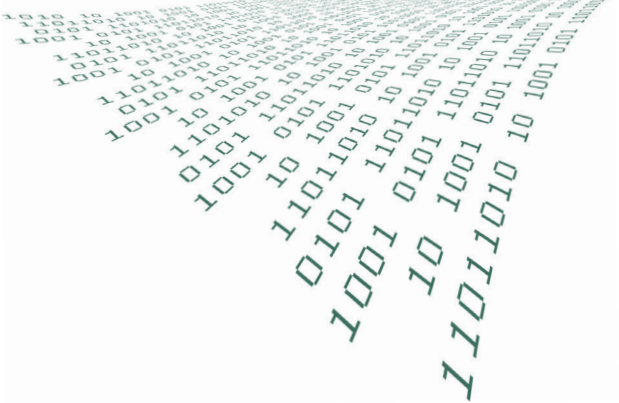


Applying three dimensions of sustainability for a better food system and better nutrition

Knowledge, cooperation and innovation



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Foreword

The importance of the food system to our ability to attain the Sustainable Development Goals has increasingly come under the spotlight in global debate. Several reports, not least from the UN Food and Agriculture Organization (FAO), show that world hunger has been on the rise for several years in a row, biodiversity is in crisis, desertification is continuing, as is the depletion of the world's soils, and the world's natural resources are being consumed at an unsustainable rate. Global food production and consumption place the climate and the environment under strain and are also contributing to malnutrition and illness.

In addition to work on the 2030 Agenda, the period 2016-2025 is also the United Nations Decade of Action on Nutrition, with commitments from UN Member States to improve the nutritional content of food. Food production and consumption are strongly intertwined with human nutrition and health, livelihoods and social justice, as well as climate change and ecosystem vitality. Furthermore, several of the Sustainable Development Goals (SDGs) that seem unlikely to be achieved by 2030 are linked to the food system in one way or another. It is thus necessary to transform our food systems to ensure that the food we eat is produced and consumed sustainably across all three dimensions of sustainability – environmental, social and economic. That said, this is no easy task. What – in fact – is a food system and how can this kind of systematic change be achieved? In this 2020 publication, the Swedish FAO Committee¹ is not aiming to shed light on every aspect of the food system but has chosen to highlight some central elements which can contribute to a transformation and a sustainable food system. The Government and public infrastructure have an important facilitating role to play, partly through their various forms of governance and regulation, but also as a good role model. Increased knowledge through research and information exchange, stronger collaboration – across sectoral boundaries and between actors, nationally and globally – and innovations of various kinds, are important tools.

Sweden's food production is one of the most sustainable in the world, but there is room for improvement here too, a fact embraced by Sweden's National Food Strategy. Food producers have a fundamental role to supply food that lives up to the high standards of societal demands. However, the role of consumers as a driving force, and ultimately as the people who will consume the food that is produced, cannot be underestimated. Nor can the responsibility incumbent on food companies to provide what consumers want but also to ensure that they deliver a range of products that is sustainable for humankind and for the planet. Sustainable business models are needed if companies are to rise to this challenge. Further developing circular models that make effective use of existing resources is of particular interest.

¹The publication as a whole is a product of the Swedish FAO Committee. The content of the individual sections is the responsibility of the writers concerned.

A change in our food system is necessary, and every part of the system offers potential for improvement and new opportunities. This publication presents some of the latest thinking in this field and introduces examples from Sweden and Swedish projects and collaboration in other countries. Although our circumstances vary in different parts of our planet, we share many of the same challenges. The Swedish FAO Committee therefore hopes that the examples provided may also prove inspiring outside Sweden's borders and that they may help to foster mutual dialogue to bring about improvements. If the change is made bearing all three dimensions of sustainability in mind, that change will do good for the climate, the environment, the food supply, health, and the global and local economy.

State Secretary Per Callenberg, Chair of the Swedish FAO Committee

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INTRODUCTION

Change requires a systems perspective

Sara Gräslund and Pernilla Johnsson, Swedish University of Agricultural Sciences (SLU)

The world's food systems bring together all the elements – the environment, people, inputs, processes, infrastructure, institutions, etc. – and all the activities relating to the production, processing, distribution, preparation and consumption of food, and the result of these activities, including socio-economic and environmental effects. These systems are of great importance to countries' economies and play a crucial role in people's nutrition, health, culture and social contexts. Many people earn their livelihoods in food systems, either directly or indirectly. Globally, a third of all people depend on agriculture for their livelihoods; in low-income countries this figure reaches 60 percent. In the past century, millions of people have been lifted out of poverty and hunger by increased agricultural yields, greater access to food and lower food prices, while the production and consumption of food have resulted in extensive negative impacts on the climate and the ecosystems.

After food security – i.e. people's access to sufficient, safe and nutritious food – having previously increased at a steady pace, the situation has deteriorated in recent years, mainly due to conflicts and climate change. Today, two million people lack food security. More than 690 million people are undernourished due to chronic hunger. Acute hunger is a reality for 135 million people, and a further 130 million risk finding themselves in that situation in 2020 due to the direct and indirect effects of the pandemic. At the same time, the number of people who are overweight or obese is growing in almost all countries of the world, causing four million deaths a year. Within a decade, the number of people who are malnourished, i.e. suffering from hunger, a lack of micronutrients or from overweight or obesity, may increase from a third of the population to two-thirds, going against the ambition of the global target, SDG 2.2², of ending all forms of malnutrition by 2030. Malnutrition affects both individuals and society. For individuals, it can mean poorer educational performance, lower income and higher medical costs, and for societies, a greater strain on the healthcare system, lower productivity and lower economic growth. Malnutrition in all its forms affects both low-income and high-income countries, indicating that economic growth is not the only solution.

A strong link between food systems and human health is diet – i.e. what people eat. Standard of living, accessibility, knowledge, values, identity, traditions and physical and mental health

² <https://www.globalamalen.se/>

play a role in what we actually eat, while health, gender, age, lifestyle and geographical conditions³ affect our nutritional needs in purely physiological terms.

Consumption of food is a driver of both sustainable and unsustainable impacts on the environment and human health, which means that factors that affect our consumption habits are key to both improved health and environmental sustainability. Improved opportunities to earn a living in infrastructure may be needed for the most vulnerable to even gain access to sufficient food. Extensive access to food on the other hand, as is the situation in many high-income countries, with a wealth of local shops, supermarkets, cafés and restaurants, contributes to over-consumption, with overweight, obesity and associated diseases as a consequence.

Decreased meat consumption is often proposed as one of the most important measures in reducing the high demand for land and other resources as well as the impacts on the climate and ecosystems. The highest meat consumption per capita is found in high-income countries. This high consumption exceeds the amount justified from a nutritional point of view and there is evidence that it is even causing disease. However, meat is a nutrient-dense food and in some places in the world, and for some vulnerable groups, e.g. women of fertile age suffering from iron deficiency, a higher consumption of meat would bring major health benefits. In areas where geographical and climate-related circumstances make it difficult to grow crops, animal husbandry is a good way of securing access to food, since animals can be moved as an adaptation to seasons and weather. As the global population increases and more people can afford a higher consumption of meat, the demand for meat and the resources needed for its production rise. Livestock farming goes hand in hand with other aspects, such as animal welfare issues, diseases transferred from animals to humans and the use of antibiotics. Antibiotic resistance is one of the greatest threats to global health, food security and development today. Globally, more than half of the amount of antibiotics are used in livestock farming, often with the purpose of promoting growth of healthy animals rather than to cure disease.

If the global food system is to be sustainable and capable of providing good nutrition and health for all, it needs to be transformed. Major societal changes and a major conversion of production and consumption are required – locally, regionally, nationally and globally. In this transformation there is a need to apply a systems approach, considering environmental, economic and social sustainability in an integrated way – actions by sector will not be enough. The need for transformation is different in different parts of the world and depending on whether the perspective is local, regional or global. However, it is important that a global perspective on sustainability is taken into account, so that improvements toward sustainability are not entirely focusing on a small and local context without considering the possible negative consequences these changes may have on sustainability elsewhere.

³ In Sweden, for example, the soil is low in selenium and iodine, which affects the content of these trace elements in crops that are grown and consumed.

One starting point is therefore the question of what we can do locally to contribute globally. The transformation must be carried out in broad collaborations in a way that addresses inequalities and takes into account the voices of those affected by the changes. It is crucial to work across sectoral and disciplinary borders in an inclusive and fair way. New knowledge, innovations, technological development, policy instruments, improved or new regulations and institutional frameworks are needed to enable the process.

Food systems have large impact on the climate and ecosystems – impacts that backfire as climate change, soil erosion, reduction of biodiversity etc. reduce the opportunities to produce food, jeopardising the fundamentals for human food security, livelihoods and health. Globally, about a third of greenhouse gas emissions comes from food systems. They also account for the highest consumption of fresh water and are the primary cause of eutrophication and changes in land use. Changes in land use for cultivation and animal husbandry, as well as over-exploitation of wild marine resources, are two major reasons why we are now experiencing large losses of biodiversity and ecosystem services. Agriculture accounts for the largest climate and environmental impact from food systems but is one of the sectors where this impact is the most difficult to reduce. When it comes to agricultural emissions of greenhouse gases, these are largely caused by turnover of nitrogen in the soil and by keeping livestock and from handling and storing manure. Increased consumption due to population growth, higher incomes and increased living standards leads to higher demand for land for growing crops and keeping livestock. For these reasons, land use change has a great impact on green house gas emissions from agriculture. A large proportion of the food system's use of resources and impact takes place to no use as it is estimated that a third of all food is lost after harvest or as food waste.

More efficient food production is a way of saving resources such as land while simultaneously increasing the amount produced. However, increased food production is not enough to ensure food security nor to safeguard health. The quality of food is also important from the perspective of transmitting disease and from a nutritional point of view. While there is a need for increased efficiency in food production, there is thus also a need to shift from a focus on quantity to a greater focus on quality.

While the food systems have negative impacts on environmental, economic and social sustainability in many ways – with different effects and challenges depending on where in the systems and where in the world you look – they also make positive contributions to economic development and people's livelihoods, social contexts and cultural expressions. Many people derive their income directly or indirectly from food systems, and changes and developments in the systems therefore affect a great many people. This opens up considerable opportunities but also presents major challenges. How can we ensure that development takes place in a rights-based manner? People have the right to decent working and living conditions, and to adequate payment for their work and products.

In global terms, people's access to food is largely dependent on the work of women in crop production, livestock farming and fishing. Women and girls often lack food security because they lack basic rights, such as the right to own land, access to decent working conditions, education and healthcare. Safeguarding women's human rights is a key strategy for ensuring food security.

The challenges are many and great in achieving the goals for sustainable development, but the fact that many of these challenges exist in the food system also means that this is where many of the solutions can be found. A sustainable food system enables food security and good nutrition for all without compromising the economic, social and environmental foundations of generating food security and nutrition for generations to come.

In all this, Sweden, like all countries, bears its share of responsibility and its unique opportunities to contribute to solutions. As a rich and democratic country, with food production that is resource-efficient from an international perspective, but also as a country in which consumption and its impact per capita far exceed what is realistic in the long run, Sweden has a particular responsibility to drive change and show opportunities.

CHAPTER 1

The Government and public sector as facilitators

The Swedish Food Agency

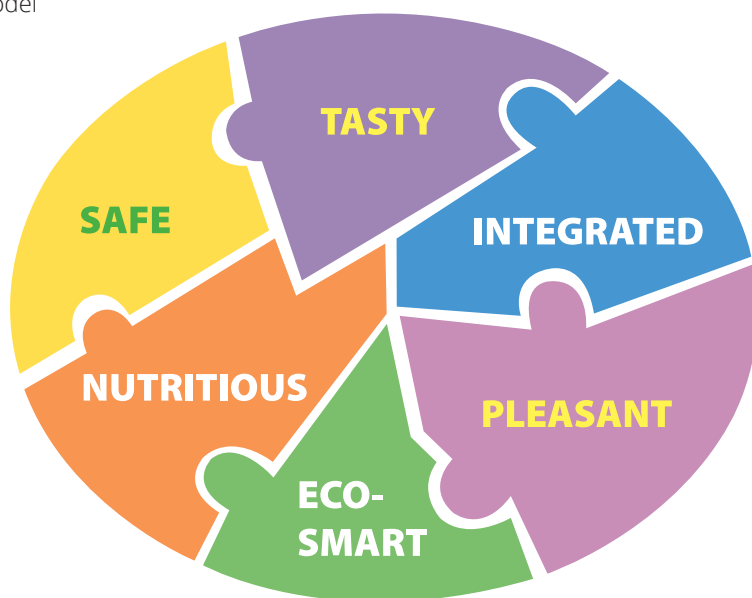
Creating social conditions for a healthy and sustainable diet in the population means illness and health inequalities can be prevented thus the human and planetary health can be improved. The Government plays a vital role in achieving a transformation of society in many ways. Passing legislation and establishing regulations is fundamental, but so are other measures such as economic instruments, knowledge building and disseminating the knowledge gained. Other political signals are also important in facilitating change. One example of such a signal is the Swedish Food Strategy, an overarching policy document agreed by the Swedish Parliament, in 2017, with a timeframe looking to 2030. Besides helping to make the Swedish food chain competitive, innovative and attractive to work in, the strategy also states that the food chain must be sustainable. Furthermore, it proposes measures by which this can be achieved, e.g. by making it easier for consumers to make informed choices. At global level, different actors, particularly the UN's Food and Agriculture Organization, contribute knowledge support and recommendations to assist governments in making decisions that will lead to sustainable development.

Government agencies play an important role by providing expertise, implementing and following up on different measures, but other actors in academia, business, and civil society also contribute to transformative efforts.

With its nationwide structure, the public sector is an effective platform for initiatives aiming at changing society, e.g. in a transition to a more sustainable food system and food consumption that is sustainable for health, climate and the environment. Every day, for example, approximately three million meals are served in the Swedish healthcare system, schools and the care sector. This is not an insignificant factor. Choices made in food procurement, for instance, can give indications to the production and supply chain regarding the type of food demanded (e.g. sustainably produced), while the meals produced have a direct impact on nutrient intake and meal experience. They constitute part of public sector consumption and offer important potential as a driver of sustainability efforts for municipalities and regions, but they can also indirectly affect private consumption and help to level out social differences.

Politically adopted municipal steering documents for public sector meals in the healthcare, education and care sectors are common in Sweden.⁴ They indicate how meals should be planned, areas that should be improved and how operations are to be followed up. This may involve setting targets for the climate and environmental impact of the meals, amount of food waste, purchase of organic produce, skills level in kitchens and canteens and input from diners. The steering documents build on accumulated scientific evidence on the importance of food for health and the environment. Six quality areas are covered – safe, tasty, integrated, pleasant, eco-smart and nutritious – spanning all three aspects of sustainability.

Meal Model



The Swedish Food Agency's Meal Model describes the quality of meals from a broad sustainability perspective. Source: The Swedish Food Agency

A long tradition of collaboration and cooperation, both nationally and internationally, is a linchpin of the Swedish social model. Other important success factors are transparency, a scientific basis and a holistic perspective, all of which have proved to be effective tools for long-term sustainable change. One example of the interaction that takes place between different areas of society and demonstrates the importance of collaboration and dialogue between sectors and actors is Sweden's national system of environmental objectives, whose

⁴ Facts on public meals in 2018: <https://www.livsmedelsverket.se/globalassets/publikationsdatabas/rapporter/2018/2018-fakta-om-offentliga-maltider-2018.pdf>

indicators, targets and annual follow-up provide a structure and make Sweden's work on climate and the environment tangible. Since 2017, the follow-up stage has been tied in with the relevant goals and targets in the 2030 Agenda. The environmental objectives have great importance for the food sector and constitute, for example, a basis for assessing environmental impact in the underlying data for Sweden's national dietary advice. Integrating health and the environment in dietary advice efforts is an important step in sustainable food consumption and Sweden was among the first countries in the world to integrate environmental aspects in their national dietary advice, doing so in 2015. The starting point of Swedish dietary advice is that food habits are to be sustainable in several dimensions: they must be healthy, safe and environmentally and climate smart. The advice is based on sound evidence, including the Nordic Nutrition Recommendations, knowledge of the population's food habits, scientific data on risks and harmful substances in food, and scientific data on the environmental impact of different food groups.

Although the Government and the public sector have a national focus, decisions and activities do not occur in isolation from the outside world. Dialogue and knowledge exchange with our Nordic neighbours, within the EU and across the globe is part of the Swedish model. If we are to transform our food systems – in which all aspects are interlinked – this is vital.

School meals – a transformative force beyond the school setting?

One illustrative and important example is the importance of school meals – in Sweden and across the globe. The Swedish school meals system is one of few that is statutory. The Swedish Education Act (Skollag 2010:800) gives all students in compulsory education the right to a nutritious school lunch every day, for everyone and free of charge. Because most children and young people eat lunch at school, Swedish schools, thanks to their meals, have a levelling effect on social differences in food habits and young people's future health. Several projects have been conducted, nationally and internationally, which explore how school meals can be a transformative force beyond the school environment.

Mission-oriented innovation

Ulrika Backlund, Swedish Food Agency

Starting in 2020, several government agencies (the Swedish Food Agency, the Swedish Agency for Education, the Swedish Board of Agriculture, the National Agency for Public Procurement, the Public Health Agency of Sweden, the Swedish Agency for Youth and Civil Society, and also the Swedish Association of Local Authorities and

Regions are included in this group) are now testing a model called mission-oriented innovation to improve school meals, under the leadership of the Swedish innovation agency Vinnova. The model looks at how we can transform systems linked to major social challenges – in this case, how to create a sustainable school meals system. The transformation covers everything from meals as part of teaching, food as an experience and new ways of using the school kitchen and eating premises when not in use, to logistics and food waste. It may also involve new conditions for farmers to produce sustainable food that municipalities can then demand. The working hypothesis is that schools are a “society” in miniature, and that a transformed school meal system can serve as leverage and an example for future transition challenges when transforming the food system throughout society.

Promoting sustainable food habits through optimised school meals

Erika Ax, Formas

The research project OPTIMAT seeks to optimise school meals with regard to greenhouse gas emissions, nutritional content and acceptance for children without increasing the cost. This is an excellent example of how a project can integrate all three sustainability perspectives.

Introducing children to healthy and environmentally sustainable school meals from an early age offers great potential to improve children’s knowledge of sustainable development and their food habits in the short and long term. Considering the major impact that Swedish school meals have in shaping children’s food habits and on food procurement, the project offers extraordinarily good opportunities to reduce environmental impact. At the same time, school meals are also a powerful tool for encouraging more equal food habits among different groups in society.

In the OPTIMAT project, researchers have developed a holistic optimisation model for a health promoting, climate-smart meal plan for schools, which is developed to reduce greenhouse gas emissions while maintaining acceptance and without increasing food costs. The method thus integrates economic, social and environmental sustainability and can help to attain Swedish and international climate goals. Menu plans have been developed and tested in one municipality looking at consumption, acceptance and food waste. The project has been highly successful, and several municipalities and other public and private meal producers have shown interest in the optimisation model. The project also produces general guidelines and tools for future sustainable public meals based on experiences gained in the project, exemplifying how research can contribute to innovation and direct practical application.

OPTIMAT is a collaboration between three unique projects: the Swedish school meals project SkolmatSverige at Karolinska institutet, the Swedish Food Agency's youth diet survey "Riksmaten ungdom" and Metropolitan University College, Copenhagen. The project is funded by the Swedish Research Council Formas' call for proposals on Sustainable food production and consumption, 2016.

For more information: ki.se/en/gph/optimat-research-project-about-optimizing-and-improving-school-meals

School meals around the world

Katarina Eriksson, Tetra Laval Food for Development

According to the UN's World Food Programme (WFP) 368 million children in 169 countries receive food at school. In most cases, school meals are publicly financed, but parents may also have to pay and in some cases school meals are paid for by donors. There is no doubt that school meals are a good investment in children's health and education. Many studies also highlight the positive effects for a country's agriculture sector, as procurement of school meals benefits local food production and processing. It is estimated that the return to society is 3-20 times what it invests in school meals, in the form of better health and education, productivity and other benefits to society. Unfortunately, the proportion of children receiving school meals is lower in the countries where the needs are greatest. In low-income countries, school feeding programmes only reach 18 percent of schoolchildren, while 80-90 percent of children in middle and high-income countries receive food at school.

Commissioned by recipient countries, WFP contributes to developing and running school feeding programmes. The ambition is for recipient countries themselves to take over funding and implementation of the programmes, as has happened in 44 countries since 1990. But many countries still continue to need support, and in 2018 16.4 million children received food at school through WFP's school feeding programmes. As far as possible, the food is procured locally, from small-scale producers. This is also the main aim of the FAO's engagement in school feeding programmes, to create a market for the products of small-scale farmers. However, the model of linking small-scale production to schools brings many challenges in terms of quality and food safety. The same applies in cases where food is produced by the schools themselves.

Tetra Pak has been an actor in school milk and school meals since the early 1960s. The company's cartons for milk and other foods are estimated to reach 68 million school children in 56 countries. The company also contributes technical assistance

to government agencies, organisations and companies implementing school feeding programmes. Furthermore, Tetra Pak is involved in developing new nutrient-enriched products for school feeding programmes around the world. In many cases, the company works in partnership with external organisations, e.g. with the public organisations and agencies responsible for the programmes, but also with UN organisations and other development organisations, civil society and the private sector. Some of the factors that make school feeding programmes sustainable and successful, besides the fact that the food served must be nutritious and safe, are local production and processing, legislation on the right of children to school meals and engagement from parents and local communities.

For more information:

tetrapak.com/sustainability/food/food-availability/school-feeding-programmes



School milk in packaging from Tetra Pak in Vietnam. Copyright: Tetra Pak International S.A.

MatLust – a regional food node for innovation, sustainability and business development

Sara Jervfors, MatLust

Since 2015, Södertälje municipality has been running the food project MatLust at Södertälje Science Park. Support is offered to small and medium-sized food businesses (SMEs) in the Stockholm region to create innovation, growth, more jobs and greater sustainability in these companies. Innovation, sustainability, lean and business development programmes are offered individually to the companies, and the municipality's 90 kitchens in the catering sector provide a test bed for developing, testing and implementing new products suitable for caterers. Products that fit the remit can then enter the procurement process and be included in Södertälje municipality's Diet Unit's food contracts, and also be made available in wholesalers' ordinary ranges or in grocery stores. About 140 SMEs have participated in MatLust's development programmes since the project began and more than 20 new products have used the test beds.

Work on sustainability with MatLust's target group companies is founded on the research-based concept Diet for a Green Planet (dietforagreenplanet.se) practised for ten years in Södertälje's public meal provision. The focus is on the environment and health, and a system perspective spanning the whole food system is also applied to individual actors active in a small part of the food chain. It is a concept that makes the most of the caterer's creativity, provides a healthy diet and takes into account the climate and the environment in the production of ingredients. Menus are composed based on each person being able to be fed from 2,000 square metres of agricultural production. The meals are also adapted to geographical location and season, and food waste is minimised.

With its practical and successful application of Diet for a Green Planet in its public meals, Södertälje municipality constitutes a living lab that has attracted a great deal of attention. The concept is also fully transferable to other regions/countries. In concrete terms, this was done in the URBACT Pilot Transfer Project 2014-15, in which the Diet for a Green Planet concept was transferred to three European cities: Mollet del Vallès in Spain, Molėtai in Lithuania and Łomża in Poland. With different starting points and organisational conditions, the outcome in the three recipient cities came to look very different – but that is Diet for a Green Planet's strength. It is a way of relating to food that can be adapted to different geographical locations and activities, and which will therefore result in different food on the plate depending on the location and the season.

The aim of MatLust is to create a permanent regional node for food production and innovation in Södertälje. One initiative is a recurring food innovation competition run jointly with regional agencies, in which new products derived from local produce compete against each other. Another recurring initiative is an annual research conference on food during



The meal concept Diet for a Green Planet forms the basis for Södertäljes work on sustainability and has been successfully practised for ten years. Photo: Fredrik Sederholm

Södertälje Science Week, at which Swedish and international researchers are invited to speak. Seminars, workshops and exhibitions are held where the SMEs can meet researchers, food experts, government agencies, representatives of large companies and potential customers and partners.

MatLust's work on sustainability constantly draws on a holistic and system perspective, where efforts focus both on the company's economic sustainability and on environmental and social aspects. The project's development programmes, seminars and conferences share an emphasis on interaction between these aspects and the importance of a strategic sustainability approach is an integrated part of the companies' business plans.

MatLust creates a neutral arena in Södertälje municipality for meetings between food companies large and small, universities and researchers, stakeholder organisations, and government agencies and the public sector.

For more information: matlust.eu/om/information-in-english



Increased collaboration for the reduction of food loss and food waste – more to do more

Karin Lindow, Swedish Board of Agriculture and Karin Fritz, Swedish Food Agency

In Sweden, three different agencies (the Swedish Board of Agriculture, the Swedish Food Agency and the Swedish Environmental Protection Agency) are tasked by the government to work together to reduce food loss and food waste in close dialogue with the industry and other actors. The work is conducted in line with a national action plan – More to do more⁵ – and the overarching objective is to meet target 12.3 of the 2030 Agenda⁶. Some of the partnerships that are essential to this work are described below.

Food waste prevention network

A network to reduce food loss and waste, Food waste prevention network, was formed about ten years ago. It is geared towards government agencies, researchers, stakeholder organisations and the industry throughout the food chain. The purpose of the network is to work to reduce food loss and waste by being an interface and information gatherer. The Swedish Food Agency, the Swedish Environmental Protection Agency, and the Swedish Board of Agriculture are the coordinators, and the work is supported by the Ministry of Enterprise and Innovation and the Ministry of the Environment.

Collaboration for reduced food loss and waste

In March 2020, a voluntary agreement was launched between actors in the whole Swedish food chain in which also government agencies and the academia are involved to work together to reduce food loss and waste. The agreement is called Collaboration for reduced food loss and waste. It is coordinated by IVL Swedish Environmental Research Institute, but the work is headed by a steering group in which agencies, industry representatives and companies are included. This collaboration brings together organisations from every step of the food supply chain. The core lies in a commitment to identify priorities, develop solutions and implement changes, both within the organisations included and by sharing new best practice across Sweden. Three components are central in Collaboration for reduced food loss and waste:

- Targets to reduce food waste and food loss.
- Data collection for following up targets and identifying “hotspots”
- A forum and working groups to bring actors along the food supply chain together for discussion and implementation of specific, industry-wide projects.

⁵ <https://www.livsmedelsverket.se/globalassets/publikationsdatabas/rapporter/2018/2018-more-to-do-more-action-plan-for-food-loss-and-food-waste-reduction-by-2030>

⁶ By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses.

Both these platforms will work in parallel in the future. The food waste prevention network is a platform for sharing information and keeping the dialogue ongoing on food loss and waste. The Collaboration for reduced food loss and waste is a commitment where the actors involved are taking an important lead to reduce food loss and waste and the actors are also obligated to share the data of food waste.

For more information:

The Swedish Board of Agriculture

jordbruksverket.se

The Swedish Food Agency

livsmedelsverket.se/en

The Swedish Environmental Protection Agency

swedishepa.se

International training programme "Healthy livestock – safe food"

*Swedish Food Agency, Swedish University of Agricultural Sciences,
Sweden's National Veterinary Institute and Swedish Board of Agriculture*

The National Veterinary Institute, the Swedish Board of Agriculture, the Swedish Food Agency, and the Swedish University of Agricultural Sciences run the joint project "Healthy livestock – Safe food" in six countries in East Africa. The project is what is termed an international training programme (ITP) financed by the Swedish International Development Cooperation Agency (Sida) and follows a model that interweaves training in Sweden and in participating countries with participant-driven change work carried out with mentoring support from the agencies that run the project.

The project seeks to reduce poverty and vulnerability of small-scale farmers and reduce the number of zoonotic infections in the population in partner countries by boosting capacity for working on animal health and antibiotic resistance, with a focus on combating poverty with agencies and organisations in the food chain. Healthy animals produce more, better quality food without greater use of resources and need no antibiotics. Improved animal health thus helps to meet several of the Sustainable Development Goals (SDGs 1, 2, 3, 5, 12, 13 and 15) in the 2030 Agenda.

In partner countries, production of animal foodstuffs takes place in a complex value chain that spans many policy areas and engages different kinds of institutions, from poor small-scale farmers to cooperatives, businesses, government agencies and other national institutions. Cooperation and coordination enables initiatives to be made more efficient and improved without increased costs or greater use of resources. The ITP programme has been designed with a value-chain perspective encompassing all animal products from field to fork, and with the hypothesis that cooperation and dialogue are a successful working method to meet the SDGs. The value chain perspective seeks to provide participants with greater insights on links and dependencies in the chain, but also opportunities for deeper analysis of problems and reflections on new solutions to shared problems.

Monitoring and control of infectious animal diseases, monitoring of antibiotic consumption and antibiotic resistance, and controls on animal foodstuffs throughout the entire value chain are examples of areas that are important to attaining the objectives of the project. In the project, these topics are applied to the Swedish model of collaboration between government agencies and with private actors. Light is also shed on how essential concepts such as sustainability, gender equality, anti-corruption, equal treatment and animal welfare can be integrated in work on animal health and antibiotic resistance.

For more information:

sva.se/en/about-us/education-and-learning/healthy-livestock-safe-food



Milk is a sensitive food which contributes valuable protein to the diets of poor families and is an important source of income for many women. Through ITP support in the small scale milk chain there is improvement in hygiene, routines and handling of milk, leading to better animal health, welfare, production capacity and quality as well as a reduced use of antibiotics. Photo: Elina Åsbjer, SVA

CHAPTER 2

Easy to do the right thing: focus on the consumer

Emma Schütt, Swedish Consumer Agency

It's five o'clock on a Friday afternoon. The shops are packed. The aisles are crowded and the noise levels are high. It feels as if the queues have been standing still for the last half hour and your blood sugar is starting to drop. As luck would have it, you arrive at the checkout just before your pounding headache sets in. You grab a bag of carrots as you pass by. The apples look good too, and you choose a red one. You hear the screaming three year-old behind you is also getting an apple before your shopping glides all the way down the conveyor belt and you pay and leave.

The scene might feel familiar but isn't there something that's a bit odd about it? Who would actually choose to crunch on carrots at the supermarket checkout at five p.m. on a Friday? Not many people, surely? Even though it would be a rational choice considering their health, the environment and their finances. So why don't we do what we "ought to do" even when we know what that is? Is it even possible to always make a sustainable choice as a consumer?

The food we eat is clearly linked to all the aspects of sustainability. The advice to throw away less food, to eat the right amount, to eat more fruit and vegetables and less meat can have a positive effect on our health, the environment and our own finances. But even if we consumers know what the "right" choice is, we don't always shop in line with our intentions. Information is an important piece of the jigsaw, but it isn't enough to make us act sustainably. Psychological and physical factors determine whether or not we will be successful. It might come down to norms and habits, knowledge, marketing, accessibility or price. The actual conditions as well as the overarching norms of society need to be in place to make the sustainable choice the easy choice.

Two examples: When the Swedish Consumer Agency had researchers investigate the obstacles and opportunities that exist for Swedish consumers to make more sustainable choices of meat and plant-based alternatives, they found that despite there being many opportunities to make more sustainable choices, there were many, quite complex, obstacles to doing so.⁷ For example, the range of more sustainable alternatives is often limited, especially outside the major cities.

⁷ E Röös, K Resare Sahlin, T Lindahl; Hållbara val av Kött – konsumenters möjligheter att agera hållbart på den svenska köttmarknaden (Sustainable meat choices – the different options that consumers have in acting more sustainably on the Swedish market for meat). Swedish Consumer Agency 2019.

Nor are they often displayed particularly clearly in the stores, in advertising material or in restaurants. This mainly applies to plant-based food. The power of habit is also great. We eat what we are used to eating, and only ten dishes make up roughly 60 percent of the daily diet of Swedish consumers. One of the main conclusions is that more is needed to enable consumers to act sustainably.

Another study investigated outdoor advertising from a health perspective in two different districts of Stockholm.⁸ It showed that most marketing messages linked to food tend to highlight energy-intensive foods such as soft drinks, hamburgers, ice cream or sweets – in other words, food that is less healthy and can lead to several lifestyle diseases. This was particularly the case in the district in the study with lower socioeconomic status. Similar results have been seen from studies in Mexico and the USA. If we assume that advertising affects our actual behaviour, the results could indicate that it may be either easier or more difficult to make a healthy and more sustainable choice depending on where you live.

However, in recent years more and more actors have started to take action to make it easier for consumers to make sustainable food choices. Several initiatives in the grocery retail sector work with information on climate footprint or provide tips and “nudge” consumers to make more sustainable choices. Schools are working systematically to reduce food loss and to make their meals more environmentally friendly. Municipalities and regions are setting targets for consumption-based emissions and producing action plans to achieve them. Around the whole world, grassroots initiatives are also springing up, bringing together small-scale producers and consumers, distributing food loss and waste or passing on information on opportunities to grow plants in someone else’s garden.

Through their choices, consumers can influence the products provided, so playing their part in the transition to more sustainable consumption. Relying on consumers to lead the transition by themselves would, however, be a mistake. A transition to sustainable food consumption presupposes that the products on offer are sustainable through their entire lifecycle. Business thus has an important task to produce and provide sustainable products, as do politicians to create incentives that eradicate obstacles and steer towards sustainability. All actors in the food chain have both an important role and great opportunities to make it easy for consumers to act more sustainably. The simplest solution of all, of course, is if sustainability becomes the standard, benefiting both us and future generations.

The example from Addis Ababa (EAT Addis) shows that many challenges, especially in the cities, are similar in much of the world, although obviously local circumstances can make it easier or more difficult for the consumer.

⁸Fagerberg P, Langlet B, Oravsky A, Sandborg J, Löf M, Ioakimidis I. Ultra-processed food advertisements dominate the food advertising landscape in two Stockholm areas with low vs high socioeconomic status. Is it time for regulatory action? BMC Public Health. 2019 Dec 21;19(1):1717.

The presentation of the Swedish Food Federation's sustainability manifesto clearly shows that sustainability – in all three of its dimensions – is seen as both an important competitive advantage for the companies but also shows how important the food industry is in the work on change. Labelling and guides, too, are important tools for consumers to easily make choices when shopping. They can also act as instruments and indications of a standard to strive for.

The women, the children and access to food in the city: the case of Addis Ababa

Eva-Charlotte Ekström, Uppsala University, Magnus Jirström, Lund University and Beatrix Alsanius, Swedish University of Agricultural Sciences

A secure food supply and a good diet are crucial driving forces in global sustainable development. The world's population is rapidly growing more urban and Africa is no exception. Africa's population and its cities are growing fast – according to forecasts, the continent's population will double in the next 30 years from just over a billion today to more than two billion. The changes are greatest in the towns and cities.

These urban areas are also home to different lifestyles, sources of income, dietary patterns and health conditions compared with rural areas. The urban population becomes largely dependent on being able to buy food, although urban farming today is an important supplement for many. Due to low, insecure and irregular incomes, and varying access to food and fluctuating prices, many people are fighting for their own survival and that of their family. Poverty also spreads in the cities where more than half of the population lives in slums.

As part of globalisation, the food on the market is changing. Energy-rich products containing small amounts of food stuff and high amounts of additives are widely available and relatively inexpensive. From first having been consumed by those with medium and high incomes, this trend is spreading to those on low incomes. The result will be that under- and overnutrition occur at the same time, also termed the double burden of malnutrition.

Women tend to be those responsible for cooking and they thus have a key role in the household's diet. In the cities, women are simultaneously responsible for food shopping and contributing to the household economy, mainly through work in the informal sector. Traditional social structures based on family relationships or neighbours that have often been important in providing help looking after children, for example, are frequently disrupted by migration. On top of this come the constant moves, with old housing areas having to give way to businesses and modern housing complexes. At the same time, there are rarely new systems capable of providing childcare while the mothers are working.

In the research project *“What are we having for dinner today? The women, the children and access to food in the city: the case of Addis Ababa”* (EAT Addis), we study the situation of women and the factors that determine what their children and families eat.

One important aspect for diet is naturally the range of food products available. In a large city like Addis Ababa, most things are available, but this does not mean that they are accessible to all. Preliminary results of our study show that food necessary to meet the need of a nutritious diet does exist but not always in the area local to the home.

Unfortunately, there are clear socio-economic differences regarding which foods households consider they can afford to buy and therefore consume. Food rich in vitamin A, such as fruit and vegetables with yellow flesh and dark green leafy vegetables are examples of foods that many people are unable to afford. However, a monotonous diet is also common among the more prosperous members of society.

Many new types of food and drink are attractive due to taste sensations based on large amounts of sugar, salt, fat and/or industrially produced flavourings. These goods are marketed intensively, are cheap but at the same time poor in nutrients. Their high energy content means they contribute to people being overweight. Children often have strong opinions on what they will and will not eat. One important question is the extent to which the children's 'pester power' rules. In-depth interviews show that the mothers often give in and let the children's wishes determine the choices made, despite the fact that they themselves question whether the food is healthy. The children are influenced in the school environment both by their classmates and by sellers nearby, and there is a great desire to eat things they think everyone else is eating. Unfortunately, this often means food with a lot of energy and few nutrients. In our study we have seen that many children are overweight. This not only affects the richest but also poorer children. At the same time, short stature, a sign of chronic malnutrition, is still common. It is a challenge for government agencies to develop measures that both prevent under- and overnutrition at the same time.

Our study also shows that the women find it stressful to look after children and help to earn a living at the same time. The study also shows that their social networks are broken up by distance to relatives and frequent changes of home and residential areas and that children have to accompany them to work, if possible, or be left with people who their mothers do not trust.

The situation in Addis Ababa is not unique and can be said to reflect difficulties experienced by much of Africa's urban population. In a long-term perspective, it is vital that women's status and influence in society increases and that their rights – political, civil, economic, social and cultural – are guaranteed. From a medium-term perspective, the access of girls and women to education at all levels is a fundamental factor. In the shorter term, targeted support to women and families with children can improve the situation, for example through greater access to childcare, credit opportunities for those starting businesses and employment in the formal sector. Direct interventions have the greatest chance of succeeding if they support the different roles and needs of women.

The sustainability manifesto of food companies

Sara Sundquist, Swedish Food Federation

To feed increasing numbers of people, the way we produce and consume food needs to change. The solutions are there to be found throughout the food chain, i.e. from primary production to food production and supermarkets, and finally also among consumers. Today the food industry plays a central role as a catalyst for change. The food industry in Sweden employs about 49,000 people, has a turnover of about SEK 185 billion and processes 70 percent of Sweden's agricultural products. Besides producing the majority of what Swedish consumers eat and drink, the industry constitutes a large and important part of Swedish society from an economic, environmental and social perspective. To an increasing extent, the industry is also producing food for the rest of the world. Many Swedish food producers also use ingredients produced outside Europe and thus have a responsibility for the environment, economy and working conditions in other countries.

Work on sustainability is part of everyday life for Swedish food producers and increasingly highly necessary to be able to compete, and ultimately to survive. Long-term sustainability is about taking responsibility from a local, regional, national and international perspective – and so strengthening competitiveness. The food industry is part of the solution, together with the other actors in the food chain.

The Swedish Food Federation, Sweden's industry and employer organisation for food companies, has therefore produced a joint sustainability manifesto on the basis of what the accumulated science has to say about the ever more obvious sustainability challenges that are a result of human activity. As a first step, the manifesto presents five sustainability undertakings that the Swedish Food Federation urges its member companies to adopt and follow, provided they are relevant to their operations. The five undertakings are fossil-free industry, reduced food loss and waste, recyclable packaging, reduced water consumption and codes of conduct in the supply chain. The first evaluation of the manifesto will be in autumn 2020.

For more information:

livsmedelsforetagen.se/in-english



LIVSMEDELSFÖRETAGEN

The Swedish Food Federation

Labelling – a guide when you are shopping but also much more

The Keyhole

Veronica Öhrvik, Swedish Food Agency

The Keyhole is an independent label from the Swedish Food Agency. It is found on products containing less sugar and salt, more wholegrains and fibres and on products that are more nutritious or less fatty. What brings together food and dishes that are Keyhole labelled is that they are a more nutritious choice in that specific food group. The purpose of the Keyhole label is firstly to make it easier for consumers to make healthy choices and secondly to encourage the companies to produce healthier foods.

The Keyhole is voluntary and free to use on packaged food, on some unpackaged food and on recipes, as long as the criteria are met. The criteria are based on the Nordic Nutrition Recommendations. This means that there are requirements on the amount of vegetables, root vegetables, legumes, fruit, berries and wholegrains and on the content of fibre, salt, saturated fat, sugar and trans fats. Products bearing the Keyhole label may not contain sweeteners, and food such as ice cream, cakes and soft drinks may not be labelled.



Important success factors for the Keyhole are that the label builds on the latest accumulated research on the links between food and health that have undergone critical examination, and that the message is simple. The Keyhole is simply a tool to make it easier to follow Swedish dietary advice and is also used in primary care. More than half of doctors and nurses state that they have used the Keyhole in encounters with patients over the past year. Research also shows that among overweight children who receive help from the healthcare system, the Keyhole is a simple and valued tool for understanding and communication.

The Keyhole was developed by the Swedish Food Agency in 1989 and is now a joint effort between Norway, Denmark, Iceland and Sweden. The Keyhole label is also used in Lithuania. Legally, the Keyhole is counted as a nutritional statement, which means that a food labelled with the Keyhole has special nutritional content that is good for health. The label is subject to official checks, and the national control programmes have shown that the rules are complied with well. For a label that has existed as long as the Keyhole, retaining the interest of consumers and companies is a challenge. It takes constant work both with the brand and with the regulations to adapt it to new products and food habits. The brand needs to be communicated regularly, which is mainly done via social media with messages emphasising that the Keyhole is not a drastic choice, such as “Don’t change your life, change your bread”.

In 2021 new rules will enter into force for the Keyhole, which partly seek to make it easier to eat vegetables by enabling the labelling of more products in which ingredients have been replaced with green leafy vegetables, legumes and root vegetables.

About a quarter of consumers state that they use the label, and companies see the criteria as a seal of quality for healthy food. Choosing the Keyhole is an easy way for people to improve their food habits without needing to redesign their whole life.

KRAV – Sweden’s best-known ecolabel for organic food

Hanna Wallén, KRAV

KRAV, Sweden’s best-known ecolabel for organic food, has the vision of all food production being economically, organically and socially sustainable, meeting today’s needs without jeopardising the opportunities of future generations to meet theirs. KRAV is based on the EU Regulation on organic production and labelling of organic products but encompasses many rules that are more far-reaching on animal welfare, climate impact and social responsibility. A product that bears the KRAV ecolabel must comply with KRAV’s rules, and all producers must be inspected at least once a year.

When KRAV was formed in 1985, there was no consistent labelling for organic products. Over the organisation’s 35 years, the scope of KRAV labelling has expanded and now includes rules on growing crops, livestock farming, slaughtering and food processing, as well as for shops, restaurants and fishing. Today KRAV focuses on the entire food chain so as to promote the development of organic food production every step of the way.

KRAV contributes by making it easier for producers and consumers to act responsibly. The choice of KRAV eco-labelled products incentivises producers to increase production in line with KRAV’s rules. More farmers and other food producers will then be able to switch to KRAV eco-labelled production, benefitting animals, nature and people.

KRAV’s activities and vision tie in well with several of the Sustainable Development Goals. KRAV supports the 2030 Agenda as a whole and actively contributes towards several of the SDGs. From KRAV’s viewpoint, SDG 12 Responsible Consumption and Production and SDG 15 Life on Land, which encompass ecosystems and biodiversity, are particularly prioritised.

For more information:

krav.se/en



Från Sverige – the voluntary label of origin makes it easy to choose Swedish!

Ulrika Norvell, Svenskmärkning AB

In Sweden, demand for Swedish ingredients and foods is strong, and consumers have very high trust in Swedish farmers and food producers. Swedish ingredients and foods are associated with good choices from an environmental and climate standpoint, and are also seen as being safe and reassuring.⁸

The Från Sverige (From Sweden) label came about to meet consumer demand for Swedish food, ingredients and plants. It was the Federation of Swedish Farmers, the Swedish Food Federation and the Swedish Food Retailers Federation that in 2016 launched the label of origin – a joint initiative to stimulate higher Swedish production, market development and growth. Inspiration and experiences were drawn from Finland and Norway, which have worked with similar labels of origin for several years.

Awareness of the label has grown rapidly from zero to more than 80 percent. Just as many people have trust in the label and think it is important.⁹ The label's criteria and checks contribute to the high levels of trust it inspires and today (2020) the label is used by more than 190 companies on more than 10,500 products.

A product labelled “Från Sverige” is grown or born and reared, packaged and controlled in Sweden. For goods with several ingredients, special rules apply, where at least 75 percent must be Swedish and all animal ingredients must always be 100 percent Swedish. The rules enable clear labelling of origin on products with many ingredients and help to drive demand for Swedish raw materials and ingredients. Several companies have rearranged their production or reviewed their recipes to meet the demands of the regulations.

Companies at every step of the food chain have the opportunity to sign up to the labelling scheme, including restaurants. The companies are certified and spot checks are also carried out to ensure compliance with the rules.

For more information:
fransverige.se/in-english



⁸ Demoskop 2020

⁹ Demoskop 2020

Guides – knowledge for the active consumer

Consumer guides for sustainable food

Anna Richert, World Wide Fund for Nature (WWF)

The World Wide Fund for Nature (WWF) in Sweden produces the Meat Guide and the Fish Guide, tools for informed choices of meat and fish. Meat and fish are an important part of many people's diets, and this affects the planet. The guides are structured differently. The Meat Guide is based on five assessment criteria: climate, biodiversity, chemical pesticides, animal welfare and antibiotics. The result, which is built on a holistic assessment, is a traffic light system for different types of meat, as well as eggs, cheese and vegetarian protein on the Swedish market. The Fish Guide is based on sustainable stocks and fishing methods. One important aspect for the guides is to demonstrate sustainability performance in the different categories. The Meat Guide makes it clear, for example, that a type of meat with a low climate impact can have a negative effect on biodiversity and a type of meat with a high climate impact can have a positive effect on biodiversity.

Eating less but better quality meat in countries where meat is over-consumed is an important element in a more sustainable food system, and the Meat Guide provides simple guidance on a question that many consumers find difficult. The Fish Guide also makes it easier for consumers, as the ecolabelled range gets a green light. The Meat Guide and the Fish Guide are available as apps and on the WWF's website. In Sweden they are used by restaurants, food retailers, schools and when training catering staff to influence food consumption in a more sustainable direction. The guides are now being spread to more WWF offices around the world, and in 2020 a Veggie Guide is being planned, as the shift to a more plant-based diet means that we also have to examine vegetables from a sustainability perspective. In the years ahead, many countries will be launching similar guides to make it easier for consumers to make sustainable food choices.

For more information:

wwf.se (in Swedish)



Consupedia – values-steered consumption for greater justice, better environment and improved health

Roberto Rufo Gonzalez, Consupedia

Consupedia is a result of several research projects in Sweden that began in 2015 and today provides innovative decision-making support that helps consumers and buyers to make sustainable food choices. The website, or the web app, are used via computers from offices or homes, and the Consupedia mobile phone app means consumers are able to use their phones to scan product barcodes while in the shop and immediately obtain relevant information.



Examples of information that Consupedia provides are:

- Impact on the climate and the environment
- Impact on people's health
- Production conditions from a Fair Trade aspect
- Material choices, weight of the packaging and recycling tips
- Transport distance
- Animal welfare and antibiotic use

The app fetches the information from the world's biggest database of environmental impact, health and justice related to food. The database has been built by the Royal Institute of Technology (KTH), Dalarna University and Consupedia with the help of data from a wealth of different organisations. The information is complex but is presented in the app in a way that is user-friendly and easy to understand.

Consupedia helps consumers and other decision-makers to compare and take informed decisions on different purchasing alternatives. Better knowledge of the origin and the impact of products gives consumers and organisations an opportunity to choose food that corresponds with their values and, by making active choices, to contribute to the transition towards a world that is fairer and more sustainable in the long term. So far, this decision-making support tool has been launched in Sweden and there are plans to see it launched internationally. Consupedia is the result of many years of collaboration between leading researchers from different scientific disciplines and universities and entrepreneurs with a burning passion for sustainability.

The more consumers, purchasers and decision-makers who use Consupedia, the greater our shared impact will be on how we produce and handle food in the world.

For more information:

consupedia.se (in Swedish)

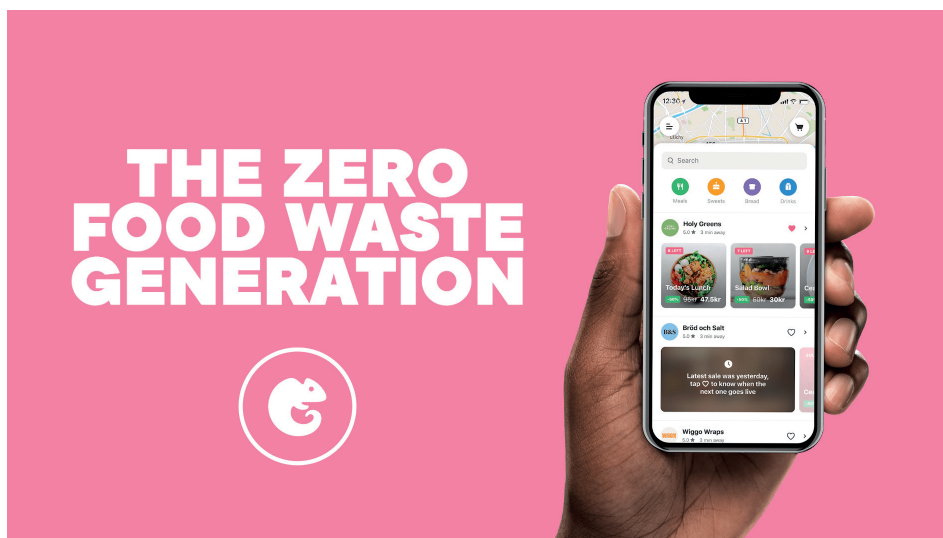
Karma – the app that reduces food waste

Elsa Bernadotte, co-founder Karma

One in four people on the planet currently feels insecure about their access to food, while we throw away more than three times as much food as we did just 50 years ago. The fact is that a third of all food produced is thrown away. The environmental impact of food waste is four times greater than all flights put together, and this costs us 1.2 trillion US dollars a year.

The question is, can we eat the problem away? Can we get discarded edible food to reach end consumers at a lower price? If so, consumers would be buying good food at a lower cost and the retailer would gain higher income from goods that otherwise would be thrown away. Both parties would save food waste.

This was how the idea of Karma started.



Karma is an app that sells good food that would otherwise have been thrown away at half price. The initiative covers 9,000 wholesalers, food retailers, restaurants, cafés and bakeries. Karma places awareness and power in the hands of consumers, who together have now saved several millions of meals from being thrown away. Karma was launched in Stockholm in 2016 and in just a few months, shops and consumers had signed up across the whole of Sweden. This was entirely without any urging from Karma; the awareness and demand were already there among the 10 percent of Sweden's population that currently has the app.

It is difficult for companies to estimate their customers' daily or weekly consumption patterns. Something as simple as one day of bad weather has a direct impact on sales and can lead to more food loss. As long as the food industry has waste, we have to do something about it together.

Karma makes it easy for companies to maximise their resources while making a profit. And consumers? They get to buy good food at half price while doing more than their bit for the environment. Win-win-win.

For more information:

karma.life



CHAPTER 3

Research and innovation – meeting the big challenges

Johanna van Schaik Dornfalk, Formas

The next ten years will be vital if the world is to make the transition to sustainable development. Entire social systems, sectors and industries will need to rethink. There is a need for bold political decisions, new ways of organising, governing and planning our societies, new more resource-efficient production methods, new business models and changed consumption patterns. None of this is easy or will happen by itself. Some of the knowledge we need to make the change already exists, but there are also many knowledge gaps that need to be filled and translated into practice. This makes major demands of researchers and companies, in particular demands that they collaborate and work together to achieve the necessary change.

The research is global and cross-disciplinary by definition. Boosting research will demand collaboration between the best researchers around the world. The 2030 Agenda is universal – all countries must develop and contribute towards the transition. Global development and sustainable development go hand in hand. There is a greater need to finance research that integrates both different perspectives and researchers from different countries, including low-income and lower middle-income countries. In the 2030 Agenda, partnership and shared responsibility are central, therefore both regional and global perspectives need to be inclusive. This is clearly linked to the food system to no minor degree.

The role of the food system in sustainable development

A growing global population, economic development, climate change, ecosystems under strain and biodiversity, as well as security policy situations across the world, are examples that put the food system at the centre of the transition to a sustainable world. We need to develop sustainable production systems and strong, innovative companies that produce and deliver safe food – good food that benefits people and the planet. We also need to get better at understanding and using driving forces in production, meals and consumption to attain a more sustainable food system and a more sustainable world.

A number of challenges need to be tackled, even in Sweden where conditions are comparatively good, in the form of a robust environmental policy, high animal welfare standards, low use of antibiotics and safe food production. This particularly applies in terms of increasing Sweden's contribution to the 2030 Agenda, because the food area is so strongly integrated with several of the SDGs and thus can also be a driving force in the transition.

Swedish food research is of a high scientific quality and is used to a great extent by researchers in other countries. Sweden is one of the world's strongest countries for innovation, ranked highly for vehicles, forests and steel, while historically the food sector has been weaker. Today, however, food Sweden is bursting with ideas, and many companies have research and innovation on their agenda. Of course, the Swedish food system is part of the global system, and international conditions influence the potential for sustainable and competitive food systems everywhere. This includes the role of the food system for public health, equality and gender equality, the profitability of the companies, and society's preparedness and resilience to disruption.

Concerted effort for research and innovation

Driving the development of a sustainable transition of the food system and strengthening companies' competitiveness will take a stronger research and innovation system. Research results must be able to be transformed to benefit society and also be used in evidence-based decisions and measures. The food sector is divided into many small and medium-sized companies. The larger companies, with the greatest capacity for research and innovation, are global and are not always able to meet national needs. It can be difficult for the smaller companies to identify research needs and adopt and translate new knowledge to new values. Dialogue and collaboration are necessary to achieve change. Improving opportunities needs investment, for example, in greater mobility between academia and surrounding society, as this increases the pace of converting research results into value for society. Dialogue and collaboration between actors also lead to the right sort of financing instruments being created to strengthen the research, innovation and skills supply most needed. In order to increase the sustainability and competitiveness of the food system, there must be the opportunity for such collaboration to be long-term and with high impact.

Several research and innovation initiatives are currently in progress in the food system at national and international level. In the EU, the new research and innovation programme Horizon Europe is currently being launched, which will open up many opportunities for transnational projects that contribute to a transformation of the food system. A new working method launched by the EU is "mission-oriented innovation", in which many different actors together work towards a goal with a deadline. One of the mission areas is "healthy soils and food". At Nordic level, research and innovation is often coordinated via Nordforsk, where one Nordic research area is sustainable aquaculture. People are also joining forces at national level, partly as part of the implementation of Sweden's Food Strategy. Additional examples are Formas' national research programme for food, founded in 2017, which builds on the strategic research agenda "The road to a sustainable and competitive food system" produced in dialogue with academia and institutes, the business community, government agencies and other actors in society. The programme has a portfolio of about 45 projects so far. These span research and innovation projects, projects for greater collaboration, greater mobility between academia and efforts on the ground in the food sector, and projects to exploit research results.

The Swedish University of Agricultural Sciences (SLU) has also been given the opportunity to finance what are termed industrial PhDs, where students conduct their research at university and on placements with companies. Another example is Sweden Food Arena, a national meeting place for companies throughout the food chain, formed to strengthen the sector in Sweden and coordinate and prioritise its research needs and increase its innovative-ness. Vinnova has a mandate to strengthen innovation in the Swedish food chain, partly through a higher ceiling for innovation and partly by encouraging greater cross-sectoral collaboration. This mandate is partly carried out with Sweden Food Arena.

Sweden Food Arena – an umbrella, needs-formulating actor for the whole food chain

Marie Gidlund, Sweden Food Arena

Few sectors are as central to society and simultaneously as complex as the food chain. Our food and beverage products must taste good and be safe, healthy, eco-friendly, fresh, ethically produced, natural, locally grown and national – a combination of requirements that are not found in many other types of product, if any. And our food chain manages to deliver this every day. However, the world is facing major challenges in terms of the climate, public health and the food supply. Continuing to ensure that we have a successfully functioning and safe food production system and distribution chain from producer to consumer is one of the foundations of a society in which people feel secure. To resolve these complex challenges, there is a need for greater focus on innovation and research, incorporating many parties with different skills that solve the challenges together.

Sweden Food Arena brings together companies and industry organisations throughout the food chain with the ambition of accelerating the pace of innovation and needs-motivated research. Sweden Food Arena was launched in spring 2019 and today has about 30 members, including Lantmännen, Arla, Orkla, Fazer, Polarbröd, ICA and the three industry organisations, the Federation of Swedish Farmers, the Swedish Food Federation and the Swedish Food Retailers Federation.

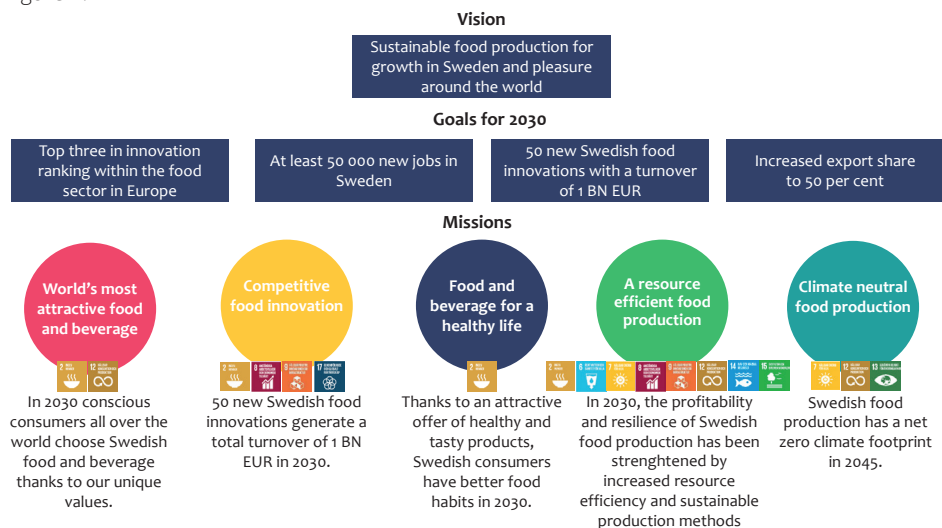
New collaboration model

The Arena is also developing a modern collaborative model in the food chain where different skillsets come together and significantly develop technology, business and skills and generate new knowledge. Collaboration between business and researchers in different academic disciplines will reduce the time from idea – via research, development and testing – to implementation and commercialisation. The model is intended to be applicable in other sectors and in other countries. The objective is a sustainable, competitive, innovative and growing food chain. Encouraging the development of sustainable food innovation also needs innovation in supporting areas that agencies and politicians are responsible for, such as financing, advice, policies and regulations.

The food chain's innovation and research agenda

In autumn 2019, Sweden Food Arena formulated the vision “sustainable food innovation for more jobs in Sweden and culinary pleasure throughout the world”. To realise this aim, four ambitious goals have been set for the food industry in the next decade. In ten years, Sweden is to be among the top three in innovation rankings within the food sector in Europe, new companies are to have launched innovations with a combined turnover of at least 1 billion euros, the sector is to have created 50,000 new jobs, and 50 percent of all food produced in Sweden is to be exported.

Figure 1.



Source: Sweden Food Arena

In June 2020, the food supply chain presented a joint innovation and research agenda. It draws on the opportunities and needs of the industry and tackles some of the food sector's biggest challenges, including competitiveness, sustainability, climate, growth and health.

The agenda builds on five commitments, missions, that form the basis of the focus areas towards which innovation and research activities are to be directed.

- The world's most attractive food and drink
- Competitive food innovation
- Food and drink for a healthy life
- A resource-efficient food sector
- Climate-neutral food production

Collaboration is the key

Greater collaboration across sectoral boundaries paves the way for a faster rate of innovation to produce high-quality food with minimal impact on the environment and climate. We can contribute to better public health together with the life science sector and continue to develop sustainable bioenergy for transport together with the energy sector. In collaboration with the technology sector, we are developing new technical and digital solutions for the sustainable production, distribution and consumption of good food in the future.

The Government and industry together investing in sustainable food innovation based on collaboration, a systems-oriented approach and inter-disciplinary science means the food chain can develop and contribute towards solutions in all three dimensions of sustainability – environmental, social and economic (see figure 1).

We see that the food sector can be the new sustainable growth industry of the 2020s. Greater collaboration within Sweden, within Europe, between sectors and actors, will increase the innovative capacity and the production capacities of the individual companies concerned. This generates a number of positive effects: besides good meals, more jobs are created across the country, as well as higher growth, a better climate, increased ability to earn a living, more robust public health and thriving rural areas!

For more information:

swedenfoodarena.se/en



SLU Future Food

Pernilla Johnsson, Swedish University of Agricultural Sciences (SLU)

The Swedish University of Agricultural Sciences, SLU, develops the understanding and sustainable use and management of biological natural resources. This is achieved by research, education and environmental monitoring and assessment, in collaboration with the surrounding society. To address complex sustainability challenges more thoroughly, SLU has created four so called future platforms, each on a theme based on SLU's research areas, of which SLU Future Food is one.

SLU Future Food stimulates and develops research on the sustainability challenges of food systems through a cross-disciplinary approach with a futures perspective, in collaboration with business, government agencies and other sectors. The work involves all aspects of food systems, mainly from a Swedish perspective, but in a global context. The three sustainability dimensions – environmental, economic and social – are included.

The platform communicates scientifically supported knowledge in the field to recipients outside SLU, including decision-makers. In contact with different societal actors, futures relevant, needs-motivated questions are also brought back to the university. The platform thereby acts as a node between SLU and surrounding society and is, for external and internal actors alike, a gateway into complex questions concerning food systems sustainability.

The strength of the platform lies in its systems approach, cross-disciplinary collaborations and a large network of contacts both in Sweden and internationally. According to the ordinary structure of a university, there is a great risk that research groups will be too narrowly composed to address complex challenges that affect several disciplines. The platform can take a dedicated, long-term approach to developing skills in cross-disciplinary working methods and provides opportunities to find and bring together partners.

The networks and the systems approach, for example, mean that the platform can quickly mobilise and support broad consortia for larger applications for research funding. In Mistra's call for proposals in spring 2019 with the aim of finding ways of "developing a sustainable, competitive, profitable and innovative Swedish food system by 2030", SLU Future Food worked precisely as the node described above. At an early stage, before the call for proposals was made public, the platform was able to mobilise researchers internally to start planning for such an advanced cross-disciplinary research application that a Mistra programme entails. The platform's network then enabled a broad group of research competencies, and company and government agency representatives to be put together to write the application. The work resulted in an invitation to run the research programme *Mistra Food Futures: excellence in research and implementation*, with SLU as project leader and with Rise and the Stockholm Resilience Centre as the two other main project owners.

The goal of the research programme is to contribute scientifically based knowledge on how the transformation of the food system is to be effected, which is largely lacking today.

It is a challenge to work together in broad constellations, where many values, experiences, perspectives and knowledge bases are to be combined, but this is the only course of action if we are to be able to tackle the complex challenges involved in creating food systems that are sustainable for everyone.

For more information:

slu.se/en/Collaborative-Centres-and-Projects/futurefood

BIO-INNOVATE

Eva Ohlsson, Sida

The BIO-INNOVATE programme (“Bio-resources Innovation Network for Eastern Africa Development”) serves as a regional research council and provides funding via competitive grant applications for research and innovation/policy in biotechnology, with a focus on small-scale farming and the small-scale process industry linked to the agriculture sector in six countries in East Africa (Kenya, Uganda, Tanzania, Rwanda, Burundi and Ethiopia). The purpose of the programme is to encourage research that can help to reduce poverty and contribute to sustainable development through innovation.

Researchers at East African universities, research organisations and companies are better placed to develop innovative ideas and contribute to the emergence of new products and services, such as translating modern biosciences into innovations geared towards small-scale farmers and input companies in the region.



Inspectors from the Tanzania Official Seed Certification Institute (TOSCI), certifying the virus free sweet potato vines produced through tissue culture by Tanzania Agricultural Research Institute. Photo: TARI

Bio-Innovate, whose second phase began in 2016, is drawing to a close, and after five years is now testing several sub-projects on the market in refined business models, having reached the stage “tested on the market and has generated income”.

In the subproject on the production of virus-free seed and plant material, with six partner institutions and a total budget of approximately USD 750,000, 885,000 units of virus-free sweet potato seed have been sold over three years to farmers in Uganda, and 17,500 units of virus-free basic seed for sweet potatoes have gone to private laboratories in Tanzania for propagation and further sale to farmers. Nitrogen-enriched and pelleted organic fertiliser made from urban bio-waste has been sold to farmers to improve productivity and increase harvests. The innovation company in the sub-project sold approximately 105 tonnes of fertiliser in 2019 and had a turnover of approximately USD 31,500.

In the sub-project on Striga, which involves maize and millet resistant to Striga, a discussion is in progress at Maseno University in Kenya on terms for continued commercial operation.

Finally, work is in progress on the terms for continued commercial operation in the subproject on a renewable biofuel known as “bio-alkanol gel”, manufactured from fruit waste, where a provisional patent was granted by the Kenyan authorities. The bio-alkanol gel also has potential to repel mosquitos that cause malaria, and the resulting biomass from the production process can also be processed to create a secondary product in the form of a bio-fertiliser.

For more information:

sida.se/English

CHAPTER 4

New business models based on circular systems

Madeleine Linins Mörner och Hanna Skoog, Axfoundation

Today's linear food and farming systems exploit the world's finite resources in an unsustainable way. One third of all edible food currently goes to waste, while ten percent of the world's population goes hungry. The agriculture and food sector is the second largest emitter of greenhouse gases in the world, and today's farming methods lead to the depletion of our food soils. Important resources such as nitrogen, phosphorus and other minerals are used in huge amounts, but at the same time are lost after only one harvest, with major consequences in the form of over-fertilisation. Moving towards a circular food system is therefore vital if we are to succeed in reaching the targets of the Paris Agreement and staying within the planetary boundaries. We must start to use our raw materials in a more resource-efficient and sustainable way and avoid resource losses at every step of the chain.

The links between our consumption and its impact on the environment and climate can be hard to grasp in their entirety – these are complex systems. Few people think, for example, that the low-priced chicken they buy for their Friday dinner could be contributing to the destruction of the rain forest due to the fact that chicken feed usually contains about 15 percent soya. Or that the Tuesday night taco with minced beef is leading to considerably higher emissions of greenhouse gases than if it was replaced by mince made from Swedish legumes. Although Sweden, compared to many other countries, has relatively strong legislation to protect the environment and safeguard animal welfare, there are still a number of areas in which regulations are lagging behind, preventing a fully resource-efficient agriculture and food system. Nevertheless, claims are sometimes made that Swedish farmers have to wrestle with competitive disadvantages, as complying with Swedish rules may lead to higher production costs. However, there is much to indicate that these potential disadvantages can be turned into advantages in a global market increasingly marked by negative climate and environmental impacts. Here, the most sensible thing we can do is to invest more, not less, in our Swedish added value. On the other hand, we cannot expect the cost of this investment to be borne by individual farmers alone. It is reasonable that other market actors downstream in the value chain are involved and invest in meeting the market's particular demands.

One of three strategic areas in the Swedish Food Strategy involves increasing the level of knowledge and innovation in the food chain. The only way this can happen is through trust, openness, collaboration and sharing the innovation costs throughout the entire food chain.

It is not reasonable that actors in the chain with the lowest margins – the farmers – are the ones that have to bear the entire risk of testing new crops, new feed and new technologies.

Making the most of waste flows

Every year substantial amounts of food are lost from field to fork – some in the form of residual products that cannot be used in production, and some in the form of complete and edible food that is simply thrown away. Food loss, in other words the edible part of the food waste, amounts to approximately 420,000 tons per year in Sweden. On top of that comes food waste – the parts we count as inedible, such as shells, cores, skin and bones. There are huge amounts of waste that we cannot afford, socially, economically or environmentally. We must find new circular systems where producers – users – recyclers – new producers are included in the production chain by seeing all waste as resources. For this to succeed, the food chain's flows need to be surveyed and the most serious sources of waste and lost resources need to be identified. Primarily the losses need to be limited at the source. In cases where this is not possible, the actors in the food chain need to work together to steer waste flows to new raw materials flows.

One person's waste can be another person's most important resource

To limit food loss and food waste, it is vital to also look upstream in the chain, not only to look at lost resources in stores and among consumers. The production and processing industry today is full of residual streams that in many cases end up as biogas. In Sweden, for example, we incinerate tonnes of laying hens every year when they are no longer laying eggs at the desired rate, while the same time importing large amounts of processed chicken meat from other countries. Another example is the fantastic product Swedish vendace roe, a quality product we are justly proud of – but where the roe only constitutes an eighth of the total weight of the female fish. The majority of all males and the emptied females currently become animal feed or biogas. In other words, we reject huge amounts of a nutritious fish, hundreds of tonnes of which are caught every year. At the same time, schoolchildren are served fish from the other side of the world. But school students probably would not eat whole vendace, so the fish would need to be processed into something that children recognise and want to eat. Fish burgers perhaps? The key thus ought to be to survey all waste flows and consumer behaviour and create new business models on the basis of this data.

One successful example is the store chain that only sold broccoli florets while the growers had to throw away the stems. The stems are two-thirds of the plant and are both nutritious and tasty. Thanks to dialogue and collaboration, today these stems are shredded in the form of “soup mix” – adapted to today's users who have less and less time to devote to cooking. A modern business model that is good for everyone – for the farmer, for the shops, for the consumers and the environment.

Circular business models demand collaboration between sectors. In the future, the most interesting sectoral overlap ought to be that between agriculture, materials and biotech.

Härnösand: a centre for circular aquaponics with large- and small-scale systems

Anneli Kuusisto, Härnösand municipality and Olof Frensborg, VISUS Härnösand

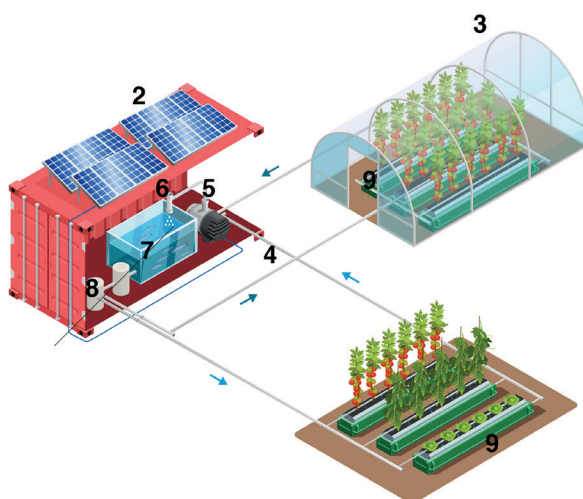
Härnösand has long been ahead on land-based circular aquaponic farming of fish and vegetables in Sweden. More than 20 years ago, pioneer Pecka Nygård moved his fish farm onto land and started experimenting with using the nutrients from the fish to fertilise vegetables. Now entrepreneurs have scaled up the idea and formed Peckas Naturodlingar AB, the biggest circular-economy aquaponic farm in Europe, and possibly the world. The farm consists of almost 12,000 square metres of greenhouses, with a capacity to produce 500 tonnes of tomatoes and 60 tonnes of rainbow trout a year.

The tomatoes are sold Sweden-wide and Peckas Naturodlingar has the goal of establishing even larger facilities adjoining one or more of Sweden's cities. The company has also developed a system of aquaponic growing on an industrial scale, based on artificial intelligence. The system will be offered to an international market.

At the same time, strong developments are being seen in small-scale and sustainable food production in Härnösand. VISUS is a company that develops small and medium-sized growing facilities for aquaponics and hydroponics. The aim is to site growing systems where natural conditions make it difficult or impossible to grow food otherwise. One version is mobile.

Container based system

1. Container
2. Solar panels
3. Greenhouse
4. Water pipes
5. Pump
6. Oxygenator
7. Fish tank
8. Filters
9. Media beds



Source: VISUS

All the equipment in the form of growing beds, fish water tanks, pumps and a solar electricity plant fit in a container that can be transported and used in areas with limited access to water and a lack of land for growing food. In a climate with a long growing season, such a facility can produce 1-2 tonnes of fish and 3-7 tonnes of vegetables a year.

VISUS is developing the systems in close collaboration with 'backyard farmers' in the region and is designing systems for urban growing in collaboration with various property companies. Training is provided in this type of growing in partnership with Härnösand Folk High School.

More and more consumers want to know where and how the food they eat has been grown. The story of what happened to the little seed on its way to becoming a fully grown vegetable is an important part of the taste experience. Demand for locally grown food is not only about lower food miles. It also creates a new market for sustainable enterprise. This may involve new, small companies, or growing food as an extension of an existing business.

As climate change is redrawing the conditions in which food is produced in many parts of the world, new sustainable production solutions are needed. What is happening in Härnösand in the form of developing climate-smart, sustainable food production on a large and a small scale, is an important contribution to the solution.

A collaboration agreement has been signed between the municipality of Härnösand and Mid-Sweden University, where several research initiatives are being carried out to support the emergence of sustainable food industry in Härnösand and Västernorrland. This strengthens the link between the local community, the business community and research and, together with other key actors, we will drive developments on the major challenges that exist in this area.

For more information:

visusgreentec.se

miun.se/samverkanharnosand



5 tonnes of green fish – producing sustainable salmon fed with circular-based feed

Madeleine Linins Mörner, program director Future Food, Axfoundation

Our food should ideally not eat our food. And ideally we should not allow any residual streams to go to waste. These are some of the fundamental ideas behind the project Five tonnes of green fish, which Axfoundation is running with the Swedish University of Agricultural Sciences (SLU).

The global population is growing – and so is the demand for fish and seafood. However, 85 percent of commercial fish stocks in the world's oceans are being exploited to their limit, or even over-exploited. Fish farming is often seen as an opportunity to provide us humans with seafood without increasing the pressure on the planet's oceans. Today about half of all seafood on the global market is farmed.

One problem with farmed fish, however, is that the feed used often consists of large amounts of soya, cereals and wild-caught fish, in other words food that we could eat ourselves directly instead of via a circuitous route through farmed fish. Global fish farming therefore makes a negative contribution to the global food supply. At the same time, the food system has major problems with waste and reabsorption of nutrients, which in today's linear flows contribute towards nutrient leaching and over-fertilisation. The project Five tonnes of green fish kills both these large birds with one stone.

Since 2017 the EU has permitted insects as fish feed. This means it is possible to solve the problem of unsustainably produced fish feed while using an unexploited raw material resource in the form of food waste. The idea involves bread and vegetable waste that is thrown away, such as peel and cores, being used as food for insects, which are then pro-cessed into fish feed. These insects, together with other domestic raw materials, could replace part of the imported fishmeal, fish oil and soya concentrate used today.

The main aim of the project is:

- Producing at least five tonnes of Swedish sustainable salmon of high gastronomic quality
- Producing a circular-based fish feed without importing any new nutrients into the Baltic drainage basin
- Supporting the development of circular-based feed ingredients
- Supporting Swedish municipalities' environmental efforts as part of circular food production

The project group consists of actors from across the whole production and distribution chain, including researchers. This cross-sectoral collaboration is one of the reasons behind the project's success.



The producer Älvdalsslax have been testing insect feed on a small scale with good results. Since the insects that have fed on residues from the food industry, a production is created that does not compete with other food production, but rather contributes to a safe and increased food security. Photo: Lemon Wedge / Stuart Dunlop

On this journey, new, circular business models are created as one person's waste becomes another's input raw material. The insect production process creates yet another stream, namely the organic waste that the insects themselves produce as they eat the vegetable residual streams. Insect poo, basically. This by-product has been evaluated in Axfoundation's experimental garden at Torsåker farm and has been found to have interesting properties as a biological fertiliser.

It is highly likely that legislation will be changed in the years ahead to allow insects to be used as feed for poultry and pigs. When this happens, we want to have the infrastructure and the skillset in place to scale up further and replace unsustainable feed raw materials there too.

For more information:
axfoundation.se/en



AXFOUNDATION

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FOR SUSTAINABLE DEVELOPMENT

Productive sanitation in Burkina Faso and Niger

Jorunn Hellman, Swedish University of Agricultural Sciences / SIANI and

Linus Dagerskog, Stockholm Environment Institute

Although sanitation is a human right, almost 700 million people in the world do not have access to a toilet. A majority of these people live in rural areas, mainly in low-income countries in South-East Asia and Sub-Saharan Africa (SSA). As we know, urine and faeces, “human waste”, can cause major health problems in the local environment, but in fact they can also be a resource. The amount of plant nutrients found in one person’s human waste is equivalent to approximately 10 kg of mineral fertiliser per year. For a whole family, this means about 50–100 kg of mineral fertiliser a year, which is often more than small farmers in SSA can afford to purchase for their crop. The largest proportion of nutrients excreted is found in urine. Unlike faeces, urine is also in principle free of pathogens, making it an excellent fertiliser. Faeces contain organic material and quite a lot of phosphorus but need to be properly hygienized to minimise risks in the ecocycle.

Unfortunately, there is very little collaboration between actors in the sanitation sector and the agricultural sector to exploit the opportunities for a safe ecocycle. Most sanitation efforts aimed at increasing access to hygiene and toilets in rural areas are focused on conventional solutions such as pit latrines, where a large part of the nutrients in urine and faeces is lost from the local ecocycle. However, there are already small-scale, ecocycle-friendly sanitation solutions, such as composting toilets and urine-separating toilets, where the urine can be used as a fertiliser without being contaminated by faecal matter. For a relatively small investment, these can enable a local nutrient cycle that leads both to an improved local environment and higher yields.

Urine-separating dry toilets need more maintenance than other solutions, and there is often a lack of supporting regulations to make it easier to implement both toilets and recycling. For obvious reasons, in many parts of the world there is a deeply rooted taboo against dealing with human waste. Spreading awareness of safe use of the toilets and the fertiliser produced, showing the economic benefits and increasing cultural acceptance are therefore key factors in establishing functioning ecocycle toilets.

Since the early 2000s, more than 17,000 urine-separating dry toilets have been installed in Burkina Faso and Niger by different organisations, with support from bodies including Sida and IFAD, where the Stockholm Environment Institute (SEI) has also contributed research and follow-up. Follow-up in Burkina Faso and Niger shows that in many places, urine-separating dry toilets have been used frequently for several years after their introduction and that many households are very pleased with their sanitation solutions. The most successful projects are those that have had the greatest focus on re-use, where local agricultural advisors and farmers have conducted trials of urine and toilet compost as a fertiliser.

Understanding in practical terms how re-use works and seeing the results on their own fields has been important in households demanding and using the toilets. One practical problem has been handling the large amounts of urine generated. To solve problems of urine storage and transport, many households have started to use the urine to enrich their compost heaps.



Hadjiratou Issoufou, project manager in Niger is demonstrating the use of urine as fertilizer.
Photo: Linus Dagerskog

Strengthening the link between sanitation and agriculture is a major challenge for all societies. A holistic approach is needed in which we deal with both the risks and the resources linked to urine, faeces, waste-water and organic waste. In many ways, the families that have engaged in the ecocycles in Burkina Faso and Niger are role models, and there is much we can learn from them.

For more information:

slu.se/en/collaboration/international/slu-global/projects-and-themes/networks/sianisci.org

AgriFoSe: Science contributes towards new business models for nutritious food in low-income countries

Sofia Boqvist and Ulf Magnusson, Swedish University of Agricultural Sciences

In the programme Agriculture for food security 2030 – translating science into policy and practice (AgriFoSe2030), we are working to improve production of and access to nutritious food in low-income countries. This work includes developing new business models to reinforce the access of small-scale food producers and distributors to markets. One example is further processing and sale of insects as an important source of protein for people and also as feed for livestock. In AgriFoSe2030 we are working closely with colleagues in low-income countries using a cross-disciplinary approach. The first step in our various partner projects and activities is to conduct a thorough analysis of the science needed to achieve the desired improvement in the food system. This analysis takes into account all three aspects of sustainability (social, economic and environmental), with risks, opportunities and assumptions along the way being evaluated and actors that should be involved in the various stages being identified. In a second step, the programme participants produce a synthesis of the scientific knowledge currently available in the area and make this accessible and comprehensible to relevant decision-makers and practitioners. A central component of AgriFoSe2030 is to involve and train colleagues from low-income countries to improve food security.

The starting point regarding insects is that these traditionally form an important component of the diet in many African countries. Insects also have great potential as food for food-producing animals. They can thus form part of a circular system, as some insects can live off food waste. The aim of the project was to promote the use and the sale of edible insects in towns and areas adjoining towns in Zimbabwe and the Democratic Republic of Congo. This was done by boosting capacity and increasing awareness of local decision-makers on safe handling and trade in edible insects. The project also sought to make it easier for local stakeholders and decision-makers to participate and has also stimulated entrepreneurship and the active participation of women. Together with local authorities, the project has supported a market model to sell and handle insects in urban areas in Chinhoyi, Zimbabwe. This model has had several positive effects, such as improved insect handling and hygiene, better access to markets, greater exposure among new consumer groups and safer access to insects. Improved insect handling has contributed to food safety and increased trade, which mainly benefits women. The growing awareness of the improvement potential has created interest in other cities across Zimbabwe and also in other countries.

For more information:

slu.se/en/collaboration/international/slu-global/agrifose

CHAPTER 5

Conclusion

2020-2030 is the UN's Decade of Action to deliver on the 2030 Agenda and the Sustainable Development Goals. Since the SDGs were decided, progress has been limited and for several of the goals, development has even moved in the wrong direction. The COVID-19 pandemic has given rise to additional obstacles that no-one could have imagined just a short time ago, exacerbating the challenges that the world faces. It also shines a light on the importance of safe food and the significance of good animal health and good animal husbandry. At the same time, many point out that the pandemic has opened a window of opportunity that may be the springboard the world needs. Build back better is being highlighted as a new dimension in global development. Even before the outbreak of the pandemic, analyses showed that several of the SDGs that were not developing in a positive direction could be linked to the food system in one way or another. At the same time, the effects of climate change on agriculture and forestry are impacting on opportunities to grow crops, especially in many vulnerable developing countries. This is already clear, with more frequent periods of drought and a risk of further increasing hunger. If the food systems change with all three dimensions of sustainability as their benchmark, this may instead help to bring about a trend that is positive for the climate, the environment, health and economic development.

Applying a systems-oriented approach is an important place to start, and this document has set out some of the components that are additional keys to change: using the infrastructure that states and the public sector can offer to drive development in the right direction; helping and listening to consumers; making space for research and innovation and allowing it to form the basis of decision-making; and being bold enough to invest in new business models that make a positive contribution to sustainable development. Several of the examples we have outlined here show that collaboration between actors and across sectoral boundaries is central and brings about results. The challenges are huge and there are many pitfalls but carrying on as usual is not an option. The decision by the UN Secretary-General to host a summit on food systems in 2021 has attracted a great deal of interest and engagement, showing that the question of food systems is relevant globally and nationally and at political level, for the industry and for individuals. Without rapid action, neither the Sustainable Development Goals nor the climate targets will be achieved.



The Swedish FAO Committee was formed in 1950, the same year that Sweden became a member of FAO. The task of the Committee is to assist the Government in its work for food security for all, while taking account of global development and the preservation of biodiversity in the areas of agriculture, forestry and fisheries. It is also to spread knowledge about and raise interest in the work of FAO in Sweden. The Committee consists of 12 members and its chair.

Swedish FAO Committee
www.svenskafaokommitten.se