

Plant Power

An industry report from
Växtbaserat Sverige 2023



About Växtbaserat Sverige/ Plant-food Sweden

Växtbaserat Sverige is an industry organisation whose goal and purpose are to promote the increased production and consumption of plant-based foods. Our members include both small start-ups and large, international companies.



At the time of this report's release, the association's members are:

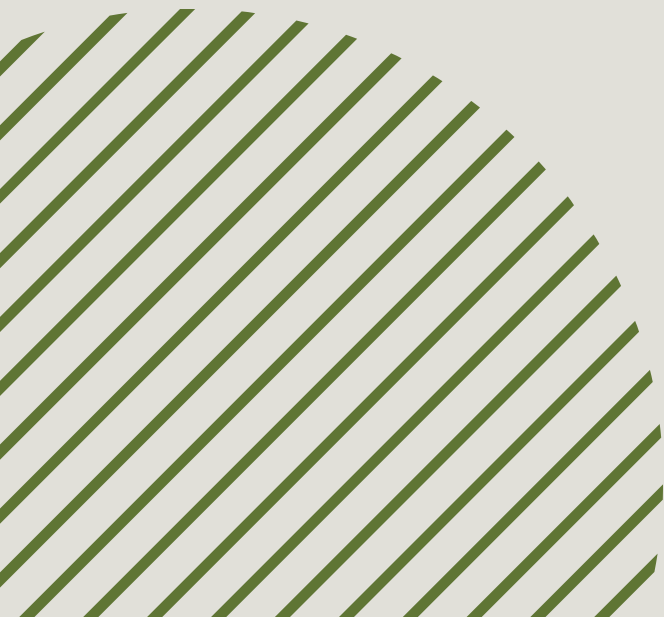
- Alpro/Danone
- Findus
- Kavli/Planti
- LiveKindly
- Nestlé/Hälsans Kök
- Oatly
- Orkla Foods Sverige
- Stockeld Dreamery



Table of content



1. The food sector has been hit hard by Russia's war in Ukraine	2
2. Bright outlook for plant-based foods.....	3
3. Plant-based food companies attract domestic and international investments	5
4. Positive sector forecasts - consumers drive growth.....	7
5. Why Sweden should invest in plant-based foods	10
6. New opportunities for Swedish primary production, but more tools needed.....	13
7. Better for the climate	16
8. Better for public health.....	19
9. New export opportunities.....	20
10. Obstacles to progress.....	21
11. How to achieve a strong plant-based sector in Sweden.....	24
12. Action plan for a strong Swedish plant-based sector.....	25



The food sector has been hit hard by Russia's war in Ukraine



2022 was a tough year for both food producers and consumers. Russia's war in Ukraine has created emergency situations across many industries, including those within the food chain. As such, vulnerabilities first exposed by the pandemic have become acute due to the concentration of raw material production and other crucial inputs in these two countries. This is unsurprising given that Russia and Ukraine account for approximately 30% of global wheat and barley exports and for around a third of the world's ammonia and potassium exports, both of which are key ingredients in fertilizers. Ukraine is additionally the world's largest producer of sunflower-based products. Russia's invasion and blockades have led to a global shortage of food, which, combined with the ensuing energy crisis, has led to steep price increases for consumers.



According to the Swedish food industry and employers' organisation Livsmedelsföretagen, the sharp rise in inflation in Sweden through 2022 and early 2023 has severely affected consumers' food purchasing habits resulting in demand for low-cost products increasing sharply. This change in consumer behaviour has affected organic foods particularly, which were previously in high demand and sales of which have now fallen drastically. Food companies have likewise stated that demand for Swedish-produced food has slowed down markedly in the hunt for lower prices.(1)

These events have similarly affected the plant-based segment.



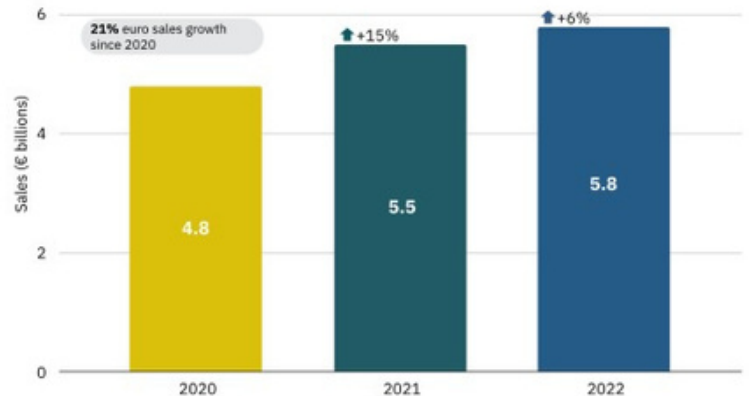
Bright outlook for plant-based foods

Demand for plant-based foods saw robust growth in the late 2010s and early 2020s with many new products entering the market. According to statistics from the Good Food Institute Europe (GFI Europe), overall European sales of plant-based foods that directly replace animal products increased by 6% to a total value of EUR 5.8 billion in 2022.(2)

Overall plant-based food market

Plant-based food sales in Europe¹ grew by 6% in 2022 to reach €5.8 billion.

Europe-wide plant-based food sales (in € billions)



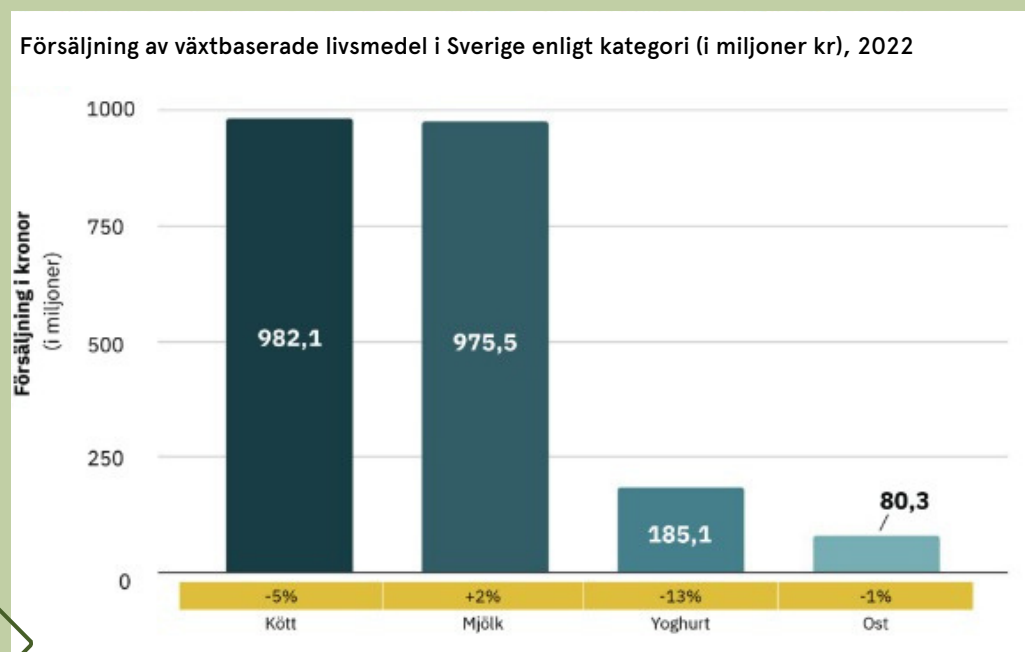
(3)

Over the past six years, the average annual sales growth for plant-based foods at Växtbaserat Sverige's members has been between 15 and 30 per cent. This represents a strong development and, unsurprisingly, has been seized upon by investors globally. The total value of the Swedish plant-based food market amounted to SEK 2.2 billion in 2022.(4)

Oatly, a producer of plant-based alternatives to dairy, recorded average annual growth of 52% per year during the period 2019-2022. (6) According to a recent report by GFI Europe based on sales data from Nielsen IQ for 13 European countries, sales of plant-based foods within the EU have increased by 22% to EUR 5.8 billion since 2020. (7)

The demand for plant-based foods has increased in the latter part of the 2010s and early 2020s.

More recently, the Swedish plant-based sector has witnessed a slowdown, with sales down 3.1% in 2022 to SEK 2.22 billion (EUR 196.2 million). This drop can largely be explained by the pandemic, war in Ukraine, and subsequent inflationary pressures, which combined have resulted in both consumer caution at the tills and start-ups potentially experiencing greater difficulties in finding financing for their investments. Despite the slowdown over the past year, there remains a clear, long-term growth trend in the plant-based sector, not least as Swedish consumers are already amongst the highest consumers of plant-based foods per capita in Europe, with plant-based alternatives to milk as a stand-out category in 2022, followed by plant-based alternatives to meat and cheese.(8)



Source: [Translated Sweden report.docx \(gfieurope.org\)](#)

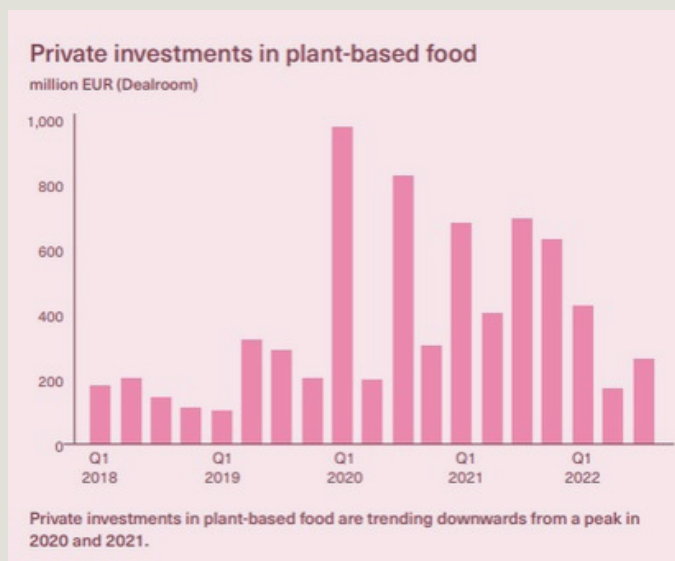
Market forecasts show a continued, positive potential for plant-based foods, which is borne out by private investments in plant-based food companies.

Plant-based food companies attract domestic and international investments

"If we look at the data, we can see that investments are beginning to slow down. In the short term, we expect this trend to continue. We see a great appetite for brands in alternative proteins and the delivery of groceries. In the long term, we expect to see really big investments in infrastructure. To meet the demand for alternative proteins, new types of factories will be required", says Matthieu Vincent from Digitalfoodlab.



In 2020, plant-based food start-ups raised €1.7 billion, three times as much as in 2019.



(10)

Globally, investments in alternative proteins have grown sharply and now exceed \$14 billion. In 2022, the alternative protein industry raised \$2.9 billion in investment.(11)

In Sweden, investment in Swedish Food Tech companies has (12) grown by over 120 per cent over the past three years, according to the consultancy firm Digitalfoodlab, a specialist strategic advisor to companies in the food industry, especially Food Tech. (13)



AGTECH

Technology and new scientific methods are being used for finding new, sustainable, and smart ways to produce agricultural goods and raw materials. This could, for example, involve using 5G and drones in cultivation or finding smarter irrigation methods.

FOODTECH

New technology and scientific knowledge are being used in the development of innovative, sustainable foods as well as in new ways for delivering our food and drink. Examples of these include companies developing new foods by using crops in new, different ways and companies working on methods to reduce their climate impact or waste in the food chain.





Some examples of recent investments in the Swedish plant-based sector include the GroPro protein factory in Bjuv, which opened in early 2022 to extract protein concentrates from Swedish-grown legumes such as peas and beans. This all-Swedish protein concentrate can replace animal proteins in all meat and dairy alternatives. (14) In September 2022, Lantmännen announced it is set to invest a billion SEK in a new protein factory in Lidköping, which will produce pea-based proteins for meat substitutes. (15)

Since 2017, Oatly has invested billions in its oat factory in Landskrona, where plant-based alternatives to dairy products are made. It has additionally established a research centre in Lund and built a new head office in Malmö.

Furthermore, several funds have been set up focusing on investments in Food Tech and plant-based products, such as Gullspång re:food (16), Nicoya (17) and Kale United (18) to name but a few.

Positive sector forecasts - consumers drive growth

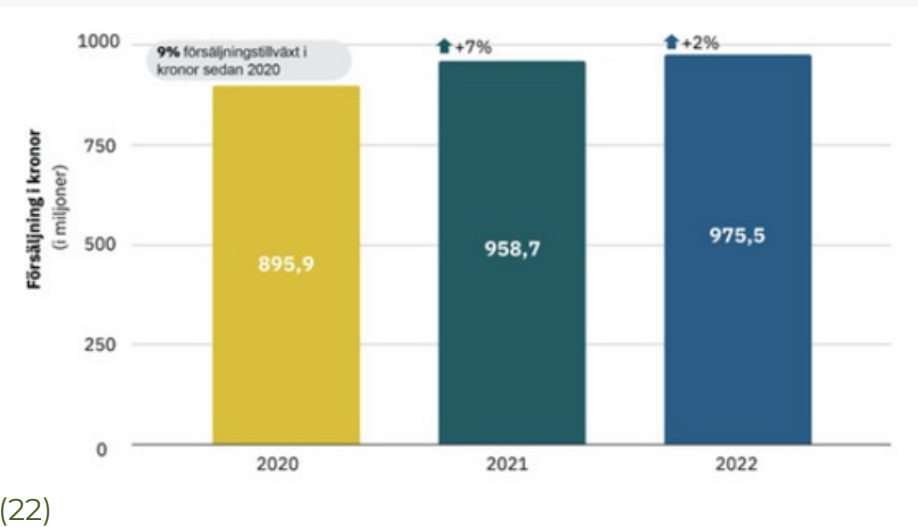
The global plant-based food and beverage market is expected to be worth EUR 13.8 billion by 2030. This would mean fivefold market growth in just 10 years, according to the statistics portal Statista. (19)

Plant-based alternatives to milk is the most mature product category, followed by plant-based alternatives to meat. The market value of plant-based dairy products is expected to grow to 29.6 billion dollars by 2027 and witness annual growth of 10.3% between 2020 and 2027. Plant-based alternatives to milk is the largest category within plant-based dairy, accounting for around 80% of its market value. (20)

In Sweden, the plant-based dairy alternative segment is valued at SEK 975.5 million (EUR 86.1 million) and grew by 9% between 2020 and 2022 (21)

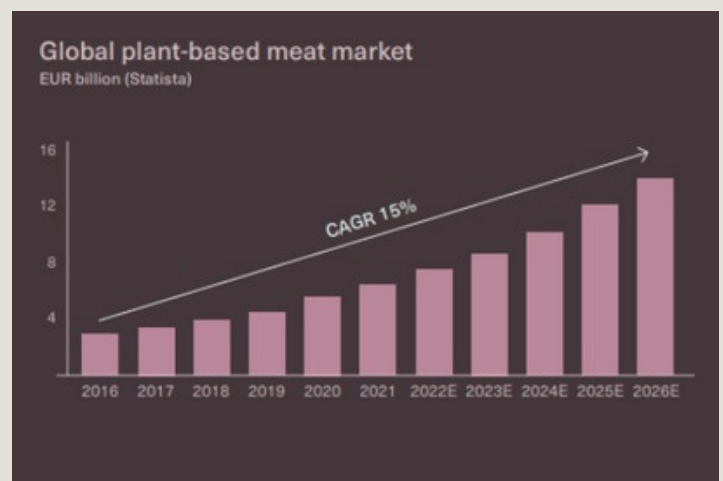


Försäljning av växtbaserad mjölk i Sverige (i miljoner kr,) 2020-2022



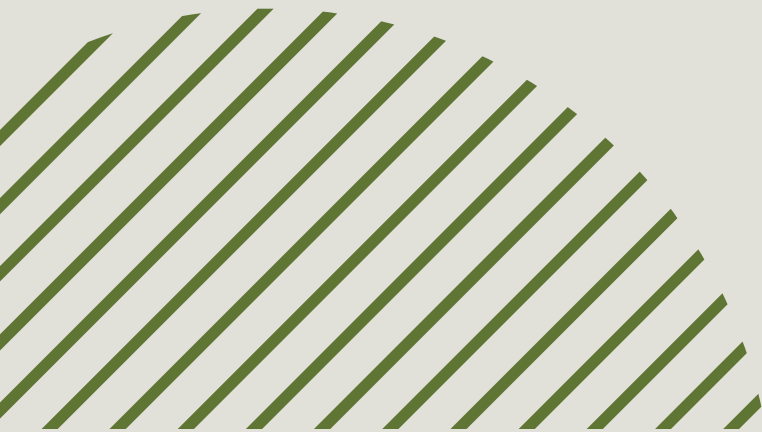
According to Dairy Global, the plant-based dairy market is expected to grow by 12% on average per year until 2027 (23)

The global market for plant-based alternatives to meat has matured in recent years and its growth rate is now comparable with the growth of plant-based beverages. According to Statista, the plant-based alternatives to meat category is expected to grow around 15% annually from 2016 to 2026. The market is expected to continue to grow at an annual rate of 9 per cent, which is comparable with forecasts for traditional meat, which is overall expected to decrease by 3 per cent(24) According to a report by Bloomberg Intelligence, (25) the global market for plant-based foods that replace animal proteins could reach a value of over \$162 billion by 2030, up from \$29.4 billion in 2020. This would mean that plant-based alternatives would have a 7.7% share of the global protein market. (26)





The development of the plant-based sector is driven by changing consumer perceptions and growing consumer demand. Several studies have revealed large-scale changes in consumer behaviour in recent years. Previously, plant-based drinks were perceived as targeting consumers unable to drink milk due to allergy/intolerance. However, this consumer group has expanded to include people who avoid milk for health, ethical, climate or environmental reasons as well as changing taste preferences. Today, several studies show that this category also attracts consumers who do not classify themselves as either vegan or vegetarian.(28) As mentioned in the introduction to this report, it is worth highlighting that Swedish consumers are among the largest consumers of plant-based foods per capita in Europe. The category that stands out the most is plant-based alternatives to milk, followed by plant-based alternatives to meat and cheese. (29)





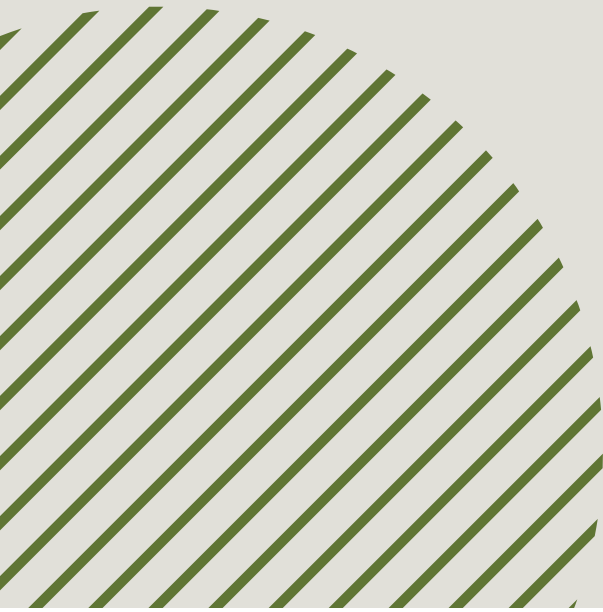
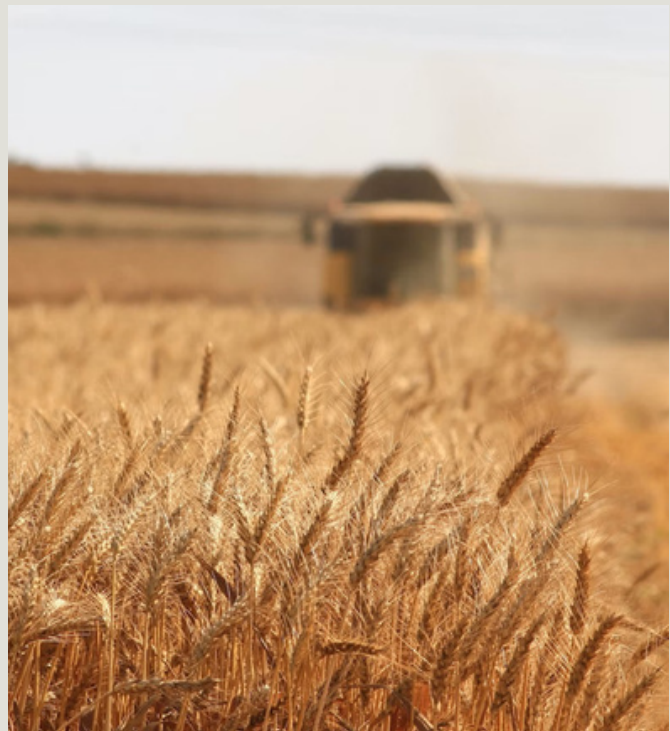
Why Sweden should invest in plant-based foods

Until Russia's invasion of Ukraine, demand for plant-based foods was increasing rapidly. This consumer-driven demand, which is expected to resume increasing in the future, has led to many new innovations and the emergence of exciting Food Tech companies. This development has the potential to provide new opportunities for the entire Swedish food chain, which has been severely tested in recent years.

Increasing resilience and security of supply

The pandemic and Russia's war in Ukraine have exposed vulnerabilities across the entire food supply chain, and highlighted the importance of strengthening the security of supply. Following some two decades of globalisation and free trade, where the West's access to food was of little concern - not least in Sweden - we now find ourselves in a situation where access to food and inputs can no longer be taken for granted.

Political issues related to access to and availability of food have been put in the spotlight, not least during the Russian blockade and ongoing disruption to the distribution of Ukrainian agricultural products. This has resulted in a shortage of artificial fertilizers as both Russia and Ukraine are major producers, which has affected production for other grain markets. Combined with the halt to India's wheat exports in spring 2022, the overall result has been a global grain shortage. The limited availability of raw materials illustrates with cold-blooded clarity the importance of strengthening security of supply and resilience in the food supply chain.





Need for greater resilience in the food supply chain

Sweden's expected accession to NATO will place new demands on Swedish civil preparedness to support military preparedness in times of crisis. Article three of the NATO Treaty, the so-called resilience clause, states that parties "separately and jointly, by means of continuous and effective self-help and mutual aid, will maintain and develop their individual and collective capacity to resist armed attack,"(30) which may entail new requirements for the security of supply of food, water, energy, and transport.

Both to deal with the current situation in Sweden and prepare for NATO membership, several government assignments to state authorities have been initiated. In February 2023, the Swedish National Food Agency and the Swedish Board of Agriculture presented a report (31) on food preparedness in civil defence, which included conducting a dependency and vulnerability analysis of the consumer milk, cereals, and legumes sectors. In May 2022, a government inquiry (32) opened looking into how Sweden's food preparedness can be strengthened, which will report back to government in February 2024. In the 2023 Spring Budget Bill, the government proposed an additional SEK 20 million to the National Food Agency to strengthen security of food supply and manage drinking water.(33)





More plant-based foods and beverages lessens vulnerability

The best way to secure food supplies in Sweden is to ensure we have healthy, competitive companies operating across the food chain, that sell products consisting of Nordic raw materials. What is often forgotten, however, is the vital role plant-based foods can play in strengthening food preparedness in the event of war or crisis. More plant-based production and consumption lessens vulnerability because the raw materials grown are used for human food and drink instead of animal feed. Today, for example, a substantial proportion of wheat grown in the EU is used for animal feed, and of the total global soya production, between 75% and 80% is used for animal feed with only 6% grown for direct, human consumption. The remainder is used for various products including the production of biofuels.(34) If this land were instead used to grow, for example, oats and legumes to produce plant-based foods, arable land would be used more effectively. According to the Good Food Institute, a broader transition in the type of protein products consumed could make land use up to 95 per cent more effective.(35) This would additionally lessen vulnerability of food availability by extending the shelf life of many plant-based foods, which is clearly highly beneficial for use in diverse types of emergency stocks. The latter was noted by the Swedish Civil Contingencies Agency (MSB) and the Swedish University of Agricultural Sciences (SLU) in a joint report from 2018.(36)

Increased production of plant-based proteins for human consumption would lessen vulnerability in terms of food security. Sweden has excellent prerequisites for increasing the production of crops well suited to Swedish conditions. The joint report(37) from SLU and MSB in 2018 drew attention to this, and additionally highlighted various vulnerabilities and solutions to ensure greater resilience within agriculture. The report highlights crop production for human consumption as a central tenet of the solution. This should be taken into account by the National Food Agency and the Swedish Board of Agriculture in their continued work in forming a coherent dependency analysis of areas including the cereals and legumes sectors and primary production stages through to consumers' purchases.(38)

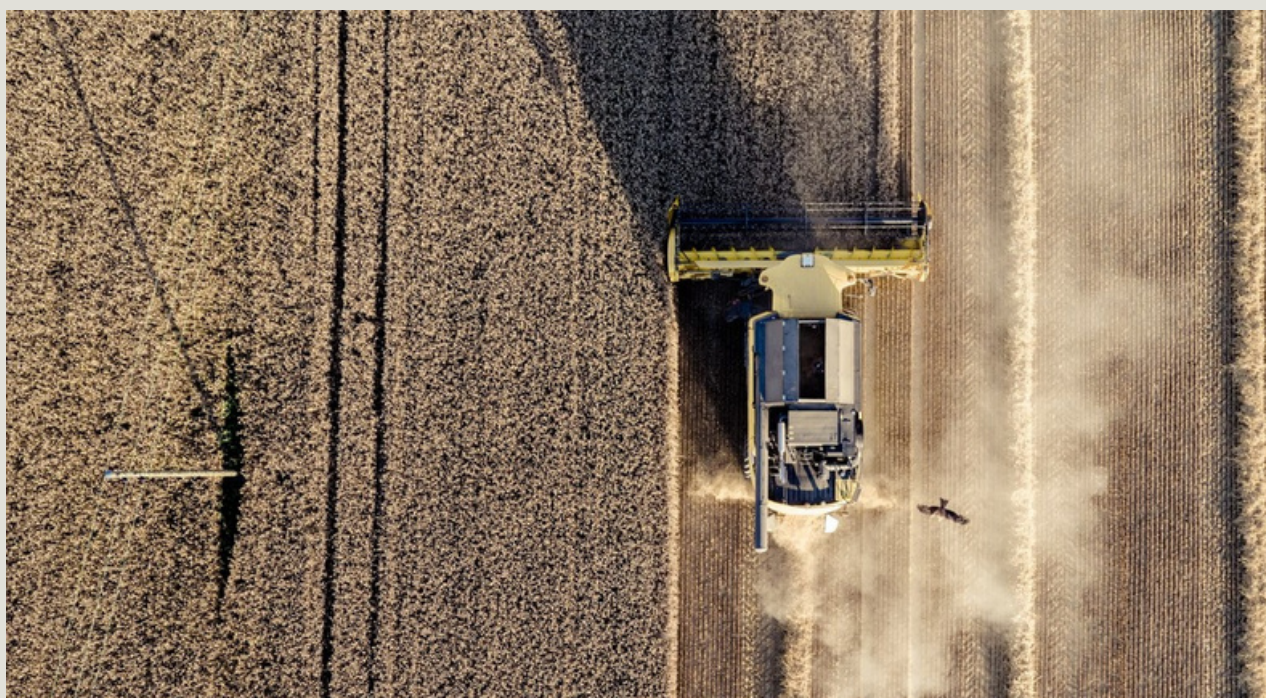
Increased production of plant-based proteins for human consumption would lessen vulnerability in terms of food security.

New opportunities for Swedish primary production, but more tools needed

Primary production is key to increasing the security of food supply in Sweden, and plant-based foods are a central tenet to a resilient and diverse agricultural sector. Sweden has excellent potential to further position itself in the market by increasing the production of crops for human consumption that are well suited to cultivation at our latitudes, which would strengthen both primary production and companies wanting to use locally grown Swedish crops. However, converting production often requires costly investments for individual farmers and a critical factor in deciding to is profitability, or expected profitability. A farmer must be able to see that growing broad beans for human consumption is more profitable than growing wheat for animal feed for them to be able and willing to invest in the change.

In this respect, policy must provide tools which enable and facilitate farmers wishing to transition their production to greater cultivation of crops for human consumption. Since 2020, SLU, with funding from EU Horizon 2020, has been conducting a pilot project (the UNESCO project) for farmers wishing convert their businesses to become more plant-based.(39)

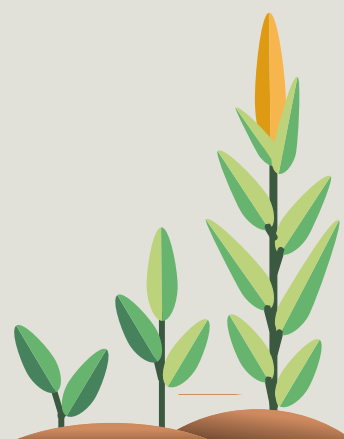
The project has studied how a transition to using mainly roughage for ruminants and growing more crops for human consumption can increase farms' sustainability levels. The conclusions drawn from the project demonstrate that specialist dairy and meat farms have the potential to improve both their economic resilience and environmental sustainability by including more crops for direct consumption through agro-ecological diversification.(40)



A further, exciting initiative can be found in Denmark with the setting up of the so-called Plant Fund. Both the Danish government and parliament have concluded an agreement aimed at supporting the green transition in the agriculture and forestry sectors and improving Denmark's water ecosystems and rural natural habitats. The agreement further targets reductions in both greenhouse gas and nitrogen emissions. A central element of the agreement is the **transition to plant-based foods, a sector the Danish government has identified as an area for future growth with the potential to create new revenues and job opportunities.** The Danish government views greater crop cultivation as playing a key role in the green transition and, as such, has decided to draw up an action plan for plant-based foods and establish **a foundation for plant-based foods.** To demonstrate its commitment, the government is to allocate DKK 7.5 million annually from 2022 to 2030 to support actions in developing a greater variety of crops, cultivation techniques, breeding, sales promotion, export promotion, education, and knowledge sharing. At least half the fund's resources are earmarked for plant-based organic food. The agreement additionally allocates DKK 580 million for the period 2023-2027 for a plant-based food ecosystem. **The parties to the agreement have additionally agreed that investment aid for protein-rich crops and their processing should be incorporated into the environmental technology scheme under the Danish Rural Development Programme.**

"It is important to have a far-reaching agreement. This means investments can be made in good confidence, regardless of whether it is a red or blue government. We have a responsibility to all the people who work daily in the agriculture and food sectors,"
said Minister for Finance Nicolai Wammen on 4 October 2021 (41)

The Danish agreement and the setting up of the Plant Fund are two, concrete measures that should serve as inspiration in the ongoing work in updating the Swedish Food Strategy.(42)





A wide range of high-quality, sustainably grown crops can attract investments and new businesses to Sweden. Food production very much concerns logistics and the importance of being able to see the chain as a whole. Strengthening primary production, therefore, requires the capacity to both store and transport raw materials from agricultural areas such as Gotland. Storage options affect where in the country we can grow fruit and vegetables. Primary production and the processing industries must be connected by a reliable transport network. This is crucial to developing greater robustness within the food chain.

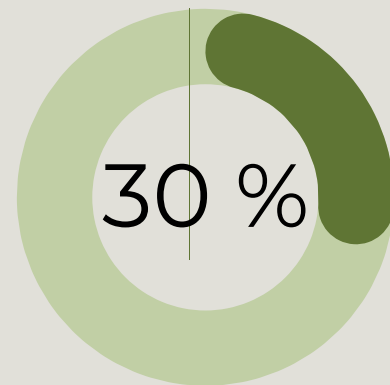
The government's forthcoming work on updating and developing the Swedish Food Strategy should promote the business opportunities that a transition to more plant-based production of crops for human consumption would create for agriculture and, furthermore, the entire Swedish food sector. The transition would, likewise, produce huge benefits to public health, the climate, and the environment. To create a food strategy that reduces exposure to food supply vulnerabilities and embraces both animal and plant-based agriculture, whilst taking into account public health and the climate, **an action plan for plant-based foods should be drawn up**. This plan should take into account the ongoing work both within the EU and other national initiatives, including the forthcoming proposals within the framework of the EU's Farm to Fork Strategy, the Sustainable Food Systems Initiative, and the development of an EU Protein Strategy as well as the previously mentioned Danish initiative and a similar one in the Netherlands. In this respect, Sweden can both inspire and gain inspiration.





Better for the climate

Greater production and consumption of plant-based foods is not only important for strengthening food security, but would make an additional, positive contribution both to reducing the food sector's impact on the climate and to public health. Greater production and consumption of plant-based foods can play a key role in reducing greenhouse gas emissions from the food and agricultural sectors. The agricultural sector currently accounts for around 30% of global greenhouse gas emissions, and around a third of Swedish households' emissions derive from food. A number of research reports (43), (44) (45) have identified the food sector as key to achieving the global climate goals set. Already in 2019, the Intergovernmental Panel on Climate Change (IPCC), in its report "Special Report on Climate and Change", stressed the importance of transitioning food systems if the UN's climate goals were to be reached. This requires both production methods becoming fossil-free, and, predominantly, wholesale changes to the food we produce and eat. Primary production is responsible for up to three quarters of the food sector's total climate impact.



"Global food security is an understated issue, as it is both affected by climate change and inherently affects the climate situation"

- Prime Minister Ulf Kristersson during his press conference at COP27 on 7 November 2022

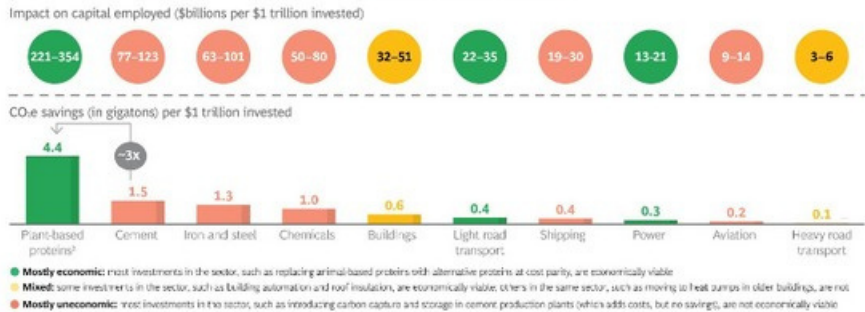
Animal-based products represent slightly less than a fifth of the world's total calorie intake, whilst accounting for over 60 per cent of the food sector's climate impact (which is greater than the entire transport sector) and use up over 80 per cent of total farmland.(46) In other words, producing plant-based foods is significantly more resource-efficient, which is important given research clearly indicates that the planet is suffering, and that food produced in the future must use existing farmland to meet both the climate and biodiversity goals set.(47) Therefore, our food production and consumption choices have a major impact on both the climate and environment.(48) The latest IPCC synthesis report (2023) clearly shows that the window of opportunity for action is shrinking rapidly, and that the world has only seven years in which to halve emissions compared to 2019 levels. The IPCC points to reducing the agricultural sector's methane emissions and greater decarbonisation through, for example, plough-free farming as key to reaching the targets. Future investments in competitive plant-based agriculture should consider carbon capture schemes and other regenerative production methods.





In a report from Boston Consulting Group (BCG), the climate benefits per dollar invested for a variety of climate-friendly investments were calculated and the conclusion reached was that transitioning to alternative protein sources is one of the most effective measures for lowering our climate impact. According to the report, switching to plant-based protein sources is three times more efficient than producing fossil-free cement and steel, and 22 times more efficient than the green transition of the aviation industry. As such, BCG highlights the need for even greater investment in the food sector. The consulting firm forecasts alternative protein sources to account for at least 11 per cent of global protein consumption by 2035. According to BCG, with the right technology, cooperation, and investments, this figure could increase to at least 22 per cent. (49)

Exhibit 1 - Plant-Based Proteins Have Greater Impact on Capital Employed¹ Than Other Decarbonization Levers in All Other Sectors



Sources: BCG/GFMA report, "Climate Finance Markets and the Real Economy"; BCG analysis.
¹ Impact return on capital employed (ICRE) - BCG Horizon has limited ICRE, or impact on capital employed, assumes a market value for avoided tons of CO₂e per dollar invested of \$40 to \$80 per ton.
² CO₂e savings from plant-based production (red meat, pork, chicken, fish, and seafood).

(50)

Politicians and decision-makers are increasingly comprehending the significance of food production and consumption's impact on the climate, which is reflected in the development of EU policies such as the Farm to fork strategy for a fair, healthy, and environmentally friendly food system.

In the strategy, the European Commission underlines the need to fundamentally change the food system as essential to addressing the challenges within public health, sustainability, resilience, and strengthening competitiveness. The strategy (51) is a key tenet of the European Green Deal as well as a key point on the European Commission's agenda (52) to achieve the UN Sustainable Development Goals.(53)





The Commission has concluded that a shift to a more plant-based diet, which entails consumption of less red and processed meat and more fruit and vegetables, not only reduces the risk of life-threatening diseases, but also reduces the food system's climate and environmental impacts. The Farm to Fork Strategy and the European Commission's report on ensuring food security both highlight the need for a shift towards more sustainable consumption patterns and the fact that adjusting to a more plant-based diet not only improves public health but also reduces the environmental impact of the food system.⁽⁵⁴⁾ The EFSA's recommendation on sustainable food systems likewise underscores how more plant-based diets can improve the health of both people and the planet, and that limiting the consumption of beef and dairy products could have the greatest potential for ensuring the sector's environmental sustainability. In addition, public policies that support demand for types of food and public investments, such as agricultural subsidies, must be adapted to achieve these objectives.⁽⁵⁵⁾

The increasing awareness of food production's impact on the climate can likewise be seen in global collaborations. The UN organised the Food Systems Summit, a high-level meeting on sustainable food systems, in connection with its General Assembly in 2021 and the most recent climate summit, COP27, was largely devoted to the role and importance of food production and consumption.⁽⁵⁶⁾

Unfortunately, Sweden's national food strategy remains a step behind the EU, and several countries such as Denmark, the Netherlands, Israel, and Singapore. This is because the current strategy does not view the issue of sustainable food systems from a systemic perspective nor does it take into account the complex interconnections between individual health, healthy societies, and a healthy planet. Therefore, news that the Swedish strategy is to be subject to review is welcome. The work should be aligned to the government's work on the upcoming Climate Policy Action Plan, which is being drafted during 2023. In this respect, it is pleasing to see the government announced in spring 2023 it is to host a national climate meeting, which will include Swedish companies, trade unions, researchers, the public sector, and civil society.⁽⁵⁷⁾ This represents an excellent opportunity for Sweden to adopt a broader, more far-reaching perspective to protecting the climate and improving public health, whilst ensuring a secure food supply.



Better for public health


Obesity has become one of the greatest public health challenges of our time, as it increases the risk of developing cardiovascular disease, type 2 diabetes, and several types of cancer. The most common cause of death today among both men and women is cardiovascular disease, followed by cancer. (58)

Large parts of the Swedish population currently consume too few vegetables, fruits, nuts, seeds, fibre, and whole grains(59) (60) There is clear, scientific evidence that fibre has a positive effect in preventing public health problems such as high blood pressure, cardiovascular disease, type 2 diabetes, and certain forms of cancer.(61) Studies show that the increased consumption of fibre-rich foods such as cereals, legumes and vegetables can contribute to better overall public health.(62) It is positive that such findings are reflected in nutritional recommendations and dietary advice, for example in the Swedish National Food Agency's recently updated Food Circle, which sees a larger intake of plant-based foods recommended. For example, enriched oat drink and plant-based yoghurt are highlighted as alternatives to cow milk/yogurt.(63) The recently revised Nordic Nutrition Recommendations, which now additionally take into account climate and environmental perspectives, recommends a transition to a more plant-based diet.(64) For example, the NNR committee has recently decided to recommend an intake of no more than 350 grammes per week of red meat and charcuterie compared with its previous advice of 500 grammes.(65)

The pandemic reinforced the importance of improving public health to ease the burden on healthcare systems,(66) I not least in light of the fact that the number of lifestyle-related diseases looks set to increase globally in the coming years.(67) In its latest trend analysis,(68) Axel Johnson Group draws attention to the more central role food and nutrition will have in healthcare in the future, driven by a shift in focus away from simply treating diseases to more preventive care. This will lead to both an increase in consumers' awareness of the connection between health and nutrition and the availability of various tools and solutions, which provide support in adopting a healthier lifestyle in the long term.

Poor economic development affects public health

Wealth and the ability to earn a living are key prerequisites for positive health outcomes. A deteriorating economic situation negatively impacts people's ability to adopt healthier lifestyles and, by extension, their health.(69) The current economic downturn represents a challenge for public health. According to the food sector and employers' organisation Livsmedelsföretagen, for the first time the pursuit of low prices is the most important consumer trend in the retail food sector.(70) This is highly likely to affect public health, as consumers prioritise price over healthy and/or organic products.



Axel Johnson Group's report predicts average food inflation will remain high in the coming years, not least due to the investments underway to lower the food sector's climate footprint. In addition, given the public health challenges, more food products will need to be more nutritious. The European Commission's proposal for integrated product labelling, that highlights various aspects of health and sustainability, is also expected to meet this need to an extent. With consideration to these necessary changes, household expenditure on food is likely to continue to need to increase.⁽⁷¹⁾ With this in mind, the share of disposable income that households have spent on food over the past 20-25 years must be considered as historically low.

The food industry has a leading role to play in regard to public health. Despite the fact that the links are well known between, for example, increased risk of colorectal cancer and too high intake of red meats such as beef, pork, lamb and, above all, processed meats and sausages, there are still many regulations that distort competition between animal- and plant-based products, such as various forms of subsidies, including EU school milk subsidies, which only cover traditional dairy, and enrichment rules for organic products.

New export opportunities

Swedish exports of plant-based foods to the expanding global market can increase if we enable more primary producers to meet both the demand for more crops being used in food products and the growing plant-based food sector as a whole. In addition, the knowledge and skills accumulated in the sector can mean that patents and ideas can be developed for export.

Countries that elect to support the emerging the plant-based food sector will be rewarded by the creation of new jobs and increased growth and export opportunities, whilst strengthening food security.

Repeatedly, Sweden has demonstrated world-leading innovative powers which have then been translated into export successes, most recently in the tech industry. Right now, Sweden has all the necessary prerequisites in place to become a world leader in the cultivation, innovation, processing, commercialisation, and export of Nordic plant-based foods.

Obstacles to progress

Systems and regulations hold back the development of plant-based foods

The plant-based food sector's development has been driven by demand as opposed to political decisions, which is a strength. However, there is now a need for policies and regulations to be updated to ensure obsolete legislation does not inadvertently place unnecessary obstacles in the way of further development.

Intensive policy and regulatory developments are currently underway in the food area, both domestically and on the EU level. For example, the government is set to update the Swedish Food Strategy, which represents an opportunity for changes that see the potential of the plant-based segment of the food chain being fully realised. There is currently intensive policy and regulatory development on the EU level in the areas of sustainability and food. The Farm to Fork Strategy establishes the overall framework for policy development and then highlights a number of areas where regulatory development is required. These areas include prerequisites for sustainable food systems, development of rules on information to consumers such as nutrient profiles and labelling, and taxonomy, green requirements, regulations on packaging waste and producer responsibility as well as school milk subsidies and public procurement.

The following obstacles should be considered in the ongoing work:

Research grants and the prerequisites for innovation

- Investments in research often focus on traditional food production and consumption, not least in research on nutrition.
- There is a lack of knowledge and skills on how crops are processed and developed into (new) foods as well as on how to extract high-quality protein from crops. Likewise, there is a shortage of skills and lack of relevant support infrastructure in the processing chain.
- Small start-ups lack support in terms of access to test facilities and the knowledge needed for scaling up production that exists and is encouraged in other sectors, which is often necessary during the initial stages of a company's growth.
- There is a shortage of vegetable proteins. Today, Swedish food producers are forced to import certain crops that could instead be grown in Sweden, by Swedish farmers. This is despite the fact that there are crops well suited for cultivation in Sweden that were once widely cultivated.

Distorting regulations and subsidies

- There currently exist a number of goals and instruments which distort competition by rewarding animal-based foods over plant-based ones, and this needs to be changed. A clearly formulated objective is needed to achieve, at the least, a regulatory framework for food that is competition-neutral regardless of raw material, so as to avoid restricting innovation, growth, and competitiveness. Examples of anti-competitive regulations include EU school milk subsidies, differing rates between animal- and plant-based foods and EU rules on food designations, both of which are regulated under the EU's Common Agricultural Policy and the regulatory framework for organic labelling. The proposals put before the European Parliament on the so-called veggie burger ban and further restrictions on the use of dairy designations are two illustrative examples that were fortunately rejected, but which demonstrate the strength of interested parties who intend – despite the unequivocal, scientific evidence of the need for a transition towards more plant-based food – to impede the development of the plant-based sector. Unfortunately, a current development is the introduction of national regulations on food names in several Member States, despite the proposals being rejected by Member States in the Council of Ministers.
- Many farmers are experiencing succession difficulties in attracting the next generation into the sector. The financial risk and threshold for individual producers to switch their operations to more plant-based production is perceived as too high in relation to potential long-term profits.



How to achieve a strong plant-based sector in Sweden

The food chain is going to need to embark on a major transformation, which will be driven by technological advances and innovations, such as new, circular production methods, and increased demand for more sustainably produced products. Sweden has a rich history of contributing to innovative new solutions in areas such as the environment and climate and the energy transition, which have created both jobs in Sweden and new export opportunities for Swedish companies. This perspective should, likewise, inspire both political and private investments in the food chain, not least in the work necessary in updating the Swedish food strategy.

Transition fund

The food sector is currently experiencing a period of turmoil, however new opportunities can be created for both farmers and food companies via an active food policy which includes and promotes the plant-based sector. By providing agricultural sector with the right tools, Swedish farmers can broaden and diversify their businesses and reach new markets. The forthcoming work to update the Swedish Food Strategy represents a golden opportunity to strengthen resilience of food supply, create new opportunities for Sweden's farmers whilst increasing the opportunities for a future-oriented segment that contributes to reducing the sector's climate impact, and improve public health. As mentioned earlier in this report, inspiration can be drawn from Denmark, where the majority of parliamentary parties during the previous term entered into a climate agreement to transform the country's agricultural sector. The agreement was drawn up in close dialogue between the Danish food industry and green organisations. Establishing both a national action plan and a fund to assist primary production in converting production to plant-based foods are central to the agreement. The Danish government is set to allocate DKK 70 million annually to the fund from 2022 to 2030. The Danish parties are in agreement that switching to more plant-based production is key to the green transition.(72)



Action plan for a strong Swedish plant-based sector

- 1.** Highlight food-tech and the entire value chain within innovative, sustainable plant-based foods as a strategically critical area that research policy can help strengthen. The aim should be for policy to contribute to both increasing Swedish competitiveness and strengthening the Swedish food sector's attractiveness.
- 2.** Implement robust, targeted investments in skills and infrastructure that support innovative start-ups in the food chain in scaling up and commencing exports, and likewise invest in greater opportunities to grow and process crops in Sweden.
- 3.** Facilitate the transition to a resilient, sustainable agricultural sector by introducing new forms of transition support for farmers who wish to convert and diversify their farming to more plant-based production, but are currently unable or unwilling due to the short-term financial risks the transition may entail.
- 4.** Ensure that policy targets, regulations, and instruments neither impede nor act to the detriment of the plant-based sector's expansion. At present, there exist - or are under discussion - policy measures that distort competition.
- 5.** Set concrete, measurable goals, which include reducing greenhouse gas emissions from meals provided within and by the public sector and ensure wide-ranging educational efforts to increase the public's knowledge about sustainable eating.



Detailed programme for a strong Swedish plant-based sector

1. Research and innovation

Any future research funding in the food and climate area should be directed towards increasing the production, processing, and consumption of plant-based foods. Such funding is to be viewed as part of wider public health, climate, and industrial policy. Investments are required in research and development aimed at both Swedish food industry's and, in particular, primary production's ability to increase the production of relevant crops required to meet the accelerating demand for plant-based foods. Investments are additionally needed in the field of nutrition research concerning novel foods and vegan diets. As consumers increasingly change their diets, far-reaching investments in clinical studies are required, which measure the effects of this consumer-driven transition from a public health perspective.

Sustainable Food Tech should be identified as a strategically critical area within Swedish food research and export:

Highlight Food Tech and the entire value chain in innovative, sustainable foods as strategically critical areas, which should be strengthened by research policy. Policy should aim to contribute to both increasing Swedish competitiveness and strengthening the Swedish food sector's attractiveness for both investors and future employees. This strengthens the attractiveness, competitiveness, and growth of a sector becoming increasingly relevant and central to society.

Research and development is required to meet consumer demand:

Research and innovation at the processing stage needs to ensure food is nutritious, healthy, tasty, and available to meet consumer demand and facilitate the trend towards environmentally friendly, healthy food consumption. Investments in research and innovation are additionally needed in the production stage (73) to ensure good access to and availability of the raw materials, crops, and vegetable proteins needed. At present, there is a shortage of the required Swedish-grown inputs and raw materials for processing plant-based foods for human consumption. As a consequence, Sweden has been forced to import these in order to maintain production rates and deliver finished products to the market to meet the increasing demand. There is currently a lack of knowledge and skills shortage in Sweden regarding the cultivation of plant-based crops and, in particular, how high-quality proteins can be extracted from crops. As the sector is growing strongly – and will continue to grow – investments in research targeting increasing the yield of crops such as green peas, lentils, lupins, and broad beans and their breeding are needed in order to be able to develop new plant-based foods.

A significant challenge is the current lack of vegetable proteins. There are currently too few Swedish-grown protein-rich crops that can be used in the cultivation stage. As such, research policy should highlight the need for research into cultivating new types of protein-rich crops as well as research into increasing knowledge of how vegetables can be processed and developed into novel foods. There additionally exists a need for research targeted at finding models for how cultivation of existing varieties can be scaled up. Furthermore, long-term investments are required in existing research facilities and projects targeting this.

For example, there currently lacks the necessary infrastructure, knowledge, and capacity for processing pure raw materials into intermediate and final raw materials. Potatoes are a good example, as there is excellent availability of potatoes and potato starch in Sweden. However, there currently exists no capacity to extract sufficient potato protein to meet demand, which means that several of Växtbaserat Sverige's members are instead forced to import it.

Increasing resilience as a priority research area

An important goal of food research should be to increase resilience in Swedish agriculture. The goal can be aligned to changes in average temperatures as well as the consequent adverse weather that risks destroying parts of the food chain. New farming methods need to be developed to increase resilience to crop failure, pest outbreaks, and extreme weather occurrences, and this requires a stronger focus on research on food resilience. An important aspect is differentiation in agriculture to ensure that climate- and environment-related extreme occurrences do not wipe out large parts of Sweden's food production chain.

During the drought in 2018, it became apparent that many farmers' high dependence on animal feed for their livestock created an unsustainable situation. Research to develop more resilient crops, which are suited for processing into plant-based foods is, therefore, important as this would spread risk across the Swedish food chain. This additionally ties in with the issue of the availability, or lack, of protein crops (for further processing into plant-based foods), which needs to increase and broaden. This is particularly relevant to the need for increasing the production of crops intended to be processed for human consumption.

Invest in research on public health and nutrition connected to Western diets:

A more holistic approach is needed, whereby research on both nutrition and public health join forces. We need more research into what a diet containing a greater proportion of plant-based foods, including alternatives to traditional animal-based foods, should consist of to promote both better public health and combat climate change.

We are calling for a broad research initiative that increases knowledge about everything from plant-based compound food properties (such as bioavailability of various nutrients) and how we can optimise raw materials' properties in the finished product to the health benefits of increasing the amount of plant-based food in our diets to behavioural studies on how to achieve healthy, sustainable changes in the population's diets. As such, we must develop our knowledge on public health and plant-based diets through both mechanistic studies, where foods or components of foods are studied, and clinical studies where, for example, people who eat completely or partly plant-based diets are studied over time. This could entail a cohort study that follows a large population over an extended period of time and examines the relationship between plant-based diets and health outcomes and which aspects of a plant-based diet can prevent diseases.

It is important to investigate which plant-based foods are, traditionally, not great sources of nutrients. In this respect, research and product development are required to see how, for example, plant-based foods could contribute to improving iron levels within groups of society who currently have a low iron intake or status.



2. Skills, support, and infrastructure

In order to improve food sector start-ups' prerequisites for scaling up their production, there needs to be greater investments in both new test facilities and incubator environments. Furthermore, there exists the need for better coordination and use of existing facilities, which allow small, growing companies to access research and innovation environments that increase their opportunities for scaling up. In addition, more knowledge is needed both on how upscaling can be better achieved, and the right skills companies need for their successful expansion. A targeted investment in a food innovation hub in southern Sweden, where primary producers, processors, innovators, large companies, researchers, and academia can come together would represent a concrete action in this respect.

Create good conditions for primary producers to switch from animal-based to plant-based production:

A key area for policy should be to develop measures aimed at making it easier for primary producers and the food industry to switch to more plant-based production, in light of the plant-based sector's growth. In this context, it is also important to encourage the change in consumption also takes place internationally and incentivise a growing global market. Sweden's potential to become a world leader in the cultivation, processing, commercialisation, and export of plant-based foods cannot be overemphasised.⁽⁷⁴⁾

3. Transition to a resilient, sustainable agricultural sector

As previously mentioned, we view the transition of the agricultural sector as a key area for research. We urge the Swedish government to actively support agriculture in transitioning to more plant-based products. This involves investing in knowledge and training, infrastructure, and financial risk management.

An impediment to this transition is that many primary producers currently associate initiating a change to their operations with considerable risk. Research projects are underway to evaluate the process of transitioning from animal-based production to increasing the production of crops for human consumption from a profitability perspective.⁽⁷⁵⁾

A research study of Jannelund's farm (run by farmer Adam Arnesson) is underway, whereby the farm's production is being diversified from a sustainability and supply perspective.

Within the framework of the EU-funded research project UNISECO,⁽⁷⁶⁾ mentioned earlier in this report, a study is looking into the conversion and diversification of more livestock farms. The interest in participating in the research project amongst livestock farmers in the application process was overwhelming (around 110 applicants). In such research projects, individual companies bear a large degree of financial risk by guaranteeing the purchase of future crops. In order to satisfy changing demand, reduce the food sector's impact on the climate, and enable greater Swedish food production and exports, other structures are required that spread the risks arising from the transition, and facilitate and stimulate the necessary systemic changes.

As a part of agricultural and industrial policy, the policy should therefore ensure concepts and models are developed that enable primary producers to convert their production, for example through spreading risks or via a guarantee mechanism.

4. Objectives and instruments

There is an urgent need for the wholesale review of, and subsequent amendment to, the relevant legislation, regulations, and policies to ensure the transition to sustainable plant-based production and its healthy consumption is promoted. Today, unfortunately, there are too many examples of regulations and initiatives that either impede and/or distort competition to the detriment of plant-based, novel foods. Sweden needs to invest in developing effective and attractive policy packages in order to capture the current momentum and exploit the potential for enhanced Swedish growth and competitiveness.

Examples of anti-competitive regulations include the EU school milk subsidies and rules on designations, both of which are regulated within the framework of the EU's common agricultural policy and the regulatory framework for organic labelling. These regulations share similarities in being applied to traditional, animal-based foods and are not adapted for application to plant-based products.

We additionally view Sweden as needing to renew its approach to integrating different policy areas (sustainability, climate, public health, agriculture, and nutrition) to promote the transition to a sustainable, more plant-based food system in line with overall goals and evidence-based studies. National sustainability targets for the food sector should be set, which could include a target to reduce emissions in the next climate policy action plan. Furthermore, actions need to be taken to make it easier for consumers to make sustainable choices (such as educational initiatives and that food's climate impact is clarified on food packaging, based on an industry-wide calculation standard).

5. Food consumption in the public sector

When the general public's food consumption patterns change, challenges arise when the regulations and frameworks governing the sectors effected do not keep pace with the trends. We believe that public procurement can be used to a greater extent than today as a tool for driving policy aimed at encouraging a more plant-based diet amongst the general public.

Knowing the importance of a meal's contents for individuals' health as well as that of the planet, Växtbaserat Sverige believes that meals served in the public sector should guide the necessary transformation of the food sector. Today, some 3 million meals are served daily in the public sector, and this represents an opportunity for it to act as a change agent and pioneer.

In June 2020, the Swedish University of Agricultural Sciences, SLU, released a report (77) on how policies can be used to create sustainable food consumption in Sweden. Intensifying this work in the public sector is one of a total of three key proposals in the report. A report produced by [Imperial College, London](#)(78)emphasises the importance of public consumption of food in the transition and how it can contribute to both a lower climate footprint as well as major health benefits and lower costs for society.

Meals served by the public sector play a key role in children and adolescents' opportunities to eat healthily as eating habits tend to be established at an early age, especially for socioeconomically weak groups. (79) In 2023, the Swedish National Food Agency presented a new, greener plate model containing more plant-based alternatives, which Växtbaserat Sverige welcomes.(80)

Concrete, measurable targets should be set for reducing greenhouse gas emissions from public meals. The climate footprint of a meal must be clearly visible at all public sector catering establishments in order to raise awareness and strengthen consumer influence. This is already being done at several forward-thinking schools and universities, which increases students' engagement in the issue. Studies show that it is possible to reduce greenhouse gas emissions from public sector meals whilst maintaining nutritional accuracy and, importantly, without increasing costs.(81) There should be broad educational efforts to increase knowledge about sustainable eating. Chefs need to be trained in good, nutritious plant-based cooking.

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Plant Power

An industry report from
Växtbaserat Sverige 2023



Växtbaserat Sverige is an industry organisation whose goal and purpose are to promote the increased production and consumption of plant-based foods. Our members include both small start-ups and large, international companies.

Please contact us if your company wants to become a member of Växtbaserat Sverige or if you have questions about our organisation:
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