



Finnish agri-food sector outlook 2020

Terhi Latvala, Jyrki Niemi
and Minna Väre (eds.)

Natural resources
and bioeconomy studies
89/2020

Contents

Summary	3
Operating environment in agriculture and food sector	6
General economic development	7
Food consumption and consumer prices	9
Foreign trade in foodstuffs	15
Agricultural policy	20
Agricultural and food markets	26
Cereals market	27
Meat market	36
Dairy market	44
Horticultural market	49
Structural development and economic situation of agriculture	55
Structural development in agriculture	56
Development of income and profitability in agriculture	60
Special themes	64
Functioning of the food supply chain during the coronavirus pandemic turbulence	65
African swine fever is disrupting the meat market	68
Experiences with publishing environmental policy evaluations	70
Sources	72



Summary

The coronavirus pandemic is hitting the economy hard, and the recovery is slow

The coronavirus pandemic has caused an unprecedented stagnation in the international economy. It has increased uncertainty, disrupted corporate production chains and led to drastic measures in several countries to limit the spread of the virus, while securing economic recovery after the crisis.

The Finnish economy is forecast to decline by around 4-5% in the current year. The estimate is based on the assumption that after the Q2 collapse, restrictions will gradually be lifted, public stimulus packages will help businesses deal with the acute crisis phase, and the economy will start to grow slowly in the late summer. However, there is still a great deal of uncertainty about the success of the pandemic repression. A significant economic recovery would therefore require an increase in demand in key export countries, which is not foreseeable before the next year.

Demand for basic foodstuffs is increasing at the expense of value-added products

The effects of the coronavirus pandemic on the agri-food sector can be divided into short- and long-term effects. At first, the coronavirus triggered a demand shock in the food market, which occurred as a shift in demand to grocery stores and long-life basic foodstuffs. Such products include rice, pasta, porridge flakes, crispbread and canned foods that can be stored in room temperature.

In the long term, the agri-food industry may be affected by an economic downturn or recession, which would result in layoffs, increased unemployment, loss of earnings and growing uncertainty. As a result, demand for value-added products would fall, and consumption would increasingly shift to basic foodstuffs. Consequently, less money would be entering the food supply chain, which in turn would reduce the profitability of the sector.

The impact on the food sector may remain relatively small if the crisis is over within a few months, and the economy returns to a growth path. The more strongly the coronavirus hits general economic development, the bigger the impact on the food sector.

Domestic food prices remain stable

Food security is deteriorating in the world. In addition to the coronavirus pandemic, migratory locust swarms were causing damage in countries that are critical in terms of food security. Worldwide, the effects of the coronavirus pandemic are reflected in abnormally strong price fluctuations in the coffee price, for example, due to changes in both supply and demand. Fluctuations in fruit and vegetable prices may also increase. In Finland, food prices have remained relatively stable despite the coronavirus pandemic. Food prices have been steadily increasing since January 2018.

In the retail trade statistics for the first quarter of 2020, the effects of the coronavirus pandemic are reflected in the growth in sales (in euros) of preserved, frozen and cereal products. In the case of canned fish and shellfish products and frozen fruit and berries, the increase in sales is as high as 25%. In beverages sold in the retail trade, grape wines and non-alcoholic and low-alcohol beers have also increased significantly.

There is also a significant increase of more than 15% for rice, flour, pasta and other cereal products, and preserved vegetables. In the second quarter, food sales are still increasing, but will stabilise once the restrictions due to the coronavirus pandemic start to lift.

Agri-food exports have increased at a record rate

Finland's agri-food exports achieved an all-time record in 2019. The value of agri-food exports from Finland totalled EUR 1,716 million, i.e. an increase of 13% on the previous year. In addition to the new markets, the value of exports was increased by an increase in export volumes and prices. The sanctions imposed by Russia have impeded food exports in recent years but have also led companies to focus their attention on other markets.

There is still work to be done in the promotion of exports, because agri-food imports into Finland in 2019 amounted to EUR 5,279 million. Imports increased only slightly, by around EUR 4 million. However, the growth in imports has slowed since 2013 and has nearly halted in recent years.

High export potential in special oat products

The Finnish cereals sector is self-sufficient for all cereals. With the exception of occasional milling and feed batches, the cereal processing industry relies on purely domestic raw materials. Finland's cereal stocks are high in comparison with other countries. This makes it possible in crop failure years to largely cover the demand with the previous years' stocks.

However, the high level of self-sufficiency, abundant stocks, competitive disadvantages in exports and underdeveloped export channels have resulted in a low domestic price level compared with European prices.

Finland has the highest export potential in oats. Special oat products in particular have good opportunities on the export market. Cereal consumption is shifting from wheat to healthier cereals such as oats, the consumption of which has been driven by food-related innovations, high-quality research and a diverse product range.

High demand for pork exports to China

Finland is almost self-sufficient in meat production. The production volume of pork and poultry meat has covered domestic demand in recent years, while beef production accounts for around 80% of consumption.

In early 2020, the consumption of domestic meat has increased in relation to imports due to the coronavirus restrictions imposed on the hospitality industry, the main user of imported meat. The annual volume of imports will be affected by the speed at which the situation in the hospitality industry and industrial kitchens stabilises once the coronavirus restrictions are lifted.

For the first time ever, the consumption of domestic meat shows signs of decrease. This almost exclusively concerns pork. However, pork production is driven by exports to China, which started in the autumn of 2019 and which has also continued to be stable in 2020. Domestic consumption of beef remains relatively stable, and poultry meat consumption is growing strongly.

Dairy exports are increasing

In 2015, the volume of milk production turned to a downward trend, and it continues to adjust to market demand even today. The self-sufficiency

rate of Finnish milk production, calculated according to milk protein, still significantly exceeds 100%.

Towards the end of 2019, the average producer price for milk passed the 40-cent mark for the first time since 2015. The producer price increased due to the stabilisation of the imported dairy products and an increase in the value of exports. Exports to China especially have increased.

However, the market uncertainty caused by the coronavirus is weakening the expectations of price increases. The global demand for milk will continue to be lower than production due to the pandemic and may lead to a relatively high stock accumulation. In Finland, however, the effects will probably remain moderate.

Domestic demand has remained generally stable, except for a decrease in the consumption of liquid milk. However, one of the main challenges for the dairy industry has been adapting to the restructuring of the dairy market due to a decrease in demand in the wholesale trade for the hospitality industry and an increase in household consumption. Some countries have struggled to receive milk collected from producers, because the processing capacity has been unable to adapt to the change in demand.

Shortage of labour on horticultural farms

In 2020, the horticultural sector has been overshadowed by the exceptional situation caused by the coronavirus pandemic and the possible infections of horticultural entrepreneurs and workers. The exceptional circumstances have been also causing a shortage of labour on horticultural farms. Uncertainty may also arise in the availability of imported products. For example, Finland's self-sufficiency rate in fresh vegetables has been around 60-70% in recent years.

In 2019, cucumber became the main greenhouse vegetable, followed by tomatoes. In 2020, the area of greenhouse production remained roughly at last year's level. In particular, the cultivation area of sweet peppers increased significantly.

Strong seasonal and annual variation is typical of producer prices for horticultural products. The weather during the growing season plays a bigger

role in the price of outdoor products than in the price of greenhouse vegetables. Producer prices are usually lowest during the main harvest season, and producer prices for stored products increase as the storage season progresses. Greenhouse vegetable prices, especially in case of cucumber and tomato, also tend to collapse during the main harvest season in June–July, because the market becomes congested.

Average farm size increases

In 2019, there were approximately 46,800 agricultural and horticultural enterprises in Finland. Since 2010, the number of farms has decreased by around a fifth, and the average farm size has increased by 10 hectares. In 2019, farms had on average 49 hectares of arable land. A good third of this area is rented.

One of the reasons for the decline in the number of farms is the decreasing trend in generation renewal. As fewer farms are passed on to the next generation, the proportion of young farmers is decreasing, and the farming population is ageing. Especially the number of farmers over 65 is increasing. Last year, the average age of farmers was 53.

Profitability of agriculture is decreasing

Despite the increase in the enterprise size, the profitability trend in agriculture and horticulture has been declining throughout the 2000s. According to a profitability study by Luke, both the cultivation area of farms and the number of animals on farms have increased, as has the gross revenue of agriculture. Nevertheless, the average real value of revenue per hectare has decreased. This development is due to poor producer price development, price fluctuations and increasing input prices.

The entrepreneurial income of agriculture and horticulture has remained stagnant for years. After hitting the bottom in 2016, the entrepreneurial income increased slightly in 2017 and 2018. However, in 2019, the entrepreneurial income decreased again, and it was sufficient to cover just under 40% of the target hourly salary of EUR 16 from agricultural work, as well as of the target net interest income from equity.

The budgetary framework for the CAP reform agreed

A lively political debate on the future of the EU's Common Agricultural Policy (CAP), which significantly affects the operating conditions of Finnish agriculture, is expected during 2020–2021. In July 2020, EU heads of states and governments finally agreed on the next budget for the bloc. The CAP for 2021–27 would get €344 billion, which is below the €383 billion in funding allocated in 2014–2020, but above €324 billion originally proposed by the Commission in 2018. The deal should also pave the way for smoother CAP reform negotiations. The lack of the next EU budget has held back progress in shaping the next farming policy for 2021–27.

For Finland, safeguarding agricultural funding in the EU budget negotiations has been one of the political priorities. A successful result in agricultural funding is directly linked to Finland's net contribution position, because agriculture accounts for more than 60% of total EU expenditure in Finland. In addition, the importance of support in agricultural income formation in Finland is significantly higher than the average in the EU Member States, because production costs in Finland are higher than market prices due to natural constraints.

Topical phenomena

The special themes of this review will introduce the reader more closely to the effects of the coronavirus pandemic on the food chain. Another special theme is the impact of the African swine fever (ASF) pandemic on pork markets. The third special theme concerns environmental evaluation and knowledge-based management in general, as well as its special role in policy guidance. Knowledge-based management refers to action carried out on the basis of the best available information at the time.

Operating environment in agriculture and food sector



General economic development

Jari Viitanen and Jyrki Niemi

The coronavirus pandemic has caused an unprecedented stagnation in the international economy. It has increased uncertainty, disrupted corporate production chains and led to drastic measures in several countries to limit the spread of the virus, while securing economic recovery after the crisis. The immediate economic impact of the epidemic has been strongest in the services sector. Demand for restaurants, accommodation and cultural services have collapsed. The economic slowdown and the resulting change in consumer demand have also led to a fall in world market prices for agricultural products. This may also affect the profitability of the food sector in Finland.

The coronavirus is hitting the world economy hard

In 2019, global economic growth declined to 2.8% from the previous year's cyclical peak. Although the economic slowdown was expected to continue in several markets at the beginning of the year, the outlook for agricultural product prices still seemed quite favourable. However, the coronavirus pandemic, which began in China, quickly changed the situation, and the global economy experienced an unprecedentedly rapid deceleration. To curb the pandemic in February-March 2020, mobility and assembly of people in Asia and Europe were restricted, national borders were closed and operating restrictions were imposed on a number of business sectors, such as restaurants. In April, the pandemic and the resulting bans and restrictions

extended to the United States, Russia and Latin America, among many other countries.

The restrictions and the increase in uncertainty were rapidly reflected in the global economy as private consumption and international trade came to a standstill. Labour-intensive sectors, such as the services and transport sector, have been particularly affected. Uncertainty and the nervousness of investors about the threat of the coronavirus also caused a general decline in the prices of agricultural raw materials at the beginning of the year. According to the FAO's food price index, world market prices of food commodities fell by an average of 11.2% from January to May. In June prices start to increase again, and in September prices were 7.6% higher than in May.

According to the October forecast of the International Monetary Fund (IMF), the global economy will decrease by 4.4% this year, and world trade by as much as 10.4% compared to the previous year. In July, the European Commission estimated that the euro area economy would decrease by almost 9% this year. Although the projections showing decline in the economies of individual countries are at this stage still mainly indicative and will be revised during the autumn, their estimated level of between 5% and 10% is significantly high. In several countries, the economy may decline more than during the financial crisis of 2008-2009.

A rapid economic recovery is not foreseen

To mitigate the economic impact of the pandemic, several countries and economic areas have tailored large-scale fiscal support packages to avoid an acute crisis and prevent a wave of bankruptcies. In

the United States, the economy is heading for the deepest recession since the 1930s, and Congress has already approved a support package totalling just under USD 3,000 billion to revitalise the economy.

In the European Union, individual Member States targeted large-scale support packages at individual sectors during the spring. In July 2020, EU heads of states and governments agreed on a EUR 750 billion stimulus fund, along with the bloc's EUR 1.1 trillion budget for the 2020-2027 period. The EU will spend 390 billion euros on grants to help member states recover from the pandemic and the recession, and offer loans totalling some 360 billion euros for the same purpose.

The world's central banks have also launched large-scale securities purchase programmes. The European Central Bank (ECB) is supporting the euro area economy with a EUR 1,350 billion debt securities purchase programme, with a view especially to secure access to funding for banks and consequently for businesses. Opportunities for a direct stimulus, for example by lowering interest rates, are limited when interest rates are already low. In March, the Federal Reserve (Fed) lowered the base rate and announced a USD 2,300 billion programme to purchase federal, local government and corporate loans, for example. Central banks' expansionary fiscal policy means that interest rates will not be subject to significant growth pressure during the rest of the year.

The latest statistics suggest that the peak of the coronavirus pandemic has already passed in Asia. Indeed, restrictions have already started to relax in China, and economic activity is gradually picking up. However, no rapid recovery is foreseen, but it will probably take years before the GDP growth lost as a

result of the epidemic is regained in many countries. The second wave of the coronavirus epidemic hitting during the autumn has required the re-imposition of restrictions on the movement and assembly of people. Such a W-shaped economic development will significantly slow down the recovery and at the same time, the global demand for agricultural products and foodstuffs.

There are other underlying uncertainties

Although the coronavirus epidemic starts to fade after the autumn, its effects will continue to be felt globally for a long time to come. Bankruptcies are likely to increase further and next winter unemployment will remain high. Uncertainty and psychological factors of the pandemic's possible renewal will limit consumer behaviour. Future consumer behaviour may also be affected by the recent large-scale fiscal stimulus packages. Awareness of future reductions in public debt and consumption, a possible decrease in pension accrual and tax increases may lead to a proactive reduction in consumption and a growth in savings rates.

In April 2020, the Finnish consumer confidence index was the weakest ever, but it increased clearly during May to July, but decreased again in August and September. Compared with other Europeans, Finns remain fairly optimistic about their future. In a survey conducted by Eurofound on the effects of the coronavirus crisis, 75% of Finns were optimistic about the future, the largest proportion in the EU Member States. At this stage, it is still difficult to assess whether there will be any permanent changes in consumer behaviour. According to a survey conducted by the Finnish Competition and Consumer Authority, Finns have reduced their con-

sumption due to the coronavirus crisis, but many respondents still believe that their consumption will quickly return to the pre-crisis level.

Issues related to the coronavirus pandemic and its spread and duration, as well as the recovery of economies, are currently the main uncertainties in the global economy. However, there are also other underlying uncertainties. For example, the presidential elections in the United States in November may be preceded by changes in trade policy. A large-scale trade war between the United States and China remains possible. The current deadline for Brexit negotiations is the turn of the year, and according to public information, several difficult issues remain to be resolved. If a trade agreement between Britain and the EU is not reached by the end of the year, trade will become significantly more difficult. Without a trade agreement, agri-food trade will see the greatest increase in customs duties and other trade restrictions.

Finland's economic development depends on export recovery

In 2019, Finland's economy grew by one per cent. This year's economic forecasts predict a contraction of 4-5% in the Finnish economy. The estimate is based on the assumption that after the Q2 collapse, restrictions will gradually be lifted, public stimulus packages will help businesses deal with the acute crisis phase, and the economy will start to grow slowly. However, there is still a great deal of uncertainty about the success of the pandemic repression. Private consumption will be constrained by increasing bankruptcies and rising unemployment. The fall in world trade and the decrease in domestic demand will in turn reduce Finland's exports and imports.

A significant economic recovery would therefore require an increase in demand in key export countries, which is not foreseeable before the end of the year. The slowdown in construction that began last year will continue this year, although some of the public stimulus will possibly be directed to the construction sector. Investments in machinery and equipment will also decrease. The crisis is also hitting central government finances hard. The Government has decided on direct measures to curb the epidemic, and to support citizens and businesses. The state also offers compensation for these measures and other losses resulting from the coronavirus pandemic to other sub-sectors of the general government. The state will also bear a major responsibility for the forthcoming general economic recovery measures aimed at ensuring that the economy returns to a growth path after the crisis.

Thus far, the food sector has survived the current coronavirus epidemic reasonably well, and demand for certain basic foodstuffs has even increased. However, the financial losses incurred by restaurant, workplace catering and school meal operators are becoming huge. The economic slowdown and the resulting change in consumer demand have also led to a fall in world market prices for agricultural products. This also has spill-over effects on the Finnish food chain and related economy. As a result of the economic downturn, demand for value-added products is falling, and consumption is increasingly shifting to basic foodstuffs. Consequently, less money is entering the food chain, which may reduce the profitability of the sector.

Food consumption and consumer prices

Terhi Latvala and Erja Mikkola

Food security is deteriorating in the world. In Finland, food consumption and prices have remained stable despite the coronavirus pandemic. The coronavirus pandemic is reflected in the growth in sales (in euros) of preserved, frozen and cereal products in the food statistics for the beginning of the year. Worldwide, the effects of the coronavirus pandemic are reflected in abnormally strong price fluctuations, for example, in coffee prices, due to changes in both supply and demand. Fluctuations in fruit and vegetable prices may also increase.

World food security has deteriorated

Globally, there is again a slight increase in the number of people suffering from malnutrition, and the FAO estimates that more than 820 million people are undernourished, which is approximately 11% of the world's population. Food security is undermined by various conflicts in different countries and by climate change, but also by the uneven recovery of the economic situation and weak economic growth.

In North America and in Europe, it is estimated that approximately 8% of the population is affected by a shortage of sufficient and continuous food supply. According to a survey on food insecurity experience (FIES, Food Insecurity Experience Scale), around 9.4% of the adult population in Finland were estimated to have insufficient access to food i.e. expressing to have moderate food insecurity, and 3.2% of Finnish adults were experiencing a severe shortage of food.

In addition to malnutrition, the FAO's annual report on food security also draws attention to the widespread problem of overweight and obesity, which is growing in all continents. In 2018, some 39% of the world's adult population was estimated to be overweight.

Domestic food consumption remains stable

The consumption of liquid milk has decreased since the 1950s, when food consumption data was first compiled. Consumption decreased by nearly 5% in 2019 compared with the previous year. The consumption of skimmed milk decreased by nearly 8%, and that of low-fat milk decreased by approximately 4%. All in all, the average volume of milk consumed

per capita was 102 litres, of which nearly a third was skimmed milk, 57% was low-fat milk, and just over 10% was whole milk.

In 2019, the consumption of yoghurt was around 19 kg per capita, which was 4% less than in 2018. The consumption of sour milk and curdled milk (viiili) decreased by around 6-7% from the previous year. The consumption of other fresh products, such as flavoured quarks, grew. The consumption of cheese decreased slightly to approximately 25 kg. Butter was also consumed slightly less than in the previous year, at 3.3 kg.

In 2019, total cereal consumption increased by a good two kilograms from the previous year to 81 kg per capita. Nominal growth was 3.0%. The consumption of oats was higher than ever, at 9.5 kg. The consumption of wheat decreased slightly, while the consumption of rye and barley remained largely unchanged. The consumption per capita for wheat was 43.9 kg, for rye 15.3 kg, and for barley 1.8 kg. The consumption of rice rose to 6.6 kg.

The total consumption of meat fell by about 1.5 kg (2%) from the previous year to 80 kg per capita, when game and offal are also taken into account. The consumption of poultry continued to grow and was 26.6 kg per capita. The consumption of poultry increased by almost 4% from 2018. The increasing trend has continued for more than ten consecutive years. Beef consumption fell by about 2.5%, and pork consumption by about 5% from the previous year. The consumption of pork has been declining for several years now. An average of 18.8 kg of beef and 30.8 kg of pork was consumed per capita. In recent years, fish consumption has amounted to approximately 15 kg per capita.

The consumption of fresh vegetables was around 66 kg per capita. However, this figure also includes possible wastage. Of fresh vegetables, tomatoes made up 12 kg, i.e. just under a fifth. The consumption of fresh fruit totalled 59.2 kg, including possible wastage. The consumption of citrus fruit grew slightly to 14.3 kg per capita. The consumption of other fresh fruit decreased slightly. Just under 7 kg of fruit preserves and dried fruit were consumed per capita.

According to preliminary data from the 2019 Balance Sheet for Food Commodities, the consumption of eggs was almost 12 kg per capita. The consumption of eggs has long been around 11-12 kilos. The consumption of sugar was around 28 kg.

The popularity of basic foodstuffs increased

The effects of the coronavirus on food consumption may be of temporary significance. For example, the consumption of perishable goods was expected to decrease, while the consumption of basic foodstuffs such as flour and easy-to-freeze and -store products, was expected to increase, at least in the early stages of the coronavirus pandemic. Consumption is also affected by a reduction in the supply of goods, such as in the supply of fruit and vegetables dependant on seasonal labour.

Moderate changes in food prices

The EU-27 food price index in January-March 2020 was slightly higher, and in March 2020, it was 3.3% higher than the previous year. In Finland, the annual price increase was more moderate: the increase was 1.5% compared to the previous year. The main difference seems to be in the price of pork. According to Eurostat, the price of pork rose only moder-

ately in Finland, by 2.8%, while in Sweden, the price index for March was 5.8% higher than in the previous year. In some Eastern European countries, such as Poland, the price of pork was almost 27.2% higher. This is due to the spread of African swine fever in Eastern Europe, which has reduced the supply of pork and increased the consumer price, especially in countries that are not self-sufficient in pork. In March, the EU-27 fruit price index was 7.8% higher than in the previous year, while the corresponding figure for Finland was 6.9%. Vegetable prices remained roughly unchanged, and no significant differences between Finland and other countries can be observed in other products either.

Until the end of 2017, there was aggressive price competition in the domestic retail trade through various campaigns promising to cut food prices. According to Statistics Finland's consumer price index, prices have been rising continuously since January

2018. The monthly change in the consumer price index describes the change from the corresponding period of the previous year. During 2019, fruit and vegetable prices fell slightly. The fruit, berry and vegetable sector is labour intensive, and the mobility of foreign seasonal labour has been restricted in the spring of 2020 due to the coronavirus pandemic. This is expected to increase prices, because it decreases the supply of fruit and vegetables. The prices of some export products will fall, because volumes that are usually exported must be sold on the domestic market. The biggest exports from Finland are milk and dairy products and processed food products. However, price changes in primary production will not necessarily directly affect consumer prices but may occur with a delay.

Consumption of selected foodstuffs per capita in 2015-2019, kg

	Fresh vegetables ¹	Cereals total	Sugar	Meat total ²	Beef	Pork	Poultry	Eggs
2019*	66.3	81.4	27.9	79.8	18.8	30.8	26.6	11.9
2018	63.5	79.1	29.2	81.3	19.3	32.5	25.6	11.8
2017	63.8	80.3	30.6	81	19.4	33.4	24.9	11.9
2016	63.7	79.7	29.1	81.1	19.2	34.7	23.5	11.9
2015	62.4	78.8	29.3	79.3	19.2	34.9	21.6	11.5

¹Including any wastage. ²Including bones, i.e. carcass meat, including edible offal.* Preliminary data
Source: Natural Resources Institute Finland (Luke), Balance Sheet for Food Commodities

The proportion of food expenditure continues to decrease

According to the preliminary consumption expenditure data from the 2018 National Accounts, the share of food and non-alcoholic beverages of the total private consumption expenditure is still declining, and was 11.5% (EUR 13.6 billion). Fruit, berries and vegetables was the largest product group with 16.9% of the total food consumption expenditure. Growth in this product group is particularly high in frozen berries and vegetables. The second largest product group in food expenditure is dairy products and eggs (EUR 2.2 billion and 16.4%). Within the product group, the proportion of chicken eggs in particular grew by 5.2% from the previous year. Meat and meat products accounted for the third largest share of consumption expenditure, at 15.6% of the total food consumption expenditure. The share of fish products continued to increase markedly (5.2%), but the product group still only accounts for a small share (4.7%) of the total food consumption expenditure. The volume of the sugars, jams and sweets product group remained unchanged in 2018 (7.8%). In the non-alcoholic beverages product group, the volume of soft drinks increased by 4%.

Food and non-alcoholic beverages price change 01/2015-05/2020. Food and non-alcoholic beverages yearly price change 2015-2020, %.

	2015	2016	2017	2018	2019	2020
Food and non-alcoholic beverages						
January	-1.4	-2.3	-2.4	1.5	2.1	1.8
February	-2.4	-1.7	-0.5	1.3	2.0	1.3
March	-1.6	-1.6	-1.7	2.5	0.9	1.3
April	-1.6	-0.9	-1.7	1.7	2.0	1.0
May	-1.3	-1.7	-1.0	2.4	0.5	2.4
June	-1.6	-1.6	-1.0	2.4	1.1	
July	-2.7	0.0	-1.5	2.0	0.7	
August	-2.4	-0.6	-0.1	1.8	1.7	
September	-2.9	-0.7	-0.4	2.8	0.3	
October	-1.3	-1.3	-0.3	2.6	0.4	
November	-1.4	-0.8	-0.3	1.1	1.1	
December	-1.8	-0.6	-0.1	1.1	1.8	
Yearly average (%)	-1.9	-1.2	-0.9	1.9	1.2	
Consumer price index	100.0	98.9	97.9	99.8	101.0	

Source: Statistics Finland, Consumer price index.

The effects of the coronavirus pandemic are already reflected in statistics

There is a clear seasonal variation in food consumption, which makes it useful to compare sales development to the same quarter in the previous year. The growth in the sales of food and non-alcoholic beverages at the beginning of 2020 was 5.34% compared with the previous quarter. The growth in food sales was partly driven by the coronavirus pandemic containment measures, which increased household food consumption. It is expected that the next quarter will see even greater growth.

The Finnish Grocery Trade Association has recently published new statistics on the development of food sales by product category. The quarterly data used in the statistics is more up to date than Statistics Finland's data on private consumption expenditure, which means that the sales data for January-March 2020, as well as data on changes to prices reported in the consumer price index compared to the previous year, is already available in May 2020.]

The changes caused by the coronavirus pandemic can only be seen in these statistics for March, but despite this, the statistics show an increase of up to 25% in sales, especially for preserved fish and shellfish products and frozen fruit and berries. In beverages, grape wines and non-alcoholic and low-alcohol beers have also increased significantly. There is also a significant increase of more than 15% for rice, flour, pasta and other cereal products, and preserved vegetables.

The increase in sales (in euros) is explained by the increase in volume for several products, because the increase in food prices was only 0.35%. The most significant price increases concerned sugar (8.7%), coffee (7.7%) and fresh or frozen fish (7.4%), while vegetable prices fell by 6.4%. Price increases are often driven by factors related to the decrease in production volumes, but during the coronavirus pandemic, consumption shock or associated expectations are also driving prices down.

Sugar is imported to Finland mainly from the EU internal market, and EU white sugar prices have been rising since the end of 2019. The price of sugar is increased by global consumption growth and a decrease in production in the main producing countries. The production volumes of coffee, especially the Arabica variety used in Finland, have also decreased. The International Coffee Organization (ICO) is concerned about the effects of the coronavirus pandemic, because they are reflected in several stages of the coffee supply chain, and production is partly highly labour intensive. Coffee was even included in the IFPRI Food Security Portal's watch list due to the abnormal price fluctuations.

Food and non-alcoholic beverages yearly price change by product groups 2016-2019, %.

	2016	2017	2018	2019
Food and non-alcoholic beverages	-1.2	-0.9	1.9	1.2
Grain products and bread	-0.9	-0.1	0.4	1.9
Meat	-3.4	-1.2	1.6	4.4
Fish and shellfish	8.0	7.3	0.3	-0.1
Milk products, cheese and eggs	-2.6	-0.6	2.1	1.7
Fats and oils	-1.9	1.8	5.2	3.1
Fruits and berries	0.0	1.3	3.8	-2.4
Vegetables	1.0	-2.8	5.7	-1.8
Sugar, jams, honey, chocolate and candies	0.1	-10.5	1.3	0.6
Prepared food, other	-1.1	-1.3	-0.2	-0.0
Non-alcoholic beverages	-2.2	2.4	-0.2	1.3

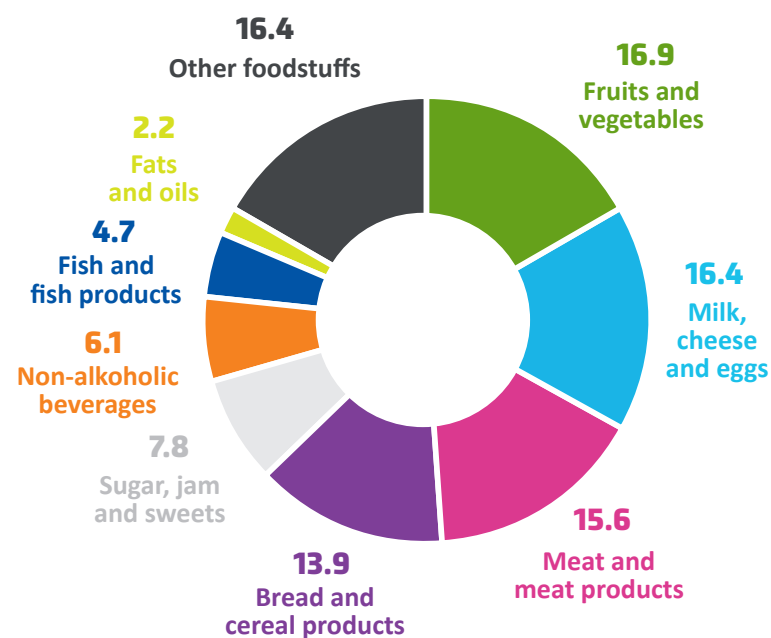
Source: Statistics Finland.

Finland was rated eighth in an EU-28 food price comparison

Statistics Finland publishes an international comparison of consumer prices. This data is based on the Eurostat European Comparison Programme (ECP). The comparison covers 28 EU Member States, some candidates, and the EFTA Member States. Statistics Finland is responsible for compiling the price material in Finland.

In Finland, the price level of foodstuffs and non-alcoholic beverages is more than 18% above the EU average. In most Nordic countries, price levels were significantly above the average levels in the EU and Finland: 61% in Norway, 50% in Iceland and 30% in Denmark. The Swedish price level has fallen to the Finnish level. The highest prices are in Switzerland, where foodstuffs and non-alcoholic beverages consumer prices are 64% higher than the EU-28 average.

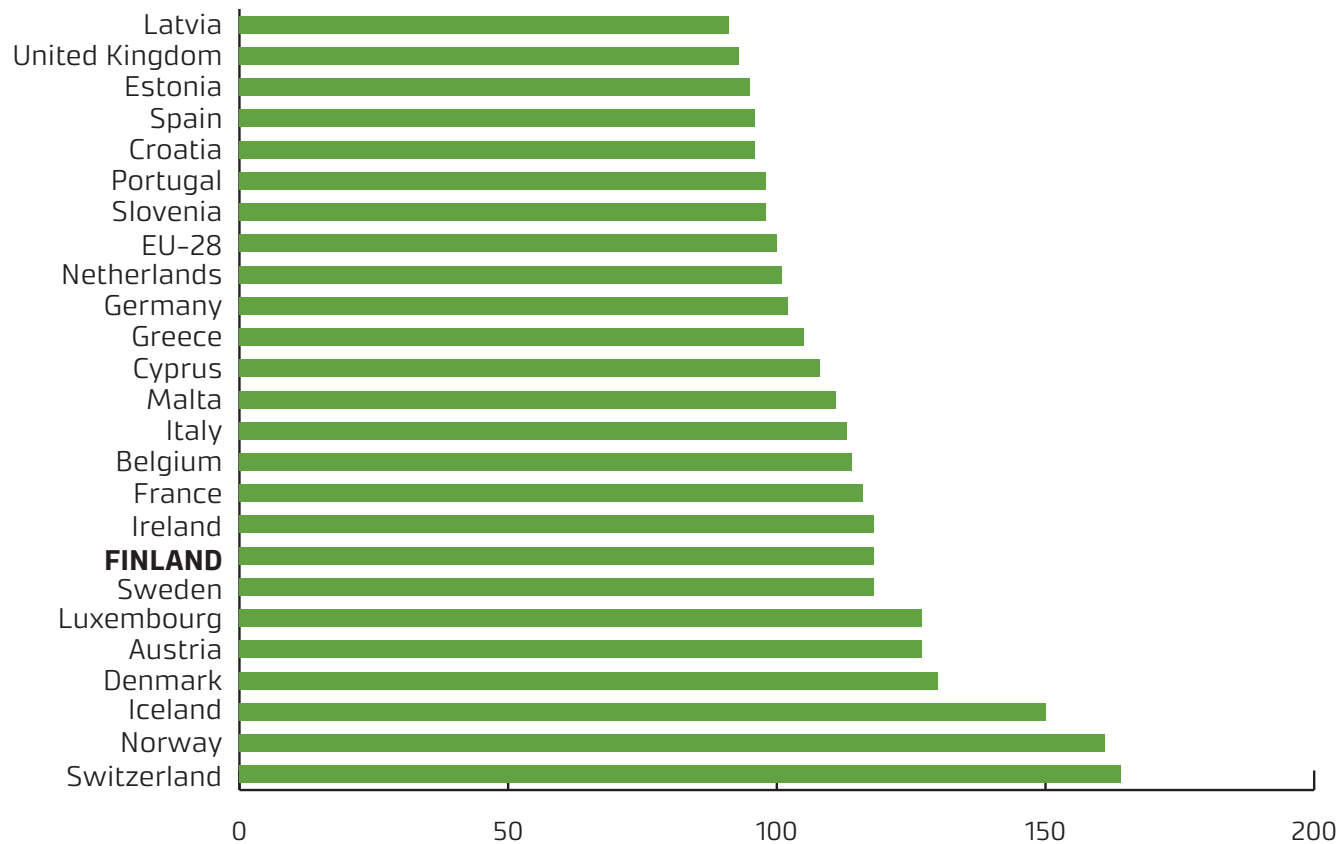
Final consumption of food and non-alcoholic beverages of households in 2018, %.



Source: Statistics Finland

Source: Luke, [Balance Sheet for Food Commodities](#)

Price level index for food and non-alcoholic beverages in selected countries in 2018, EU-28=100.



Source: Statistics Finland, individual consumption expenditure



Foreign trade in foodstuffs

Csaba Jansik

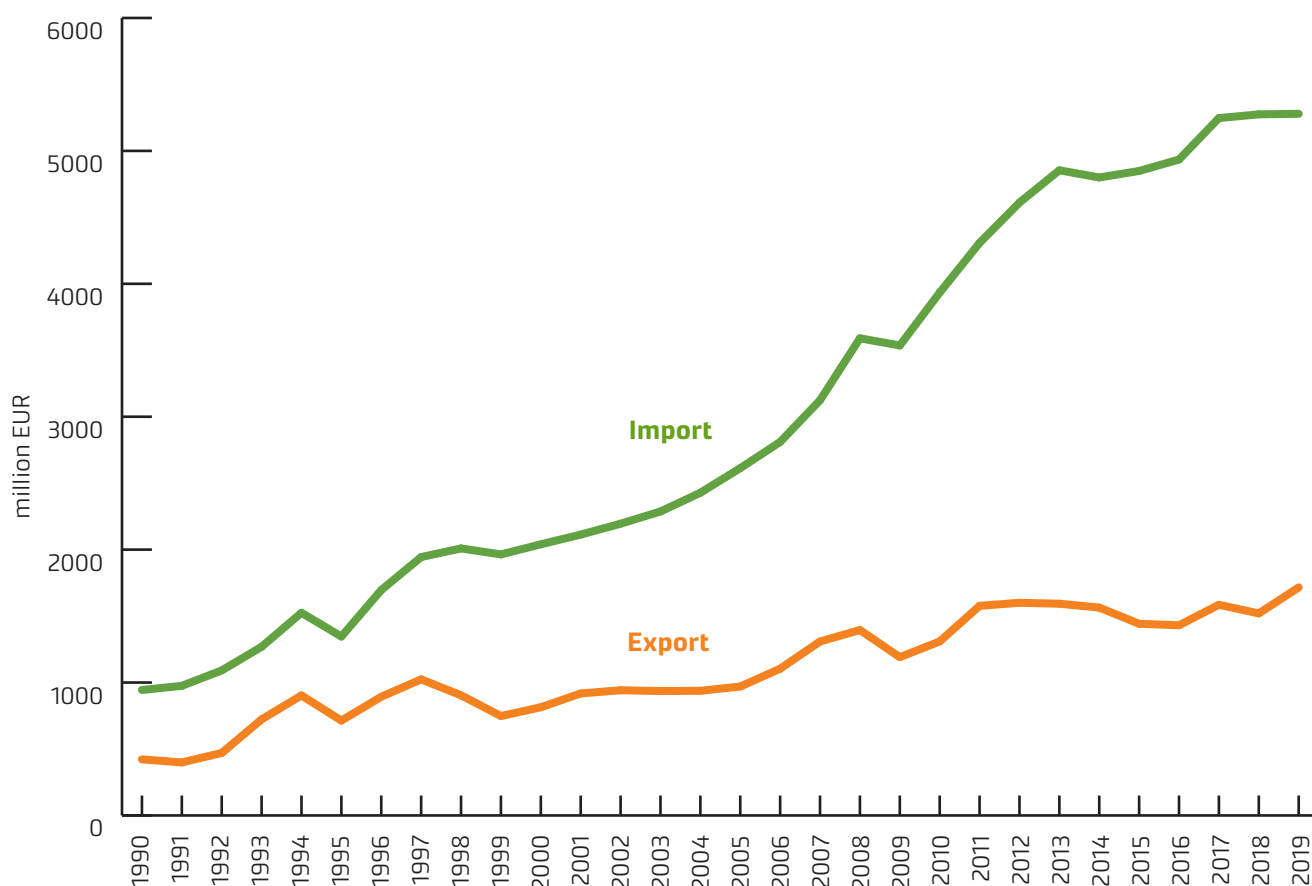
Finland's food exports achieved an all-time record in 2019. The value of food exports from Finland totalled EUR 1,716 million, i.e. an increase of 13% on the previous year. The sanctions imposed by Russia in 2014 have shaken Finland's food exports and led Finnish companies to target their sales to other markets. The process has been going on for years, and the significant public and private investment in food exports is finally reflected in the record results for 2019.

In 2019, the value of food imports to Finland was EUR 5,279 million, roughly the previous year's level. Imports rose only slightly, EUR 4 million, from the previous year. After the years of high growth around the turn of the millennium, the growth in imports started to slow in 2013 and halted between 2017 and 2019.

The development of the trade balance

In recent years, there has been no significant change in the geographical distribution of imported agricultural products and foodstuffs. Between 72% and 78% of food imports into Finland have come from EU Member States. Food has increasingly been imported into Finland from countries that joined the EU in 2004 or thereafter, while the weight of the older Member States has slightly decreased. Despite the developments in relative shares, the sharp increase in the total import value resulted in a steady increase in the value of imports from both EU and third countries.

Imports and exports of agricultural products and foodstuffs in 1990-2019, EUR million (CN01-24).



Source: Finnish Customs, ULJAS database

The table below shows the value of imports according to the Combined Nomenclature (CN01-24). The categories contain individual products whose commercial purpose is other than 'food'. These are usually smaller batches, with the exception of one product: palm oil and its fractions imported for the production of biodiesel. They are imported from the

Far East via the Netherlands, so the figure in the table must be corrected for the Netherlands. The value of palm oil imports was EUR 190 million in 2018 and EUR 122 million in 2019, so excluding these, the value of Dutch imports was less than EUR 600 million in both years. After these corrections, Germany has been the largest importing country for several years.

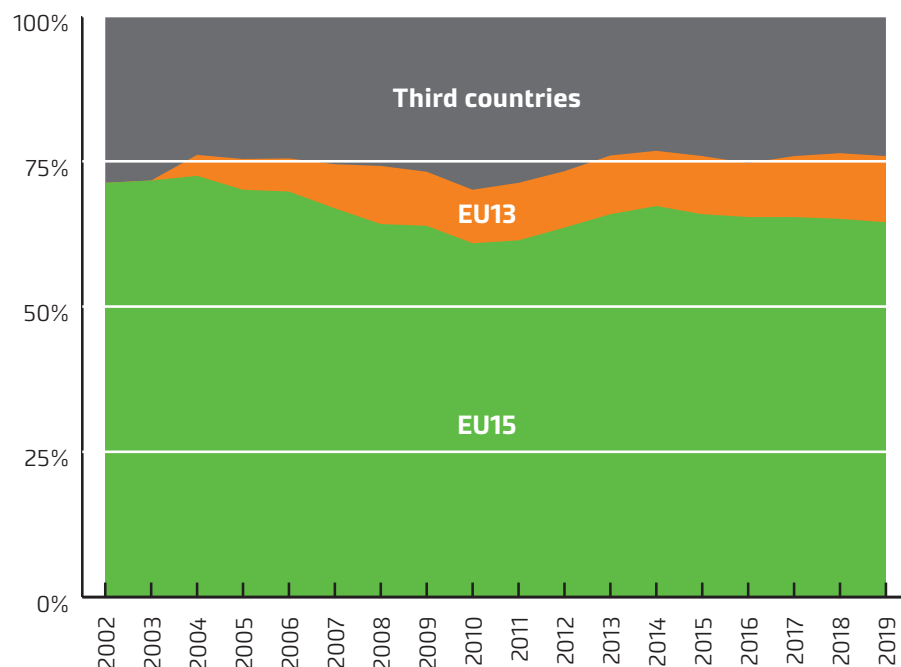
The balance sheet has deteriorated throughout Finland's EU membership, most strongly in the second half of the 2000s and the first half of the 2010s, when the gap between imports and exports increased by EUR 150-350 million almost every year. The trade balance has only improved three times: in 2001, 2014 and 2019. In the first two, the position only improved by around EUR 30 million. Compared to this, the improvement of last year's trade balance by nearly EUR 200 million is an extraordinary achievement.

Exports and imports by country

In recent years, there has been no significant change in the geographical distribution of imported agricultural products and foodstuffs. Between 72% and 78% of food imports into Finland have come from EU Member States. Food has increasingly been imported into Finland from countries that joined the EU in 2004 or thereafter, while the weight of the older Member States has slightly decreased. Despite the developments in relative shares, the sharp increase in the total import value resulted in a steady increase in the value of imports from both EU and third countries.

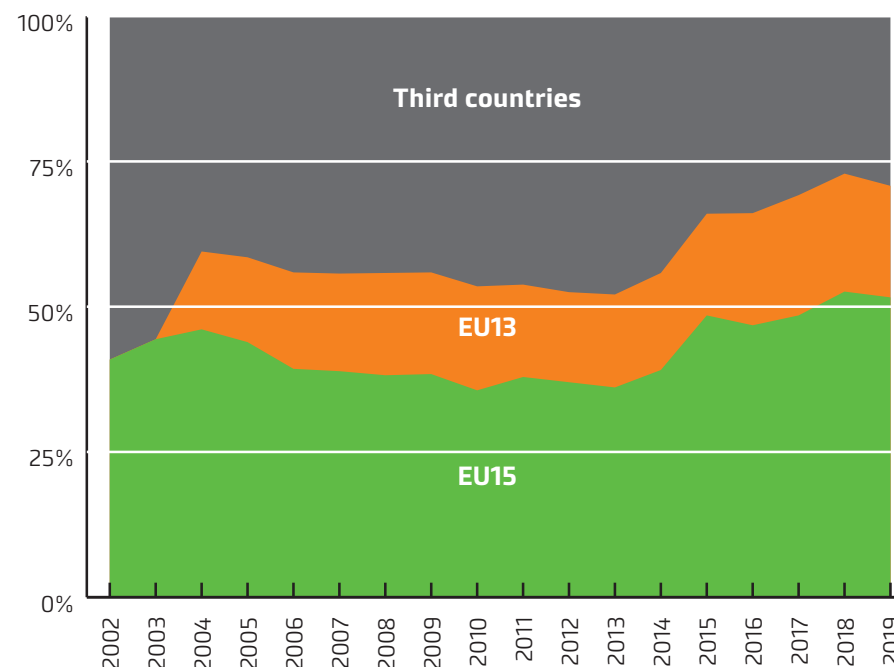
The table below shows the value of imports according to the Combined Nomenclature (CN01-24). The categories contain individual products whose commercial purpose is other than 'food'. These are usually smaller batches, with the exception of one product: palm oil and its fractions imported for the production of biodiesel. They are imported from the Far East via the Netherlands, so the figure in the table must be corrected for the Netherlands. The value of palm oil imports was EUR 190 million in 2018 and EUR 122 million in 2019, so excluding these, the value of Dutch imports was less than EUR 600 million in both years. After these corrections, Germany has been the largest importing country for several years.

Finland's food imports by region



Source: Finnish Customs.

Finland's food exports by region



Source: Finnish Customs.

The most important countries importing agri-food products to Finland

	2018		2019		Change of value 2019/2018 (%)
	m EUR	%	m EUR	%	
The Netherlands	735	1.9	721	13.7	-2.0
Germany	698	13.2	675	12.8	-3.3
Sweden	553	10.5	578	11.0	4.6
Spain	327	6.2	340	6.4	3.9
Norway	353	6.7	324	6.1	-8.0
Denmark	302	5.7	293	5.5	-2.9
Italy	203	3.8	208	3.9	2.4
Poland	191	3.6	197	3.7	3.6
France	186	3.5	187	3.5	0.3
Belgium	175	3.3	171	3.2	-2.2
Estonia	173	3.3	168	3.2	-2.9
Brasilia	117	2.2	142	2.7	20.9
Great-Britain	137	2.6	116	2.2	-15.5
Lithuania	102	1.9	100	1.9	-2.3
USA	58	1.1	71	1.3	23.4
Others	967	18.3	990	18.8	2.4
Total	5,275	100.0	5,270	100.0	0.1

Source: Finnish Customs.

The most important destination countries of Finnish agri-food exports

	2018		2019		Change of value 2019/2018 (%)
	m EUR	%	m EUR	%	
Sweden	316	20.8	366	21.3	15.8
Estonia	139	9.1	151	8.8	8.6
Germany	94	6.2	120	7.0	27.9
Russia	100	6.6	104	6.0	4.1
China	50	3.3	88	5.1	75.8
The Netherlands	66	4.4	87	5.1	31.4
Denmark	80	5.3	87	5.1	7.9
France	105	6.9	86	5.0	-18.3
Poland	67	4.4	76	4.4	14.6
Norway	45	2.9	62	3.6	39.7
Lithuania	48	3.1	44	2.6	-8.1
Great Britain	48	3.2	43	2.5	-10.5
Belgium	32	2.1	36	2.1	12.8
USA	32	2.1	33	1.9	3.9
Latvia	29	1.9	29	1.7	0.4
Others	299	17.7	333	17.7	11.2
Total	1,520	100.0	1,716	100.0	12.9

Source: Finnish Customs.

The geographical distribution of food exports has varied considerably. Until the beginning of the 2010s, Russia was the most important destination country for exports. In 2014, as a result of the import duty imposed by Russia, Finland's exports to its Eastern neighbour have fallen dramatically. In the peak year of 2013, the value of food exports to Russia totalled EUR 440 million. In 2016, Russian exports were only EUR 126 million, and in 2019 only EUR 104 million.

Traditionally, neighbouring countries have been the mainstay of Finnish food exports, accounting for more than half of Finland's food exports, but their total share decreased dramatically following

Russia's import ban. In 2018, neighbouring countries accounted for less than 40% of total food exports.

The proportion of food exports to Russia has fallen from the peak levels of 26-28% to 6%. Exports to other EU Member States have increased, notably to Germany, France, the Netherlands and Denmark. Exports to these countries increased by 65-80% between 2014 and 2019, and the value of exports to France increased by as much as five times.

In 2019, exports increased both inside and outside the European Union. Within the EU, the most significant growth comes from the German and Dutch markets. From third countries, it comes from the

Chinese and Norwegian markets. China's growth rate (75%) was the highest of all target markets: exports to China increased from EUR 50 million in the previous year to EUR 88 million. 60% of the increase came from pork, and 40% from milk powder. The 40% increase in exports to Norway was exclusively due to fish feed. The highest growth rates of all EU Member States were achieved in exports to Germany and the Netherlands, which both grew by 30%. New projects and campaigns have been launched in the German market in cooperation with local retail chains. However, most of the growth in 2019 was due to oats, while the Dutch growth came from dairy products.

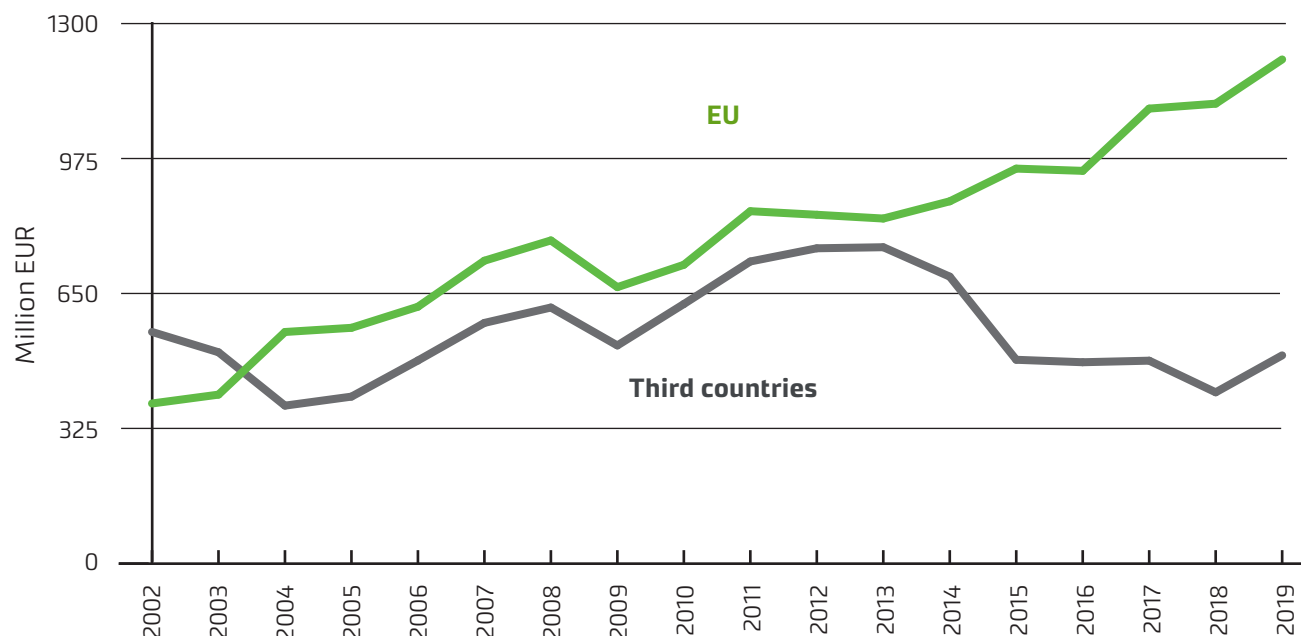
Foreign trade by product group

The main items of food imports into Finland are beverages (10.4%), fruit (8.9%), bakery products (8.1%), miscellaneous edible preparations (7.6%), fish (7.0%), coffee, tea, and spices (5.5%), cheese (5.3%), and vegetables (5.1%).

Dairy products continue to form the most significant single product group in food exports. However, exports of dairy products have dropped from EUR 521 million in the peak year of 2013 to EUR 411 million in 2019. In 2019, the sector made up less than a quarter of total food exports, while dairy products accounted for a third of all food exports just a few years ago.

However, the dairy industry continues to be the only industry in the Finnish food sector that has maintained a positive trade balance throughout Finland's EU membership. Nevertheless, the trade balance was barely positive following a dive from EUR 160 million in 2013 to under EUR 16 million in 2016. Until 2019, the external trade balance of dairy

The value of Finland's food exports to the EU and to third countries



Source: Finnish Customs.

products increased to EUR 67 million. At the same time, the product structure of dairy exports has developed less favourably. For example, the dramatic drop in exports of cheese was replaced by exports of butter and milk powder. The share of cheese in dairy exports in 2013 and 2019 fell from 32% to 14%, while the share of butter and milk powder rose from 32% to 52%.

Although exports increased by a record amount of EUR 196 million in 2019, the export performance is overshadowed by the fact that more than half of this increase was in Norwegian salmon exports. Like Sweden, Finland has become a transit country for Norwegian salmon. Currently, Sweden is the main export route for Norwegian salmon to the EU, worth EUR 3-4 billion. Finnish fish imports from Norway increased by about EUR 100 million in

2017, while Finnish fish exports to EU countries increased by EUR 90 million in the same year. Salmon transit exports have since remained at the same level, amounting to around EUR 100 million in 2019.

The increase in exports in 2019 is also explained by exports of cereals, which increased by EUR 40 million, from EUR 80 million to EUR 120 million. The exports were driven by increased demand as a result of the weak harvest in Europe in 2018. Demand for oats especially increased from other EU Member States, and exports of oats increased by EUR 24 million compared to the previous year.

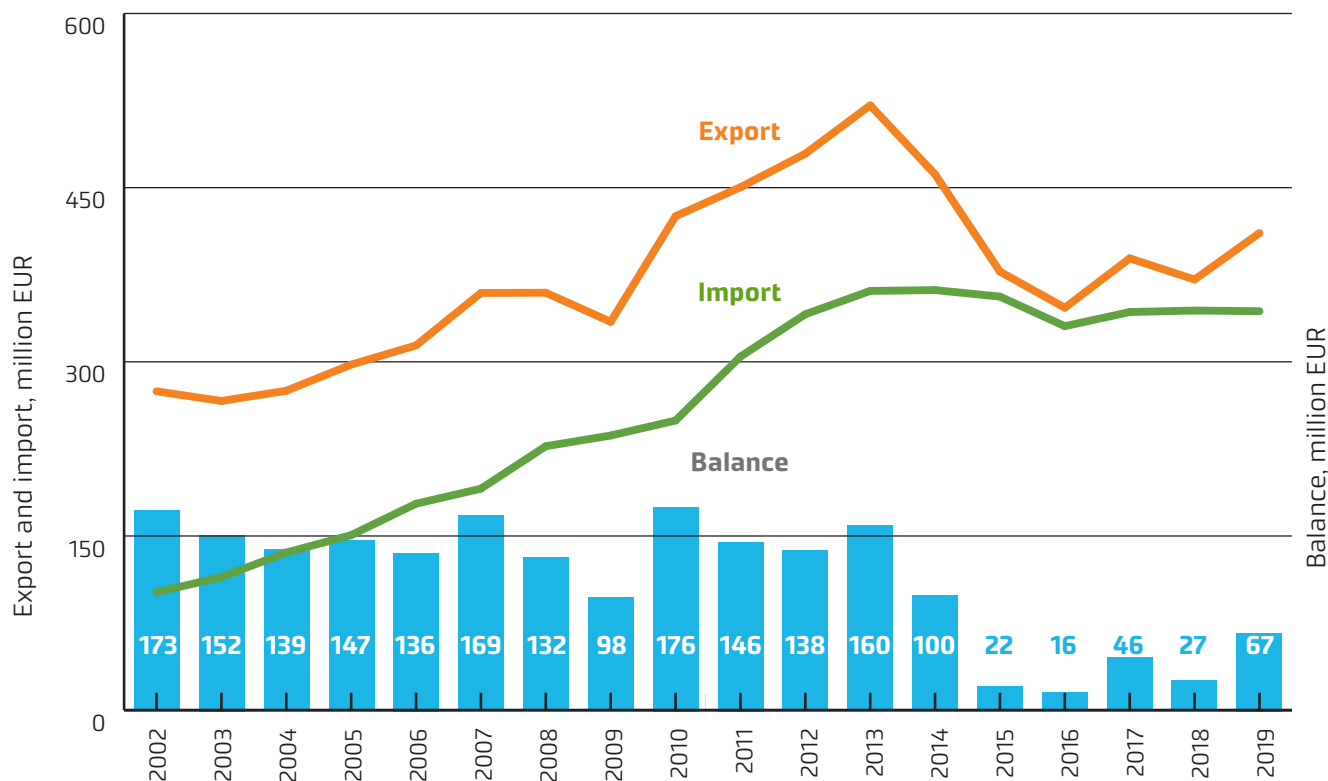
As a result of improved market prospects for pork and the rise in world market prices, pork exports increased by EUR 30 million in 2019, reaching EUR 74 million. Most of this increase came from China, where African swine fever cut domestic production.

In addition to dairy products, pork and cereals, the increase in exports in 2019 was due to the increased exports of beverages, especially alcoholic beverages, by EUR 31 million, and exports of confectionery, sugar and cocoa products, by EUR 23 million. The growth in exports, which is in itself significant, is therefore largely due to raw materials and semi-finished products, whereas processed products account for less than a third of the increase. The aim of the food sector is to achieve export growth in the future through further processed products in the future.

Source: Luke, [Foreign trade in agri-food products](#)

Statistics: Luke, [ULJAS - International Trade Statistics](#)

Trade balance of dairy products in Finland 2002-2019



Source: Finnish Customs.

Agricultural policy

Jyrki Niemi, Timo Karhula and Olli Niskanen

The future of Finnish agriculture will again be at stake when the EU decides in 2020 what the budget and content of the Common Agricultural Policy will be for the next seven years. Securing agricultural funding has been one of Finland's political priorities in the EU budget negotiations for the 2021-2027 programming period. Fully or partially EU-funded support instruments account for around 80% of total agricultural support. The total support for farmers in Finland is more than EUR 1.7 billion in 2020.

A lively political debate on the future of the EU's Common Agricultural Policy (CAP), which significantly affects the operating conditions of Finnish agriculture, is expected during 2020-2021. The policy reform agreed in 2013 sets out the financing and content of the Common Agricultural Policy up to 2020. The debate on agricultural policy for the upcoming programming period (2021-2027) started to intensify following the publication of the European Commission communication on the future of the CAP in November 2017. In May 2018, the Commission presented its proposal for the Multiannual Financial Framework (MFF) for 2021-2027, and in June 2018, the Commission presented a more detailed proposal for legislative measures related to the CAP.

A solution for the post-2020 EU budgetary framework and agricultural policy has therefore been sought in the EU for a couple of years. In July 2020, EU heads of states and governments finally agreed on the next budget for the bloc along with a new recovery instrument, worth over €1.8 trillion. The

CAP for 2021-27 would get €258.6 billion for direct payments and market related expenditure (Pillar I) while funding for rural development support (Pillar II) sees an allocation of €85.4 billion. The total amount - €344 billion - is below the €383 billion in funding allocated to the CAP in 2014-2020, but above €324 billion originally proposed by the Commission in 2018.

The European Parliament must still approve the Council's MFF position, but it is highly unlikely that the Parliament will reject this deal after the hard-fought compromises between member states. The deal is expected to pave the way for smoother CAP reform negotiations. In the absence of a political agreement on the 2021-2027 budget, the decision on the CAP reform has been delayed. EU policy-makers have been reluctant to commit to some elements of the next CAP without knowing how much money is available to support farmers.

The new CAP will therefore not enter into force in the EU as originally planned from the beginning of 2021, but will be subject to a transitional period of up to two years. This means that the implementation of the CAP reform will not start in the EU until 2023 at the earliest. Therefore, in 2021-2022, the budget for the new 2021-2027 programming period will be followed, while the implementation of the agricultural policy for the current programming period will continue.

For Finland, safeguarding agricultural funding in the EU budget negotiations has been one of the political priorities. A successful result in agricultural funding is directly linked to Finland's net contribution position, because agriculture accounts for more than 60% of total EU expenditure in Finland.

In addition, the importance of support in agricultural income formation in Finland is significantly higher than the average in the EU Member States, because production costs in Finland are higher than market prices due to natural constraints.

According to the Commission's 2018 original budget proposal, total EU support to Finnish agriculture in the 2021-2027 programming period would have decreased by around 7% compared to the 2014-2020 programming period. Direct payments under the first pillar were subject to a reduction of just over 2%, but rural development aid under the second pillar as much as 14%. According to the Council conclusions on the MFF 2021-2027 and the Next Generation EU fund agreed in July 2020, the total amount allocated to Finnish agriculture for the 2021-2027 programming period would, however, increase by 6%, from EUR 6.02 billion to EUR 6.38 billion.

EU agricultural support in Finland

During Finland's EU membership, agricultural support has ensured the competitive conditions for Finnish agriculture and the preservation of production volumes in different parts of the country, and in different production lines. In 2018, the total amount of support for farmers in Finland was about EUR 1.7 billion, which was almost a third of total agricultural gross returns. Fully or partly EU-funded support form the basis of the agricultural support system in Finland. In recent years, they have accounted for around 80% of total agricultural support. EU support has been supplemented with support from national funds.

In 2020, according to the government budget presentation, the total amount of support for farmers in Finland will be EUR 1,742 million, which is the

same as in 2019. CAP support totals EUR 1,423 million. The support consists of CAP income payments for arable crop and livestock farmers (EUR 525 million), natural constraint payments for less-favoured agricultural areas (EUR 544 million) and agri-environment payments (EUR 238 million). In addition, compensation for organic production and animal welfare is paid (EUR 116 million).

EU agricultural support is either fully funded or co-funded by the EU. EU-funded support accounts for 44% of the total support for Finnish farmers, totalling EUR 767 million. In addition to the fully or partly EU-funded support, a total of EUR 319 million of nationally funded aid will be paid to farms in 2020. The national aid consists mainly of Nordic aid (EUR 296 million) and national aid for farmers in Southern Finland, as well as other forms of aid (EUR 23 million).

CAP income payments are closely linked to the functioning of the market systems of the CAP and are financed entirely from the EU budget. The EU pays just under 20% of the natural constraint payment and a little over 40% of the agri-environment payments. The remainder is nationally funded.

For the allocation of the payments, Finland is divided into two main support areas (AB and C support areas). Support paid throughout the country includes CAP direct payments, natural constraint payments and environment payments. Nordic aid is paid in support area C, which is divided into five subregions for the differentiation of the aid. Support regions C3 and C4 are also further divided into sub-regions. National aid for farmers in Southern Finland is paid in support area AB.

CAP payments

Most of the CAP income payments fully financed by the EU are paid in Finland through the single payment scheme ('basic payment' since 2015), approved by the EU in 2013. In order to be eligible for CAP support payments, farmers must comply with so called cross-compliance (i.e. basic) requirements. Cross-compliance rules consist of stand-

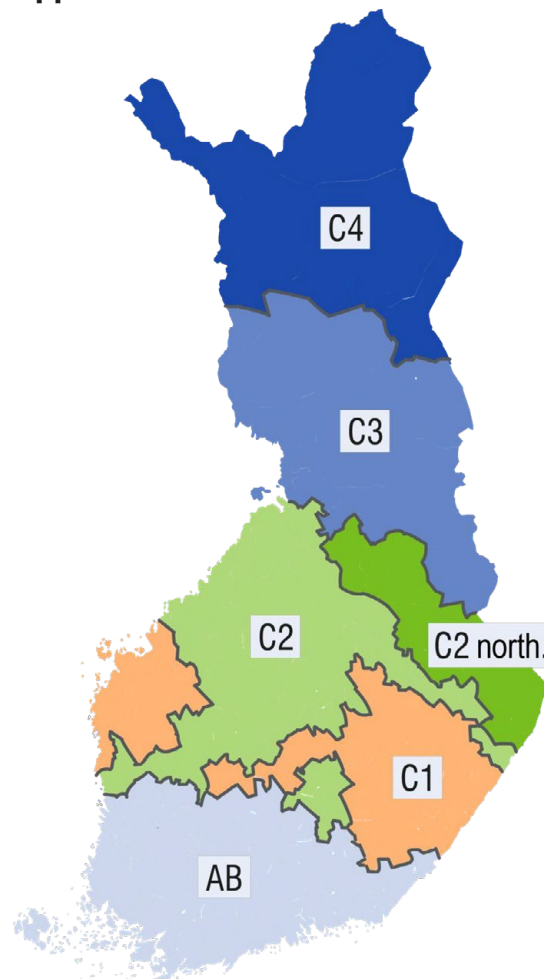
ards for good agronomic and environmental conditions, and statutory management requirements. Statutory management requirements relate to environmental, public health, plant health, and animal health and welfare.

From 2015, CAP conditions have also included 'greening measures', which are environmental measures that go beyond the minimum requirement. The Member States are required to use 30% of their total national funding allocations for this greening component. To qualify for the support, the farmer must cultivate at least two or three different crops on the holding, maintain existing permanent grassland, maintain an 'ecological focus area' (EFA) of at least 5% of the arable area of the holding in the regions of Uusimaa and Southwest Finland.

The fully EU-funded support for young farmers is paid for five years after the establishment of the holding if the applicant has established their holding for the first time as the main entrepreneur under the age of 40. The support is intended to facilitate the establishment of agricultural production and the structural development of agriculture.

Part of CAP support may also be paid as coupled support. In Finland, coupled payments account for almost 20% of the total CAP support. Coupled support is paid for suckler cows and bulls, as well as for ewes.

Support areas in Finland



Structure of CAP support from 2015.

Type of support	Status	Amount
Basic payment	Mandatory	Remaining share
Greening	Mandatory	Fixed 30% share
Natural constraint payment	Optional	Max 5%
Aid for young farmers	Mandatory	Up to 2%
Coupled support	Optional	Max 8% or 13%, optional 2% to protein crop top-up
Small farmers' payment	Optional	Max 10%

Natural constraint payment

Certain rural areas in the EU are classified as less-favoured areas (or areas with natural constraints). Areas are those that are more difficult to effectively farm due to specific problems caused by natural conditions. In order to prevent this land from being abandoned, the EU provides natural constraint payments to farmers in these areas. In Finland, these payments account for almost the entire cultivated area (2.16 million hectares).

The objective of the natural constraint payment is to maintain agricultural production despite the unfavourable climatic conditions, manage the number of farms and maintain economically viable agricultural units, and thus to also maintain employment in rural areas and promote their economic development.

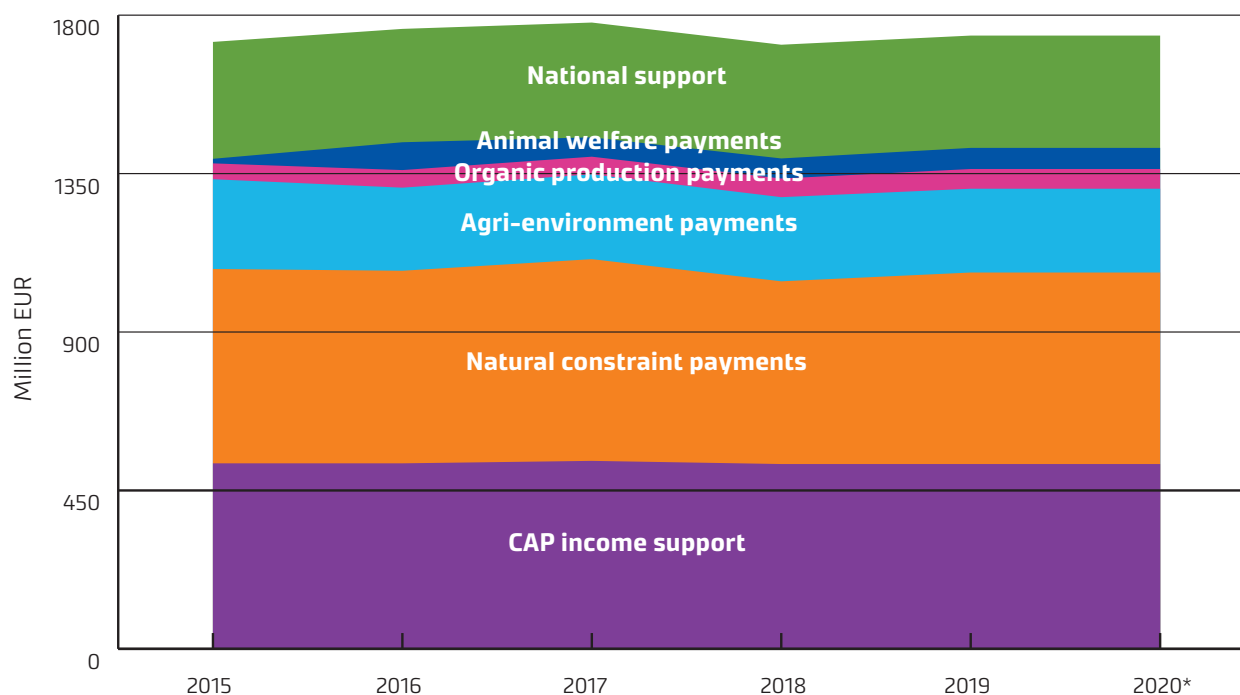
In 2007-2013, Finland's payments to less favoured areas totalled an average of EUR 421 million per year. The budget for 2020 is EUR 544 million. The amount of aid has increased, because a national supplement (approx. EUR 120 million) has been paid since 2015 as part of the EU-funded compensatory allowance. The EU contribution to the natural constraint payment is just under 20%.

Agri-environment payments

The agri-environment support introduced in 1995 is intended to compensate farmers who commit to measures to reduce the environmental burden of agriculture for income losses resulting from reduced production and increased costs.

Since 2015, agri-environment support has been called 'agri-environment payments'. At the same time, the three-tier system of basic, additional and special support measures was replaced by parcel-specific measures.

Composition of agricultural support in Finland in 2015-2020



EU agricultural support in Finland in 2012-2020 (fully or partly financed by EU), million €									
	2012	2013	2014	2015	2016	2017	2018	2019	2020**
CAP income support	539	539	524	527	527	534	525	525	525
Natural constrain payments	422	412	423	552	547	573	536	543	543
<i>EU contribution</i>	118	115	118	97	97	103	95	95	
<i>National share</i>	304	297	305	455	450	470	441	449	
Agri-environment payments*	363	379	369	255	236	241	239	238	238
<i>EU contribution</i>	107	112	107	107	99	101	101	100	
<i>National share</i>	265	267	262	148	137	140	138	138	
Organic production payments				45	50	50	53	56	56
<i>EU contribution</i>				19	21	21	22	22	
<i>National share</i>				26	29	29	31	34	
Animal welfare payments				13	79	55	57	60	60
<i>EU contribution</i>				5	33	23	24	25	
<i>National share</i>				8	46	32	33	35	
Total*	1,324	1,330	1,316	1,431	1,439	1,453	1,410	1,422	1,422
EU contribution, mill. €, total	764	766	749	755	777	782	767	767	
National share, mill. €, total	560	564	567	637	662	671	643	656	

*In the years 2012-2014 agri-environment payment also includes support payments to organic production and animal welfare
**Estimate

The aim of the agri-environment payments scheme is to promote biodiversity and reduce emissions from agriculture to air and water. Agri-environment payments are divided into the compulsory measure of balanced use of nutrients and optional parcel-specific measures.

All farmers committed to the programme must adhere to certain limits for the use of nitrogen and phosphorus in arable crops. Parcel-specific measures account for manure use and the promotion of biodiversity, for example.

In the 2007-2013 programming period, the average annual amount of agri-environment support paid in Finland was EUR 320 million. The EU contribution to the agri-environment support has averaged 28%. The agri-environment payments budgeted for 2020 total EUR 238 million, of which the national contribution is EUR 138 million. In addition to the agri-environment payments, a total of EUR 116 million is paid as compensation for organic production and animal welfare. Support for organic production and animal welfare aims to steer agricultural production in a more ethical and ecological direction.

National aid

Nordic aid, national aid for Southern Finland and certain other forms of support paid from national funds form a whole which aims to ensure the conditions for Finnish agriculture in different parts of the country and in different production lines. In connection with the EU accession negotiations, the basic principles for determining the level of national aid and for regional distribution were agreed. The aid must not increase production or exceed the total pre-accession aid level.

National agricultural aid in Finland in 2012–2020, € million.									
	2012	2013	2014	2015	2016	2017	2018	2019	2020
Nordic aid	328.2	317.4	314.7	296.5	285.7	296.3	294.5	297.3	296.3
National aid for Southern Finland	74.9	62.5	62.5	28.9	27.0	25.1	23.2	20.2	17.4
Nationally paid natural constraint top-up*	119.4	119.3	118.6	-	-	-	-	-	-
Other national aid	11.8	5.7	6.3	6.7	9.6	5.4	5.5	5.0	5.3
Total	534.3	504.9	502.1	332.1	322.3	326.8	323.2	322.5	319.0

*Since 2015, the national top-up for natural constraint payment has been paid as part of the EU payment scheme.

Nordic aid

The Treaty of Accession of Finland (Article 142) includes the right to pay national Nordic aid for regions north of the 62nd parallel and some adjacent areas south of that parallel, i.e. to support area C. A good 1.4 million hectares, or 55.5%, of Finland's arable land has been defined as eligible area.

Nordic aid consists of milk production aid, aid paid on the basis of livestock numbers and aid paid on the basis of the arable area. The scheme also includes greenhouse production aid and storage aid for horticultural products, wild berries and mushrooms, as well as headage-based reindeer husbandry aid.

In 2020, the total amount of Nordic aid will be close to EUR 296 million. The most significant individual forms of support are the Nordic milk production aid (EUR 160 million) and Nordic livestock headage aid

(EUR 78 million).

The effectiveness of Nordic aid is regularly assessed at five-year intervals. The latest evaluation report on whether the targets set for Nordic aid have been met and whether the instruments used in the scheme were still appropriate and justified was completed in 2016. On the basis of the evaluation results, the Commission and Finland held negotiations in 2016 on the continuation of the aid and on the development needs.

National aid for Southern Finland

In 2015, Finland transferred a significant share of the coupled support to Southern Finland to the direct payments fully funded by the EU. As a result, Southern Finland milk and beef production, sheep and goat husbandry and cultivation of starch potato, as well as outdoor production of vegetables, are now mainly supported by a scheme based on EU subsidies.

National income aid in Southern Finland is still paid for pig and poultry farming and horticultural production under Article 214a of the Single CMO Regulation and Commission Decision C(2014) 510 for the period 2014-2020. This legal basis under Community law to continue the payment of national aid for farmers in Southern Finland was approved by the EU institutions in the autumn of 2013. The total amount of aid paid in 2020 will be approximately EUR 17 million.

Structural support

Structural support aims to develop the operating conditions and competitiveness of agriculture by improving the efficiency and quality of agricultural production following the principles of sustainable development. In practice, forms of structural support include subsidies, interest subsidies and state guarantees. In 2019, some 2,350 subsidy decisions were made for farms within the scope of structural support, and the funding granted totalled EUR 154 million.

Agricultural investment payments aim to promote growing farm sizes and thus to reduce production costs. In 2019, investment payments were granted to 2,057 farms, totalling EUR 143 million, of which the establishment of dairy cattle farms has been the largest single topic, accounting for around 40%. In 2020 and 2021, the number of investments in dairy cattle farms is expected to decrease significantly, which will also lead to a slight reduction in the need for investment funding. The start-up subsidy paid to young farmers supports the passing on of business activities from one generation to the next. In 2019, the start-up subsidy was granted to around 280 farms, totalling EUR 9.4 million.

In 2020, interest subsidy loans can be granted to finance farm production buildings and purchase real estate and movable property related to the start-up subsidy paid to young farmers up to a maximum of EUR 250 million. The budget for 2020 is EUR 88 million for start-up subsidies paid to young farmers and for investments. It has not been possible for early retirement aid decisions to be made since 2018, but the budget for existing early retirement aid payments is EUR 45 million. Investment grants financed entirely from national funds are still awarded and paid from the Development Fund for Agriculture and Forestry. To ensure sufficient financing for investments during the change of the programming periods, EUR 90.3 million will be transferred to the Development Fund from the State budget for 2020.

Farm relief services

Farmers involved in livestock production on a full-time basis are entitled to 26 days of holiday per year. The Ministry of Social Affairs and Health is responsible for the management, control and co-ordination of farm relief services. Their purpose is to ensure that farming activities continue uninterrupted during holidays, and that substitute help is available in the event of illness or accidents. The number of farmers entitled to an annual holiday has decreased annually as the number of livestock farms has decreased. In 2020, the estimated number of entrepreneurs is 14,105, which is approximately 900 fewer than in the previous year. Ten years earlier, in 2010, there were 26,340 entrepreneurs. In 2019, a total of around EUR 135 million was spent on farm relief services, whereas in the 2020 budget the amount will be cut to EUR 123 million as a result of structural development.

Structural support, number of objects and funds (€ million) committed to these in 2012-2019.

	2012	2013	2014	2015	2016	2017	2018	2019
Number of support decisions	2,205	2,461	2,694	1,317	2,133	2,726	2,720	2,602
Funds committed, € mill.	73.1	92.2	92.3	52.8	96.9	119.2	133.7	153.8
Dairy and beef cattle buildings	363	376	319	116	255	311	305	310
Buildings in pig production	38	29	27	17	29	37	33	48
Horticulture investments	55	51	41	51	59	72	54	69
Sub-surface drainage	368	324	428	336	590	618	554	494
Interest subsidy loans for investments	129.9	140.3	105	60.1	103.9	128.9	135.7	159.3
Subsidy for young farmers	544	597	1108	127	300	312	474	281
Interest subsidy loans for starting farm, € mill.	60.9	68.9	134.9	19.4	45.1	46.3	67.4	39.6
Total interest subsidy expenses, € mill.	18.6	11.3	12.5	1.7	11.0	10.6	11	12.2

Source: Ministry of Agriculture and Forestry, Finnish Food Authority

Agriculture and food markets



Cereals market

Csaba Jansik and Anneli Partala

The Finnish cereals sector is self-sufficient for all cereals. Self-sufficiency was achieved for wheat in the early 2000s and for rye in recent years. With the exception of occasional milling and feed batches, the cereal processing industry relies on purely domestic raw materials. Finland's cereal stocks are high in comparison with other countries. This makes it possible in crop failure years to largely cover the demand with previous years' stocks, as the 2018/19 crop year has shown. The high level of self-sufficiency, high stocks, competitive disadvantages in exports, and underdeveloped export channels result in a low price level compared with European prices. Finland has the highest export potential in oats, where Finland has a comparative competitive advantage. Special oat products in particular have good opportunities on the export market. Cereal consumption is shifting from wheat to healthier cereals such as oats, the consumption of which has been driven by food-related innovations, high-quality research, and a diverse product range.

Cereals balance sheets

The international review period for cereal balances is the crop or market year. The logical start for the review period is 1 July, which means that the use of crops harvested in the autumn is monitored until the beginning of the harvest of the following year. The basis for the cereals market year is the new crop harvested during the late summer and autumn, which will be mostly used by the next harvest. This means that the balance sheet includes both supply and demand volumes for the same period.

In Finland, the current cereals balance is jointly monitored by the Finnish Cereal Committee and Luke four times during the crop year. The production figures for the new crop year beginning in the summer of 2020 have been calculated on the basis of the March sowing forecasts and the average yields in the last five years. The crop usage figures for 2020/21 are estimates.

Self-sufficiency has been achieved in wheat production

Wheat production doubled from 400,000 tonnes to 800,000 tonnes between 1995 and 2005. Domestic consumption already then varied between 600,000 tonnes and 650,000 tonnes, so some of the consumption had to be covered by imports. Self-sufficiency was achieved in the early 2000s, after which the imports of wheat have been low and sporadic.

The increase in wheat production, which started at the beginning of Finland's EU membership, continued steadily until the mid-2010s, when it exceeded one million tonnes. Until then, domestic use remained relatively constant despite the fact that wheat starch production, which consumed 100,000 tonnes of wheat, was driven down in the early 2000s. After the turn of the millennium, the steady growth in the feed use of wheat replaced both the decreasing bakery use and the disappearance of wheat starch production. Wheat was used considerably more in the feed industry's recipes, as well as on farms. The growth was strongly linked to the production of poultry meat, in which wheat is the main raw material.

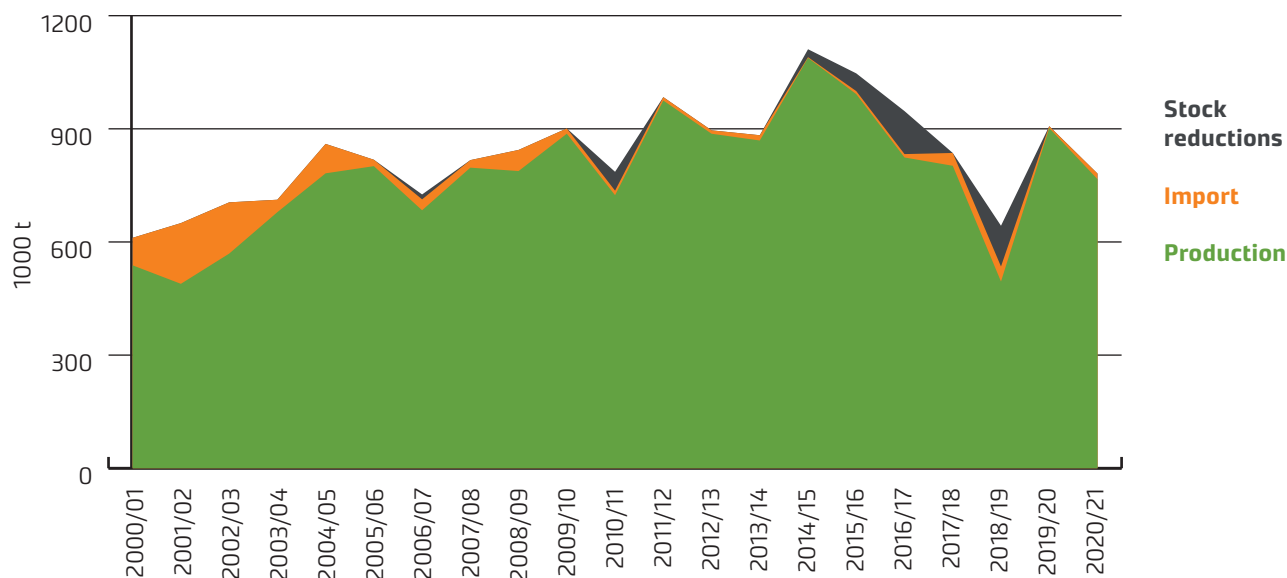
Between 2014 and 2016, peak yields were harvested, resulting in a high supply and low prices, which enabled the feed use of wheat to increase to a new

level. Between 200,000 tonnes and 300,000 tonnes of wheat were also exported during those years.

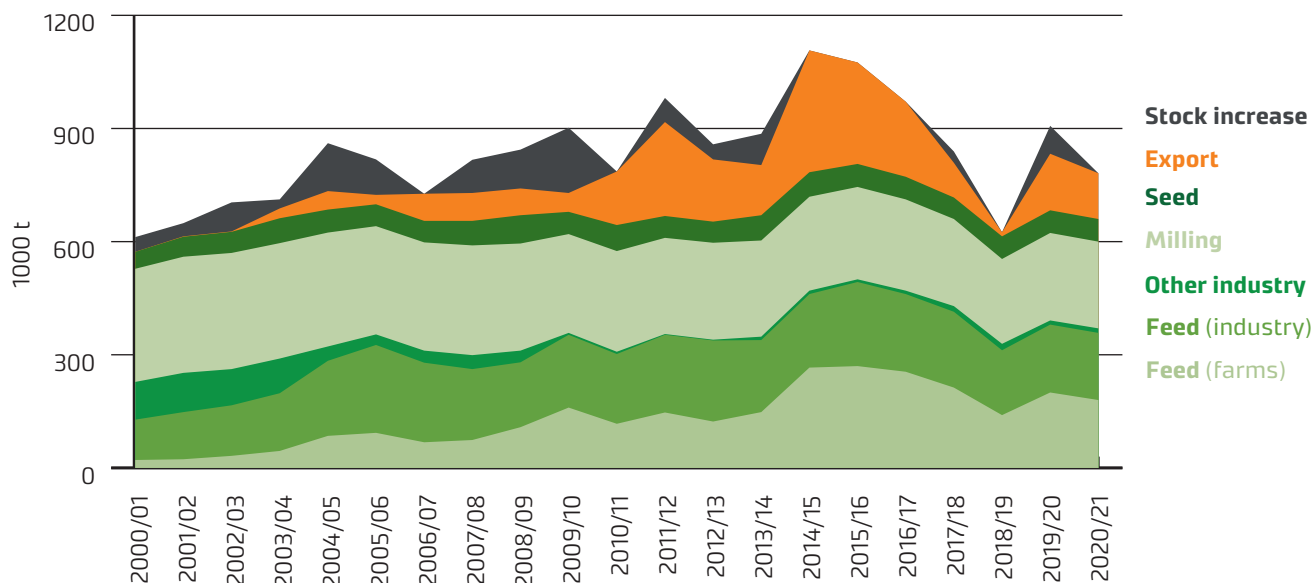
However, in good crop years, supply is also high in Europe's intensive production countries, and low world market prices, combined with Central European countries' average yields, which are one and a half to two times higher than in Finland, are putting the competitiveness of Finland's wheat production to the test. In Finland's challenging growth conditions, wheat production faces the challenge of obtaining a sufficiently high falling number and protein content. In addition, Finland mainly produces spring wheat, whereas the rest of Europe almost exclusively produces winter wheat, which provides higher yields. Thus, systematic export is hampered by this quality risk, which is typical of northern latitudes and can make Finnish wheat exports unprofitable. Finland therefore mainly exports basic bread wheat, for example, to countries in the Middle East. On the international fodder wheat market, Finnish wheat is not competitive. The export of wheat and barley also has a logistical disadvantage compared to oats, because their markets are further away, which increases freight costs compared with Central European producer countries.

Towards the end of the 2010s, production returned closer to domestic consumption, at a level of 700,000-800,000 tonnes. The extreme weather conditions experienced in the last few years, the most severe of which was the 2018 drought, has led to a huge variation in crop quantity and quality. The 2018 wheat harvest was the lowest since the turn of the millennium and well below domestic consumption. For the most part, the shortage due to crop failure was covered from stocks accumu-

Wheat supply in Finland in crop seasons 2000/01-2020/21



Wheat use in Finland in crop seasons 2000/01-2020/21



lated over the previous years, with limited wheat imports. The price of fodder wheat rose above the price of other fodder cereals, and the focus in the use of fodder cereals shifted to barley and other fodder crops during the 2018/19 season. However, the use of fodder wheat recovered thanks to the improved yield and lower price levels in the 2019/20 season.

The abundant wheat harvest in the 2019/20 season partly resulted from the favourable winter wheat sowing weather, which guaranteed a large winter wheat area. Average wheat yields were exceptionally high in winter wheat parcels. The rainy harvesting weather weakened the quality of spring wheat in particular.

In addition to the summer and harvest season weather conditions, the autumn 2020 yield is affected by the exceptionally mild and rainy winter with periods of severe frost, which has made it harder for winter wheat to survive the winter and has thus decreased the winter wheat yield.

Rye popularity has increased

Rye is Finland's second most important bread cereal. Rye bread is a strong pillar of Finland's rich bread culture, which involves age-old traditions and a lot of sentiment. In a vote arranged in 2017 as part of Finland's centennial celebrations, rye bread was chosen as Finland's national food. Rye is our smallest cereal in terms of production volume, and almost the entire crop is used as food. Since most rye is sown in the autumn, the autumn sowing conditions will be crucial for the following year's cultivation area and yield.

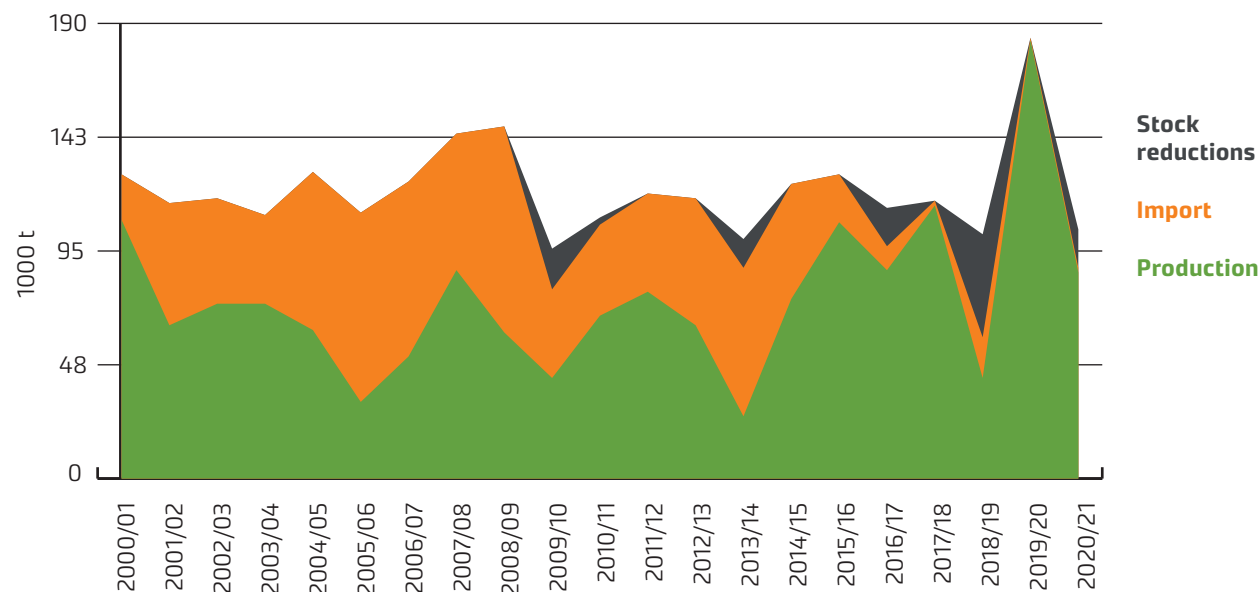
Against this background, it is rather embarrassing that the domestic rye harvest only covered around half the Finnish rye bread production until the mid-2010s and half of Finland's rye demand had to be covered by imports from the Baltic States, Poland and Germany. The volumes required in rye bread production varied between 86,000 tonnes and 100,000 tonnes over the last 25 years. The volume of imports varied between 20,000 tonnes and 80,000 tonnes before 2014.

The Pro Ruis association was founded in 2011 to resolve the situation. The association has promoted the availability of domestic rye and the development of the supply chain with the help of the entire rye chain. The commitment of the rye chain to self-sufficiency was also reflected in producer prices, and rye prices were kept at a significantly more attractive level in 2013-2017 compared with other cereals. The results of this cooperation and strong commitment have been reflected in rye production volumes since the 2015 harvest.

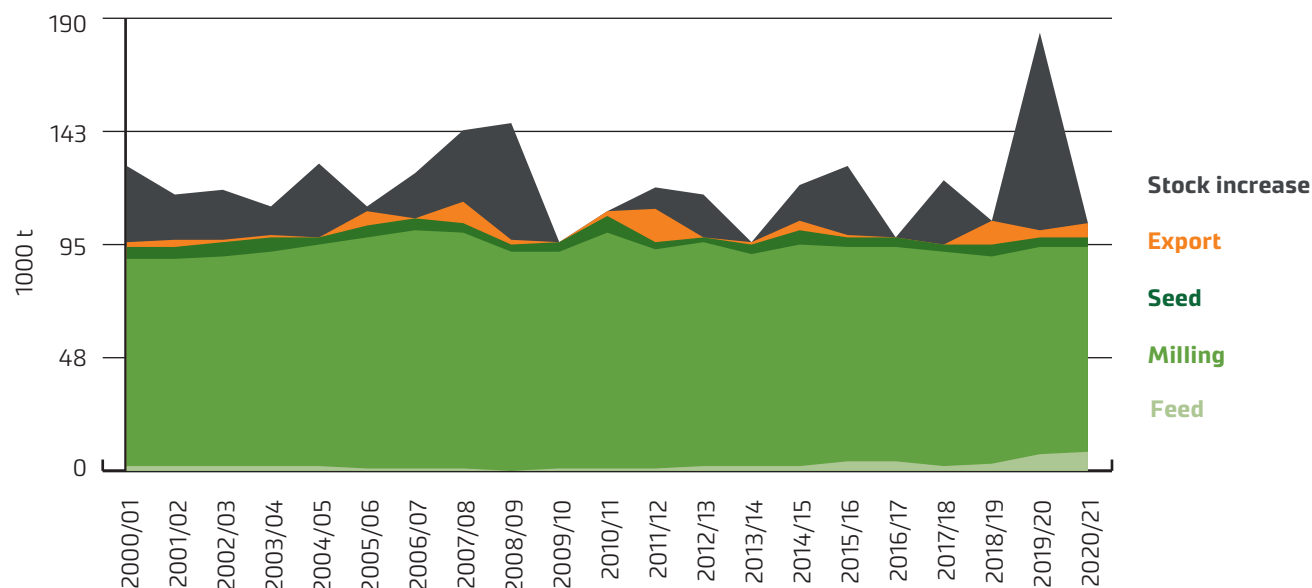
Rye self-sufficiency was achieved in the 2016/17 season, after which only limited import volumes have been needed. Even the demand in the 2018 crop failure year was largely covered by previous years' stocks.

The price of more than EUR 200 per tonne paid in the autumn of 2018, together with favourable autumn sowing conditions, saw an explosion in the popularity of rye cultivation. The 2019 summer harvest resulted in the highest yield in this century and was 183,000 tonnes. The supply is almost twice as large as the demand, which has had serious impacts on the balance sheet, and the price of rye has returned to the level of EUR 160 per tonne.

Rye supply in Finland in crop seasons 2000/01-2020/21



Rye use in Finland in crop seasons 2000/01-2020/21

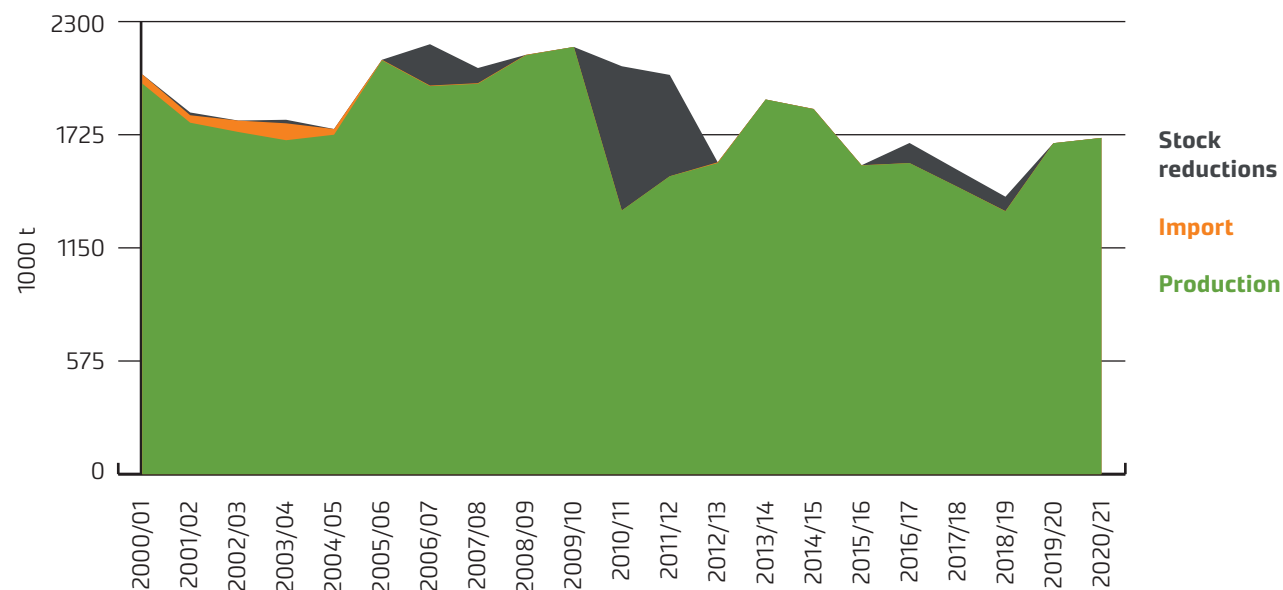


Rye differs from Finland's three other main cereal types in that it does not have alternative uses in addition to food. Export of rye is unrealistic due to the price level in Poland and Germany, the intensive production countries. The use of rye in feed has not gained popularity in Finland due to the scarcity of supply. However, feed is the mode of use that will in future be able to buffer minor imbalances in supply and demand.

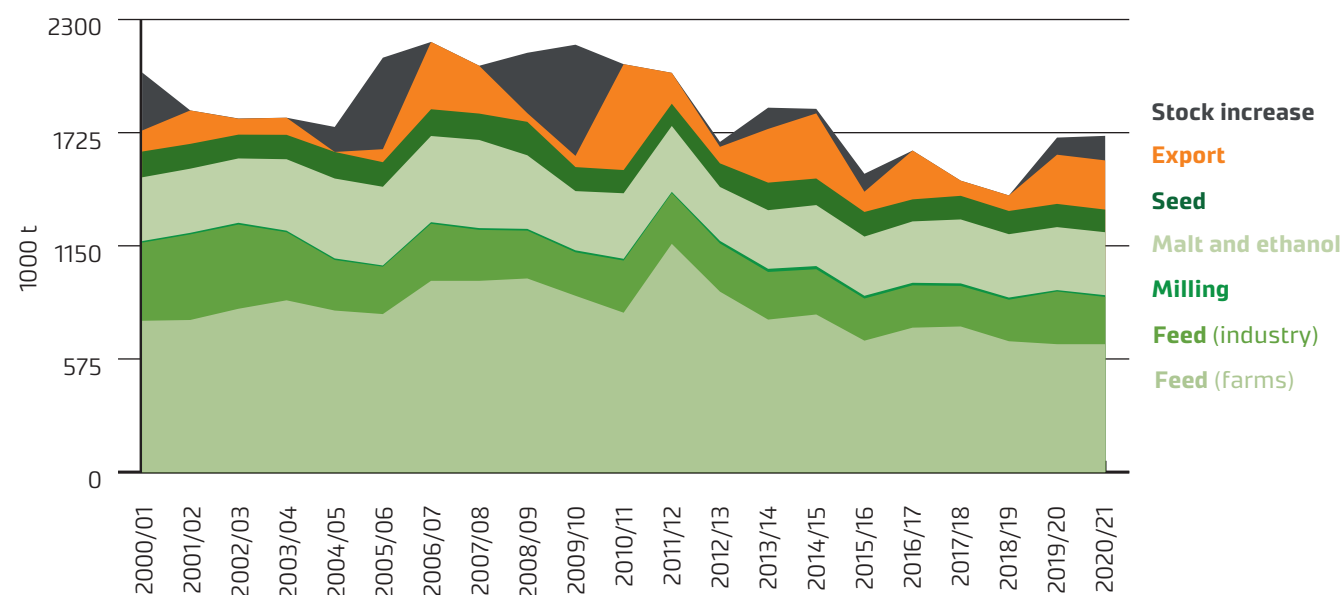
The use of rye in feed has increased slightly, especially during the last crop year, as a result of the use of rye on livestock farms. Domestic feed industry recipes will require more systematic feed production and larger volumes. In a number of countries, such as Denmark, Germany and Poland, rye is well established as a raw material for industrial feed.

Another market-balancing factor is the increase in contract production. The last crop year gave farmers a lesson in the importance of contracts. Farmers with a fixed-price contract continued to fetch up to the top price level of the previous winter, while the prices fell dramatically for batches produced without a contract. The possibility of contract production is widely available, and over the last two to three years, the level of contract production has significantly increased. After the record harvest in the summer of 2019, the fixed prices and market prices of contract producers varied considerably, and the price of uncontracted rye fell below EUR 100 per tonne. If all farmers understood and attempted to grow rye exclusively under a contract, this would improve the market balance for rye production and rye prices. However, the extent of rye cultivation is always affected by the weather in the autumn, because the autumn sowing period may be very short due to weather conditions.

Barley supply in Finland in crop seasons 2000/01-2020/21



Barley use in Finland in crop seasons 2000/01-2020/21



Barley has many uses

Barley has been the most cultivated of the cereal crops in Finland. This is because it has been the main fodder crop in the Finnish livestock sector, and because barley also has many other uses. In practice, production has always covered domestic demand, with no need for imports since the early 2000s. And even before that, the import volumes were small in relation to the total consumption.

In the second half of the 2000s, a peak harvest of 2-2.1 million tonnes of barley was achieved in four consecutive years, which is well above the level of domestic consumption of 1.8 million tonnes. The surplus barley was used to compensate for the poor harvests in 2009 and 2010, and the rest was exported partially based on intervention purchases. The record low prices paid for barley in these years showed that production exceeding two million tonnes was unprofitable, and there is a lack of motivation for the cultivation of such large volumes. The production level stabilised between 1.4 million tonnes and 1.9 million tonnes in the 2010s.

The domestic use of barley has been in the last five years between 1.3 million tonnes and 1.4 million tonnes. Compared to the fluctuations in previous decades, the main application of barley, i.e. as feed, has remained surprisingly stable, at around 900,000 tonnes. The actual use of barley in animal feed is even higher, as certain by-products of barley used by the ethanol industry are also used in animal feed for the Finnish livestock sector.

The use of barley for human consumption is the smallest of all cereal types, and the milling industry uses only about 10,000 tonnes of barley per year. The use of barley by other industries has also

remained constant: as a result of a slight decrease in malting needs and increased ethanol use, other industries have used 320,000 tonnes of barley annually for several years.

In addition to domestic use, 100,000-300,000 tonnes of barley have been exported each year. The high level of self-sufficiency is the reason - unlike in the case of the two important bread cereals, wheat and rye - that the production of barley covered domestic consumption needs even during the critical crop year of 2018/19. However, this was partly due to the fact that Finland's total feed requirements were supplemented by imports of maize from Eastern Europe totalling 70,000 tonnes. This exceptionally large import batch is not reflected in the balance sheet for our traditional cereal types. In the autumn of 2018, maize was sourced in the fear that as a result of Finland's poor domestic harvest, feed cereal volumes would be insufficient to cover the needs of the livestock sector. During the last crop year, barley production recovered and returned to closer to 1.7 million tonnes, which means that around 250,000 tonnes of this volume is again available for export.

According to the cultivation area forecasts for 2020, the same amount of barley can also be expected this year, provided that the weather conditions remain within normal range, and yields follow the average levels harvested in recent years. No significant changes in consumption levels are expected, except for a 3% fall in feed use, which is mainly due to a decrease in pork production.

Finnish oats have international potential

Oats are the second largest crop in Finland in

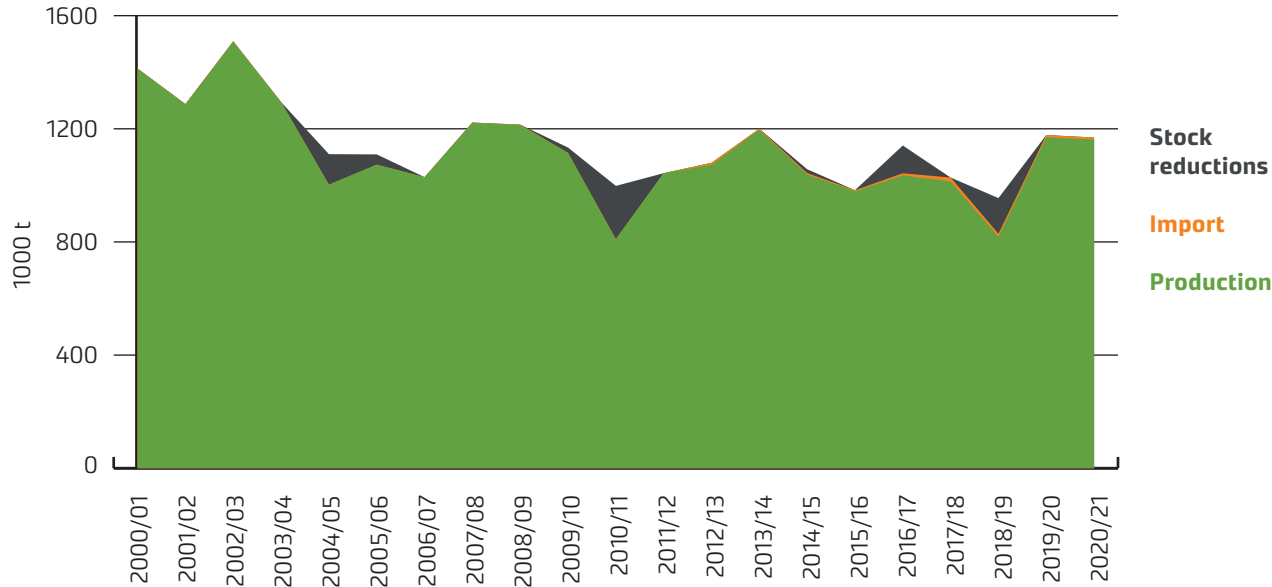
terms of production volume but by far the most significant from an international perspective. Every year, Finland is among the three largest production countries in the EU. Oats thrive in northern weather and light conditions, and the quality of Finnish oats is recognised on the international market. Almost every year, Finland exports the highest quantities of oats of all EU Member States. As a rule, oats are mostly sold for the needs of the foreign milling industry.

The most significant domestic use of oats is as feed for production animals. In the feed industry's recipes, wheat and oats are mutually substitutable, and in the 2000s and 2010s, the feed use of wheat increased partly at the expense of the feed use of oats. The feed use of oats fell from 700,000-800,000 tonnes in the 2000s to 500,000-600,000 tonnes within a period of a few years. The level of feed use of oats is determined by the price of oats in relation to the price of feed barley and fodder wheat. Over the last three years, the feed use of oats has stabilised at 500,000 tonnes.

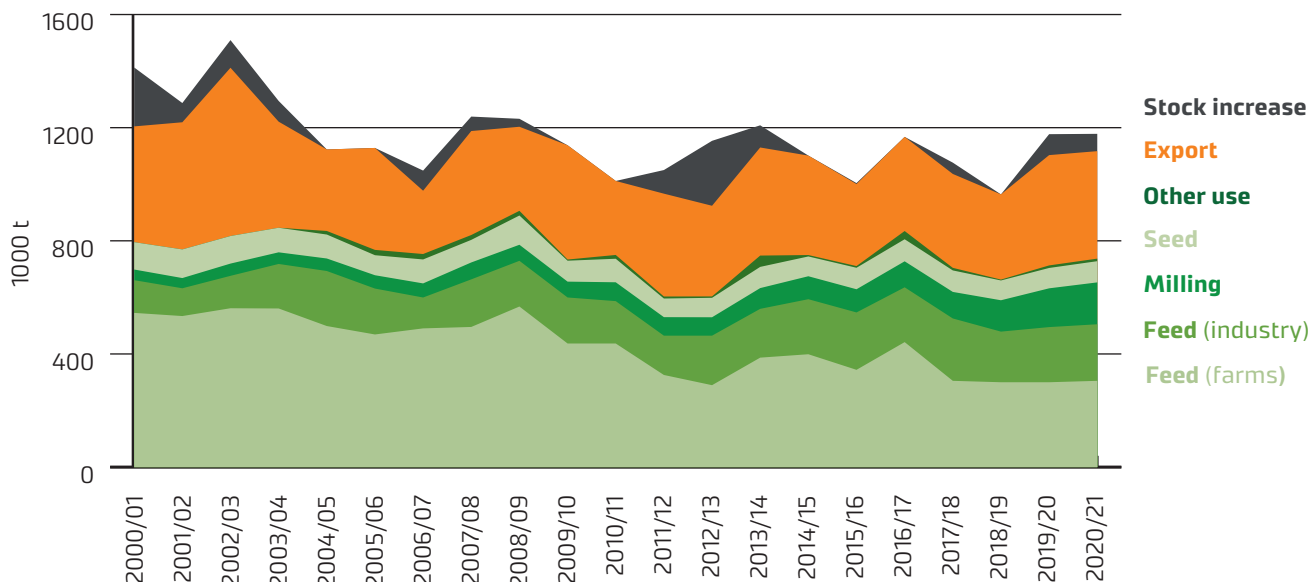
Oats are increasingly used for food production. While oat milling has steadily increased since the 1990s, the growth rate has accelerated significantly over the last three years, increasing from 90,000 tonnes to 137,000 tonnes by 2019. This is due to increased demand and the significant expansion of the capacity of oat milling by several large mills. The popularity of oat milling products is growing in both the domestic and export markets, and an increasing proportion of the oats used by mills is being exported in the form of finished products.

Considering the spring 2020 cultivation areas, the harvest in Finland this summer is expected to re-

Oats supply in Finland in crop seasons 2000/01-2020/21



Oats use in Finland in crop seasons 2000/01-2020/21



main at the previous year's level, assuming that the conditions of the growing season are normal. For the 2020/21 crop year, feed use is estimated to be at the level of the previous crop year, but food use will probably continue to increase to around 148,000 tonnes.

Oat products are the only product group in the Finnish milling industry that have realistic opportunities on the international market. The greatest potential is found in products made from special oats, such as pure oats or organic oats. It is therefore very important to collect information about and monitor the production volumes of Finnish organic and pure oats in the future.

The export of oats as grains will also continue. Thanks to their good quality and reputation, there is well-established demand for Finnish oats. If the expected 1.16 million tonnes of oats is achieved in the summer, exports are estimated to reach 380,000 tonnes in the 2020/21 crop year, i.e. close to the volume in the current crop year.

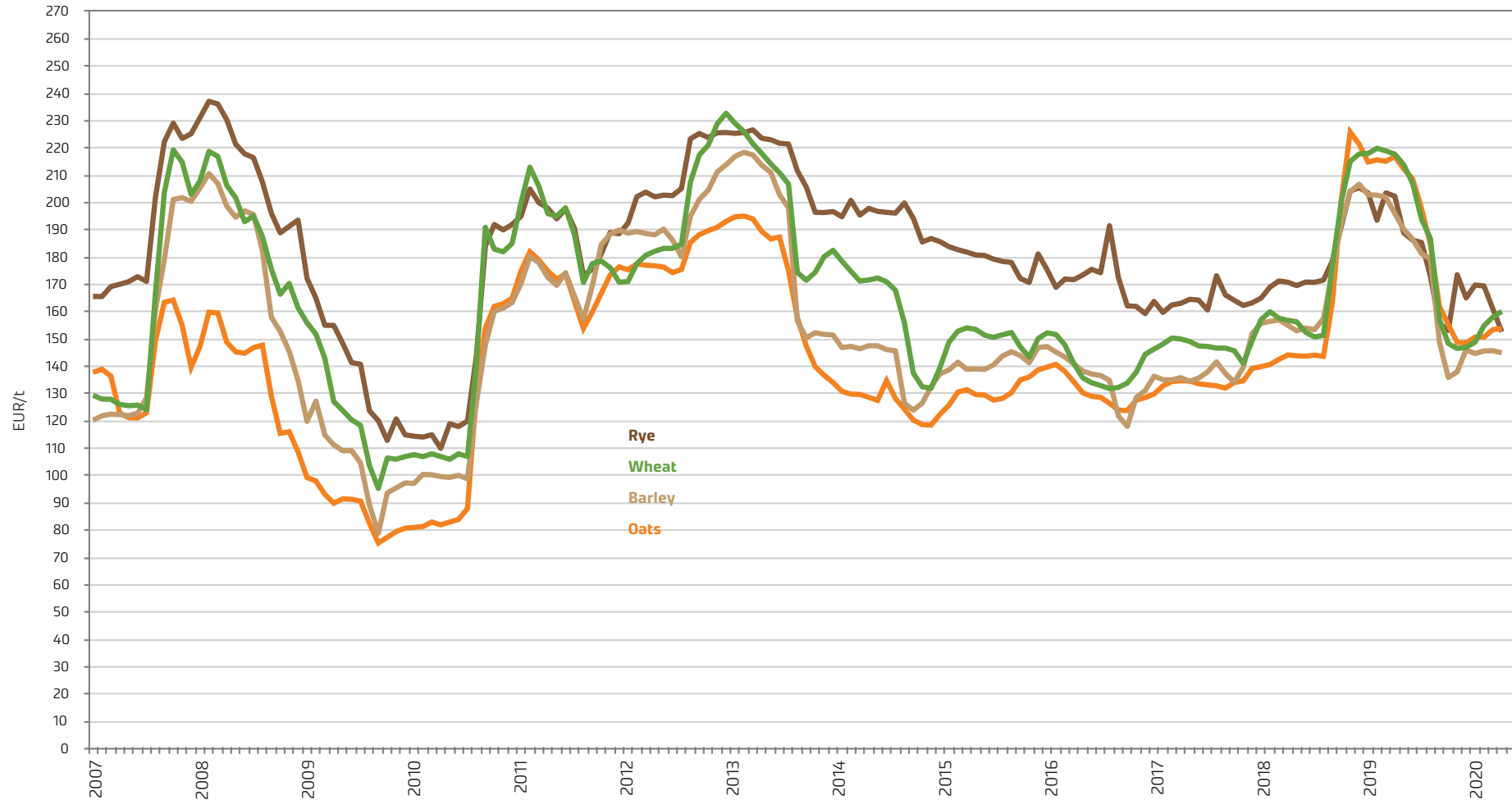
Price development

Next figure presents certain basic prices fetched by cereal producers (excluding possible quality premiums or adjustments) when delivered to the destination, i.e. the mill gate. The prices are the average prices of completed transactions and represent around 80% of all cereal sold to industry and trade.

Cereal prices have fluctuated extensively. In the last ten-plus years, there have been three significant price peaks, in the crop years 2007/08, 2010-2013 and 2018/19. The reason for these has always been a supply shock, either a global one

Monthly producers' grain prices in Finland, 2007-2020

Source: Luke



or one in the neighbouring regions, combined with a poor domestic harvest in Finland. The most significant price changes - the steepest increases and decreases - have always occurred during the summer at the time of the new harvest.

The last price spike was due to the drought-induced crop failure in the summer of 2018. Instead of the normal yield of 3.5-4 million tonnes, Finland's total crop yield was less than 2.7 million tonnes, which was the lowest during Finland's EU membership. Last year's good harvest restored prices to the

previous level, i.e. EUR 140-160 per tonne. The price level in the coming autumn will entirely depend on the weather conditions in the spring and summer and at the time of the harvest in Finland, the EU and the world's largest cereal production areas.

In addition to the yield, the level of stocks will also affect the price development. Just before the beginning of the 2020/21 crop year, Finnish wheat, barley and oats stocks are at least at a reasonable level, while rye stocks are at record high levels.

Self-sufficiency has been achieved for all cereals

Finland has been self-sufficient for oats and barley throughout its EU membership. The self-sufficiency rate for oats has been quite high and has allowed the export of 300,000-400,000 tonnes of oats each year. The barley self-sufficiency rate has remained above 100%, although surplus pro-

duction has decreased. For bread cereals, wheat self-sufficiency was achieved in the early 2000s, while for rye it was only achieved in recent years.

Consumption

The change in food culture over the past century has reduced the consumption of cereals, potatoes and milk in favour of meat and cheese, and partly also vegetables and fruit. A hundred years ago, rye and wheat were the most important bread cereals. The use of rye decreased rapidly in favour of light wheat bread. At the same time, the consumption of biscuits and various types of pastries increased rapidly. The development of the indus-

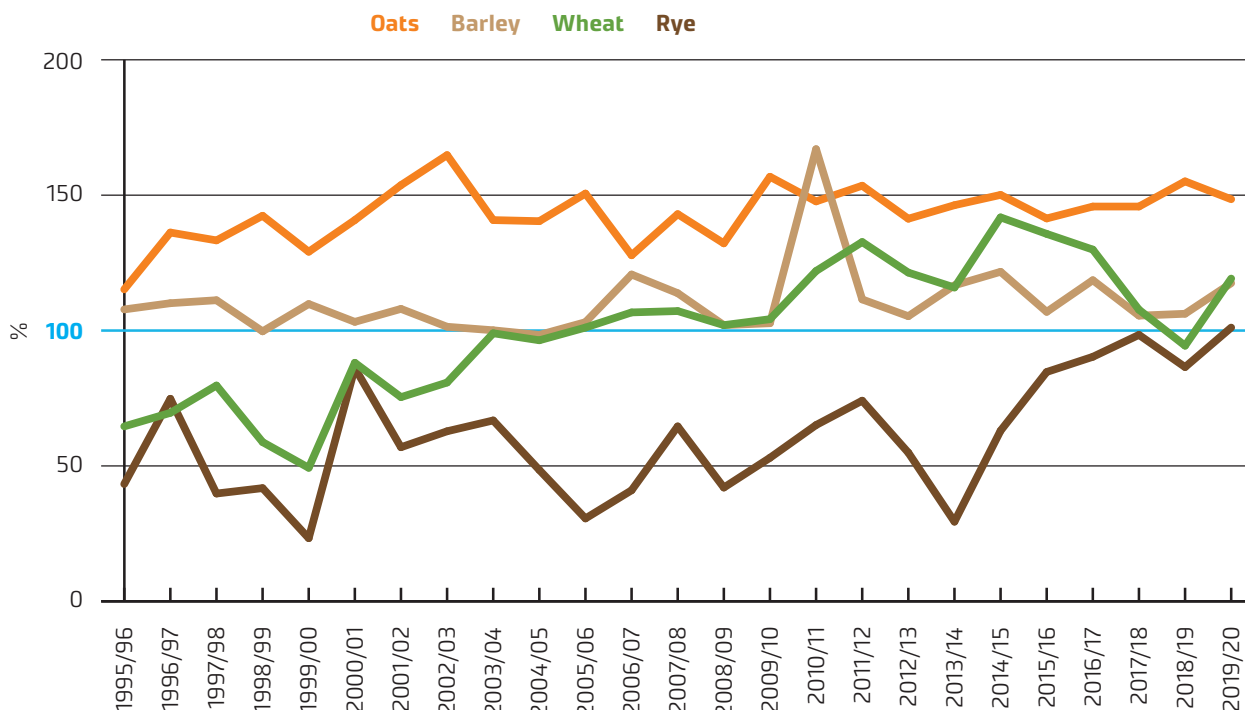
trial production of bread and pastry has shifted the focus of consumption from home-baked bread to purchased bread. At the same time, rye has been replaced by wheat. These trends continued - albeit more moderately - until the last years of the 20th century.

Health became a major trend shaping consumption in the 2000s. The health impacts of fibre were increasingly recognised, and the popularity of multi-grain and full-grain bread increased at the expense of light bread. The consumption of rye stabilised between 15 kg and 16 kg per capita, while the consumption of wheat fell from 50 kg to 45 kg per capita.

The clear winner of the increase in international and Finnish health awareness has been oats, the consumption of which was as low as 3 kg per capita in 2000. The consumption of oats has increased by 250% over the last two decades, and this growth is expected to continue at the same rate in the coming years. However, the consumption volume is still modest compared to the consumption of rye and wheat. Oats consumption is estimated to be 7.5 kg per capita in 2020.

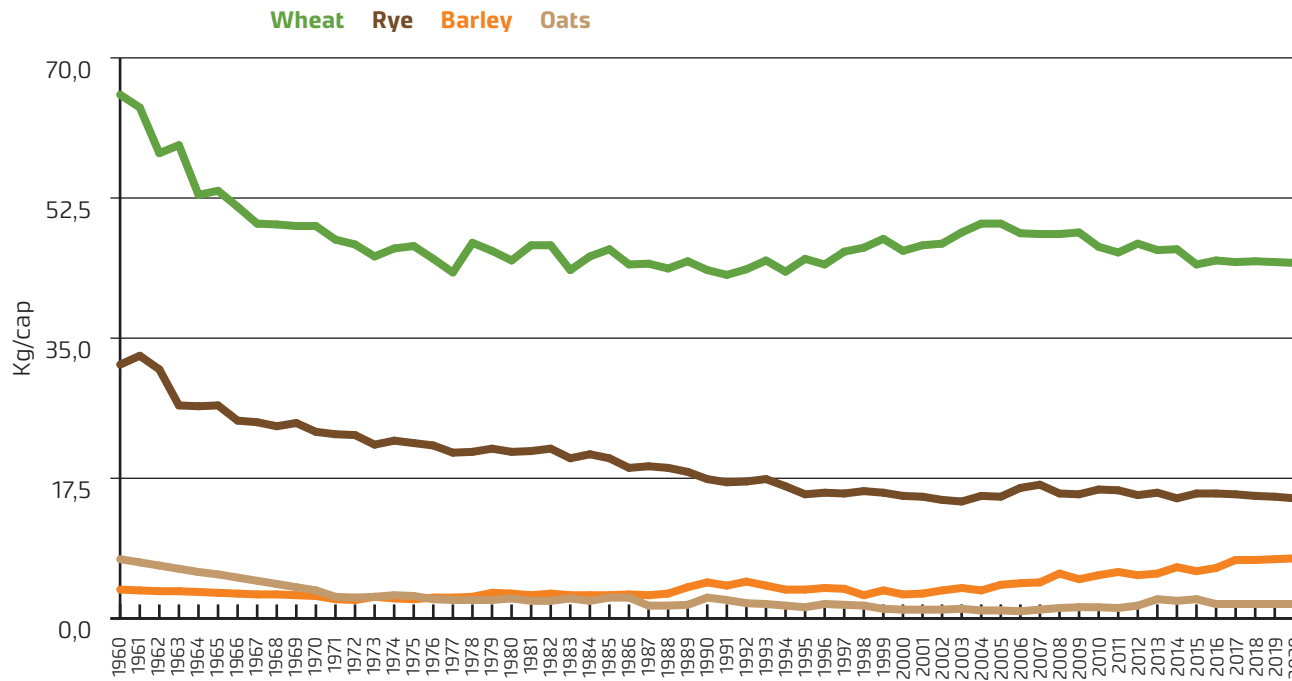
The popularity of oats is driven by new studies that confirm the multiple health benefits of oats for the brain, heart, blood circulation, and the stomach and intestines. The health claims associated with oats permitted by the EU in the 2010s further strengthened health awareness and the positive image of oats. One reason for the increased consumption is the diverse and innovative uses of oats: in addition to traditional bread and rolled oats products, new products are produced to replace drinks, snacks, pasta and meat. Oat products gained popularity as

Grain self-sufficiency rates in Finland, 1995-2020



Source: Own calculations

Consumption trends of grains, 1960-2020



Source: Luke, year 2020 is estimated.

a substitute for livestock products such as dairy and meat products. Because they are lactose- and gluten-free, oats are also well suited for the manufacture of special products for people with various food allergies.

In 2020, it is likely that the consumption of cereals will not change significantly, and the consumption of all four crops will remain at their current level. Wheat consumption is estimated to be 44.5 kg, rye 15 kg, oats 7.5 kg and barley 1.8 kg per capita. In the coming years, it is possible that in addition to oats, the consumption of rye and barley will also increase. The growth will depend on the rate of research progress and commercial innovation.



Meat market

Csaba Jansik

The self-sufficiency rate of Finnish meat production is close to 100%. The production volume of pork and poultry meat has covered domestic demand in recent years, while beef production accounts for 80-85% of consumption. In the foreign trade of meat, valuable parts of the carcass have traditionally been imported and less valuable parts exported. During the exceptional circumstances of 2020, the consumption of domestic meat has temporarily increased in relation to imports due to the suspension of the business activities of the HoReCa sector, the main user of imported meat. The annual volume of imports will be affected by the speed at which the situation in the HoReCa sector and industrial kitchens stabilises once the restrictions are lifted. Pork production is driven by pork exports to China, which started in the autumn of 2019 and which has also continued to be stable this year. For the first time ever, the consumption of domestic meat shows signs of decrease. This almost exclusively concerns pork. Beef consumption remains relatively stable, and poultry meat consumption is growing strongly.

Beef breeds are becoming more common in beef production

The most important driver for beef production is the number of cows. The number of cows affects the number of calves born, and the number of bulls and heifers for slaughter, with a delay of about two years. Another determining factor is the carcass weight of the animal. The carcass weight of bulls weighing more than 130 kg, which account for almost 60% of beef production, increased

from 336 kg to 366 kg between 2013 and 2019.

The share of beef breed cattle in Finland has increased, but the growth has been slow. At present, 81% of cows are dairy cows, and 19% are suckler cows. Seasonal variation is significant in beef breed holdings, where around 90% of calves are born in the spring. It is difficult to balance supply throughout the year. Seasonal pricing is used to distribute the supply more evenly throughout the year.

Rearing places decreased in the early 2010s due to the increasing number of farms abandoning production, and limited investments made in rearing places between 2010 and 2012. As a result, in 2013, most calves were stuck in dairy farms. Between 2014 and 2017, tens of thousands of new rearing places were established. Today, Finland has a total of around 250,000-300,000 rearing places.

Beef markets differ between different countries. In Denmark and the Netherlands, for example, consumers prefer younger beef or veal. In Finland, where approximately 50% of the consumption is minced meat, larger animals are better suited to the production chain. The larger size of the animals on Finnish cattle farms also partly reflects the provisions and the market situation in the 1990s. In 1995, cattle farms still had a limit of 90 bulls, and there was no investment aid at that time, so the cattle growth rate and carcass weight were crucial for profitability.

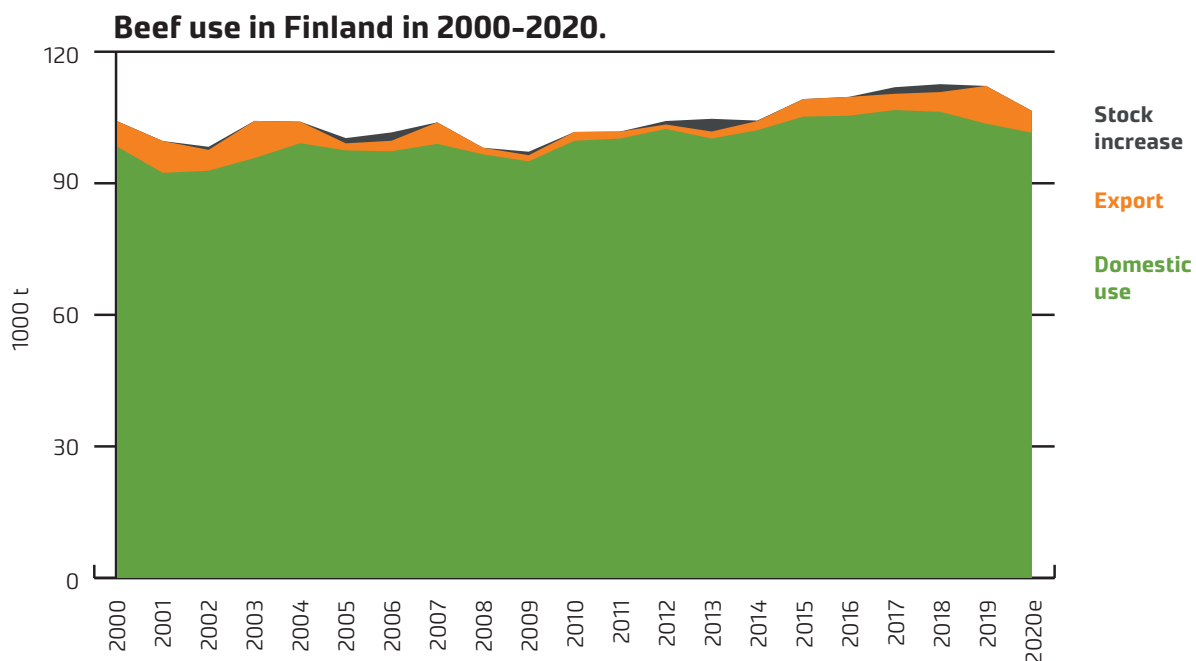
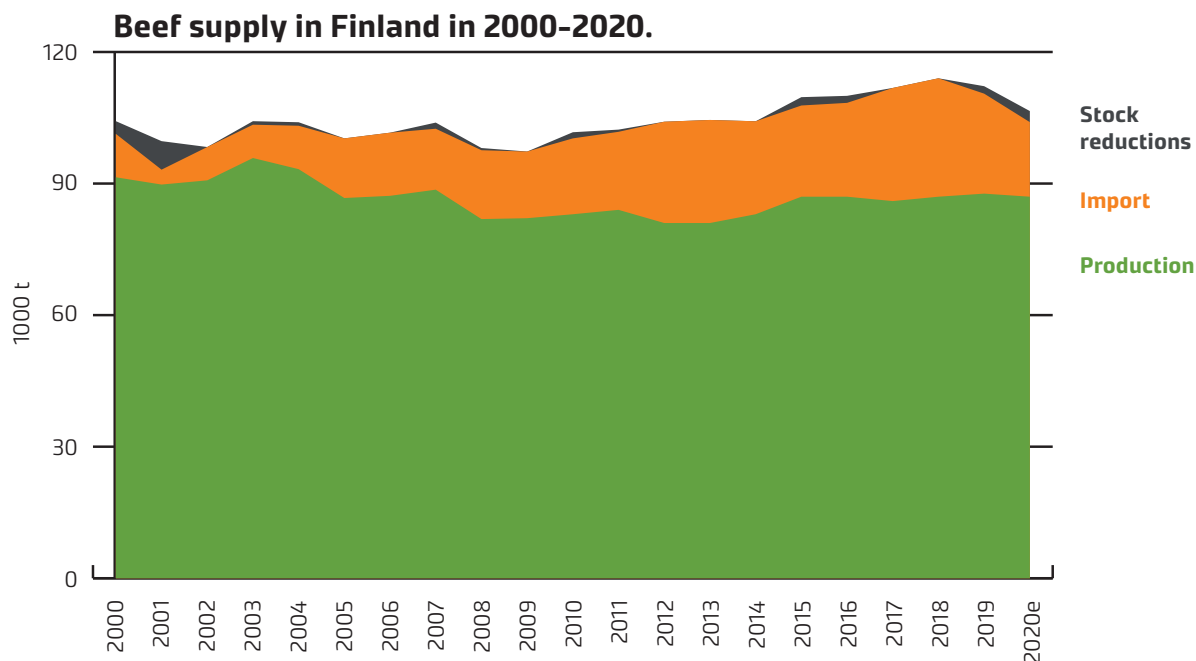
The importance and impact of subsidies on the performance of cattle farms has been significant throughout Finland's EU membership. Back when aid was granted for 24 months, cattle farms maximised their income from agricultural support and

grew their cattle for two years. Limiting the subsidised number of months to 20 in 2015 increased the efficiency of rearing and pressurised farms to achieve an optimal weight in a shorter period.

Developments in productivity have been achieved by improving a number of factors on cattle farms. For example, feeding and rearing conditions have been improved, which has led to faster growth and greater carcass weights in both bulls and heifers. Cross-breeding using beef breed semen has increased in dairy farms to 25% of all first inseminations. This has improved the animals' meat production characteristics.

In October 2019, the number of dairy cows fell below 260,000, and the actors of dairy chain no longer have an incentive to produce more calves. The maximum carcass weight has also been reached. In 2020, production is estimated to decrease slightly, to 85,000 tonnes. This estimate is based on two factors that have the opposite effect: (1) The number of dairy cows and as a result, the number of young cattle entering the rearing cycle is decreasing year on year. (2) A reduction in the loss and mortality rate helps to moderate the fall in production. An increase in cattle herd size, including dairy cattle herds, increases the disease pressure in the cattle chain. A big challenge in the cattle chain is infectious respiratory diseases, which cannot currently be managed in the same way as in the pig chain.

Restaurants are increasingly using beef imported from countries such as Poland, Germany and Brazil. The imports have mainly consisted of valuable carcass parts such as striploin and tenderloin. However, as a result of the exceptional circumstances in the spring of 2020 and the restrictions



Source: Luke and Kantar

on the HoReCa sector, beef imports will decrease, and domestic beef consumption will increase in the same proportion.

Pork exports to China are growing

In the period under review, i.e. Finland's EU membership, clear periods of growth and decline in pork production can be observed. The peak was reached in 2008, after which production has decreased steadily. The development of production has been driven by changes in demand. The sharp increase in production in the 2000s was on the one hand, export-driven: half of the increase in exports came from the Russian market, and half from other countries. On the other hand, increased domestic demand also stimulated production growth. Between 2002 and 2008, exports increased by around 30,000 tonnes, and domestic consumption by around 20,000 tonnes.

The growth in exports halted following the financial crisis of 2009, after which exports to Russia also started to fall. By the 2014 import ban, pork exports to Russia had already dried up to an insignificant level. The increase in domestic consumption continued to support pork production and mitigate the fall in production until 2016. The step decline in domestic demand, coupled with the increasing unprofitability of pig farms, has since resulted in a more than 10% decrease in pork production in a couple of years, from 190,000 tonnes in 2016 to 169,000 tonnes in 2018.

A comparison of pork producer prices with other countries shows that Finnish prices have followed price changes on international markets, but the speed of reaction of Finnish prices and the scale of changes have remained much more moderate

than in the reference countries. The main reason for this is the overwhelming weight of domestic sales channels relative to exports and the long contracts between industry and trade, which even out the pace of change. Export prices are directly determined based on the world market prices, while domestic sales are subject to much longer-term contracts covering several months. The pork sectors in Germany and Denmark are both highly export-oriented, so changes in world market prices are reflected in them almost immediately.

Although the demand for pork in Finland continued to fall in 2019, the opening up of exports to China prevented pork production from diving more deeply. In Finland's exports, the share of spot exports, i.e. surplus exports, has been significant. Around 14,000-15,000 tonnes of Finland's pork exports went to China. This mainly included side streams and certain carcass parts such as tails, feet, ears and bones. However, the range of pork exports to China is now increasingly focusing on more valuable parts of the carcass.

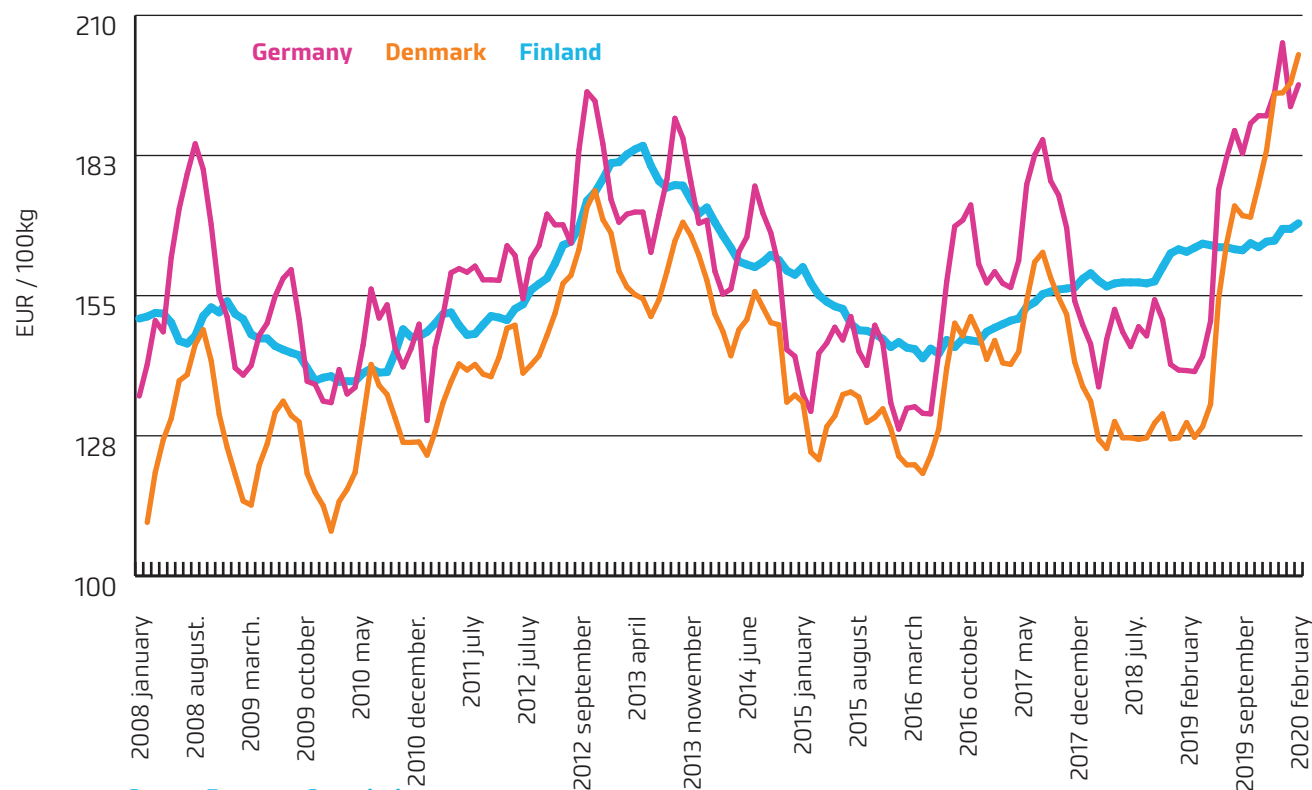
Export of quarter pigs, i.e. actual pig cuts, to China only really started in September 2019, but as a result of this, exports increased in 2019 from 22,000 tonnes in the previous year to 36,000 tonnes. This was sufficient to compensate for the decrease in domestic consumption. The consumption of domestic pork is estimated to continue to decline in 2020, and it is expected to be around 165,000 tonnes. At the same time, however, exports are expected to reach the previous year's volume due mainly to trade with China. In addition, the market position of domestic pork relative to imported meat will increase due to the restrictions imposed on the HoReCa sector in the spring of 2020. Imports are therefore estimated to decrease in the current year. If all these expectations materialise, domestic production will reach at least the previous year's level, i.e. around 170,000 tonnes.

If the foreign trade balance for pork improves for the above reasons more than expected, pork production could even slightly increase. The medium-term objective is to exploit the market potential in the Far East, particularly in China, and to increase the export volume. The trend in production (a decline or an increase) will entirely depend on the trend in exports in the next few years.

There is no doubt that two global diseases - ASF (African swine fever) and COVID-19 - will shape the foreign trade flows of pork in 2020, but the concrete mechanisms involved and the magnitude of the impacts are less clear. It is especially difficult to predict the coronavirus situation and its impacts for the remaining year.

As a result of Chinese ASF infections, the world market price for pork started to rise sharply at the

Development of producer prices of pig meat (CLASS E) in Denmark, Germany and Finland in 2008-2020

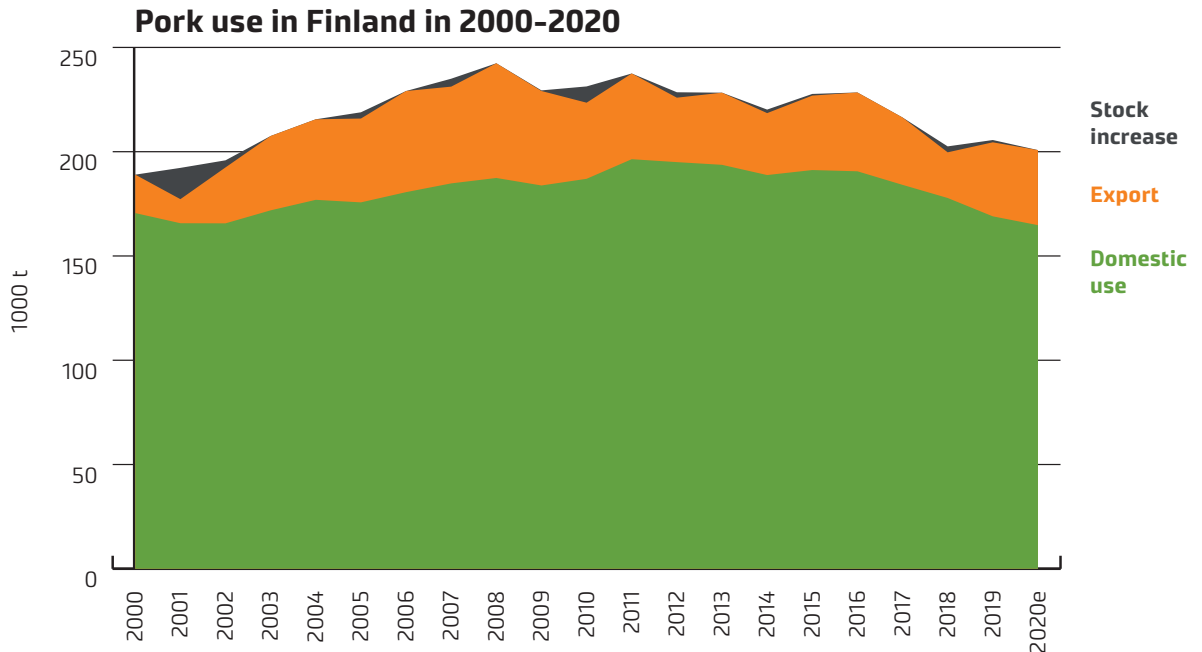
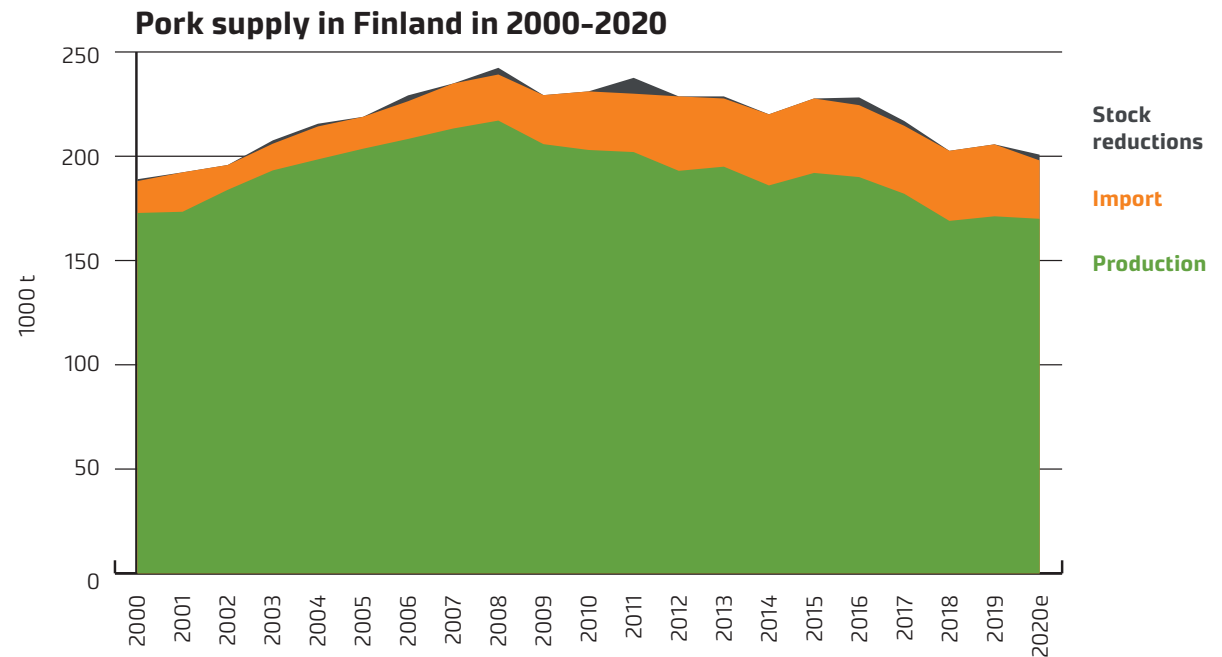


Source: European Commission

beginning of 2019. The Chinese ASF situation gives reason to expect that pork demand will continue to be strong in China in the coming years. According to China's own and international calculations, Chinese pig production will not reach the levels preceding the ASF crisis (i.e. the 2018 levels) until 2024. China's share of world pork imports has the potential to increase from 17% to 23% by 2020, although several experts warn of the deterioration in China's ability to pay due to the coronavirus crisis and its negative impacts on more expensive food such as meat. However, China already lost more than half its domestic production in 2018 due to ASF, so there may still be a need to compensate for it. Opportunities to increase exports will probably be available to EU Member States, as well as to Brazil and Canada. In Europe, large exporting countries such as Germany, Denmark, Italy and Spain can most easily increase their export volumes, but the market situation also provides a good opportunity to increase Finnish exports to China.

However, ASF also jeopardises the realisation of market opportunities for Europe. According to the latest information, the disease has already travelled to within only a few dozen kilometres of Germany's eastern border. ASF jumped from eastern to western Poland within a few months and has infected one of the largest production units in Poland (Beek 2020).

The possible spread of ASF to Germany would entail a massive influx of exports intended for China in the EU's internal market, resulting in unprecedented market disturbances, sudden price changes and the dumping of pork. Through German retail chains, which have spread across every European country, German pork would find its way quickly and easi-



Source: Luke and Kantar

ly even into the most remote parts of Europe. This is also a real danger for Finland, because Germany's share of Finnish pork imports has increased from 56% in 2011 to 81% in 2019. In 2011, only 9,300 tonnes of pork were imported from Germany; last year, the figure was nearly 17,000 tonnes.

It is important to remember that ASF has also spread to Finland's immediate neighbours, Russia and the Baltic States. The eradication of ASF has proved an insurmountable challenge for many countries where the infection has remained for several years. The only successful country is the Czech Republic, which managed to eradicate the disease in a relatively short period. The situation is also promising in Belgium.

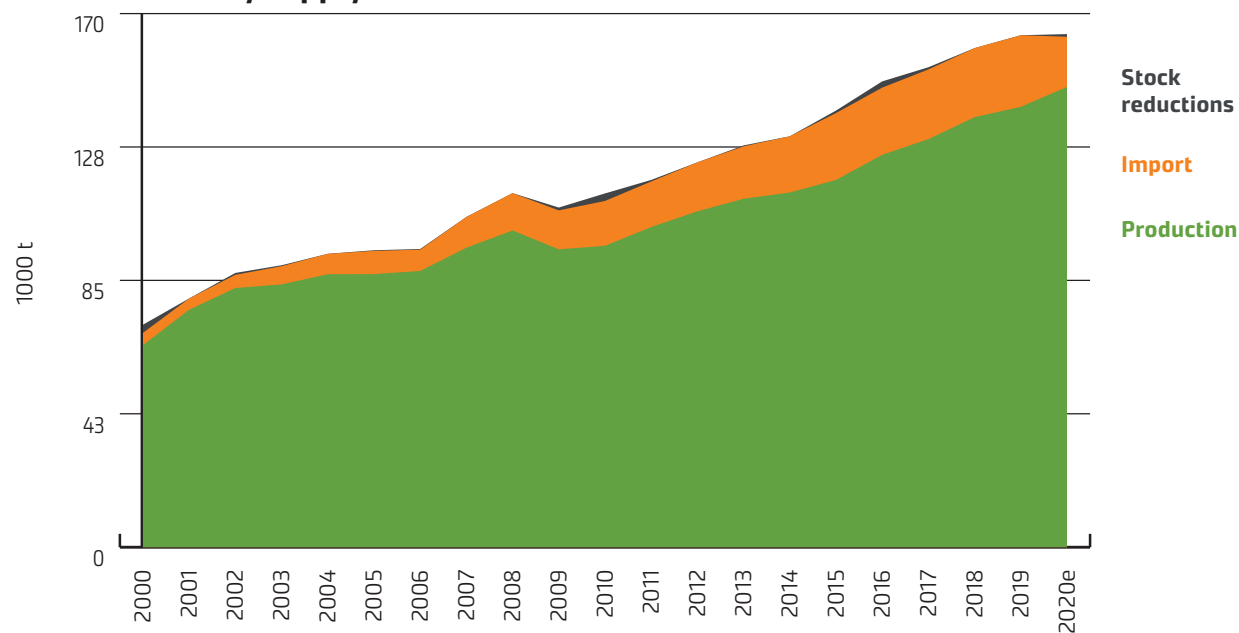
The coronavirus will probably affect the foreign trade in pork through indirect mechanisms such as the disease situation in importing and exporting countries, increased protectionism, the closing of borders or logistics routes, or the availability of transport capacity, feed raw materials or other production inputs. However, it remains extremely difficult to estimate the impacts. It is clear that the longer the pandemic lasts, the greater the risks to realising the world market potential.

Poultry meat is very popular

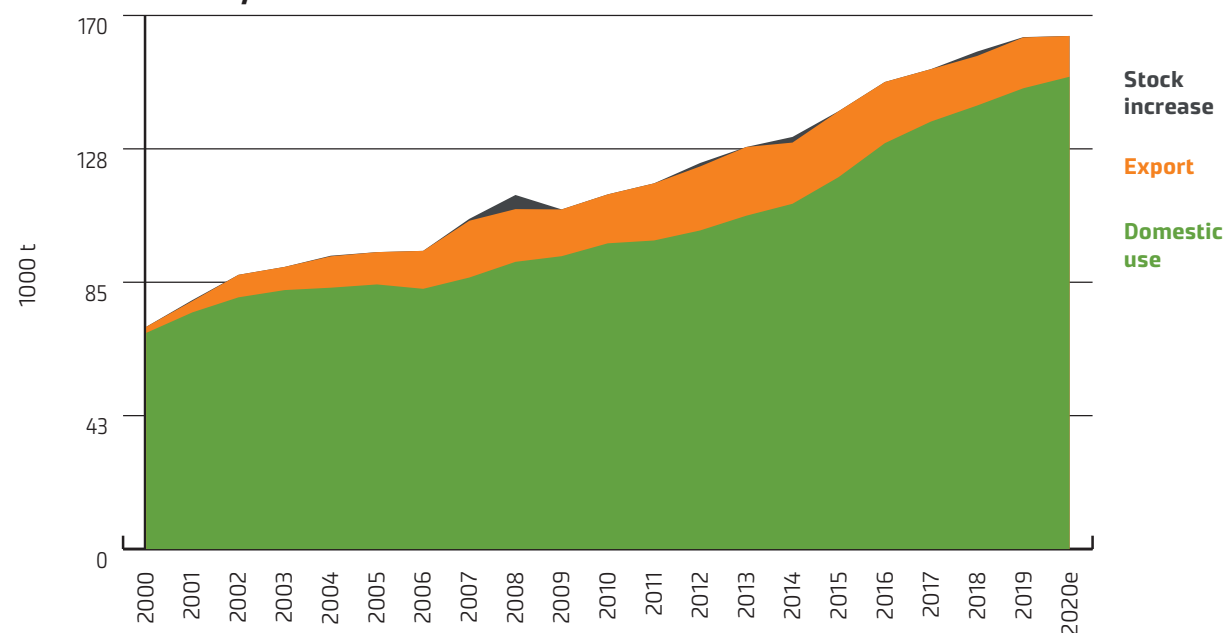
The situation of poultry meat is unique compared to other meats. Its demand has grown steadily in Finland, as well as in Europe and the world. International forecasts (e.g. by the OECD and FAO) expect the long-term trends to continue in the next decade as well.

The popularity of poultry meat is based on its health benefits, low environmental impact and low

Poultry supply in Finland in 2000-2020



Poultry use in Finland in 2000-2020



Source: Luke and Kantar

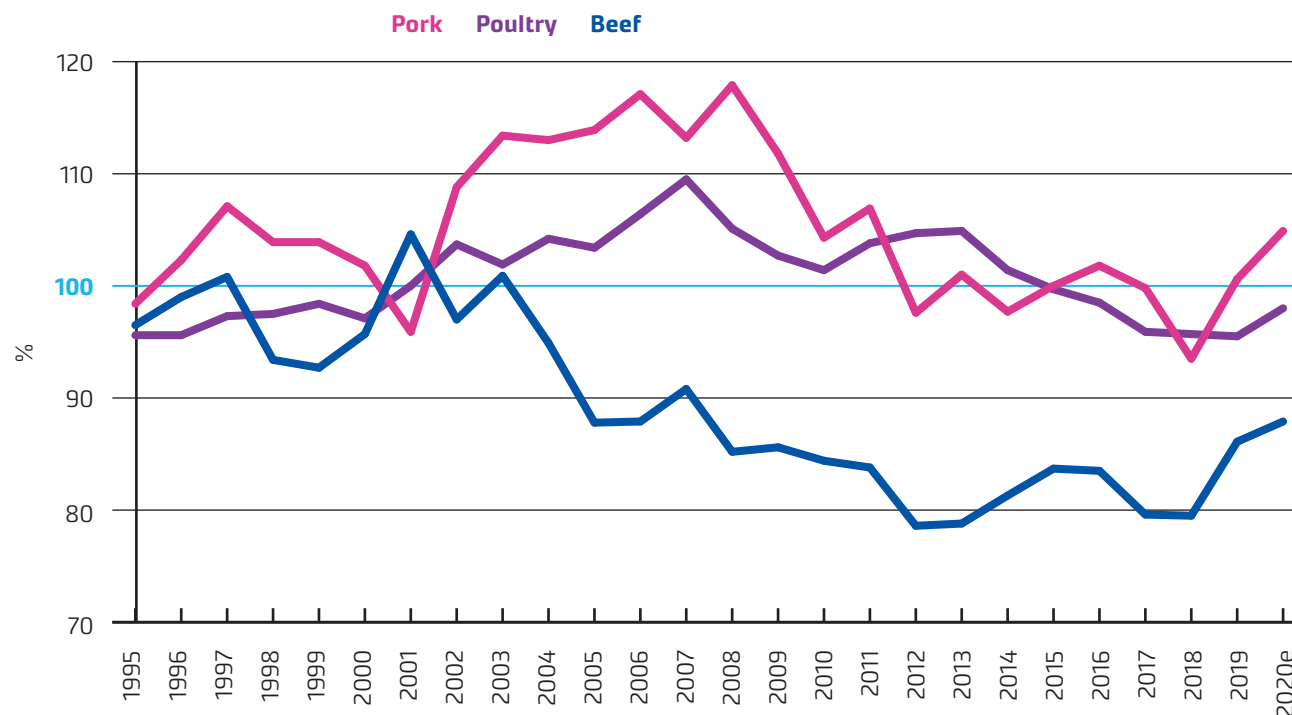
cost. Consumers also appreciate its convenience and versatility in cooking. Poultry meat is not burdened by religious or cultural consumer habits anywhere in the world. Production also has its own advantages. The biological and production cycles of poultry meat are fast, making it easy to regulate supply and react to even rapid price changes. Production is also easily scalable.

In Finland, the production of poultry meat has been developed in a controlled manner to meet the growth rate of domestic demand. This has been possible due to the concentrated farm and industrial structure, and strong chain integration. In the last decade, production rose by 46%, and consumption by 51%, which meant that by the end of the decade, supply, which had matched the level of domestic demand in 2010, fell slightly behind the pace of demand. In 2019, almost 147,000 tonnes of poultry meat were consumed in Finland, with production at 140,000 tonnes.

The weight of foreign trade in the poultry balance sheet has increased from less than 10% in the 2000s to 15% in the 2010s. The above trends in domestic production and consumption in the 2010s also mean that exports and imports, which were roughly balanced in 2010, have also developed at slightly different rates. By 2019, imports already exceeded exports by more than 6,000 tonnes. In 2019, imports accounted for 15.5% of domestic consumption, while 11.5% of Finland's production was exported.

These growth trends are also expected to continue in 2020. However, as a result of the exceptional situation caused by the coronavirus, the position of domestic meat is expected to strengthen. Supply

Self-sufficiency rates of meat in Finland, 1995-2020



Source: own calculations based on meat balance sheets

will probably begin to catch up with demand, and the gap between them is expected to decrease to 4,000 tonnes. In 2020, both imports and exports are expected to decline compared to the previous year.

Self-sufficiency is high for all meats

The beef self-sufficiency rate fell in the 2000s from 100% to 80-85% and has remained at that level for almost the entire 2010s. In 2019, the self-sufficiency rate increased as the slight decrease in domestic consumption pushed down imports, while domestic production increased slightly. In 2020, the rate may ultimately be close

to 90%, depending on the consequences of the COVID-19 situation.

The pork self-sufficiency rate has long remained at around 100% in a market situation in which domestic production has matched domestic consumption, and exports and imports have been roughly at the same level. In 2018, the rate decreased significantly below 100% for the first time since the turn of the millennium. The reason was a sudden drop in domestic production, partly due to a general lack of profitability and partly due to a significant salmonella outbreak on a sow farm.

Since then, the self-sufficiency rate has again exceeded 100% due to a strong decrease in domestic consumption. In the future, self-sufficiency will be affected, among other things, by competition in imported meat and Finland's position in the pork export market.

Poultry meat production has long been developed in line with the growth in domestic consumption, but in the second half of the 2010s, the poultry self-sufficiency rate fell below 100%. At that time, with the problems of one of the largest domestic broiler meat processors at their height, the commercial operators balanced the market by importing more broiler chickens than usual. In the coming years, the poultry meat self-sufficiency rate will probably stabilise again at a level of 100%.

The structure of meat consumption is changing

Meat demand began to rise in the 1960s as the standard of living improved. The increase in meat consumption was first due to pork, the consumption of which doubled in the 1960s and 1970s. Since the 1980s, the increase in total meat consumption has been attributed to the popularity of poultry meat. It resulted in a sharp increase in meat consumption, especially in the 1990s. The growth curve of total consumption levelled off in the 2010s. The long-term increase in meat consumption was due to the shift in the consumption structure from low-cost basic crops such as cereals and potatoes to the more expensive processed cereal products and meat.

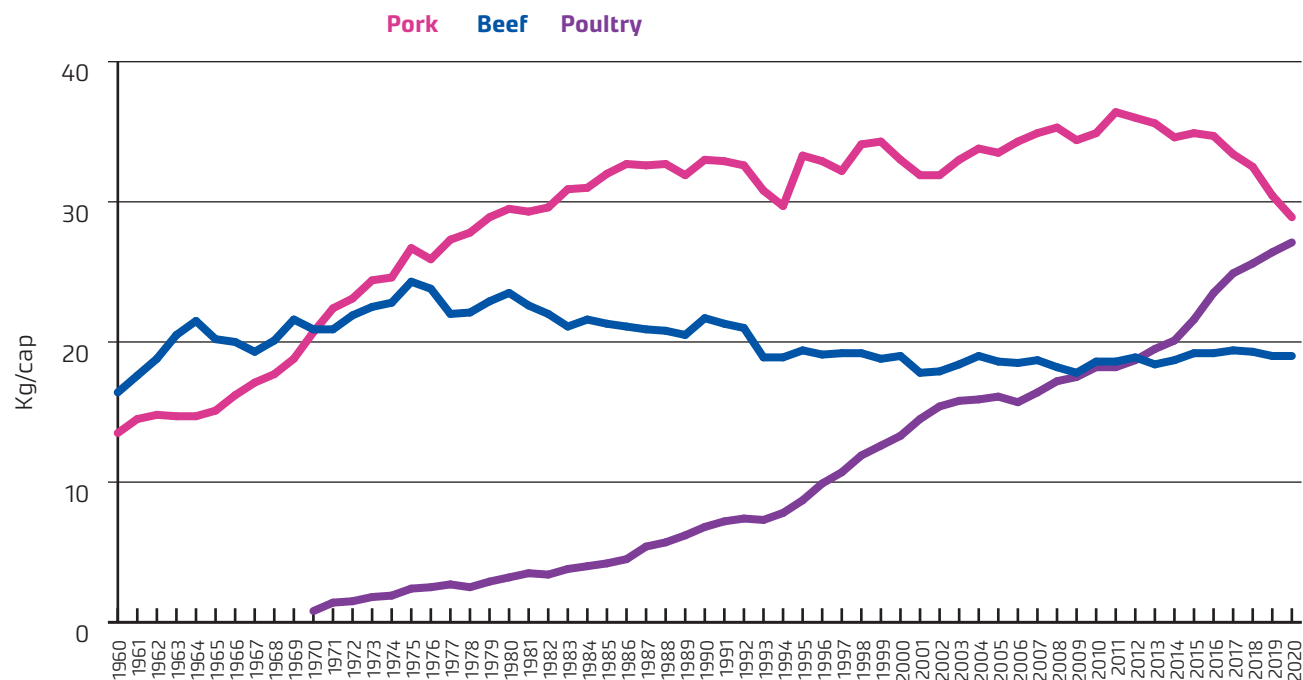
Over the last decade, total meat consumption has increased moderately, while the consumption structure between different meats has changed

significantly. Only beef consumption has been stable over time: it has remained at 18-20 kg per capita for almost 30 years. The reason for the stable beef situation is the consumption patterns typical of Finland, where more than half of all beef is eaten as minced meat. This also enables the use of less valuable carcass parts.

The public debate questioning the consumption of meat for ethical, nutritional or climate reasons seems only to have cut the consumption of pork. It fell by more than 12%, from 35 kg to 30.7 kg per capita, between 2016 and 2019. This trend is also remarkable, because cattle have often been the

target of accusations in the climate debate. Like beef, pork is red meat. The decline in pork consumption is explained by the fact that it lacks any significant characteristics that would distinguish it from other meats. The public image of broiler meat is good, and its popularity is growing all the time. Beef, on the other hand, is considered a prestigious festive food. Pork does not have a similar image that would drive consumption. The most important pork products in Finland are the striploin and tenderloin in raw meat products, and cold cuts and sausages in cooked and processed products. Elsewhere in Europe, for example, in Germany and Spain, pork is a popular main dish

Consumption trends of meat in Finland 1960-2020



Source: Luke, year 2020 is estimate.

in restaurants. In Finland, the only notable exception is the Christmas ham, but its consumption is limited to one clear carcass part and time period.

The popularity of broiler meat is increasing for a number of reasons: it is light, easy to prepare and considered healthy. The popularity of broiler meat is evidenced by the fact that its consumption has increased from 20 kg to 26.4 kg per capita in 2014-2019, i.e. almost 6% per year.

The consumption of poultry meat has replaced some of the consumption of pork in recent years. The consumption of standard pork products, striploin and tenderloin, and ham has not changed significantly, so the structural change has largely taken place in other product groups. The retail trade has decreased the low-priced sale campaigns for pork and pork products, and the industry has replaced pork with broiler and turkey meat in frankfurters, sausages, cold cuts and barbecue products. Consumers have started to favour new products in which poultry meat is used as a raw material. In addition, they have started to more appreciate fresh broiler and turkey meat.

The consumption trends of recent years are also expected to continue in 2020. Beef consumption is estimated to fall by 2%, and pork consumption by 4% in the current year, while poultry meat consumption is estimated to increase by almost 3%. According to these estimates, the consumption of beef, pork and poultry meat in 2020 would be around 18 kg, 30 kg and 27 kg per capita respectively.

According to preliminary data, total meat consumption in Finland decreased by around two kilos in 2019 from the previous year, i.e. from 81.3 kg to 79.4 kg per capita. If other meat consumption (mutton, horsemeat, game, etc.) does not change, total meat consumption will probably fall by around half a kilo per capita in the current year to 78.9 kg. It has also temporarily decreased by 1.0-1.5 kg on several occasions in previous years but has since continued to grow. This would therefore be the first time that total meat consumption has decreased for two consecutive years.

As beef consumption is unlikely to change significantly, the total consumption of meat will depend mainly on the consumption of pork and poultry meat in the coming years. If pork consumption stabilises, and poultry meat consumption continues to grow, total consumption may even start to increase again. The same will happen if poultry meat consumption increases more quickly than pork consumption falls. In any case, the consumption of poultry meat is expected to exceed that of pork in 2021 or 2022.



Dairy market

Olli Niskanen and Sanna Vuorisalo

The average producer price for milk passed the 40 cent mark at the end of 2019 for the first time since 2015. Domestic demand for dairy products remained generally stable, except for a decrease in the consumption of liquid milk. The producer price was supported by stabilisation of dairy product import growth and an increase in the value of exports. In 2015, the volume of milk production turned to a downward trend, and it continues to adjust to market demand even today. Structural development has progressed rapidly: the number of producers fell by as much as 7% in 2019, but at the same time, a record number of enlarging investments by developing farms are underway. Another significant change concerning the primary production is the announcement by Valio Group, which collects more than 80% of all milk produced, that they will start to apply farm-specific production volume contracts from the beginning of 2021. The market uncertainty caused by the coronavirus weakens the outlook for the near future for the continued positive development of prices, but in Finland, the effects will probably remain moderate.

Total milk production decreased slightly

The number of milk producers decreased by 7% during 2019. At the end of the year, milk was produced on 5,783 farms, of which 142 produced organic milk. The amount of milk delivered to dairies in 2019 totalled 2,262 million litres (2,334 million kg), which was 23.3 million litres (24.1 million kg) less than in 2018. The total milk volume has gradually decreased every year since 2015. Organic milk accounted for approximately 74 million litres of to-

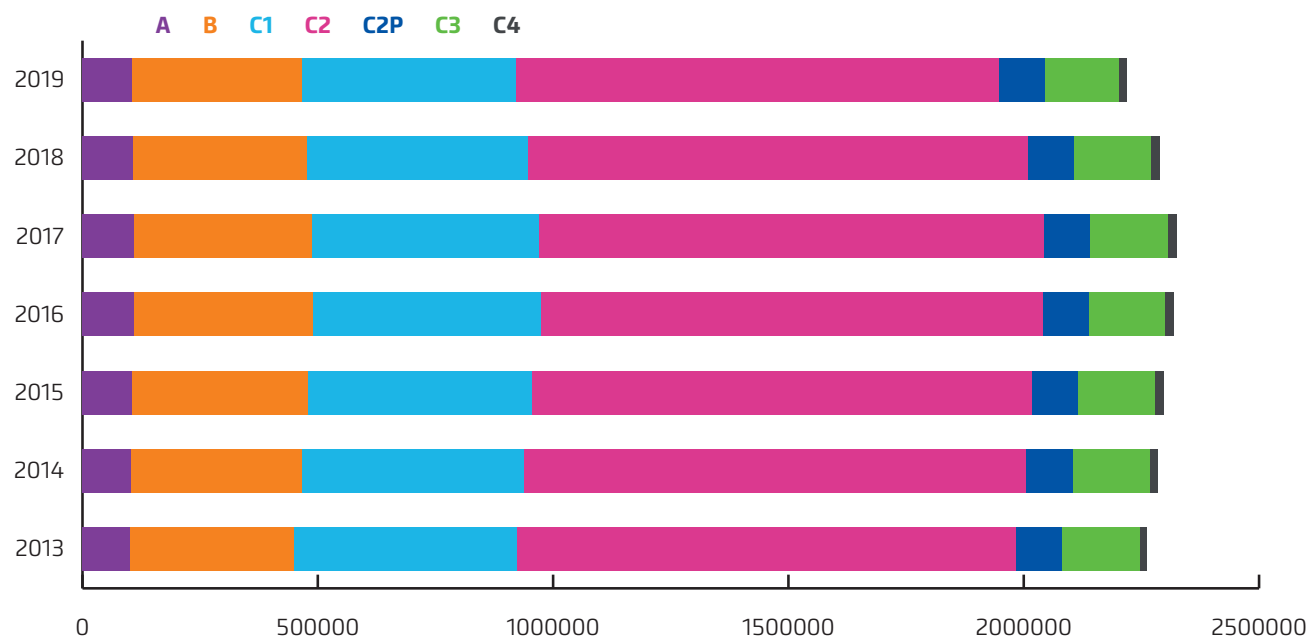
tal production, which was 7% more than in 2018. Organic milk production has increased 2.5 times over the last ten years.

Compared with many competitor countries, the production costs of milk are high in Finland. Increasing farm size has been a key method of reducing unit-level production costs and introducing better practices in terms of work productivity and animal welfare, for example. Although structural development has progressed rapidly, the majority of farms (73% or 4,632 farms) still have fewer than 50 cows. Yet only 42% of cows were on farms with fewer than 50 cows. There were 457 farms with more than 100 cows, i.e. four more than in the previous year, and already more than a quarter of all dairy cows were on these farms. In 2019, dairy cattle housing investments reached a record

high, more than EUR 140 million according to cost estimates. Subsidies for these projects amounted to EUR 57 million, of which 31% were allocated to South Finland (support area AB). The AB area accounted for about 20% of total milk production in 2019. The largest production area was support area C2, where 47% of all milk was produced.

In December 2019, the number of dairy cows was 258,940, which was around 4,700 fewer than in the previous year. The number of heifers was 136,853, which was 3,571 fewer than in the year before. The number of dairy cows per farm increased by 2.6 cows from the previous year. The average yield of dairy cows increased by 1.8% to 8,810 litres per cow. The fat and protein content of dairy milk increased: the average fat content was 4.39% (4.34%), and the protein content was 3.55% (3.50%). The average en-

Milk production by subsidy region in 2013-2019.



ergy-corrected milk yield (ECM) was 9,624 kg, calculated using a conversion weighting factor of 1.032 kg per litre, and was up by 2.8% on the previous year.

According to Luke's projection model, based mainly on the number of heifers raised for milk production and the slaughter of animals, total milk production could fall by around 1.5% in 2020, amounting to around 2,230 million kg of milk received in dairies. The production forecast for the spring of 2020 lacks the impact of the forthcoming harvest and the price uncertainty associated with the coronavirus pandemic, so it is at best indicative. Valio Group's procurement cooperatives, which collect more than 80% of all milk produced, will start to apply milk production volume contracts from the beginning of 2021. The details are still being discussed, but it is likely that the farm-specific contract volume will be based on the yield levels of some previous years. Milk produced above the contract would fetch a lower price than the volume of milk below it. In the case of newly completed or pending investments, the contract would be equivalent to the yield of a completed dairy cattle house, which is, of course, also a prerequisite for the implementation of investment calculations and the ability to repay loans. According to publicly available information, applications submitted after the publication of the contract policy not for the time being, be assigned a contract by Valio Group until a sufficient volume is released from farms exiting production, or market situation allowing profitable increase of total volume.

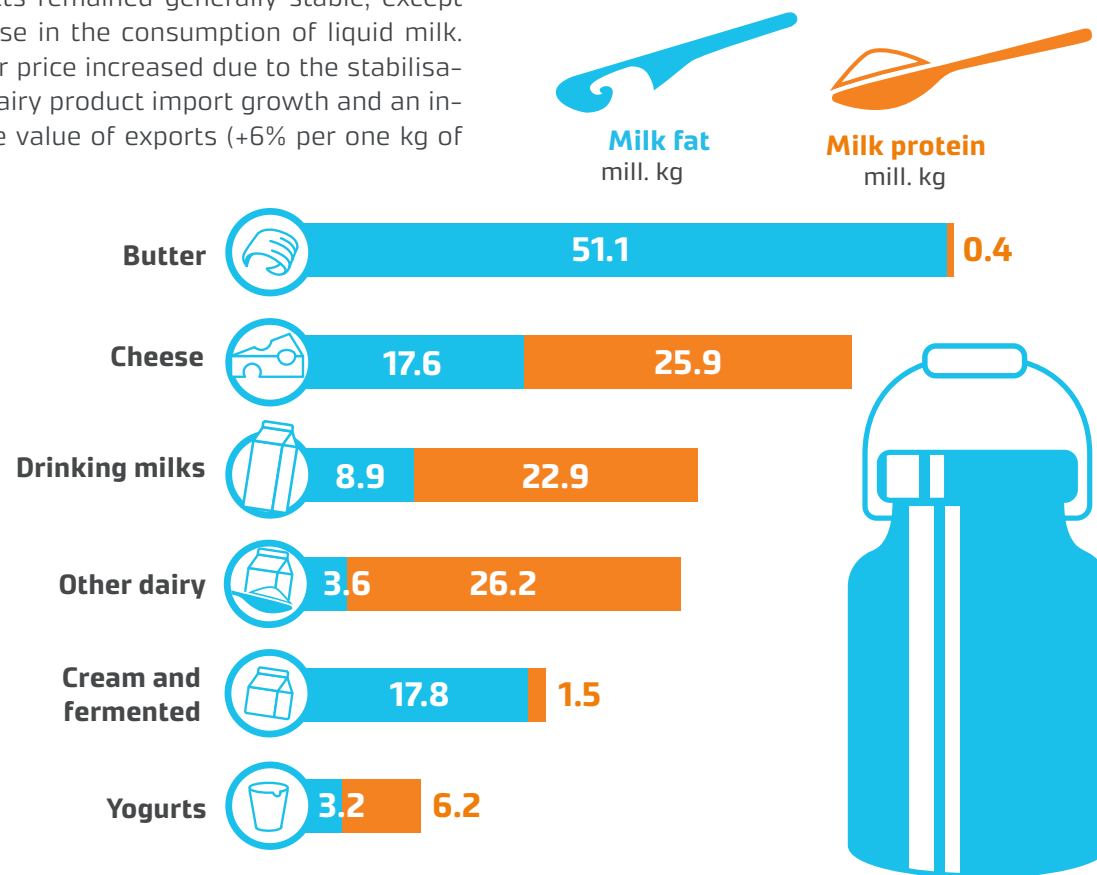
In the short term, farms developing their production must therefore consider development strategies other than increasing their milk production, provided that changing dairies is not a feasible option for them. In the short term, the volume contract

policy will have only a limited impact on total milk production, because the ongoing investment will in any case be completed, while the pricing model will have no direct impact on the production exit decisions. However, the focus of farm development will shift, at least in the short term, from increasing the volume of production per farm to cutting costs. A possible option for farms is to rear heifers and possibly bulls for the production of meat by themselves.

Producer price for milk increased

The average producer price for milk passed the 40 cent mark at the end of 2019. Domestic demand for dairy products remained generally stable, except for a decrease in the consumption of liquid milk. The producer price increased due to the stabilisation of the dairy product import growth and an increase in the value of exports (+6% per one kg of

Milk contains not only water but fat, protein, lactose (i.e. milk sugar), minerals and many other components. Fat and protein form the bulk of the value of raw milk: they are the basis for its pricing, and their concentrations are recorded by the authorities. Total fat (102.3 million kg) and protein (82.7 million kg) produced can be calculated on the basis of total production and reported content. In 2019, the fat and protein components of milk were found in different products as follows:



product). The last time the average producer price exceeded 40 cents was at the beginning of 2015.

In 2019, a total of 573 million litres of liquid milk was packed. Liquid milk accounts for around 30% of total milk protein consumption and around 11% of fat consumption. Compared with the previous year, the production of liquid dairy products decreased by 4%. The production volume of sour milk was 44.1 million litres (-5%), while the figure for cream was 45.5 million litres (-1%), for yoghurt 107 million kg (+0%) and for cheese 83.6 million kg (-4%). Butter production increased by 2% to 51.3 million kg.

Price control has been strengthened to encourage increasing the fat and protein content of milk delivered to dairies. The increased targeting of price control at value components stems from the decrease in the consumption of liquid milk, for example. In recent years, the production of liquid milk has decreased significantly, by more than 15% over the last five years alone, corresponding to a reduction of more than 100 million litres. There is no clear reason for this reduction, but the issue involves a major change in consumption patterns and is similar in many Western countries. The sales of plant-based drinks are not recorded, but various sources suggest that the growth in the consumption of plant drinks to date is equivalent to about a fifth of the reduction in the demand for liquid milk.

The export price for butter improved

The value of dairy products exports increased by EUR 40 million from the previous year, and the volume increased to more than 200 million kilos. Exports increased slightly, because domestic demand decreased from the previous year. The improved export situation was explained by the slow growth in

milk production in the European Union, which was only 0.5%. This was the lowest annual increase in production since the abolition of the quota system. In the largest producer countries, Germany and France, the volume of production even decreased slightly. The production growth was curbed by the decrease in the number of cows and the decline in average yield due to last summer's drought.

41% of the milk fat and 35% of the milk protein produced in Finland were exported. Around 70% of the exports of milk protein concerned other fresh dairy products and milk-based drinks and powders. In addition, 20% of all protein exports concerned cheese. The majority of milk fat, 76%, is exported in the form of butter, and 13% as cheese. The relative export price of butter improved in 2019 and was on average 7% higher than the EU internal market price. However, during the exceptionally high peak in the world market price for butter in 2017 and 2018, Finland could not fully exploit the highest prices. According to the EU Commission's market forecast, the price peak was exceptional and led to the adaptation of the food industry, for example, by introducing substitute vegetable oils for baking. In coming years, EU prices for fat and protein are expected to align, and a corresponding price differentiation is not expected to occur in the future.

The milk market is affected by the coronavirus pandemic

The COVID-19 pandemic also affects the dairy market. At world market level, the slowdown in economic growth resulting from the crisis may lead to a shift in demand for substitutable dairy products from value-added to cheaper products and a general fall in prices. Yet the decrease in the price of crude oil that took place at the beginning of the year af-

fects the purchasing power of certain countries that depend on oil exports. The oil price has typically correlated with world market prices for dairy products with a delay of a few months. World market prices can therefore be expected to fall as the pandemic continues. The pandemic spread to the northern hemisphere in the spring, when milk production is typically at its highest, pushing prices down further by increasing supply to a saturated market. Various policy instruments for reducing supply have been investigated in several countries during the spring.

Consumers do not need to worry about the adequacy of dairy products. However, in local markets, the main challenge for the dairy industry is to adapt to the restructuring of the dairy market, because demand in the wholesale trade for the hospitality industry is decreasing, and domestic consumption is increasing. This phenomenon applies to all countries where the share of public catering services of total consumption has decreased because of the closure of restaurants and schools, for example. Some countries struggle to receive milk collected from producers, because the processing capacity has been unable to adapt to the change in demand. In some cases, dairies have not had enough labour because of people getting infected.

The global demand for milk will continue to be lower than production due to the pandemic and may lead to a relatively high stock accumulation. However, estimates are very uncertain. In its forecast based on the situation in the spring, the international IFCN Dairy Research Network has set a fairly wide range of 0-11 million tonnes for a production surplus in 2020 relative to demand. The futures prices of dairy products quoted at the end of 2020 do not foresee a major dive in world prices but a near-recovery by the end of the year. The previous serious dairy crisis

started in 2014, when global production exceeded consumption by around 6.8 million tonnes. However, the resulting market signal, i.e. the impact of the price decrease on production volume as a result of the imbalance, did not decrease the production volume in the EU as it normally would have due to the abolition of milk production quotas and the closure of the Russian market from EU Member States, and the subsequent reorganisation of normal trade routes, which took place at the same time. Global consumption already reached a balance with production during 2015, but the accumulation of intervention stocks in Europe continued until the end of 2016 for the reasons described above.

China's importance is growing in foreign trade

Sweden and France were the main export countries in 2019. The most important products exported to Sweden were butter and yoghurt. The majority of exports to France consisted of butter for the baking industry. In 2019, China became the third most important export country for dairy products from Finland, mainly due to exports of dry dairy products. The value of exports to China was more than EUR 50 million.

The most important import countries were Denmark and Germany. The majority of Danish imports were different cheeses, while a variety of dairy products was imported from Germany. The volume and value of imports have remained relatively stable in recent years. 28% of the milk fat and 29% of the milk protein consumed in Finland were imported. Around 90% of the imports of both components took place in the form of cheese. The second most important product group for imports is yoghurt.

The majority of the milk fat and protein produced in Finland end up in dairy products for domestic consumption. However, exports play an important role, because 41% of the fat and 35% of the protein produced are exported. Similarly, fat and protein are imported mainly in cheeses. According to Luke's Balance Sheet for Food Commodities, the domestic content in cheeses is approximately 51% based on weight, but only 45% based on fat and protein. This difference is mainly due to a lower fat content in domestic cheeses compared with imported cheeses. Exports take place in the form of cheese (fat and protein), butter (practically fat only) and other dairy products (especially protein). In 2019, the self-sufficiency rate of milk production, calculated according to the limiting component of milk protein, was around 108%.

The most important foreign trade countries of milk products

Exports	Mill. Eur	Imports	Mill. Eur
Sweden	109.2	Denmark	93.9
France	51.5	Germany	82.9
China	51.2	Netherlands	34.6
Netherlands	50	Sweden	34.4
Belgium	11.8	Estonia	29.6
USA	11.7	France	13.9
Saksa	10.5	Italy	12.4

Development of import and export of milk products in 2012-2019

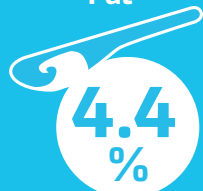
	Imports		Exports	
	Value (mill. eur)	Quantity (mill. kg)	Value (mill. eur)	Quantity (mill. kg)
2019	344	119	411	201
2018	344	121	371	191
2017	343	124	389	189
2016	331	131	347	199
2015	356	142	378	202
2014	362	137	461	207
2013	361	174	521	217
2012	341	170	479	204

The infographic describes the distribution of the main components of domestic milk by product group, as well as their imports and exports. The production volume is packaged as liquid milk or processed into cheese, butter or other milk products such as yoghurt or dry dairy products. The largest product group consumed domestically is cheese, of which slightly more than half is imported. Butter exports exceed domestic consumption.

Sum of imported fat and protein in dairy products totals 45 mill. kg, mostly in cheeses.

Milk delivered
2334 mill. kg, of which

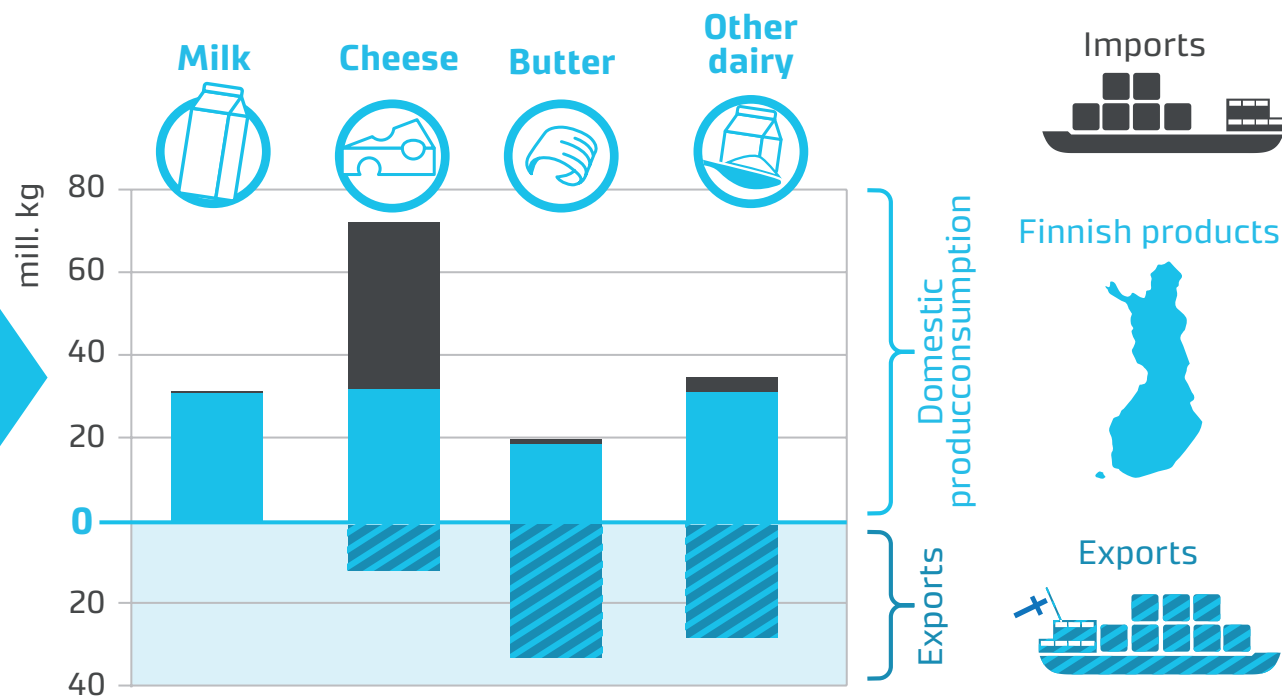
Fat



Protein



The sum of fat and protein total of 185 mill. kg, is further processed to following products:



Sum of exported fat and protein in dairy products totals 71 mill. kg.

Source:
 Luke, [Milk and Milk products statistics](#)
 Luke, [Milk Production by Area](#)
 Luke, [Foreign trade in agri-food products](#)

Horticultural market

Timo Karhula and Anna-Kaisa Jaakkonen

The 2019 Finnish growth season can be described as widely varying from one region to another. The summer was generally warm, some areas had plenty of rain, but farms also suffered from widespread drought. This year, the horticultural sector is also overshadowed by the exceptional situation caused by the coronavirus pandemic and the possible infections of horticultural entrepreneurs and workers. The exceptional circumstances are also causing a shortage of labour on horticultural farms. In addition, during the year, uncertainty may affect imports, because there is no certainty that the imports of horticultural products can continue. Maintaining the best possible self-sufficiency rate in primary production will then become important in the horticultural sector as well.

Horticultural production is a labour-intensive industry

In addition to weather, final yields, especially in outdoor production, are especially affected by the availability of the seasonal workforce. Horticultural production is very labour-intensive, and greenhouse enterprises need a large workforce, because many of them employ people year-round. Based on the annual workload, dairy farms employ the larg-

A person-year is 1,800 working hours, i.e. 225 working days (8-hour days), or 5 days a week, 11 months.

est number of people (11,640 person-years), but the amount of annual work per enterprise is the highest in greenhouse enterprises (3.3 person-years per enterprise).

Outdoor horticultural production employs a large number of foreign workers. In 2016, the foreign workforce accounted for 3,650 person-years on farms, of which 37% were outdoor horticultural farms, and 28% were greenhouse enterprises. 40% of the 490 person-years achieved by seasonal workers were made on outdoor horticultural farms. In addition, some of the horticultural holdings were classified as mixed farms, so their person-years numbers are missing from these figures.

The nature of horticultural production is hectic in many ways because a large proportion of the products are fresh produce such as strawberries, lettuce, cauliflower, broccoli and greenhouse vegetables. The production of ornamental plants is also considered “fresh production”. The commercial chain of these products is short: straight from the field to consumption, perhaps via a wholesaler. This means that harvesting and other operations must be carried out in a timely manner. In addition, the harvesting of fresh produce is mostly carried out manually.

The situation is slightly easier in the production of storage vegetables such as root vegetables and onions, where mechanisation is possible, and a smaller workforce is needed. These plants can also be harvested with some time flexibility.

As a result of the exceptional situation, there were already problems in getting seasonal labour to horticultural farms early in the spring. The labour

shortage will probably affect the largest vegetable, berry and fruit farms during the growing and harvest season.

The prices of horticultural products vary

Strong seasonal and annual variation is typical of producer prices and production volumes of outdoor horticultural products. Producer prices are usually low during the main harvest season, when the supply is high. The supply of stored horticultural products decreases during the storage period, which is usually reflected in higher producer prices.

However, the weather during the growing season also plays a part, especially in the price of outdoor products. For example, the average price for carrot was higher in 2019 than in the previous year. The average price for carrot was EUR 0.94 per kg, but the monthly price for carrot varied between EUR 0.64 and EUR 1.07 per kg in 2019. The average price for apples, EUR 1.59 per kg, was also higher than in the previous year, with monthly prices ranging from EUR 1.48 to EUR 1.96 per kg. The average price for strawberry was EUR 5.14 per kg in 2019.

Producer prices for greenhouse vegetables do not follow weather conditions as closely as those for outdoor vegetables. Typically, the prices for greenhouse vegetables, and especially cucumber and tomato, drop in June and July, when crops produced using natural light enjoy their main harvest season. During most years, cucumber and tomato markets become congested, resulting in a price decrease during the summer.

In 2019, the lowest monthly price for cucumber was EUR 0.87 per kg, and the highest was EUR 2.70 per kg. The average price for cucumber was EUR 1.26 per kg, lower than the producer price in the previous year.

The average price for tomatoes remained at the 2019 level, at EUR 1.84 per kg. During the main harvest season, the price for tomatoes decreased as in previous years. The monthly price for tomatoes varied between EUR 0.85 and EUR 3.19 per kg in 2019.

This year, the market and prices for horticultural products are very difficult to predict due to the current exceptional situation.

Horticultural production is diverse

In 2019, there were 3,348 horticultural enterprises in Finland. Of these, 2,705 farms were engaged in outdoor production, and 887 farms in greenhouse production. Some farms were engaged in both outdoor vegetable and greenhouse production. The distribution of horticultural farms between outdoor and greenhouse production is unclear, because horticultural farms often have other production alongside their main production line. Only around half of the farms engaged in outdoor horticultural production are classified as outdoor horticultural farms when determining the production line. In outdoor vegetable production, mixed farms are common, i.e. farms grow cereals and/or berries in addition to vegetables. In the case of fruit and berry cultivation, focusing on these products alone is more common.

In greenhouse production, the main production line is commonly determined according to the crop produced, and the enterprises are quite often en-

gaged in either ornamental plant or vegetable production. Mixed enterprises are also found in the greenhouse sector, but it is very rare for greenhouse enterprises to have outdoor production as their main production line.

In 2019, the area of outdoor vegetable, berry and fruit production was around 19,000 hectares. Compared with the previous year, the total area grew by around 480 hectares. The production area for outdoor vegetables increased by around 150 hectares, and for berries by 331 hectares. It decreased for fruit by three hectares. In 2019, the area of greenhouse production decreased by 30 hectares from the previous year and was 360 hectares.

Of the outdoor horticultural production area, 7,700 hectares are allocated to perennial crops, such as fruit and berries. For these crops, the cultivation area varies more strongly compared with annual crops and less work is required to establish crops than is the case for annual crops, for example. Last year, vegetables accounted for 11,500 hectares of the outdoor production area. This year's aid application round ends on 15 June, so the outdoor horticultural area is only known until towards the end of June.

Strawberry is the most important outdoor berry

In 2019, garden pea was by far the most common outdoor vegetable in Finland in terms of area. The pea area was 4,952 hectares. Other important vegetables were onions (1,232 hectares), and regular and Savoy cabbages (583 hectares). Carrot was cultivated on 1,831 hectares. In terms of yield, carrot was the most important vegetable, with just under 78 million kg of produced crop. In addition, a good 9 million kg of carrot was imported to Fin-

land. The consumption of carrots is estimated to be around 78 million kg per year. Last year, more than 95% of total carrot consumption was estimated to be for domestic production.

Strawberry is the most important berry in terms of both the cultivation area and the yield. In 2019, the strawberry area was more than 4,300 hectares, and the yield was 18 million kg. The import of strawberries to Finland was around 3 million kg, and the estimated consumption was around 20 million kg per year. Approximately 90% of the consumption of strawberry was estimated to be of domestic production.

Of fruit, apples were grown on approximately 690 hectares. The domestic apple harvest was 8.1 million kg, and apple imports to Finland totalled around 42 million kg in 2019. The majority of apples consumed in Finland (around 85%) are of foreign production. This year, the potential disturbances to imports will primarily affect the import of fruit.

Cucumber production exceeded tomato production

Greenhouse vegetables were cultivated on 233 hectares, and ornamental plants on 117 hectares in 2019. The total yield for greenhouse vegetables was 100 million kg. Cucumber is the main greenhouse vegetable, at 48 million kg and 53 hectares. Tomato is the second most important greenhouse vegetable (93 hectares and 40 million kg). In 2018, the cultivation area of tomatoes was larger than that of cucumber, but this changed in 2019.

The volume of tomato imports was 27 million kg last year. Cucumber imports totalled less than 7

million kg. Export volumes have been very low for both tomatoes and cucumbers. Tomato consumption is estimated at around 60 million kg and 50 million kg for cucumber. It is estimated that approximately 65% of tomatoes and 90% of cucumbers consumed were of domestic origin in 2019.

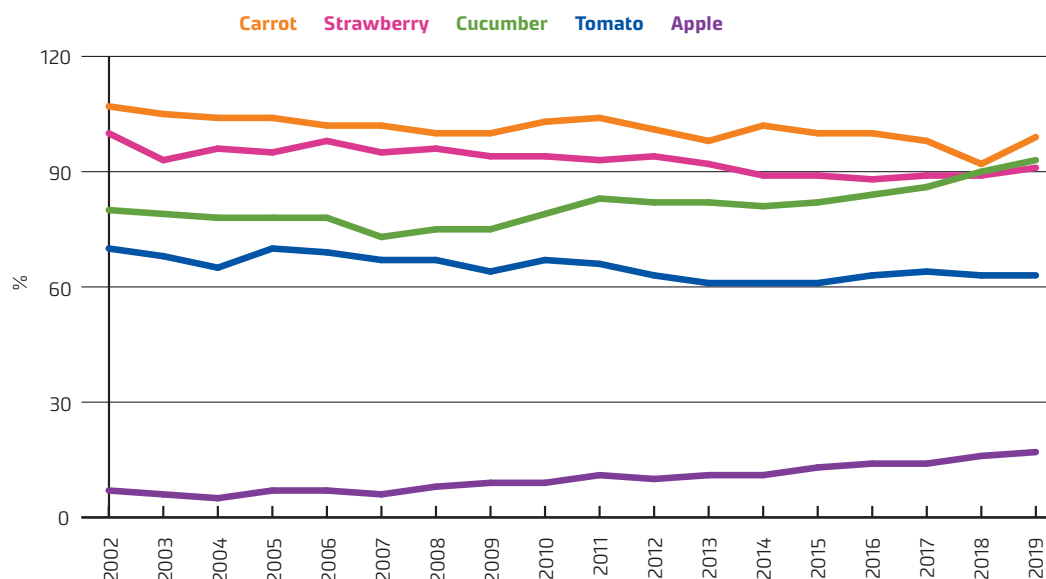
In 2019, 102 million units of potted vegetables were produced, 14 million fewer than in the previous year. The most important potted vegetable is potted lettuce, of which 66 million units were produced last year.

In 2019, around 62 million flowering potted plants were produced. The most important flowering potted plants were potted daffodil (8 million units), poinsettia (1.5 million) and winter-flowering begonia (1.3 million). The production of bulbous flowers totalled 87 million units. By far the most important bulbous flower (74 million units) was tulip. The production of bedding plants amounted to 36 million units, with violet the most important in terms of production volume (10 million units). The production of ornamental plants has decreased since 2018 for the main products.

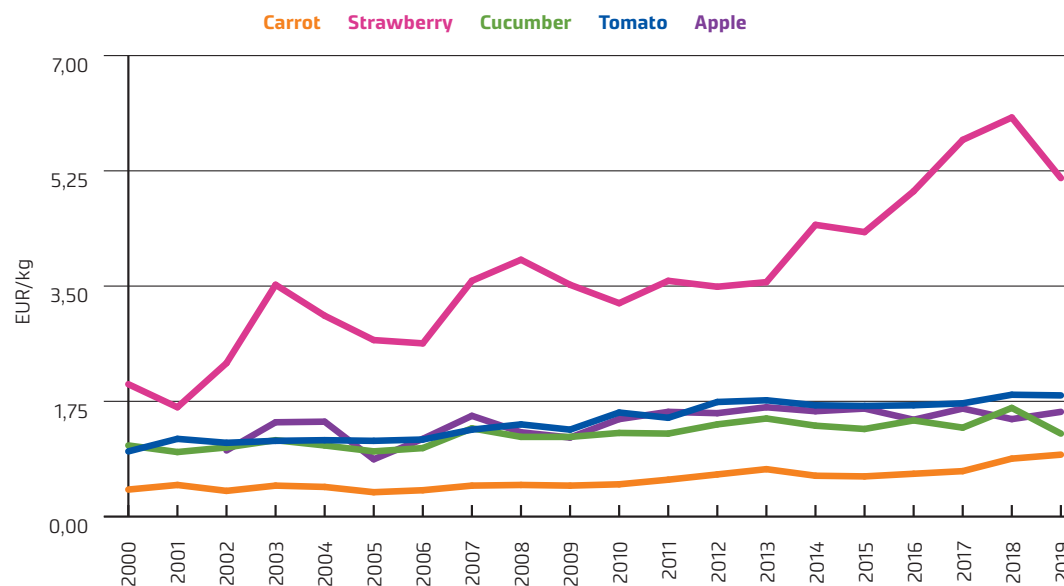
The cultivation area of sweet peppers will increase by a third this year

In greenhouse production, cultivation decisions have already been taken early in the year, and the areas indicated in the aid applications are already known. Based on the applications, the total area will be at the 2019 level. The areas indicated in the applications are as follows: 56 hectares (-2%) for greenhouse cucumber, 106 hectares (+3%) for tomatoes, 11 hectares (+28%) for sweet pepper and 30 hectares (-5%) for potted vegetables. The area of ornamental plants remains at 137 hectares. This

Estimated self-sufficiency rate (%) of most important horticultural products in 2002-2019.



Producer prices (average prices) of most important horticultural products in 2000-2019 (€/kg).



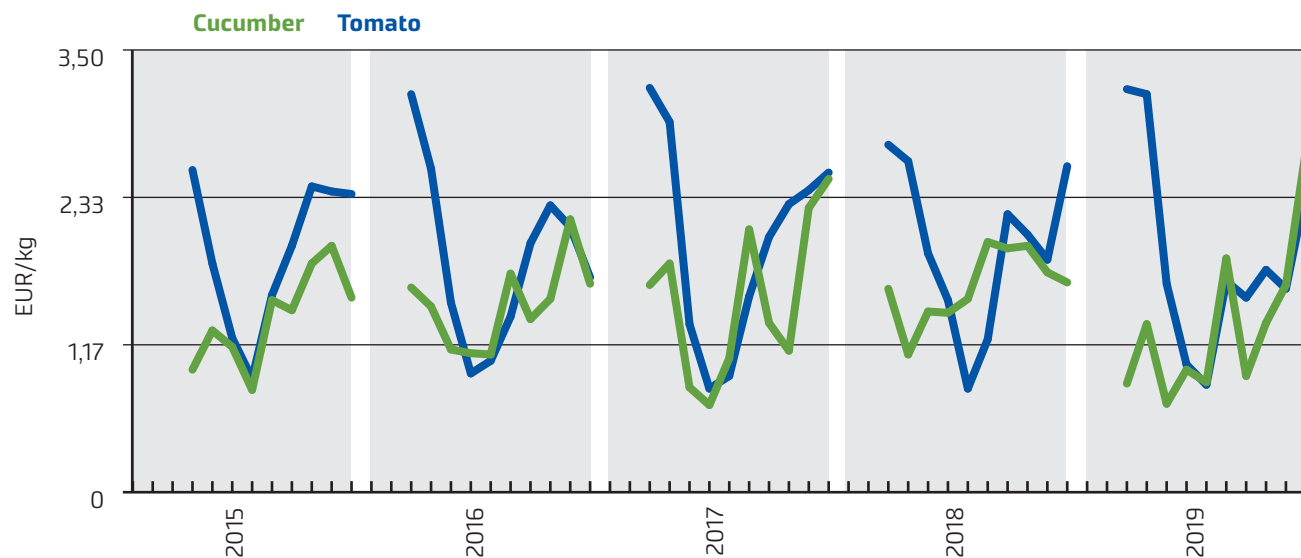
year, the cultivation area of sweet peppers will take a big leap upwards.

Foreign trade went into deficit

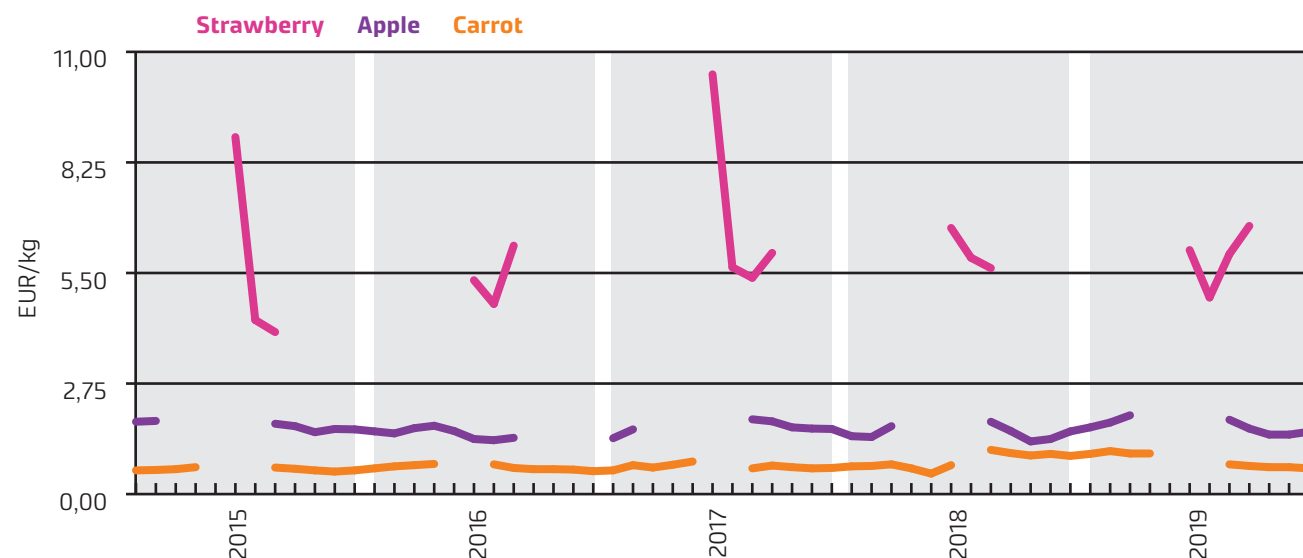
In foreign trade in horticultural products, the value of imports exceeded the value of exports. In 2019, vegetables to a value of EUR 293 million were imported to Finland, while exports remained at EUR 20 million. The main import countries were Spain and the Netherlands, and tomatoes were imported the most. The Netherlands and Spain were the leading importing countries. After tomatoes, the second most important import product was frozen vegetables. Surprisingly, frozen peas were also exported from Finland to Italy.

The fruit and berry trade had an even larger deficit than the vegetable trade. The value of fruit and berries imports to Finland totalled EUR 400 million last year. Of these, fruit accounted for EUR 350 million and 325 million kg. These figures include fresh and frozen imports, but not canned or juice products. The deficit in the fruit trade is largely due to Finland's northern location, because in practice, Finnish fruit production is limited to apples. Apples were also imported, especially from Poland and Italy. Citrus fruits from Spain and bananas from Central America were imported the most. Fresh berries were imported from Spain, and frozen berries from Poland. The small berry exports from Finland concerned exports of frozen wild berries, especially to China.

Producer prices (monthly prices) of most important horticultural products in 2015-2019 (€/kg).

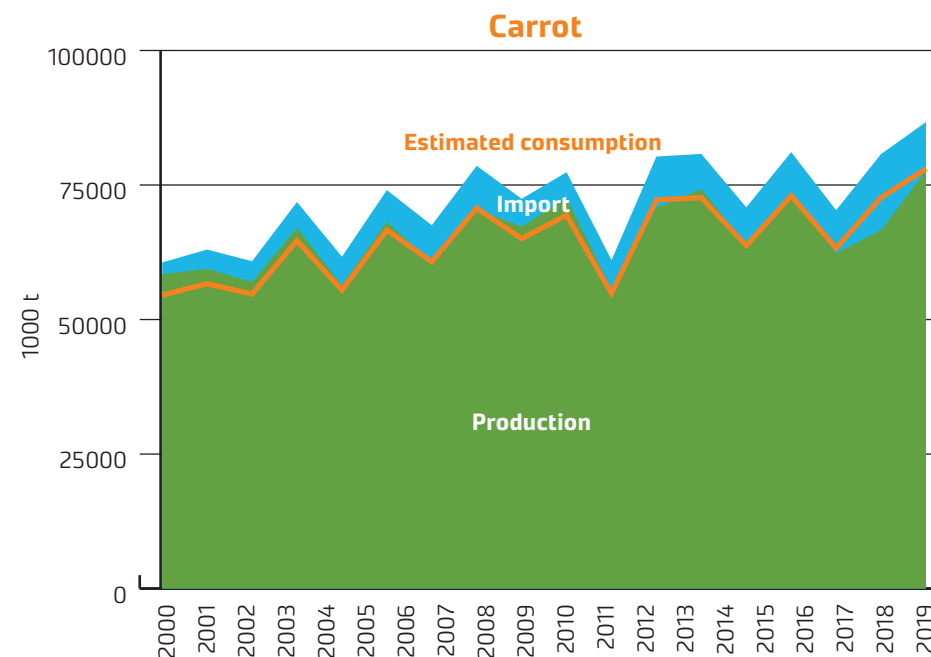
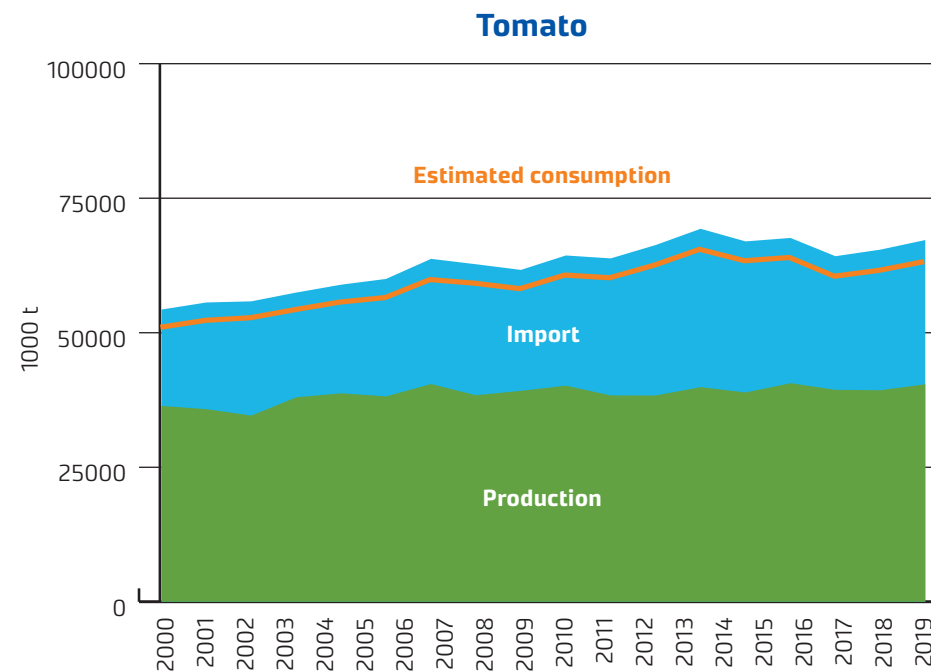
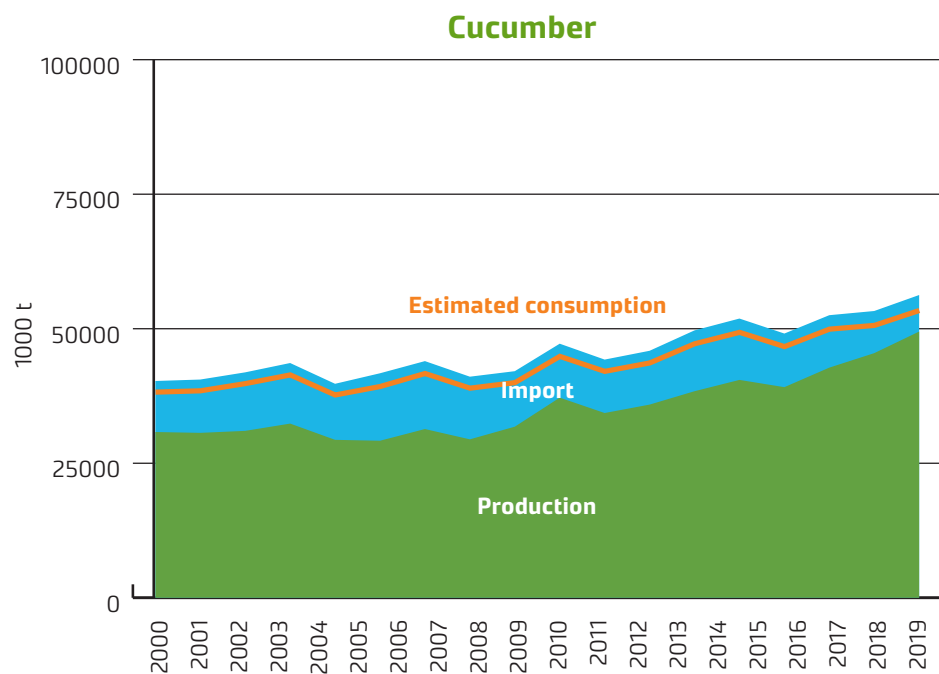


Producer prices (monthly prices) of most important horticultural products in 2015-2019 (€/kg).

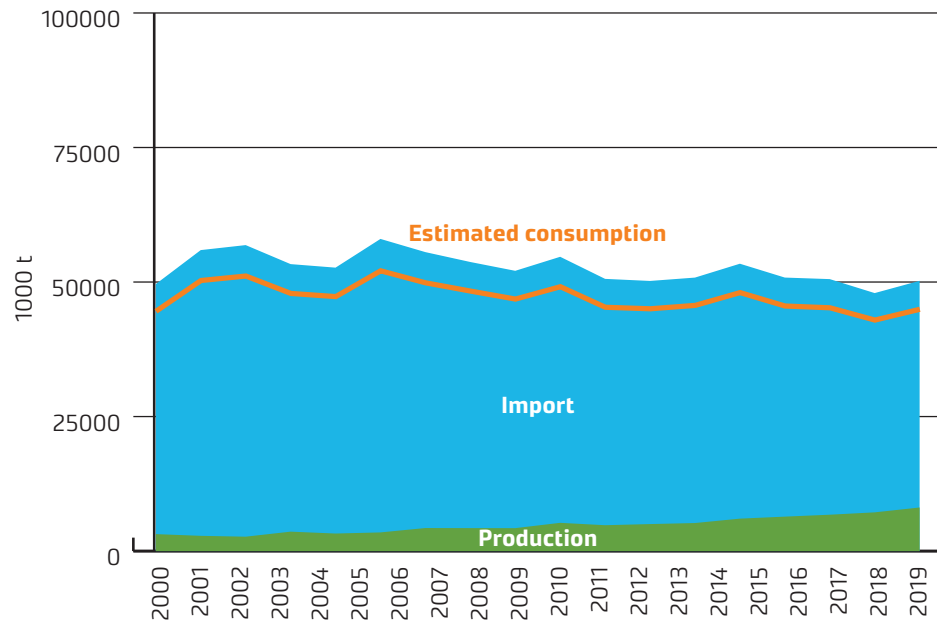


Domestic production, import, export and estimated consumption of most important horticultural products (1,000 tn).

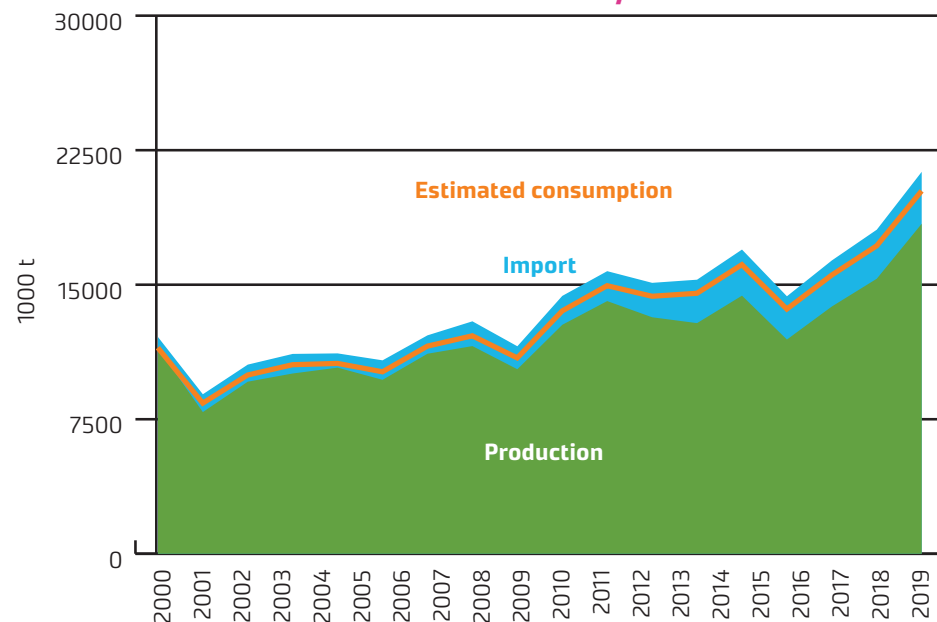
Estimated spoilage of tomato, cucumber and strawberry is 5% and of carrot and apple 10%.



Apple



Strawberry



Domestic production, import, export and estimated consumption of most important horticultural products (1,000 tn).

Estimated spoilage of tomato, cucumber and strawberry is 5% and of carrot and apple 10%.

Source: Luke, [Foreign trade in agri-food products](#)

Source: Luke, <https://stat.luke.fi/en/horticultural-statistics>

Structural development and economic situation of agriculture



Structural development in agriculture

Jaana Kyyrä and Minna Väre

As the number of farms is decreasing, the average farm size is increasing. Smaller farms are disappearing, and the number of large farms is growing. However, the majority of farms are still family-run farms. In Finland, as elsewhere in Europe, the farming population is ageing. In 2019, already 16% of farmers on privately owned farms were more than 65 years old.

The number of farms is decreasing

According to the register of agricultural and horticultural enterprises, there were approximately 46,800 agricultural and horticultural enterprises in Finland in 2019. The number of farms has decreased by around 20% since 2010. Of all agricultural and horticultural enterprises, some 86% were family-run farms, and 9% were farming syndicates. In addition, farms run by heirs of the estate and limited companies each accounted for 2% of all farms. The relative distribution of farms by legal form has remained almost unchanged for the last ten years.

The register of agricultural and horticultural enterprises includes farms and horticultural enterprises. The lower limit for the register is EUR 2,000, calculated using the Standard Output (SO) method. SO is the calculated monetary value of the agricultural output at farmgate prices. The prices are the average prices over the last five years. SO does not take account of subsidies.

Division of agricultural and horticultural enterprises into legal forms, %, 2010 and 2019

Year	Private individual	Farming syndicate	Heirs	Limited company	Others
2010	88 %	7 %	3 %	1 %	1 %
2019	86 %	9 %	2 %	2 %	1 %

Source: Luke



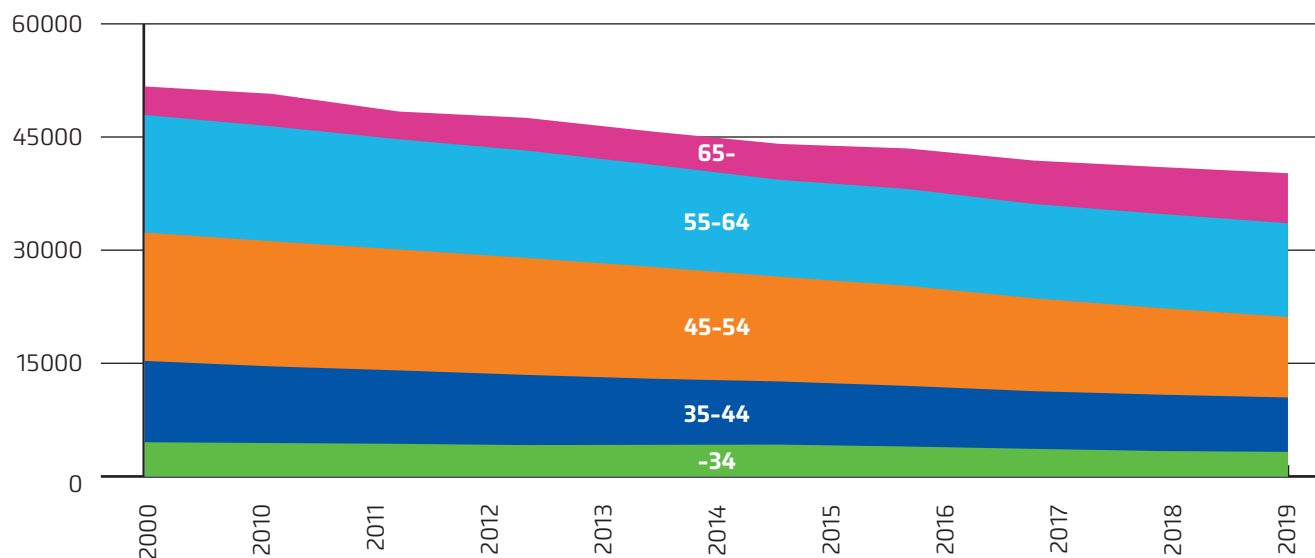
The farming population is ageing

The average age of farmers in 2019 was 53. Farmers on limited liability farms were the youngest, with an average age of 48. On farms run by heirs of the estate, the average age of farmers was 60. The average age of farmers on privately owned farms and on farming syndicates was 53.

The majority of farmers on privately owned farms were between 55 and 64. Their share was around 30%. The number of farmers over 65 is increasing. In 2019, they accounted for 16% of farmers on privately owned farms. The share of farmers under 35 was only 8%.

The ageing of farmers is a common trend through Europe. One of the reasons for this is the decreasing trend in generation renewal. Young farmers entering the sector are supported, for example, through the start-up subsidy paid to young farmers. However, the number of start-up aid decisions has decreased in recent years. Although in 2009-2019, the average number of farms receiving a start-up subsidy was nearly 500 per year, the corresponding figure in 2015-2019 was just under 300. The decision to cease farm operations is typically taken when an ageing farmer retires. As the number of farms decreases, the average size of farms increases, because farms that continue production can acquire additional production resources from farms that cease their operation.

Number of farmers on privately owned farms by farmer's age



Source: Luke

The number of large farms is increasing

In 2019, the average utilised agricultural area was 49 hectares per farm. Since 2010, the average arable area of farms has increased by 10 hectares. The share of rented land has remained at 35% for a long time. In 2019, the total area of rented land was around 800,000 hectares.

The number of farms is still the highest in the 25-50-hectare category, although the number of farms of this size has decreased most since 2013.

In relative terms, the number of farms of less than five hectares of arable land has decreased most. Since 2013, the number of these smallest farms has decreased by 60%. The number of farms of more than 100 hectares has increased considerably. The largest increase has been in farms of more than 150 hectares. The number of farms in this size category has increased by around 50% from 2013. By Centre for Economic Development, Transport and the Environment (ELY Centre), the largest numbers of agricultural and horticultural enterprises are found in South Ostrobothnia. The second larg-

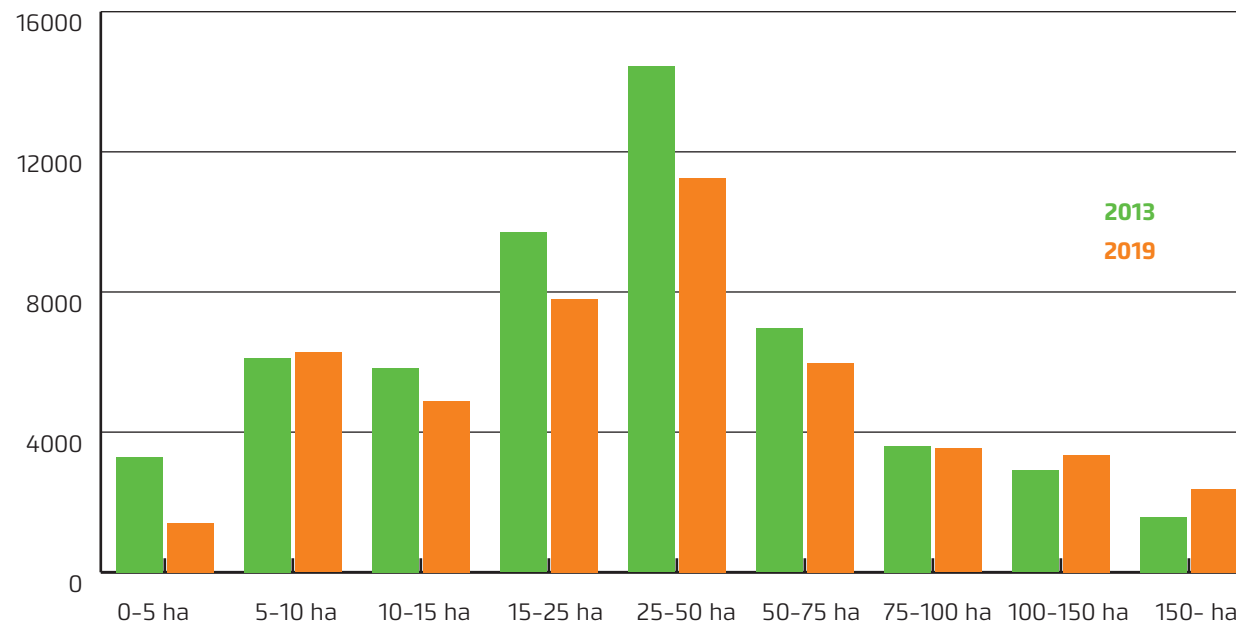
est number of farms is in Southwest Finland. The number of farms is lowest in the Åland Islands and in the area of the ELY Centre for Kainuu. In these regions, the number of farms has decreased most in relative terms compared with 2010. The decrease in the number of farms has been smallest in the areas of the ELY Centres for Central Finland and Pirkanmaa.

Utilised agricultural area and share of rented area, 2010 and 2019

Year	Utilised agricultural area (1,000 ha)	Share of rented area (%)
2010	2,261.5	35
2019	2,273.4	35

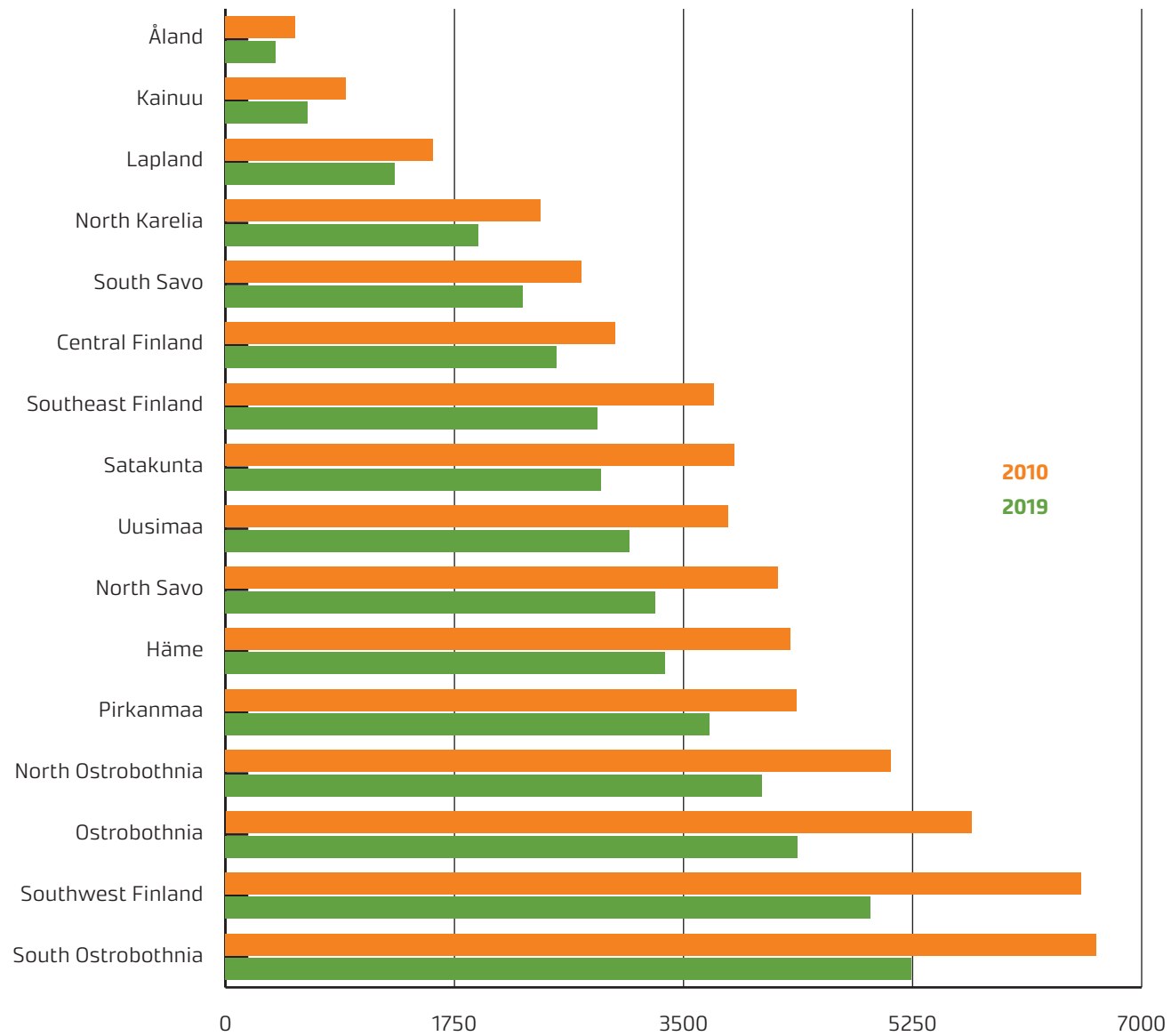
Source: Luke

Number of agricultural and horticultural enterprises by utilised agricultural area, 2013 and 2019



Source: Luke

Number of agricultural and horticultural enterprises by ELY centre, 2010 and 2019



Source: Luke

Source: Luke, [Structure of agricultural and horticultural enterprises](#)

Development of income and profitability in agriculture

Jukka Tauriainen

The profitability trend in agriculture and horticulture has been declining throughout the 2000s. According to a Luke forecast, the entrepreneurial income from farms in 2019 decreased by around 20% from the previous year to less than EUR 14,000 per enterprise. The entrepreneurial income was sufficient to cover just under 40% of the target hourly salary of EUR 16.0 earned by the entrepreneur family from agricultural work, as well as of the target net interest income from equity.

Prices affect results

The structure of agriculture and horticulture has developed rapidly in the 2000s: the number of farms has decreased by 2.6% per year. By increasing the enterprise size, entrepreneurs attempt to respond to the competitive situation in the food market. The fluctuation in producer prices seems to have become an established feature of the crop and livestock products markets. The Finnish food chain is also significantly affected by various crises and market shocks.

Production input prices have also fluctuated strongly, but the prices have increased more quickly than product prices. This has significantly weakened the profitability of agriculture, because farmers are unable to include their production costs in

product prices. For example, fluctuations in energy prices are also reflected in other inputs, such as fertilisers and purchased feed.

The significance of yield fluctuations is growing

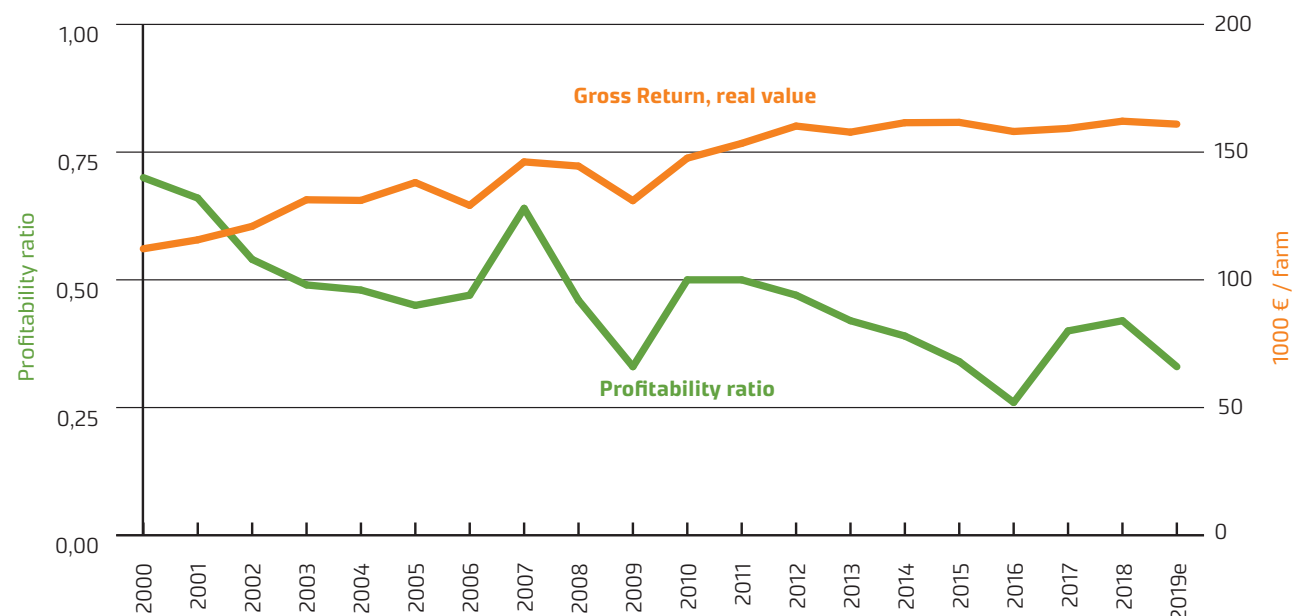
In 2016, the state compensation for crop failure was abandoned, due largely to the reform of the EU state aid regulations. However, since then, farmers have not extensively taken out insurance against crop losses. The risk of crop failure is therefore mainly borne by the entrepreneur.

The varying weather conditions in recent years have complicated farming activities and increased crop uncertainty. Researchers have different views on the magnitude of the future impacts of climate

change. It is expected to increase extreme weather phenomena and autumn rainfall in Finland as well, and to increase the prevalence of plant pests and weeds. However, climate change could also increase yields and decrease the need to use certain production inputs.

The comparisons of the time series of financial figures are carried out in real terms at the 2019 price level. The aim is to present the real change, adjusted for the nominal change caused by price increases. Statistics Finland's cost-of-living index has been used as the deflator.

The development of Gross Return (the average value of production on Finnish Farms) and Profitability Ratio (the average relative profitability on Finnish farms).



Source: Natural Resources Institute Finland (Luke) / Finnish FADN.

The increase in enterprise size is reflected in the income

According to profitability accounting, the average arable area of farms increased by 68% between 2000 and 2018 to around 68 hectares, and the number of animals by 12% to around 26 livestock units. The number of livestock units per farm has more than doubled from 35 to 75.

Especially with the increase in the size of livestock farms, the gross return of agricultural production has increased to EUR 160,000 per farm. Although the enterprise size has increased, the average real value of return per hectare in agriculture has decreased. This development is due to poor producer price development, as well as to the conversion of small livestock farms into crop production farms.

In recent years, the share of agricultural subsidies of gross return has varied between 33% and 34%. The importance of subsidies was greater at the beginning of the 2000s, but with the decrease in unit subsidies and changes in the aid structure, their share of return has decreased by around four percentage points.

Despite the increase in the enterprise size, the overall profitability trend in agriculture has been decreasing in the 2000s.

Milk production

Lypsykarjatalouden tilakoon kasvu ja tuotannon The growth in the size of dairy cattle farms and in the automation of production has been rapid. At the same time, the average milk yield of dairy cattle farms has also increased. Real gross returns of dairy farms have also increased by a good 140% between 2000 and 2019 to approximately EUR 305,000 per farm.

The development of real gross return per cow has been modest. Milk price fluctuations are reflected in returns. Between 2000 and 2006, the return was around EUR 7,400 per cow. The upward trend in the dairy market between 2007 and 2014 increased gross return to around EUR 8,000, but due to the sanctions on trade with Russia, return fell to EUR 7,000 per cow.

The production costs of dairy farms have increased at the same rate as gross return to EUR 370,000 per farm. Until 2014, the real costs per cow were around EUR 9,000. Entrepreneurs attempted to respond to the 2015 milk price shock by cutting costs, and the real costs fell to some EUR 8,000 within a three-year period. The costs have since increased to around EUR 8,500 per cow.

The increase in farm size has not resulted in a significant increase in family farm income. Due to unfavourable price levels, the family farm income relative to gross returns has decreased throughout the 2000s. Since 2015, family farm income has fallen to less than 10% of gross returns. The importance of the milk producer price for dairy farms' family farm income has therefore increased during the period under review. A 1% change in the producer price affects family farm income by 4-5%, depending on the year.

The relative profitability of dairy farms is low. The projected profitability ratio for 2019 is approximately 0.2, which means that the entrepreneur would earn approximately EUR 3.2 per hour of work and less than 1% of interest income from equity.

Other cattle production

Beef production shows a similar growth trend in farm size to that in milk production. The average real gross return of beef farms in 2019 was nearly 2.5 times higher than in 2000. Real returns per animal unit have remained almost unchanged: they have grown by only 4% since the beginning of the 2000s. The share of subsidies of gross return has remained at around 40%.

The increase in the enterprise size has also increased production costs. However, this increase has failed to bring any economies of scale at farm level, because production costs per livestock unit have increased by 5% since 2000. Although the cost of labour per animal has decreased significantly, the cost of capital and variable costs have increased.

The profitability of beef production varies from one year to the next. This is partly due to changes in economic cycles and environmental factors, but some of the variation is sporadic and due to the selection of the farms included in the profitability accounting sample, for example.

The increase in farm size has not resulted in an improvement in income or profitability. The profitability trend is decreasing, and there is no foreseeable significant change that will reverse it. In 2019, family farm income is expected to remain below EUR 15,000, and the profitability ratio is expected to be around 0.22. The outlook for other cattle farms is less certain compared with dairy farms due to a smaller sample and greater dispersion.

Pig farming

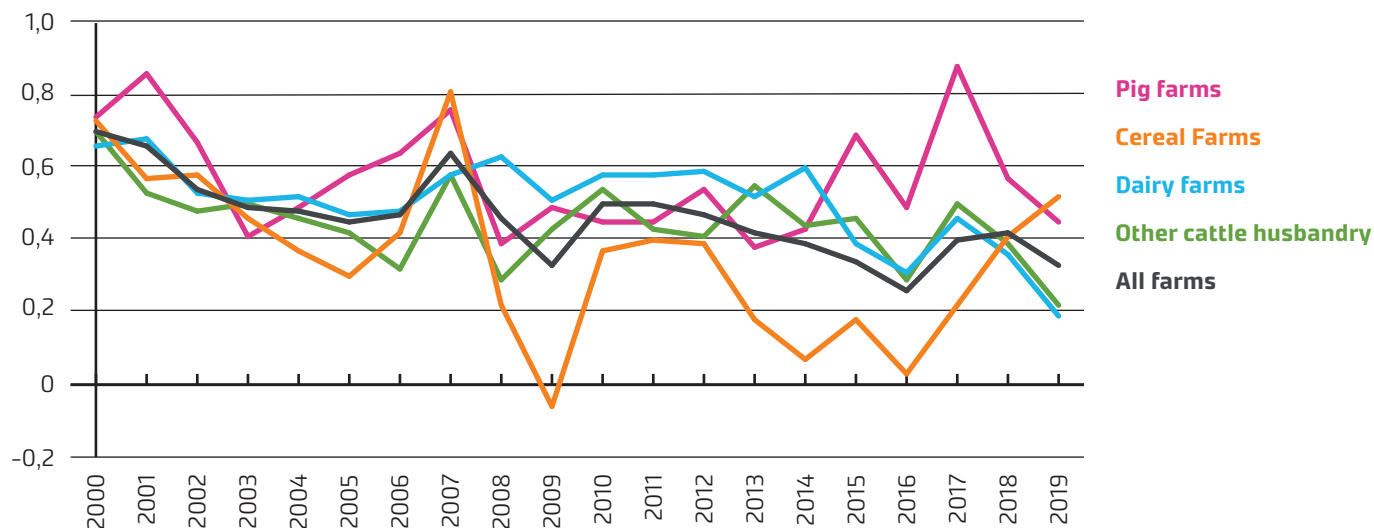
The structural development of pig farms has been faster than in cattle farms. On average, the remaining farms are three times larger than at the beginning of the 2000s. By tripling the number of animals, real gross return have doubled to around EUR 570,000 per farm. Real gross return per livestock unit have increased by 7%, which means that the development of producer prices has been very slow. In the pig sector, subsidies have accounted for less than 20% of revenues in recent years.

On pig farms, the increase in unit size in the 2000s has decreased production costs per animal unit by around 3%. A large part of this is due to the decrease in the entrepreneur family's own labour costs. The increasing price assumptions of production inputs will continue to undermine the profitability of production.

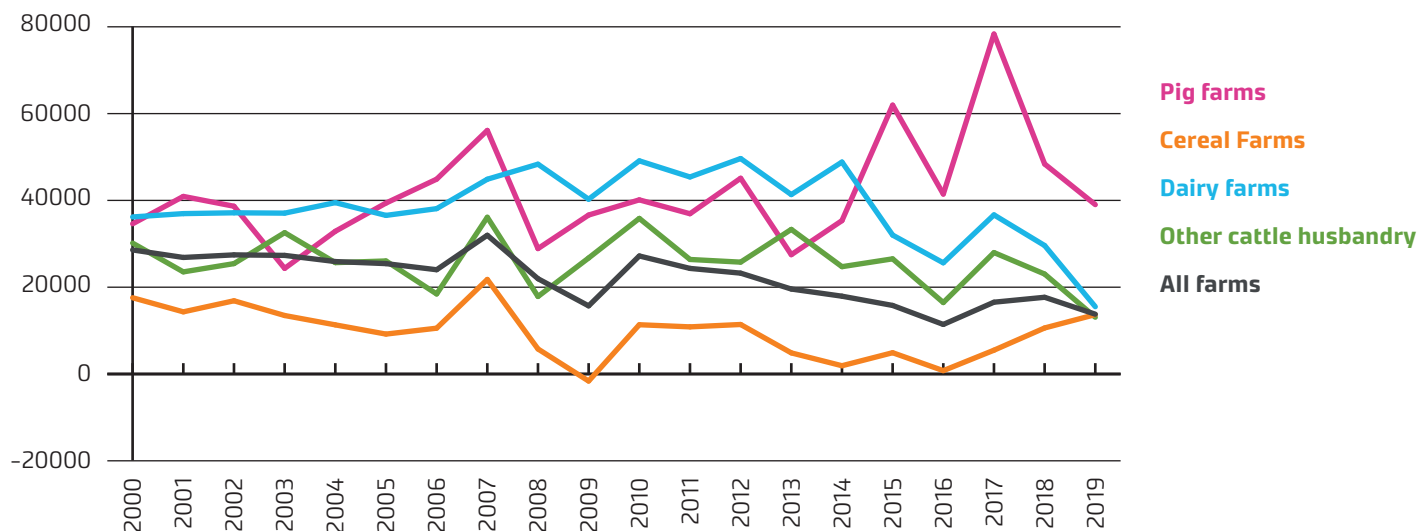
The profitability of pig farms varies widely between years, especially in recent years due to changes within a relatively small sample. For example, the profitability ratio in 2017 increased to 0.88 from 0.49 in the previous year and fell to 0.57 in the following year.

In 2019, the family farm income of pig farms is forecast to be around EUR 39,000 per holding. The real family farm income per animal unit has halved in the 2000s, which means that the price sensitivity of the result has increased. Although in 2000, a 1% change in pig prices changed family farm income by 3%, the latter figure was 8% in 2019.

The development of the Profitability ratio by production type.



The development of the Family Farm Income (EUR per farm) by production type in 2000-2019E.



Source: Natural Resources Institute Finland (Luke) / Finnish FADN

Cereal production

Compared with livestock production, cereal production is less commonly the primary production line of a farm. Technological development, and possibly the search for cost savings by reducing farming activities, has reduced the number of hours worked by the entrepreneur family to less than 900 per year in the 2000s. At the same time, the area under cultivation has increased from 53 hectares to 65 hectares. The growth in farm size has been slowed by the conversion of smaller farms that have abandoned livestock production into crop and cereal production farms.

Real gross return of farms have increased by just under 40% since 2000 to around EUR 78,000. Agricultural subsidies account for around half the gross return. Return per hectare has decreased by 12%. Production costs have increased by 17% to around EUR 90,000, especially due to variable costs. Costs per hectare have decreased by around 3%.

The profitability of cereal production varies considerably between years. Crop and price fluctuations explain the variation. The sensitivity of family farm income to price fluctuations has increased. Between 2000 and 2008, a 1% change in cereal prices changed family farm income by just under 2%. The impact has since exceeded 20% in some years.

The profitability ratio of cereal farms has fallen to close to zero or even below in several years in the 2000s. In 2018, the profitability ratio increased to 0.41 and has since returned to the same level as in 2001-2012. The result for 2019 is expected to be slightly better than in the previous year due to increased producer prices.

Financial results are available in the Economydoctor service

The financial results for agriculture and horticulture are presented as nominal figures (i.e. at the prices for each review year) in Luke's Economydoctor service (<https://portal.mtt.fi/portal/page/portal/economydoc->

tor). In the service, the user can view the results by production line, region and farm size category. In addition, the service's FADN section contains profitability accounting results for all EU Member States.

Source: Luke, Economydoctor



Special themes



Functioning of the food supply chain during the coronavirus pandemic turbulence

Jyrki Niemi

The coronavirus crisis has again raised concerns about food supply and food security as a topic for discussion, even in developed industrialised countries like Finland. History shows that food shortages can easily lead to political unrest. The proper functioning of food production and distribution is therefore crucial, especially in times of disruption and exceptional circumstances. Securing the food supply for the population is one of the basic tasks of each country.

Finland's self-sufficiency in production is high

National food self-sufficiency rates, which are based on domestic production and consumption levels, indicate that Finnish agriculture can currently respond well to the needs of domestic consumers. Finland produces milk, meat and cereals almost in line with consumption.

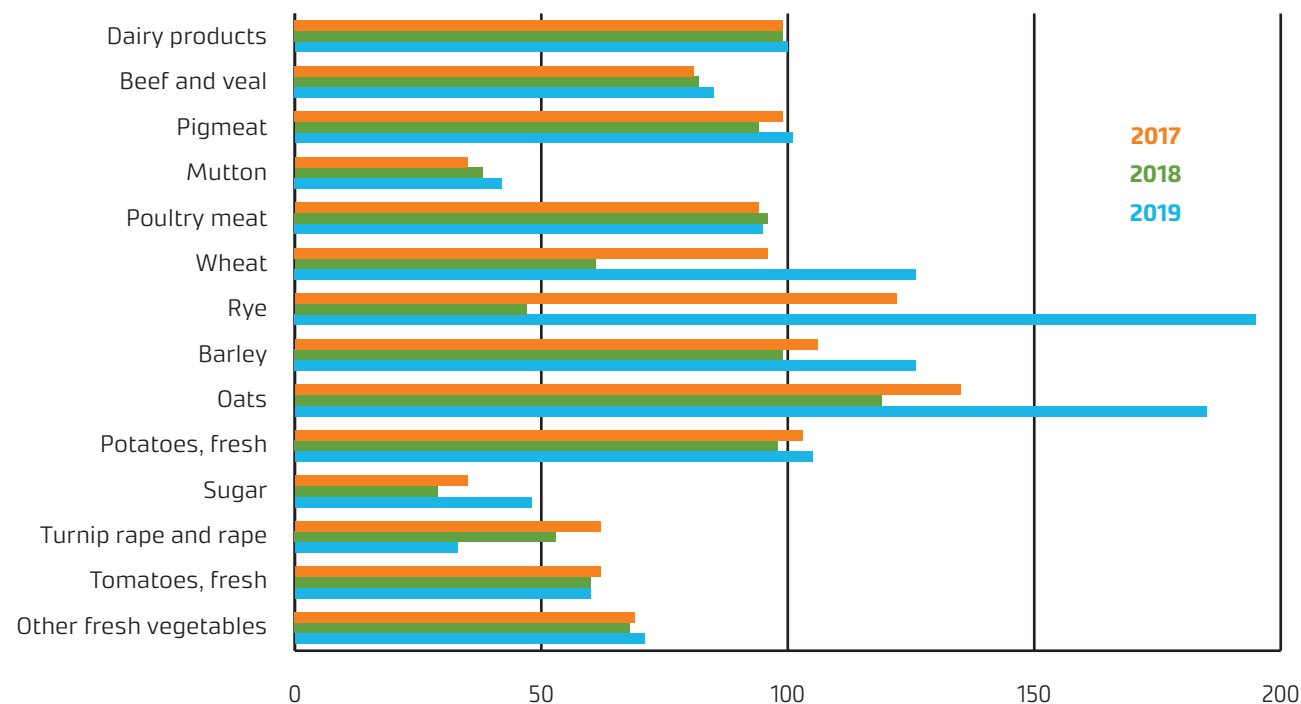
In recent years, the self-sufficiency rate for dairy products in Finland has been more than 100% and for meat products more than 90%. In cereals, yield variations have some impact on the production self-sufficiency rate in different years. Nevertheless, for feed cereals, oats and barley, self-sufficiency has remained above 100%. For bread cereals, wheat and rye, the self-sufficiency rate has varied between 50% and 100%.

Finland's overall protein self-sufficiency rate is also high. Protein sources include both plant- and animal-based products. The self-sufficiency rate for plant-based protein is more than 80%. The majority of the plant-based protein grown in Finland comes from either cereals or grass, the latter being an important source of protein for ruminants.

For complementary plant-based protein (such as turnip rape, rape, soy, pea and broad bean products) used in animal nutrition, the protein self-sufficiency rate is only around 15% in Finland. Turnip rape, rape and soy are imported into Finland in various

forms. In recent years, domestic alternatives have been actively sought for imports. However, due to its amino acid composition, the substitution of soy with domestic feed materials is challenging, especially in poultry feed.

Self-sufficiency level for various food products in Finland in 2017, 2018 and 2019.



Self-sufficiency alone is not enough to measure food security

Domestic agricultural production and the food processing industry are important for maintaining skills and resources, but also because they enable increasing production in possible crisis situations, such as in the event of prolonged difficulties in the supply of imported goods. A decrease in production below a certain critical mass may lead to the loss of the viability of the infrastructure and production capacity in the sector.

Self-sufficiency alone is not a sufficient indicator of food security; rather, it reflects the overall competitiveness of Finnish agriculture in domestic and international markets. Agricultural production depends on imported inputs, such as fertilisers, pesticides, fuels, machinery and foreign seasonal labour. The maintenance of production requires effective international trade relations and supply chains.

In terms of safeguarding food security, it is especially important that the logistical system and infrastructure supporting the entire food chain are sustainable. A logistical system that is based on low stock levels and re-stocking at the last possible moment is vulnerable to supply and IT system failures, and interruptions in energy or fuel supply, for example.

In an energy- and oil-dependent economic system, food security is particularly strongly linked to the security of energy supply. In its current form, agriculture does not survive without imported energy, and processing and distribution cannot be carried out without imported energy. A complete breakdown in fuel or energy distri-

bution would therefore paralyse the current food system.

Vulnerabilities, risks and threats in the food supply chain are widespread and in line with those of other production and service chains. Measures to ensure the security of energy supply and functioning of the electronic and transport infrastructure, for example, also contribute to the resilience of the food supply chain.

The impact of the coronavirus on the agri-food industry

The effects of the coronavirus pandemic on the agri-food sector can be divided into short- and long-term effects. At first, the coronavirus triggered a demand shock on the food market. It occurred as hoarding behaviour and a sharp decline in restaurant, workplace and school meals, as well as a shift in demand to grocery stores and long-life basic foodstuffs. Such products include rice, pasta, porridge flakes, crispbread and canned foods that can be stored in room temperature. Hoarding temporarily weakened the availability of some products.

In the long term, the agri-food industry may be affected by an economic downturn or recession, which would result in layoffs, increased unemployment, loss of earnings and growing uncertainty. As a result, demand for value-added products would fall, and consumption would increasingly shift to basic foodstuffs. Consequently, less money would be entering the food supply chain, which in turn would reduce the profitability of the sector. The impact on the food sector may remain relatively small if the crisis is over within a few months, and the economy returns to a growth

path. The more strongly the coronavirus hits general economic development, the bigger the impact is on the food sector.

The biggest direct risk of the coronavirus pandemic to agricultural production is the illness of the farmer or farmworkers, or a labour shortage caused by quarantine due to contact with an infected person. The majority of Finnish farms are family-run enterprises with a small number of staff. The availability of foreign seasonal labour, spare parts, feed, antibiotics and other production equipment can also be crucial for the continued production of a farm.

In the food industry, and in the logistics system supporting the food chain, the main concerns caused by the coronavirus situation are related to the illness of workers and consequently, potential production breaks and disruptions in international production chains. However, there are currently no known acute circumstances that would impede the activities of food companies.

Uncertainty in the food sector would especially increase if a large number of farmers and workers in the food chain were seriously affected by the coronavirus at the same time, resulting, for example, in a break in the food logistics chain. Such a risk could lead to an increase in food prices.

The extensiveness and diversity of the grocery trade network mitigate the effects of possible interruption risks in Finland. In addition, food retail companies have already adopted both government-recommended and voluntary measures to prevent the spread of the coronavirus.

Finland's food supply is also secured under exceptional circumstances

Food supply in Finland is not threatened as a result of the coronavirus pandemic, even though it tests the functioning of the food security and food supply chain. However, major food supply problems may arise if the coronavirus crisis lasts more than a year and extends to the next growing season. In a long-term and difficult crisis, it may become necessary to streamline the assortment of food industry and grocery trade, and the availability of some production inputs on the world market could weaken.

Finns are also guaranteed the food needed for essential nutrition in the worst-case scenario. With the food industry, the National Emergency Supply Agency has drawn up a list of the most essential food products whose production is maintained even in exceptional circumstances. The preservation of the current diet is not guaranteed, but adequate food in terms of energy content is also guaranteed in the event of a particularly difficult disruption.



African swine fever is disrupting the meat market

Jarkko Niemi

Over the last six years, African swine fever (ASF) has spread to ten EU Member States (Belgium, Bulgaria, the Czech Republic, Estonia, Latvia, Lithuania, Hungary, Poland, Romania, Slovakia). It has also been detected in neighbouring areas, including Russia, Belarus and Ukraine. Especially in the Baltic States and Poland, the disease has been spreading in the wild boar population and on pig farms. In Asia, ASF has also spread widely.

Swine fever is feared in Europe due to production losses and effects on foreign trade of pigmeat. Whether the disease occurs in wild boar populations or in production pigs is important for the impacts. Outbreaks on pig farms especially can have a significant impact on the functioning of the production chain.

Under the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement), other countries have the right to ban the import of pigs and pig products from regions where ASF has been detected. According to the Animal Health Code of the World Organisation for Animal Health (OIE), restrictions must be applied for a minimum of three months after the eradication of the disease. In the EU, restrictions have been applied regionally, so Poland, for example, has been able to export pork from its disease-free regions to the rest of the EU. Even one infected pig may be enough to extend the application of restrictions to the entire country, which is why countries are very concerned about the risk of the disease entering their territory.

If African swine fever is detected within the EU, a protection and surveillance zone of a radius of at least ten kilometres must be established around the outbreak site. In restriction zones, the transport of pigs is prohibited, and activities of pig farms may also otherwise be restricted. All infected pigs

and all other pigs at the same establishment must be culled and destroyed, and the establishment must be cleaned and disinfected. New pigs can only be imported after the restrictions have been lifted. In practice, in restriction zones and on infected farms, pig production is disrupted for a period of at least a few months.

ASF affects Finland indirectly via the markets

Although there has never been an outbreak of African swine fever in Finland, the effects of the disease are also felt on the Finnish market. In China, the world's largest producer and consumer of pork, the number of pigs fell by just under a third in 2019 from the previous year. The situation in China has raised increased the world market price for pork. In China, ASF has decreased production so strongly that new export opportunities have opened up for Finnish pork.

ASF also affects Finland via the EU pig market. The spread of ASF to the EU in 2014 is considered the reason for the subsequent Russian ban on imports of pig products from the EU, which resulted in a decrease in the producer price for pork in the EU. In addition, the outbreaks observed in Member States have affected the price level and competitive situation of pork in the EU. Such market-relevant phe-

nomena have been the most obvious impact of African swine fever on the Finnish meat market.

Changes in the European single market and the risk of the disease spreading to the country affect the development of pig production in Finland. The increase in disease and price risks also affects production costs in Finland, because the business risk must be compensated. Simulation models have estimated that if a disease similar to ASF entered Finland on average once every 20 years, the long-term cost of the risk to producers would be less than one cent per kilogram of meat produced, and the production-decreasing impact of the risk is less than 1%. In practice, such effects occur over time as decreasing investment, farms abandoning production or production breaks, for example. As ASF approaches Finland, the risk may increase rapidly and simultaneously decrease the attractiveness of investment in pig farms.

ASF causes sudden oversupply

African swine fever causes supply and demand shocks on the pig market. A decline in pork exports can result in a temporary oversupply situation in a country where the disease has been detected. The production volume cannot be drastically adjusted over the short term, because current production depends on the production decisions taken over the

last one or two years. The shock causes a downward pressure on pork prices when both imported meat and a large volume of domestic meat are available on the local market, some of which would normally have been exported. This is a problem, especially in countries where a large proportion of production is exported. However, restrictions in the internal trade within the EU are imposed on regional basis and therefore intra-community trade may be allowed from other parts the country.

The industry can adapt to this situation to some extent by storing meat, adjusting the product portfolio and targeting marketing efforts to countries to which export is possible. The number of animals can also be adjusted, with a delay of a few months. However, the adjustment possibilities are limited.

Millions of euros in losses due to export disruptionst

Another impact of ASF on the meat market is that it decreases production in two different ways. First, the destruction of animals on infected farms and the interruption of production removes production from the market, both directly and indirectly. At the same time, the deterioration of the economic outlook for the pig sector reduces production incentives for producers, which, together with the disease, decreases pig production with a delay of one to three years. The decrease in production eases the price pressures and after the export restrictions are lifted, may even increase the pork price level in the country.

Major outbreaks can result in increasing demand on the European market and raise prices, because even relatively small export volumes can influence the development of world market prices. This was

clearly the case during the classical swine fever epidemic in the Netherlands in 1997-1998, which had a major impact on the European pig market (the prices first fell and then increased).

Luke and the Finnish Food Safety Authority Evira (the current Finnish Food Authority) have simulated the economic impact of the entry of African swine fever into Finland on the Finnish pig sector (Lyytikäinen et al., 2015). According to the report, losses in the Finnish pig sector would probably be in the range of EUR 7.4 million and EUR 38.1 million (95% confidence interval) per outbreak, assuming that exports outside the EU are suspended according to OIE guidelines and exports to the EU continue. The overall loss to the national economy would be slightly lower (EUR 4.6-22.7 million), because consumers would benefit from the oversupply. However, pig production losses could increase rapidly if export restrictions are prolonged. A 6-9-month export disruption could result in losses of more than EUR 100 million.

Impacts of ASF vary across member states

Although the mechanism by which swine fever influences the markets is clear, the consequences of the disease can be varied and cannot be identified by a simple comparison of statistics. In Estonia and Latvia, for example, pork production has increased despite the widespread presence of ASF. However, as a result of swine fever, the production growth rate has decreased. An econometric analysis by Luke indicates that in EU Member States where African swine fever was detected in 2014-2019, the export of pork as carcasses or frozen meat in the year following the outbreak was on average around 15%, and pig production and pig numbers close to 5%, below the long-term trend.

The price impacts are more varied, and there appears to be no clear price impact. According to the statistical data, African swine fever has had varied effects on the meat market in the EU Member States where the disease was detected in 2014-2019. In Belgium, for example, the ASF outbreak observed in wild boar in 2018 decreased the pork producer price temporarily, and the average price for the year was 18% lower than in 2017. However, the pork price fell in 2018 across Europe - for example, in Denmark by 14% - which means that the price change in Belgium was not only due to swine fever.

The price debate often emphasises the initial market reactions, but long-term reactions are typically less pronounced. Yet the importance of the single market is sometimes underestimated in the debate. An outbreak, particularly in large and export-driven Member States, can affect the entire EU pig market. In Germany and Denmark, the pork price fell by around 18% between 2013 and 2015, i.e. just as much as in Estonia and only slightly less than in Poland and Lithuania (-21%), where ASF was detected at the time.

By way of comparison, the ongoing coronavirus pandemic has caused disturbances in world pig production chains, with partly the same effects as those described above. Although the operation of food logistics chains has continued, the closure of restaurants has led to a change in demand and adjustments to product ranges in the meat sector. Closures of slaughterhouses have been reported worldwide (e.g. in the United States), which has caused a demand shock for pig farms: there is a supply of pigs that have achieved slaughter weight on farms but suddenly no demand, which has led to a fall in the producer price.

Experiences with publishing environmental policy evaluations

Anja Yli-Viikari

The results of agri-environmental measures as part of the Common Agricultural Policy (CAP) was recently assessed in Finland which happened now for the fourth time. The evaluation was dealing with the effectiveness and efficiency of the actions carried out during the period of 2014-2020 with Rural Programmes.

Publishing of the results can be, however, complicated. For several times, we have noticed, how the process repeats the same pattern. First, the media launches the news focusing on the problems and the inefficiency of environmental measures. This leads to farmers feeling that they are being stigmatised, a vigorous response from the farmers' interest organisation, bewilderment among the programme planners and conservative comments from researchers. Finally, the importance of cooperation and interaction is, again, emphasised.

Information is considered as most crucial instrument for developing in modern society. However, the conditions and constraints associated with the successful utilisation of information can be still poorly managed. Information could be addressed as a tool for enabling meaningful discussions and joint decision-making. As with all other tools, there are also skills needed for using information wisely and skilfully.

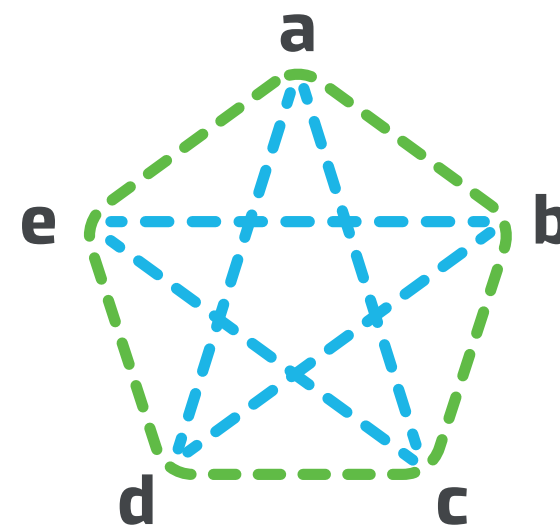
For media, it can be most difficult to formulate clear findings for the public, while the results of evaluations are mostly dealing with professional and very detailed kind of information. This is accompanied by the fast rhythm of news making and the general tendency of the media to focus on problems - the best way to get attention and attract public interest with the current overflow of media released.

The outcome of this process may be fairly obvious. The achievements of agri-environmental measures become foregone conclusions, and attention will be drawn to the prevailing shortcomings.

Managing the environmental impacts of agriculture is, indeed, a most challenging topic. At level of Rural Programmes, there are policy indicators created, that should address the clear policy messages about the results of programme measures. Indicators can be most useful when used in the analysis of linear, well-managed issues. In such a situation, they are able to address the outcomes showing also the appropriate management decisions; whether it is necessary to increase factor A in relation to factor B. However, the themes of political decision making are mostly concerning systemic entities, where great number of factors are affecting on the outcomes. Decision makers should base their decision on factors A, B, C, D and E, all of which interact with each other.

Linear versus systemic problem-solving situation.

$$a + b = x$$



Quantitatively addressed policy objectives with the related indicators can certainly contribute to supporting and clarifying the policy debate. However, also more comprehensive analysis in which numerical values are in-depth studied, are also quite essential for meaningful policy debates.

Creating clear and meaningful interpretation over the data will be the one of the main challenges for researchers, who should be able to communicate about the results of complex phenomena with most clear and well-addressed sentences. For the media and public, who can be accustomed to the Twitter lines with the most straightforward contents.

For agri-environmental issues there is no single solution to be mechanically carried out in each farm of the European Union. The process is more about joint learning for each region. Which are the practices that have been proved to be effective? What can be learned from the past, and how can we move forward in the next stage?

The processes of social learning can sometimes be painfully long and slow, as has been the case with Finnish water protection in agriculture. Nonetheless, the long-term downward trend in the nitrogen and phosphorus balances shows that there is a lot of improvement already happened. And also some way still to go until we have reached agricultural routines for as closed nutrients cycles as possible.

Slowing down a bit with each section of the society, could create better circumstances for the utilization of complex informations sets and facilitating of meaningful discussions.



Sources

Beek V. (2020) ASF Poland: First outbreak on farm in Western Poland, Pig Progress, 23.3.2020,

<https://www.pigprogress.net/Health/Articles/2020/3/ASF-Poland-First-outbreak-on-farm-in-Western-Poland-559288E/>

FAO 2008. An Introduction to the Basic Concepts of Food Security. FAO. **<http://www.fao.org/3/a-al936e.pdf>**.

FAO 2016. Methods for estimating comparable prevalence rates of food insecurity experienced by adults throughout the world. FAO Rome.

<http://www.fao.org/3/a-i4830e.pdf>

FAO 2019. The state of food security and nutrition in the world. FAO Rome. **<http://www.fao.org/3/ca5162en/ca5162en.pdf>**

Guy Pe'er, Yves Zinngrebe, Francisco Moreira, Clélia Sirami, Stefan Schindler, Robert Müller, Vasileios Bontzorlos, Dagmar Clough, Peter Bezák, Aletta Bonn, Bernd Hansjürgens, Angela Lomba, Stefan Möckel, Gioele Passoni, Christian Schleyer, Jenny Schmidt, Sebastian Lakner. 2019. A greener path for the EU Common Agricultural Policy. *Science* 365(6452), pp. 449–451. DOI: 10.1126/science.aax3146

Hyvönen, Terho. 2020. Ympäristötuen vaikutusten uutisointi etenee aina samalla kaavalla: kritiikki-syyläistäminen-tärkeiden myöntäminen. Natural Resources Institute Finland. Guest column 23.3.2020 in *Maaseudun Tulevaisuus*.

International Farm Comparison Network (IFCN). The IFCN Dairy Report 2019.

Lyytikäinen, T, Niemi JK, Sahlström, L, Virtanen, T, Rintakoski, S, Kyyrö, J, Sinisalo, A, Lehtonen, H. 2015. The effects of structural change in agriculture on the spread of animal disease in Finland. *Evira Research Reports* 3/2015. Helsinki, Finland: Finnish Food Safety Authority. Available online at:

https://www.ruokavirasto.fi/globalassets/tietoa-meista/julkaisut/julkaisusarjat/tutkimukset/riskiraportit/kotieläintalouden-rakennemuutoksen-vaikutukset-eläintautien-leviamiseen-suomessa_3_2015.pdf

Niemi JK, Lehtonen H. Modelling pig sector dynamic adjustment to livestock epidemics with stochastic-duration trade disruptions. *Eur Rev Agric Econ* (2011) 38: 529–551. **<https://doi.org/10.1093/erae/jbq047>**.

OECD/FAO 2019, OECD-FAO Agricultural Outlook 2019–2028, OECD Publishing, Paris/Food and Agriculture Organization of the United Nations, Rome.

https://doi.org/10.1787/agr_outlook-2019-en

Agri-food sector outlook analyses the current situation and the near-term prospects of Finnish agri-food sector.

Description of development in the agri-food sector:

- food production
- food consumption and prices foreign trade in foodstuffs
- agricultural policy
- agricultural structures
- development of economic situation in agriculture

Outlook replaces the previously published “Agriculture and food sector in Finland” review.

Editors

Terhi Latvala
Minna Väre
Jyrki Niemi

Inquiries

Jyrki Niemi
Natural Resources Institute Finland
Latokartanonkaari 9
FI-00790 Helsinki
Finland
Tel. +358 29 532 6390

firstname.lastname@luke.fi

Authors

Anna-Kaisa Jaakkonen
Csaba Jansik
Timo Karhula
Jaana Kyyrä
Terhi Latvala
Erja Mikkola
Jarkko Niemi
Jyrki Niemi
Olli Niskanen
Anneli Partala
Jukka Tauriainen
Jari Viitanen
Sanna Vuorisalo
Minna Väre
Anja Yli-Viikari

firstname.lastname@luke.fi



ISBN 978-952-380-094-6 (Print)

ISBN 978-952-380-095-3 (Online)

ISSN 2342-7647 (Print)

ISSN 2342-7639 (Online)

URN <http://urn.fi/URN:ISBN:978-952-380-095-3>

Copyright: Natural Resources Institute Finland (Luke)

Authors: Terhi Latvala, Minna Väre and Jyrki Niemi (eds.)

Publisher: Natural Resources Institute Finland (Luke), Helsinki 2020

Year of publication: 2020

Cover photo: Finnish Glasshouse Growers' Association

Other photos: Erkki Oksanen/Luke, Tapani Kivinen/Luke, Timo Karhula, Terhi Latvala, Csaba Jansink, Kanta-Hämeen kuvapankki, Pixabay

Printed at and publication sold by: PunaMusta Oy, <http://luke.juvenesprint.fi>