Government report on food policy

Food2030

Finland feeds us and the world

Contents

Glossary

The glossary words are printed in *italics* when they appear in the body text for the first time.

Value chain: In a value chain, a raw material is processed into a product, which is transported to the end user. The value chain is composed of organisations or companies in the supply chain, each one of which brings some added value to the products.

Big data: Big data is a collective name for large and disorganised data masses. Information technology has made it possible to collect, store and analyse large data masses, which in earlier times was very expensive or even impossible. Data is generated from different sources, and it accumulates and may change very quickly. Data may also have been collected without an exact plan for its use.

Bioeconomy: Bioeconomy refers to an economy that relies on renewable natural resources to produce food, energy, products and services. The bioeconomy aims to reduce reliance on fossil-based natural resources. The most important renewable natural resources in Finland are forests, (green economy) soil, fields, (yellow economy) waterways and marine biomass i.e. organic matter as well as fresh water (blue economy).

Biosecurity: Biosecurity means striving to prevent biological hazards that threaten the environment and human health. These hazards include the unintentional spreading of hazardous chemicals and organisms in the environment and premeditated bioterrorism.

Fossil economy: The fossil economy is based on the use of fossil-based raw materials. Concerns relevant to the fossil economy include the availability of fossil raw materials, such as oil, and the consequences of their use for the climate. One of the advantages of fossil fuels is that they are easy to transport and store.

GMO, genetically modified food: GMO means genetically modified organisms. Transgenesis technology enables people to transfer combination genes they have created into plants, animals or bacteria and thus change their genome. When GMOs are used as raw materials in food, we speak of genetically modified food. The production of genetically modified foods is regulated, and their trade is supervised. By law, food packaging must contain information about genetically modified raw materials.

GE, genome editing: In genome editing, the organism's own genome is altered by making small changes to it which does not introduce the genome of an alien species or another individual.

Security of supply: An activity which is intended to protect the critical production, services and infrastructure that are essential to secure a population’s income, the economic life of a country and a country’s defence from the dangers of serious disturbance and exceptional circumstances.

IPM, integrated pest management: Integrated pest management promotes sustainable plant protection through versatile combinations of different control techniques. Rather than carried out routinely, plant protection measures are always based on a need detected by observing pests.

Resilience: Resilience describes the ability of a society and individual to maintain their functional capacity in changing conditions as well as their preparedness for disturbance and crises and their ability to recover from them.

Food system: The food system is the complete system of food production and consumption which consists not only of the actors in the food chain, but also the private and public sector bodies and institutions that in one way or another participate in the operations of the system. The food system is a conceptual tool which helps describe the total structure, its parts and operations with all the various links and interactions between them.

Food citizenship: a situation in which citizens are aware of the overall quality of food; not just in respect of health and safety, but also the quality factors related to the food production and consumption system (right to food, food ethics, fairness, environmental impact and culture).

Food sense: Food sense is seen for example in values and attitudes as well as in ways of relating to food in an appropriately appreciative manner. Food sense includes good manners, social skills, respect for food and responsible choices as well as an understanding of the complex significance of food in our society. Food sense is seen in the sensible use of food and being economical with it and minimising waste.

Sapere method: In food education relying on the Sapere method, a child gets acquainted with food using different senses. The method encourages children to familiarise themselves with different foods and aims to encourage a positive and natural relationship with food and eating. The method supports the evolution of a diverse food culture.

Protein self-sufficiency: Protein self-sufficiency measures how much of the protein needed in Finland is of domestic origin.

Corporate social responsibility in the food chain: Corporate social responsibility in the food chain has seven dimensions, which are localisation, the environment, animal welfare, well-being at work, nutrition, economic responsibility and product safety.

Aquaculture: Aquaculture is the rearing of fish, bivalves and other shellfish as well as water plants such as seaweed.

Zoonosis: Zoonoses are infectious diseases that can be transmitted from animals to humans and vice versa. They may be transmitted either directly or indirectly through food, water or insects. The causes of zoonoses include different bacteria, viruses, protozoans and parasites.

Generation Z: Generation Z refers to people born after the mid-1990s who routinely and naturally utilise modern technology.

Vision

The best food in the world

In 2030, Finnish consumers eat tasty, healthy and safe Finnish food that has been produced sustainably and ethically. Consumers have the ability and possibility to make informed choices.

A transparent, highly skilled, flexible, internationally competitive and profitable food system that responds to demand. The growth and advancement of the sector are supported by well-coordinated, high-level research, development, innovation and teaching. There is a high level of marketing and communication skills in the sector. Finland is a significant exporter of high quality and safe foodstuffs and food sector skills.

1 Introduction

Food policy creates the preconditions for the competitiveness and diversity of primary production, food safety, security of supply, and the operation of the food industry in Finland. It also helps to promote welfare in society, reinforces regional and local vitality, and encourages food sector companies to reinvent themselves and to develop their operations. Food policy aims at the responsible and sustainable production and consumption of food, as well as a food system that generates financial and social well-being. A common food policy supports the development of food citizenship.

This food policy report is part of Finnish national food policy, and it sets out the policy objectives and key priorities of the activities far into the future. The government, parliament and all the actors in the food system must be committed to the objectives of the common food policy in order for them to be achieved.

The food policy report reviews the changes that have occurred in our operating environment as well as those that are forecast. The most important global challenges are ensuring the sufficiency of food, water and energy production while using limited natural resources sustainably, as well as the impact on the global food system of climate change and the attempts to combat it. The principles of resource efficiency and the circular economy will shape future production and consumption. A global increase in consumer demand for food and changes in consumption behaviour will create major challenges, but also opportunities, for food system actors.

In years to come, increasing economic inequality of citizens and ageing of the population as well as urbanisation will continue in Finland and other parts of the world. The changes in the geopolitical environment will have a powerful impact on global market prices, and on thinking on food and security policy. In addition, globalisation will commit Finland to being part of international markets to a greater extent than heretofore. Technological development and digitalisation will create opportunities which should be exploited.

Key challenges facing the food system are associated with securing the profitability and productivity of primary production and diversifying it, environmental sustainability, the development of the circular economy, improving the competitiveness of the food industry, the coverage of distribution channels, developing exports and maintaining a high level of food safety. Challenges related to food consumption include lifestyle diseases and the role of promoting a healthy diet in their prevention and treatment.

Finland needs an independent and successful food system in order to guarantee food security for its citizens in all circumstances. This is a core question of civil peace and security policy and one of the priority tasks of a responsible government.

The objective of the food policy report is:

- to increase the appreciation of food
- to strengthen Finland’s country brand through high quality food and food tourism
- to ensure consumer-focussed, responsible food production and distribution
- to improve the competence, profitability, productivity, sustainability and competitiveness of the food system based on domestic resources
- to play its part in achieving climate and environmental targets
- to develop and support the food sector so that Finnish food is attractive to consumers in Finland and abroad
- to strengthen the role of government as an enabler of the functioning of the food system
- to promote the availability and production of food that is tasty, safe, highly nourishing and reasonably priced
- to increase collaboration among actors in the food sector.

1.1 The report as a process

The report was prepared in collaboration with stakeholders, involving an extensive group of participants. Preparation of the report was launched in January 2016 at a large kick-off meeting that brought together over 200 people to discuss future food policy. With the help of communication consultants Cocomms, the Ministry of Agriculture and Forestry organised five workshops, which were attended by over 100 experts in total. The workshops addressed the profitability and competitiveness of the food system, food security and security of supply, the position of primary production, and innovations and a culture of experimentation.

The Ministry of Agriculture and Forestry also opened an online mailbox which could be used to send feedback and ideas to the team preparing the report. The Ministry prepared a summary and analysis of food policy outlines in other countries. While the framework of the report was prepared by the Ministry, expert contributions were also requested from parties outside central government.

The report was circulated for public comment from 9 September to 28 October, 2016. Over 60 statements were received on the report, which have been taken into consideration in the final version.

The report is divided into seven sections. Each of them lists the most important measures which are needed in order to achieve the targets. After being considered by parliament in the spring of 2017, an implementation plan will be prepared which will enable the achievement of the report's objectives to be monitored and evaluated.

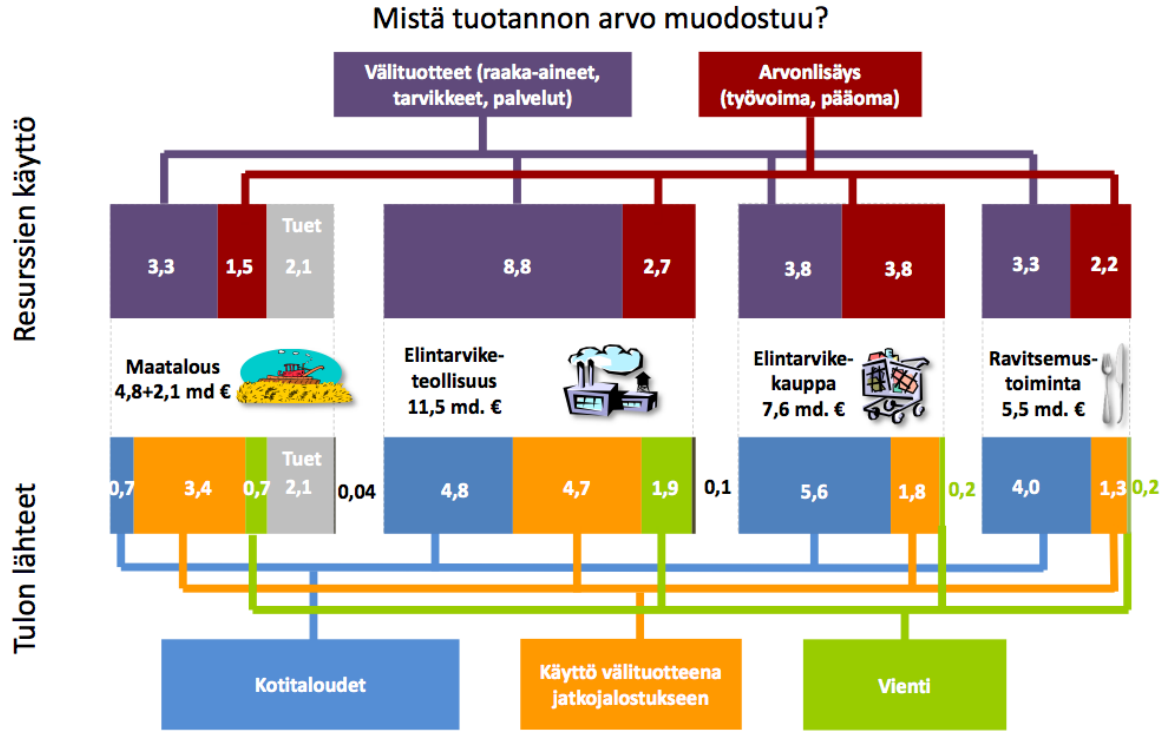
The new food policy report replaces the following documents:

- Huomisen ruoka - esitys kansalliseksi ruokastrategiaksi (Tomorrow's Food – National Food Strategy Proposal 2010)
- Government report on food policy (2010)
- Ruokaketjun toimenpideohjelma (Food Chain Action Plan 2011)
- Government report on food safety (2013)

The report's measures will be implemented within the public finances frame decisions and the government's budget limits on appropriations and person work years. The report will be monitored as part of the government's key project monitoring. The implementation plan for the measures will be prepared after parliament has issued its statement.

The report does not replace the government's organic and local food programmes which remain as independent documents. The objectives of the local and organic food programmes will be refined during 2018.

Elintarvikealan rahavirrat



Lähde: Tilastokeskuksen aineiston pohjalta Luken laskelmat, Marja Knuuttila. Huom. Elintarvikekaupan tuotannon arvo on välitysmarginaali, joka sisältää tavaroiden välityskustannukset (ei sis. kauppatavaroita). Elintarviketoimialojen tuotanto on tuotteita jalostukseen, kotitalouksille ja vientiin. Investointitavaroina niitä käytetään vain vähän, maatalous 40 milj. euroa (esim. kotieläimet) ja elintarviketeollisuus 0,1 mrd. euroa.

2 Primary production

Sustainable, ethical and competitive primary production of a high quality is the foundation of the Finnish food system. Skilled and motivated farmers who apply the latest research-based knowledge and technologies in their work are the backbone of profitable primary production. Farmers, now and in the future, will use safe and high-quality production inputs in line with the principles of sustainable development, use resources efficiently, look after animal welfare, recycle nutrients, utilise the possibilities of generating renewable energy, and openly seek new opportunities for cooperation and business. The factors will underpin the building of competitive and profitable Finnish agricultural production which in this report also includes horticultural production.

Finland's clean soil, air and plentiful water resources constitute a good base for food production as well as for utilising our rich natural resources. Because of the northern location, fewer plant pests are found than elsewhere and so pesticides are not needed as much in primary production. The fertilisers used in Finland are of good quality and among the safest in Europe. The situation with regard to animal diseases is extremely good and the use of antimicrobial drugs in livestock farming is low compared to elsewhere in Europe. Crop yields are low in northern conditions, but the application of research, teaching, advice and technology in particular will enable crop yields to be increased. There is a need to increase them significantly in the future. Active, domestic plant breeding will play a central role in this. Northern fields are well-suited for grass production which is the cornerstone of Finnish animal husbandry. Food production that is adapted to northern conditions, strong technological skills in northern conditions, as well as Finland's plentiful water resources, enable the sustainable production of food production that requires a lot of water and lays the foundation for new business opportunities.

The Finnish countryside also provides a variety of food: game, fish and natural products, such as berries, mushrooms and herbs. Wild products are nutritionally valuable. "Everyman"s right" is a globally exceptional, valuable heritage which enables forest mushrooms and berries to be utilised alongside a multitude of opportunities for fishing and hunting.

2.1 Local agricultural enterprises build regional economies

Farming and the food companies continue to have a major impact on our national economy, and in some regions, they create significant numbers of jobs and added value. Using food policy instruments to develop food production, processing and distribution channels is vital in order to maintain the relative proportion of Finnish food in the total available market at as high a level as possible so as to keep as high a share as possible of the economic benefits generated by the food system in Finland. In addition to highly processed products, less processed basic ones should also be produced in Finland for the domestic market. Diversification of food distribution channels may increase local and regional opportunities for finding employment and earning a living, which will in turn promote economic development.

In the future too, food will mainly be produced in agricultural areas, but as technology and the operating environment develop it will also be produced nearer the consumer than previously in urban suburbs and in cities. This will change the traditional understanding of food production. The application of new technology and experiments as well as specialisation in new cultivation approaches on a smaller scale than today, will also create export opportunities related to these skills. Diverse food production will also shape logistics solutions.

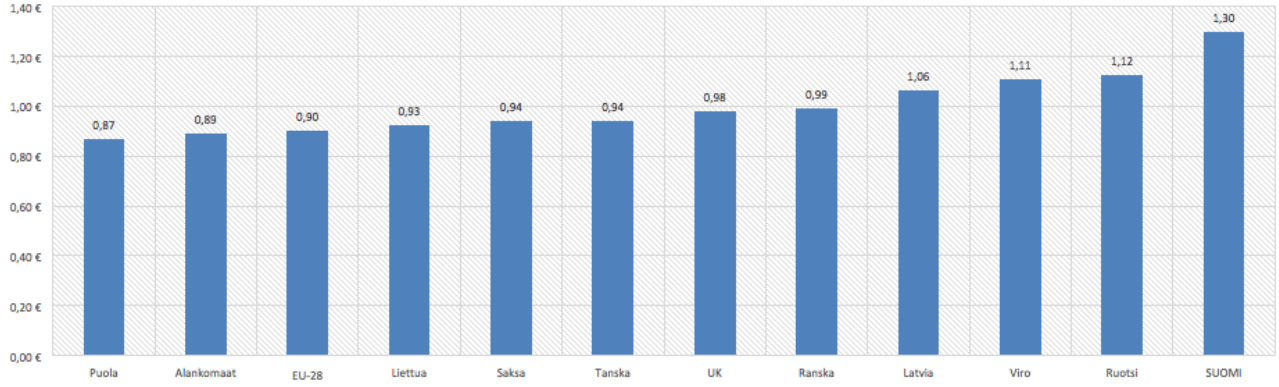
The existence of farms, fishing industry primary production and food processing companies also creates preconditions for the development of industrial sectors that serve food production, including machinery, instrument and electronics industries, and for using their potential in exports. The food system is also linked with business that exploits the side streams of farms, fishing industry primary production and food sector companies.

2.2 Agricultural policy enables primary production

The European Union's CAP instruments maintain, and will develop further, diverse agricultural production, reasonable income levels for farmers and the availability of moderately priced food for consumers. Different types of subsidies and market control instruments continue to form the core of the European agricultural policy. In order to achieve the CAP objectives, farming is subsidised in all EU Member States, both from common EU funding and from national budgets. Without support schemes the volume of agricultural production across the EU would be significantly lower than today, and very centralised in regional terms. Agricultural support also indirectly subsidises consumers.

"WHEN AN AGRICULTURAL PRODUCER RECEIVES ONE EURO FROM THE MARKET, HOW MUCH DOES THE PRODUCTION OF FOOD ON THE FARM COST?"

(EU countries average and northern Europe's member states)



Source: EU Farm Accountancy Data Network (FADN)

The EU's Common Agricultural Policy also provides the framework for the support system for Finnish agriculture. In Finland the share of payments to farmers that are made under the Rural Development Programme and co-funded by the EU, including environment and natural constraint payments and animal welfare payments, is higher than average in the support scheme as a whole. Finland additionally pays farmers national aid that complements EU support.

The northern conditions in Finland differ from the natural conditions in other EU Member States, and the production costs in agriculture are high. A policy of strong support for basic farming is thus required in order to maintain agricultural production in the country. Rather than solely consisting of passive maintenance support, however, aid should be targeted at active production and its development. However, more accurate targeting of the support instruments and emphasis on active production will unavoidably require administrative work and normative steering. At the same time, the conditions must also be established for situations where, for example, cultivation of grass and other methods would reduce the nutrition loading and promote protection of the environment and the climate.

Safeguarding profitable and sustainable primary production is a basic requirement for the entire food system. EU policies have a strong impact on the profitability and future of Finnish farming. Finland must ensure that farming will also be possible in areas of the EU where the climate conditions are not the most favourable for farming. Due to our northern location, smaller farm sizes than in many of our competitor countries and other special characteristics of Finnish agriculture, particularly those resulting from natural conditions, the production costs of agricultural products in Finland are significantly above the EU average. Income from the sales of agricultural products only covers part of the production costs. For instance, the average farm-level production costs of one litre of milk are almost twice the price paid to the producer.

The current CAP programming period will continue until the end of 2020. The complexity of the support scheme and the need to simplify it have emerged strongly in both European and Finnish debate. The detailed rules and control procedures place an administrative burden on the farmers and the government that needs to be reduced. At the same time, the instruments and necessary exceptions of the Common Agricultural Policy need to be found which take the special features of Finnish production conditions into account and safeguard and develop production. In this context, it is vital to find a balanced scheme for Finland that is adequately targeted and efficient in maintaining production while also administratively as clear-cut and simple as possible. Consistency between the different policy sectors such as the EU's environmental, climate and agricultural policies is also a requirement for balanced and clear policy. The actual negotiations on CAP post-2020 will be initiated in 2017. The future policy and its funding mechanism will still have an impact on the Finnish food system in 2030, even if the markets play an increasing role in what will happen to farming and forestry incomes, profitability and production.

Support schemes that are as streamlined and simple as possible cannot simultaneously be carefully defined and individually targeted steering instruments. Throughout its membership of the EU, Finland has benefited broadly from the opportunities for targeted and production-linked support to secure the basic profitability of production, for example in cattle farming. In the future it will be more important to evaluate whether a given support instrument should be used automatically or whether it might generate too heavy an administrative burden in relation to its impact. On the other hand, animal welfare payments have enabled the well-being of animals on farms to be improved.

Legislation aiming for climate change mitigation and adaptation is evolving both in the EU and at the international level, increasingly shaping the Common Agricultural Policy. In the spring of 2016, the Commission issued legislative proposals for achieving emissions reductions targets by 2030. The proposals also include agriculture. It is clear that there will be a growing need for more efficient and effective climate and environment measures. Adapting to climate change will require structured policy which, for example, will ensure the development of new plant varieties and develop new approaches to water management. In addition, it must be ensured that the facilities are in place to destroy or combat new plant diseases and pests that spread naturally or through trade in plants, and also develop financial risk management mechanisms. In Finland too, the pressure to eradicate the plant diseases and pests that have already been found will increase with climate change and that will place new demands on plant protection methods.

The EU is currently negotiating bilateral free trade agreements with several different countries and country groupings. In the future, free trade will increase competition in EU markets. Free trade agreements will also have an impact on the future Common Agricultural Policy. According to the research published by the European Commission in November 2016, free trade agreements would open up export markets to European producers of milk and pork among others. On the other hand, increased competition from imports would particularly be felt by producers of beef and sugar.

The Common Agricultural Policy may help to ameliorate the impacts of production and market risks and stabilise the operating environment. The payback time of agricultural investments is long, and balancing measures will thus be necessary. It is likely that risk management will be a more elemental part of the CAP in the future.

Structural development in farming has been fast since Finland's accession, and it is expected to continue along the same lines. The number of livestock farms will reduce at the same time as their size is forecast to continue to increase. Prerequisites for improving the competitiveness of the Finnish farming and food sector include both continued structural development along current lines, which makes use of new technologies, along with specialisation and versatile development of farms. Improving productivity is one critical factor in promoting agricultural competitiveness. Long-term support policy and investment support are required to achieve controlled structural change.

2.3 Growth from natural water resources

Finland's extensive aquatic environment as well as high level of competence provide good opportunities for the sustainable utilisation of natural water resources. Our lakes and rivers cover an area of more than 33,000 km², while maritime areas total more than 52,000 km². The total yield of Finland's groundwater areas amounts to 5.4 million cubic metres a day. Only 0.71 million m3 a day is utilised. The extensive water resources mean that not only is good quality household water available, but it is also available for water-intensive food production and processing. The surface area of irrigated land and the amount of irrigation could also be increased without endangering water resources and investments in drainage systems benefit from the efficiency of recycling water and nutrients. Important business areas are, for example, water expertise and technology, the fisheries' *value chain*, water services and aquatic tourism.

Fish has an important role in Finnish food policy. Fish is an important part of Finnish food policy, and the demand for fish increasing faster than that of other foods. The revenue generated by the fisheries sector has almost doubled over the past ten years. The profits of fish processing and trade in fish in particular have grown significantly in recent years. Fish is a healthy and trendy food, and the demand for it is predicted to continue. This will create preconditions for the development and expansion of the fishing industry value chain.

With catches amounting to some 150 million kilos, Finland was the largest fishing nation of the Baltic Sea in 2015. The catches of freshwater fish amount to approximately 5 million kilos a year. Leisure fishermen also catch nearly 30 million kilos of fish annually. The greatest opportunities in fishing are related to developing the use of the catches and increasing their value, for example by means of environmental certificates or brands and by developing new products of a high added value, especially based on pelagic fish which are Baltic herring, Baltic sprat and vendace. The supply of fish caught on the coasts and in freshwater areas may shrink in the future as the number of fishermen declines.

Sustainable *aquaculture production* and the related expertise and technologies have significant growth potential both in the domestic and the overseas markets. Sustainable aquaculture could also become an important sector in Finland that would create preconditions for new enterprises and jobs as well as increasing our self-sufficiency in fish, thus improving Finland's trade balance.

The Finnish fish market is largely based on foreign-farmed fish, especially salmonids. In 2015, over 80 per cent of the fish eaten in Finland was imported. The value of imports exceeds EUR 400 million a year. The export volumes of Finnish fish products are small, and the Finnish trade balance thus shows a deficit of over EUR 350 million when it comes to fish products.

The steady supply of imported fish has enabled a rapid growth of the fish processing industry and fish trade as well as the processing of competitive fish products in Finland. This has also supported the operation of value chains based on domestic fish and the market entry of Finnish products. Finland's geographical location close to Norway will also create a strategic competitive advantage in the future for developing the exports of the Finnish fish processing industry.

By expanding the production of domestic farmed fish and increasing the degree of processing of the Finnish fish catches, we could rapidly reduce our dependence on imports. Increasing the exports of products with a high degree of processing that are based on imported raw materials would also improve the Finnish trade balance in terms of fish products.

2.4 Future primary production will respond to changes in needs and operating environment

The future of primary production will be shaped by the trends referred to in the introduction, including urbanisation, digitalisation and climate change. The food system is global, and many of its actors are large international corporations. Primary production also has an important role in the transition from the fossil economy towards the bio- and circular economy. In addition to food and feeds, primary production also turns out other products and services. The level of professionalism

in primary production is increasing further, which will encourage integration between different actors in the production chain and structures based on contract production. Internationalisation will increase in the production chain.

Primary production should be capable of responding to many different challenges. Extreme weather phenomena caused by climate change, such as increased amounts of rain, floods and drought, pose challenges for primary production and affect harvest volumes. The risks associated with the occurrence of animal diseases and plant pests that threaten production will increase and could result in the use of increased amounts of plant protection products and drugs in animals in primary production and thus result in a significant challenge for food safety and the profitability of production. In addition, not all the risks of recycled fertilisers are sufficiently well recognised.

Global markets and increases in travel by people also increase the risks of animal and plant diseases spreading to Finland from areas where the disease situation is worse than in Finland or where the species of plant pests is different from those in Finland. It is not clear what all the dispersal routes are for new plant pests. The aim will be to manage risks through international collaboration and by joint development of international standards and observing them carefully. The greatest risks relate to live animals, plants and products derived from them which, either deliberately or through ignorance or carelessness, have been brought into the country against import regulations or the requirements of the internal market. On the other hand, there is some degree of risk associated with imports that do meet legislative requirements or internal market trading, as the animals and seedlings could be symptom-free at the time of import and wooden packaging material used in the transport of foodstuffs and ingredients could disperse difficult tree pests throughout Finland.

In order to manage the risks, farmers need more business thinking and risk awareness, new cultivation techniques, water economy management and upskilling. The markets for agricultural products are worldwide and a degradation of conditions in today's good production regions will also have an impact on Finland's agricultural markets. Climate change will thus also increase agricultural risks in Finland indirectly. Entrepreneurs can prepare for production risks by diversifying their production, for example, or by outsourcing certain work or production phases. Diversity of production, as much self-sufficiency as possible in farms' energy, nutrient and animal feed, management of flood and drought risk, ensuring water management in exceptional conditions too, as well as cooperation between farms will help in being prepared for market risks. Primary production's responsibility for its own risk and quality management will be highlighted.

The global population is growing, and considerably larger quantities of food will thus need to be produced. On the other hand, more and more stringent goals for the sustainability of food production are being set both by the European Union and in international treaties. For example, greenhouse gas emissions from the entire food system must be reduced significantly to mitigate climate change.

The production and consumption of organic food are increasing rapidly. Organic production is a profitable option for some farmers, and for consumers it is important to know how their food has been produced. A limited number of production inputs, a need to recycle nutrients, and improvement in animal welfare as well as the desire to protect the environment will steer some agricultural production towards organic production methods.

Genetically modified foods may also enter the Finnish market over time. Presumably however, that would only happen when there is a clear benefit offered to the consumer, such as improved quality of nutrition, sustainability of trade and product safety. Genetically modified feeds are already in widespread use both in Finland and elsewhere in Europe. However, an animal fed on feed of this type does not produce genetically modified foods.

Genetically modified foods are more probably going to be genome edited (GE) raw materials. It is important to continually distinguish between these definitions and methods. Genetic editing corrects the organism's own genome using small changes without introducing the genome of an alien species. Consumers would probably accept this kind of editing in future more easily than genetic modification.

The digitalisation and robotisation of farming will bring plenty of opportunities for both farms and the administration. By means of digitalisation, such aspects as better quality management of the crops, targeted fertilisation as well as controlled drainage and irrigation, traceability and supervision can be developed. It is vital to ensure that digital machines, equipment, data and systems are interoperable and that the actors are able to use them. The high costs of replacing machines and buildings and farm profitability are challenges to the deployment of new systems.

Digitalisation allows farmers to develop new kinds of networking among themselves and join value networks with other players both in Finland and internationally. Digitalisation will also increase the number of new kinds of business models that exploit the virtual environment. Solutions to these challenges facing primary production could be provided by new and more efficient, accurate and safe methods. New measurement methods enable automatic monitoring of animals. The use of sensors and modelling enables animals' health and welfare to be monitored as well as optimising feeding and conditions in buildings. Automatic measurement data can also be used in processing livestock. When it comes to new plant and animal breeding techniques, for example, European legislation is not clear in all parts, which slows down the utilisation of such applications. There may also be extensive international markets for innovations in plant, insect and fish protein production.

From the perspective of increasing protein self-sufficiency, the crucial factor is the price of Finnish protein in proportion to the cultivation costs and the price of imported protein. One way of improving protein self-sufficiency would be improving the crop yields of grassland and arable fields by using these areas for cultivating peas and broad beans. The return of Finnish slaughterhouse waste to the food system would also support self-sufficiency targets. It will be possible in the near future once new diagnostic methods for identifying different kinds of protein have been approved.

In addition to boosting the production of domestic plant protein, including peas and broad beans, using more fruit and vegetables would also be squarely in line with the objectives related to increasing the consumption of healthy and environmentally friendly plant products. From the perspective of vegetable producers, the operating environment and consumer needs are diversifying. The current operating and product concepts will not necessarily be sufficient in the new situation, and such measures as increased cooperation in the production chain and consumer participation in the planning of the production chain and products could be needed.

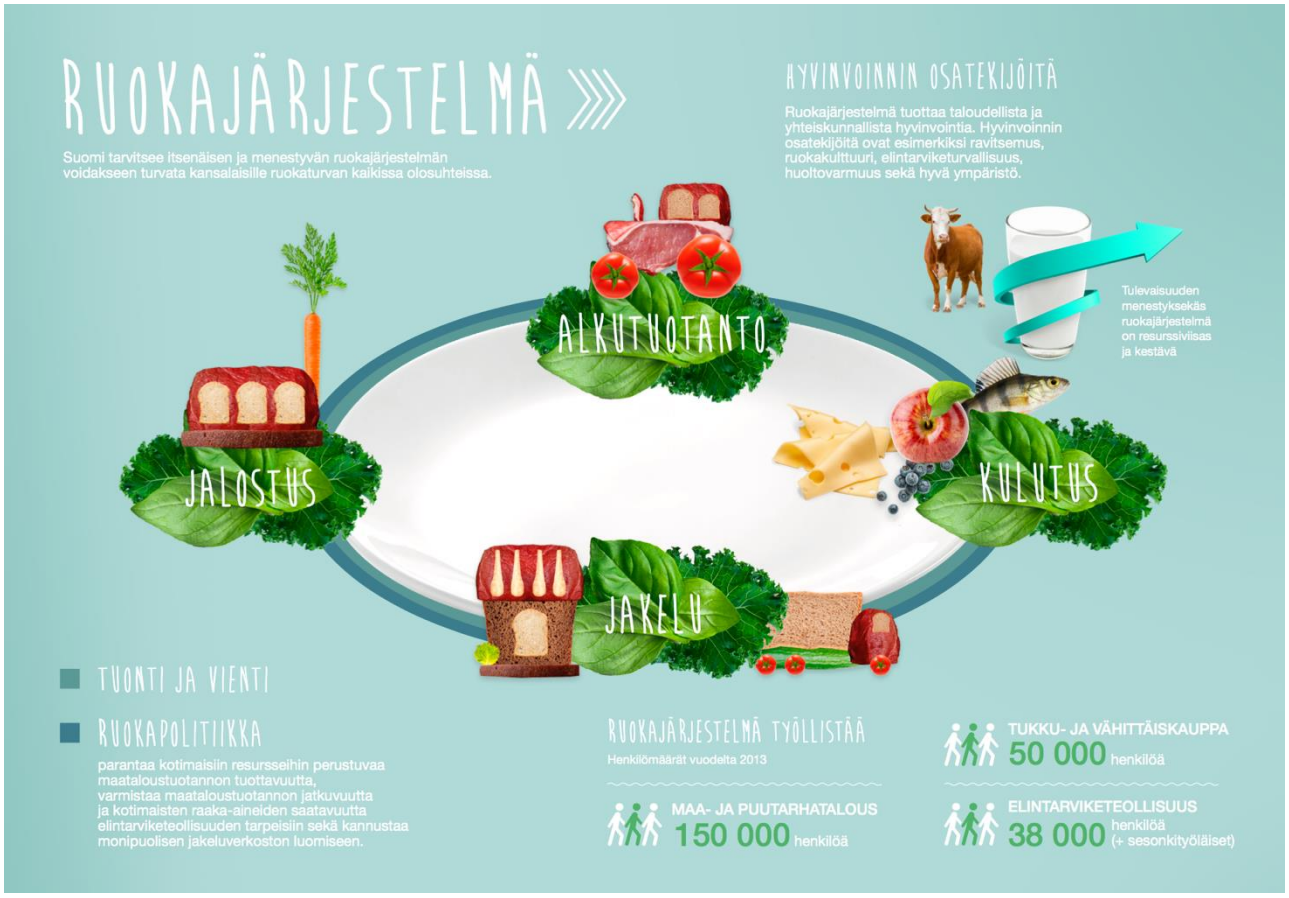
2.5 What should we do?

- Exert influence on different EU institutions and other Member States to ensure that CAP post-2020 will continue to take into consideration Finland's special characteristics in the targeting of production, different support schemes and funding. Member states must be able to adapt the support system as flexibly as possible to their own conditions. Safeguard support payments that level out differences caused by natural constraints between regions and the flexibility of support schemes as indicated by circumstances.
- In planning the support system, the objectives of sustainable food production and changes in consumer demand must be taken into consideration.
- The long-term care of fields will be improved by promoting such things as the addition of soil carbon, nutrient recycling and water economy management.
- When developing support schemes, also take into account the impacts of different support instruments and conditions on the price of arable land as well as the administrative burden caused by the support system.
- Encourage producers to engage in new forms of cooperation with the aim of improving productivity and resource efficiency, creating closer cooperation between producers and consumers, and thus developing the market.
- Increase the production of domestic food and protein feed by means of research and plant breeding and by developing support schemes.

- Make strong investments in increasing the volume of sustainably produced crops and promote a significant improvement in average yields of arable plants by good soil management, the development of drainage and irrigation systems, suitable crop rotation and exploitation of the latest production technology.
- On the basis of research data, define how structural development of agriculture and agricultural production can guarantee that rural areas do well and that consumers receive sustainably and responsibly produced, safe and varied foods.
- The environmental compensation system must be made simpler and clearer so that it is an efficient system that is appropriate for farmers.
- Prevent and combat animal diseases and plant pests as well as improving animal welfare so that the basic conditions for plant and livestock production can be ensured, and plant and animal derived products still meet export requirements.
- Actively participate in international cooperation regarding animal and plant health such as organising the international year of plant health 2020, and improving international standards and EU regulations.
- Ensuring the uninterrupted production of high quality household water as well as the water required in primary production and food processing by improving risk management throughout the water production chain.
- Safeguard the operating conditions for the fishing industry by ensuring sustainable use and management of fish resources, creating a competitive operating environment for the fishing industry value chain, and by investing in developing new high added value products and the renewal of the sector.
- Ensure that domestic fish as a healthy and safe product finds its way into the consumer's shopping basket.
- Collect natural products more efficiently and expand the collection areas of organic products. By means of information activities, attract more interest in picking natural products for household use, encourage the creation of picking networks, and promote streamlined and responsible procedures in commercial picking.

3 Routes for food from field to table become more diversified

Consumer behaviour shapes the functioning of the whole food system. On the other hand, the consumer's choices depend on what is offered by food sector companies and shops. With changes in the operating environment and trends, food consumption behaviour changes too and the consumer segments will fragment in the future to become even smaller. Changes in eating habits and meal times and individualisation of diets can already be seen today. Our country is becoming more multicultural, and on the other hand, internationality is used as a source of inspiration for tweaking familiar foods. Some consumers are only interested in the lowest price, but more and more people will consciously choose ethical, responsible and health-promoting foods, not forgetting taste.



Awareness of links between health and food has grown, and diets are being tailored in greater detail. Whereas the origins of food are blurred by global food systems, consumers are increasingly interested in where their food comes from. Product labelling is an important channel for communicating information about the nutritional content and origin of the food. On the other hand, consumers want food that creates experiences. One way of delivering these experiences is narrating the journey of the food to the consumer as a story.

Technological advancement, including digitalisation, the Internet of Things, augmented reality, brain-computer interfaces and systems that use algorithms and big data will change our consumption and purchasing behaviours. They will enable more individualised food selection, tailored diets and the use of different smart technologies, for example smart food service lines or cutlery, or foods that the consumer can print at home at mealtimes. As health and environmental awareness are highlighted in our diet, we will need more protein sources that provide alternatives

to meat. New foods and new raw materials will be part of the future consumer's menu. The circular economy and sharing economy will have their part to play in the food system.

Trends will also trigger opposing reactions. As a counterbalance to globalisation, localisation and, along with it, local foods and their own distribution channels, will increase in popularity. People will want food to be easy and the food companies will respond through their product development. On the other hand, some consumers will be prepared to take a more active role in the food system: various producer-consumer-collaboration models such as community-supported agriculture will increase in popularity as will urban cultivation. The amount of tailored production will increase in line with consumers' values and some consumers will start to be producers. Civic activism, or the so-called fourth sector, will influence our entire society and challenge its current structures and production modes. Fostering traditions will emerge as an opposing force to technological advancement.

Acquiring new information, promoting information sharing, and using existing information resources better will be vital. Reliable market information would serve both product development and policy choices. While all these factors will challenge our entire food system, they will also create opportunities for companies that can rapidly innovate and productise new ideas to keep up with consumer preferences.

3.1 Importance of collaboration in food sector companies

The food industry is an important employer in Finland. It is the biggest manufacturer of consumer goods in the country, and measured by the value of its production, the fourth largest industrial sector after the metal and chemical industry and forestry. The gross value of its production was EUR 13.3 billion in 2013, and the added value was EUR 2.7 billion.

In Finland, the food industry is characterised as being bipolar. Most of the companies in the sector are small and medium-sized food companies (SME). This number includes farms that engage in processing activities. Their significance to the local economy and employment as well as to business structure is considerable. There also are a few large food sector companies in the country; however, these are small on the European scale. In food manufacturing, three quarters of the turnover is created by establishments that employ more than 50 people. Large companies produce the large volumes in their sector. As companies get larger the product range also expands, but the sector's small and medium-sized companies bring resilience, especially in exceptional situations. Jobs in the sector are created by SMEs in particular.

The common challenge faced by processing companies is the growing imports of finished products and the limited availability of domestic raw materials. The Finnish food sector competes with international imported products in domestic markets every day. Access to competitive domestic raw materials of a high quality will be a matter of life and death, not only for the Finnish food industry, but also the entire society.

Global changes, and the challenges and opportunities associated with them, will accentuate the need to utilise, productise and commercialise expertise and innovations. Company sizes will grow, and average investments will also be greater than today. Large companies often have more development resources at their disposal than SMEs. The role of networking and cooperation will be increasingly important.

Food exports could help to increase production volumes, achieve lower unit costs, and improve price competitiveness. It is important that the companies and organisation that provide export support services cooperate for example when trying to penetrate new export markets. This way, a small country like Finland will have a better chance of being successful in international competition, in particular with highly processed, greater added value products. New growth cannot be created without inputs in the operating conditions of the food industry and investment possibilities of the processing industry.

3.2 Food is purchased through multiple channels

The role of the retail shop at the consumer interface is to make food available to the consumer efficiently and provide the customer with a selection that matches their wishes. The Finnish grocery trade is exceptionally centralised. The remote location and small customer base of the country have little attraction for international retail chains. This has put the retail sector in a strong negotiating position throughout the food chain when it comes to food prices and selections. However, in recent years the competitive situation for retail shops has changed as new players have entered the sector.

Food system players both in Finland and at the EU level are trying to find solutions that will enable value added to be divided evenly. Consumers will also be interested in knowing how the prices they pay are divided between the different parts of the system. The future of food purchasing will be in the hands of all the actors. It will be influenced by consumers as individuals and in groups as well as by companies, NGOs and even various communities.

Digitalisation and management by information have led to increasing selections in retail outlets. This has also created new opportunities for cooperation with small and medium suppliers. The main distribution channel for local and organic food is the retail trade. This does not exclude a diversity of distribution channels and ways of networking.

The way the food distribution chain works is influenced by the current economic situation. It is also affected by the pressures of global competition and consumer expectations. However, our every-day practices of purchasing or obtaining food and the structure of food consumption are only changing slowly. Grocery stores, both large hypermarkets and smaller shops, will continue to be the main outlet for purchasing food. Food distribution channels will diversify, however, following the changing needs of consumers. An ageing population will increase the need for new food service concepts.

The changes in the structure of the operating environment will produce major challenges in sparsely populated areas. Although the largest shops will be able to compete efficiently and respond to customers' expectations for a varied product range, the local shop will try to respond to changes in the population structure by developing ancillary services in various areas: in cities, other conurbations and in sparsely populated areas. The number of small village shops has significantly reduced in recent years. Their importance cannot be measured just in terms of sales volumes; their significance is also based on preserving the habitability of areas as well as organisation a comprehensive service offer. For example, the postal service has 850 full service post offices, of which over 80 per cent are part of retail shops. A village shop for example could also be a café or it could provide an ordering service for Alko, the state alcohol retail monopoly.

While buying food online is a trendy subject in the media, for a large number of Finnish people it is still foreign. The share of online food purchases is a few tenths of a percent of the Finnish grocery trade. The underdeveloped online trade of food in Finland, and also elsewhere in Europe, gives foreign actors the advantage, and many special products are already being bought online, including nutrition supplements and protein powders. However, with digitalisation, the importance of online shopping will increase in the future and enable small batches too to have access to the markets. On the other hand, the growth of online shops puts pressure on supervision and challenges the buyer to understand the quality of the products they buy.

Generation Z, which is adept at using technology, will pick up food from fully automatic collection points, and different home delivery services will be more common. In addition to food, consumers will buy entire service concepts. Digitalisation improves traceability and widens the selection of information offered to consumers. On the other hand, consumers who prefer local foods produced nearby will buy food through parallel marketing systems: directly from farms and fishermen, or from markets, specialist shops, food circles or shops they set up themselves.

A significant proportion of food reaches the consumer via professional kitchens. There are over 14,000 professional kitchens in our country, of which a quarter are in the public sector. Altogether,

almost 900 million portions are eaten in them every year, of which the public sector kitchens account for almost 45 per cent with a total value of about 350 million Euros. The sector employs about 68,000 people. Professional kitchens are very important in promoting healthy and sustainable food choices, creating experiences for their customers and spreading food trends. Professional kitchens can also affect the impact of the food chain on the climate and environment considerably by regulating the amount of energy, water and chemicals used and reducing food waste as well as the amount of wastewater and other wastes.

The sales or restaurant food are increasing significantly which says a lot about changes in young people's eating behaviour in particular. For tourists, restaurants act as a showcase for Finland and food served to tourists is part of food exports and the creation of the country's image.

3.3. What should we do?

- Initiate measures to promote the change, growth and cooperation of the food sector that will improve the operating conditions and competitiveness of companies and create preconditions for the exports of Finnish high added value foods. These kinds of measures could, for example, be approaches that are part-funded through the EU's rural programme and structural funds and national projects.
- Direct food sector resources not only to physical investments but increasingly also to research, development and innovation, including different operating modes, technology skills, digitalisation, product development, commercial testing, export skills and export market investigations as well as risk assessment (as part of investigative activity).
- Develop regional and local food systems and diverse distribution channels.
- Ensure that the authorities have sufficient resources to oversee online shopping and other distance sales and for the development of oversight measures. Clarify the legislation on official and supervisory responsibility for distance sales, and improve entrepreneurs' and consumers' online shopping competence particularly with respect to legislation.
- Create new operating models to combat food fraud in collaboration with the police, customs, prosecution service, tax administration and the food authorities.
- Reinforce active and well-timed official communications which take account of the needs of target groups and provide a risk-based service.
- Encourage food sector companies of different sizes and retailers to carry out joint market and consumer surveys in order to obtain more market and customer insights.
- Ensure that food advertising is responsible and complies with the set guidelines.
- Encourage the diversification of the structure of trade by expanding the operating possibilities of SMEs.
- Examine the opportunities and tools to safeguard the operation of village shops.
- Remove duplication in oversight of operations by utilising the opportunities provided by digitalisation such as cloud architecture. Supervision information collected by one reliable party can be disseminated to other parties that need it.

4 Research, advice and training

All food system actors should have an opportunity to receive training and advice and access to the latest research and development results that can be applied in practice in the sector. The most challenging aspect is ensuring that sufficient information is available and that the information resources are utilised.

More needs to be invested in research and innovation as well as in productising and commercialising innovation, especially in processing companies so that we would produce more refined products with higher value added for the domestic market and for export. Innovation activities should be needs driven. A key part of innovation activities is that both companies and funding providers take risks, and that through new operating methods, the risk is also shared with the consumers.

4.1 Food system employees require more diverse competence

A food system skills needs analysis indicates that in the future, more diverse competence will be required of those employed in the food system, including production, business, marketing and entrepreneurial skills, knowledge of various consumer groups, competence in occupational and product safety, IT, language and interaction skills as well as legal knowledge.

The most important skills in the future may well be those related to marketing, corporate social responsibility, process and safety, which will be guarantees of ethical and transparent food production. The skills related to responsibility and safety include paying more attention to versatile risk management, good nutrition and environmental questions, understanding species-specific animal behaviour and the importance of welfare, a high standard of professional ethics and competence in traceability, not forgetting traceability technologies. Competence related to strategic information and networking will be highlighted. Its key areas will be information management, collection and analysis of continuously mounting information masses, network building and management, and marketing.

The food system must improve its technology skills. Understanding digitalisation and an ability to exploit its possibilities will be a natural part of success in the future. Examples of technological solutions that are getting more common are digital applications, utilisation of virtual technologies, advancement of automation, robotics, printed electronics and unmanned devices. Competence in the circular economy will help to identify the ecological framework of the food system and translate it into a competitive advantage. As environmental awareness increases, resource and energy efficiency will be stressed. Material efficiency will bring cost savings, some of which may be significant.

Competence in needs-driven product development will be more and more important. It requires insight into customer needs, research-based information, networking, knowledge of different cultures, an ability to tailor products and services, and marketing skills.

4.2 Training and advice can improve competence

A basic requisite for developing the food system is creating a foundation for food sense for the entire population, starting from early childhood education and comprehensive school, and high quality of vocational education and training from secondary education up to Master’s level and doctoral training. Developing the education system will lay the foundation for an innovative and successful food system. The situation is made difficult by cuts in education which weakens competence. Without strong competence related to raw materials and technologies, it is impossible to create new, highly processed products with a high added value.

The food sector must be made more attractive, as currently adequate numbers of university level students do not always show interest in it, and skilled labour cannot be attracted even though the

employment situation is good. A particular cause for concern is cutbacks in research and education in food technology. It is very important that the food sector has skilled people with research training. Business training related to the processing of raw materials should be a fixed part of training related to primary production, and training in marketing, on the other hand, should be integrated into food sector training. Advisory and risk management operations should be based on research data and scientific risk evaluation.

Companies are increasingly required to have capabilities for overall management of their operations, planning, financial administration and anticipation of different actions, risk management, implementation and monitoring of impacts. In this area, up-to-date, networked training and advice of a high standard are needed. The advice should cover a wide field, which sets a challenge to the competence and continuing training of the advisers.

In the offer and targeting of training and advice, the different strategies of companies, the life cycle stages of companies, and the time span of management should be taken into account. Different advice and tools are needed for planning the growth and investments of a company than for the daily monitoring of results. As the farm size and output grow, additional labour often needs to be recruited or activities need to be outsourced or carried out in cooperation with other actors. This also increases the need for advice. In particular, calculations need to be produced to gauge labour force needs as well as the profitability of an investment and its inherent risks. Calculations are required regarding the availability and sufficiency of resources (for example relief workers and other additional labour) in special situations too. For example, complementary sources of income on farms, including production of local specialities or tourism and well-being services, and the possible incorporation of operations, will require new skills.

Advice will also promote sustainable production methods such as organic production and animal health care. The cleanness, quality and traceability of products will be improved by developing systematic quality work. Advice will also promote the health and welfare of productive animals as well as biosecurity, the appropriate use of plant protection products, management of the risks of plant pests and plant protection and competence using integrated pest management (IPM) methods. The climate impacts of production and the need to adapt to climate change must play a bigger part in training and advice provided for farmers.

Exports are a precondition for the success of the Finnish food system, but a high standard of education and advice is needed to promote exports. A company aiming for the specialist product market must also master issues related to distribution channels and marketing on a broad front. Familiarity with the destination country and legal issues are also highlighted in the export market. Each target market has its own licensing requirements and processes, and SMEs frequently do not have the resources to investigate these. The majority of the export requirements are challenges that a company, regardless of its size, cannot tackle, and the involvement of Finnish authorities is needed. Companies are not always admitted to negotiations and meetings organised to discuss export requirements, as the process is often seen as an issue of official cooperation.

Training and advice should also offer competence and tools for company management, helping to ensure corporate social responsibility and customer orientation. Competence will also be needed to support the development and maintenance of raw material processing and various production processes. The competence of micro enterprises and SMEs that supports their market entry should be improved. Consumers are also required to have competence in an ever more complex food environment, and this requires new operating approaches and resources for consumer advice.

4.3 Research and development cooperation open up new opportunities

While Finnish research relevant to the food system is of a high standard in many ways, in places it still remains too fragmented. More multidisciplinary networking across the boundaries of different branches of science is needed in Finland. In addition, internationalisation of the research sector needs to be improved and financial instruments for international research should be utilised.

Food is in a key role not only in bioeconomy but also in culture, social interaction and health. More international research and product development cooperation between different branches of science could open up opportunities of a completely new type. Global changes and trends may also create opportunities. There is an increasing demand for nutritionally modified foods, such as products containing less salt, saturated fat or sugar, and for special foods, including lactose and gluten free products. We already have a lot of excellent competence and product development potential in this sector. Wheat, soy and antibiotic free products are also growing new food trends around which product brands could be built. There is a lot or product development potential in Finland's wild berries and cereals. Demand for them is also growing at the moment. The small carbon or water footprint of products could also be an important factor. Finnish products can be differentiated from their competitors also by the sustainable use of water resources in their production.

There are versatile possibilities for modifying the energy content and other composition of food. This development is guided by the latest research, technological development and unanticipated trend-based consumer demand. Scenario development as part of food sector research is an essential tool for anticipation.

At the moment, most food sector companies are not making sufficient investments in research and product development. SMEs, in particular, do not necessarily have the resources or skilled staff required to utilise research results in their business. Further upskilling will be needed in the food sector players, as this will create better opportunities for innovation, also in SMEs. Cooperation with other actors and sectors should be developed. Small enterprises in particular should be helped to take advantage of the research and development activities of such actors as universities, research institutes and other companies through partnership and networking models. Food hygiene and joint training provision in the food sector should be developed.

The impacts of climate change on production and product safety should be monitored. This will require long-term research. In addition to possible disease and toxin risks, an increase in the carbon dioxide content may reduce the nutritional value of products. In the circular economy, the accumulation of harmful substances bound to nutrients and the transfer of human and animal pathogens to end products in the chain should be monitored.

4.4 How should research be targeted?

It is important to open up and analyse existing research material and data resources for general use. This opening up also includes authorities' and institutes' internal and shared data resources and projects. The collected information will only promote the interests of society if utilised better than today. For example, there is scope for improved efficiency in the use of public research data. The advancement of digitalisation is providing new possibilities for this. It is essential to ensure sufficient resources so that existing data resources can be updated so that the information they contain is reliable and in such a form that it will be able to be used later as technology advances. The national Fineli database, for example, is an important tool for both monitoring nutrition in the population and examining the reliability of product labelling. It should also be possible to exploit different existing systems and the product registers and sales and consumption statistics of the retail trade more extensively, also for research and monitoring purposes.

A national strategic research agenda for food research, "Sustainable and profitable production and consumer welfare lay the foundations for the success of the Finnish food chain", was created in Finland in the early 2010s. A broad group of researchers, food company representatives and officials were involved in drawing it up. The strategy is still comprehensive and topical, but it ought to be updated.

Strong research in raw materials and technologies is an essential requirement for developing new products. It is essentially related to insights into consumer needs and behaviour. The Finnish food industry uses mainly domestic raw materials which is why it is important to direct sufficient resources to research into versatile primary production and its investments in production.

We have solid nutrition and health related knowledge concerning working age people, while less information is available about children, young people, immigrants and older people. Too little is known about the needs and circumstances of these groups, and there is no knowledge about the effectiveness of different measures targeting them. The consumer insights of the food companies and trade may be utilised through a dialogue between the public and the private sector and more open information exchanges.

Securing the safety of the food system requires continuous, long-term research and risk management based on this research. The impacts of chemical substances, and especially their interactions, on public health need to be researched in the near future. The aim of research in nutritional risks, on the other hand, is to promote and maintain human health through diet. Food safety and nutrition research promote public health and reduce medical expenses from the perspective of the national economy and the individual. Research should be targeted at comprehensive risk assessment and management that has a sharper focus on cost-effectiveness.

Research needs related to primary production, on the other hand, include breeding species that are suitable for Finnish conditions, increasing crop yields (for example grasses and plant proteins), utilising traditional varieties and wild plants as well as improving cultivation techniques and the agricultural condition of land and the correct use of recycled fertiliser preparations. Preparedness for climate change and changes in the operating environment also require research into the cultivation of new plant species and research into plant protection, especially biological methods, and promoting their adoption. For livestock production, research into the competitive production and sustainability is important and should be focusses, for example on reducing the environmental impact, increasing resource efficiency as well as improving the quality and wholesomeness of animal derived products. Care must also be taken to ensure that sufficient research into animal health and welfare and risk analysis continues to feature in the Finnish production environment. In addition, new kinds of production opportunities (such as new sources of protein, gluten-free products) should be investigated, and these may also have export potential. The opportunities offered by digitalisation and the impacts of steering instruments in the entire food system are other important areas of research.

4.5 What should we do?

- Secure and develop high quality and multi-disciplinary basic and continuing education for the food sector.
- Ensure adequate public and private sector funding for research and development, and coordination between funding providers to enable multidisciplinary, long-term and effective projects. Promote the internationalisation of research and education.
- Carry out communications regarding the bioeconomy as part of dissemination of information about the Finnish food system, research and risk management.
- Respond to the diverse skills needs by offering training for all levels of the food system that is of a high standard and up to date in order to improve sustainability, security of production and productivity as well as the processing degree of foods.
- As part of the bioeconomy strategy, create a common administration for the food research strategy and link it to the existing Strategic Agenda for Food Research, which will be updated as necessary.
- Add impact research on the risk management methods (including cost-benefit analyses) used in livestock and plant production for the food system as well as in managing the risks related to food safety and nutrition.
- Ensure sufficient monitoring, research and risk assessment of animal diseases, plant pests and soil nutrients in the Finnish production environment taking into account new production methods too.
- Prepare a financial calculation in the context of food policy showing the way forward, or illustrating the impacts of our food policy on the national economy, the current account,

employment and health care costs and, among other things, the significance of food policy and farming for the viability of rural areas.

- Prepare an overall risk assessment of the food system risks that are the most significant for the national economy (microbiological, chemical, nutritional and production related production and environmental risks), with possible indications of how resources should be targeted to combat them.
- Utilise and provide access to existing information resources better and more efficiently.
- Promote research and product development into utilising side streams from food production as part of the bioeconomy as well as, for example, in cosmetics products.
- Promote research which would help in using health claims in foods.
- Provide skilled and broad-based advice at a reasonable price for companies and farmers. Provide sufficient resources for consumer advice as well.
- Promote the participation of all branches of administration in the food policy to enhance its societal impacts.

5 Food culture and appreciation of food

Food is a key part of our culture and daily life. Rather than being just nutrition, a product or health impact, food is also associated with specific social and cultural meanings and values that guide our food choices. The rich Finnish food culture is based on regional differences in the raw materials and traditions, utilisation of products from nature as well as seasonal produce. The food culture also comprises all the knowledge and expertise in the food system, the production and processing methods, and the utilisation of these methods to promote the profitability and safety of the system.

Food culture is vital for building national and regional identities. The every-day choices of consumers and consumer communities are continually changing the food culture. It is further shaped by the available raw materials and local conditions for food production, political steering, internationalisation, marketing, food education, the media and trends. Our food culture, product ranges and production methods are also diversified by immigration. Tourists' conception of Finland as a food country are formed from the customer's food experience and the quality of service.

Appreciation of food is part of the food culture and defines our consumer behaviour. Appreciation of food and familiarity with foods are established at an early stage. We should actively communicate about food issues at home and at school. The path of food education that fosters appreciation of food and those who produce it, responsible choices and good manners starts with models and behaviour we learn as children. Eating together, preparing food and awareness of the food culture and of food available in nature, as well as the origin of our food and the routes it follows increase interest in, and the appreciation of, food. Reducing or completely avoiding food waste is also associated with appreciating food. Food waste should be reduced across the entire food system. A participative food system involves everyone in food production and thus increased awareness and appreciate of food production and the environment. An active food citizen is aware of the different dimensions of food quality. For example, participating in a local food association creates meaning and well-being.

Along with the changes in our food culture, our drink culture is also diversifying although liquid dairy products are still an important part of it. Wine and various waters are found on our dining tables, and spirits are giving way to weaker alcoholic drinks and also to non-alcoholic drinks. Cafés and tea rooms are increasing in popularity. Farm wine production is becoming well established, and appreciation of local values and the local food trend have made small breweries and small distilleries popular, thus also bringing added value to tourism and to exports.

There is also demand and good opportunities to increase exports of water-based products as well as to increase appreciation of domestic waters. Substantially more packaged water is imported to Finland than we export. On the other hand, in Finland the amount of water used annually is only a very small proportion of all the water resources available to us. Skills related to water purification are at a high level in Finland which is why Finnish mains water is of better quality that domestic or imported bottled water. The appreciation of domestic mains water should be increased.

5.1 Appreciation and health start from food education

Food education utilises cooperation based on research and good practices and involves a large number of actors in the public, private and third sectors. Food education is an important part of a child's upbringing at various ages. Its goal is to promote food sense that supports responsible food choices.

Food education has a more prominent position in the new core curricula for pre-primary and basic education. School meals should be developed comprehensively. Food education and culture should be a natural part of the local curriculum in multidisciplinary learning modules of different subjects and the school culture.

The methods of food education should be developed, drawing on research-based information. The nutrition recommendations issued by the National Nutritional Council will be used as a foundation

for this as well as in recommendations for school meals. Good practices in food education, such as the Sapere method, chef's schools, food schools and food quizzes, will be spread to schools, day-care centres and leisure activities. The various food sector competitions such as cooking competitions have an important role in increasing the appreciation of food factors and in food responsibility. Competence and cross-administrative cooperation in food education should be promoted.

Multichannel communication that utilises the possibilities of new media can be used to increase consumer awareness of Finnish food, food culture and food education. Digital solutions that guide food behaviour are also evolving. For example, digital solutions can be used to promote health and responsible consumption in different contexts and areas of life. On the other hand, food education can be understood as a life-long system of information and skills that influence our entire lives.

5.2 What should we do?

- Promote food education more prominently by including food and nutrition perspectives, as well as sustainable development perspectives in preschool education, different subjects taught in comprehensive school and general and vocational upper secondary education, and teacher education as well as in teaching practice.
- Encourage all children and young people to participate in school meals that promote equality in health and ensure the continuation of subsidised school meals.
- Introduce an "everyone is an educator" model in schools, in which the entire school staff participates in delivering food education.
- Use various means of communication and participatory methods in delivering food education to children and young people, including food ambassador activities.
- Encourage families and the third sector to take part in providing food education.
- Cooperate with the media to spread positive images associated with the Finnish food culture.
- Support consumer skills by means of different campaigns that increase food and purchasing awareness.
- Reduce waste in the food chain by increasing appreciation of food and improving measurement and the monitoring of the amount of food wasted in the food chain.
- Raise the level of appreciation of domestic household water by branding and through campaigns aimed at restaurants.
- Promote food citizenship, for example through urban cultivation, local public kitchens, food circle activities and community supported agriculture and fishing as well as through partner farms for schools as well as by going deeper into food policy with different partners.

6 Food and public health

Food plays a key role in promoting human health and well-being. As well as the quality of nutrition, from the perspective of health the microbiological and chemical safety of food is also important as is sufficient and safe drinking water. The significance of clean domestic water will increase further as its global availability declines.

Eating in accordance with nutritional recommendations promotes health. Promoting health is less expensive than treating illness. Treatment costs of lifestyle diseases amount to over two billion Euros a year in Finland. Obesity is one of the most significant public health problems as it increases the risk of developing many illnesses. Obesity results from taking in too much energy in relation to energy use and is linked to early physical activity. Key Finnish problems are a low consumption of vegetables, fish and brown cereals as well as an excessive intake of salt and saturated fat. Children and young people consume more sugar that recommended in food and especially in drinks. Nutritional challenges associated with the ageing of the population and allergies will also be more numerous in the future.

While individuals should personally bear the primary responsibility for their health and well-being, the lifestyles and choices of individuals are also affected by stimuli from their living environment and opportunities offered or lack of them. Small children, for instance, are totally dependent on choices made by adults. Nor is it always possible for older people to make personal choices. Making healthy food choices should be easy, regardless of which consumer group you belong to. Consumers should have both the ability and the possibility to make informed choices. Food choices and the safety and health impacts of the supply are influenced by the entire operation of the food chain, and nutrition and health issues should thus always be taken into account when making decisions on food policy. Healthy food choices as well as industry's product development towards healthier food could, for example be encouraged through health-based taxation. This work could take advantage of the nutrition profiles drawn up for different food groups, such as the WHO's nutrition profile model or the criteria established for the Heart mark.

According to nutrition recommendations, people should reduce the amount of meat products and red meat they eat. The recommendation to eat low fat, white meat, in practice poultry, instead of fatty meat promotes healthy food choices. From the perspective of health and the environment, it would be good if we ate less meat in future and ate other sources of protein as well such as domestic fish, broad beans, peas and other legumes as well as cereals, seeds and mushrooms.

Food services play a major role in promoting healthy nutrition in Finland, as one Finn out of three uses food services on a daily basis. Public food services and other professional kitchens guide the nutrition and consumer behaviour of Finnish people. Schools also promote food appreciation through home economics, health awareness and through pupils participating in school meals. It must be possible to guarantee healthy, safe, sustainable and tasty food for as many people as possible. The availability of nutritionally high-quality mass catering and various food services for different population groups should be further improved and diversified.

6.1 Food safety has a direct impact on health

The food system actors and authorities in Finland have engaged in successful long-term cooperation to improve food safety. Food safety means protecting human health from hazards caused by microbes as well as from chemical substances and physical factors. Food safety also means providing consumers with accurate and adequate information on foodstuffs and ensuring that they are not misled. Taking care of food safety is an advantage for companies. Compared to many other countries, foodstuffs produced in Finland contain very few microbes that cause food poisoning or residues of antibiotics or chemical substances. However, the safety of all foodstuffs in the market must be guaranteed.

In Finland, water that meets the quality requirements for domestic water can naturally be used directly in the food industry. The food industry in Finland uses about 16 million cubic metres of

water a year. As well as being used in food industry processes, water is also used as an ingredient. On the other hand, either natural phenomena or the actions of people can cause disruption to water supplies. With regarding to disruptions, it is critically important food companies are prepared for them and that communications between the water treatment companies and the food companies works well. There are a few water epidemics in Finland each year. The number of people that fall ill is most often very low as the epidemics most commonly affect small water treatment plants. Most epidemics are caused by microbes polluting ground water.

Food safety has direct impacts on human health. Food safety problems can directly cause food poisoning and allergic reactions, chronic secondary complications such as rheumatic joint inflammations or even long-term illnesses such as cancer. These cases have an impact on public health and the national economy, as they result in mortality, increased health care costs, hospital days and absences from work. Compliance with food safety requirements is also a condition for exporting food from Finland.

Traceability of foods (including raw materials) used in the food system improves food safety and the reliability of information provided for consumers. It must be possible to trace the implements that come into contact with a food product in all phases of production, marketing and the food chain. In addition to the actual manufacturers, the traceability of materials and implements applies to importers and marketers all the way to the retailing phase, and similarly to the food industry chain that uses materials and implements up to the retailing phase. Digitalisation can be used in many different ways in traceability solutions for product safety. Food packaging, the packing material and production methods are also part of a responsible food chain where recycling and environmental questions have an ever increasing importance.

The food industry is affected by changes in the operating environment such as structural change in domestic livestock production as well as in the threats posed by animal and plant diseases. Care must be taken over the cleanliness and safety of fertilisers used in agriculture, including recycled fertiliser preparations, so that any alien substances that may be in the fertilisers do not accumulate in foods.

Networks of players in the sector and the chaining of operations as well as multi-channel sales are an challenge to traceability. New modes of production and technological development could result in microbes and chemical substances occurring in foods. Marketing, differentiation between consumers and diverse needs as well as continuing urbanisation have an impact on food consumption and provision.

The production of food raw materials, manufacture and sales are becoming more international. This brings other countries' threats to food safety onto Finnish consumers' plates. Intentional food fraud is becoming more common and affecting food safety and consumer trust. The increase in online sales and other distance selling bring into the market products and actors that are difficult to supervise.

The differentiation of consumer groups and multiculturalism add to the risks to consumers, which may be caused by such factors as the use of unknown raw materials or foods, incorrect manufacturing or storage methods, or lack of correct information. Trade has to respond to consumer needs by formulating its own standards of various types. The challenge for the authorities is to communicate credibly and in good time about threats to food safety and their message must be based on scientific samples.

6.2 What should we do?

- Players in the whole food system commit to promoting the population's health and good nourishment by increasing the opportunities and skills of different groups to make food choices that promote good health. At the same time, sustainable consumption should be promoted nationally and at the EU level.
- Support decision-making by evaluating the impacts of different policies, such as the agricultural and trade policy, on nutrition and using health economics calculations.
- Investigate the possibilities of using taxation to steer citizens' consumption habits as well as product development towards foods that are better quality with respect to nourishment.
- Ensure a good level of food safety in Finland as a key advantage for our exports and see to it that the actions of the authorities support exports.
- Ensure that the organisation of authorities in Finland is able to meet supervisory challenges, and that Finland has capabilities for efficiently identifying, treating, preventing and combating plant and animal diseases, zoonoses as well as other new and known food safety threats.
- Create an effective monitoring system and indicators to describe the way the food system supports public health through chemical, microbiological and nutritional safety.
- Risk-based and customer focussed supervision by the authorities ("supervisor as trainer" operating culture) will be developed and care taken that it is consistent nationally.
- Business will be encouraged to use responsibility systems that support food safety.
- The authorities' risk communications will be developed. The third sector's advisory role will be utilised especially in management of household food safety risks as well as in recognising the individual's own role.
- Strengthen the role of the regions in promoting healthy nutrition and encourage municipalities to observe nutrition recommendations in their procurement as well as making qualified nutrition therapists' services available to the public.
- Strengthen the role of food services, improve the quality, attractiveness and availability of services; encourage all Finnish people to eat a balanced meal every day. Invest in serving tasty and healthy food to pupils in early childhood education, in schools and in universities.
- Utilise new technologies in promoting and supervising food safety.

7 Food security and security of supply

The world population is expected to rise to 8.5 billion in 2030. Guaranteeing food security and good nutrition for the growing population in a sustainable manner is thus a global challenge. Food security means that everyone receives adequate quantities of nutritious and safe food at all times. Food security includes the availability of food, the ability of people to obtain food, the usability and safety of food, and the stability of food supply. It is estimated that in 2030, the world will need 60% more food, 45% more energy and 30% more water.

Extreme weather phenomena will increase with climate change. Some of today's best arable land will become unusable. This will result in mounting pressures to clear new fields elsewhere and increase productivity and crop yields on existing arable land – however mitigating the negative environmental impacts of these activities. To achieve better productivity, improved plant species will be needed as well as more efficient processing methods to develop them. Good soil management, new technologies that save and optimise resources, and effective, sustainable plant protection techniques and fertilisation methods will also be needed. In addition, as water conditions change a prerequisite for increasing production is the management of the water economy in production areas, and that sufficient and timely availability of water is ensured. Producers will need information and resources in order to make sustainable improvements in the efficiency of production. The number of animal diseases and plant pests will increase with climate change. It is important to ensure that there are sufficient skills to identify and manage new diseases and pests.

Global trends will necessitate the deployment of new solutions for increasing the production potential of aquatic ecosystems for producing energy, nutrition or other biomass for example as well as the production of domestic water of sufficient quality. The fish catches of the world can be increased little or not at all. The significance of aquaculture in the world's food supply has increased rapidly, and it is generally considered one of the most sustainable methods with the greatest potential for producing animal protein for the rapidly growing population. In addition to aquaculture, water areas are important not only for economic activity but also for human well-being, recreation and health.

According to the UN's Food and Agriculture Organisation's, FAO, statistics, aquaculture already produces more protein for food than fishing or beef production, and aquaculture will also continue to grow strongly. The biological resources of the waters, including algae, will be exploited more diversely and efficiently. On the global level, the need for solutions in water production and waste water treatment, that save water and energy and recycle nutrients is being emphasised.

Globally and in the European Union, policies will direct food production and consumption towards a more sustainable and efficient direction. The UN's Sustainable Development Goals adopted in 2015 oblige all UN member states. One of the goals consists of ending hunger, achieving food security and promoting sustainable agriculture by 2030. In addition, many other sustainable development goals, such as the goals for health and clean water, have direct or indirect links with food security. In order to achieve these goals, the operation of the global food system will need to be reviewed.

Each state is responsible for seeing to the food security of its own citizens. The objective of Finnish food policy is to guarantee national food security and good nutrition for every resident in the country. The policy must be in line with global goals related to food security and ending poverty.

A competitive, sustainable and flexible national food system and national production will also promote global food security. The best way to guarantee food security is to maintain responsible domestic production and consumption and to utilise the possibilities offered by international trade.

Clean water and a functioning water supply are essential for people's well-being and the functioning of society, and their availability must be ensured in all conditions. Although the situation has improved, particularly in regard to the availability of clean water, worldwide there are still 800 million people without clean water and 2.4 billion people without waste water treatment. In Finland there are no problems with drought except for occasional and local situations, and water supply

services are available to everyone. However, in legislation and in the maintenance of water plants and distribution networks care must be taken to prepare for disruptive situations. The regulations related to water supply apply to sparsely populated areas too, where water supply is the responsibility of the property owners and where water supply is most often arranged through wells on each property and with waste water treatment solutions.

As part of national and global food security and security of supply, it is important also to develop urban and subsistence cultivation. Increasing urban and subsistence cultivation will also increase active food citizenship. Even a good crop of wild products, berries, mushrooms and herbs, does not require any investment in energy and fertiliser on the part of people. Collecting wild products is part of a resource-wise food system. It is also important to ensure that the tradition of gathering wild products is preserved and that getting to collection areas is easy. Leisure fishing and hunting is also part of the national food system.

7.1 Risk management as a challenge to food security

Urbanisation has made us more and more dependent on a well-functioning food system as well as on reliable water supplies. As migration to the cities increases, structural change in primary production is towards lager farm sizes and fewer producers. The distance between the producer and consumer of food is becoming greater. The food sector companies shape their product range in accordance with consumer preferences and at the same time produce food that can be transported, is available and if necessary, has a longer storage time. Logistic chains are optimised to the requirements of normal conditions. The products can be transported to the customers rapidly while still fresh.

The number and range of risks that affect the functioning of the food system are increasing. Risks associated with such things as:

- more powerful natural phenomena,
- profitability of production,
- availability of investment in production or alternatives,
- management,
- energy dependence (especially dependence on electricity),
- availability of sufficient and appropriate quality water,
- vulnerability of payment systems,
- the impact of information,
- cyber threats,
- the coping ability of primary production employees,
- livestock production,
- the threat of the spread of animal and plant diseases,
- international politics and
- markets.

The increasing digitalisation of food chains has created opportunities that can be utilised in the entire food system. The flows of physical materials and digital information will become more closely linked. Order-delivery chains will become automatic and be integrated into larger systems. However, the move to electronic data transfer and automated work processes increase the risk that production, logistics and trade will be crippled in a crisis situation. In automated livestock production the situation could quickly become critical if there are no back-up systems in place. In addition, the number and impacts of disruptions will grow, increasing the need for risk management and thus better business continuity management in the entire food system. Digitalisation will be safe when cyber security threats (including unintentional disruptions) and vulnerabilities have been identified and their importance for business continuity management in the food chain has been understood. A precondition for this is an ability to prepare for the risks with effective solutions. Farmers and other primary producers will also need more business-thinking and risk awareness. More information, skills and preparedness related to cyber security are needed.

The direct link between buying Finnish food and security of supply does not necessarily occur to a consumer. It is difficult to keep society's interests in mind when making decisions on what you will put in your fridge. We often regard food and water as obvious issues that are directly associated with our day-to-day well-being. In a crisis, significant problems in food and water availability will have direct impacts on psychological crisis tolerance, internal security, state government and the nation's defence capability. Food supply is a fundamental element that must be secured in order for Finnish people to preserve their trust in the state's ability to function.

The availability of food and water must be safeguarded also in a time of crisis. In case of serious disruptions and emergencies, consumers are dependent on the security of supply of food system actors. The continuity of production relies on the operating preconditions of companies. The entire primary production sector, selected food companies and food distributors will be supported in business continuity management. Safeguarding security of supply takes place in cooperation between the authorities and businesses, with a *security of supply organisation* serving as a link. Without viable agricultural production and food processing we cannot strive for adequate self-sufficiency in all circumstances.

Viable agricultural production and food processing are based on domestic raw materials, renewable domestic energy, the availability of plentiful supplies of water and modes of materials management associated with a circular economy. Security of supply measures safeguard the production self-sufficiency required in a crisis. The profitability of livestock production and preparedness to cope with crisis situations will also be reinforced by promoting diversity of exports in normal times and through projects that support growth and provide the possibility, if necessary, to switch production capacity from exports to securing the domestic food supply in a crisis.

Security of supply is built on securing different critical functions. As well as the availability of food, we must guarantee electricity distribution, social and healthcare services as well as water supply services, and the availability of fuel and critical raw materials and production inputs. As actors specialise, their interdependence will increase. Preparedness will not prevent all disruptions, but it can help to shorten the time it takes to get back to normal operation.

The objective of cooperation is to bring actors critical for security of supply and the authorities closer together. Finnish strengths include close networks that enable agile adaptation. This capability must, however, also be maintained under the pressure of efficiency requirements. Once we get used to digital connections, subcontracting chains and undisrupted services, we run the risk of being paralysed as a result of an unexpected major disruption. However, the retail trade, food services and a good water supply are essentials that the citizens will rely on.

In modern society, many of the practical skills, even recognising ingredients, have declined. Finnish urban dwellers especially have largely outsourced their food supply and responsibility for food security. Lunch is often eaten out, and at home there is not necessarily space to store food for a rainy day. However the preservation of home economics skills is key to coping in crisis situations. If one is used to using ready-made foods and technical devices to help in food preparation, preparing food from scratch oneself could be difficult. The need to have sufficient reserves at home is not recognised when the shops are open around the clock.

In order to cope with disruptive situations in society, it is important to reinforce households' readiness to be independent and self-sufficient. Associations have a significant role in society in supporting the independence of households. The associations disseminate information and advice and through their courses they promote people's readiness to act and their practical skills such as food and household skills.

Particularly vulnerable groups who are dependent on municipal food services include older people and those who are ill, children and poor people, and these groups will need support in a time of crisis. In the event of transport disruption, municipal meals services will need to be based a lot more on local food producers than they are at present.

Our agricultural production is currently based largely on imported production inputs, such as machinery, energy, plant protection products and feeds, and this makes our food system highly

dependent on international trade in many ways. The degree of this dependence varies in different types of production. The large fluctuation in the price of fertilisers can affect the profitability of agriculture and thus the extent to which they are used. Our degree of self-sufficiency in oleaginous plants and sugar is low, and their availability is highly dependent on imported inputs. The use of biological recycled fertilisers is recommended as phosphorus is not a renewable natural resource and the manufacture of nitrogenous fertilisers is a process that uses a lot of energy. Phosphorus is also an essential plant nutrient and the availability of phosphorus for fertilisers must be secured. The degree of self-sufficiency in milk production is greater, as cows eat grass that grows in Finland.

If necessary, the food supply chain can adapt to a more limited selection than usual and less frequent deliveries. Versatile domestic arable and livestock farming will not only serve our daily consumer habits, but also promote our ability to adapt and improve sustainability.

Natural products and other wild food are a good addition to Finland's security of supply. No seeds, nursery plants or fertilizers need to be purchased to obtain these crops, and even if the borders were closed, it would have no effect on their availability.

7.2 Resource wisdom as the foundation of food security

A successful food system of the future will be resource wise and sustainable. Food production should have as few negative impacts on the environment and the climate as possible. Food consumption should also be targeted at products that are less harmful, and products intended for food should really end up as nutrition and be eaten. In addition to production intended for the domestic market, exports and sustainable imported foods will make it possible to ensure an adequate supply of foodstuffs for consumers.

Over the long term, food production should also adapt to changing climatic conditions to ensure that the quality and quantity of production remain adequate and that the environmental impacts of production are as small as possible. It is thus important that we use the resources at our disposal carefully and resort to recycling, both in production and consumption. Food that ends up as waste undermines the food system's resource efficiency and profitability and adversely affects the trade balance. Food waste places unnecessary stress on the environment and is socially unsustainable.

Maintaining versatile domestic agricultural production and security of supply is an important part of climate change adaptation. As the climate changes, measures that promote adaptation will be needed to manage the risks and grasp the opportunities. In the future, such non-renewable production inputs of farming as fossil fuels and inorganic fertilizers will be scarcer or increasingly expensive. Climate change alters production conditions. We will need to adjust to the new conditions in many ways, even if the strength and direction of the change may be difficult to anticipate at the local level. It is likely that climate change will exacerbate the current environmental challenges of agricultural production, including impacts on water systems and changes in biodiversity.

Good soil management on arable land and nutrient recycling are key mechanisms for improving the sustainability of the food system. Biological and technical solutions exists and are being developed for agricultural production that will make production more efficient, help adaptation to climate change and restrict nutrient and greenhouse gas emissions. Research in these solutions and their utilisation should be intensified. The impacts of different measures to improve sustainability may also be conflicting. Coordinated policies will thus be important in order to achieve common goals.

The agricultural condition of arable land, nutrient recycling and making the latest research-based information available to producers should be promoted while also creating good preconditions for innovations and their deployment, diversification of production and renewal of operating methods. A high degree of self-sufficiency in primary production and the availability of domestic production

inputs must be ensured. At the same time, efforts should be made to reduce our dependence on imported inputs. Investing in research that aims for these goals is vital.

Organic production is regulated by European Union legislation and comprises supervised and sustainable food production. Its principles include the recovery and recycling of nutrients and a balance between arable farming and livestock production. As the use of synthetic chemical fertilizers and plant protection products is prohibited, organic production reduces dependence on fossil raw materials.

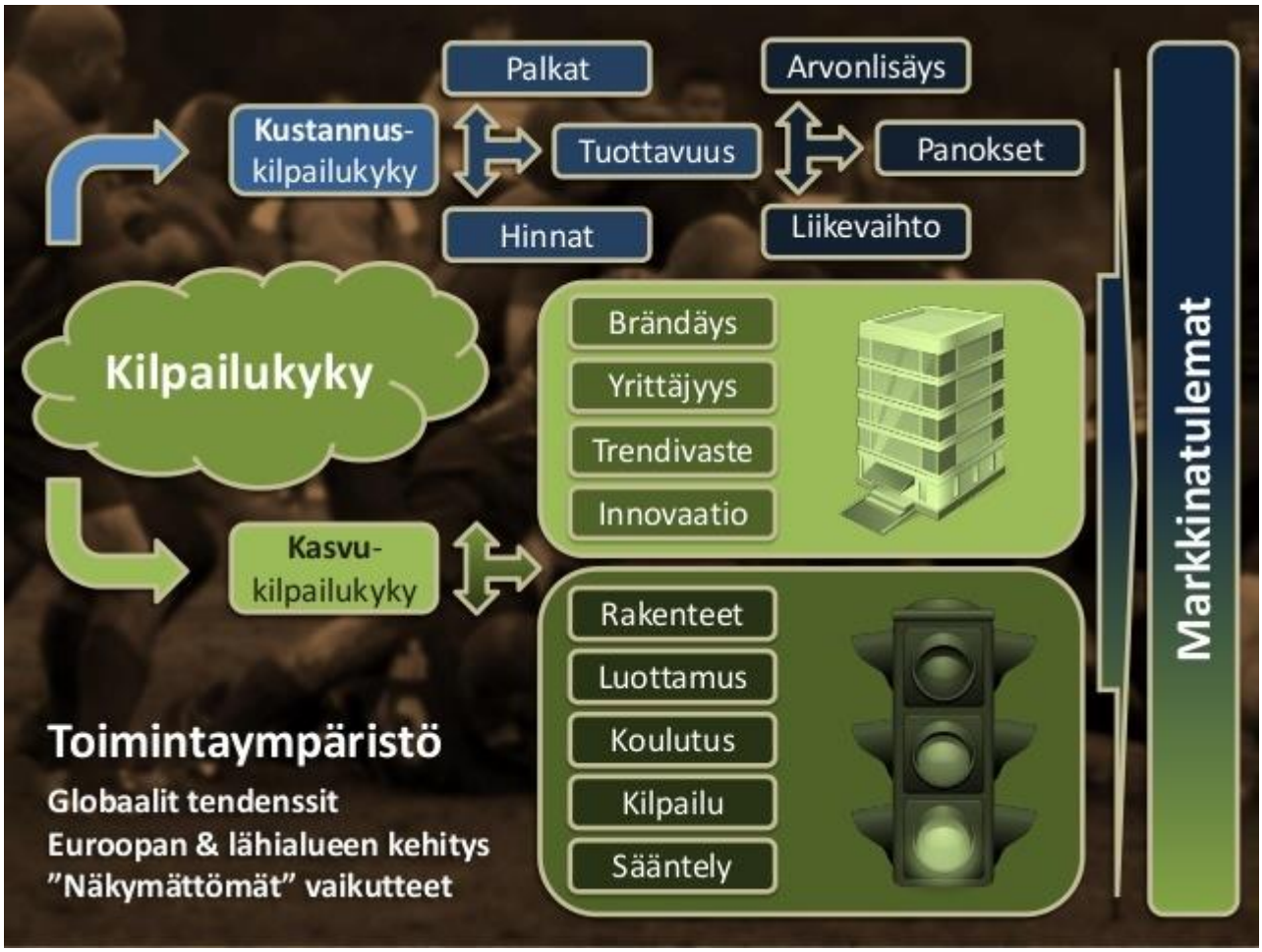
7.3 What should we do?

- In line with the objectives set by the Government, safeguard the sufficiency, quality and safety of food available for the population by means of adequate domestic agricultural production and emergency stockpiling, by developing the production system's ability to utilise renewable and recyclable production inputs, and by guaranteeing access to the necessary imported production inputs.
- Reduce dependence on fossil fuel raw materials by increasing the use of bio-energy and other renewable energies. Increase the use of bio-gas and electricity also as power sources for working machines.
- Improve the sustainable circular economy and energy and material efficiency of the food system by such means as advice, cooperation and renewal of farms and production equipment. Support new technologies that enable a sustainable circular economy.
- Boost domestic protein production, increase the efficiency and diversity of the use of domestic protein for feed, and expand the direct use of domestic plant protein as human food while providing incentives for food sector players to engage in innovative product development. Support domestic plant breeding both with respect to agriculture and horticulture.
- Increase food system players' preparedness skills and improve preparedness arrangements.
- Ensure that there are effective preventative measures to stop the spread of new plant diseases and infectious animal diseases.
- Promote preparedness for independent activity.
- Take note in the implementation of Finland's national sustainable development Agenda 2030 of the interaction between the different policy areas on food security in Finland and globally.

8 Competitiveness

The success factors of the food system can be roughly divided into three areas: competitiveness, preparedness for operating environment changes and position in the international and domestic markets. While good competitiveness is a prerequisite for coping with international competition, national and international changes in the operating environment are a challenge to the domestic food system. In order to respond to these challenges, companies need both an ability to recognise long-term trends and rapid changes in the operating environment, and capabilities for responding to them.

The fact that parts of the food system are among the economic sectors subject to the most stringent political regulation has a direct impact on competitiveness. Over the short term, costs are highlighted in competitiveness. Other factors include product prices, wages paid to employees and the productivity of companies. The ability to produce added value efficiently is one of key definitions for competitiveness in economics. Over the long term, growth as well as the ability to produce high added value products or services are essential factors. They are associated with other factors that affect competitiveness, such as education, skills, well-functioning competition and a level playing field, and productisation. Additionally, companies' ability to react to trends and, for example, utilise the digital operating environment will be essential.

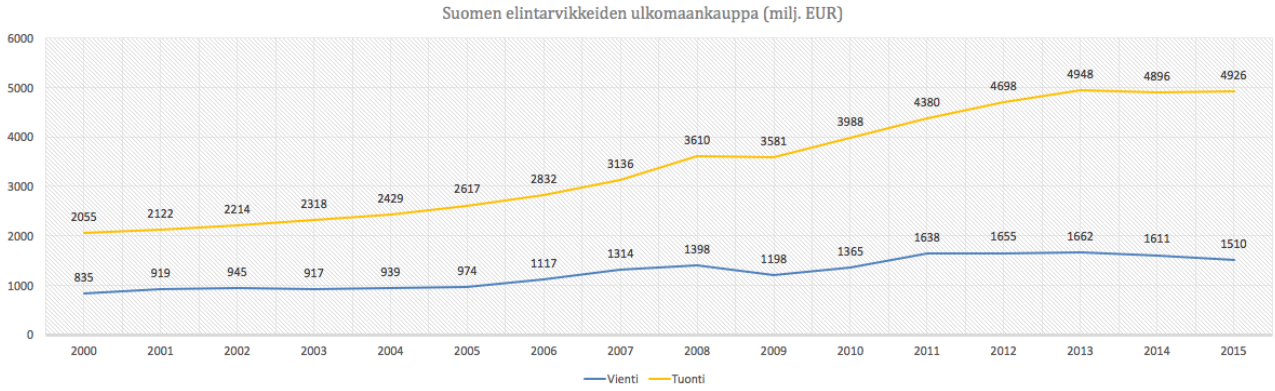


8.1 International competitiveness and exports

The preconditions for the competitiveness of the European food chain are functioning internal markets and active trade policy. Increasing value added, improving employment and the

attractiveness of the sector are critical for the maintenance and promotion of competitiveness both at the EU level and the national level.

The majority of Finnish foodstuffs are consumed in the domestic market, and only a small part of companies in this sector focus on exports. However, the food market is increasingly opening up for international competition and integrated into international value chains. Both in the domestic market and exports, a product manufactured in Finland and from Finnish raw materials competes against products manufactured elsewhere. The growth potential of Finnish companies is mainly found abroad, as the domestic market will in practice not grow any further and as imports are steadily increasing due to tough price competition and expansion of the offer.



By upholding the international competitiveness of the food sector and integrating with international markets, Finland can boost her food exports, including alcoholic drinks and products from the brewing industry, improve the competitiveness of the entire food sector, and safeguard the domestic production of primary and specialised products. Finland cannot compete on price so growth in food exports must be based on products with high value added and that have a high degree of processing. It requires solid knowledge of export markets and resources which can be used to build up local brands and presence.

It is a feature of the farming and food sector that the differences which affect international competitiveness typically lie in national regulation and support schemes for agriculture. Differences arising from natural conditions in cost levels and productivity are also in key role. EU free trade agreements will lower customs duties and reduce other obstacles to imports. Cooperation in the field of regulation will lay a foundation for more streamlined trade between the EU and its non-EU partners. International competition creates pressures to harmonise regulation.

In an increasingly international market, the significance of national regulation for competitiveness is highlighted. Stringent requirements related to food safety, the environment or the health care and welfare of production animals push up companies' costs while they also contribute to supporting high quality and responsible production methods of the products. This, in turn, reinforces the competitiveness of companies in the eyes of well-informed consumers.

European food exports have in recent years shown a positive trend, thanks to highly processed products. These include products whose names have been protected, and in Finland there are only ten such food/agricultural products and two alcoholic drinks. A Finnish food company may also become successful by increasing the degree of processing of its products and by stressing and reinforcing Finnish food production's competitive factors, such as safety, cleanness and responsibility. In addition, Finland should draw up a strategy for the protection of names.

A key factor for success in the international market is that the company has sufficient skills for export activities and an ability to take risks. The Food from Finland growth programme funded from the budget of the Ministry of Employment and the Economy, which has especially supported small and medium enterprises in launching exports and opening up new markets, has been a key central

government investment in promoting food exports. It is worth ensuring the continuation of the programme.

Growth in exports should also be sought in the SME sector, which has plenty of unused potential. While the majority of food sector actors in Finland are SMEs, these companies account for less than one fifth of exporters. The SMEs that do export their products only receive a small share of their turnover from these activities. The export opportunities of SMEs are restricted by a lack of skills and international networking. The export efforts of SME actors should be supported, and obstacles to their market entry should be eliminated.

Foodstuffs made from high-quality domestic raw materials will continue to be Finland's strength in the international market. Increasing the degree of processing, food innovations and special products that are tailored to target markets will play a key role in efforts to increase the value of our food exports. Attention should also be paid to products turned out by the food industry that, for such reasons as Finnish consumer habits, cannot be used sufficiently in the domestic market. These include offal and other parts of the carcass, which could be exported more efficiently to promote both the profitability of Finnish food production and sustainable development.

Determined efforts over the long term will be required to promote food exports and to open up new export markets. Companies are in a key role in boosting exports, but the government should offer its support, especially in markets where it is needed the most and where the assisting role of the government has significance. Opening up new market areas outside the EU, particularly for animal and plant based foods is challenging because of the arduous market entry process in many target countries. However, the basic condition for food exports is that Finnish products and production meet the requirements of EU legislation. The digitalisation of international trade could bring a lot of opportunities for export companies and for the government. The use of digitalisation, for example for electronic certification of animal and plant health, could make savings in the inspection and administrative resources associated with exports and increase the competitiveness of Finland’s food exports significantly.

Tourism in Finland, and foodstuffs that tourists buy to bring home, are an important source of income, especially in the border regions. Shopping tourism is a good way of introducing tourists to Finnish foodstuffs and food expertise, thus also laying the foundation for actual food exports. Food tourism is one of the world’s strongest growing sectors of tourism. Among all leisure tourists too, food and food related experiences have also become a considerably more important activity than earlier. The development of food tourism and and productisation that meets the criteria for internationalisation will support Finland’s country brand and attract more interest in Finnish foods while at the same time improving the competitiveness of the foods and the tourism sector.

Finnish spring water and expertise in water have significant, if at the moment underutilised, export potential. Water expertise is needed in both food production and in the production of household water. The recent national development plan for the blue bioeconomy i.e. business based on the sustainable development of natural water resources, underlines the growing global demand for water-related services, products and technology. Water expertise has become one of Finland’s key export sectors. The vision is that the blue bioeconomy will become a strong growth sector by the year 2025 and that the business activities will develop in accordance with the objectives laid out for good environmental conditions.

8.2 Responsible livestock production as a competitive advantage

In the future, the share of plant products in the Finnish diet will grow, while the consumption of animal products will decline. On the other hand, people will have better possibilities to invest in their personal well-being and food quality. Consequently, the future of domestic production lies specifically in the quality of the product, one key factor of which is production methods that take animal welfare into consideration.

Requirements that exceed the levels based on common EU legislation in farming related to animal welfare, environmental requirements and food safety will unavoidably also mean a higher level of production costs. When setting higher requirements on domestic activities than those imposed in competitor countries, we must ensure that a better price can also be obtained from higher quality than from compliance with baseline requirements.

Expertise in animal welfare and controlling animal diseases and the use of drugs are some of the strengths of Finnish production. In the future, the needs of production animals will be catered for better and better. In order to maintain and develop these strengths, both high-quality research and dissemination of information to producers, to the sector in general, to companies and, most emphatically, to consumers will be needed. In addition to public procurement, it is vital to also involve private food sector actors in favouring foods in whose production animal welfare has been taken into account.

In order to have a future, Finnish livestock production will have to market the sector's specific strengths to Finnish consumes, while on the other hand, the goals should also include exporting these high-quality products. The fact that the products are Finnish will no longer be sufficient to guarantee their quality. In the Eurobarometer report published in spring 2016, 90 per cent of Finns wanted better protection for productive livestock. The corresponding figure in 2006 was 67 per cent. The increase in Finland was the greatest of all European countries.

It will be necessary to justify the use of animals in food production better than before. Thus a quality label related to animal welfare is needed to support credible marketing of a high-quality product. The quality label should be clear, credible, sufficiently ambitious, and based on scientific research. A reliable system of certification of quality labels is needed.

In food exports, production based on a quality label will be easier to market. It would be particularly appropriate to establish whether Finland should create its own labels or whether we could use existing animal welfare quality labels that are internationally well known. Exporting quality built on animal welfare into a growing market should be one of the goals of food exportation.

Driven by consumers, the food system needs to be able to differentiate its product range while using certified tracing systems for food, all the way from raw material production and the use of production inputs. Primary responsibility for the quality and safety of foodstuffs rests with food sector actors. The aim is to have sector-specific quality systems which are certified regularly and which take into consideration traceability and those perspectives of corporate social responsibility that are the most important for each sector. These systems will be able to provide consumers with increasingly detailed information on the origin and production methods of food. Such systems are required for the needs of food exports and food safety, as well as to preserve the trust of the Finnish consumer.

8.3 Correct application of the Public Contracts Act

The value of food procurement for public food services amounts to EUR 350 every year. Customs statistics show that food imports into Finland have grown further. The trade balance of foods shows a large deficit. Including a higher proportion of domestic foods in public procurement would be an effective and easy way of participating in joint efforts to boost the national economy. In order to promote this, the government approved a decision in principle regarding public procurement of food and food services in June 2016. The related procurement guide will be completed in spring 2017 and after that implementation of the guide will begin.

The responsibility for procuring foodstuffs for public food services mainly rests with municipal management consisting of elected officials and public servants. Procuring responsibly produced Finnish foodstuffs should be set down as a goal in municipal strategies as well. The Act on Public Contracts enables bodies to establish requirements for foods and food services which will ensure the freshness of foods for example (bakery products are to be supplied to the procuring body in bakery transport boxes unpacked for example or potatoes washed and peeled) or their safe use

(for example berries can be used without being cooked). Among other things, these approaches can enable the procurement of high quality domestic foodstuffs while at the same time respecting the principle of freedom of movement of goods within the EU.

Deplorably often, the price is considered the most important factor in the planning and decision-making related to procurements. Procurement should be looked at not only from the perspective of economic indicators but also from the viewpoint of food quality, nutrition, freshness, seasonal availability, sustainable development and local foods. Open information on the origin of food also helps to make informed procurement decisions.

In addition to conventional procurement, the Government Programme seeks to promote innovative public procurement. This procurement would be carried out in a close dialogue between the customer, the producer and stakeholders, and their aims would include more efficient production or reducing the carbon footprint, life cycle environmental impacts or overall costs of the product.

8.4 Employment and well-being at work

Finnish competitiveness is based on well-functioning and productive workplaces that create new work. It is expected that jobs in the food sector will continue to be created in SMEs. VATT Institute for Economic Research predicts that while the number of food sector employees will grow until 2030, the number of employees in agriculture and fisheries will start declining after 2020. A survey carried out as part of the SME Barometer in autumn 2015 indicates that the food sector seeks growth in the areas of turnover, jobs, exports, profitability, solvency, order book and capacity utilisation rate.

The use of new technologies may push job numbers in the food sector in either direction. On the one hand, automation reduces the need for human work, but on the other, new products and services, including 3D printing of foods and individually tailored diets, will generate new types of jobs.

A farmer, for example, is faced with plenty of requirements and supervision in his or her work. Uncertainty about new regulations and support forms and their impact on the future cause frustration from time to time. It is important that these issues are publicised and dismantling the standards could partly ease the emotional burden. In addition, farmers must have access to sufficient support services including relief and occupational health care. A thriving farmer has an impact on the efficiency and profitability of the whole company, and on livestock farms it is a precondition for the animals' welfare too.

The working environments and tasks in primary production and the food sector companies present many risks of accidents and illnesses, as well as psychological stress. This is one reason for the sickness absences and occupational accident risks that affect many food industry sectors. To improve well-being at work, functional changes are needed, but in particular good leadership too.

8.5 What should we do?

- Develop programmes and training aimed at export skills as well as support services and their availability. Exploit skills developed in other sectors to develop food exports.
- Promote exports, especially of products with a high degree of processing, thus supporting domestic production and utilising the opportunities of international markets.
- Ensure that the authorities have what is required to verify that official export requirements are met and to participate in opening up markets by supplying essential official information to third countries.
- Develop digital systems that support exports and international trade.
- Promote the export of water expertise and technology.
- Improve the efficiency of international marketing related to the quality and safety of Finnish food and the strengths of the food system that have been studied and verified.
- In the area of coordinating EU and national legislation, look for flexibility that will facilitate enterprising. Pay attention to development of supervision, and strive to reduce supervision based on different legislative bases that takes up companies' time.
- Strive to reduce administrative and technical obstacles to trade in the export market.
- Promote deregulation and less stringent implementation of regulations. This will improve the competitiveness of the entire food system and secure reasonable operating conditions for companies.
- Ensure that products that enter the EU's single market meet the rules and regulations established for products on the market.
- In bilateral trade negotiations, promote the adoption of responsible production methods that correspond to those in the EU, such as methods that take animal welfare into account, in the partner countries.
- Communicate to young people about the food sector and the different jobs it provides to safeguard the sector's future in Finland.
- Reinforce procurement expertise by providing training and advice.
- Improve consumer awareness of the quality and safety of Finnish food and the strengths of the food system, for example by means of product labelling and other communication directed at consumers.
- Promote the development and adoption of certified quality systems in individual sectors. Utilise quality systems more effectively, particularly in supervision.

Summary of the most important steps forward

- The Food policy report aims to improve the overall value added produced by the food system.
- Exert influence on different EU institutions and other Member States to ensure that CAP post-2020 will continue to take into consideration Finland's special characteristics in the targeting of production, different support schemes and funding. The Member States should be allowed as much flexibility as possible in applying the support schemes to their national conditions. Safeguard support payments that level out differences caused by natural constraints between regions and the flexibility of support schemes as indicated by circumstances.
- Initiate measures to promote the change, growth and cooperation of the food sector that will improve the operating conditions and competitiveness of companies and create preconditions for the exports of high added value foods. These kinds of measures could, for example, be approaches that are part-funded through the EU's rural programme and structural funds and national projects.
- Ensure the prerequisites for food safety and profitable food production by preventing animal and plant diseases and developing risk management.
- Ensure and develop high quality and multi-disciplinary basic, further and continuing education and training related to the food sector.
- Ensure adequate public and private sector funding for research and development, and coordination between funding providers to enable multidisciplinary, long-term and effective projects. Promote the internationalisation of research and education.
- Promote food education by including food and nutrition perspectives and sustainable development thinking in preschool education, different subjects taught in comprehensive school and general and vocational upper secondary education, and teacher education more prominently as well as in the operation of educational institutions.
- Support decision-making by evaluating the impacts of different policies, such as the agricultural and trade policy, on nutrition and using health economics calculations.
- Reinforce the regions' role in promoting their inhabitants' health by investing in food service resources so that the purchase of local, organic and seasonal foods increases in accordance with nutritional recommendations.
- In line with the objectives set by the Government, safeguard the sufficiency, quality and safety of food available for the population by means of adequate domestic agricultural production and emergency stockpiling, by developing the production system to utilise renewable and recyclable production inputs, and by guaranteeing access to the necessary imported production inputs.
- Reduce dependence on fossil fuel raw materials by increasing the use of bio-energy and other renewable energies. Increase the use of bio-gas and electricity also as the power source for working machines.
- In the area of coordinating EU and national legislation, look for flexibility that will facilitate enterprise. Pay attention to development, especially in supervision, and strive to reduce supervision based on different legislative bases that takes up companies' time.
- Develop programmes and training aimed at improving export skills as well as support services and their availability. Exploit skills developed in other sectors to develop food exports.

The preconditions for the competitiveness of the European food chain are functioning internal markets and an active trade policy. Increasing value added, improving employment and the attractiveness of the sector are the critical factors to maintain and promote competitiveness at both the EU and national level.