results of this study have outlined that food consumption in Sweden in 2015 accounts for roughly 188 million tonnes of CO2-eq emissions per year. This results in roughly 2 tonnes of CO2-eq emissions per capita annually. Similar results are found in Röös et al. (2015) for Sweden and in Martin et al. (2015a) for Europe, where roughly 20-30% of per capita emissions originate from food production.

The scenarios outline dietary choices based on available choices to current consumers and provide the environmental implications of these choices. By no means can the results be used to choose the "best" diet, but only illustrate potential impacts (and a broader range than presented in other studies) associated with different types of food. Several of the scenarios provide small changes in current consumption patterns, although others provide radical changes. Despite the potential for environmental impact reductions, there are many obstacles to both implementing changes toward more sustainable diets. The following sections will provide a discussion of the implications that dietary choices may have and review different insights from literature on the subject.

8.1 Meeting Targets and Shifting Burdens

Results from this study suggest that food products with a large share of greenhouse gas emissions generally have large potential impacts in other environmental impact categories reviewed as well; see the results for animal based products. Similar results in previous studies find that carbon impacts may serve as an indication for other impact categories; see (Röös et al., 2013). Nonetheless, this is not applicable when reviewing toxicity potential.

While animal based production consumption leads to large potential impacts in all other categories, the impact on human toxicity and terrestrial ecotoxicity are low in comparison to agricultural based foods, e.g. cereals, and oils. Nonetheless, vegetarian diets with an increased amount of organic foods may further improve upon the toxicity potential by removing conventionally produced products and removing pesticides. (See next sections for more discussion on toxicity assessments in LCA).

There is a large body of literature available reviewing the greenhouse gas emissions of food production and consumption. Again, those papers concerned with assessing consumption impacts generally address a limited set of impact categories, typically climate impacts. While carbon emissions and energy use continue to be apparent in policy, Martin et al. (2015b) and (Jordbruksverket, 2013) discuss that a focus on carbon emissions in policy may lead to a sub-optimization of production systems. As Röös et al (2013) suggest, this violates the principles of LCA, although its use has become a proxy for environmental impacts and may serve as an important indicator of environmental pressure.

8.2 Organic vs. Conventional Foods

This study investigated increasing the amount of organic food consumed in Sweden and the implications it would have on the environmental impacts. Results show that the global warming potential for a food system with increased share of organic foods can increase compared to Scenario 0. Previous studies have typically reviewed the impact of conventional and organic food production methods on a comparative basis per food product (Bengtsson et al., 2005; Meier et al., 2015; Tuomisto et al., 2012). While these provide interesting results to compare different food products, there is no consensus that organic production methods result in reductions of environmental impacts across all impact categories. Furthermore, it is important that the aggregate impacts for consumption and diets are reviewed to find how the consumption of a combination of foods contributes to environmental impacts.

This study has shown that organic production may lead to many environmental impact reductions. Toxicity potential, both terrestrial and human toxicity potential, could potentially be reduced if more organic food was consumed and produced both in Sweden and abroad. In a review of available literature on LCAs of organic and conventional products, Meier et al. (2015) find similar results with reductions in toxicity generally quite high for organic products. Previous clinical trials, limited to one family over a period of a month, have also shown toxicity, in the form of pesticides, to be significantly reduced in individuals eating only organic food[6]. Despite the higher levels of pesticides and toxicity associated with conventional products, Winter and Katz (2011) assert that conventional foods pose negligible risks to consumers and organic foods have no appreciable reduced risks. Nonetheless, there are many studies questioning the “safe” levels for humans and the environment; see e.g. (Castorina and Woodruff, 2003)

Results from the scenarios also indicate that organic foods may lead to reduced biodiversity damage. Although the results on biodiversity damage potential are not as robust as other impact categories provided in this report, as they do not follow the CML LCIA methodology and were provided and based on work by (Röös et al., 2015), the results agree with the meta-analysis conducted by (Bengtsson et al., 2005). The study outlines an overall species richness of 30% or more in organic production landscapes. Bengtsson et al. (2005) suggest that shifting from conventional to organic practices have the largest effect in intensive production landscapes as opposed to small scale landscapes with diverse biotopes. The said study also outlines potential enhancement of insect predators and soil fauna in organic production practices, with little evidence of larger quantities of pests.

In this study, organic foods were shown to increase land use, which is also present in other studies (Meier et al., 2015); see also harvest statistics for Swedish organic and conventional crops (Jordbruksverket, 2014a). Once again this is due to lower harvests from organic production processes per hectare, thus the benefits of organic food may not be entirely transparent when using a functional unit of kg of food when comparing

[6] The Organic Effect. Available at : http://www.ivl.se/english/startpage/pages/consulting/chemicals/the-organic-effect-for-coop.html

with conventional products. Fraser et al. (In Press) also discuss the importance of providing sustenance to the growing population worldwide, which may put pressure on less efficient production systems and promote conventional practices with enhanced biotechnologies to ensure larger yields for future generations.

Studies on the potential for environmental improvements from organic production systems are limited. Meier et al. (2015) found difficulties in drawing conclusions on environmental performance of the different systems due to the fact that there is no transparent differentiation of characteristics in the data used for the modelled systems. In another study, Tuomisto et al. (2012) found similar results. In general they also concluded that organic farms may have higher soil organic matter content and lower nutrient losses, but when reviewed from a per product unit perspective, may lead to higher land use, eutrophication potential and acidification potential. Accordingly, Meier et al. (2015) found that GHG emissions per unit area of organic products were often less than conventional product.

Despite the lack of consensus, the emergence of organic foods has been key to bring about a debate on sustainable food production and consumption (Klintman and Boström, 2012; Vittersø and Tangeland, 2015). Many consumers have chosen to consume more organic food, as they feel that the products provide many benefits to the environment and their health (Aertsens et al., 2009; Huber et al., 2011; Magnusson et al., 2001). While there are many studies outlining the health benefits of eating organic foods, there is insufficient evidence to support comparisons (Huber et al., 2011).

One of the largest obstacles to overcome is the relative price, as consumers find the high costs for organic foods are not reasonable (Padel and Foster, 2005). Aertsens et al. (2009) suggest that with increased purchases of organic food, the economy-of-scale will ultimately result in reduced prices of organic foods. However, some researchers suggest that this will result in intensive scale organic production, and with labelling systems already contested due to a lack of controls and a large array of materials permissible, this may undermine the purpose of organic production systems (Fraser et al., In Press). In studies on Swedish consumers' willingness to purchase organic foods, the majority of consumers indicated a positive attitude toward purchasing organic foods. Nonetheless, a very small percentage of respondents stated that it is very likely that they will choose organic varieties of milk and potatoes the next time they buy these types of products. Corresponding figures for meat and bread were 8 per cent and 4 per cent respectively (Magnusson et al., 2001; Magnusson et al., 2003). The authors found that women and university educated consumers were more likely to purchase organic food. Tobler et al. (2011) found that consumers were unwilling to purchase organic food and reduce meat consumption, with more precedence given to eating seasonal products. They associated reduced packaging having the strongest environmental impact reduction potential with organic foods and meat reduction being the lowest. As such, research suggests that consumers are not knowledge on exactly what "organic" entails (Zander et al., 2015; Zanoli et al., 2007). Alternative products, such as organic and fair trade, are usually more expensive. This may result in a negative rebound effect, i.e. reducing the overall amount of products bought by the consumer (Hertwich and Katzmayr, 2003)

Nonetheless, as outlined in work by Jordbruksverket (2015) and other reports by (Ekoweb, 2015), the consumption of organic foods has increased dramatically in the past decade since Manusson et al (2001) published the results. This can possibly be due to the promotion of organic foods by many retailers, the increasing variety and selection of organic foods available and the purchasing power of consumers in the developed world (Aertsens et al., 2009; Padel and Foster, 2005). Europe and North America currently constitute more than 90% of the organic market; both regions of which have large purchasing power to help promote organic and regional foods in the future (Aertsens et al., 2009; Sahota, 2009).

8.3 Regional Food

The results show a reduction of many impacts when consumption of regional foods (i.e. Swedish foods) is increased. This is consistent with available LCI data available for Swedish foods; see Appendix. Nonetheless, some products are assumed to be similar to French and European products when no data was available.

When reviewing the consumption of vegetables consumed from greenhouses, Röös and Karlsson (2013) found reductions in many impact categories possible from Swedish foods, due primarily due to the large share of renewable energy in greenhouses in Sweden. As Röös and Karlsson (2013) illustrate, Swedish consumers generally consume more greenhouse based vegetables annually than those produced from conventional farming practices. As shown in the origin of the different food products, many of these come from greenhouses abroad, thus putting a limit to the potential for eating seasonal and regional foods. Nonetheless, further details on the origins of the foods and e.g. where they are grown were not reviewed in this report; which would provide more detail to the type, methods, etc. reviewed. Katz and Winter (2009) also emphasize the importance of the origins of foods in order to identify impacts related to production methods.

In a report to the Swedish National Food Agency, Lagerberg Fogelberg (2013) discusses the possibility to reduce impacts from Swedish products such as e.g. meats and dairy products by increased use of regional feed. This may be a promising strategy, as the LCI data collection in this study identified Swedish grains (e.g. wheat) to have significantly less contribution of GWP, Acidification and Eutrophication compared to imported grains.

Despite the importance of transitioning to sustainable diets, supporting Swedish production of foods may support regional economies. Recent turbulence the Swedish dairy industry has raised debate on not only the origin, but also price for products. Consumers have supported initiatives to pay more for Swedish milk in order to support regional dairy farmers; which has seen a large decline in the number of farms and farmers in recent years (LRF-Mjölk, 2015). Similar results have been found in studies abroad where consumers preferentially purchase local foods to benefit the local economy (Edwards-Jones et al., 2008). Swedish consumers, similar to results from Ohio in the USA (Darby et al. (2008), found that consumers were more willing to purchase strawberries from the regions, due to the “local grown” and were willing to pay much more for the local variety[7][8]. There are a number of reasons consumers choose local food. These include reducing corporate control of food systems, empowering producers and consumers in local systems, improving diversity, and improving the health and long term sustainability of local communities offering a local "food sovereignty," (Fraser et al., In Press).

Fraser et al. (In Press), through a meta-analysis of literature on developing local food systems, conclude that long-term sustainability of the systems is enhanced. Other than consumers, public procurement of foods from e.g. municipalities may have large implications. Many municipalities have prioritized the use of regional food (either from the surrounding area or other areas in Sweden) in e.g. schools and other large cafeterias in order to improve regional economies and reduce environmental impacts.

8.4 Reducing Meat Consumption

As discussed previously, many studies have outlined how environmental impacts can be reduced through reductions in meat consumption. Meat consumption is often targeted as a prominent cause of many environmental impacts. This study has provided further justification of results in previous assessments of potential impact reductions through reductions in meat consumption; see e.g. studies focusing on global warming potential (Hallström et al., 2015; Jordbruksverket, 2013; Röös et al., 2013; Westhoek et al., 2014; Åström et al., 2013) and other impacts such as biodiversity, land and water use (Machovina et al., 2015; Martin et al., 2015a; Röös et al., 2015). Nonetheless, this study provides new insights into toxicity potential from meat consumption.

Many previous studies have shown the effects of vegetarian diets for reducing climate impacts (Berners-Lee et al., 2012; Risku-Norjaa et al., 2009; Vieux et al., 2012; Vieux et al., 2013). Nonetheless, the studies do not review impact categories other than climate change, risking providing guidance that sub-optimizes choices (Martin et al., 2015b). Jordbruksverket Jordbruksverket (2013) review many of the positive environmental impacts of meat production which may not be reviewed in studies based on climate change. These include e.g. biodiversity, preserving landscapes and even socio-economic impacts of meat production.

Results also indicate higher toxicity in diets with more vegetable based products and less meat. When reviewing the LCI data many vegetable products contribute to toxicity potential per kg of product. Accordingly, Finley and Davis (1999) discuss the potential toxicity of vegetarian diets due to increased manganese intake. Gibson (1994) associate increased levels of Mg, in addition to selenium and copper, from increased intake of cereals.

In the LCA community, the development of toxicity assessment models has led to some consensus on the limitations of their use of characterization factors in addition to fate and effect modelling (Hauschild et al., 2008). Despite this, the issue of toxicity, and the

[7] http://www.dn.se/nyheter/sverige/midsommarmaten-i-fara-jordgubbar-och-farskpotatis-hotade/

[8] http://www.dn.se/nyheter/sverige/utlandska-jordgubbar-saljs-som-svenska/

overall dominance of certain metals, has perplexed LCA researchers the past decade. Several studies have shown that metals such as chromium dominate the toxicity assessments of different products (Haye et al., 2007; Plouffe et al., 2015). Nonetheless, there is poor agreement between different methods on the toxic impacts of metals (Pizzol et al., 2011). The validity of different methods, such as the USES-LCA method as applied in this study, has therefore been questioned, although no consensus for the different fate and effect and characterization factors among different methods has been reached (Plouffe et al., 2015). For more information on the differences between ecological toxicity and human toxicity assessment methods in LCA, see an extensive review provided by Pizzol et al. (2011) and Plouffe et al. (2015).

The toxicity level increases are only relative to 2011 consumption figures and there is no consensus on the risk that current toxicity levels, or an increase, may have. Therefore, uncertainty in the toxicity assessments provided in this report must be stressed. Vegetarian diets, despite potential for increased toxicity, have the potential to reduce many environmental impacts as shown in this study. Furthermore, the data for vegetarian diets is based on current consumption; vegetarians may consume more organic foods, which may also reduce toxicity levels although this was not taken into account.

Customers may also choose not to eat meat, regardless of the environmental impact. Many perspectives can be reviewed, such as the ecological, ethical and emotional effect of meat consumption (Vinnari and Tapio, 2012). Nevertheless, meat consumption, and potential reductions, is a complex issue to tackle. Besides the environmental impacts, the consumption of meat has both positive and negative nutritional attributes; being a rich source of high quality protein and nutrients, while also associated with increased risks for a number of diseases (Macdiarmid et al., 2016). Previous research neglects to review the social and cultural aspects of meat consumption, which may make it hard to reduce in certain cultures and countries (Macdiarmid et al., 2016).

Consumers will ultimately have to tackle the challenge, which may be difficult as many retailers have used meat to entice customers to supermarkets. Tjärnemo and Södahl (2015) suggest that the meat department of a supermarket is what sets different stores apart and may provide competitive advantages. Swedish supermarkets also obtain a large share of their economic returns from meat sales. Swedish retailers may be confronted with a complex economic conflict. On one hand they are aware of the environmental impacts that may occur from meat consumption, but meat has become a product to entice customers to shop at their stores; with minced meat in the forefront (Tjärnemo and Södahl, 2015).

8.5 Data Variability and Assessment Methods of Agricultural Processes

The results provided are based on LCIA methods and data available for the foods consumed in Sweden. Many assumptions were made in this study in order to e.g. find foods which were representative of Swedish conditions. In many cases, European averages (Ecoinvent, 2014)and French data was used (Colomb et al., 2015). When assessing the impacts of different regions, it may not be entirely representative of environmental impacts for different regions and foods. This can be improved by developing more representative data.

Furthermore, the study did not model or produce data for different foods or impact categories, but relied on available data in the literature. A large uncertainty can be identified in the assessment (labelled “screening”) of biodiversity damage potential. Figures were based on a study by Röös et al (2015). While these may be robust in the aforementioned study, their use in this study may not be representative of Swedish and organic conditions and improvements in both data availability and methods may be needed in the future to provide more transparent and robust data for biodiversity damage potential. This is similar for toxicity potential assessment methods, as aforementioned.

Variability of data available to assess the impact of dietary choices is a significant limitation to studies such as this. While LCA of food continues to advance, there are many data gaps and limitations. These limitations once again include:

- LCI data for foods
- LCI specific for Swedish conditions
- Statistical data on country of origin for the different foods
- Statistics on organic amounts

Meijer et al. (2015) also recognize the limitations in data, and provide a review of data variability for many conventional and organic food products and impact categories; some of which have large variance.

In 2016, a collaboration of many food producers and consultants led to a new LCI database on food production systems to be included in the Ecoinvent database. The *World Food LCA database* will become available sometime in 2016, which may alleviate the problems and provide more transparency. Nonetheless, the datasets included cover only conventional production practices, and are not representative of all countries. Despite this, it is a step toward providing more transparency and availability for researchers.

In the analysis, the impacts for different regions were reviewed, i.e. based on Swedish and imports. However, the results are not computed for each region separately as the LCIA methods applied are based on global averages. In order to provide more detail, LCIA methods with more regional transparency may be needed to assess impacts and provide characterization factors which are spatially explicit (Martin et al., 2015b). This is important as environmental impacts have local implications on, e.g. acidification, eutrophication, biodiversity damage, etc.; see e.g. discussions on the implications of regional impacts and impact categories (Curran et al., 2011a; Curran et al., 2011b; Finnveden and Nilsson, 2005; Huijbregts et al., 2000; Koellner et al., 2013; Potting et al., 1998). Despite the lack of consensus for many LCIA methods, e.g. toxicity assessment, Hauschild et al. (2008) deliberate on the development of methods, and how different approaches have led to harmonization in the scientific community. It is therefore possible that future assessment methods may become more robust to take into account a large number of factors affecting the outcomes.

8.6 Assuring Sustainability and Implementing Changes

While this study provides results assuming different degrees of increase and decreases in certain foods, realizing these changes may require support from all actors along the supply chain from consumers to policy makers. Increasing the consumption of sustainable food choices will require an array of policy instruments in addition to consumers' willingness to accept changes. The FAO also recommends the sustainability be included in designing food-based dietary guidelines and policies (FAO, 2012). Reisch et al. (2013), Ekvall et al. (2015) and Åström et al. (2013) provide a collection of potential instruments, which can be aimed at producers, distributors and consumers. These include instruments related to information and voluntary agreements, in addition to economic and legal instruments; see Table 23.

Table 23: Some policies instruments to address sustainable dietary choices; adapted from Reisch et al (2013) and Åström et al. (2013)

Information-based	Market-based	Regulatory	Self-committing
• Develop national organic labels • Highlight environmental consequences of choices • integrate food-related considerations into formal curricula • Highlight impacts from food wastes in informational campaigns	• Subsidies for farms for transition to organic production • Support marketing of organic products and foodstuffs • Implement tradeable nitrogen quotas • Place a tax on harmful pesticides • Lower VAT for organic products • Higher VAT for meat (specifically targeting bovine)	• Simplify distribution of organic products and foodstuffs • Introduce green accounts for farmers • Public procurement of sustainable foods and meals for public sector	• Increase share of organic food in public sector cafeterias • Increase range of organic food available in retail markets

As Åström et al (2013) outline, information campaigns are often easy and less costly to implement; although results are not entirely positive as it is difficult to change behavior by providing advice. Alternative choices are available to the public from a number of actors ranging from food bloggers, buying groups, food bags and farmers markets; all being important for disseminating knowledge for more sustainable food choices. Joosse and Hracs (2015) suggest that these instruments provide consumers with inspiration to improve their knowledge and environmental impacts from their food choices and may impose new habits and knowledge which can have enormous potential for influencing behavior on food consumption (Joosse and Hracs, 2015).

In several studies, the limitations of using VAT increases for e.g. meats and reductions for organic foods have been reviewed. Åström et al (2013) found, these may not be possible as the principle of equal treatment must be followed based on European Commission Law. Nonetheless, the Swedish Board of Agriculture (Jordbruksverket, 2012) suggests that VAT on meat at high rates would be needed to prompt a considerable reduction in meat consumption. Martin et al. (2015a) also review the potential reductions in environmental impacts from the use of VAT increases on meat, showing large emission reduction potential.

Economic instruments are used to influence behavior through market signals by providing incentives for more sustainable solutions. As mentioned previously, section 8.3, public procurement of sustainable foods and meals are also outlined in studies by Åström et al. (2013) and Jordbruksverket (2012 & 2013). In addition to setting limits for certain meals with large environmental impacts, this would provide signals to producers and distributors to provide more sustainable choices.

While this study does not aim to deliberate upon the effectiveness of policies or outline potential policies, it is important to recognize their potential for shifting toward more sustainable diets. Further research will therefore be needed on how this can be done across Europe, and globally, as consumer demands on food and other products are becoming more arduous. Current work with Product Environmental Footprints (PEF) and Environmental Product Declarations (EPD) are one such method to ensure transparent information on food products. As such, this could also provide demands on food producers in public procurement and retail sector to improve food systems and to improve upon current systems to offer more environmentally benign products.

9 Conclusions

Swedish food consumption has implications on many environmental aspects other than climate change. This research report reviews these implications by assessing scenarios on dietary choices including reducing meat consumption, increasing organic food production and consumption and eating based on nutritional recommendations. The results are not meant to provide a comparison of the "best" methods, but to provide an indication of the impacts associated with increasing and decreasing the consumption of different foods.

The results indicate that an increased influx of organic foods showed no significant reductions in GHG emissions or other impact categories. However, when reviewing if all food was produced using organic practices, reductions in large reductions in ecotoxicity and human toxicity were apparent. GHG emissions and biodiversity damage potential were also greatly reduced. Despite this, organic production methods may lead to increased eutrophication and acidification in addition to increased land use, due to reduced yields.

It was found that a reduction in meat consumption led to potential impact reductions in nearly all impact categories. Vegetarian diets led to large potential GHG emissions reductions of nearly 30%, abiding with previous assessments. Other impact categories could also be reduced dramatically, although the toxicity to the ecosystem and human toxicity was shown to increase due to an increase in vegetable products; which was also apparent in the reduced meat scenario. Eating based on nutritional guidelines had similar reductions in environmental impacts as vegetarian diets, as guidelines suggest largely reduced meat consumption and an increase in vegetables and fruit.

Swedish foods showed reduced environmental impacts compared to imported foods in nearly all impact categories. However, it should be noted that with a growing population and limited growing season, the availability of foods for consumers may be limited. Furthermore, the results depend upon global average impact assessment methods and thus regional environmental impacts (other than global warming potential, which is a global impact) for Sweden could be under and/or over represented. It is important therefore that further transparency in the methodology for consumption models be improved in the future through a larger base of LCI data and regional specific characterization factors.

The results indicate that certain trade-offs could be possible with certain dietary choices. While e.g. climate related impacts may be reduced, others may increase. This is seen in vegetarian and organic scenarios. It is therefore important to understand the implications of these changes both regionally and globally in order to make sound decisions on the environmental impact of food choices. As there is no standard to assess the sustainability of food products from a broader range of sustainability indicators, it may be up to consumers to makes choices based on their own values. Basing these only on climate impacts may not be important to all, and impacts such as toxicity and biodiversity may be most important to some.

While the results provide an indication of the potential impacts, it is argued that more development in LCI data for imported and Swedish foods will be needed. Furthermore, LCIA methods and regional specific characterization factors will be needed in the future to assess food consumption with more transparent details on the local emissions caused by consumption as much of the food consumed in Sweden is imported from a large array of regions worldwide.

10 Future Research

Assessing the environmental impacts of consumption, in this case of food products, is no small task. Many improvements can be included in future research, not only to improve upon this project, but to provide more transparency for future work. Improvements outlined in this research include:

- Improve availability of LCI data
    - For Swedish Foods
    - For European Foods
- Include more detail in consumption models on where emissions occur
- Review the extent to which vegetarian diets differ, and the consumption of organic foods in vegetarian diets
- Combine environmental assessments with nutritional information
- Review social and socio-economic impacts and benefits of the foods
- Improve upon LCIA methodology for different impact categories and to provide more regional specific characterization methods
- The importance (or effect) of labelling of foods

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Appendix

Consumption Figures

Appendix Table 1: Consumption of Products 2011 w/ Scale-Up Factor and Chosen Representative Food Products (FAOStat, 2015)

Food Category	Scale-Up Factor	Representative Food Products for Category	Amount from FAO (kg/year)	Amount w/Scale-Up (kg/year)
Milk - Excluding Butter	**1.00**	Milk	3.23E+09	3.23E+09
Sugar Crops	**1.00**	Sugarbeet	2.29E+09	2.29E+09
Cereals - Excluding Beer	**1.07**	Wheat	9.59E+08	1.03E+09
	1.07	Rye	1.10E+08	1.18E+08
	1.07	Barley	9.20E+07	9.86E+07
Fruits - Excluding Wine	**1.29**	Oranges	4.72E+08	6.11E+08
	1.29	Fruits_Other	2.30E+08	2.98E+08
	1.29	Apples	2.22E+08	2.87E+08
	1.29	Bananas	1.30E+08	1.68E+08
Vegetables	**1.09**	Vegetables_Other	6.03E+08	6.55E+08
	1.09	Tomatoes	2.14E+08	2.32E+08
Meat	**1.05**	Pig	3.59E+08	3.77E+08
	1.05	Bovine	2.29E+08	2.40E+08
	1.05	Poultry	1.61E+08	1.69E+08
Alcoholic Beverages	**1.05**	Beer	5.15E+08	5.39E+08
	1.05	Wine	1.87E+08	1.96E+08
Starchy Roots	**1.00**	Potatoes	5.80E+08	5.81E+08
Sugar & Sweeteners	**1.09**	Sugar	3.73E+08	4.06E+08
Oilcrops	**1.14**	Rapeseed	3.05E+08	3.46E+08
	1.14	Oilcrop_Other	2.10E+07	2.39E+07
	1.14	SoyaBeans	2.00E+07	2.27E+07
Fish, Seafood	**1.06**	Crustaceans	7.20E+07	7.62E+07
	1.06	Freshwater	7.10E+07	7.51E+07
	1.06	Demersal	7.00E+07	7.40E+07
	1.06	Pelagic	6.40E+07	6.77E+07
Animal fats	**1.13**	Cream	1.35E+08	1.52E+08
	1.13	Butter	3.80E+07	4.28E+07
Vegetable Oils	**1.18**	Palm Oil	9.10E+07	1.07E+08

	1.18	Rapseed Oil	2.40E+07	2.82E+07
	1.18	Sunflower Oil	2.10E+07	2.47E+07
Stimulants	1.03	Coffee	9.70E+07	1.00E+08
	1.03	Cocoa	2.20E+07	2.27E+07
Eggs	1.00	Eggs	1.17E+08	1.17E+08
Treenuts	1.00	Nuts	4.30E+07	4.30E+07
Pulses	1.20	Peas	1.20E+07	1.44E+07
	1.20	Beans	3.00E+06	3.60E+06
Spices	1.00	Spices_Other	5.00E+06	5.00E+06
	1.00	Pepper	2.00E+06	2.00E+06
	1.00	Pimento	2.00E+06	2.00E+06
Offals	1.00	Offals	8.00E+06	8.00E+06
Miscellaneous	1.00	InfantFood	3.00E+06	3.00E+06

Appendix Table 2: Amount of food eaten per capita and RFP

Category	RFP-Origin/Type	Amount	Amount per RFP	*Amount per Category*
Milk	Milk-ROW	107.33	341.07	***341.07***
	Milk-ROW ECO	7.34		
	Milk-Swedish	197.59		
	Milk-Swedish ECO	28.81		
Sugarbeet	Sugarbeet-ROW	-	240.98	***240.98***
	Sugarbeet-ROW ECO	-		
	Sugarbeet-Swedish	236.65		
	Sugarbeet-Swedish ECO	4.34		
Wheat	Wheat-ROW	26.04	108.37	***131.20***
	Wheat-ROW ECO	0.67		
	Wheat-Swedish	78.56		
	Wheat-Swedish ECO	3.10		
Rye	Rye-ROW	1.87	12.43	
	Rye-ROW ECO	0.05		
	Rye-Swedish	10.16		
	Rye-Swedish ECO	0.35		
Barley	Barley-ROW	0.86	10.40	
	Barley-ROW ECO	0.02		

	Barley-Swedish	9.30		
	Barley-Swedish ECO	0.21		
Oranges	Oranges-ROW	61.02	64.43	***143.88***
	Oranges-ROW ECO	3.41		
	Oranges-Swedish	-		
	Oranges-Swedish ECO	-		
Fruits_Other	Fruits_Other-ROW	27.03	31.40	
	Fruits_Other-ROW ECO	1.51		
	Fruits_Other-Swedish	2.57		
	Fruits_Other-Swedish ECO	0.28		
Apples	Apples-ROW	26.37	30.30	
	Apples-ROW ECO	1.48		
	Apples-Swedish	2.22		
	Apples-Swedish ECO	0.24		
Bananas	Bananas-ROW	13.31	17.75	
	Bananas-ROW ECO	4.44		
	Bananas-Swedish	-		
	Bananas-Swedish ECO	-		
Vegetables_Other	Vegetables_Other-ROW	45.52	68.94	***93.53***
	Vegetables_Other-ROW ECO	2.85		
	Vegetables_Other-Swedish	19.29		
	Vegetables_Other-Swedish ECO	1.28		
Tomatoes	Tomatoes-ROW	21.81	24.58	
	Tomatoes-ROW ECO	1.37		
	Tomatoes-Swedish	1.32		
	Tomatoes-Swedish ECO	0.08		
Pig	Pig-ROW	14.73	39.62	***82.78***
	Pig-ROW ECO	0.21		
	Pig-Swedish	24.31		
	Pig-Swedish ECO	0.37		
Bovine	Bovine-ROW	12.55	25.34	
	Bovine-ROW ECO	0.18		
	Bovine-Swedish	10.88		
	Bovine-Swedish ECO	1.73		

Poultry	Poultry-ROW	6.79	17.82	
	Poultry-ROW ECO	-		
	Poultry-Swedish	10.99		
	Poultry-Swedish ECO	0.04		
Beer	Beer-ROW	12.67	56.87	***77.52***
	Beer-ROW ECO	0.13		
	Beer-Swedish	43.60		
	Beer-Swedish ECO	0.46		
Wine	Wine-ROW	19.58	20.65	
	Wine-ROW ECO	1.07		
	Wine-Swedish	-		
	Wine-Swedish ECO	-		
Potatoes	Potatoes-ROW	16.57	61.22	***61.22***
	Potatoes-ROW ECO	1.04		
	Potatoes-Swedish	42.72		
	Potatoes-Swedish ECO	0.89		
Sugar	Sugar-ROW	7.21	42.82	***42.82***
	Sugar-ROW ECO	0.13		
	Sugar-Swedish	34.83		
	Sugar-Swedish ECO	0.64		
Rapeseed	Rapeseed-ROW	6.59	36.54	***41.43***
	Rapeseed-ROW ECO	0.34		
	Rapeseed-Swedish	29.22		
	Rapeseed-Swedish ECO	0.38		
Oilcrop_Other	Oilcrop_Other-ROW	2.15	2.50	
	Oilcrop_Other-ROW ECO	0.11		
	Oilcrop_Other-Swedish	0.23		
	Oilcrop_Other-Swedish ECO	0.00		
Soyabeans	Soyabeans-ROW	2.25	2.40	
	Soyabeans-ROW ECO	0.14		
	Soyabeans-Swedish	-		
	Soyabeans-Swedish ECO	-		
Crustaceans	Crustaceans-ROW	7.38	8.03	***30.70***
	Crustaceans-ROW ECO	0.65		
	Crustaceans-Swedish	-		

	Crustaceans-Swedish ECO	-		
Freshwater	Freshwater-ROW	5.95	7.81	
	Freshwater-ROW ECO	0.52		
	Freshwater-Swedish	1.11		
	Freshwater-Swedish ECO	0.23		
Demersal	Demersal-ROW	3.27	7.72	
	Demersal-ROW ECO	0.29		
	Demersal-Swedish	3.46		
	Demersal-Swedish ECO	0.71		
Pelagic	Pelagic-ROW	-	7.14	
	Pelagic-ROW ECO	-		
	Pelagic-Swedish	5.93		
	Pelagic-Swedish ECO	1.21		
Cream	Cream-ROW	3.12	16.05	***20.45***
	Cream-ROW ECO	0.21		
	Cream-Swedish	11.91		
	Cream-Swedish ECO	0.81		
Butter	Butter-ROW	1.58	4.40	
	Butter-ROW ECO	0.08		
	Butter-Swedish	2.60		
	Butter-Swedish ECO	0.13		
Palm Oil	Palm Oil-ROW	11.29	11.29	***16.87***
	Palm Oil-ROW ECO	-		
	Palm Oil-Swedish	-		
	Palm Oil-Swedish ECO	-		
Rapseed Oil	Rapseed Oil-ROW	2.04	2.98	
	Rapseed Oil-ROW ECO	0.11		
	Rapseed Oil-Swedish	0.82		
	Rapseed Oil-Swedish ECO	0.01		
Sunflower Oil	Sunflower Oil-ROW	2.48	2.61	
	Sunflower Oil-ROW ECO	0.13		
	Sunflower Oil-Swedish	-		
	Sunflower Oil-Swedish ECO	-		
Coffee	Coffee-ROW	9.81	10.57	***12.97***
	Coffee-ROW ECO	0.76		
	Coffee-Swedish	-		

	Coffee-Swedish ECO	-		
Cocoa	Cocoa-ROW	2.36	2.40	
	Cocoa-ROW ECO	0.04		
	Cocoa-Swedish	-		
	Cocoa-Swedish ECO	-		
Eggs	Eggs-ROW	1.76	12.34	***12.34***
	Eggs-ROW ECO	0.12		
	Eggs-Swedish	9.46		
	Eggs-Swedish ECO	1.00		
Nuts	Nuts-ROW	4.29	4.53	***4.53***
	Nuts-ROW ECO	0.24		
	Nuts-Swedish	-		
	Nuts-Swedish ECO	-		
Peas	Peas-ROW	0.06	1.52	***1.90***
	Peas-ROW ECO	0.00		
	Peas-Swedish	1.31		
	Peas-Swedish ECO	0.14		
Beans	Beans-ROW	0.24	0.38	
	Beans-ROW ECO	0.01		
	Beans-Swedish	0.12		
	Beans-Swedish ECO	0.01		
Spices_Other	Spices_Other-ROW	0.50	0.53	***0.95***
	Spices_Other-ROW ECO	0.03		
	Spices_Other-Swedish	-		
	Spices_Other-Swedish ECO	-		
Pepper	Pepper-ROW	0.20	0.21	
	Pepper-ROW ECO	0.01		
	Pepper-Swedish	-		
	Pepper-Swedish ECO	-		
Pimento	Pimento-ROW	0.20	0.21	
	Pimento-ROW ECO	0.01		
	Pimento-Swedish	-		
	Pimento-Swedish ECO	-		
Offals	Offals-ROW	0.31	0.84	***0.84***
	Offals-ROW ECO	0.00		
	Offals-Swedish	0.52		

	Offals-Swedish ECO	0.01		
InfantFood	InfantFood-ROW	0.19	0.32	***0.32***
	InfantFood-ROW ECO	0.13		
	InfantFood-Swedish	-		
	InfantFood-Swedish ECO	0		

Appendix Table 3: Imports vs. Domestic Production for Food Categories (FAO Stat, 2015)

Product-Origin	%	Product-Origin	%
Milk-ROW	33.6%	**Pelagic-ROW**	0.0%
Milk-Swedish	66.4%	**Pelagic-Swedish**	100.0%
Sugarbeet-ROW	0.0%	**Cream-ROW**	20.7%
Sugarbeet-Swedish	100.0%	**Cream-Swedish**	79.3%
Wheat-ROW	24.6%	**Butter-ROW**	36.8%
Wheat-Swedish	75.4%	**Butter-Swedish**	60.5%
Rye-ROW	15.4%	**Palm Oil-ROW**	100.0%
Rye-Swedish	84.6%	**Palm Oil-Swedish**	0.0%
Barley-ROW	8.5%	**Rapseed Oil-ROW**	72.1%
Barley-Swedish	91.5%	**Rapseed Oil-Swedish**	27.9%
Oranges-ROW	100.0%	**Sunflower Oil-ROW**	100.0%
Oranges-Swedish	0.0%	**Sunflower Oil-Swedish**	0.0%
Fruits_Other-ROW	90.9%	**Coffee-ROW**	100.0%
Fruits_Other-Swedish	9.1%	**Coffee-Swedish**	0.0%
Apples-ROW	91.9%	**Cocoa-ROW**	100.0%
Apples-Swedish	8.1%	**Cocoa-Swedish**	0.0%
Bananas-ROW	100.0%	**Eggs-ROW**	15.2%
Bananas-Swedish	0.0%	**Eggs-Swedish**	84.8%
Vegetables_Other-ROW	70.1%	**Nuts-ROW**	100.0%
Vegetables_Other-Swedish	29.8%	**Nuts-Swedish**	0.0%
Tomatoes-ROW	94.6%	**Peas-ROW**	4.2%
Tomatoes-Swedish	5.4%	**Peas-Swedish**	95.8%
Pig-ROW	37.6%	**Beans-ROW**	66.7%
Pig-Swedish	62.1%	**Beans-Swedish**	33.3%
Bovine-ROW	50.2%	**Spices_Other-ROW**	100.0%
Bovine-Swedish	49.8%	**Spices_Other-Swedish**	0.0%
Poultry-ROW	38.1%	**Pepper-ROW**	100.0%
Poultry-Swedish	61.9%	**Pepper-Swedish**	0.0%
Beer-ROW	22.5%	**Pimento-ROW**	100.0%
Beer-Swedish	77.5%	**Pimento-Swedish**	0.0%
Wine-ROW	100.0%	**Offals-ROW**	37.5%
Wine-Swedish	0.0%	**Offals-Swedish**	62.5%
Potatoes-ROW	28.7%	**InfantFood-ROW**	100.0%
Potatoes-Swedish	71.2%	**InfantFood-Swedish**	0.0%
Sugar-ROW	17.2%		
Sugar-Swedish	82.8%		
Rapeseed-ROW	19.0%		
Rapeseed-Swedish	81.0%		

Oilcrop_Other-ROW	89.9%	
Oilcrop_Other-Swedish	9.5%	
SoyaBeans-ROW	100.0%	
SoyaBeans-Swedish	0.0%	
Crustaceans-ROW	100.0%	
Crustaceans-Swedish	0.0%	
Freshwater-ROW	81.7%	
Freshwater-Swedish	16.9%	
Demersal-ROW	45.6%	
Demersal-Swedish	53.3%	

Data Sources for Origin and LCI Data

Appendix Table 4: Percentage of Conventional vs. Organic in Each Food Category (see references)

Product	% Conventional vs Organic	Reference	Details/Report Number
Milk-ROW	93.6%		
Milk-ROW ECO	6.4%	SCB 2013	HA 24 SM 1301
Milk-Swedish	87.3%		
Milk-Swedish ECO	12.7%	SCB, 2014	Production of organic and non-organic farming 2014
Sugarbeet-ROW	98.2%		
Sugarbeet-ROW ECO	1.8%	SCB 2013	HA 24 SM 1301
Sugarbeet-Swedish	98.2%		
Sugarbeet-Swedish ECO	1.8%	SCB 2013	HA 24 SM 1301
Wheat-ROW	97.5%		
Wheat-ROW ECO	2.5%	SCB 2013	HA 24 SM 1301
Wheat-Swedish	96.2%		
Wheat-Swedish ECO	3.8%	SCB, 2014	Production of organic and non-organic farming 2014
Rye-ROW	97.5%		
Rye-ROW ECO	2.5%	SCB 2013	HA 24 SM 1301
Rye-Swedish	96.7%		
Rye-Swedish ECO	3.3%	SCB, 2014	Production of organic and non-organic farming 2014
Barley-ROW	97.5%		
Barley-ROW ECO	2.5%	SCB 2013	HA 24 SM 1301
Barley-Swedish	97.7%		
Barley-Swedish ECO	2.3%	SCB, 2014	Production of organic and non-organic farming 2014
Oranges-ROW	94.7%		
Oranges-ROW ECO	5.3%	SCB 2013	HA 24 SM 1301
Oranges-Swedish	100.0%		
Oranges-Swedish ECO	***0.0%***	***Not Swedish Product***	
Fruits_Other-ROW	94.7%		
Fruits_Other-ROW ECO	5.3%	SCB 2013	HA 24 SM 1301
Fruits_Other-Swedish	90.2%		
Fruits_Other-Swedish ECO	9.8%	Organic World Report	
Apples-ROW	94.7%		
Apples-ROW ECO	5.3%	SCB 2013	HA 24 SM 1301
Apples-Swedish	90.2%		
Apples-Swedish ECO	9.8%	Organic World Report	

Bananas-ROW	75.0%		
Bananas-ROW ECO	25.0%	SCB Flyer	http://www.scb.se/sv_/hitta-statistik/artiklar/okad-
Bananas-Swedish	100.0%		
Bananas-Swedish ECO	***0.0%***		***Not Swedish Product***
Vegetables_Other-ROW	94.1%		
Vegetables_Other-ROW	5.9%	SCB 2013	HA 24 SM 1301
Vegetables_Other-Swedish	93.8%		
Vegetables_Other-Swedish	6.2%		Organic World Report
Tomatoes-ROW	94.1%		
Tomatoes-ROW ECO	5.9%	SCB 2013	HA 24 SM 1301
Tomatoes-Swedish	100.0%		
Tomatoes-Swedish ECO	6.2%		Organic World Report
Pig-ROW	98.6%		
Pig-ROW ECO	1.4%	SCB 2013	HA 24 SM 1301
Pig-Swedish	98.5%		
Pig-Swedish ECO	1.5%	SCB, 2014	Production of organic and non-organic farming 2014
Bovine-ROW	98.6%		
Bovine-ROW ECO	1.4%	SCB 2013	HA 24 SM 1301
Bovine-Swedish	86.3%		
Bovine-Swedish ECO	13.7%	SCB, 2014	Production of organic and non-organic farming 2014
Poultry-ROW	100.0%		
Poultry-ROW ECO	0.0%		*Chose to keep this zero*
Poultry-Swedish	99.7%		
Poultry-Swedish ECO	0.3%	SCB, 2014	Production of organic and non-organic farming 2014
Beer-ROW	99.0%		
Beer-ROW ECO	1.0%		Systembolaget, 2014
Beer-Swedish	99.0%		
Beer-Swedish ECO	1.0%		Systembolaget, 2014
Wine-ROW	94.8%		
Wine-ROW ECO	5.2%		Systembolaget, 2014
Wine-Swedish	100.0%		
Wine-Swedish ECO	0.0%		*Not Swedish Product*
Potatoes-ROW	94.1%		
Potatoes-ROW ECO	5.9%		
Potatoes-Swedish	98.0%		
Potatoes-Swedish ECO	2.0%	SCB, 2014	Production of organic and non-organic farming 2014
Sugar-ROW	98.2%		
Sugar-ROW ECO	1.8%	SCB 2013	HA 24 SM 1301
Sugar-Swedish	98.2%		
Sugar-Swedish ECO	1.8%	SCB 2013	HA 24 SM 1301
Rapeseed-ROW	95.1%		
Rapeseed-ROW ECO	4.9%	SCB 2013	HA 24 SM 1301
Rapeseed-Swedish	98.7%		
Rapeseed-Swedish ECO	1.3%	SCB, 2014	Production of organic and non-organic farming 2014
Oilcrop_Other-ROW	95.1%		
Oilcrop_Other-ROW ECO	4.9%	SCB 2013	HA 24 SM 1301
Oilcrop_Other-Swedish	98.7%		
Oilcrop_Other-Swedish ECO	1.3%		Assumed same as rapeseed
Soyabeans-ROW	94.1%		
Soyabeans-ROW ECO	5.9%	SCB 2013	HA 24 SM 1301
Soyabeans-Swedish	94.1%		
Soyabeans-Swedish ECO	5.9%	SCB 2013	HA 24 SM 1301
Crustaceans-ROW	91.9%		

Crustaceans-ROW ECO	8.1%	SCB 2013	HA 24 SM 1301
Crustaceans-Swedish	91.9%		
Crustaceans-Swedish ECO	8.1%	SCB 2013	HA 24 SM 1301
Freshwater-ROW	91.9%		
Freshwater-ROW ECO	8.1%	SCB 2013	HA 24 SM 1301
Freshwater-Swedish	83.0%		
Freshwater-Swedish ECO	17.0%	SCB Flyer	http://www.scb.se/sv_/hitta-statistik/artiklar/okad-
Demersal-ROW	91.9%		
Demersal-ROW ECO	8.1%	SCB 2013	HA 24 SM 1301
Demersal-Swedish	83.0%		
Demersal-Swedish ECO	17.0%	SCB Flyer	http://www.scb.se/sv_/hitta-statistik/artiklar/okad-
Pelagic-ROW	91.9%		
Pelagic-ROW ECO	8.1%	SCB 2013	HA 24 SM 1301
Pelagic-Swedish	83.0%		
Pelagic-Swedish ECO	17.0%	SCB Flyer	http://www.scb.se/sv_/hitta-statistik/artiklar/okad-
Cream-ROW	93.6%		
Cream-ROW ECO	6.4%	SCB 2013	HA 24 SM 1301
Cream-Swedish	93.6%		
Cream-Swedish ECO	6.4%	SCB 2013	HA 24 SM 1301
Butter-ROW	95.1%		
Butter-ROW ECO	4.9%	SCB 2013	HA 24 SM 1301
Butter-Swedish	95.1%		
Butter-Swedish ECO	4.9%	SCB 2013	HA 24 SM 1301
Palm Oil-ROW	100.0%		
Palm Oil-ROW ECO	0.0%		Chose not to classify this as ECO…..
Palm Oil-Swedish	100.0%		
Palm Oil-Swedish ECO	0.0%		Not Swedish Product
Rapseed Oil-ROW	95.1%		
Rapseed Oil-ROW ECO	4.9%	SCB 2013	HA 24 SM 1301
Rapseed Oil-Swedish	98.7%		
Rapseed Oil-Swedish ECO	1.3%	SCB, 2014	Production of organic and non-organic farming 2014
Sunflower Oil-ROW	95.1%		
Sunflower Oil-ROW ECO	4.9%	SCB 2013	HA 24 SM 1301
Sunflower Oil-Swedish	100.0%		
Sunflower Oil-Swedish ECO	***0.0%***		***Not Swedish Product***
Coffee-ROW	92.8%		
Coffee-ROW ECO	7.2%	SCB 2013	HA 24 SM 1301
Coffee-Swedish	100.0%		
Coffee-Swedish ECO	***0.0%***		***Not Swedish Product***
Cocoa-ROW	98.2%		
Cocoa-ROW ECO	1.8%	SCB 2013	HA 24 SM 1301
Cocoa-Swedish	100.0%		
Cocoa-Swedish ECO	***0.0%***		***Not Swedish Product***
Eggs-ROW	93.6%		
Eggs-ROW ECO	6.4%	SCB 2013	HA 24 SM 1301
Eggs-Swedish	90.4%		
Eggs-Swedish ECO	9.6%	SCB, 2014	Production of organic and non-organic farming 2014
Nuts-ROW	94.7%		
Nuts-ROW ECO	5.3%	SCB 2013	HA 24 SM 1301
Nuts-Swedish	94.7%		
Nuts-Swedish ECO	5.3%	SCB 2013	HA 24 SM 1301
Peas-ROW	94.1%		
Peas-ROW ECO	5.9%	SCB 2013	HA 24 SM 1301

Peas-Swedish	90.3%		
Peas-Swedish ECO	9.7%	SCB, 2014	Production of organic and non-organic farming 2014
Beans-ROW	94.1%		
Beans-ROW ECO	5.9%	SCB 2013	HA 24 SM 1301
Beans-Swedish	94.1%		
Beans-Swedish ECO	5.9%	SCB 2013	HA 24 SM 1301
Spices_Other-ROW	94.1%		
Spices_Other-ROW ECO	5.9%	SCB 2013	HA 24 SM 1301
Spices_Other-Swedish	94.1%		
Spices_Other-Swedish ECO	5.9%	SCB 2013	HA 24 SM 1301
Pepper-ROW	94.1%		
Pepper-ROW ECO	5.9%	SCB 2013	HA 24 SM 1301
Pepper-Swedish	100.0%		
Pepper-Swedish ECO	***0.0%***		***Not Swedish Product***
Pimento-ROW	94.1%		
Pimento-ROW ECO	5.9%	SCB 2013	HA 24 SM 1301
Pimento-Swedish	100.0%		
Pimento-Swedish ECO	***0.0%***		***Not Swedish Product***
Offals-ROW	98.6%		
Offals-ROW ECO	1.4%	SCB 2013	HA 24 SM 1301
Offals-Swedish	98.6%		
Offals-Swedish ECO	1.4%	SCB 2013	HA 24 SM 1301
InfantFood-ROW	60.0%		
InfantFood-ROW ECO	40.0%	SCB Flyer	http://www.scb.se/sv_/hitta-statistik/artiklar/okad-
InfantFood-Swedish	60.0%		
InfantFood-Swedish ECO	40.0%	SCB Flyer	http://www.scb.se/sv_/hitta-statistik/artiklar/okad-

Calories included in different diets

Appendix Table 5: Calories (kCal) included in each scenario

		Total Calories per Year (Including Wastes)	kCal/person/year (Excluding Wastes)	Difference from Respective Scenaro 0
2015	Scenario 0	1.94E+13	3489	
	Reduced Meat	1.91E+13	3442	-1.4%
	ECO	1.94E+13	3489	0.0%
	Eco Sweden	1.94E+13	3489	0.0%
	Sweden Incr.	1.94E+13	3489	0.0%
	Veg	1.93E+13	3487	-0.1%
	Nutrition	1.75E+13	3163	-9.4%
	All Conv	1.94E+13	3490	0.0%
	All ECO	1.93E+13	3479	-0.3%
2020	Scenario 0	2.06E+13	3489	
	Reduced Meat	2.01E+13	3404	-2.4%
	ECO	2.06E+13	3488	0.0%
	Eco Sweden	2.06E+13	3489	0.0%
	Sweden Incr.	2.06E+13	3489	0.0%
	Veg	2.06E+13	3487	-0.1%
	Nutrition	1.87E+13	3163	-9.4%
	All Conv	2.06E+13	3490	0.0%
	All ECO	2.05E+13	3479	-0.3%

Final Food Consumption in Each Scenario

Appendix Table 6: Amount of Food Consumed in 2015 for Different Scenarios in kg per year

	Scenario 2011	Scenario 0	Reduced Meat	ECO	Eco Sweden	Sweden Incr.	Veg.	Nutrition 1	All Conv	All ECO
Milk-ROW	1.02E+09	1.06E+09	1.06E+09	9.88E+08	1.06E+09	8.65E+08	1.06E+09	7.48E+08	1.13E+09	0.00E+00
Milk-ROW ECO	6.96E+07	7.25E+07	7.25E+07	1.45E+08	7.25E+07	7.25E+07	7.25E+07	5.11E+07	0.00E+00	1.13E+09
Milk-Swedish	1.87E+09	1.95E+09	1.95E+09	1.67E+09	1.67E+09	2.15E+09	1.95E+09	1.38E+09	2.24E+09	0.00E+00
Milk-Swedish ECO	2.73E+08	2.85E+08	2.85E+08	5.69E+08	5.69E+08	2.85E+08	2.85E+08	2.01E+08	0.00E+00	2.24E+09
Sugarbeet-ROW	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sugarbeet-ROW ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sugarbeet-Swedish	2.24E+09	2.34E+09	2.34E+09	2.29E+09	2.29E+09	2.34E+09	2.34E+09	2.34E+09	2.38E+09	0.00E+00
Sugarbeet-Swedish ECO	4.11E+07	4.29E+07	4.29E+07	8.57E+07	8.57E+07	4.29E+07	4.29E+07	4.29E+07	0.00E+00	2.38E+09
Wheat-ROW	2.47E+08	2.57E+08	2.57E+08	2.51E+08	2.57E+08	5.19E+08	2.57E+08	1.53E+08	2.64E+08	0.00E+00
Wheat-ROW ECO	6.33E+06	6.60E+06	6.60E+06	1.32E+07	6.60E+06	6.60E+06	6.60E+06	3.93E+06	0.00E+00	2.64E+08
Wheat-Swedish	7.45E+08	7.76E+08	7.76E+08	7.45E+08	7.45E+08	1.55E+09	7.76E+08	4.63E+08	8.07E+08	0.00E+00
Wheat-Swedish ECO	2.94E+07	3.07E+07	3.07E+07	6.13E+07	6.13E+07	3.07E+07	3.07E+07	1.83E+07	0.00E+00	8.07E+08
Rye-ROW	1.78E+07	1.85E+07	1.85E+07	1.80E+07	1.85E+07	8.45E+06	1.85E+07	1.85E+07	1.90E+07	0.00E+00
Rye-ROW ECO	4.55E+05	4.74E+05	4.74E+05	9.48E+05	4.74E+05	4.74E+05	4.74E+05	4.74E+05	0.00E+00	1.90E+07
Rye-Swedish	9.64E+07	1.00E+08	1.00E+08	9.70E+07	9.70E+07	1.10E+08	1.00E+08	1.00E+08	1.04E+08	0.00E+00
Rye-Swedish ECO	3.28E+06	3.41E+06	3.41E+06	6.83E+06	6.83E+06	3.41E+06	3.41E+06	3.41E+06	0.00E+00	1.04E+08
Barley-ROW	8.19E+06	8.54E+06	8.54E+06	8.32E+06	8.54E+06	0.00E+00	8.54E+06	8.54E+06	8.76E+06	0.00E+00
Barley-ROW ECO	2.10E+05	2.19E+05	2.19E+05	4.38E+05	2.19E+05	0.00E+00	2.19E+05	2.19E+05	0.00E+00	8.76E+06
Barley-Swedish	8.81E+07	9.18E+07	9.18E+07	8.97E+07	8.97E+07	1.01E+08	9.18E+07	9.18E+07	9.39E+07	0.00E+00
Barley-Swedish ECO	2.03E+06	2.12E+06	2.12E+06	4.24E+06	4.24E+06	2.12E+06	2.12E+06	2.12E+06	0.00E+00	9.39E+07
Oranges-ROW	5.79E+08	6.03E+08	6.03E+08	5.69E+08	6.03E+08	6.03E+08	6.03E+08	1.14E+09	6.37E+08	0.00E+00
Oranges-ROW ECO	3.24E+07	3.37E+07	3.37E+07	6.75E+07	3.37E+07	3.37E+07	3.37E+07	6.40E+07	0.00E+00	6.37E+08
Oranges-Swedish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Oranges-Swedish ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Fruits_Other-ROW	2.56E+08	2.67E+08	2.67E+08	2.52E+08	2.67E+08	2.64E+08	2.67E+08	5.06E+08	2.82E+08	0.00E+00
Fruits_Other-ROW ECO	1.43E+07	1.49E+07	1.49E+07	2.99E+07	1.49E+07	1.49E+07	1.49E+07	2.83E+07	0.00E+00	2.82E+08
Fruits_Other-Swedish	2.44E+07	2.54E+07	2.54E+07	2.27E+07	2.27E+07	2.80E+07	2.54E+07	4.82E+07	2.82E+07	0.00E+00
Fruits_Other-Swedish ECO	2.65E+06	2.76E+06	2.76E+06	5.53E+06	5.53E+06	2.76E+06	2.76E+06	5.24E+06	0.00E+00	2.82E+07
Apples-ROW	2.50E+08	2.60E+08	2.60E+08	2.46E+08	2.60E+08	2.58E+08	2.60E+08	4.94E+08	2.75E+08	0.00E+00
Apples-ROW ECO	1.40E+07	1.46E+07	1.46E+07	2.92E+07	1.46E+07	1.46E+07	1.46E+07	2.77E+07	0.00E+00	2.75E+08
Apples-Swedish	2.10E+07	2.19E+07	2.19E+07	1.95E+07	1.95E+07	2.41E+07	2.19E+07	4.16E+07	2.43E+07	0.00E+00
Apples-Swedish ECO	2.29E+06	2.38E+06	2.38E+06	4.76E+06	4.76E+06	2.38E+06	2.38E+06	4.52E+06	0.00E+00	2.43E+07
Bananas-ROW	1.26E+08	1.31E+08	1.31E+08	8.77E+07	1.31E+08	1.31E+08	1.31E+08	2.49E+08	1.75E+08	0.00E+00
Bananas-ROW ECO	4.21E+07	4.38E+07	4.38E+07	8.77E+07	4.38E+07	4.38E+07	4.38E+07	8.31E+07	0.00E+00	1.75E+08
Bananas-Swedish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bananas-Swedish ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vegetables_Other-ROW	4.32E+08	4.50E+08	5.62E+08	4.21E+08	4.50E+08	4.31E+08	6.74E+08	8.53E+08	4.78E+08	0.00E+00
Vegetables_Other-ROW ECO	2.71E+07	2.82E+07	3.52E+07	5.64E+07	2.82E+07	2.82E+07	4.23E+07	5.35E+07	0.00E+00	4.78E+08
Vegetables_Other-Swedish	1.83E+08	1.91E+08	2.38E+08	1.78E+08	1.78E+08	2.10E+08	2.86E+08	3.62E+08	2.03E+08	0.00E+00
Vegetables_Other-Swedish ECO	1.21E+07	1.26E+07	1.57E+07	2.52E+07	2.52E+07	1.26E+07	1.89E+07	2.39E+07	0.00E+00	2.03E+08
Tomatoes-ROW	2.07E+08	2.15E+08	2.15E+08	2.02E+08	2.15E+08	2.14E+08	3.23E+08	4.09E+08	2.29E+08	0.00E+00
Tomatoes-ROW ECO	1.30E+07	1.35E+07	1.35E+07	2.70E+07	1.35E+07	1.35E+07	2.03E+07	2.56E+07	0.00E+00	2.29E+08
Tomatoes-Swedish	1.26E+07	1.31E+07	1.31E+07	1.23E+07	1.23E+07	1.44E+07	2.62E+07	2.48E+07	1.39E+07	0.00E+00
Tomatoes-Swedish ECO	7.79E+05	8.11E+05	8.11E+05	1.62E+06	1.62E+06	8.11E+05	1.62E+06	1.54E+06	0.00E+00	1.39E+07
Pig-ROW	1.40E+08	1.46E+08	1.09E+08	1.43E+08	1.46E+08	1.22E+08	0.00E+00	8.63E+07	1.48E+08	0.00E+00
Pig-ROW ECO	1.98E+06	2.07E+06	1.55E+06	4.13E+06	2.07E+06	2.07E+06	0.00E+00	1.22E+06	0.00E+00	1.48E+08
Pig-Swedish	2.30E+08	2.40E+08	1.80E+08	2.36E+08	2.36E+08	2.64E+08	0.00E+00	1.42E+08	2.44E+08	0.00E+00
Pig-Swedish ECO	3.55E+06	3.70E+06	2.78E+06	7.40E+06	7.40E+06	3.70E+06	0.00E+00	2.19E+06	0.00E+00	2.44E+08
Bovine-ROW	1.19E+08	1.24E+08	9.30E+07	1.22E+08	1.24E+08	1.13E+08	0.00E+00	7.35E+07	1.26E+08	0.00E+00
Bovine-ROW ECO	1.69E+06	1.76E+06	1.32E+06	3.52E+06	1.76E+06	1.76E+06	0.00E+00	1.04E+06	0.00E+00	1.26E+08
Bovine-Swedish	1.03E+08	1.08E+08	8.06E+07	9.04E+07	9.04E+07	1.18E+08	0.00E+00	6.37E+07	1.25E+08	0.00E+00
Bovine-Swedish ECO	1.64E+07	1.71E+07	1.28E+07	3.42E+07	3.42E+07	1.71E+07	0.00E+00	1.02E+07	0.00E+00	1.25E+08
Poultry-ROW	6.44E+07	6.71E+07	5.03E+07	6.71E+07	6.71E+07	5.63E+07	0.00E+00	3.98E+07	6.71E+07	0.00E+00

Poultry-ROW ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.71E+07
Poultry-Swedish	1.04E+08	1.09E+08	8.14E+07	1.08E+08	1.08E+08	1.19E+08	0.00E+00	6.43E+07	1.09E+08	0.00E+00
Poultry-Swedish ECO	3.57E+05	3.71E+05	2.79E+05	7.43E+05	7.43E+05	3.71E+05	0.00E+00	2.20E+05	0.00E+00	1.09E+08
Beer-ROW	1.20E+08	1.25E+08	1.25E+08	1.24E+08	1.25E+08	8.21E+07	1.25E+08	1.25E+08	1.27E+08	0.00E+00
Beer-ROW ECO	1.27E+06	1.33E+06	1.33E+06	2.66E+06	1.33E+06	1.33E+06	1.33E+06	1.33E+06	0.00E+00	1.27E+08
Beer-Swedish	4.13E+08	4.31E+08	4.31E+08	4.26E+08	4.26E+08	4.74E+08	4.31E+08	4.31E+08	4.35E+08	0.00E+00
Beer-Swedish ECO	4.38E+06	4.57E+06	4.57E+06	9.13E+06	9.13E+06	4.57E+06	4.57E+06	4.57E+06	0.00E+00	4.35E+08
Wine-ROW	1.86E+08	1.93E+08	1.93E+08	1.83E+08	1.93E+08	1.93E+08	1.93E+08	1.93E+08	2.04E+08	0.00E+00
Wine-ROW ECO	1.02E+07	1.06E+07	1.06E+07	2.12E+07	1.06E+07	1.06E+07	1.06E+07	1.06E+07	0.00E+00	2.04E+08
Wine-Swedish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Wine-Swedish ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Potatoes-ROW	1.57E+08	1.64E+08	1.64E+08	1.53E+08	1.64E+08	1.22E+08	4.91E+08	1.64E+08	1.74E+08	0.00E+00
Potatoes-ROW ECO	9.85E+06	1.03E+07	1.03E+07	2.05E+07	1.03E+07	1.03E+07	3.08E+07	1.03E+07	0.00E+00	1.74E+08
Potatoes-Swedish	4.05E+08	4.22E+08	4.22E+08	4.13E+08	4.13E+08	4.64E+08	1.27E+09	4.22E+08	4.31E+08	0.00E+00
Potatoes-Swedish ECO	8.43E+06	8.78E+06	8.78E+06	1.76E+07	1.76E+07	8.78E+06	2.63E+07	8.78E+06	0.00E+00	4.31E+08
Sugar-ROW	6.84E+07	7.13E+07	7.13E+07	7.00E+07	7.13E+07	3.69E+07	7.13E+07	7.13E+07	7.26E+07	0.00E+00
Sugar-ROW ECO	1.25E+06	1.31E+06	1.31E+06	2.61E+06	1.31E+06	1.31E+06	1.31E+06	1.31E+06	0.00E+00	7.26E+07
Sugar-Swedish	3.30E+08	3.44E+08	3.44E+08	3.38E+08	3.38E+08	3.79E+08	3.44E+08	3.44E+08	3.50E+08	0.00E+00
Sugar-Swedish ECO	6.05E+06	6.31E+06	6.31E+06	1.26E+07	1.26E+07	6.31E+06	6.31E+06	6.31E+06	0.00E+00	3.50E+08
Rapeseed-ROW	6.25E+07	6.51E+07	6.51E+07	6.18E+07	6.51E+07	3.62E+07	6.51E+07	6.51E+07	6.85E+07	0.00E+00
Rapeseed-ROW ECO	3.22E+06	3.36E+06	3.36E+06	6.71E+06	3.36E+06	3.36E+06	3.36E+06	3.36E+06	0.00E+00	6.85E+07
Rapeseed-Swedish	2.77E+08	2.89E+08	2.89E+08	2.85E+08	2.85E+08	3.18E+08	2.89E+08	2.89E+08	2.92E+08	0.00E+00
Rapeseed-Swedish ECO	3.62E+06	3.77E+06	3.77E+06	7.55E+06	7.55E+06	3.77E+06	3.77E+06	3.77E+06	0.00E+00	2.92E+08
Oilcrop_Other-ROW	2.04E+07	2.12E+07	2.12E+07	2.01E+07	2.12E+07	2.10E+07	2.12E+07	2.12E+07	2.23E+07	0.00E+00
Oilcrop_Other-ROW ECO	1.05E+06	1.09E+06	1.09E+06	2.19E+06	1.09E+06	1.09E+06	1.09E+06	1.09E+06	0.00E+00	2.23E+07
Oilcrop_Other-Swedish	2.23E+06	2.32E+06	2.32E+06	2.29E+06	2.29E+06	2.55E+06	2.32E+06	2.32E+06	2.35E+06	0.00E+00
Oilcrop_Other-Swedish ECO	2.91E+04	3.03E+04	3.03E+04	6.07E+04	6.07E+04	3.03E+04	3.03E+04	3.03E+04	0.00E+00	2.35E+06
Soyabeans-ROW	2.14E+07	2.23E+07	2.23E+07	2.09E+07	2.23E+07	2.23E+07	8.91E+07	2.23E+07	2.37E+07	0.00E+00
Soyabeans-ROW ECO	1.34E+06	1.40E+06	1.40E+06	2.79E+06	1.40E+06	1.40E+06	5.59E+06	1.40E+06	0.00E+00	2.37E+07

Soyabeans-Swedish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Soyabeans-Swedish ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Crustaceans-ROW	7.00E+07	7.29E+07	7.29E+07	6.65E+07	7.29E+07	7.29E+07	7.29E+07	7.73E+07	7.93E+07	0.00E+00
Crustaceans-ROW ECO	6.17E+06	6.43E+06	6.43E+06	1.29E+07	6.43E+06	6.43E+06	6.43E+06	6.82E+06	0.00E+00	7.93E+07
Crustaceans-Swedish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Crustaceans-Swedish ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Freshwater-ROW	5.64E+07	5.87E+07	5.87E+07	5.36E+07	5.87E+07	5.76E+07	5.87E+07	6.23E+07	6.39E+07	0.00E+00
Freshwater-ROW ECO	4.97E+06	5.18E+06	5.18E+06	1.04E+07	5.18E+06	5.18E+06	5.18E+06	5.49E+06	0.00E+00	6.39E+07
Freshwater-Swedish	1.05E+07	1.10E+07	1.10E+07	8.73E+06	8.73E+06	1.21E+07	1.10E+07	1.16E+07	1.32E+07	0.00E+00
Freshwater-Swedish ECO	2.16E+06	2.25E+06	2.25E+06	4.50E+06	4.50E+06	2.25E+06	2.25E+06	2.38E+06	0.00E+00	1.32E+07
Demersal-ROW	3.10E+07	3.23E+07	3.23E+07	2.94E+07	3.23E+07	2.89E+07	3.23E+07	3.42E+07	3.51E+07	0.00E+00
Demersal-ROW ECO	2.73E+06	2.85E+06	2.85E+06	5.69E+06	2.85E+06	2.85E+06	2.85E+06	3.02E+06	0.00E+00	3.51E+07
Demersal-Swedish	3.28E+07	3.41E+07	3.41E+07	2.72E+07	2.72E+07	3.76E+07	3.41E+07	3.62E+07	4.11E+07	0.00E+00
Demersal-Swedish ECO	6.71E+06	6.99E+06	6.99E+06	1.40E+07	1.40E+07	6.99E+06	6.99E+06	7.42E+06	0.00E+00	4.11E+07
Pelagic-ROW	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pelagic-ROW ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pelagic-Swedish	5.62E+07	5.85E+07	5.85E+07	4.65E+07	4.65E+07	5.86E+07	5.85E+07	6.21E+07	7.05E+07	0.00E+00
Pelagic-Swedish ECO	1.15E+07	1.20E+07	1.20E+07	2.40E+07	2.40E+07	1.20E+07	1.20E+07	1.27E+07	0.00E+00	7.05E+07
Cream-ROW	2.95E+07	3.08E+07	3.08E+07	2.87E+07	3.08E+07	1.90E+07	3.08E+07	3.08E+07	3.29E+07	0.00E+00
Cream-ROW ECO	2.02E+06	2.10E+06	2.10E+06	4.21E+06	2.10E+06	2.10E+06	2.10E+06	2.10E+06	0.00E+00	3.29E+07
Cream-Swedish	1.13E+08	1.18E+08	1.18E+08	1.10E+08	1.10E+08	1.29E+08	1.18E+08	1.18E+08	1.26E+08	0.00E+00
Cream-Swedish ECO	7.72E+06	8.04E+06	8.04E+06	1.61E+07	1.61E+07	8.04E+06	8.04E+06	8.04E+06	0.00E+00	1.26E+08
Butter-ROW	1.50E+07	1.56E+07	1.56E+07	1.48E+07	1.56E+07	1.31E+07	1.56E+07	1.56E+07	1.64E+07	0.00E+00
Butter-ROW ECO	7.73E+05	8.06E+05	8.06E+05	1.61E+06	8.06E+05	8.06E+05	8.06E+05	8.06E+05	0.00E+00	1.64E+07
Butter-Swedish	2.47E+07	2.57E+07	2.57E+07	2.44E+07	2.44E+07	2.83E+07	2.57E+07	2.57E+07	2.70E+07	0.00E+00
Butter-Swedish ECO	1.27E+06	1.32E+06	1.32E+06	2.65E+06	2.65E+06	1.32E+06	1.32E+06	1.32E+06	0.00E+00	2.70E+07
Palm Oil-ROW	1.07E+08	1.12E+08	1.12E+08	1.12E+08	1.12E+08	1.12E+08	1.12E+08	1.12E+08	1.12E+08	0.00E+00
Palm Oil-ROW ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.12E+08
Palm Oil-Swedish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Palm Oil-Swedish ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rapseed Oil-ROW	1.94E+07	2.02E+07	2.02E+07	1.91E+07	2.02E+07	1.94E+07	2.02E+07	2.02E+07	2.12E+07	0.00E+00
Rapseed Oil-ROW ECO	9.98E+05	1.04E+06	1.04E+06	2.08E+06	1.04E+06	1.04E+06	1.04E+06	1.04E+06	0.00E+00	2.12E+07
Rapseed Oil-Swedish	7.76E+06	8.09E+06	8.09E+06	7.98E+06	7.98E+06	8.90E+06	8.09E+06	8.09E+06	8.19E+06	0.00E+00
Rapseed Oil-Swedish ECO	1.01E+05	1.06E+05	1.06E+05	2.11E+05	2.11E+05	1.06E+05	1.06E+05	1.06E+05	0.00E+00	8.19E+06
Sunflower Oil-ROW	2.35E+07	2.45E+07	2.45E+07	2.32E+07	2.45E+07	2.45E+07	2.45E+07	2.45E+07	2.57E+07	0.00E+00
Sunflower Oil-ROW ECO	1.21E+06	1.26E+06	1.26E+06	2.52E+06	1.26E+06	1.26E+06	1.26E+06	1.26E+06	0.00E+00	2.57E+07
Sunflower Oil-Swedish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sunflower Oil-Swedish ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Coffee-ROW	9.30E+07	9.69E+07	9.69E+07	8.94E+07	9.69E+07	9.69E+07	9.69E+07	9.69E+07	1.04E+08	0.00E+00
Coffee-ROW ECO	7.22E+06	7.52E+06	7.52E+06	1.50E+07	7.52E+06	7.52E+06	7.52E+06	7.52E+06	0.00E+00	1.04E+08
Coffee-Swedish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Coffee-Swedish ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cocoa-ROW	2.23E+07	2.33E+07	2.33E+07	2.28E+07	2.33E+07	2.33E+07	2.33E+07	2.33E+07	2.37E+07	0.00E+00
Cocoa-ROW ECO	4.09E+05	4.26E+05	4.26E+05	8.53E+05	4.26E+05	4.26E+05	4.26E+05	4.26E+05	0.00E+00	2.37E+07
Cocoa-Swedish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cocoa-Swedish ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Eggs-ROW	1.66E+07	1.73E+07	1.73E+07	1.62E+07	1.73E+07	8.00E+06	1.73E+07	1.73E+07	1.85E+07	0.00E+00
Eggs-ROW ECO	1.14E+06	1.19E+06	1.19E+06	2.37E+06	1.19E+06	1.19E+06	1.19E+06	1.19E+06	0.00E+00	1.85E+07
Eggs-Swedish	8.97E+07	9.35E+07	9.35E+07	8.36E+07	8.36E+07	1.03E+08	9.35E+07	9.35E+07	1.03E+08	0.00E+00
Eggs-Swedish ECO	9.50E+06	9.90E+06	9.90E+06	1.98E+07	1.98E+07	9.90E+06	9.90E+06	9.90E+06	0.00E+00	1.03E+08
Nuts-ROW	4.07E+07	4.24E+07	4.24E+07	4.01E+07	4.24E+07	4.24E+07	4.24E+07	2.53E+07	4.48E+07	0.00E+00
Nuts-ROW ECO	2.28E+06	2.37E+06	2.37E+06	4.75E+06	2.37E+06	2.37E+06	2.37E+06	1.41E+06	0.00E+00	4.48E+07
Nuts-Swedish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nuts-Swedish ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Peas-ROW	5.65E+05	5.88E+05	7.35E+05	5.51E+05	5.88E+05	0.00E+00	2.35E+06	5.88E+05	6.25E+05	0.00E+00
Peas-ROW ECO	3.54E+04	3.69E+04	4.61E+04	7.38E+04	3.69E+04	0.00E+00	1.48E+05	3.69E+04	0.00E+00	6.25E+05
Peas-Swedish	1.25E+07	1.30E+07	1.62E+07	1.16E+07	1.16E+07	1.36E+07	5.19E+07	1.30E+07	1.44E+07	0.00E+00
Peas-Swedish ECO	1.34E+06	1.39E+06	1.74E+06	2.79E+06	2.79E+06	1.39E+06	5.57E+06	1.39E+06	0.00E+00	1.44E+07

Beans-ROW	2.26E+06	2.35E+06	2.94E+06	2.21E+06	2.35E+06	2.24E+06	9.41E+06	2.35E+06	2.50E+06	0.00E+00
Beans-ROW ECO	1.42E+05	1.48E+05	1.84E+05	2.95E+05	1.48E+05	1.48E+05	5.90E+05	1.48E+05	0.00E+00	2.50E+06
Beans-Swedish	1.13E+06	1.18E+06	1.47E+06	1.10E+06	1.10E+06	1.29E+06	4.71E+06	1.18E+06	1.25E+06	0.00E+00
Beans-Swedish ECO	7.08E+04	7.38E+04	9.22E+04	1.48E+05	1.48E+05	7.38E+04	2.95E+05	7.38E+04	0.00E+00	1.25E+06
Spices_Other-ROW	4.71E+06	4.90E+06	4.90E+06	4.59E+06	4.90E+06	4.90E+06	4.90E+06	4.90E+06	5.21E+06	0.00E+00
Spices_Other-ROW ECO	2.95E+05	3.07E+05	3.07E+05	6.15E+05	3.07E+05	3.07E+05	3.07E+05	3.07E+05	0.00E+00	5.21E+06
Spices_Other-Swedish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Spices_Other-Swedish ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pepper-ROW	1.88E+06	1.96E+06	1.96E+06	1.84E+06	1.96E+06	1.96E+06	1.96E+06	1.96E+06	2.08E+06	0.00E+00
Pepper-ROW ECO	1.18E+05	1.23E+05	1.23E+05	2.46E+05	1.23E+05	1.23E+05	1.23E+05	1.23E+05	0.00E+00	2.08E+06
Pepper-Swedish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pepper-Swedish ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pimento-ROW	1.88E+06	1.96E+06	1.96E+06	1.84E+06	1.96E+06	1.96E+06	1.96E+06	1.96E+06	2.08E+06	0.00E+00
Pimento-ROW ECO	1.18E+05	1.23E+05	1.23E+05	2.46E+05	1.23E+05	1.23E+05	1.23E+05	1.23E+05	0.00E+00	2.08E+06
Pimento-Swedish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pimento-Swedish ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Offals-ROW	2.96E+06	3.08E+06	3.08E+06	3.04E+06	3.08E+06	2.57E+06	3.08E+06	3.08E+06	3.13E+06	0.00E+00
Offals-ROW ECO	4.20E+04	4.38E+04	4.38E+04	8.75E+04	4.38E+04	4.38E+04	4.38E+04	4.38E+04	0.00E+00	3.13E+06
Offals-Swedish	4.93E+06	5.14E+06	5.14E+06	5.06E+06	5.06E+06	5.65E+06	5.14E+06	5.14E+06	5.21E+06	0.00E+00
Offals-Swedish ECO	7.00E+04	7.29E+04	7.29E+04	1.46E+05	1.46E+05	7.29E+04	7.29E+04	7.29E+04	0.00E+00	5.21E+06
InfantFood-ROW	1.80E+06	1.88E+06	1.88E+06	6.25E+05	1.88E+06	1.88E+06	1.88E+06	1.88E+06	3.13E+06	0.00E+00
InfantFood-ROW ECO	1.20E+06	1.25E+06	1.25E+06	2.50E+06	1.25E+06	1.25E+06	1.25E+06	1.25E+06	0.00E+00	3.13E+06
InfantFood-Swedish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
InfantFood-Swedish ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Appendix Table 7: Amount of Food Consumed in 2020 for Different Scenarios in kg per year

	Scenario 0	Reduced Meat	ECO	Eco Sweden	Sweden Incr.	Veg.	Nutrition	All Conv	All ECO
Milk-ROW	1.13E+09	1.13E+09	9.74E+08	1.13E+09	5.05E+08	1.13E+09	7.95E+08	1.21E+09	0.00E+00
Milk-ROW ECO	7.71E+07	7.71E+07	2.31E+08	7.71E+07	7.71E+07	7.71E+07	5.44E+07	0.00E+00	1.21E+09
Milk-Swedish	2.08E+09	2.08E+09	1.47E+09	1.47E+09	2.70E+09	2.08E+09	1.46E+09	2.38E+09	0.00E+00
Milk-Swedish ECO	3.03E+08	3.03E+08	9.08E+08	9.08E+08	3.03E+08	3.03E+08	2.13E+08	0.00E+00	2.38E+09
Sugarbeet-ROW	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sugarbeet-ROW ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sugarbeet-Swedish	2.49E+09	2.49E+09	2.40E+09	2.40E+09	2.49E+09	2.49E+09	2.49E+09	2.53E+09	0.00E+00
Sugarbeet-Swedish ECO	4.56E+07	4.56E+07	1.37E+08	1.37E+08	4.56E+07	4.56E+07	4.56E+07	0.00E+00	2.53E+09
Wheat-ROW	2.74E+08	2.74E+08	2.60E+08	2.74E+08	2.60E+07	2.74E+08	1.63E+08	2.81E+08	0.00E+00
Wheat-ROW ECO	7.02E+06	7.02E+06	2.11E+07	7.02E+06	7.02E+06	7.02E+06	4.18E+06	0.00E+00	2.81E+08
Wheat-Swedish	8.26E+08	8.26E+08	7.60E+08	7.60E+08	1.07E+09	8.26E+08	4.92E+08	8.58E+08	0.00E+00
Wheat-Swedish ECO	3.26E+07	3.26E+07	9.78E+07	9.78E+07	3.26E+07	3.26E+07	1.94E+07	0.00E+00	8.58E+08
Rye-ROW	1.97E+07	1.97E+07	1.87E+07	1.97E+07	0.00E+00	1.97E+07	1.97E+07	2.02E+07	0.00E+00
Rye-ROW ECO	5.05E+05	5.05E+05	1.51E+06	5.05E+05	0.00E+00	5.05E+05	5.05E+05	0.00E+00	2.02E+07
Rye-Swedish	1.07E+08	1.07E+08	9.96E+07	9.96E+07	1.27E+08	1.07E+08	1.07E+08	1.10E+08	0.00E+00
Rye-Swedish ECO	3.63E+06	3.63E+06	1.09E+07	1.09E+07	3.63E+06	3.63E+06	3.63E+06	0.00E+00	1.10E+08
Barley-ROW	9.08E+06	9.08E+06	8.62E+06	9.08E+06	0.00E+00	9.08E+06	9.08E+06	9.31E+06	0.00E+00
Barley-ROW ECO	2.33E+05	2.33E+05	6.99E+05	2.33E+05	0.00E+00	2.33E+05	2.33E+05	0.00E+00	9.31E+06
Barley-Swedish	9.77E+07	9.77E+07	9.32E+07	9.32E+07	1.07E+08	9.77E+07	9.77E+07	9.99E+07	0.00E+00
Barley-Swedish ECO	2.26E+06	2.26E+06	6.77E+06	6.77E+06	2.26E+06	2.26E+06	2.26E+06	0.00E+00	9.99E+07

Oranges-ROW	6.41E+08	6.41E+08	5.69E+08	6.41E+08	6.41E+08	6.41E+08	1.22E+09	6.77E+08	0.00E+00
Oranges-ROW ECO	3.59E+07	3.59E+07	1.08E+08	3.59E+07	3.59E+07	3.59E+07	6.81E+07	0.00E+00	6.77E+08
Oranges-Swedish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Oranges-Swedish ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fruits_Other-ROW	2.84E+08	2.84E+08	2.52E+08	2.84E+08	2.76E+08	2.84E+08	5.39E+08	3.00E+08	0.00E+00
Fruits_Other-ROW ECO	1.59E+07	1.59E+07	4.77E+07	1.59E+07	1.59E+07	1.59E+07	3.02E+07	0.00E+00	3.00E+08
Fruits_Other-Swedish	2.71E+07	2.71E+07	2.12E+07	2.12E+07	3.52E+07	2.71E+07	5.13E+07	3.00E+07	0.00E+00
Fruits_Other-Swedish ECO	2.94E+06	2.94E+06	8.82E+06	8.82E+06	2.94E+06	2.94E+06	5.58E+06	0.00E+00	3.00E+07
Apples-ROW	2.77E+08	2.77E+08	2.46E+08	2.77E+08	2.70E+08	2.77E+08	5.26E+08	2.93E+08	0.00E+00
Apples-ROW ECO	1.55E+07	1.55E+07	4.65E+07	1.55E+07	1.55E+07	1.55E+07	2.94E+07	0.00E+00	2.93E+08
Apples-Swedish	2.33E+07	2.33E+07	1.83E+07	1.83E+07	3.03E+07	2.33E+07	4.42E+07	2.59E+07	0.00E+00
Apples-Swedish ECO	2.53E+06	2.53E+06	7.60E+06	7.60E+06	2.53E+06	2.53E+06	4.81E+06	0.00E+00	2.59E+07
Bananas-ROW	1.40E+08	1.96E+08	4.66E+07	1.40E+08	1.40E+08	1.40E+08	2.65E+08	1.87E+08	0.00E+00
Bananas-ROW ECO	4.66E+07	4.66E+07	1.40E+08	4.66E+07	4.66E+07	4.66E+07	8.84E+07	0.00E+00	1.87E+08
Bananas-Swedish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Bananas-Swedish ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Vegetables_Other-ROW	4.78E+08	7.18E+08	4.18E+08	4.78E+08	4.18E+08	7.18E+08	9.07E+08	5.08E+08	0.00E+00
Vegetables_Other-ROW ECO	3.00E+07	4.50E+07	9.00E+07	3.00E+07	3.00E+07	4.50E+07	5.69E+07	0.00E+00	5.08E+08
Vegetables_Other-Swedish	2.03E+08	3.04E+08	1.76E+08	1.76E+08	2.64E+08	3.04E+08	3.85E+08	2.16E+08	0.00E+00
Vegetables_Other-Swedish ECO	1.34E+07	2.01E+07	4.02E+07	4.02E+07	1.34E+07	2.01E+07	2.54E+07	0.00E+00	2.16E+08

Tomatoes-ROW	2.29E+08	2.29E+08	2.00E+08	2.29E+08	2.25E+08	3.44E+08	4.35E+08	2.44E+08	0.00E+00
Tomatoes-ROW ECO	1.44E+07	1.44E+07	4.31E+07	1.44E+07	1.44E+07	2.16E+07	2.73E+07	0.00E+00	2.44E+08
Tomatoes-Swedish	1.39E+07	1.39E+07	1.22E+07	1.22E+07	1.81E+07	2.78E+07	2.64E+07	1.48E+07	0.00E+00
Tomatoes-Swedish ECO	8.63E+05	8.63E+05	2.59E+06	2.59E+06	8.63E+05	1.73E+06	1.64E+06	0.00E+00	1.48E+07
Pig-ROW	1.55E+08	7.74E+07	1.50E+08	1.55E+08	7.82E+07	0.00E+00	9.18E+07	1.57E+08	0.00E+00
Pig-ROW ECO	2.20E+06	1.10E+06	6.60E+06	2.20E+06	2.20E+06	0.00E+00	1.30E+06	0.00E+00	1.57E+08
Pig-Swedish	2.55E+08	1.28E+08	2.48E+08	2.48E+08	3.32E+08	0.00E+00	1.51E+08	2.59E+08	0.00E+00
Pig-Swedish ECO	3.94E+06	1.97E+06	1.18E+07	1.18E+07	3.94E+06	0.00E+00	2.33E+06	0.00E+00	2.59E+08
Bovine-ROW	1.32E+08	6.59E+07	1.28E+08	1.32E+08	9.76E+07	0.00E+00	7.82E+07	1.34E+08	0.00E+00
Bovine-ROW ECO	1.87E+06	9.36E+05	5.62E+06	1.87E+06	1.87E+06	0.00E+00	1.11E+06	0.00E+00	1.34E+08
Bovine-Swedish	1.14E+08	5.72E+07	7.80E+07	7.80E+07	1.49E+08	0.00E+00	6.78E+07	1.33E+08	0.00E+00
Bovine-Swedish ECO	1.82E+07	9.11E+06	5.46E+07	5.46E+07	1.82E+07	0.00E+00	1.08E+07	0.00E+00	1.33E+08
Poultry-ROW	7.14E+07	3.57E+07	7.14E+07	7.14E+07	3.68E+07	0.00E+00	4.23E+07	7.14E+07	0.00E+00
Poultry-ROW ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.14E+07
Poultry-Swedish	1.15E+08	5.77E+07	1.15E+08	1.15E+08	1.50E+08	0.00E+00	6.85E+07	1.16E+08	0.00E+00
Poultry-Swedish ECO	3.95E+05	1.98E+05	1.19E+06	1.19E+06	3.95E+05	0.00E+00	2.34E+05	0.00E+00	1.16E+08
Beer-ROW	1.33E+08	1.33E+08	1.30E+08	1.33E+08	0.00E+00	1.33E+08	1.33E+08	1.35E+08	0.00E+00
Beer-ROW ECO	1.41E+06	1.41E+06	4.24E+06	1.41E+06	0.00E+00	1.41E+06	1.41E+06	0.00E+00	1.35E+08
Beer-Swedish	4.58E+08	4.58E+08	4.48E+08	4.48E+08	5.93E+08	4.58E+08	4.58E+08	4.63E+08	0.00E+00
Beer-Swedish ECO	4.86E+06	4.86E+06	1.46E+07	1.46E+07	4.86E+06	4.86E+06	4.86E+06	0.00E+00	4.63E+08
Wine-ROW	2.06E+08	2.06E+08	1.83E+08	2.06E+08	2.06E+08	2.06E+08	2.06E+08	2.17E+08	0.00E+00
Wine-ROW ECO	1.13E+07	1.13E+07	3.38E+07	1.13E+07	1.13E+07	1.13E+07	1.13E+07	0.00E+00	2.17E+08
Wine-Swedish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Wine-Swedish ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Potatoes-ROW	1.74E+08	1.74E+08	1.52E+08	1.74E+08	3.95E+07	5.23E+08	1.74E+08	1.85E+08	0.00E+00
Potatoes-ROW ECO	1.09E+07	1.09E+07	3.28E+07	1.09E+07	1.09E+07	3.28E+07	1.09E+07	0.00E+00	1.85E+08
Potatoes-Swedish	4.49E+08	4.49E+08	4.30E+08	4.30E+08	5.84E+08	1.35E+09	4.49E+08	4.58E+08	0.00E+00
Potatoes-Swedish ECO	9.34E+06	9.34E+06	2.80E+07	2.80E+07	9.34E+06	2.80E+07	9.34E+06	0.00E+00	4.58E+08
Sugar-ROW	7.58E+07	7.58E+07	7.30E+07	7.58E+07	0.00E+00	7.58E+07	7.58E+07	7.72E+07	0.00E+00
Sugar-ROW ECO	1.39E+06	1.39E+06	4.17E+06	1.39E+06	0.00E+00	1.39E+06	1.39E+06	0.00E+00	7.72E+07
Sugar-Swedish	3.66E+08	3.66E+08	3.53E+08	3.53E+08	4.43E+08	3.66E+08	3.66E+08	3.73E+08	0.00E+00
Sugar-Swedish ECO	6.71E+06	6.71E+06	2.01E+07	2.01E+07	6.71E+06	6.71E+06	6.71E+06	0.00E+00	3.73E+08
Rapeseed-ROW	6.93E+07	6.93E+07	6.21E+07	6.93E+07	0.00E+00	6.93E+07	6.93E+07	7.28E+07	0.00E+00
Rapeseed-ROW ECO	3.57E+06	3.57E+06	1.07E+07	3.57E+06	0.00E+00	3.57E+06	3.57E+06	0.00E+00	7.28E+07
Rapeseed-Swedish	3.07E+08	3.07E+08	2.99E+08	2.99E+08	3.80E+08	3.07E+08	3.07E+08	3.11E+08	0.00E+00
Rapeseed-Swedish ECO	4.01E+06	4.01E+06	1.20E+07	1.20E+07	4.01E+06	4.01E+06	4.01E+06	0.00E+00	3.11E+08
Oilcrop_Other-ROW	2.26E+07	2.26E+07	2.03E+07	2.26E+07	2.19E+07	2.26E+07	2.26E+07	2.38E+07	0.00E+00
Oilcrop_Other-ROW ECO	1.16E+06	1.16E+06	3.49E+06	1.16E+06	1.16E+06	1.16E+06	1.16E+06	0.00E+00	2.38E+07
Oilcrop_Other-Swedish	2.47E+06	2.47E+06	2.40E+06	2.40E+06	3.21E+06	2.47E+06	2.47E+06	2.50E+06	0.00E+00
Oilcrop_Other-Swedish ECO	3.23E+04	3.23E+04	9.68E+04	9.68E+04	3.23E+04	3.23E+04	3.23E+04	0.00E+00	2.50E+06
Soyabeans-ROW	2.37E+07	2.37E+07	2.07E+07	2.37E+07	2.37E+07	9.48E+07	2.37E+07	2.52E+07	0.00E+00
Soyabeans-ROW ECO	1.49E+06	1.49E+06	4.46E+06	1.49E+06	1.49E+06	5.94E+06	1.49E+06	0.00E+00	2.52E+07
Soyabeans-Swedish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Soyabeans-Swedish ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Crustaceans-ROW	7.76E+07	7.76E+07	6.39E+07	7.76E+07	7.76E+07	7.76E+07	8.23E+07	8.44E+07	0.00E+00
Crustaceans-ROW ECO	6.84E+06	6.84E+06	2.05E+07	6.84E+06	6.84E+06	6.84E+06	7.25E+06	0.00E+00	8.44E+07
Crustaceans-Swedish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Crustaceans-Swedish ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Freshwater-ROW	6.25E+07	6.25E+07	5.15E+07	6.25E+07	5.90E+07	6.25E+07	6.63E+07	6.80E+07	0.00E+00
Freshwater-ROW ECO	5.51E+06	5.51E+06	1.65E+07	5.51E+06	5.51E+06	5.51E+06	5.84E+06	0.00E+00	6.80E+07
Freshwater-Swedish	1.17E+07	1.17E+07	6.89E+06	6.89E+06	1.52E+07	1.17E+07	1.24E+07	1.41E+07	0.00E+00
Freshwater-Swedish ECO	2.39E+06	2.39E+06	7.18E+06	7.18E+06	2.39E+06	2.39E+06	2.54E+06	0.00E+00	1.41E+07
Demersal-ROW	3.44E+07	3.44E+07	2.83E+07	3.44E+07	2.35E+07	3.44E+07	3.64E+07	3.74E+07	0.00E+00
Demersal-ROW ECO	3.03E+06	3.03E+06	9.09E+06	3.03E+06	3.03E+06	3.03E+06	3.21E+06	0.00E+00	3.74E+07
Demersal-Swedish	3.63E+07	3.63E+07	2.14E+07	2.14E+07	4.72E+07	3.63E+07	3.85E+07	4.38E+07	0.00E+00
Demersal-Swedish ECO	7.44E+06	7.44E+06	2.23E+07	2.23E+07	7.44E+06	7.44E+06	7.89E+06	0.00E+00	4.38E+07
Pelagic-ROW	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pelagic-ROW ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pelagic-Swedish	6.23E+07	6.23E+07	3.68E+07	3.68E+07	6.23E+07	6.23E+07	6.60E+07	7.50E+07	0.00E+00
Pelagic-Swedish ECO	1.28E+07	1.28E+07	3.83E+07	3.83E+07	1.28E+07	1.28E+07	1.35E+07	0.00E+00	7.50E+07
Cream-ROW	3.27E+07	3.27E+07	2.83E+07	3.27E+07	0.00E+00	3.27E+07	3.27E+07	3.50E+07	0.00E+00
Cream-ROW ECO	2.24E+06	2.24E+06	6.72E+06	2.24E+06	0.00E+00	2.24E+06	2.24E+06	0.00E+00	3.50E+07
Cream-Swedish	1.25E+08	1.25E+08	1.08E+08	1.08E+08	1.60E+08	1.25E+08	1.25E+08	1.34E+08	0.00E+00
Cream-Swedish ECO	8.56E+06	8.56E+06	2.57E+07	2.57E+07	8.56E+06	8.56E+06	8.56E+06	0.00E+00	1.34E+08
Butter-ROW	1.66E+07	1.66E+07	1.49E+07	1.66E+07	8.44E+06	1.66E+07	1.66E+07	1.75E+07	0.00E+00
Butter-ROW ECO	8.57E+05	8.57E+05	2.57E+06	8.57E+05	8.57E+05	8.57E+05	8.57E+05	0.00E+00	1.75E+07

Butter-Swedish	2.73E+07	2.73E+07	2.45E+07	2.45E+07	3.55E+07	2.73E+07	2.73E+07	2.87E+07	0.00E+00
Butter-Swedish ECO	1.41E+06	1.41E+06	4.22E+06	4.22E+06	1.41E+06	1.41E+06	1.41E+06	0.00E+00	2.87E+07
Palm Oil-ROW	1.19E+08	1.19E+08	1.19E+08	1.19E+08	1.19E+08	1.19E+08	1.19E+08	1.19E+08	0.00E+00
Palm Oil-ROW ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.19E+08
Palm Oil-Swedish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Palm Oil-Swedish ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Rapseed Oil-ROW	2.15E+07	2.15E+07	1.93E+07	2.15E+07	1.89E+07	2.15E+07	2.15E+07	2.26E+07	0.00E+00
Rapseed Oil-ROW ECO	1.11E+06	1.11E+06	3.32E+06	1.11E+06	1.11E+06	1.11E+06	1.11E+06	0.00E+00	2.26E+07
Rapseed Oil-Swedish	8.60E+06	8.60E+06	8.38E+06	8.38E+06	1.12E+07	8.60E+06	8.60E+06	8.72E+06	0.00E+00
Rapseed Oil-Swedish ECO	1.12E+05	1.12E+05	3.37E+05	3.37E+05	1.12E+05	1.12E+05	1.12E+05	0.00E+00	8.72E+06
Sunflower Oil-ROW	2.60E+07	2.60E+07	2.34E+07	2.60E+07	2.60E+07	2.60E+07	2.60E+07	2.74E+07	0.00E+00
Sunflower Oil-ROW ECO	1.34E+06	1.34E+06	4.03E+06	1.34E+06	1.34E+06	1.34E+06	1.34E+06	0.00E+00	2.74E+07
Sunflower Oil-Swedish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sunflower Oil-Swedish ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Coffee-ROW	1.03E+08	1.03E+08	8.71E+07	1.03E+08	1.03E+08	1.03E+08	1.03E+08	1.11E+08	0.00E+00
Coffee-ROW ECO	8.00E+06	8.00E+06	2.40E+07	8.00E+06	8.00E+06	8.00E+06	8.00E+06	0.00E+00	1.11E+08
Coffee-Swedish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Coffee-Swedish ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cocoa-ROW	2.48E+07	2.48E+07	2.38E+07	2.48E+07	2.48E+07	2.48E+07	2.48E+07	2.52E+07	0.00E+00
Cocoa-ROW ECO	4.54E+05	4.54E+05	1.36E+06	4.54E+05	4.54E+05	4.54E+05	4.54E+05	0.00E+00	2.52E+07
Cocoa-Swedish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cocoa-Swedish ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Eggs-ROW	1.85E+07	1.85E+07	1.59E+07	1.85E+07	0.00E+00	1.85E+07	1.85E+07	1.97E+07	0.00E+00
Eggs-ROW ECO	1.26E+06	1.26E+06	3.78E+06	1.26E+06	0.00E+00	1.26E+06	1.26E+06	0.00E+00	1.97E+07
Eggs-Swedish	9.94E+07	9.94E+07	7.84E+07	7.84E+07	1.19E+08	9.94E+07	9.94E+07	1.10E+08	0.00E+00
Eggs-Swedish ECO	1.05E+07	1.05E+07	3.16E+07	3.16E+07	1.05E+07	1.05E+07	1.05E+07	0.00E+00	1.10E+08
Nuts-ROW	4.51E+07	4.51E+07	4.01E+07	4.51E+07	4.51E+07	4.51E+07	2.69E+07	4.77E+07	0.00E+00
Nuts-ROW ECO	2.53E+06	2.53E+06	7.58E+06	2.53E+06	2.53E+06	2.53E+06	1.50E+06	0.00E+00	4.77E+07
Nuts-Swedish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nuts-Swedish ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Peas-ROW	6.26E+05	9.39E+05	5.47E+05	6.26E+05	0.00E+00	2.50E+06	6.26E+05	6.65E+05	0.00E+00
Peas-ROW ECO	3.92E+04	5.89E+04	1.18E+05	3.92E+04	0.00E+00	1.57E+05	3.92E+04	0.00E+00	6.65E+05
Peas-Swedish	1.38E+07	2.07E+07	1.09E+07	1.09E+07	1.45E+07	5.53E+07	1.38E+07	1.53E+07	0.00E+00
Peas-Swedish ECO	1.48E+06	2.22E+06	4.44E+06	4.44E+06	1.48E+06	5.93E+06	1.48E+06	0.00E+00	1.53E+07
Beans-ROW	2.50E+06	3.75E+06	2.19E+06	2.50E+06	2.13E+06	1.00E+07	2.50E+06	2.66E+06	0.00E+00
Beans-ROW ECO	1.57E+05	2.35E+05	4.71E+05	1.57E+05	1.57E+05	6.28E+05	1.57E+05	0.00E+00	2.66E+06
Beans-Swedish	1.25E+06	1.88E+06	1.09E+06	1.09E+06	1.63E+06	5.01E+06	1.25E+06	1.33E+06	0.00E+00
Beans-Swedish ECO	7.85E+04	1.18E+05	2.35E+05	2.35E+05	7.85E+04	3.14E+05	7.85E+04	0.00E+00	1.33E+06
Spices_Other-ROW	5.21E+06	5.21E+06	4.56E+06	5.21E+06	5.21E+06	5.21E+06	5.21E+06	5.54E+06	0.00E+00
Spices_Other-ROW ECO	3.27E+05	3.27E+05	9.81E+05	3.27E+05	3.27E+05	3.27E+05	3.27E+05	0.00E+00	5.54E+06
Spices_Other-Swedish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Spices_Other-Swedish ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pepper-ROW	2.09E+06	2.09E+06	1.82E+06	2.09E+06	2.09E+06	2.09E+06	2.09E+06	2.22E+06	0.00E+00
Pepper-ROW ECO	1.31E+05	1.31E+05	3.92E+05	1.31E+05	1.31E+05	1.31E+05	1.31E+05	0.00E+00	2.22E+06

Pepper-Swedish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pepper-Swedish ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pimento-ROW	2.09E+06	2.09E+06	1.82E+06	2.09E+06	1.93E+06	2.09E+06	2.09E+06	2.22E+06	0.00E+00
Pimento-ROW ECO	1.31E+05	1.31E+05	3.92E+05	1.31E+05	1.31E+05	1.31E+05	1.31E+05	0.00E+00	2.22E+06
Pimento-Swedish	5.23E+05	5.23E+05	5.23E+05	5.23E+05	6.80E+05	5.23E+05	5.23E+05	5.23E+05	0.00E+00
Pimento-Swedish ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.23E+05
Offals-ROW	3.28E+06	3.28E+06	3.19E+06	3.28E+06	1.64E+06	3.28E+06	3.28E+06	3.33E+06	0.00E+00
Offals-ROW ECO	4.66E+04	4.66E+04	1.40E+05	4.66E+04	4.66E+04	4.66E+04	4.66E+04	0.00E+00	3.33E+06
Offals-Swedish	5.46E+06	5.46E+06	5.31E+06	5.31E+06	7.10E+06	5.46E+06	5.46E+06	5.54E+06	0.00E+00
Offals-Swedish ECO	7.76E+04	7.76E+04	2.33E+05	2.33E+05	7.76E+04	7.76E+04	7.76E+04	0.00E+00	5.54E+06
InfantFood-ROW	2.00E+06	2.00E+06	0.00E+00	2.00E+06	2.00E+06	2.00E+06	2.00E+06	3.33E+06	0.00E+00
InfantFood-ROW ECO	1.33E+06	1.33E+06	3.67E+06	1.33E+06	1.33E+06	1.33E+06	1.33E+06	0.00E+00	3.33E+06
InfantFood-Swedish	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
InfantFood-Swedish ECO	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Origins of Impact Categories

Appendix Table 8: GWP Contribution from Swedish and Imported Foods

	2015		2020	
	Sweden	Import	Sweden	Import
Scenario 0	41%	59%	41%	59%
Reduced Meat	41%	59%	41%	59%
ECO	42%	58%	42%	58%
Eco Sweden	42%	58%	42%	58%
Sweden Incr.	47%	53%	54%	46%
Veg.	40%	60%	40%	60%
Nutrition	37%	63%	37%	63%
All Conv	41%	59%	41%	59%
All ECO	49%	51%	49%	51%

Appendix Table 9: AP Contribution from Swedish and Imported Foods

	2015		2020	
	Sweden	Import	Sweden	Import
Scenario 0	31%	69%	31%	69%
Reduced Meat	33%	67%	37%	63%
ECO	31%	69%	30%	70%
Eco Sweden	31%	69%	30%	70%
Sweden Incr.	37%	63%	49%	51%
Veg.	55%	45%	55%	45%
Nutrition	33%	67%	33%	67%
All Conv	32%	68%	32%	68%
All ECO	23%	77%	23%	77%

Appendix Table 10: EP Contribution from Swedish and Imported Foods

	2015		2020	
	Sweden	Import	Sweden	Import
Scenario 0	43%	57%	43%	57%
Reduced Meat	45%	55%	47%	53%
ECO	42%	58%	41%	59%
Eco Sweden	42%	58%	42%	58%
Sweden Incr.	50%	50%	60%	40%
Veg.	56%	44%	56%	44%
Nutrition	42%	58%	42%	58%
All Conv	43%	57%	43%	57%
All ECO	37%	63%	37%	63%

Appendix Table 11: Land Use Contribution from Swedish and Imported Foods

	2015		2020	
	Sweden	Import	Sweden	Import
Scenario 0	56%	44%	56%	44%
Reduced Meat	56%	44%	55%	45%
ECO	56%	44%	56%	44%
Eco Sweden	56%	44%	56%	44%
Sweden Incr.	65%	35%	70%	30%
Veg.	55%	45%	55%	45%
Nutrition	52%	48%	52%	48%
All Conv	56%	44%	56%	44%
All ECO	56%	44%	56%	44%

Appendix Table 12 TETP Contribution from Swedish and Imported Foods

	2015		2020	
	Sweden	Import	Sweden	Import
Scenario 0	57%	43%	57%	43%
Reduced Meat	57%	43%	57%	43%
ECO	57%	43%	57%	43%
Eco Sweden	57%	43%	56%	44%
Sweden Incr.	69%	31%	71%	29%
Veg.	58%	42%	58%	42%
Nutrition	56%	44%	56%	44%
All Conv	57%	43%	57%	43%
All ECO	35%	65%	35%	65%

Appendix Table 13: HTP Contribution from Swedish and Imported Foods

	2015		2020	
	Sweden	Import	Sweden	Import
Scenario 0	61%	39%	61%	39%
Reduced Meat	61%	39%	61%	39%
ECO	61%	39%	60%	40%
Eco Sweden	60%	40%	60%	40%
Sweden Incr.	82%	18%	79%	21%
Veg	60%	40%	60%	40%
Nutrition	56%	44%	56%	44%
All Conv	61%	39%	61%	39%
All ECO	63%	37%	63%	37%

Appendix Table 14: BDD Contribution from Swedish and Imported Foods

	2015		2020	
	Sweden	Import	Sweden	Import
Scenario 0	60%	40%	60%	40%
ECO 1	60%	40%	61%	39%
ECO2	59%	41%	59%	41%
Eco Sweden	59%	41%	59%	41%
Sweden 10%	72%	28%	75%	25%
Sweden 30%	62%	38%	62%	38%
Nutrition	58%	42%	58%	42%
All Conv	60%	40%	60%	40%
All ECO	60%	40%	50%	50%

Contribution to Environmental Impact Categories

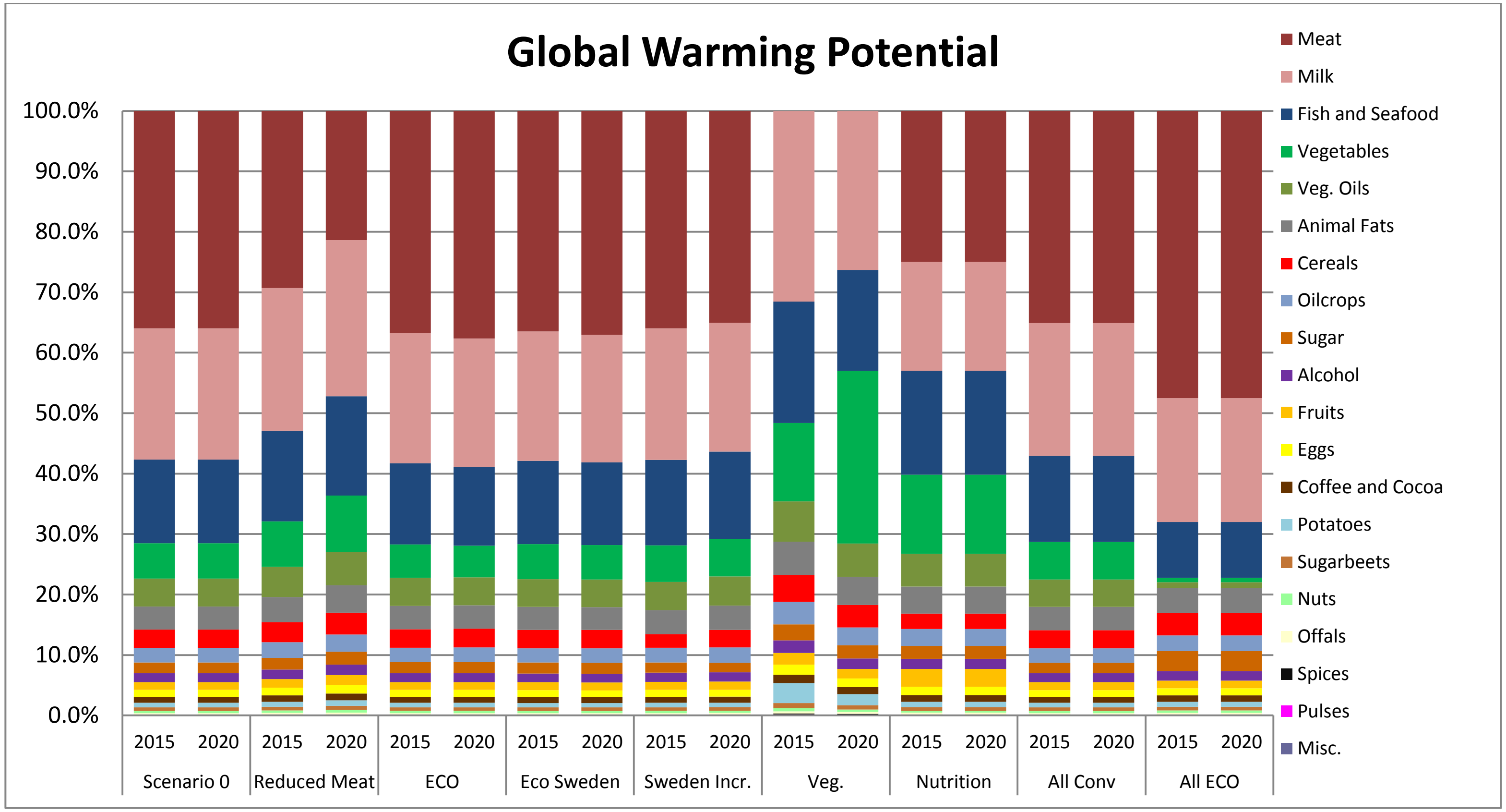

Figure A 1: GWP Contribution for different foods in 2015 and 2020

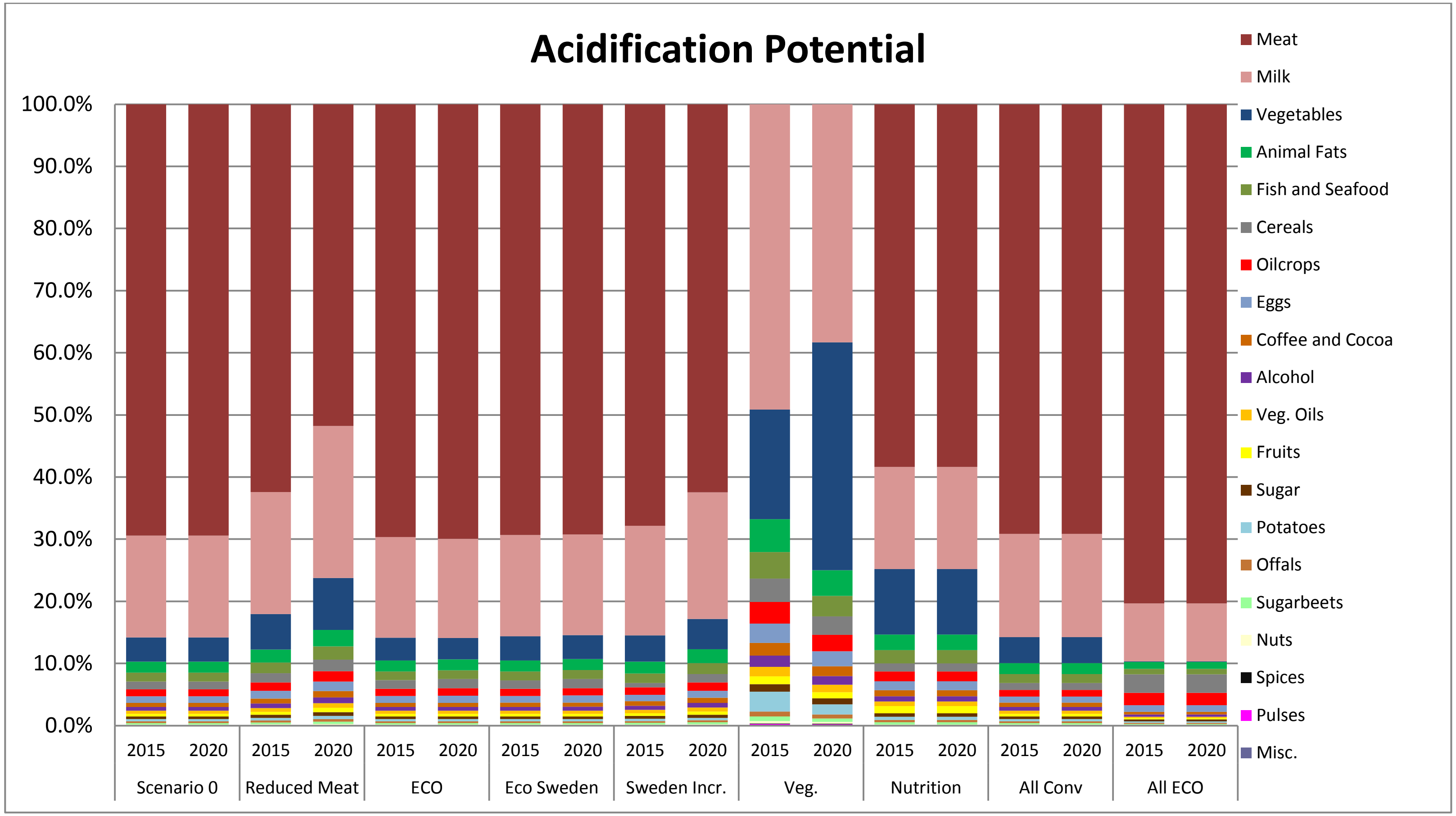

Figure A 2: AP Contribution for different foods in 2015 and 2020

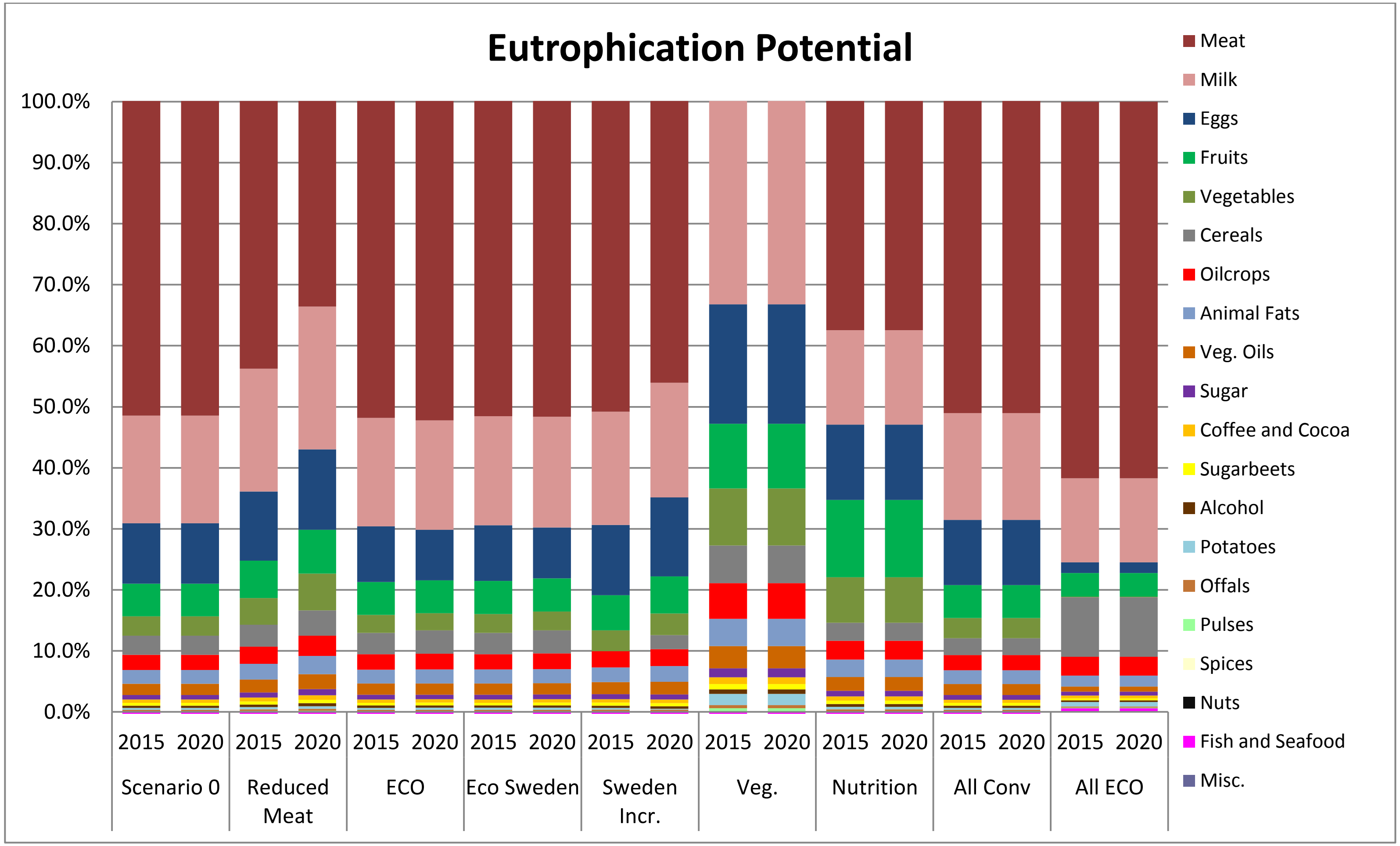

Figure A 3: EP contribution for different foods in 2015 and 2020

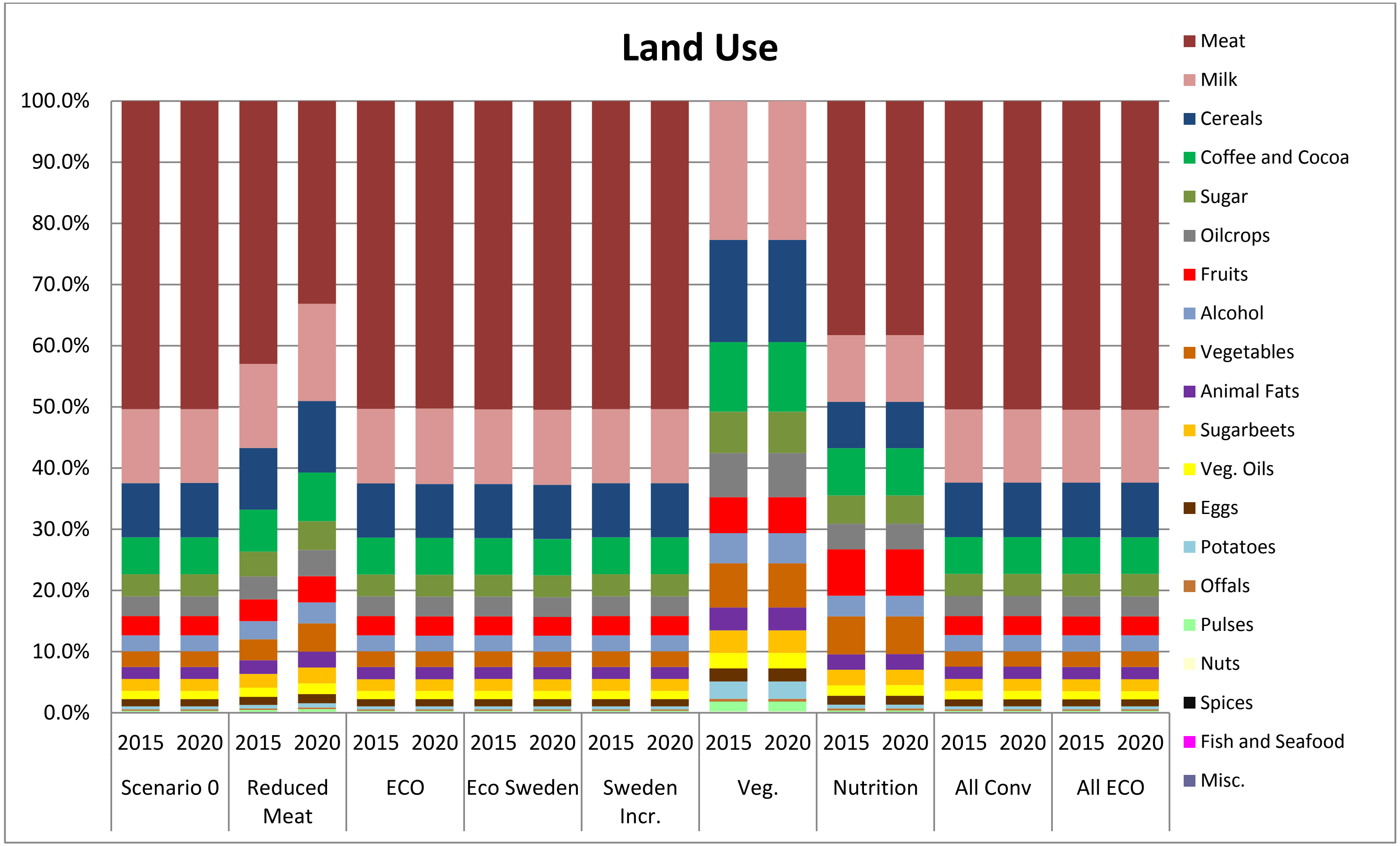

Figure A 4: Land Use contribution for different foods in 2015 and 2020

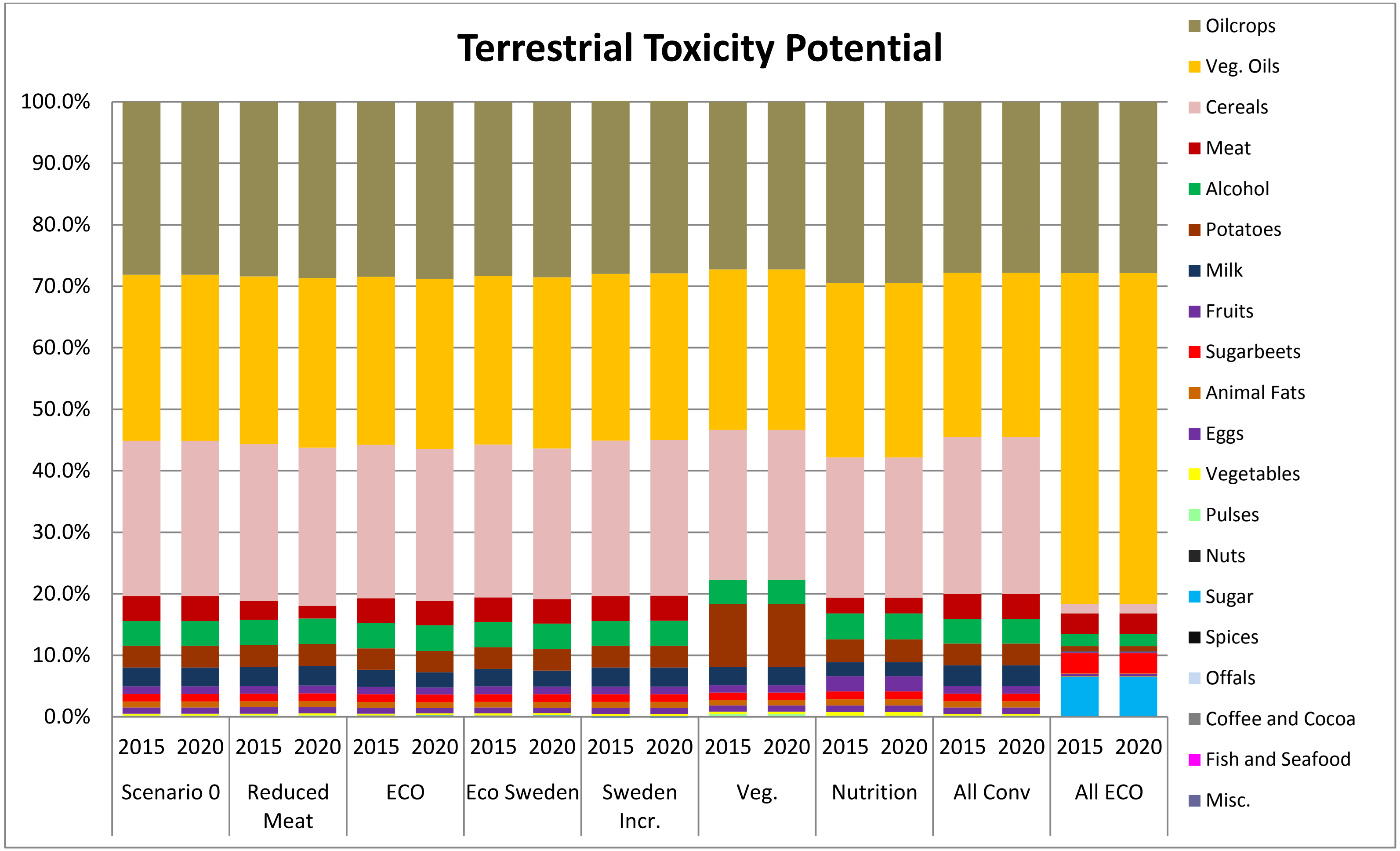

Figure A 5: TETP Contribution for different foods in 2015 and 2020

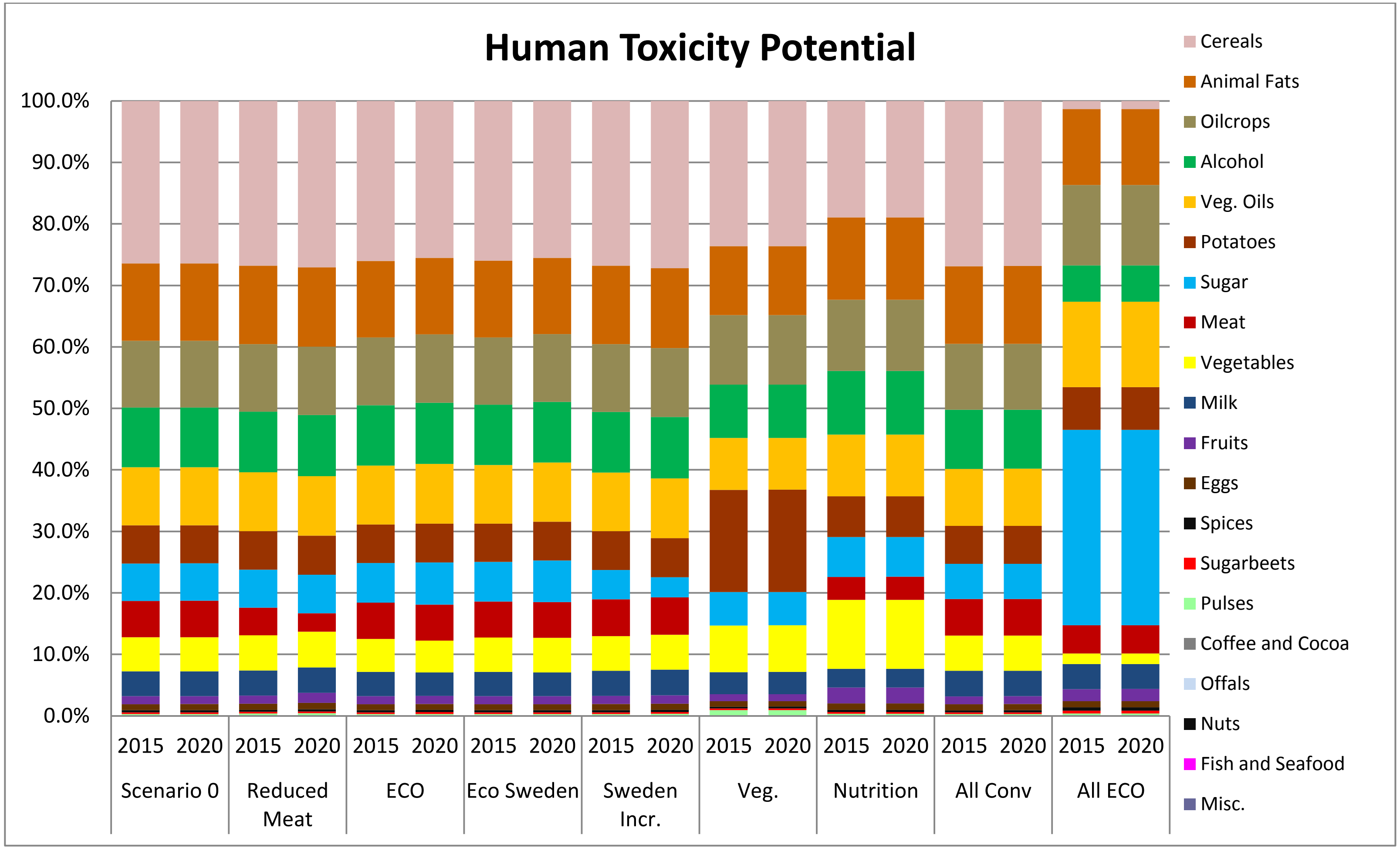

Figure A 6: HTP contribution for different foods in 2015 and 2020

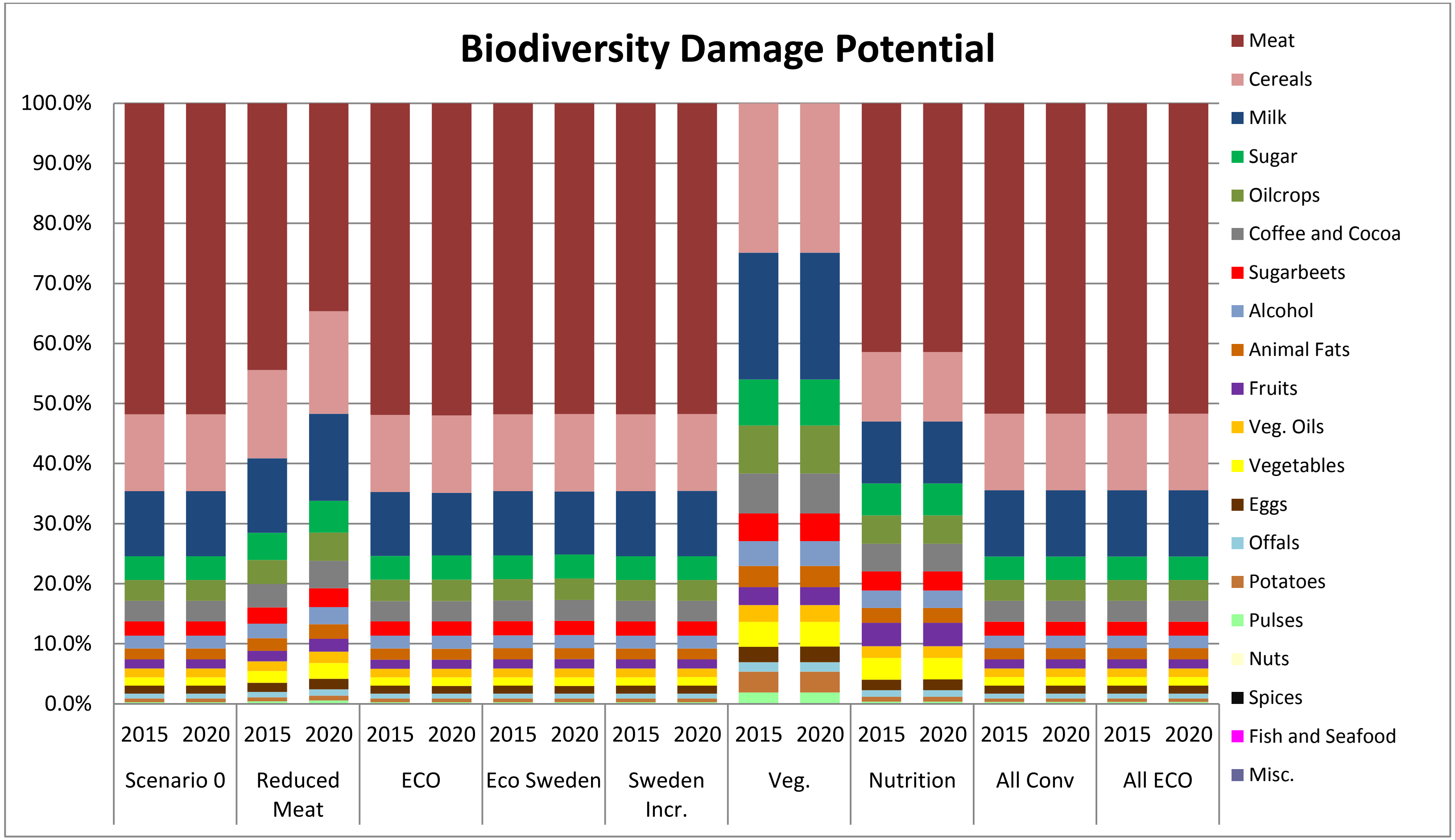

Figure A 7: BDD contribution for different foods in 2015 and 2020

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