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Finnish agriculture and food sector 2016/17

Jyrki Niemi and Minna Väre (eds.)

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Natural Resources Institute Finland, Helsinki 2017

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Foreword

The annual review of agriculture and the food industry in Finland presents a current outlook for the sectors covered and the most recent research data in a single volume. It provides comprehensive information on the operating environment in agriculture and the food sector, the development of the agricultural and food markets, agricultural policy, the structural development and economic situation in agriculture, and the interaction between agriculture and the environment.

The special themes of the review at hand explore the competitiveness of the Finnish food chain, the implications of the UK leaving the EU for the agriculture and food markets, the implementation of policy measures related to risk management in agriculture, and consumers' interest in animal welfare.

We hope our readers in and outside Finland will find this report useful.

Helsinki, 8 June 2017

Jyrki Niemi and Minna Väre

Keywords: agriculture and food markets, production, consumption, income, profitability, agricultural policy, the environment.

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1. Operating environment of agriculture

1.1. Agriculture and the food sector in the national economy

In Finland, the total annual consumption expenditure on food and beverages is €23.3 billion. Food and non-alcoholic beverages consumed at home account for almost 60% of this at €13.6 billion.

As living standards have risen, the share of food and non-alcoholic beverages consumed at home in the total consumption expenditure of Finnish households has decreased to about the same level as in the old EU countries. In 2015, this share was 12.4%, slightly down from the previous year.

When alcoholic beverages and eating out are also included, food accounts for 21.3% of household consumption expenditure. The share of eating out (5.9%) has remained fairly constant in recent years. It is smaller than the share in the old EU countries (7%).

Agriculture and horticulture

According to national accounts, the agricultural and horticultural output at the basic price was €4.4 billion in 2015. Output at the basic price went down 7.1% on the previous year. When all subsidies on production are included, the output was €6 billion.

The agricultural use of intermediate products, i.e. one-off goods and services acquired, was €3.3 billion. Intermediate products went down 2% on the previous year. The main intermediate products are fertilisers, feedstuffs, plant protection products, electricity, transport fuels and various services that support production.

Consumer expenditure on foodstuffs and beverages, € million.			
	2014	2015	% change
Total	23,334	23,298	0
Foodstuffs*	12,445	12,288	-1
Non-alcoholic beverages*	1,292	1,288	0
Alcoholic beverages*	3,414	3,319	-3
Catering services (eating out)	6,183	6,403	4

*Food consumed at home
Source: Statistics Finland, National accounts.

Share of foodstuffs and non-alcoholic beverages in consumer expenditure of households, %.		
	2014	2015
EU28	12.4	12.3
EU15	11.8	11.7
Belgium	13.1	13.3
Denmark	11.5	11.4
Estonia	21.0	20.7
Finland	12.7	12.4
France	13.3	13.3
Germany	10.5	10.5
Greece	16.4	16.6
Italy	14.3	14.3
Norway	11.9	11.9
Portugal	17.3	17.0
Sweden	12.4	12.5
United Kingdom	8.7	8.4

Source: Eurostat National accounts.

The agricultural and horticultural value added at the basic price was €1.1 billion. This is down €0.3 billion, or 20.1% on the previous year. The share of agriculture and horticulture of the total value added was 0.6%, which is less than the previous year. In addition to weather conditions

during the growing season, fluctuations in product and input prices influence the financial out-turn of these sectors more than before.

Agriculture is very capital-intensive because of the machinery, buildings and fields needed in production. In 2015, total investments in agriculture were €1,072 million, which is down slightly on the previous year. Its share of the total investments of the national economy was 2.5%.

Food processing

The output of the food industry decreased from €11.3 billion in the previous year to €10.9 billion in 2015. The use of intermediate products decreased from €8.6 billion to €8.3 billion. The value added generated in the food industry was almost at the same level as the previous year, €2.6 billion.

The share of the food industry in the total value added decreased to 1.4% in 2015. The food industry accounted for 8.4% of the value added in the manufacturing industries, which is slightly less than in the previous year (8.9%).

After the metal, chemical and forest industries, the food industry is the fourth largest industry in Finland. Like the forest industry, the food industry is raw material intensive. Intermediate products make up almost 80% of the output. The food industry purchases most of its raw materials from domestic agricultural and horticultural suppliers. Because of transportation costs, a significant proportion of the food industry is highly dependent on domestic raw materials.

In 2015, domestic investments in the food industry went down slightly when compared to the record €539 million level of the previous year. Its share of the total investments also went down to 1.2%.

Domestic wholesale and retail trade in foodstuffs

The whole sale and retail trade sector traditionally serves as an intermediate between producers and consumers. The value of production in the whole sale and retail trade sector is not as readily available as that of primary production and processing because, in most cases, only information on sales and turnover is published. In addition to the retail trade, the trade sector also supplies foodstuffs to providers of catering services and engages in foreign trade by exporting and importing agricultural and food products.

Foodstuffs require a great deal of handling, which is why wages and salaries and production facilities are significant cost items in the whole sale and retail trade sector. Other major cost items are transportation and logistics, various business services and advertising.

The position of trade at the end of the food chain differs from primary production and processing. The sector is not dependent on domestic primary production in the same way as the food industry, and thus it is capable of taking advantage of competition both within the domestic food industry and between Finnish and foreign companies.

Food trade is still largely in the hands of domestic operators and is founded on chains of wholesalers and retailers in which the buying-in operations both in Finland and abroad are highly centralised. Besides the German discount chain Lidl, which came to Finland in 2002, the small markets and high transportation costs have not attracted any other foreign food chains.

Food and beverage services

Food and beverage services include eating outside the home in restaurants and cafés. The output of food and beverage service

activities in 2015 was €5.7 billion, which is up 3% on the previous year. Its value added, €2.4 billion, is up by 5.8% on the previous year. The share of the food and beverage services in the total value added was 1.3%. Investments in the industry were €104 million, which is down 13% on 2014.

Foreign trade in foodstuffs

The value of food imports (CN 1–24) totalled €4.8 billion in 2015. Food imports went up just under 1% compared to the previous year. The value of food exports, €1.4 billion, was down 8.6% on the previous year. In 2015, total goods imports (CN 1–99) went down by 6.1%, and goods exports by 3.8%.

Food imports account for almost 9% of total goods imports. Meanwhile, food exports account for just under 3% of total goods exports.

In addition to foodstuffs and raw materials, imports also include energy, transport fuels and various chemicals required in domestic food production. Most of the machinery, equipment and their parts are imported.

The import of services in various management, planning, and research tasks is also on the rise. When food imports and the imports needed in domestic production are included, the food sector is 78% domestic.

Taxes and support in the food sector

The state contributes to the food chain by collecting taxes and allocating financial support to agriculture. In addition to value added tax, consumers pay excise duties on the prices of foodstuffs and beverages, and energy taxes are collected in food production. Income tax is also collected on food chain income.

The 14% value added tax on food and restaurant services is lower than the standard VAT rate. The VAT on food rose from 12% to 13% in July 2010 and to 14% at the beginning of 2013. The VAT on restaurant services decreased from 22% to 13% in July 2010 and rose to 14% at the beginning of 2013. The standard VAT rate of 24% is applied to alcohol.

The tax revenue collected as VAT and excise duties totals €4.7 billion.

GDP share of agriculture¹ and food industry (at basic price) and investments (at current prices).

Year	Gross domestic product				Share in investments	
	Agriculture million €	Food industry million €	Agriculture %	Food industry %	Agriculture %	Food industry %
2015	1,086	2,558	0.6	1.4	2.5	1.2
2014	1,359	2,644	0.8	1.5	3.1	1.3
2013	1,766	2,688	1.0	1.5	2.7	1.1
2012	1,596	2,683	0.9	1.6	2.6	1.0
2011	1,509	2,589	0.9	1.5	2.7	0.9
2010	1,511	2,617	0.9	1.6	2.7	0.9
2009	1,379	2,815	0.9	1.8	2.9	1.0
2008	1,206	2,549	0.7	1.5	2.6	1.0
2007	1,421	2,499	0.9	1.5	2.8	1.1
2006	1,083	2,340	0.7	1.6	2.8	1.1
2005	1,549	2,414	1.1	1.7	2.9	1.2

¹Agriculture including subsidies on production in addition to subsidies on products.

Source: National accounts 2003–2015e. Statistics Finland.

The VAT revenue from food is just under €1.7 billion and that from the retail sales of alcoholic beverages €0.6 billion.

Restaurant services generate just under €0.8 billion of VAT revenue. The VAT revenue from food is around 10% of the total VAT revenue. When restaurant services and alcohol are included, the share of the food sector in the total VAT revenue amounts to 18%.

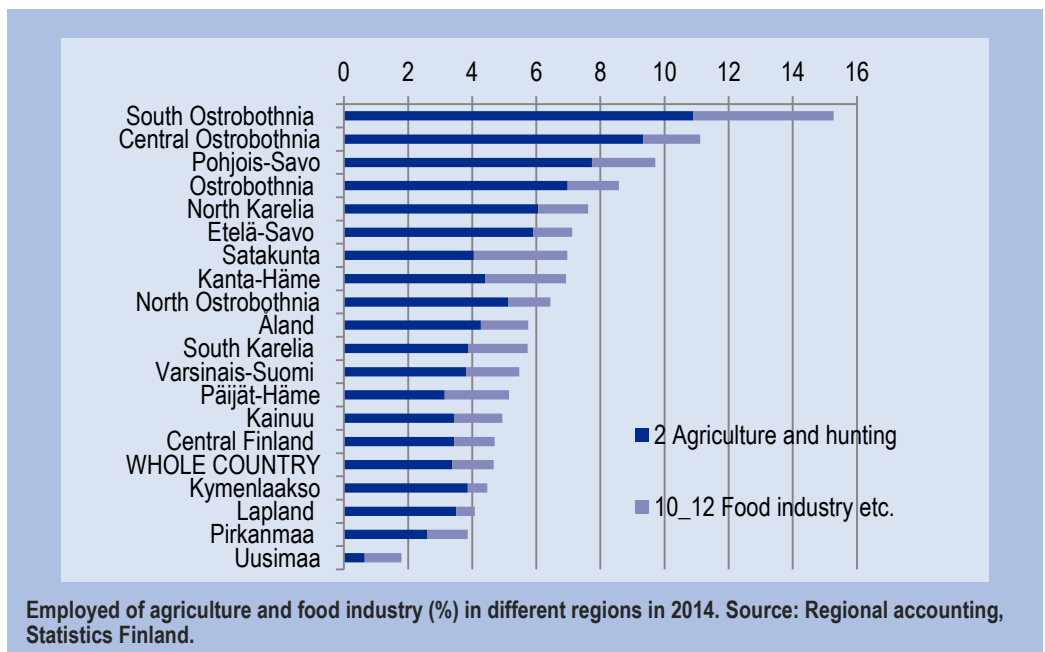
The tax revenue from alcoholic beverages is just under €1.4 billion. A total of almost €0.3 billion is also collected as excise duties on confectionery, ice cream and soft drinks. The excise duty on alcoholic beverages was raised in 2008, twice in 2009 and again in 2012 and 2014. The duty on confectionery and ice cream became applicable in 2011, and the duty on soft drinks was raised at the same time. The duty on confectionery and ice cream was raised in 2012 and the duty on soft drinks in 2012 and 2014. The duty on confectionery and ice cream is due to be abolished in 2017.

The taxes levied by the state on the food sector exceed the support to the sector.

Subsidies for agricultural production, a total of just under €2 billion, are funded by the EU, co-funded by the EU and Finland, or paid from national funds only. The EU contributions to agricultural support amount to just under €1 billion a year, and the support from the state budget is just under €1.2 billion. Since Finland's EU membership fees from the state budget are around €2 billion, it can be thought that part of the contribution is returned in the form of agricultural support.

Economy-wide effects of the food sector

Besides agriculture, the food and trade sectors and the restaurant and catering services, many other sectors are involved in food production by producing goods and services for it. In practice, the effects of the food sector extend throughout the economy and various industries, including the transportation, trade and energy sectors and water and waste management.



Households use income generated from food production for purchasing goods and services, thereby spreading the effects to sectors producing consumer goods and services.

Part of the investment effects flow abroad, especially through the purchase of machinery. Construction has a more direct impact on the regions themselves than investments in machinery. In addition to agriculture and the processing industry, building investments have been made in recent years in the food trade in particular.

Employment effects of the food chain

According to national accounts, the number of people employed in agriculture was 83,500 in 2015, representing 3.4% of the employed labour force. This number declined by 2,500 from the previous year. The number of people employed in agriculture has fallen in all regions, along with the number of farms and increased substitution of machines for labour.

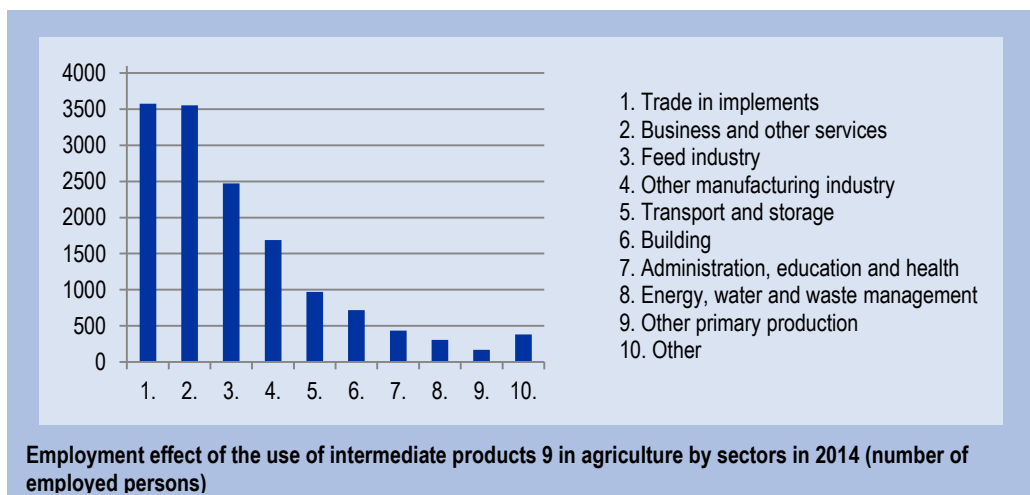
In absolute terms, the number of people employed in agriculture is the greatest in the regions of South Ostrobothnia, Southwest Finland, North Ostrobothnia and North Savo. These regions make up 40% of the total labour force involved in agriculture in Finland.

Proportionally, the share of agriculture in the employed labour force is the highest in South Ostrobothnia (10.9%), Central Ostrobothnia (9.3%), the coastal regions of Vaasa (7.7%), and in North Savo (7%).

By purchasing goods and services, agriculture also employs around 15,000 people in other sectors. In the service sector, agriculture employs people in veterinary services, the trade of implements and machine maintenance, among others. The industry provides animal feed and fertilisers.

National accounts show that the food industry employed 37,600 people in 2015, or 1.5% of the employees in all sectors. A quarter of the jobs in the food industry are located in the region of Uusimaa. 10.1% of the people employed in the food industry are in South Ostrobothnia, 8.2% in Southwestern Finland, and around 7% each in Pirkanmaa and Satakunta. Proportionally, the food industry is the largest employer in South Ostrobothnia (4.4% of the employed labour force), followed by Kanta-Häme (2.9%) and Satakunta (2.5%).

As the number of jobs in primary production and processing is decreasing, more people find employment in services in the food chain. In 2015, the number of people employed in restaurants and catering services was around 67,900. The food trade employs people in the wholesale and retail trade.



1.2. Food consumption and consumer prices

Food consumption

At 19.7%, fruit and vegetables are the largest product group in consumption expenditure of food and non-alcoholic beverages. The share of fruit and vegetables has been on the increase, and in 2014, it exceeded the share of the meat and meat products, the largest group until then far.

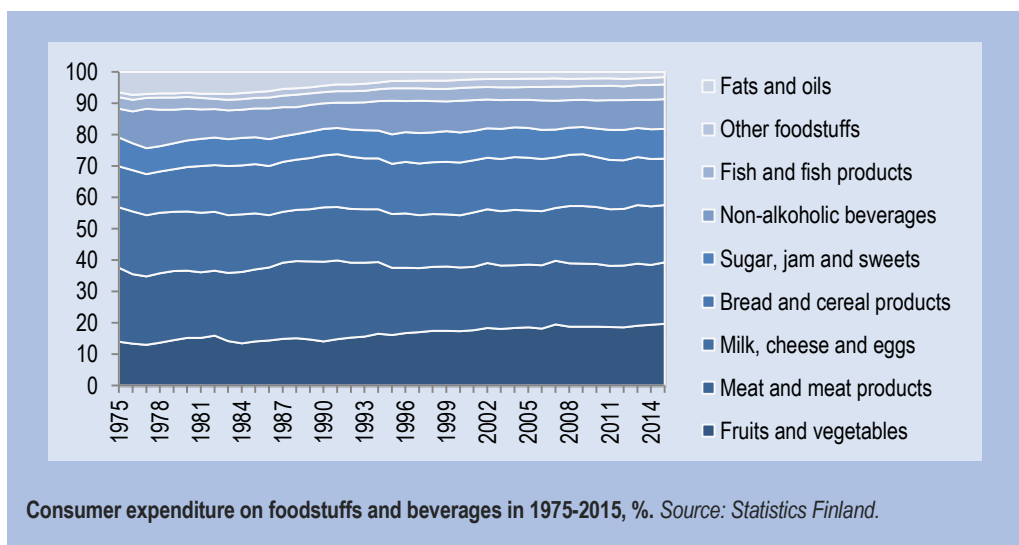
The share of meat and meat products is 19.6%, compared to the early 1990s, when it peaked at 25%. The product group of milk, cheese and eggs has been on the increase and is now at 18.3%, having been at its lowest in the late 1980s, at 16.2%. At 14.7%, bread and cereal products are the fourth largest product group in consumption expenditure of food and non-alcoholic beverages. Its share peaked in 2004, at 16.9%.

The shares of the product groups of sugar, jam and confectionery, and non-alcoholic beverages are both at 9.5%. Their shares have remained more or less the same since 1975.

However, in the group of non-alcoholic beverages, the content has changed with the share of coffee, tea, and cocoa down from 70% to 30% and the share of soft drinks, mineral water and juices has increased.

The share of fish and fish products in consumption expenditure is growing slowly. In 2015, the share was 4.7%, compared to 3.7% in 1975. The most significant reduction has been in the share of oils and fats. In 2015, its share was 1.6%, compared to 6.6% of the consumption expenditure in food and non-alcoholic beverages in 1975.

Most of the consumers' need for energy is still made up of cereal, dairy products and meat. Meat consumption per person increased in 2015 after three consecutive years of decline. At 2.8 kg, the growth was significant, and consumption, 79.4 kg per person, exceeded the previous record year, 2011. The majority of the growth, 1.5 kg, is seen in poultry meat, which is increasing consistently. Both beef and pork consumption increased by 0.5 kg. Consumption of pork meat is the largest group, 35.1 kg per person per year. The consumption of poultry meat exceeded the consumption of beef in 2012.



The consumption of fresh vegetables is on the increase, although the figure went down slightly in 2015. The consumption is 62.3 kg per person. Of fresh vegetables, the share of tomatoes is around 20%, or just over 12 kg. Among fruit, the group of other fresh fruit is on the increase. The consumption in 2015 was around 45 kg, compared to the stable consumption level of citrus fruit at around 13 kg.

Consumption of liquid milk products has been on the decrease. In 2015, milk consumption was 127 kg per person. It was down 4 kg on the previous year. Growth in the consumption of full milk only continued for a few years. Growth of skimmed milk consumption has also halted.

Buttermilk consumption, 10.1 kg, is down 0.8 kg on the previous year. In 2015, yoghurt consumption was 21.3 kg per person and we did not see growth similar to the previous years. Butter consumption was in decline until 2007, when it was at 2.5 kg. This was followed by six years of growth, until the trend turned down again in 2014.

Among dairy products, growth is seen in cheese, sour products and flavoured quark and puddings.

Egg consumption took an upward turn after the all-time low of 9.2 kg in 2003. In 2015, egg consumption was 11.5 kg per person. This was up 0.7 kg on the previous year.

Consumption of some foodstuffs per capita in 2007–2015, kg.

	Fresh vegetables	Cereals total	Sugar	Meat ¹ total	Beef	Pigmeat	Poultry	Eggs
2015e	62.3	78.8	29.3	79.4	19.2	35.1	21.6	11.5
2014	65.4	80.0	29.5	76.6	18.7	34.6	20.1	10.8
2013	61.2	80.0	28.9	77.1	18.4	35.6	19.5	10.7
2012	57.4	79.2	29.8	77.5	18.9	36.0	19.1	10.6
2011	62.6	78.8	30.1	77.6	18.6	36.4	18.2	10.0
2010	56.1	79.3	31.8	76.4	18.6	34.9	18.2	9.8
2009	59.0	79.5	32.6	74.1	17.8	34.4	17.5	9.5
2008	56.2	80.2	31.8	75.4	18.2	35.3	17.2	9.4
2007	56.4	79.8	30.9	74.9	18.7	34.9	16.4	9.3

¹) Including bones, i.e. carcass meat, incl. edible offals.

Source: Luke, Statistical services.

Consumption of some milk products per capita in 2007–2015, kg.

	Liquid (litres) milk	Whole milk	Skimmed milk	Sour milk	Yoghurt	Sour cream products ¹	Other fresh products ²	Cheese ³
2015e	127.0	11.7	48.0	10.1	21.3	2.4	3.2	26.6
2014	131.0	12.5	50.7	10.9	21.2	2.8	2.8	25.0
2013	132.2	12.8	51.2	11.3	22.6	2.7	2.5	23.2
2012	133.9	12.5	50.8	11.8	23.3	2.5	2.2	21.9
2011	133.5	11.4	52.0	11.9	23.9	2.4	2.0	21.0
2010	135.3	10.4	54.5	12.4	23.4	2.3		19.0
2009	136.8	10.0	54.9	12.5	22.5	2.2		18.7
2008	138.6	10.2	53.8	13.0	22.4	2.1		18.4
2007	140.3	10.5	52.3	13.4	22.2	2.0		17.5

¹) Incl. sour cream, crème fraîche and smetana.

²) Incl. among other things puddings and quark with additives.

³) Incl. quark, natural and cottage cheese.

Source: Luke, Statistical services.

Cereal consumption was on the increase in the early 2000s, but no growth is seen today. In 2015, consumption was 78.8 kg per person, making it 1.2 kg less than the previous year. Wheat consumption, at 44.2 kg per person, was the largest item, but consumption has been on the decrease during the previous decade. Rye consumption has been stable at around 15 kg per person per year. Consumption of other cereals is considerably smaller, but their share is on the increase. Particular growth has been seen in barley, but the consumption of oat and other cereals suitable for making bread (buckwheat and quinoa) is also on the increase.

Sugar consumption is decreasing slowly. In 2015, the consumption was 29.3 kg per person, compared to more than 36 kg in the early 1990s.

Consumer prices

In 2016, consumer food prices on the annual level were down for a third year running. In 2014, the figure was down 0.5% on average and in 2015, just over 2.2%. The same trend continued in 2016, with food prices decreasing by around 1% on average.

In addition to poor economic development, slow growth in demand and decreased prices of raw materials, the lower prices are a result of the import bans imposed by Russia and the so called “cheapening campaigns” in the retail trade. In 2015, the general consumer price index went down by 0.2%, but it rose by 0.4% in 2016.

Food prices increased particularly fast in 2010–2013, rising by almost one-fifth in three years. Prices continued to climb until May 2013, after which the rise slowed and prices began to decline in 2014.

Prices dropped considerably in February 2015, when lower costs in the food chain were partly passed on to consumer prices. A second considerable drop in prices came during July–September 2015.

Development of average consumer price index and the consumer price index of foodstuffs in Finland in 2000–2016, 2000=100.

	Price index of foodstuffs	Consumer price index
2016	136.4	127.5
2015	137.8	127.0
2014	140.9	127.3
2013	141.6	126.0
2012	133.4	124.1
2011	126.8	120.7
2010	121.1	116.7
2009	126.1	115.3
2008	123.3	115.3
2007	113.2	110.8
2006	110.9	108.1
2005	109.5	106.2
2004	109.5	105.3
2003	108.8	105.1
2002	108.2	104.2
2001	104.8	102.6

Source: Statistics Finland.

At that time, food prices were 3.3% lower on average than the previous year.

The consumer prices of meat products fell by an average of 7.6% from 2013 to 2016. During 2013–2016, the consumer prices of pork went down almost 12%, beef 5% and poultry meat almost 8%. Meanwhile, the consumer prices of fish and shellfish rose by almost 9% during the same period.

The consumer prices of dairy products took a downward turn in the spring of 2014. On average, consumer prices went down by 6.8% from 2014 to 2016. The biggest drop was in the consumer price of liquid milk. In 2016, liquid milk was on average 9%, cheese more than 8% and yoghurt 5% cheaper than in 2014. The declining trend continued during the second half of 2016, although it was not quite as strong as the previous year.

Butter prices dropped by an average of 22% during 2013–2016, primarily due to Russia's import bans. In 2014, the consumer price had already dropped by almost 17%.

Average consumer prices of some foodstuffs in 2012–2016, €/kg.						
	2012	2013	2014	2015	2016	change % 2015–2016
Light milk, €/litre	0.87	1.05	1.10	1.03	1.01	-1.9
Butter	5.84	6.12	5.74	4.96	4.92	-0.8
Margarine	3.75	3.85	3.90	3.60	3.48	-3.5
Emmenthal cheese	13.82	14.13	14.02	14.52	13.85	-4.6
Beef roast	15.87	16.88	16.74	16.21	16.07	-0.9
Pork fillet ¹	12.37	13.62	12.63	12.11	11.78	-2.7
Chicken breast fillet	13.12	13.75	13.47	13.18	13.02	-1.2
Eggs	3.93	4.25	3.68	3.60	3.45	-4.2
Wheat flour	0.62	0.69	0.68	0.68	0.66	-2.2
Rye bread, portion size	3.85	4.05	3.92	3.74	3.59	-4.0
Tomato	3.24	3.08	3.25	3.19	3.03	-5.0
Potato	0.82	0.94	0.87	0.93	0.97	4.3

¹ From 2011 pork tenderloin.

Source: Statistics Finland, consumer price statistics.

The consumer prices of cereal products fell by 3.5% during 2013–2016. In 2014, the figure was down by 0.4% but in 2015, it was down by just over 2%.

The 3% drop in the consumer prices of fruit and berries during 2014–2015 halted in 2016. In 2016, the prices remained on average on the same level as the previous year.

In the 2000s, food prices have increased much faster than consumer prices in general. From 2000 to 2016, the price of food rose by just over 36%, while the general consumer price index went up by just under 28%. Relative to the level of earnings, however, food has become much cheaper, since wages and salaries have increased by more than 60% since 2000.

According to Statistics Finland, food prices in Finland were 19% higher in 2015 than the EU average. In 2014, the difference was 23%. Food prices in the Nordic Countries, Switzerland and Austria were higher than in Finland. Food was cheapest in Poland and other eastern EU countries.

One reason why food is still more expensive in Finland than in the rest of the EU is the high value added tax, which even after the reduction from 17% to 14% is the second highest in the EU-15. Only in Denmark is the tax on food higher than in Finland.

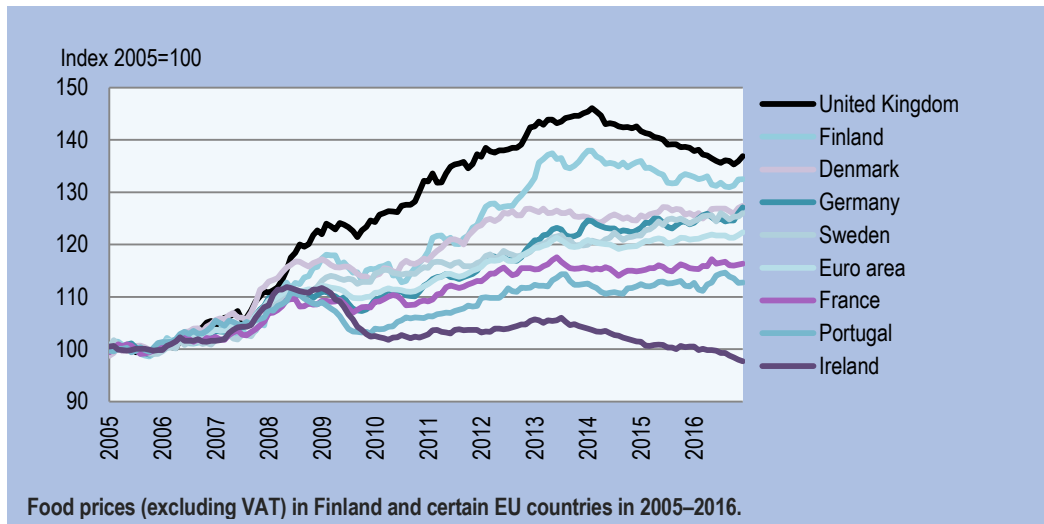
International comparison of prices is complex, however. Prices still depend on various national characteristics and eating habits. For example, Finnish consumers value domestic products and are prepared to pay extra for domestic tomatoes and cucumber. This makes the statistical prices in Finland higher.

Looking at food price trends in 2005–2016, VAT excluded, it can be stated that among the EU-15, only in the UK have prices risen more rapidly than in Finland. The most significant price increases have been seen in the more recent EU Member States, such as Estonia, Lithuania, Hungary and Bulgaria. In EU countries, food prices rose by 1.7% a year on average in 2005–2016. In 2014, the trend of increasing food prices halted in the Eurozone, and the following two years were fairly moderate. In 2016, prices took another upward turn.

In addition to the development of consumer prices, public debate has been lively on the way the price paid by consumers is divided within the food chain. The share of trade in the taxable consumer price has increased. The position of trade has become stronger since it is possible to shop around to find the best deals in the food sector and thus set stricter conditions on primary production.

However, the wholesale sector's stronger purchasing and negotiation position is not the only reason for the growing difference in consumer and producer prices.

Other reasons include the increased degree of food processing, stricter standards in food hygiene and differences in productivity in various parts of the chain.



1.3. Retail trade

The consolidation trend in the Finnish retail sector has continued for a long time, leading to the two largest chains having a market share of almost 80% in the 2010s. S Group in particular has expanded strongly since 2005. According to research firm Nielsen, S Group's market share in 2016 was 47.2% while K Group's was 36.2%. The German chain Lidl's market share in 2016 was 8.8%. Since 2011, Lidl has increased its share by as much as four percentage points.

In 2016, the most significant individual event in the Finnish retail sector was the disappearance of Suomen Lähikauppa from the market. In late 2015, Kesko acquired the chain and in the spring of 2016 the merger was approved by the Finnish Consumer and Competition Authority on certain conditions. The merger meant that K-Group's market share rose by 3.4% from the previous year. Within K Group, the K-

Market chain showed the most growth as 223 former Siwa and Valintatalo outlets were transferred to the chain by the end of the year. Kesko was forced to sell 60 Suomen lähikauppa outlets to the competing chains.

This transaction means that the consolidation trend in the Finnish retail sector continues as the market now suddenly consists of three actors of national significance. The earlier price competition between the retail chains became even tougher during 2015–2016. In 2016, the total value of the sales of daily consumer goods was €16.7 billion, which is up 0.9% on the previous year. There are various reasons for increased sales. Growth was impacted by the deregulation of shop opening hours at the beginning of 2016, the drop in prices, and the upward turn in consumer confidence after a steady downward trend during the 2010s. Lowering prices also stimulated food consumption.

Market shares of retail companies in 2006–2016.											
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
S-ryhmä	39.9	41	42.4	43.2	44.1	45.2	45.6	45.7	45.7	45.9	47.2
K-ryhmä	33.4	33.9	33.7	34.2	35	35.3	34.7	34	33.1	32.7	36.2
Suomen lähikauppa*	11.9	11.9	11.3	10.2	9.0	7.8	7.3	7.0	6.8	6.4	1.5
Spar**	0.5	-	-	-	-	-	-	-	-	-	-
Lidl***	4.1	4.7	5	5.1	4.8	4.8	5.5	6.6	7.6	8.3	8.8
Other companies	10.2	8.4	7.6	7.3	7.1	6.9	6.9	6.7	6.8	6.7	6.3
Total	100	100	100	100	100	100	100	100	100	100	100

*Earlier Tradeka. **From 2006 M Group; in 2007–2008 included in "Other". ***estimate
Source: AC Nielsen.

The fast progress of the Lidl chain and the S Group's cheapening campaign prove the significance of price when it comes to steering consumer choices. The economic recession has made consumers more price-sensitive. Due to this, they are turning to more affordable foods, which has led to a rise in the popularity of discount stores and own brands all over Europe.

Retail chains' own brands have, in fact, been given much more shelf space than before. Previously, they played a major role in non-food goods and dry foodstuffs, but own brands have in recent years been introduced in an increasing number of product groups. For example, in dairy products they have achieved a significant position over the past three or four years in the sales of liquid milk, fresh products and cheese.

The increasing number of own brands, the threat posed by imported goods, and the price level and limited selection of discount stores intensify competition between Finnish suppliers and bring production margins down.

In 2016, the winners were hypermarkets and large supermarkets, while sales in smaller shops (below 400 sq.m.) declined to the level they were about ten years ago. In 2015, the share of hypermarkets in total sales was 28.0%, and that of larger supermarkets was 36.8%.

In many countries across Europe, online trade has challenged hypermarket chains in non-food product groups. However, online food sales are still marginal in Europe, and in Finland their share of total sales is around 0.3%.

1.4. Food industry

In 2015, the turnover of the food industry fell by €400 million to €10.4 billion. The fall was due to a decline in revenue from both domestic and export markets.

The number of people employed in the food industry has risen slightly since the recession year of 2009. The upward trend continued in 2015, with the number of people employed increasing by 208 people on the previous year, making the total number 33,653. In the long-term development of staff numbers, the turning point was during 2010–2012.

At first sight, it may be difficult to understand why staff numbers would be increasing in a sector where output is smaller every year. One possible explanation is the employment impact of small enterprises. The number of enterprises increased by 138 from 2013 to 2015.

As a result of the growth of staff and the contracted turnover, the real turnover

Turnover of the Finnish food industry (at current and fixed prices) in 1995-2015.

	Turnover (at current prices, billion €)	Turnover (at 2015 prices, billion €)
1995	7,7	10,6
1996	7,8	10,6
1997	8	10,8
1998	8	10,4
1999	7,5	9,8
2000	7,9	10
2001	8,3	10
2002	8,4	10,2
2003	8,5	10,2
2004	8,9	10,7
2005	8,9	10,6
2006	9,2	10,8
2007	9,7	11,1
2008	10,5	11,6
2009	10,3	11,3
2010	10,2	11,1
2011	10,8	11,4
2012	11,2	11,4
2013	11	11,1
2014	11	10,8
2015	10,4	10,4

Source: Statistics Finland, Finnish Enterprises 1995-2015.

per person in 2015 decreased to €309,000 in the food industry. This indicator of productivity has been on a steady increase since Finland joined the EU, but in 2012, it reached its highest point and has been decreasing at a worrying rate since then. The two main sectors in the Finnish food industry are the dairy and the meat processing industries. Between them, they contributed to 45% of the turnover of the food industry in 2015. The dairy industry peaked in 2013, when prices on the demand-driven world market were high, and a new sales record was achieved in the Russian market. At that time, the turnover of the dairy industry exceeded that of the meat processing industry. Since then the dairy industry has faced difficulties in the market resulting in a steep decline and the order of the two largest industries has been restored.

1.5. Foreign trade

Finland's food exports have still not recovered from the decline caused by Russia's import ban. Although the drop in 2016 was considerably smaller than the previous year, exports were down for the fourth year running.



The total value of food exports from Finland in 2016 was €1,431 million, indicating a fall of 1% on the previous year.

In 2016, the value of food imports to Finland was €4,935 million, which is up almost 1,8% on the previous year. The development of food imports has been moderate since 2013, following previous years of strong growth. Explaining factors may be consumers' weakened financial standing and the fact that goods intended for exports remained in the domestic market. The combined outcome of the developments in exports and imports is that the deficit in the food trade grew moderately by around €100 million, from €3,407 million to €3,504 million. Traditionally, the balance deficit has mainly been due to the large import volumes of fruit, vegetables, raw coffee, alcoholic beverages and tobacco. Other important products imported to Finland include cheeses and cereal products. However, in recent years, the Finnish food industry has been faced with competition in product groups that used to be dominated by domestic production, such as meat, dairy and fish.

There have been no significant changes in the geographical distribution of imported agricultural and food products. In 2016, the majority (65.3%) of Finnish food imports came from the old EU countries. Food imports from countries that joined the EU in 2004 or later decreased from the previous year and were at 9.2%. The share of non-EU countries rose to 25.5%.

As a result of the sanctions, exports to Russia have fallen dramatically. In the peak year of 2013, the value of food exports to Russia was €440 million. In 2015, exports to Russia crashed down to €119 million. In 2016, the export value declined to €117 million.

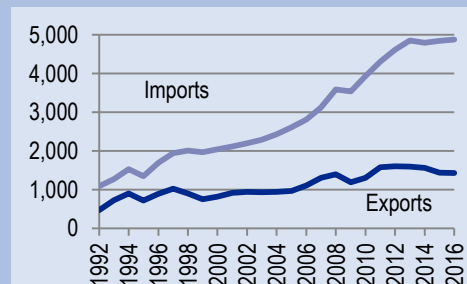
The share of exports to Russia has, in fact, fallen from the best years of 26-28% to 8.4%. Exports to other countries have been increased, with the focus on Sweden, the

Netherlands and France. More than half of Finnish food exports have traditionally gone to neighbouring countries, but in 2016, their total share of food exports was down to just a little over 42% (Sweden 21.3%, Estonia 10.1% and Norway 2.5%).

Despite Russia's ban on imports, dairy products were still the most significant single product group in food exports. Having said that, exports of dairy products are down from €533 million three years ago to €357 million, and the sector's share of total exports is down from 33% to 25%. The value of butter exports in 2016 totalled €108 million, that of cheese exports only €48 million and that of whey exports €53 million.

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. However, the trade balance was barely positive following a dive from €162 million in 2014 to €13 million in 2016.

The value of the export of cereals in 2016 was almost €27 million less than the previous year, around €120 million. The value of oat exports fell down to €54 million, while the value of wheat exports was €37 million. Other key exports include meat, alcoholic beverages and products of the sugar and confectionery industries.



Exports and imports of agricultural and food products (CN 01-24) in 1992-2016. Source: Finnish Customs, ULJAS database.

Competitiveness of the food chain can only be improved by a change of attitude¹

Csaba Jansik

For the Finnish food chain, competitiveness is the prerequisite for maintaining and developing the activities in the long term. Competitiveness is a relative concept, given significance only when the performance is compared to that of the competitors. Several concepts and key figures exist for measuring competitiveness. The best known is probably productivity, i.e. the ratio of production inputs and outputs. A country, sector, or company is competitive when it can produce something more efficiently than others. In other words, its productivity – its total factor productivity (TFP) including all production inputs in particular – is better than that of the competitors. However, productivity is not the whole truth, a better ratio can be achieved by constantly tightening the belt and reducing the outputs, in which case improved productivity may, in fact, lead to a declining position in the market.

The most distinctive sign of genuine competitiveness is growth. As in all other sectors, companies also compete in the food market for popularity among consumers. Actors that increase their outputs and sales revenues and accomplish larger and larger market shares are genuinely more competitive than others. This means that cost efficient production processes and productivity are only a prerequisite. The real indicator of competitiveness, growth, requires skilful marketing and sales operations. Real competitiveness is manifested in your ability to convince consumers that your product is the best choice.

Russia's import embargo was a trigger for making changes

At first sight, the long-term development of the Finnish food chain is not showing improved competitiveness when compared to the competitors. The real turnover of the Finnish food industry has been stagnating throughout Finland's EU membership (see p. 15) while the volume of food imports has increased two and a half fold when calculated in real prices. This means that the industry has been losing its market share to imports, which in turn is evident when looking at the ever-growing deficit in foreign trade.

The negative trade balance can in part be explained by the biased focus of our food production on the domestic market. Exports have been treated as a 'relief valve' for production rather than making active investments in export markets and the development of exports. It is unfortunate that there have been no signs of change in the deficit in the foreign trade balance. Every year, imported foodstuffs have taken over more and more of the market at the cost of domestic operators.

The changes that emerged in the global food market in 2014: the general decline in demand and the Russian import embargo, have hit Finnish food exports hard. The ex-

¹ This article is based on the report funded by the Prime Minister's Office, prepared by the Research Institute of the Finnish Economy (Etlä) and Natural Resources Institute Finland (Luke) and published in January 2017, entitled "Critical success factors of the Finnish food chain". The project compared the competitiveness of the Finnish food chain to those in Sweden, Denmark and Germany using various key indicators. The project also included interviews with around 60 representatives of the food industry and retailers, as well as their interest groups in the four countries. The international examples and references in the article to the reference countries are based on the findings of the report.

ports are down by almost 13 per cent from 2013 to 2016. Meanwhile, Swedish exports have remained stable, Danish exports are up by almost 1.5% and German exports are up by more than 5%.

The Russian import embargo has been a wake-up call for the Finnish food industry, forcing it to pay attention to the excessive geographic concentration of exports. It is, then, possible to take the embargo as a positive fact, as it has awakened the actors to the necessity of change.

Sustainable growth only through internationalisation

The cornerstone of the competitiveness of the Finnish food chain is internationalisation. The industry and retail trade have both been focusing too much on the domestic market, treating their understanding of Finnish consumers' way of thinking and behaviour as their best, if not the only, expert skill. The total turnover of the sector has not increased because the domestic market is saturated and companies can only take turns in taking over each other's market shares.

The only way to generate genuine growth, however, is through internationalisation. For the industry, this primarily means exports, and for the retail trade, it means foreign direct investments (FDI). Success in both requires a deep understanding of the target markets and the local consumers. Finnish food exports lack the strong tradition of the competing countries, which means that considerable investments are required to establish the infrastructure and traditions for exports.

At this early stage it would be wise to learn from the success factors of the competing, exporting countries. Practices in Germany and Denmark show that when establishing new export markets, the key is to investigate the demand and consumption patterns in the target country and to customise foodstuffs accordingly. Leading politicians and diplomats should play a highly visible role in promoting exports. Particularly in Denmark, exports benefit from the seamless cooperation between the state and business life. The agility and energy of German SMEs in the export markets could encourage similar actors in Finland to realise that smaller companies can export as long as they have the ability and the attitude.

Finnish food enterprises also need young sales and marketing professionals with the appropriate language skills who are prepared to make bold and unconventional moves to open up new export markets. Society and businesses must offer young people training programmes and professional challenges.

Added value generates growth in domestic and export markets

Although Sweden is facing serious challenges in terms of food production and self-sufficiency, there is one thing we should absolutely learn from our neighbour. Sweden is the master of branding in food exports; the share of highly processed, branded products in total exports is 59%. This can be compared to 46% in Germany, 39% in Finland and 31% in Denmark. These countries represent the two strategic options in food exports: in Germany and Denmark, exports are based on economies of scale; on large volumes in intensive farming and on low costs, while in Sweden, exports are based on the value of highly processed products. The latter is a noteworthy alternative for Finland as we do not have the conditions for intensive farming.

There is great potential in Finnish food processing for added value merely based on the current raw material volumes. Every year, Finland exports around 300 million kg of oats as grains, when the value could be three to five fold if exported as traditional milling products. In snacks, biscuits, bars, and other new innovative products, the margins are even bigger. Finland is full of top innovations and technology but we also need marketing and sales expertise, networks, branding, and a bold attitude toward taking risks. Opportunities for added value can also be found in other raw materials such as berries and meat.

Revenue can also be increased in the domestic market by a bigger proportion of high value added products, and operators in the food industry have indeed been doing this commendably. Good examples of this are the numerous innovative products of the dairy industry. In addition to added value, growth may also be generated through increased production volumes, but this potential is currently restricted by matters such as political mechanisms and the climate.

Added value through cooperation within the chain

Price competition has traditionally set the stage for the sales and marketing of food products in Finland. Since the accession to the EU, food basket comparisons and advertising have focused too much of the consumers' attention on this single sales argument. After all, food has a lot more attributes than price. In Germany – the home of low-cost food – there has recently been a turn away from selling cheap food toward selling more valuable food and appreciating food and eating more.

There is great potential in increasing the value and appreciation of food in the Finnish food chain. Primary production creates a high quality product because our production methods exceed the level of EU requirements in many ways. Yet, consumers are not aware about grains not being sprayed with glyphosate before harvesting, about milk production being GM free, about animal protection standards being much higher than the EU level, about Finland using the second least antibiotics in the EU countries, about absolutely salmonella-free livestock farming, and about the highest European levels of ethical production and responsibility. Many of these elements generate additional costs for which farmers do not get compensation.

Domestic industries are turning high quality raw materials into high quality food. It is in the interests of the entire Finnish food chain that these quality factors are communicated to consumers more effectively in order to help them understand the price differences between imported and domestic food. The retail trade holds the key to this, with hundreds and thousands of shops offering effective advertising space and channels for enlightening the consumers precisely on site of their purchase decisions.

Increasing the value and appreciation of food can only be done if all the links in the food chain work together to convey to the consumers fact-based information about the quality of Finnish food. This may also alleviate the profitability problems faced in primary production and help to promote the long overdue growth in the industry and retail trade.

Overall change in attitude is required

The three conditions for growth presented above: (1) internationalisation, (2) increasing the proportion of high value added products, and (3) cooperation among the food chain actors to increase the appreciation of food, require an overall change in attitude in the entire food chain, including consumers, administration and stakeholders.

Administration is required to encourage and promote the export efforts of companies and actively promote export activities, and the supervisory authorities are required to have a more consultative approach. The measures outlined in the recent government report on food policy "Food2030" are leading the way.

As farms grow in size, more entrepreneurial and business management skills are required. In industrial companies, internationalisation requires an entirely new attitude. In order to open up new markets, companies need to take the initiative and proceed without prejudice, with determination, courage and an open mind. More than anything, they need competent and committed sales professionals with language skills.

The food retail chains must step up to the challenge for growth either through internationalisation or by working actively to increase the value of food. Unless they do this, the domestic market will continue to shrink. Consumers must learn to see food through its numerous quality factors outside the price. If we value healthy and clean food, good production methods, animal protection, traceability and responsibility, it must be reflected in the way we shop. We have to understand and accept that these quality factors cost more than products of regular intensive farming.

It is promising that many actors – authorities and businesses – have recently demonstrated a willingness to make genuine changes. We have every opportunity to improve the competitiveness of the Finnish food chain in the coming years.

2. Agricultural and food markets

2.1. Trends on the world market

The global market for agricultural products has experienced rapid changes in the last decade. In 2007-2008, world market prices increased dramatically. In two years, the Food Price Index of the Food and Agriculture Organisation of the United Nations (FAO) rose by almost 60%. Strong growth was, however, followed by a sudden drop in prices after the middle of 2008. In late 2010, cereal and other agricultural product prices on the world market shot up again, reaching their peak in early 2011.

Having peaked in 2011, global cereal prices have been falling steadily. In 2016, cereal prices were down, on average, by almost 40% on 2011. Despite the steep decrease, cereal prices remain around 70% higher than they were in 2000.

Over the past decade, total cereal consumption and production in the world have risen by nearly a quarter. Two countries, the United States and China, account for almost 40% of global cereal production. The EU countries produce a total of 300 million tonnes of cereal, or 15% of the global production.

In the 2016/17 crop season, world cereal production is estimated to amount to 2,593 million tonnes. This is just under 60 million tonnes, or 2.3%, more than in the previous year.

Global wheat production will reach a new record of 728 million tonnes, up by 3.1% from the previous year. Feed cereal production will grow to 1,340 million tonnes, representing an increase of 2.5% over the previous year's yield. Rice production will remain at 496 million

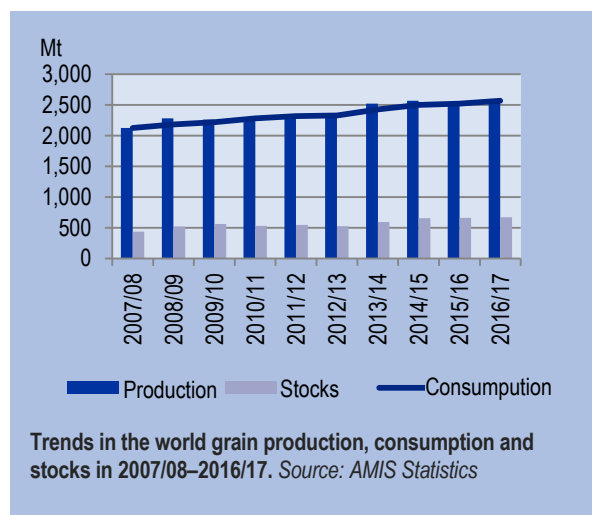
tonnes, up 0.8% on the previous year.

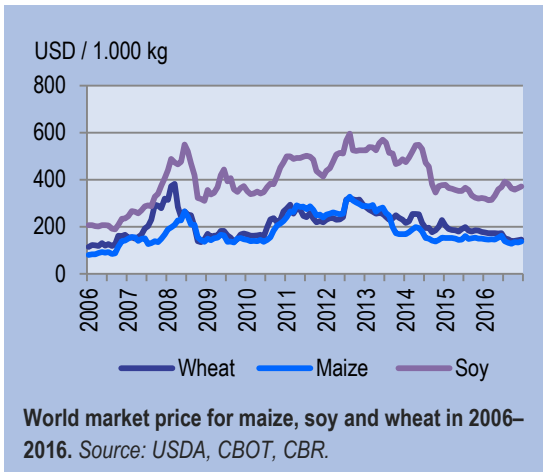
Global oilseed production in 2016/17 is projected to total 557 million tonnes, showing growth of 4.3% over the previous year. Soy production will increase by 4.8% to 333 million tonnes, which is a new record.

In 2016/17 global cereal consumption will total 2,568 million tonnes, 2.0% more than in the 2015/16 season. Cereal food consumption is forecast to rise to 1,105 million tonnes and feed utilisation to 922 million tonnes.

Since 2011, global cereal reserves have grown by almost a quarter and are estimated to amount to over 680 million tonnes in the 2016/17 crop season. The expansion has increased the global cereal stocks-to-use-ratio for wheat to almost 32%, for feed cereal to just over 20% and for soy to around 13%.

After the record year of 2015/16 in cereal trading, the volumes on the world market will fall by just over 1% in the 2016/2017 crop season. World cereal trade is estimated to amount to 391 million tonnes, which is 15% of the global production.





Feed cereal trade is expected to decline by 4.8% to around 177 million tonnes, representing 13% of the global feed cereal production. Meanwhile, the world wheat trade is forecast to increase by 17% and amount to 171 million tonnes, which is about one-fifth of the global wheat production.

Rice trade is estimated to reach 43 million tonnes, in which case it would be at almost the same level as the year before. The forecast for global soy trade is a record 139 million tonnes, 3.1% higher than in 2015/2016. Less than 9% of the total rice production enters the global market, whereas for soy, the figure is over 41%.

World sugar production is forecast to rise in the 2016/17 crop season to 170 million tonnes, which is up 3.0% on the previous year. Higher outputs in Brazil, the EU, and certain other producer countries will compensate for the falling yields in India and Thailand.

The continuing fall in sugar prices finally halted in October 2016. The price slumped again in early 2016 but has been rising sharply ever since. In 2016, the average price was more than one-third higher than in 2015, but it was still around 30% below the 2011 price level. The price increase was mainly caused by the smaller than expected yields in India and China,

although yields in the largest sugar exporter, Brazil, exceeded expectations. This increased exports and prevented even sharper price increases.

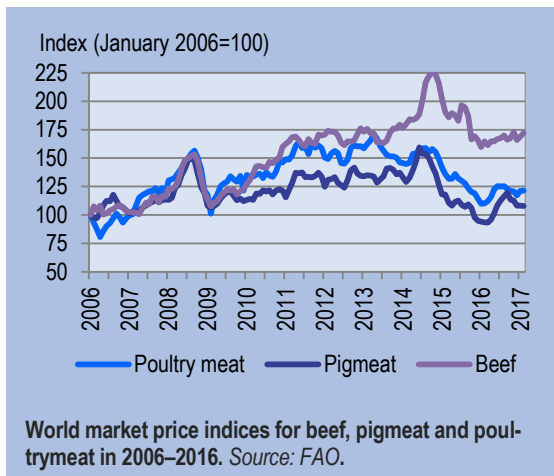
Milk production in 2016 is estimated to have risen to almost 817 million tonnes, up by 1.1% on the previous year. Most of this growth occurred in Asia. In the world's largest milk producing country, India, production grew by nearly 5% to over 160 million tonnes. Population growth, together with the increasing level of income, boosts the consumption of milk products in Asia.

The world market prices for milk products were at a record high at the beginning of 2014, but they began to decline in March 2014. This was the result of reduced purchasing by China and an increase in the EU's export supply. The import restrictions imposed by Russia in August 2014 aggravated the market situation further.

In March 2016, the FAO Dairy Price Index was already more than 50% lower than in March 2014. However, in late 2016, the world market prices for dairy took an upward turn. In January 2017, dairy products already cost a third more than they did a year ago.

Growth in global meat production almost halted in 2016. In 2016, the production was an estimated 320 Mt. Growth from 2015 was only 0.3%. Most of the growth occurred in the developing countries, where demand also grew the most.

In 2011–2014, meat prices were remarkably high compared to historical levels. In late 2014, the world market prices for meat took a slight downward turn. The prices continued to fall until early 2016, after which, the prices rose by 10% on average until the end of the year. According to the FAO Meat Price Index, in 2016, meat prices were on average almost 15% lower than their 2011 level.



The global meat trade is estimated to have increased by 4.3% to 31 million tonnes in 2016. This is 10% of global meat production. There are significant differences in trading between different types of meat. About 13% of the beef production and 11% of the poultry meat production is traded globally. For pig and sheep meat, this figure is 6%-7%. Globally, poultry accounts for more than 40% of the total meat trade, the figure for beef is just under 30% and for pork around 25%.

2.2. Arable crops

2015 was not an easy year for arable crop production. Spring was late across Finland, the summer was cool and rain caused problems at harvest time. The cereal harvest was lower than in previous years, although the long autumn prevented a massive loss of harvest. 2016 can be considered a normal crop year. Large numbers of insect pests that caused particular trouble for oilseed crops but also for cereals were typical for this summer. More mould toxins were also found in cereals when compared to previous years.

Areas and yields

In Finland, the utilised agricultural area is about 2.27 million hectares, of this about a million hectares are used to grow cereals. In 2015, the cereal yield was around 3,700 million kg, while in 2016, the yield was around 3,500 million kg, representing a fall of 4% in total cereal yield. The smaller sown area and the lower per-hectare yield were the main reasons for the second-lowest harvest in the 2000s.

About 0.4-0.5 million hectares are used to grow barley, most of which is grown for feed. In 2015-2016, the barley yield was around 1,550 million kg, down almost 300 million kg, or 15%, when compared to 2014. In 2015, 79% of the feed barley yield, 980 million kg, reached a hectolitre weight of at least 64 kg. In 2016, the hectolitre weights were lower, and 61% of the feed barley crop, 773 million kg, reached a hectolitre weight of at least 64 kg. Although the hectolitre weights in 2016 were lower than in the three previous years, the barley had fewer small grains than in the two previous years.

In 2015, 61% of the yield of malting barley (199 million kg) fulfilled the quality requirements regarding protein content and grain size set by the malting industry. The figure in 2016 was 63% (186 million kg). The average protein content was 10.3%, and the sorting size was 87% in both years.

Today, oat has a significant status in field cropping in Finland. In 2016, oat was cultivated on more than 0.3 million hectares. The total oat yield was 1,030 million kg, which is up around 50 million kg on the previous year. The average hectolitre weight of oat was 56.8 kg in 2016, which is almost a kilo less than in the previous year. 93% of the oat yield, or 955 million kg, was above the hectolitre weight of 52 kg, which is the minimum requirement commonly used in quality control. 364

million kg of the oat yield was above the hectolitre weight of 58 kg commonly used for oat used for food. This figure is considerably smaller than that of the previous year.

In 2016, DON toxins lowered the quality of the oat yield, as around 25% of the samples examined exceeded the limits. In addition, around 10% of the samples examined exceeded the higher recommended values set for animal feed.

In 2016, cereals used for making bread were cultivated on 240,800 hectares in total. Of this, 190,100 hectares were used for spring wheat; 25,100 for winter wheat, and 25,600 hectares were used for rye.

Of the wheat yield, spring wheat accounted for 719 and winter wheat for 92

million kg, bringing the total down 180 million kg (18%) on 2015. In autumn 2016, the wheat yield was 811 million kg in total, of which 211 million kg reached the hectolitre weight of 78 kg, the falling number of 180, and the protein content of at least 12.5%.

In 2015, the quality of the wheat yield suffered from low protein contents and fall numbers, and in 2016, the quality was affected by a lower-than-normal hectolitre weight and DON toxin levels that exceeded the limits set for food.

In 2015, the rye yield was large enough, for the first time in 15 years, to guarantee the supply of domestic bread rye for the next year.

Harvested areas and yields of main crops in 2014–2016.

	2014			2015			2016		
	Area 1,000 ha	Yield kg/ha	Total million kg	Area 1,000 ha	Yield kg/ha	Total million kg	Area 1,000 ha	Yield kg/ha	Total million kg
Winter wheat	40.8	4,350	177.3	42.4	4,920	208.8	25.1	3,660	91.9
Spring wheat	226.6	4,020	911	199.4	3,930	783.3	190.1	3,780	718.6
Rye	23.7	3,160	74.9	31.4	3,420	107.5	25.6	3,370	86.5
Barley	496.9	3,730	1854.8	451.6	3,470	1569	433.5	3,590	1,555.4
Oats	304.7	3,410	1039	281.1	3,480	979.6	304.3	3,380	1,028.5
Mixed cereals	23.9	2,970	70.9	11.4	3,020	34.6	14.8	2,670	39.5
Peas	5.6	2,540	14.2	11.9	2,130	25.3	10	2,360	23.5
Potatoes	22	27,300	600.3	21.9	24,31	532.1	21.5	26,830	577.6
Sugar beets	13.7	45,820	626.3	12.4	32,74	406.5	12.5	36,800	459.2
Dry hay	94.1	3,460	325.4	85.7	3,760	322.1	...	...	...
Silage	471.6	15,540	7,326.9	492.3	15,67	7,713.6	...	...	...
Green fodder	6.1	11,580	70	5.9	9,570	56.7	...	...	...
Cereals harvested green	68.6	3,910	267.9	103.7	4,110	426.1	...	...	...
Turnip rape	28.3	1,170	33.2	35.5	1,310	46.6	29.1	1,230	35.9
Rape	14.7	1,970	28.9	17.3	1,810	31.3	30.3	1,820	54.9
Caraway				2.5	2,970	7.5	...	...	...
Pasture	10.1	490	4.9	10	730	7.3	20.5	...	...
Other crops	70.8			58			57.7	...	...
Total	98.1			119.4			...	...	...
Set aside and managed uncultivated arable land	246.9			271.3			262.6	...	...
Utilized agricultural area	2 258,6			2 273,3			2 273,6		

Source: Natural Resources Institute Finland (Luke), Statistical services.

In 2016, the cultivation area of rye was reduced by 20% bringing the total yield down 25% on the previous year. However, the yield amounted to 87 million kg, which is the fourth largest rye yield in 2000s. 43% of the rye yield exceeded the hectolitre weight of 71 kg and the fall number of 120 in 2016. This made the average fall number of rye 135, down on the seven previous years.

In oilseed crops, the cultivation area of spring oilseed rape exceeded that of spring turnip rape for the first time in 2016. The total cultivation area of oilseed crops was around 60,000 hectares and the yield amounted to 91 million kg. The increasing cultivation of spring oilseed rape can be explained by higher yield levels. For example, the per-hectare yield of spring turnip rape was 1,230 kg/ha, while oilseed rape reached higher yield levels, 1,820 kg/ha in 2016.

The cultivation area of potato is around 22,000 hectares and the total yield in the last few years has been 530–580 million kg. The cultivation area of sugar beet is around 12,500 hectares and the yield is 400–460 million kg.

In 2015, the total cultivation area of silage was around 492,300 hectares, which is slightly more than in 2014. The total yield was around 7,714 million kg, up by 5% on the previous year. The average yield of silage was 15,700 kg/ha. The dry hay area fell from the previous year to 85,700 hectares. The total yield was 322 million kg, which is similar to the 2014 level. The average dry hay yield, 3,760 kg/ha was higher than the previous year. In 2015, the pasture area decreased by 20% on the previous year to 57,600 hectares.

Market prices for arable crops

The producer prices of cereals remained fairly steady in 2014–2015 but took a downward turn in 2016.

Market prices of cereals in 2015, €/1,000 kg.

	Rye	Wheat	Barley	Oats
Belgium	124.1	198.7	173.2	124.9
Denmark	167.0	205.0	190.3	155.9
England	-	219.5	186.0	167.9
Finland	217.5	204.2	-	139.9
Germany	201.7	202.6		186.4
Poland	-	190.0	175.3	127.1
Sweden	153.7	193.0	156.0	139.9

Source: Eurostat.

The producer price of feed barley kept falling during 2016 and average price settled at €127 per tonne, which is down by almost 7% on 2015. In January 2015, the quality-adjusted price of feed barley was around €127 per tonne, and in January 2016 it was €145 per tonne. The price of malt barley was higher than feed barley, the average price in 2016 settled at €152 per tonne. The average quality-adjusted price of oat remained at €133 per tonne in 2015–2016. In 2015, the price of oat rose, falling again during the course of 2016.

The quality-adjusted price of feed wheat fell by 7% from 2015 to 2016. In 2016, the average price paid for feed wheat was €130 per tonne. During that time, the price of bread wheat fell more, by around 11%.

In 2015, the average price paid for bread wheat was €168 per tonne, but in 2016, it was down to €151 per tonne.

Rye produced a record yield in 2015, but the price paid for it (€183/tonne) was lower than in 2014. In 2016, the price of rye continued to fall to €171 per tonne.

The prices of oilseed crops have remained at a fairly good level in recent years. In 2015, the average price of turnip rape and oilseed rape was €358 per tonne, and in 2016 it was €366 per tonne.

In 2015, the price of food potato was €177 per tonne, and in 2016, it was €208 per tonne. In the course of 2015, the price of food potato was strengthened consider-

ably, rising from €146 per tonne in January to €222 per tonne in December. Meanwhile, the change in 2016 was quite the opposite; the price fell from €230 per tonne in January to €165 per tonne in December.

Cereal prices in Finland are on the European fairly low level, despite high production costs. In Europe, prices in France have remained high, and only the price of Finnish rye has been at a competitive level.

On the domestic market, the prices are slow to react to a rise in the price level, while a drop in EU prices is quite rapidly reflected on the Finnish market. Strong fluctuations in the prices have become a permanent feature on the cereal market, which means that farms should better prepare for the market risks caused by these fluctuations.

Market prices of cereals in Finland from 2004 to 2016, €/1,000 kg.

	Rye	Wheat	Barley	Oats
2016**	170.6	151.0	127.0	133.4
2015	183.3	168.2	135.4	133.4
2014	191.7	168.5	132.9	125.7
2013	217.5	204.2	174.3	169.3
2012	213.6	203.5	186.7	186.2
2011	186.9	196.9	162.4	166.1
2010	159.7	147.4	112.6	115.7
2009 ¹	134.2	132.0	93.9	86.4
2008	207.0	189.1	160.7	137.8
2007	192.2	159.9	145.8	149.7
2006	139.8	110.5	102.0	107.3
2005	118.4	106.2	99.5	87.1
2004	120.9	119.8	106.5	87.3

¹Statistics has changed. Quality-adjusted price paid to farmers on delivery to first customer

Source: Luke, Statistical services

2.3. Horticultural production

In Finland, horticulture is considered to comprise vegetable production in the open, the production of cultivated berries and apples, nursery production and greenhouses. In some cases, the cultivation of mushrooms and potato production under cover are also included in horticultural production.

Cultivation areas and horticulture enterprises

The total outdoor cultivation area for vegetables, berries and fruits was around 16,600 hectares in 2015. The area grew slightly from the previous year. There was growth in the production areas of both outdoor vegetables and berries. The apple production area remained almost unchanged.

In 2015, greenhouse production area was 319 hectares. This is slightly down on the previous year. Areas were reduced in all sectors: vegetables, ornamental plants and berries.

In 2015, there were 3,600 horticultural enterprises in Finland. Of these, 2,800 farms were engaged in the open and 1,200 farms in greenhouse production. Some of the farms had both outdoor and greenhouse production.

In 2015, the average area of production in the open was 5.87 ha/enterprise and the average area of greenhouse production was 3,370 m²/enterprise.

Satakunta and Southwest Finland are significant areas for vegetable cultivation in the open, and North Savo is an important berry production region. Most of the apple production takes place in the Åland Islands, southwestern Finland and Western Uusimaa. Much of the greenhouse production of vegetables is concentrated in Ostrobothnia, in and around Närpiö in particular.

Weather conditions

The weather conditions in winter 2014-2015 were favourable to berries, and no abnormal damage occurred during the winter. In contrast, there was damage in winter 2015-2016. In particular, strawberries suffered from the cold temperatures that followed the warm and wet autumn weather, as there was no snow cover to protect it.

In early 2015, the weather was mainly cloudy. This affected the production of greenhouse vegetables and meant that yields remained even. Spring was early that year, but the cool weather, sleet and night frost in April delayed the planting of early vegetables in places.

Areas under horticultural production in 2009–2015, ha.							
	2009	2010	2011	2012	2013	2014	2015
Production in the open, total							
Vegetables grown in the open	15,734	16,032	16,213	15,753	15,708	15,736	16,164
Berries	8,378	8,731	9,034	8,562	8,650	9,100	9,510
Fruits	6,278	6,206	6,094	6,100	6,028	5,918	5,936
Greenhouse production, total	685	696	702	700	706	718	718
Vegetable production	375	369	360	335	341	331	341
Ornamental plants	231	231	226	211	220	218	227
Production in the open, total	143	138	134	124	122	112	114

Source: Luke; Finnish Agency for Rural Affairs.

The plant trade was also delayed due to the cold spring weather. Although the spring was cold, there was no more night frost that would have been harmful to the flowering of berries, and the berry yield was good. Meanwhile, in spring 2016, night frost damaged flowering berries in places.

In the summers of 2015 and 2016, the weather was rainy. In summer 2015, May in particular was very wet in some areas, creating problems for the sowing and planting of vegetables. The summer months were also predominantly cool and wet, which slowed down the growth and ripening of most outdoor vegetables. In summer 2016, the hardest continuous rain fell in June. This destroyed entire crops of vegetables in some areas. Most outdoor vegetables were damaged by the weather conditions during the 2016 growth season and yields of cabbage and carrot were smaller than average.

In 2015, because of the cold summer, almost all horticultural plants were harvested a week or two later than usual. Luckily, the warm, sunny and long autumn helped save the harvest and stock of storage vegetables, with the growth season continuing long into the autumn. Thanks to the dry and warm weather in late autumn, the harvesting weather was good and the produce could be stored in good condition. In 2016, harvesting was carried out at the normal time and the dry weather meant that the storage vegetables could be stored in good condition.

Production in the open

In terms of area, garden peas are by far the most common vegetable, In 2015, peas were grown on 3,470 hectares. In terms of yield, however, the most important vegetable was the carrot, with a yield of just under 64 million kg. Other important vegetables were onions with a cultivation area of 1,190 hectares and cabbages with 550 hectares. Outdoor vegetables were culti-

vated under production contracts on 1,900 hectares. The main vegetables cultivated for the processing industry were garden peas, carrots and gherkins.

Strawberries are by far the most significant berry plant in terms of both area and total yield. In 2015, the cultivation area of strawberries was 3,400 hectares and the total yield was 14 million kg. Other important berries were black and green currants, cultivated on 1,390 hectares, and raspberries and a hybrid between the raspberry and the Arctic bramble, cultivated on 440 hectares. Berries were cultivated under production contracts on 800 hectares. Blackcurrants were by far the most significant berries cultivated under production contracts with the processing industry, representing 58% of the contract production area. The cultivation area of fruits, mainly apples, totalled 670 hectares in 2015.

Areas under the most important horticultural products grown in the open and yields in 2014.

	Area ha	Yield kg/ha	Total 1,000 kg
Vegetables grown in the open			
Garden pea	3,030	2,245	6,802
Carrot	1,652	44,928	74,221
Onion	1,150	22,749	26,161
White cabbage	585	41,388	24,212
Cauliflower	262	9,947	2,606
Beetroot	430	29,205	12,558
Swede	352	40,020	14,087
Gherkin	182	49,973	9,095
Chinese cabbage	138	16,188	2,234
Other plants	1,361	9,966	13,564
Total	9,142	20,295	185,540
<i>share of contract production¹⁾</i>	1,702	30,832	52,468
Berries and apples²⁾			
Strawberry	3,298	3,899	12,858
Black and green currant	1,449	791	1,146
Raspberries and raspberry- arctic bramble cross bred	408	1,900	775
Other berries	639	1,252	800
Total	5,794	2,689	15,579
<i>share of contract production¹⁾</i>	770	1,787	1,376
Apple	669	7,789	5,211

¹⁾ 2013 instead of 2014, ²⁾ Crop yielding area

Source: Luke, Horticultural Statistics.

Greenhouse production

Greenhouse vegetables were cultivated on 214 and ornamental plants on 123 hectares in 2015. The total output of greenhouse vegetables was just over 84 million kg. For the first time, the cucumber became the most important vegetable, as its harvest exceeded the tomato harvest. In terms of cultivation area, the tomato remains the most important greenhouse vegetable. In 2015, the cultivation area of tomato was 104 hectares and the total yield was 39 million kg. Around 30 hectares of the area is cultivated round the year, while the rest is only cultivated in summertime.

In 2015, cucumbers were grown on 55 hectares, of which 20 hectares is cultivated in all seasons. The total yield of cucumbers was 40 million kg. The cultivation area of potted vegetables was 33 hectares. Most of the production area of potted vegetables is cultivated round the year. Lettuce is the most important potted vegetable, with a cultivation area of 24 hectares. A total of 112 million potted vegetables were produced in 2014.

The production of flowering potted plants declined slightly to around 9 million in 2015. The production of bulbous flowers rose from the year before to 74 million. The most important potted plants were daffodils (3.5 million), poinsettia (1.9

million) and winter-flowering begonias (1.3 million). Tulips were the most common bulbous flowers, with a total production of 69 million.

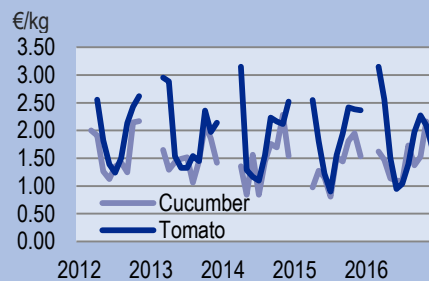
The production of bedding plants amounted to 37 million, and violets were the most important with a production of 9.8 million.

Areas under greenhouse vegetables (m²) and yields (kg/m²) in 2015.

	Area 1,000 m ²	Yield kg/m ²	Total. 1,000 kg
Total ¹	2,164	39	83,923
Tomato	1,037	38	38,891
Cucumber	552	73	40,488
Other vegetables	575	8	4,544

¹ Does not include potted vegetables.

Source: Luke, Horticultural Statistics.



Producer prices for greenhouse cucumbers and tomatoes from 2006 to 2016, €/kg.

Source: Kasvistiето Ltd.

Producer prices for the most important horticultural products in 2009–2016, €/kg.

	2009	2010	2011	2012	2013	2014	2015	2016
Greenhouse production								
Rose (€/unit)	0.46	0.47	0.45	0.45	0.48	0.61	0.46	0.47
Tomato	1.32	1.58	1.50	1.74	1.77	1.69	1.68	1.69
Cucumber	1.21	1.27	1.26	1.40	1.49	1.38	1.33	1.46
Production in the open								
White cabbage	0.42	0.49	0.48	0.52	0.65	0.62	0.54	0.60
Onion	0.43	0.56	0.57	0.56	0.69	0.65	0.56	0.63
Carrot	0.47	0.49	0.56	0.64	0.72	0.62	0.61	0.65
Strawberry	3.52	3.24	3.58	3.49	3.56	4.43	4.32	4.94
Apple	1.20	1.48	1.59	1.57	1.66	1.60	1.64	1.47

Sources: Kasvistiето Ltd.; Glasshouse Growers Association.

Organic horticultural production

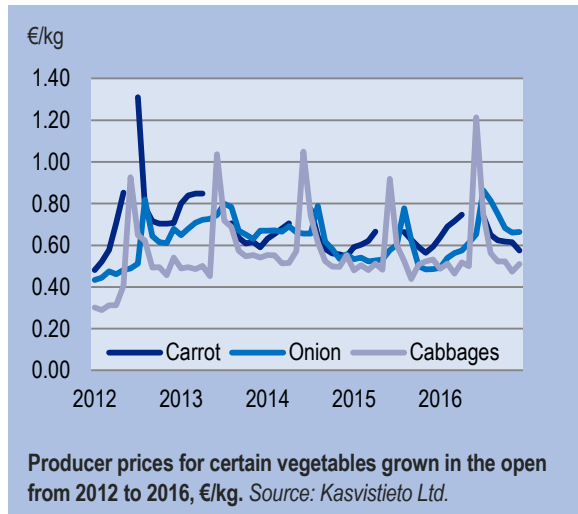
The number of organic farms growing vegetables in the open rose slightly on the previous year, to 160 farms in 2015. However, the total yield of 3.3 million kg was considerably smaller than in the previous year. This was due to the weather conditions during the growing season, which were unfavourable to growing vegetables in the open. The number of producers of organic greenhouse vegetables and organic berries increased. The cultivation area of organic greenhouse vegetables remained the same, but the total yield fell slightly on the previous year. The cultivation area of organic berries decreased slightly on the previous year to 557 hectares in 2015, but the total yield increased by just over 30%. In terms of both the cultivation area and yield, the strawberry is the most important organic berry, with 135 hectares and 336,000 kg.

Horticultural product market

Strong seasonal and annual variations are characteristic of the producer prices and volumes of horticultural products grown in the open. Producer prices are typically low during the main crop season, when the domestic supply is high. The supply decreases during the storage period, which usually raises the prices.

In terms of the market for greenhouse vegetables, the first part of 2015 was stable. The demand and supply were in balance, and the prices of tomato and cucumber remained at a good level. In April, there was a slight oversupply of cucumber, causing the prices to fall.

Meanwhile, the tomato market avoided congestion and dramatic drops in prices. Among tomatoes, the share of special tomatoes in the demand has increased steadily. The supply of domestic special



tomatoes has increased slightly, but most of the special tomato consumption consists of foreign tomatoes. In 2016, the prices of greenhouse vegetables remained stable, apart from the temporary drop in cucumber prices.

Due to the cold summer in 2015, outdoor vegetable production was slow, and there were no periods of heat that could cause congestion in the market. The outdoor growing season was long and the prices remained steady. The cold weather caused the vegetable yield to fall, but the yield of berries and apples was good. In 2016, the prices in outdoor production also remained steady due to the scarcity caused by the difficult growing season. The good apple yield in amateur gardens reduced the demand for apples in some areas and this caused the price to remain lower than in the previous year.

Return calculation

The return calculation of horticulture comprises the value of the crop produced at producer price and the calculated support payments for the horticulture production area and products in storage.

The horticultural returns, forecast at market price for 2016, are €527 million, which is considerably higher than the

previous year. These higher horticultural returns are due to a relatively good harvest year and, most importantly, to the fact that the prices of vegetables grown in the open remained at a good level. The value of berry and fruit production grew from the year before thanks to a relatively good harvest year and prices that remained at a good level.

The total revenue of greenhouse production increased on the previous year because of the good year in flower production and prices that remained at a good level.

The value of greenhouse vegetable production also rose slightly, primarily because of the higher average price of tomato and cucumber, when compared to the previous year.

The subsidy reform of 2015 affected subsidies in horticulture. The greenhouse subsidy was reduced, the storage subsidy remained fairly unchanged and the basis of payment of subsidies for outdoor horticultural production underwent considerable changes. In general, the amount of subsidies paid to horticulture was reduced by just under 7% from 2014 to 2015.

Return calculation of horticulture at current prices, € million.								
	2009	2010	2011	2012	2013	2014	2015	2016e
PRODUCTION IN THE OPEN								
Vegetables	102.2	106.9	130.8	109.9	136.7	148.5	131.4	131.6
Berries and fruits	54.2	48.1	66.1	66.9	64.9	74.9	81.9	96.1
Nursery production	32.1	34.1	34.1	27.1	28.4	28.4	28.4	28.4
Total	188.5	189.1	231.0	203.9	229.9	251.7	241.7	256.1
GREENHOUSE PRODUCTION								
Ornamental plants	97.5	88.1	82.8	80.8	79.6	79.7	74.5	76.0
Vegetables	150.4	151.9	183.7	160.0	196.2	191.5	180.5	195.0
Total	247.8	240.0	266.5	240.8	275.8	271.3	254.9	271.0
Return at producer price, total	436.3	429.0	497.4	444.7	505.7	523.0	496.6	527.0
SUPPORT PAYMENTS								
Support for greenhouses	36.5	36.5	35.6	32.9	29.9	29.6	28.7	
Storage aid for horticulture products	2.1	2.1	2.0	2.1	2.4	2.5	1.6	
Environmental payment*	9.0	9.1	9.3	8.9	8.8	9.0	8.9	
Basic support**	3.2	3.3	3.4	3.3	3.2	3.3	1.1	
LFA support	2.8	2.9	2.9	2.8	2.8	2.8	3.6	
Other support***	0.9	0.9	0.9	0.9	0.9	0.9	1.0	
Total	54.5	54.8	54.1	50.9	48.0	48.1	44.9	
RETURN ON HORTICULTURE, TOTAL						571.1	541.5	
<i>*environmental support until 2014, ** single payment until 2014, *** organic production and crop premium</i>								
<i>Sources: Luke; Finnish Agency for Rural Affairs; Kasvistiето Ltd.; Finnish Glasshouse Growers' Association.</i>								

2.4. Livestock production

Milk

The amount of milk delivered to dairies in 2015 totalled 2,325 million litres, 36 million kg more than in 2014. In 2016, the amount of milk went down to 2,320 million litres. Organic milk accounted for around 55 million litres of all annual milk production. Kantar TNS has forecast that the milk output of 2017 will total 2,300 million litres.

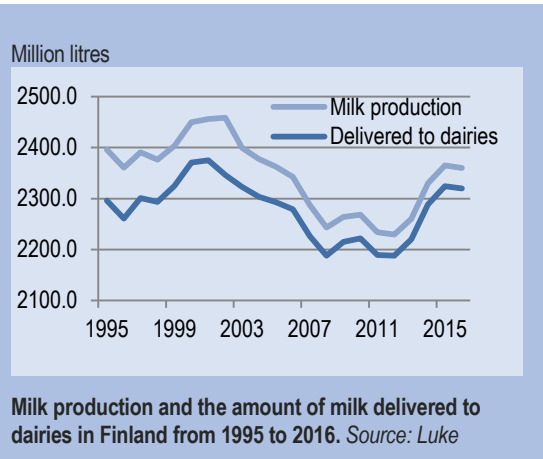
The average production amount of dairy cows rose by just over 1% in a year. According to statistics on the total production of milk, the average output was 8,323 in 2015 and around 8,400 litres in 2016.

The number of milk producers decreased by 6% in 2015 and by 7% in 2016. Milk was produced on 7,318 farms by the end of 2016. The number of dairy farms has declined by 35% in the last five years, but the amount of milk delivered to dairies has increased by 5%. Most of the farms that gave up milk production were farms with less than 20 dairy cows.

The number of dairy cows per farm increased by 1.7–1.8 cows in a year. A fifth of the farms had at least 50 cows, and half of all cows in Finland were on these farms. The total number of farms with more than 100 dairy cows is 338.

In 2015, dairy cows numbered around 285,147. In 2016, the number was down by 2,700. In 2015, heifers numbered around 154,600, while the number a year later was smaller by around 4,400. In 2015, the number of calves was nearly 325,000, and in 2016, the number was down by 1%.

In 2016, the amount of packed liquid milk was 653 million litres, which is down 4% on the previous year. In 2015, butter-milk production was 54 and cream production 41 million litres. In 2016, the figures were 51 and 43 million litres respectively. Yoghurt production (107 million



kg) and cheese production (84 million kg) were down 5% on the amounts in 2015. Meanwhile, butter production (55.5 million kg) was up by 0.8 million kg on the previous year.

The consumption of dairy products increased by 1.2% in 2015, but took a slight downward turn in 2016. In 2015, cheese consumption was 146 million kg (+3.6%), yoghurt consumption 117 million kg (+0.9%) and butter consumption 18 million kg (+4.3%). In 2016, cheese consumption increased by 2.5% and butter consumption was up by 1.7%, but yoghurt consumption down by as much as 5.4% from the previous year. The consumption of liquid milk was 641 million kg in 2015, falling by around 4% in 2016.

A significant part of the fat contained in the milk produced in Finland is used to manufacture export products. Over 70% of butter is exported. However, the protein fractions in milk find use in Finland. In certain product groups, a significant share of dairy products is of foreign origin. This figure in cheeses is almost one half. According to Valio, 58% of milk was consumed as cheese in 2015.

Over the past 20 years, the consumption of imported cheese has increased, with an annual rate of 1–2 percentage points. The consumption of fromage frais has also increased, while that of aged

cheeses has declined. In 2015, the amount of imported cheese was 75 million kg. Meanwhile, the amount of exported cheese was only 20 million kg. Provisional data for 2016 shows that exports fell by almost one fifth but exports increased only slightly. The import and export of milk and cream increased in 2015, but the trend in 2016 was the opposite. The export of butter and butterfats increased by just under 44% in 2015 to almost 39 million kg, but in 2016 exports were expected to amount to less.

Beef

Meat production in Finland, including all farm animal species, totalled 395 million kg in 2015, and 404 million kg in 2016. The annual growth in total meat production has been 2.2-3.4%, which is mainly due to increasing boiler production.

In 2015-2016, the annual production of beef was 86-87 million kg. The number of cattle slaughtered in a year was around 280,000. In 2016, the average slaughter weight of bulls was 347 kg, that of cows 283 kg and that of heifers 243 kg. Of the slaughtered cattle, around 51% were bulls, 30% were cows and 17% were heifers. In 2015-2016, the annual beef consumption was 104-105 million kg, of which imported

beef accounted for around 21%. Kantar TNS has forecast that in 2017 beef consumption will be 103.3 million kg and production 86 million kg.

The number of farms specialising in beef production was around 3,000. In addition, around 600 farms grew both suckler cows and beef cattle. The number of suckler cows has more than doubled during the 2000s. In December 2016, the number of suckler cows was 59,000 on 2,167 farms, and the number of bulls was 107,800 on 5,373 farms in total.

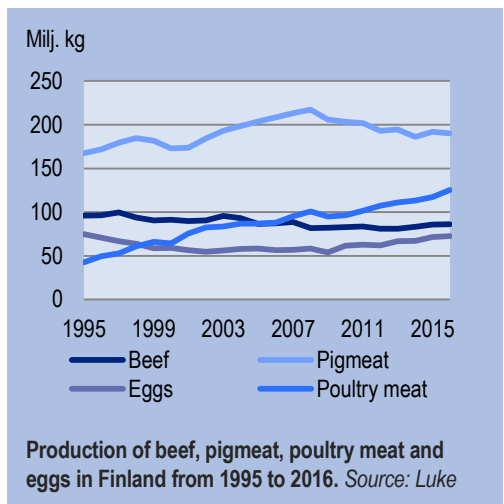
In 2015, a total of 21.8 million kg of beef was imported to Finland and 4.0 million kg was exported. In 2016, the import and export figures were up 7% and 3%. More than half of the processed beef product imports come from Sweden, where Finnish meat companies also operate. Of the total imports of carcass meat, imports from Poland, Denmark, Germany and the Netherlands account for more than 80%. Most of the beef exports from Finland go to Sweden.

Pork

Around 2.08 million pigs are slaughtered in Finland every year. In 2015, pork production was nearly 192 million kg, while in 2016 it was around 191 million kg. Pork consumption was close to 193 and close to 195 million kg respectively. Kantar TNS has forecast that pork production will fall to 186 million kg, while consumption would fall to 192 million kg.

In recent years, the number of pig farms has declined by 7-10% a year. There were only around 1,200 pig farms in Finland. Pig farms with more than 800 pigs kept 57% of all pigs, although the number of such farms is only 207.

In 2015, the average slaughter weight of pigs was 90.6 kg, and in 2016, it was 89.6 kg. The average slaughter weight of pigs has gone up by about 7 kg since 2005. In 2015, pork exports amounted to 34.3



million kg (+15%) and imports to 35.7 million kg (+5%). The export (-2%) and import (-3%) figures for 2016 were slightly smaller than in 2015.

Finland has traditionally exported carcass meat, but the share of meat pieces in exports has risen in recent years. For example, in 2015, pork cuts accounted for 62% of the total pork exports. Most of the exports went to Estonia, Sweden, New Zealand, Japan and South Korea.

Of all pork consumption, less than a fifth was covered by imports. Most of the imported pork comes from Germany, Denmark and Spain. Most of the processed meats come from Germany and Sweden.

Poultry meat

In 2015, poultry meat production in Finland totalled 117 million kg. In 2016, the production was 125 million kg.

This means a 7% increase in poultry meat production. Approximately 92% of the poultry meat produced in Finland is broiler. The production of broiler meat in 2015 was close to 108 million kg, and in 2016 it rose by 7% to 116 million kg. The production of turkey meat totalled 7.5 and 7.9 million kg per year, and that of other types of poultry meat was 1.7 million kg per year.

Poultry consumption has been on a steady increase and it is estimated to continue to be strong. The market outlook for broiler in the next few years seems more favourable than that for other production sectors, with mainly growth to be expected. According to Kantar TSN estimates, poultry meat production will increase to 131 million kg in 2017.

In 2016, broilers were grown on around 130 farms and turkeys on 57 farms. The number of broilers slaughtered was around 69 million, and the average slaughter weight was 1.7 kg per bird. The annual number of turkeys slaughtered was 847,000, and the average slaughter weight was 9.4 kg per bird.

Livestock production in Finland from 2006 to 2016.

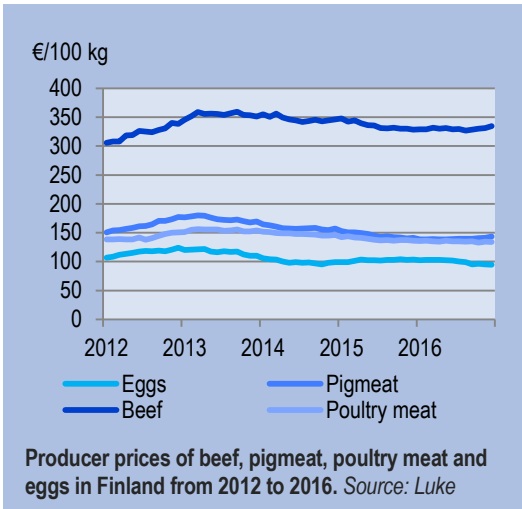
	Dairy milk million litres	Beef million kg	Pigmeat million kg	Eggs million kg	Poultry meat million kg
2016*	2,320	86	190	73	125
2015	2,325	86	192	71	117
2014	2,289	82	186	67	113
2013	2,220	80	195	67	111
2012	2,188	80	193	62	107
2011	2,190	82	202	63	102
2010	2,222	82	203	62	96
2009	2,215	81	206	54	95
2008	2,188	80	217	58	101
2007	2,226	87	213	57	95
2006	2,279	85	208	57	88

Source: Luke, Statistical services.

In 2015, a total of 16.9 million kg of broiler meat (+19%) and 3.8 million kg of turkey meat (+19%) were imported to Finland. Imports covered 16% of the broiler meat consumption and as much as 41% of the turkey meat consumption. In 2016, the imports of broiler meat increased to 17.9 million kg and the imports of turkey meat decreased to 3.2 million kg. by almost 20%.

In 2015-2016, most of the broiler imports were processed products or boneless pieces. In contrast, most of the imported turkey meat was boneless pieces. Broiler meat was imported mainly from Thailand, Germany, the Netherlands, Denmark and Lithuania. Most of the turkey meat imports came from Poland and Germany, which are among the largest turkey meat producers in Europe.

In 2015, broiler meat exports from Finland amounted to 17.6 million kg (+10%) and turkey meat exports to 1.7 million kg (-5%). In 2016, broiler meat exports were down to 17.8 million kg while turkey meat exports were at the previous year's level. Poultry meat exports consisted mainly of wings and pieces of meat with bones. Most of the broiler meat exports went to Belarus and the Baltic States. The Baltic States are also an important export market for turkey meat.



Eggs

In 2015, egg production was 71.5 million kg, and in 2016, it was around 72.6 million kg. In 2016, egg production was the highest in 21 years.

In 2016, 62% of class A eggs were produced in enriched battery cages, 33% were barn eggs and 5% were organic. The number of organic eggs rose by 5%, but the number of barn and free-range eggs declined by 2% from 2015.

In 2015, the consumption of whole eggs in Finland was around 63.2 million kg. Less than 10%, or 4.9 million kg of these eggs were imported.

The amount of eggs used in egg products was 8.6 million kg. In 2016, the total consumption of eggs went up to about 65 million kg, although there was almost no increase in the consumption of egg products.

In 2015, eggs exported totalled 13.1 million kg, of which whole eggs accounted for 8.4 million kg and egg products just over 4.8 million kg. In 2016, the export of eggs fell by almost a fifth on the previous year. Exports accounted for one sixth of the total egg production, and the exported eggs went mainly to Sweden, Denmark and Estonia.

In 2015, the number of egg-laying hens in Finland was 3.52 million. In 2016, the number of hens was 3.56 million, but the number of chicks (0.76 million) was up 7% on the previous year. In December 2016, egg-laying hens were kept on 1,061 farms, but 71% of the hens were kept on farms with less than 300 hens. More than 80% of the hens were kept on farms with more than 10,000 hens, although the number of such farms was only 127.

Producer prices

The market prices for livestock products in the EU influence their prices in Finland, but Finnish prices have certain special characteristics. The market prices for pork and milk, for example, vary less in Finland than in many other EU countries. Egg production in Finland has exceeded the demand, and the producer price has been low compared to other parts of the EU. The prices paid to Finnish milk producers have typically been slightly higher than in other parts of the EU on average, and in Finland the seasonal variation in prices is also greater.

Market prices for livestock products in selected EU countries in 2016, €/100 kg¹.

	Milk	Pigmeat	Beef (bull)	Poultry meat ²	Eggs ³
Finland	37.20	145.55	378.98	256.66	144.21
Sweden	30.70	181.93	472.47	266.73	196.56
Denmark	28.68	136.75	368.75	239.55	171.92
Estonia	23.76	143.34	310.60	174.40	110.88
Germany	27.38	151.76	370.43	265.46	107.58
France	30.18	138.82	360.92	225.79	108.61

¹The average price of January–December, except for milk January–September. ²Sale price at slaughterhouse,

³Sale price at packaging plant. Source: European Commission.

The producer prices of the most important livestock products in Finland from 2006 to 2016 including production support (€/100 kg, milk €/100 l)¹.

Year	Milk	Beef	Pig-meat	Poultry meat	Eggs
2016	33.62	285	140	135	100
2015	34.05	290	146	139	102
2014	45.60	303	158	148	100
2013	47.27	311	174	154	117
2012	46.26	281	163	142	116
2011	43.90	253	146	131	96
2010	40.59	240	137	120	88
2009	40.11	247	141	124	87
2008	44.79	241	144	130	92
2007	39.05	221	132	114	77
2006	36.90	212	126	109	62

¹ The milk producer price comprises the price of standard milk which includes the quality portion and other premiums but not production subsidies or quota payments. The estimated retroactive payment of 1.05 cents/l has been added to the 2014 price of milk. Source: Luke

In 2015, a predominantly downward trend was seen in the market prices for livestock products. The milk and pig meat markets in particular were affected by the restrictions imposed by Russia on EU food exports. Milk quotas were abolished in the beginning of 2015, freeing the market for competition. However, the EU has taken adaptation measures in order to reduce milk production. In addition, pork producers have been concerned about the spread of the African swine fever in the Baltic States.

In 2015, producers were paid, with all subsidies and deductions, an average of €38.64/100 l for milk (-14% on 2014). In 2016 the price was €38.25/100 l. In addition, an average 7.2 c/l was paid in 2015 as milk production aid. In 2016 the aid was 6.7 c/l. The final price of milk is determined when the dairies complete their

financial statements and the retroactive payments based on the results are decided.

In 2016, the price paid for bull meat was €3.30/kg, for heifer meat €2.82/kg, for cow meat €1.88/kg, and the average paid for all beef was €2.85/kg.

In 2016, the price of a male colostrum calf was up 1% and that of a female calf up 6% on the previous year.

The average price paid for pork was €1.46/kg in 2015, and €1.40/kg in 2016.

Meanwhile, the average price of pigs was €0.02 higher. In 2016, the average price paid for piglets (30 kg) was €55.25.

The average price paid for poultry was €1.39/kg (-7%) in 2015, and €1.35/kg in 2016. The price paid for broiler meat was €1.36/kg in 2015, and €1.31 /kg in 2016.

The product monitored in the EU price monitoring (whole broiler, wholesale price) does not represent well the Finnish broiler market.

In 2015, the average price paid for eggs was €1.02/kg, but in 2014 and 2016, the price was €1/kg. The price of cage eggs fell by 13% during 2016. In 2016, the price paid for cage eggs was around €0.14/kg less, and the price for organic eggs was around €1.55/kg more than the price paid for class A eggs on average.



Consumers interested in animal welfare

Jarkko Niemi

Citizens of Finland view animal welfare and health as important elements of responsible production, and something to which companies and public authorities should pay attention. Finns consider that animal welfare refers especially to respecting animals and to the way they are treated in particular. The naturalness is also considered as an important aspect.

Most citizens are unaware of the methods of modern livestock production. People do not know how animals are kept and why certain decisions have been made. According to the Eurobarometer published in 2016, 64% of Finns would like more information regarding the conditions that production animals are kept in. Ten years ago, only 42% of Finns felt that way. The figure is at the European average level, but within the EU, thirst for knowledge has increased the most in Finland. However, 52% of Finns thought that production animals need more protection in Finland.

What does welfare mean?

The Finnish Farm Animal Welfare Council states that welfare is the animal's experience of its physiological and physical state. An animal's welfare is affected by its ability to adapt to developments and conditions in its environment. If adaptation is not possible or it causes the animal constant or intense stress, strain or pathological changes, the welfare of the animal is reduced. Factors that affect animal welfare include the housing conditions, care-taking and breeding. A key factor in animal welfare is the livestock farmer.

Traditionally, animal welfare has been defined through *the five freedoms*: 1) freedom from hunger and thirst, 2) freedom from discomfort, 3) freedom from pain, injury or disease, 4) freedom to express normal behaviour, and 5) freedom from fear and distress. In recent years, however, more attention has been paid to assessing welfare from the animal itself rather than the resources available to it. *The Welfare Quality*® method lists four principles of welfare as 1) good feeding, 2) good housing, 3) good health, and 4) appropriate behaviour. These principles are defined by 12 criteria.

According to literary research conducted in the PROHEALTH project (Clark et al 2016) *citizens* have different ideas about the meaning of animal welfare. But central concepts in these ideas are naturalness and humane treatment of animals: The concept of animal welfare extends beyond animal health, production buildings, slaughter, and animal transport. Welfare is considered to include appropriate behaviour.

Citizens' attitudes to animal behaviour and living conditions focus on the natural aspect. The aspect of naturalness is connected to adequate space allowance, opportunities to express natural behaviour, access to outside areas and feed qualities. Extensive farming is often considered to be more natural than intensive production, but benefits can be seen in both methods.

Livestock farmers play a key role

According to the Eurobarometer published in 2016, around 50% of the Finnish respondents said that animal welfare concerns all citizens, and that public authorities should reg-

ulate animal welfare. The rest of the Finnish respondents emphasised the role of cooperation between public officials and companies in this matter.

The role of livestock farmers was considered important. However, views on the investments made by livestock farmers on animal welfare varied from striving for efficiency to caring about animal welfare.

From the sector's point of view, the challenge comes from the fact that generating animal welfare tends to generate costs. Often the best result cannot be achieved by maximising animal welfare. In order to make investing in animal welfare worthwhile, the investments should be rewarded with increased market prices or subsidies.

Production costs generated by animal welfare vary from case to case. Measures that improve welfare tend to require labour inputs, capital, or materials and supplies. They may also affect the farmer's income. According to a survey carried out at the turn of the millennium, in the European Union, the share of animal welfare requirements in total production costs was 3-22% depending on the species.

Some consumers would be happy to pay for welfare

According to research, consumers in industrialized countries are prepared to pay around 14% more for products that take animal welfare into consideration. Willingness to pay does vary, however, depending on the product, country and other factors. According to a survey published in 2010, in beef and pork products, the Finns' willingness to pay extra for animal welfare varied from 0 to 13% of the product price.

Willingness to pay also varies between consumer groups (Figure 1). Groups that are willing to pay the most include young people, students, those in managerial positions, the self-employed, and clerical workers. In Finland and Northern Europe, people seem to be less willing to pay for animal welfare than people in Southern Europe. This may cause conflicts: If people wish to improve animal welfare through regulation but they are not willing to pay extra for it, additional costs for welfare must be covered in another way.

In order to gain added value from the market, companies need to respond to consumer wishes in an adequate manner. They also need to be able to redeem the value promises made to consumers through certification, for example.

Consumers' trust in the operators in the chain varies. Consumers in Northern Europe trust livestock farmers and the trade more than consumers in Southern Europe. Trust towards organisations is increased if they have plenty of expertise. In its turn, trust alleviates worries about animal welfare.

A standard symbol is missing

According to the Eurobarometer, 46% of Finns thought that the selection of animal-friendly products in shops was adequate. The share of those happy with the selection has fallen by as much as 19% in ten years.

In Finland, there is no actual label for animal welfare. Pork producers are pioneers in this field with their certified quality certification label 'Laatuvaistuu'. Organic products and barn eggs also pay attention to animal welfare.

According to research, some consumers are suspicious about the information provided by the animal welfare labels. The labels are often considered confusing and the connection between the label and the production method may remain unclear. The labels are still considered to have value in communication.

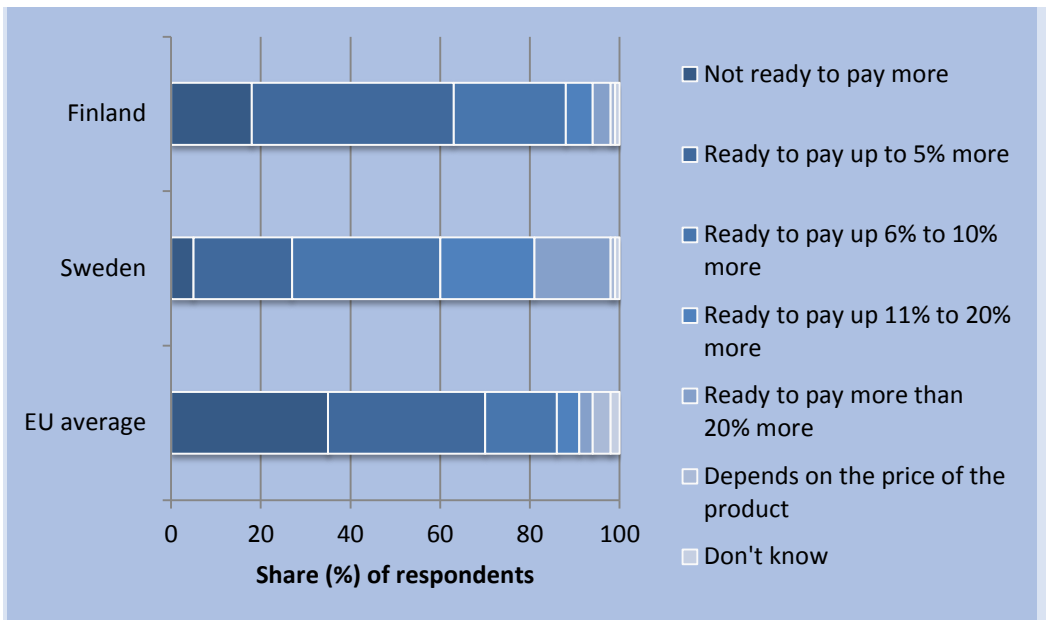


Figure 1. Citizens' willingness to pay extra for products that take animal welfare into consideration in Finland, Sweden, and the entire EU on average (the share (%) of citizens that would pay a set extra price) (Source: *Special Eurobarometer 442*)

It has been shown that consumers also connect animal welfare to other product qualities. For example, people associate better taste and smaller environmental impacts, along with human health and welfare, to animal welfare. These connections are partly based on impressions, as in some cases, there is no factual connection, or the connection depends on the meter under review.

Desire for political responsibility

According to the Eurobarometer, practically all Finns think that European products and products coming from outside Europe should fulfil the same animal welfare requirements. Many Finns also feel that EU should be responsible for making sure that imported products comply with the European standards.

This is an important aspect as setting less strict requirements for imported products compared to domestic products would give them a competitive edge at least in the consumer segments that base their choices purely on price. This could mean that production is moved to countries with less strict legal requirements than Finland. This is why internationally binding quality requirements are needed in the livestock sector.

3. Agricultural policy

Since joining the EU, the motivation behind the national objectives of Finland's agricultural policy has been to compensate for the permanent drawbacks in the country's competitiveness due to conditions that exist in order to facilitate the success of domestic production in the EU Common Market. To achieve this, Finland has strived to modify the common agricultural policy of the EU (CAP) in order to better meet the needs of Finland, and taken national measures in accordance with the accession criteria.

Finnish agricultural policy is founded on the support schemes set down in the common agricultural policy of the EU, i.e. direct payments funded by the EU and the co-funded less-favoured area (LFA) and agri-environment payments. These are supplemented by the Finnish national aid system.

3.1. Common agricultural policy of the EU

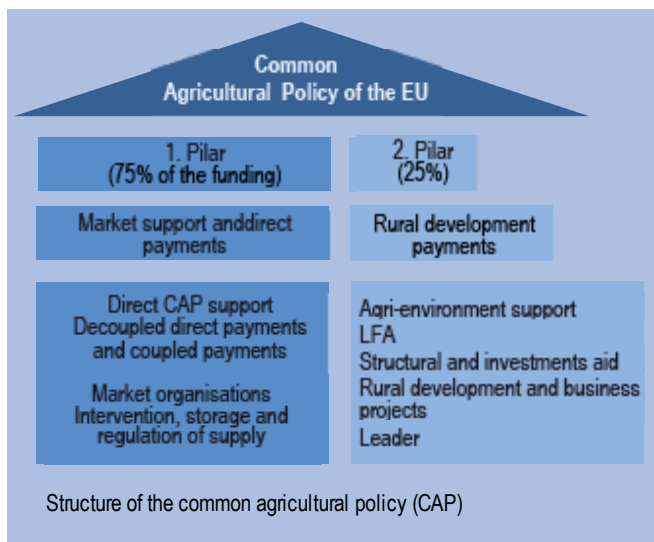
The common agricultural policy (CAP) of the EU has been implemented for more than 50 years. From the very beginning, the main objectives were to improve the productivity of agriculture and balance the food markets, as well to secure the supply of food, a reasonable standard of living for farmers, and reasonable prices for consumers.

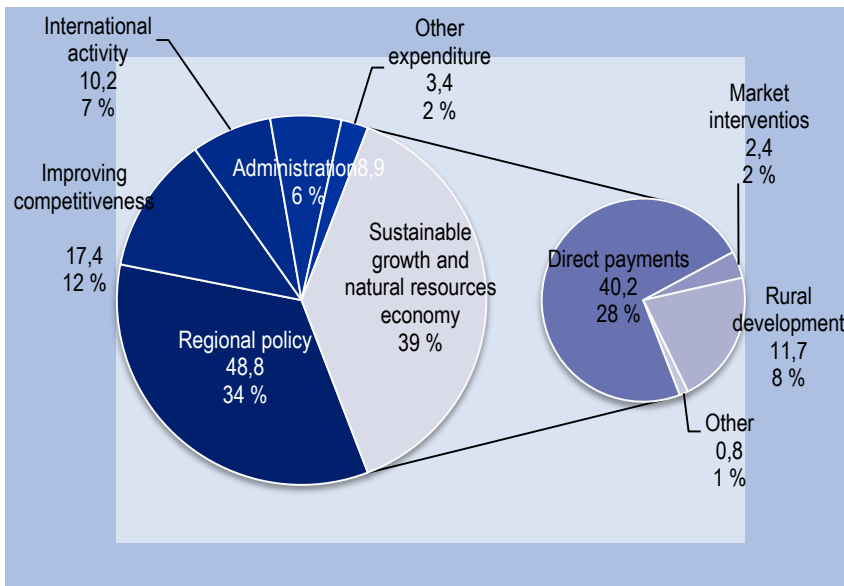
In time, these objectives have been supplemented by other aims, in particular, those relating to environmental issues, which reflect the societal demands that have arisen over recent decades.

The share of expenditure that arises from the CAP in the EU budget is considerably high, about 39% of the total budget in 2016. It should be born in mind, however, that in the other sectors of the EU the integration does not go as wide and deep, and there is no common policy in the same way as is implemented in the agriculture sector through the CAP.

The CAP is comprised of the so-called first and second pillar. Most of the funding (75%) is allocated to the first pillar, mainly direct and market support. The smaller share of the funding (25%) is used for rural development measures under the second pillar (Rural Development Programmes, RDP).

As an outcome of the policy reforms during the past two decades, direct payments to farmers now constitute the lion's share of EU agricultural expenditure. In the early 1990s, most of the CAP funds were still used for export refunds for agricultural products and other market interventions.





EU budget for 2016, € billion

CAP reforms since 1992

As a result of the policy reforms of 1992 and 1999, the intervention prices of agricultural products in the EU were lowered to be closer to the world market prices. The price reductions were compensated for by means of direct payments, which is why support payments based on arable area and livestock numbers gained a central position in the CAP.

In the policy reform of 2003, most of the EU payments for arable crops and livestock were transferred to the decoupled single payment scheme (SPS). At the same time, new conditions relating to the environment, maintaining the condition and productivity of the land, food safety, animal welfare, and occupational safety were incorporated into the scheme.

In November 2008, the EU agriculture ministers again decided on a reform of the CAP, also called the health check. The decision continued the earlier reforms and strategic outlines, aiming to increase the market orientation of EU agriculture. Decoupled payments are now applied even more widely, and some of the remaining

production restrictions have been abolished, to allow farmers to better respond to market demand.

The most recent CAP reform, decided in 2013, was launched by the Commission Communication issued in autumn 2010. This was followed by wide discussions on the future agricultural policy between the EU institutions, states, EU citizens and various stakeholders. The process aimed at drafting the new legislation was initiated in October 2011, when the Commission published its legislative proposal concerning the CAP reform.

CAP until 2020

Political understanding on the outlines and content of the CAP until 2020 was reached in June 2013. The European Commission, the EU Council of Ministers and the European Parliament were finally able to harmonize their views after two years of negotiations, which had become more and more intense, especially towards the end. Because of the new co-decision procedure and the long process of stakeholder consultation in 2010–2011, reaching

an agreement took longer than had been planned, and the implementation of the new policy did not start until the beginning of 2015.

The new CAP includes the so-called greening of direct payments, and it aims for a more even distribution of payments among the Member States. However, most of the main elements of the earlier policy have been retained, even reinforced.

The reform not only put an end to the trend for liberalisation which gained strength in the middle of the first decade of the 2000s, but in some respects it actually “turned back the hands of time”. In fact, the new policy allows some degree of recoupling of EU payments to the production of certain commodities.

The reform also contains measures that aim to improve the supervision of the commercial interests of the producers and reinforce the position of producer organisations so that they have more negotiating power relative to the processing industry and the retail trade. The reform also gave the Member States the right to develop insurance schemes and income stabilisation tools with EU co-funding.

Distribution of EU support for agriculture 2014-2020

The average annual budget for the EU agriculture policy for the programme period 2014-2020 is €55.7 billion. Even though the objective of the agriculture policy reform regarding the period 2014-2020 was to improve the equal distribution of aid, no significant changes occurred in the aid focus. Due to the stringent economic situation, cuts in the EU budget had more impact on the support received by the Member States. EU support for agriculture for 2014-2020 was reduced by 5.9% compared to the funding period 2007-2013. Budget cuts particularly affected the second pillar, i.e. rural development

funds, which were cut by as much as 13% compared to the previous funding period.

The largest recipient of EU support for agriculture during the current funding period is France, whose share of all EU support for agriculture amounts to 16% (€8.9 billion). The second largest recipient is Germany (€6.2 billion) and the third largest is Spain (€6.1 billion). Finland’s share of all subsidy payments for agriculture is some 1.5% (€864 million).

On average, about €13.6 billion is distributed annually in the EU as rural development payments, which amounts to 24% of all EU support for agriculture. The largest recipient of rural development funds was Poland (€1.6 billion) and the second largest was Italy (€1.5 billion). In relation to its size, Finland has traditionally received a significant amount of rural development payments. During 2014-2020, Finland will receive an annual average of €340 million of second-pillar support.

Farm structures vary significantly between Member States. On average, a farm receives annually €4,133 EU support for agriculture. The Finnish farms receive significantly more: on average, €12,663 per farm annually. Meanwhile, in Romania, the average payment per farm is only €756 annually. In the Czech Republic, where the average farm size is large, an average amount of more than €30,000 per farm is paid annually.

Support for agriculture has a significant impact on the total income of farms in the EU. The relative importance of EU support for income formation can be examined through the ratio between the subsidy payments and the farm net value added. The farm net value added is compensation to the farms for their work and capital. In the EU, the average share of subsidies for agriculture in farm net value added is 37.6%. In other words, agricultural support represents more than a third of the results of farms. The lowest rate in

the EU is in the Netherlands, where the share of agricultural support in farm net value added is only 13.7%. In the large Member States, the figures are close to the EU average. In Finland, the share is the highest in the entire EU at 142.9%.

This means that in Finland, only part of the production costs are covered by the

sales revenue from agricultural products generated on the market. A large share of the support goes to covering the production costs and only a small part goes toward agricultural results. In addition to EU support, national support is paid in Finland.

Agricultural support per year in EU-28 by Member State on average in the programming period 2014–2020.

Country	Agricultural support, € million per year on average	Rural development payments under Pillari II, € million per year on average	Share of the MS of EU agricultural support %	Average EU support per farm, € per year	Share of subsidies* in farm net value added, %
France	8,899	1,416	16.0	16,875	39.9
Germany	6,243	1,174	11.2	16,852	38.2
Spain	6,056	1,184	10.9	5,801	33.6
Italy	5,275	1,490	9.5	3,141	22.5
Poland	4,593	1,563	8.2	1,921	44.2
Great Britain	3,944	369	7.1	13,155	48.2
Rumania	2,973	1,145	5.3	756	27.4
Greece	2,584	599	4.6	3,004	46.9
Hungary	1,763	494	3.2	2,815	48.3
Ireland	1,525	313	2.7	11,893	74.2
Austria	1,255	563	2.3	7,584	56.8
Czech Republic	1,183	310	2.1	30,033	63.7
Portugal	1,165	580	2.1	4,235	45.1
Bulgaria	1,116	334	2.0	2,264	36.0
Denmark	985	90	1.8	22,077	21.8
Sweden	948	249	1.7	13,052	72.8
Finland	864	340	1.5	12,663	142.9
Netherlands	839	87	1.5	10,934	13.7
Lithuania	706	230	1.3	3,066	48.8
Slovakia	659	270	1.2	9,546	100.4
Belgium	597	79	1.1	12,430	27.5
Croatia	534	332	1.0	-	-
Latvia	396	138	0.7	3,680	67.3
Slovenia	255	120	0.5	3,391	125.1
Estonia	253	104	0.5	10,850	62.7
Cyprus	68	19	0.1	1,705	36.4
Luxembourg	48	14	0.1	20,809	80.7
Malta	19	14	0.0	1,725	28.0
EU-28	55,747	13,620		4,133	37.6

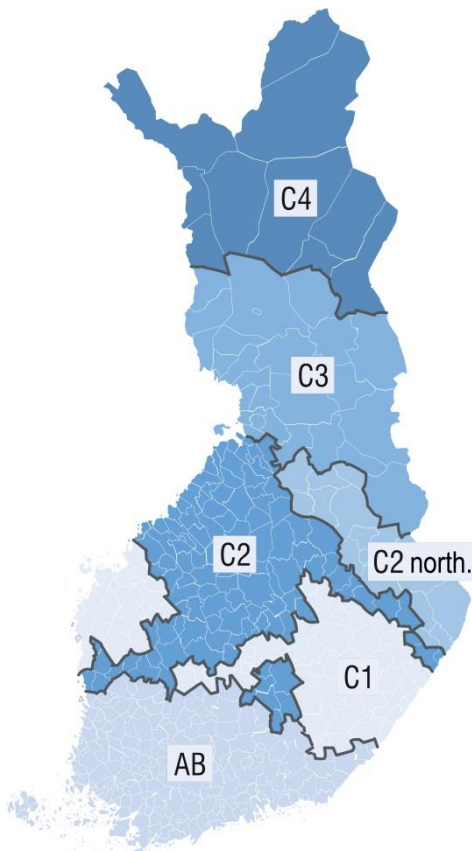
*Total subsidies (which includes direct payments and rural development support, but not investment support) as a share of agricultural value added in the period 2010-2012.

Source: Official Journal of the European Union L 347/655; Official Journal of the European Union L 347/487; EUFADN Database.

3.2. Payments of EU agricultural support in Finland

In 2017, the support for Finnish agriculture under the CAP will total €1,377 million. This consists of the CAP payments for arable crops and livestock (€525 million), less-favoured area (LFA) payments (€552 million) and environmental payments (€300 million). These are funded either by the EU alone or co-financed by the EU and Finland.

CAP payments are an integral element of the common market organisations and they are funded in full from the EU budget. The EU contributes less than 20% of the LFA and more than 40% of the environmental payments. The rest is paid from national funds.



Besides the EU support, in 2017, about €330 million will be paid to Finnish farms as national aid. The national aid scheme comprises northern aid (€297 million), national aid for southern Finland (€25 million), and certain other national aid programmes (€8 million). As of 2015, national top-ups to LFA payments are paid as part of the EU LFA payments.

Before 2015, Finland was divided into three main support areas for the allocation of payments. In the reform of 2015, the support areas were reduced to two. CAP support, environmental and LFA payments are paid throughout the country. Northern aid is only paid in support area C. This has been divided into five subregions for the differentiation of the aid. Support areas C3 and C4 are also divided into subregions. National aid for southern Finland is paid in support area AB (previously areas A and B).

Because the agricultural policy of the EU was not designed for farming in northern conditions and mainly by small farms, Finland has to pay for 56% of the necessary support for agriculture from national funds, while just under 44% comes from the EU agriculture budget. Still, Finland can be considered to have succeeded relatively well in obtaining EU funding for agriculture. In the period 2014-2020, the average annual EU payments to Finnish agriculture are about €864 million, of which around 39% are rural development payments.

CAP support

Most of the so-called CAP support, financed in full by the EU, is paid in Finland through the single payment scheme adopted in 2006 (as of 2015, basic payment). In Finland, the single payment scheme is implemented as the so-called hybrid model. Former CAP payments have been converted into payment entitlements, which consist of a regional flat-

rate payment and farm-specific top-ups. Most of the top-ups have now expired.

In order to be eligible for CAP support, farmers must comply with certain complementary conditions. According to the conditions, arable lands must be kept in good farming condition and minimum requirements for animal welfare and the state of the environment must be met.

Along with the reform agreed upon in 2013, so-called greening measures, i.e. environmental measures that go beyond the base level, are included in the conditions for direct CAP payments as of 2015. 30% of the national maximum amount of direct payments of each country must be reserved for greening. To be eligible for the payment, a farm must have at least two/three crops in cultivation and at least 5% of the cultivation area must be left as an ecological focus area in the regions of Uusimaa and Varsinais-Suomi.

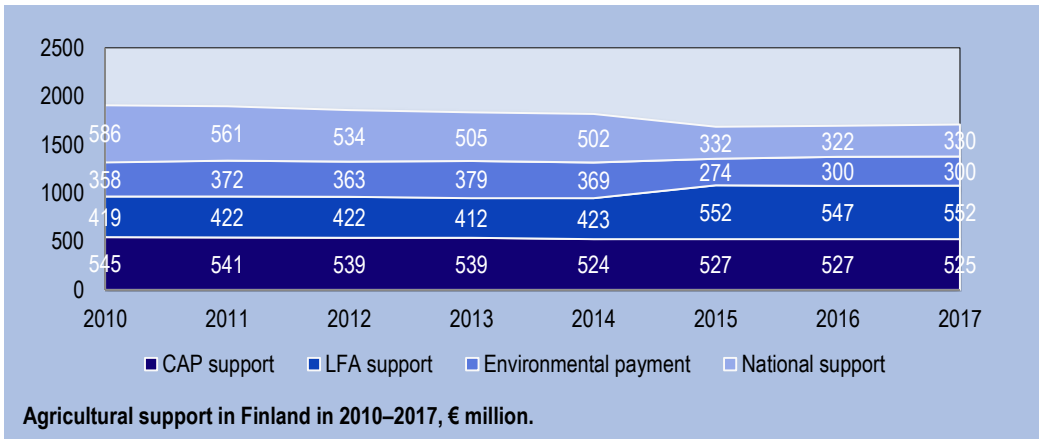
In Finland, 90% of direct CAP support has been paid as decoupled single payments. In the 2008 Common Agricultural Policy health check, Finland was authorised to pay 10% of the support as coupled payments until 2013.

Coupled CAP support has been very important for Finland, especially as regards the supply of domestic beef. Coupled support is paid for suckler cows, bulls and ewes. In addition, a total of €13.7 million is paid annually as coupled support for certain arable crops.

The possibility of applying coupled support payments remains in the EU agricultural policy. The reform of 2013 even allows payments to be re-coupled to the production of certain commodities in the coming years. In Finland, the share of coupled payments of the total amount of CAP support rose to 20% in 2015, decreasing to 18% toward the end of the period 2014-2020.

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%



Less-favoured area payments (LFA)

Certain rural regions in the EU have been defined as less favoured areas (LFA). The purpose of LFA payments is to ensure the continuation of farming in these regions and to keep rural areas populated. In Finland, LFA support is paid for practically the entire cultivated area (2.16 million hectares).

The objective of the LFA payment is for agricultural production to continue in spite of the adverse climate conditions due to the northern location, the number of farms to develop in a controlled manner, and economically viable farming units to continue to exist, thus contributing to rural employment and promoting economic development in rural areas.

The whole of Finland is entitled to LFA payments. The maximum amount of the payment in the so-called mountain area, i.e. in Finland support area C in the north, is €450 per hectare, while in the rest of the country it is €250 per hectare. The payment for plant production farms is €217 per hectare in area AB and €242 per hectare in area C, and for livestock farms €277 per hectare and €302 per hectare, respectively.

In 2007-2013, the average annual LFA payments totalled €421 million. The amount budgeted for 2017 is €552 million. The payment sum has increased because the national LFA payment (ca €120 million) has been paid as part of the EU LFA payment as of 2015. The EU contribution to the LFA payment in Finland is less than 18%.

Environmental payment

As of 2015, environmental support has been called environmental payment. At the same time, the scheme that comprised

three types of measures (basic, additional and special measures) was replaced by measures targeted to specific parcels.

Agri-environmental support, introduced in 1995, compensates for income losses resulting from reduction in production and increased costs to farmers who commit to undertake measures aimed at reducing environmental loading caused by agriculture.

The environmental payment scheme strives to further the biological diversity of nature and to reduce emissions from agriculture into the air and waterways. The environmental payments are divided into the measure of nutrient balance, which is universally mandatory, and voluntary parcel-specific measures.

In the programming period 2014-2020, the basic level of environmental protection in agriculture continues to be set by the complementary conditions that are based on good agricultural and environmental standards and statutory requirements. All farmers who are committed to the scheme must adhere to certain limits for the use of nitrogen and phosphorus in arable farming. Farm-specific measures deal with the use of manure and the promotion of biodiversity, among other things.

In the programming period 2007-2013, an annual average of €320 million was paid in environmental support. The average share of the EU contribution to environmental support has been 28%. The funds for environmental and LFA payment budgeted for 2017 total €300 million, of which €174 million comes from national funds. Animal welfare support accounts for around €50 million of that sum.

The environmental payment scheme is presented in more detail in Chapter 5 (pp. 68-78).

3.3. National aid

The national aid paid in Finland comprises northern aid, national aid for southern Finland, and certain other payments. The aim is to secure the preconditions for Finnish agriculture in different production sectors and parts of the country. The principles to be applied in determining the level and regional distribution of national aid were agreed in the EU membership negotiations. The aid may not increase production, nor may the amount of aid exceed the total payments before the accession.

Northern aid

The Accession Treaty of Finland (Article 142) allows for the payment of national northern aid to areas north of the 62nd parallel and adjacent areas (support area C). A little over 1.4 million hectares, i.e. 55.5% of the cultivable arable area in Finland, is eligible for this aid.

Northern aid consists of milk production aid and aid programmes based on the number of animals and cultivated area.

The northern scheme also includes aid for greenhouse production, storage aid for horticultural products and wild berries and mushrooms and headage-related payments for reindeer. Northern aid paid in 2017 will total almost €297 million. The most significant types of aid are northern aid for milk production (€161.2 million) and northern aid based on livestock units (€76 million).

The effectiveness of the northern aid is evaluated every five years. The latest evaluation report was completed in 2016. It assessed to what level the objectives set for northern aid were achieved, and the feasibility and justification of the measures applied in the scheme. Based on the results, the European Commission and Finland discussed the future development needs of the northern aid in 2016.

The EU Commission's new decision on Finland's northern aid scheme came into force on 1 January 2017. The decision provides Finland with considerably more flexibility in the implementation and monitoring of the aid. The recipients and types of northern aid remained the same.

Agricultural support based on the CAP in Finland (financed in full and part-financed by the EU), € million.

	2011	2012	2013	2014	2015	2015	2017 estimate
Total	1,336	1,324	1,330	1,316	1,353	1,374	1,377
CAP income support	541	539	539	524	527	527	525
Natural handicap payments	423	422	412	423	552	547	552
<i>EU contribution</i>	118	118	115	118	97	97	97
<i>National financing</i>	304	304	297	305	455	450	455
Environmental support*	372	363	379	369	274	300	300
<i>EU contribution</i>	107	107	112	107	115	126	126
<i>National financing</i>	265	265	267	262	159	174	174
EU financing, total	766	764	766	749	739	750	748
National financing, total	569	560	564	567	614	624	629

*Environmental support also includes payments relating to animal welfare and non-production investments.

National aid for agriculture in Finland, € million (aid per production year).

	2011	2012	2013	2014	2015	2016	2017 estimate
Total	560.8	534.3	504.9	499.4	323.9	322.3	330.0
Northern aid	333.5	328.2	317.4	310.9	288.5	285.7	297.0
National aid for Southern Finland	83.4	74.9	62.5	62.9	28.9	27.0	25.0
National supplement to the LFA support*	119.3	119.4	119.3	119.7	-	-	-
Other national aid	22.4	11.8	5.7	5.9	5.5	9.6	8.0

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

National aid for southern Finland

Until 2013, national aid for southern Finland, i.e. support area AB, was paid under Article 141 of the Accession Treaty. This article allowed the payment of aid due to serious difficulties resulting from accession to the EU. However, it did not define the concept of serious difficulties in any more detail or limit the duration of the measure. The Finns interpreted the article to give authorisation for the payment of aid in the long term. The Commission, on the other hand, saw it as a temporary solution.

Finland negotiated with the Commission on the continuation of the aid based on Article 141 on many occasions. According to the outcome of the negotiations, Finland was granted both national direct aid and raised investment aid for livestock production and horticulture in southern Finland until 2014.

In 2015, Finland transferred a significant share of the coupled aid in southern Finland to EU-funded direct payments. This means that milk and beef production, sheep and goat husbandry and cultivation of starch potato and vegetables in the

open, in southern Finland, is mainly supported by a scheme based on EU support.

The 'old' national aid, so-called aid for serious difficulties, is still paid to pig and poultry husbandry and horticultural production in southern Finland. The aid will no longer be paid under Article 141 of the Accession Treaty, but under Article 149a instead for the new programming period. This new legal basis under Community law to continue the payment of national aid for agriculture in southern Finland was approved by the EU institutions in autumn 2013.

In connection with this, the national income aid for southern Finland decreases from around €63 million to around €29 million, and will decrease further to €17 million in 2020.

National top-ups to LFA payments

National top-ups to LFA payments have been paid throughout the country since 2005. The top-up was based on a preliminary agreement reached in the 141 negotiations between Finland and the Commission in 2003. Since 2015, the national top-up for LFA payments has been paid as part of the EU LFA payment.

3.4. Structural support for agriculture and farm relief services

Investment aid and early retirement

The agricultural investment aid and early retirement arrangements aim to promote growth in farm size by reducing production costs. In practice, these forms of structural aid comprise subsidised interest rates, subsidies, and state guarantees. In 2016 interest rate subsidy loans, mainly for financing production buildings on farms and the acquisition of real estate and movables relating to setting-up aid for young farmers, may be granted up to €250 million. The costs to the state from interest rate subsidies totalled around €29 million in 2016.

In 2016, agricultural investments, the interest subsidy for interest rate subsidy loans, and the state guarantee were financed entirely from national funds. Setting-up aid for young farmers, on the other hand, was partially funded by the EU. In 2016, €54.8 million was budgeted for

investments and setting-up aid for young farmers.

The early retirement scheme offers ageing farmers the opportunity to give up the farm or its production. In 2016, the total retirement support was estimated to be €77.1 million.

Setting-up aid for young farmers supports the transfer of farms to the next generation. In 2015, aid was granted to set up 127 farms. In 2014, setting-up aids were granted to 1108 young farmers, which was an increase compared to previous years.

Farm relief services

Farmers practising livestock production on a full-time basis are entitled to 26 days holidays per year. The Ministry of Social Affairs and Health is responsible for the management, control, and coordination of the relief services. The purpose of the services is to ensure that farming activities continue uninterrupted during holidays, and that substitute help is available in the case of illness or accidents. In 2017, the funds used for the relief services to farmers will be around €160 million.

Number of objects of structural support and funds committed to these in 2010–2015.

	2010	2011	2012	2013	2014	2015
Number of decisions on subsidies	2,771	2,537	2,205	2,461	2,694	1,317
– building in dairy husbandry	398	389	363	376	319	116
– building in beef cattle production	87	46	38	29	27	17
– horticulture investments	67	63	55	51	41	51
Number of setting-up aids	542	535	544	597	1,108	127
Funds committed, € million	95.7	77.3	73.1	92.2	92.2	52.8

Source: Ministry of Agriculture and Forestry

Consequences of Brexit on the EU agriculture and food market

Jyrki Niemi and Alan Matthews²

In June 2016, the EU suffered an unpleasant blow as the side advocating to leave the union won the referendum in the United Kingdom (UK). Although the possibility of the UK voting to withdraw from the Union had long been acknowledged, few people were prepared for it actually happening.

The UK leaving the EU will also have an impact on the agriculture and food sectors. At this stage, as it is still unclear what the post-EU policy in the UK will be, it is difficult to draw definite conclusions. The consequences of Brexit will depend very much on the type of policy Britain will pursue following the exit, particularly in the areas of foreign trade and regulation.

The UK trade policy options following Brexit

The UK has several options when it comes to negotiating a new relationship with the EU. Options involve a trade-off between greater regulatory autonomy on the one hand and lower costs of trading with the EU on the other. In terms of the degree of integration, the options are: i) an agreement with the EU on European Trade Area similar to Norway, Iceland and Liechtenstein, (ii) EFTA membership and an EU free trade agreement similar to Switzerland, (iii) a customs union with the EU similar to Turkey, (iv) a free trade agreement similar to Canada, or (v) application of the WTO agreement.

However, the UK's membership of the EU single market and customs union is unacceptable to those who voted for Brexit as the UK would effectively have to transpose all EU regulations into its own laws without being able to help shape those rules. The UK Prime Minister Theresa May has therefore made it clear in her bold speech of January 17, 2017, and reiterated in the Conservative Party election manifesto for the June 2017 election, that her government is aiming for a complete withdrawal from the EU single market and customs union and for trade relations to be maintained via a bilateral trade agreement. With this being the case, the most likely alternative is a free trade agreement similar to that with Canada. Should they manage to reach such an agreement within the two year time limit set for the negotiations, it may be possible to secure free movement of agricultural and food products between EU countries and the UK.

This would mean taking the trade relations back to the time before 1992 and the creation of the EU single market. Back then, many non-tariff barriers to trade made it difficult to move products freely between Member States. Such barriers were related to food safety, plant health and veterinary regulations, among other things.

Trading costs will rise

The free flow of agri-food products in the EU is currently made possible by the single market. At the core of the single market is the principle of mutual recognition. According to this principle, a Member State must allow the marketing of a product if the product is

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legally marketed in another EU Member State. Since the UK withdraws from the EU and the single market, this would no longer apply to EU exports to the UK or UK imports to the EU. This would entail additional costs related to certification and fulfilling requirements and regulations.

For example, without an agreement on mutual recognition, meat producers wishing to export their products to the UK would need to acquire the required certification from authorities in both the UK and the EU. In the future, if the UK develops different regulations regarding food packaging, food producers in the EU would need to manufacture different packaging in order to sell their products in the UK market.

An important consideration in post-Brexit trade policy will be the relationship the UK intends to seek with the rest of the world. Both the EU and the UK have many bilateral agreements in place with a wide variety of countries, which govern aspects of trade. In many cases these will cover technical aspects, such as sanitary and phytosanitary (SPS) measures, export certification or inspection processes. Also relevant will be the EU preferential trade agreements which currently give many third countries preferential access to the EU (and UK) markets. Many of these bilateral agreements will require renegotiation to reflect the new situation.

Agricultural trade relations between the EU and the UK

The UK has provided the other 27 EU member states a large and important market for agricultural exports. Total exports of agri-food products to the UK from the EU-27 reached nearly €35 billion in 2016. Meanwhile, the EU imported approximately €14.7 billion worth of agri-food products from the UK, meaning the EU-27 had a trade surplus approaching €20bn.

In terms of agricultural produce exported from the EU to the UK, the highest in value terms are beverages & spirits at €5.4 billion. But the UK is also heavily dependent on the EU to meet many of its fresh produce needs like meat & edible meat offal, dairy products, vegetables and fruit. The biggest earning agri-food exports from the UK to the rest of the EU are also beverages & spirits followed by other prepared goods.

Common agricultural policy without the United Kingdom

The EU's common agricultural policy (CAP) may also face changes as a result of Brexit. Traditionally, the UK has promoted the liberalisation of the CAP, together with Sweden, the Netherlands and Denmark. Furthermore, the UK has been largely critical over the cost to run the CAP and how the funds distributed are targeted. It has also been influential in the shift from coupled direct payments to decoupled payments, the introduction of rural development as a 'pillar' of the CAP and environmental payments. Therefore, the general public opinion in the Council of the European Union and the European Parliament is likely to shift marginally in favour of stronger CAP protection as a result of the British leaving.

Then again, the second largest net contributor after Germany leaving the union is likely to have an opposite effect. If the Member States wish to maintain the current level of agricultural support they must also be prepared to make larger contributions to the EU budget. In 2013, the United Kingdom received €3.9 billion in CAP support and funded it with €6.8 billion.

These figures will help understand the impact of missing the contribution made by the UK. The overall impact of Brexit on the CAP budget is limited to around €2.9 billion annually – less than 5% of the CAP budget. This 5% needs to be balanced politically in the financial negotiations following Brexit.

Conclusions

The potential consequences of Brexit on the agri-food sector depend primarily on the nature of the post-Brexit trade agreement reached with the EU. Trading costs are likely to increase from the current level. However, it is possible to minimise the negative impact of the increased costs by negotiating as many bilateral agreements on mutual recognition as possible. But the benefits of such agreements would undoubtedly be more limited and cover less ground than the benefits of membership in the internal market.

It is unlikely that this 'divorce' will be finalised and binding before the end of 2020, which marks the end of the current multiannual financial framework. In any case, as of 2021, the UK and the 27 EU Member States will need to make arrangements in their national policies independently and separately.

4. Structural development and economic situation of agriculture

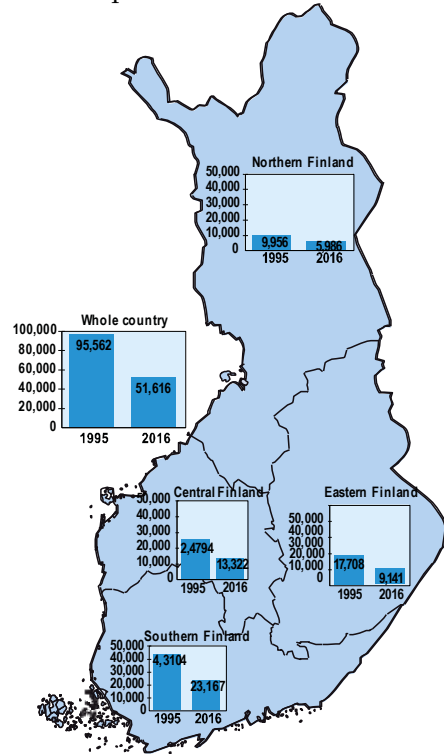
4.1. Structural development of agriculture

Number and size of farms

In 2016, the total number of farms (over 1 ha) that applied for agricultural support was a little over 51,600. This number was more than 1,200 (2.3%) smaller than in 2015. In both absolute and proportional terms, the decrease in the number of farms was smaller than in 2015 and below the long-term average. During the 21 years that Finland has been part of the EU (1995–2016), the number of Finnish farms has fallen by more than 46%, or 43,946 farms. On average, the number of farms has decreased at a rate of 2.9% a year. Proportionally, the decrease has been the greatest in eastern Finland (48%) and the smallest in northern Finland (40%). In southern and central Finland (46%), the rate of change has corresponded to the national average.

As the number of farms has decreased, the average farm size has grown. In 1995–2016, the average size of farms applying for agricultural support increased by almost 95%, from 22.8 ha of arable land to just over 44 ha. The average farm size increases as the number of the smallest farms declines and that of the largest farms goes up.

In 20 years, the share of farms of less than 20 ha in size has fallen from 56% to 38%, while the share of farms of more than 50 ha has risen from 7% to 30%. Large farms with more than 100 ha of arable land make up 10% of the Finnish farms.



Number of farms receiving agricultural support in 1995 and 2016 (main regions of Uusimaa and Åland according to NUTS II have been included in Southern Finland). Source: Finnish Agency for Rural Affairs.

Number of farms receiving agricultural support in 2006–2016.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Whole country	68,766	66,821	65,292	63,716	62,450	61,153	58,898	57,559	56,016	52,858	51,616
Southern Finland ¹	30,967	29,945	29,368	28,694	28,098	27,578	26,517	25,874	25,119	23,726	23,167
Eastern Finland	12,173	11,812	11,501	11,218	11,033	10,808	10,479	10,281	10,027	9,469	9,141
Central Finland	17,947	17,574	17,119	16,650	16,177	15,771	15,172	14,812	14,410	13,645	13,322
Northern Finland	7,679	7,490	7,304	7,154	7,142	6,996	6,730	6,592	6,460	6,018	5,986

¹ Main regions of Uusimaa and Åland according to NUTS II have been included in Southern Finland.

Source: Finnish Agency for Rural Affairs.

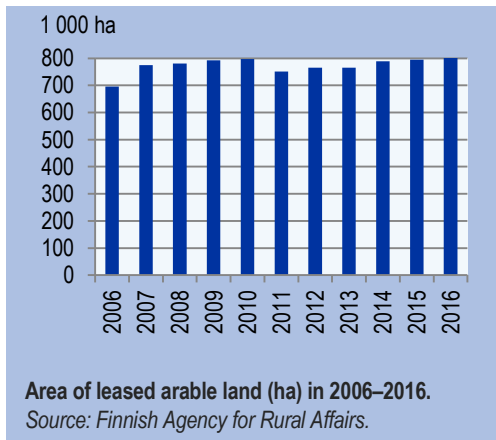
Size class distribution and average arable area of farms receiving agricultural support in 2016¹.

	Southern Finland ²		Eastern Finland		Central Finland		Southern Finland ²		Whole country			
									1995		2016	
	Number of farms	%	Number of farms	%	Number of farms	%	Number of farms	%	Number of farms	%	Number of farms	%
Arable land <10 ha	3,821	17	2,075	23	2,352	18	1,070	18	22,850	24	9,318	18
10–20 ha	4,166	18	2,098	23	2,889	22	1,112	19	30,698	32	10,265	20
20–30 ha	3,213	14	1,285	14	1,992	15	776	13	19,669	21	7,266	14
30–50 ha	4,233	18	1,588	17	2,454	19	1,078	18	15,414	16	9,353	18
50–100 ha	4,903	21	1,436	16	2,488	19	1,249	21	5,706	6	10,076	20
>100 ha	2,761	12	633	7	1,086	8	691	12	784	1	5,171	10
Number of farms	23,097		9,115		13,261		5,976		95,121		51,449	
Average arable area, ha/farm	48,33		36,66		41,01		46,91		22,77		44,3	

¹ The figures do not include horticultural enterprises if they have no fields under cultivation.

² Main regions of Uusimaa and Åland according to NUTS II have been included in Southern Finland.

Source: Finnish Agency for Rural Affairs.



About half of the growth in farm size during the time of Finland's EU membership has occurred through leasing. In 2016, the total cultivated arable area of farms was 2,278 million ha, of which 822,382 ha (almost 36%) were leased. In 1995, the share of leased land was 22%. In the 2000s, the leased arable area has grown by almost 16%. There is considerable regional variation in leased land: in the Åland Islands, almost half of the arable land is leased, while the share of leased land in Central Ostrobothnia is only around 28%.

Forests are an integral part of Finnish farms. In 2016, the average forest area of farms was nearly 53 ha. Regional variation is considerable, however: in Southwest Finland and the Åland Islands, the average forest area of farms is 33 ha, while in Lapland it is 109 ha.

Ownership of farms and age of farmers

Finnish agriculture is almost exclusively based on family farms: in 2016, 87% of the farms that applied for support were privately owned and 11.3% were owned by heirs and family companies and corporations. Cooperatives and limited companies owned 1.5 %, general and limited partnerships 0.2 % and sole traders 0.1 % of the farms. The state, municipalities, schools and parishes owned 0.07 % of the farms, and foundations, associations and the like owned 0.05% of the farms. In 2016, the average age of farmers on farms that applied for support was 52.38 years. The age of farmers was the highest, 54.2 years, in the Åland Islands and the lowest, 51.1 years, in Central Ostrobothnia. As the farm population ages, the share of young

farmers has fallen while that of older farmers has increased. In 2001, 26% of farmers on privately owned farms were aged over 55. In 2015, their share was almost 40%. During the same time, the share of farmers aged below 44 fell from 38% to less than 29%.

Production structure of farms

The changes in the production structure of Finnish agriculture have been characterised by a decline in the number and share of livestock farms, and an increase in the share of crop farms. In 2016, 25% of the farms which applied for support were livestock farms and 70% were crop farms, while in 1995, the share of livestock farms was 52% and that of crop farms 39%.

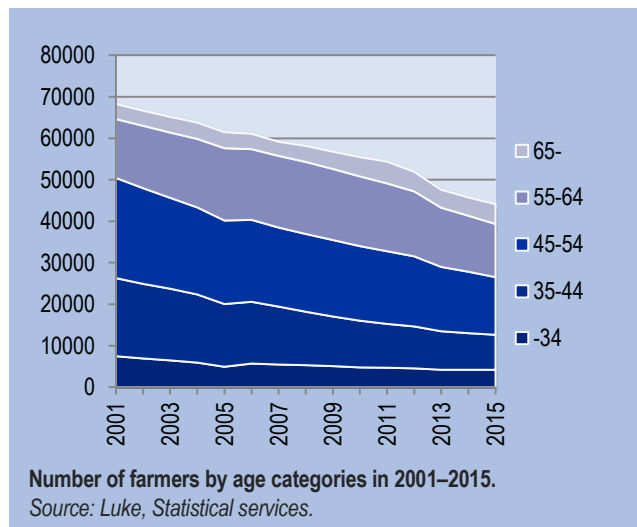
In 2016, less than 8,000 farms practised dairy husbandry as their main activity. In 1995-2016, the number of dairy farms fell by more than 24,200 farms, at a rate of 6.5% a year. The share of dairy farms of all Finnish farms has also decreased: in 1995, dairy husbandry was the main activity on almost 34% of the farms receiving agricultural support, but in 2016 their share had fallen to around 15%. Proportionally, the number of dairy farms is the highest in eastern and northern Finland, where they account for a quarter of the farms. Dairy farms are more evenly distributed across all regions of Finland than the other lines of production.

In 2016, less than 3,400 farms specialised in beef production. That is 7% of all farms that applied for agricultural support. In 1995-2016, the number of these farms fell by almost 5,700, at a rate of 4.6% a year. In 1995, 9.5% of all farms specialised in beef production. The distribution of beef farms across the country is quite similar to the regional distribution of dairy farms.

The number of farms specialising in pig meat production was about 1,250 in 2016, representing 2.4% of the farms that applied for support. Of the pig farms, 301 specialised in piglet production, 531 farms in pig meat production and 418 farms practised combined pig production. In 1995-2016, the number of pig farms decreased the most compared to other production sectors: by 80%, or by 7.4% a year. In 1996, the share of pig farms was 6.5%. Pig meat production is focused in southern and western Finland.

The number of poultry farms was 546 in 2016, which is 1% of the farms that applied for support. During the period of Finland's EU membership, the number of poultry farms has fallen by 75%, at an annual rate of 6.4%. In 2016, around 47% of poultry farms specialised in egg production, 40% in poultry meat production and 13% were breeding units. In 2000, the respective shares were 68%, 21% and 12%. Most of the poultry farms are located in southern and western Finland.

In 2016, there were just under 36,000 crop farms, which is only 1,260 farms (3.4%) fewer than in 1995. Following years of growth, however, the number of crop farms has also taken a downward turn. In recent years, the number of farms only



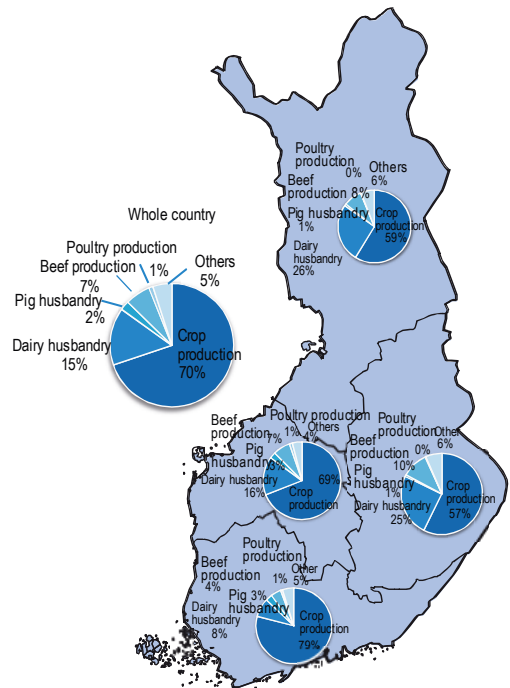
engaged in other crop production (e.g. hay) has increased, but in 2013-2016 this increase also halted. Half of the crop farms are located in southern Finland, but in recent years the share of crop farms of all farms in the area has grown the most in eastern and northern Finland.

The number of other types of farms was just over 2,600 in 2016, which is 5% of all farms. Over the past 20 years, their number has fallen by more than 70%, at an annual rate of 5.6%. Other farms include those engaged in horse, sheep or goat husbandry, and those engaged in other types of production or activities (e.g. farm tourism). After a period of growth, the number of farms engaged in horse husbandry has also decreased in recent years.

4.2. Development of results and profitability in agriculture and horticulture

The profitability of agriculture and horticulture has been falling throughout the 2000s. Annual variations are more common, but the trend is a declining one. The average size and total revenue of agricultural and horticultural enterprises have grown rapidly since the early 2000s, but the results have remained poor. Goals set in terms of wage income and return on assets, have not been achieved. Entrepreneurial income per farm in real terms fell and no return on assets was generated. Costs are rising faster than results. Attempts have been made to make up the difference through structural development.

In recent years, results have been affected by a fall in producer prices while there has been no change in costs. After some positive years, practically all key producer prices took a downward turn in 2013-2014.



Distribution of farms receiving agricultural support according to production line in 2016 (main regions of Uusimaa and Åland according to NUTS II have been included in Southern Finland).

Source: Finnish Agency for Rural Affairs.

The drop in prices of cereals and oilseed plants already began to affect the results of crop farms in 2013, and the effects of lower prices were particularly evident in livestock farms in 2015. According to the profitability bookkeeping records of the Natural Resources Institute Finland (Luke), in 2015, the family farm income of agricultural and horticultural enterprises fell by around 14% on the previous year. The results only cover 32% of the goal set in terms of income of the farming household and interest yield. Lower prices and delays in payment in the new support system meant that many farms faced profitability and solvency problems. Measures were taken to alleviate the situation of farms through crisis support funded by the EU and the Member States.

Prices, yields and support show in results

The structure of agriculture and horticulture has changed rapidly in the 2000s. Entrepreneurs are expanding their farms and using various forms of business in an effort to keep pace with ever-fiercer competition in the food sector. Finnish agriculture and horticulture are closely integrated with markets in the surrounding regions, the EU, and the global environment. In recent years, external changes in particular have increased instability and shocks to the operating environment, also influencing prices and markets in Finland.

Input prices have for many years been rising faster than producer prices, which has led to higher costs and lower profitability. The prices of supplies, especially energy and fertilisers, have risen rapidly. Russia's embargo following the sanctions had a particular impact on the prices and markets of meat and milk in the entire EU. The agricultural support policy acts as a safety net in agriculture, but prices and markets play a key role in the formulation of farmers' income and the profitability of farms.

Production volumes and yields also cause variation in profitability. The cereal yield harvested in 2010 was the smallest in the 2000s. In 2014, the cereal yield was the largest since the peak year of 2009, and the yields of other crops and grasses were also good. In 2015, the cereal yield fell by 10% to the second smallest since the early 2000s. In 2016, the yield was at the same level as the previous year with slightly poorer quality.

In 2000-2006, the share of support payments in gross returns grew from 36% to 40%. By 2015, the share of support payments had fallen to 33%. Factors behind this development include increased sales proceeds, falling unit aid and changes in the support structure.

Prices of supplies took a downward turn

Because of growing farm sizes, gross return, or the value of agricultural production rose to €156,000 per farm in 2015. But gross return per hectare calculated in real terms has still fallen. In 2015, gross return also decreased by 3% on the previous year as a result of lower producer prices.

In 2015, the average production costs in agriculture were €186,500 per farm. In the long term, costs have risen faster than results. Input costs, i.e. the cost of energy products, fertilisers and feed in particular, have risen significantly. An increase of cereal prices in autumn 2010 also increased the prices of fertilisers and feed. Environmental reasons have caused increases in fuel and electricity costs. Prices of supplies took a downward turn in 2013 following a prolonged recession and falling raw-material prices. In 2013-2015, prices of supplies fell by 5% and the overall index of input prices by 3%. Meanwhile, producer prices, excluding fur, fell by as much as 15%. Supplies account for 24% of total costs, which means that their prices have a significant impact on the results. Prices of machinery and other capital goods have risen less than other input prices.

Labour expenditure is the second largest cost item, accounting for 20% of total costs. More hired labour was used and its cost rose to 19% of the total labour expenditure. The farming family's work input accounted for 80% of the total work input.

Pressure on profitability

In 2015, the average family farm income of a farming family received as compensation for their work and capital was €14,500 per farm, which is the weakest in the 2000s. Family farm income was the compensation for the use of farmers' own resources in agriculture and horticulture, the 1,930 hours of labour input and €343,000

of farmers' own capital invested in the enterprise. The trend in family farm income has been declining since 2012. In 2016, family farm income is estimated to decline further due to lowering producer prices. Changes in producer prices affect the results quickly. Even with a slight fall in the prices of production inputs, adaptation was too slow, resulting in lower family farm income levels.

To begin with, profitability in agriculture has not been great in recent years. Family farm income has been low; entrepreneurs have made no profit and generated no return on assets. In 2010-2015, the return on total assets was positive only in poultry farms. The return on total assets varied from +2% to -10% by production line.

Despite the poor profitability, solvency within the sector has remained at a typically healthy level. The 2015 balance sheet showed the average farm's capital to be €472,000, which is twice the amount it was in the early 2000s. Farmer's equity has risen to €343,000. The amount of debt has grown faster than equity. The financing of investments has largely depended on external capital and investment subsidies. The average equity ratio is 74%. It is the highest for cereal farms and the lowest for greenhouse enterprises and poultry farms.

Relative indebtedness, i.e. the amount of debt relative to turnover, has risen from 60% in the early 2000s to almost 90%. In recent years, as a result of increased debts and slowly growing turnover, indebtedness has begun to increase. There are considerable differences in indebtedness between farms and production sectors. Farms that invest the most have the highest debt rates. Large amounts of debt have increased the financial risk, which has partly been reduced by the low interest rates.

Dairy farm crisis

Milk production is the most important production sector of agriculture in Fin-

land. One in six farms produces milk, and more than 60% of agricultural income is attributed to milk. Structural development in the milk sector has been fast for a long time. Since 2000, the average number of cows, and the average arable area per farm have doubled, and the turnover has almost tripled. Meanwhile, the profitability of dairy farms has not improved much, although it has been fairly stable. In 2010-2014, the dairy farms' profitability ratio varied between 0.50 and 0.60 with family farm income in real terms averaging €45,000 per farm.

The positive trend in the dairy sector halted with the Russia's import ban and the consequent 16% drop in producer prices in 2015. More pressure was put on the producer price by growing production in the EU. This was the result of the abolition of milk quotas and expected growth in global demand. The collapse in milk prices cut 10% off milk sale revenues. Thanks to subsidies and growing plant production, gross return only decreased by 4%. Family farm income fell by 35% on the previous year, and the profitability ratio declined by more than two tenths to 0.38. The result is the weakest in the entire 2000s.

The plight of pig farms

The profitability of pig farms has varied significantly in recent years, but the trend has been downward. Despite the fast structural change and increased profitability, family farm income in real terms has not increased at all since the early 2000s. The tough structural change is continuing, as there are a number of farms facing closure due to poor profitability. Profitability is highly dependent on the price ratio of meat and feed, and the worst results usually come when cereal prices are high, as was the case in 2008 and 2013. In recent years, the profitability ratio has varied from 0.2 to 0.6 with the entrepreneurial income averaging at €35,000 per farm.

In recent years, the pig sector has suffered from weak markets, falling prices and changes in the support system. The EU market for pork was already depressed before Russia's ban on imports, which increased both supply and pressure on prices. However, the recovery in the pig sector following higher producer prices halted in 2013 due to the weak market situation. Producer prices began to fall, and by 2015, they had already fallen by 16%. The decline in producer prices seems to have stopped in 2016, but the impact on poor profitability is insignificant.

Bad years in crop production

The average size of crop farms is fairly small, and growth in farm size has been slow. Many crop farms are cultivated on a part-time basis. The results per farm and hectare, in real terms, have been on the decline for a long time, and the moderate increase in the amount of arable land has not been enough to improve the results. Variations in prices and yield have influenced the results of crop farms significantly, but there are also variations in input prices, in the purchase prices of energy and feed in particular. Family farm income has varied a great deal and the downward trend has prevailed for a long time.

The results of crop farms have varied considerably, but the results were not satisfactory even during 2010-2012, when prices were high. Family farm income rose to €11,000 per farm with the profitability ratio at 0.38, which is far below the target. Part of the benefits of rising producer prices were eaten away by high input prices and rent paid for land. The period of high prices ended at the beginning of the harvest season in 2013. The prices of cereal and oilseed plants fell by one-third, bringing the profitability of cereal farms down to the level of the weakest years of 2008-2009.

In 2013-2014, the results in crop farming fell to a poor level, and 2015 was no

better. Family farm income fell to €3,380 per farm in 2015, while the profitability ratio settled at 0.12. There was slightly less cost pressure, but it was not enough to improve the 2015 results as producer prices remained low.

Best-performing farms remain competitive

There is significant farm-specific variation behind the average figures. In profitability bookkeeping, the results of the best (strong) and worst (weak) performers are calculated. In the group of strong performers, farms tend to achieve the goals set in terms of wage income and interest yield, while the weak performers make heavy losses. In 2015, the family farm income of the strong performers was €44,600 on average, with the profitability ratio at 0.74. In this group, return on interest on assets was 1.0%. The family farm income of the weak performers was negative, -€11,300 per farm, meaning that these farming families received no compensation for their own labour and equity.

Differences in profitability are also vast between farms of the same production line and of similar size. Among dairy farms, the profitability ratio of the strong performers was 0.72, while that of the weak performers was 0.01. Changes in the economic cycle had a negative effect on the results of the weak performers in particular. The returns of the best dairy farms calculated per livestock unit were 10% better with 12% lower costs. The biggest differences were caused by the costs of machinery, labour and supplies. Farm size and number of livestock were clearly larger than among the weak performers.

The strong performers among crop farms achieved a profitability ratio of 0.6 and the return on total assets was 1.1%. Among the weak performers, the results were clearly negative. The returns per hectare among the strong performers were

18% better with costs that were a quarter smaller. The biggest differences were in the costs of supplies and capital.

Profitability differences between support areas have been fairly stable. Profitability has been above average in areas C2, C2p, and C3, which are strong dairy and beef cattle regions. The poor profitability of plant production makes support areas A and B fare the worst. The differences in profitability are mostly due to the different production structures of different regions. There are no significant differences in profitability between farms engaged in similar production in different support areas.

Result calculations

Agricultural and horticultural results are based on the Luke profitability bookkeeping data. The results are calculated from the results of around 900 bookkeeping farms and presented as weighted. In calculating the results, individual revenue and expense items and support payments are allocated as returns and costs to the year of production, in accordance with the accrual principle. Annual variations in yields and returns and changes in prices and support payments are thus directly reflected in annual profitability figures.

The gross return includes the value of products produced on the farm and used as feed for animals or as seeds. Since this item is also recorded as an expense, it does not influence entrepreneurial income or other results.

On the balance sheet, asset items are measured at current value, and investment subsidies or investment reserves are not deducted from the value of assets.

The farming family's wage claim for labour has been calculated using the recorded working hours and average hourly wages of agricultural employees. In 2015, the hourly wage claim was €15.60. The interest claim on equity is farm-specific

and based on risk-free interest and risk premium. The risk-free interest corresponds to the return on five-year Finnish government bonds and the risk premium is calculated for each enterprise on the basis of actual key indicators. The average interest rate for 2015 was 4.4%.

In the results of profitability bookkeeping, production types and economic size classes are determined using EU farm typology. Classification is based on the total output of crops and livestock calculated by region (NUTS 3 area) excluding subsidies. The production type is determined on the basis of the total output of the farm. The financial size of the farm is determined on the basis of the total output.

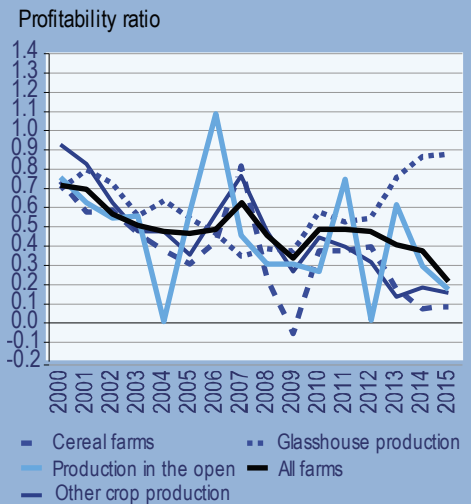
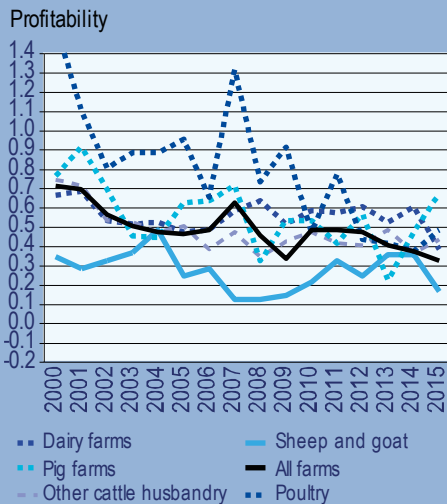
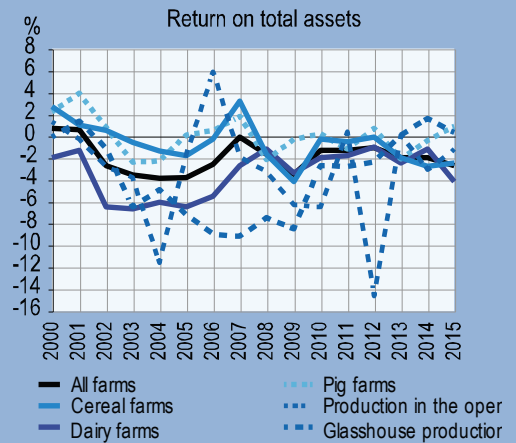
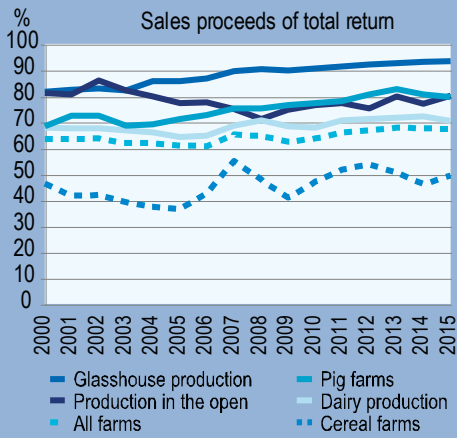
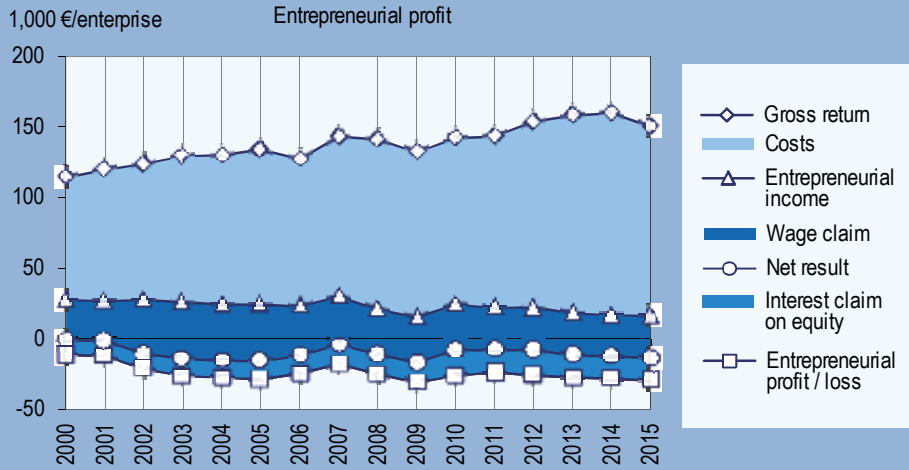
Results in EconomyDoctor

The results of the various lines of production in Luke profitability bookkeeping are presented online in EconomyDoctor. Users can, for example, view the average results of enterprises representing various agricultural and horticultural production types and economic size classes since 2000, using the selected classifications.

In addition, the service includes results of reindeer farming, fur farming and bee-keeping. The results shown are calculated by means of weighting on the basis of the figures of the bookkeeping farms, which means that they represent the average figures of all farms in the selected area or classification.

EconomyDoctor also provides the average figures for agriculture in EU Member States (FADN Standard Results) and the financial indicators calculated by Luke (FADN Advanced Results). The FADN data cover the results of more than 80,000 farms, which are weighted so as to reflect the finances of around 5 million farms in the EU.

Result and profitability development of agriculture and horticulture



4.3. Overall level of agricultural income

The trends in the return and cost items as well as assets of Finnish agriculture and horticulture in general, are followed at Luke using the total calculation system for agriculture. The overall results are calculated from farm-specific profitability bookkeeping data by weighting and summing up. The updated results are available in the total calculation online service of Luke's EconomyDoctor website (www.luke.fi/taloustohtori/kokonaislaskenta).

Trends in the results

The gross return of agriculture and horticulture was €5.7 billion in 2015, while the production costs totalled €7.0 billion. The entrepreneurial profit, obtained as the difference between the gross return and production costs, which indicates absolute profitability, was negative at -€1.3 billion. The entrepreneurial profit in the sector has been negative every year, meaning that income from sales and subsidies has not been enough to cover production costs.

When the costs due to the farming family's own labour input and capital are excluded from the total costs, we arrive at the entrepreneurial income remaining for these inputs.

In 2015, the entrepreneurial income totalled €447 million. In the early 2000s, the entrepreneurial income was more than €1 billion. If we account for inflation, the entrepreneurial income of today is only equal to a third of the income in the early 2000s.

Specification of returns

In the 2000s, the number of farms has fallen from 78,000 to 51,000 farms. Due to growing farm sizes, the returns of agricultural and horticultural enterprises have remained at €5-6 billion throughout this period.

Earlier, sales revenues from products fluctuated due to yield variation, but in the past decade fluctuation has been due to changes in prices.

The share of the return on crop production has remained constant at just under 20%, the return on livestock at around 33%, return on horticultural production at just over 10%, and the share of subsidies at around 33% of the total returns. The shares have remained fairly stable throughout the 2000s.

In addition to sales revenues, the returns include the prices of agricultural products delivered outside the agricultural sector or used by the entrepreneur. The returns also include the value (around €500 million) of products sold and intermediate products, e.g. feedstuffs, produced and used on farms.

Economic development of agriculture and horticulture (€ million) and profitability ratio as well as return on total assets from 2008 to 2015.

Year	Farms represented	Total return	Production cost	Entrepreneurial profit	Entrepreneurial income	Entrepreneurial income at 2014 prices	Profitability ratio	Return on total assets %
2015	50,883	5,714	6,999	-1,293	447	447	0.26	-3.5
2014	52,950	5,829	7,056	-1,233	558	557	0.31	-2.9
2013	54,369	6,148	7,382	-1,236	625	636	0.34	-2.9
2012	56,792	6,146	7,409	-1,266	767	805	0.38	-2.4
2011	58,001	5,863	7,004	-1,135	828	897	0.42	-2.1
2010	59,303	5,689	6,927	-1,234	892	1,006	0.42	-2.5
2009	61,018	5,405	6,859	-1,453	534	655	0.27	-4.5
2008	62,540	5,644	6,982	-1,333	645	806	0.33	-3.6

Source: Luke

Support payments also include the items of investment subsidies from earlier years that are allocated as returns alongside the corresponding asset item depreciations.

In calculating the results, individual revenue and expense items and support payments are allocated as returns and costs to the year of production, in accordance with the accrual principle. This means that annual variation in yields and returns and changes in prices and support payments are directly reflected in the results. The transfer of sales or support payments to the next accounting year has no impact on the results.

Specification of costs

The production costs of agriculture and horticulture totalled €7.0 billion in 2015. In the early 2000s, the level of production costs was almost €1 billion lower.

The wage claim cost due to the farming family's own work input has fallen €500 million in the 2000s, to around €1.2 billion. This is partly due to moving from livestock production to less labour-intensive plant production, and also due to technical developments in production.

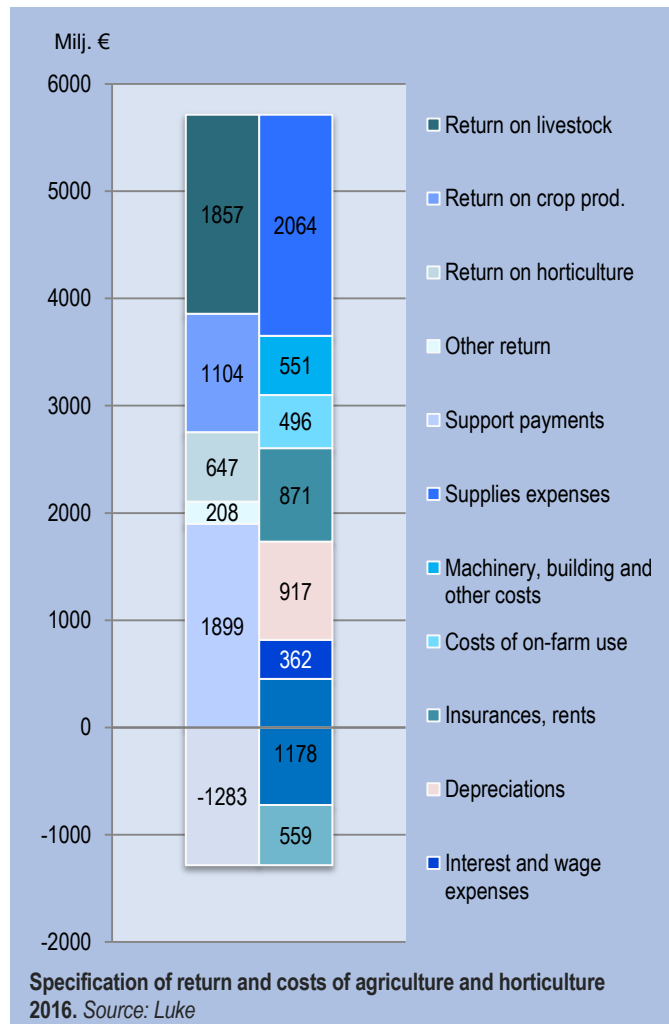
The total amount of equity invested in agriculture by the farming family has increased from under €9 billion to €13 billion. The amount of equity tied to production, calculated per farm, has doubled in the 2000s. On the whole, the interest cost has increased from €450 million in the early 2000s to around €600 million.

The share of these non-expense-generating wage and

interest claims of the production costs has fallen from 28% to 18%. As a rule, all other costs have increased, the cost of supplies in particular. Production costs also include the intermediate products listed above as returns. In this way, the use of intermediate products does not increase the entrepreneurial income.

Profitability

The entrepreneurial income of about €450 million in 2015 covers around 26% of the costs due to the farming families' own labour and capital (€1.7 billion), resulting in a profitability ratio of 0.26. In the early 2000s, the profitability ratio was around 0.5.



If the total wage claim of €1.2 billion is deducted from the entrepreneurial income of €450 million, the compensation for the farmers' own capital is negative, and the return on the farmers' own capital also turns negative, to the level of -5.5%. It has remained negative, meaning that in order to maintain the current level of production, entrepreneurs require constant external funding.

Solvency

At the end of accounting year 2015, the capital invested in agriculture and horticulture totalled €17.5 billion. Asset items have been measured at current value, and investment subsidies have not been deducted. The calculated depreciation cost of fixed assets purchased using investment subsidies and the subsidies are allocated as returns alongside the corresponding depreciation amounts.

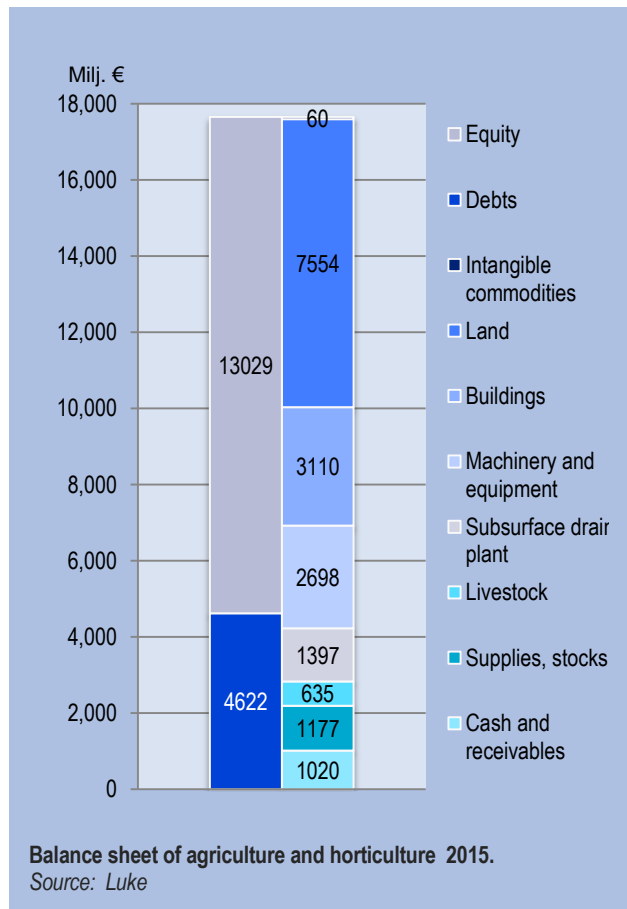
Around €13 billion of the total assets was the farmers' own capital, bringing the relative proportion of equity from total assets, i.e. the average equity ratio, to 74%. Total liabilities amounted to €4.6 billion at the end of 2015. The equity ratio has remained very high. In general, agriculture is a capital-intensive sector, and turning capital into income is slow in relation to the cost of interest and payments on external capital. International FADN results show that a successful agricultural enterprise requires a high equity ratio.

No debts of the farming families for forestry, other business activities and private household purposes are included in the debts of agriculture. The debt-to-turnover ratio, i.e. relative indebt-

edness, was 92%. The turnover includes subsidies as well as sales revenues.

Weighting system

In the total calculation, the results for the whole country are obtained by summing up the results of the bookkeeping farms. In 2015, the total number of farms in Finland was about 50,880, but the number of bookkeeping farms was only 840, which means that the figures for each bookkeeping farm are included in the calculation several times in accordance with the weighting coefficient determined for each farm. The weighting coefficients are determined by area, production type and economic size class.



Market margins and our American cousin

Sami Myyrä and Minna Väre

As of 2009, national aid for the pig and poultry sector was detached from production across the entire country. In the 2008-2013 period, particularly in the last two years, the total amount of national aid for southern Finland for the pig and poultry sector was reduced considerably. In 2014-2020, it continues as reduced decoupled aid based on the EU Regulation on the organisation of agricultural markets rather than on Finland's Act of Accession to the EU (Article 141).

Together with researchers, the Finnish agricultural administration has begun to search for opportunities to support the pig and poultry sector. One option under consideration is the implementation of policy measures related to risk management and income stabilisation in agriculture (the second pillar of CAP, the Rural Development Programme) in a sector susceptible to rapid changes in prices. Large and irreversible investments are also required in the pig and poultry sector. They come with the prerequisite of risk management related to both product and input prices.

In order to implement policy measures related to risk management, some indicators showing the risk realisations are needed. Such indicators are required to show both the long-term average level and the fast realisation of price risks. The indicators used in the implementation of the risk management policy measures must be free from moral hazard and adverse selection, which typically hamper farm level measurements of income changes.

The American cousin

Market margins were developed for the needs of agricultural policy, but they are also handy tools for farmers. The American cousin of market margins is the Crush margin. American pork producers see pork production as a simplified transaction that involves buying pigs, corn, and soy oil cake (a by-product of the soy oil crushing process), and selling pigs. All these markets have their own variables, but by studying prices, engaging in futures contracts, and selecting production times, a producer can have a significant impact on the gross margin in meat production and thus on profitability. From the point of view of the meat producer, the ratio of prices is vitally important, as it has a direct impact on the money they will make. The futures prices enable American pork producers to partially hedge the gross margin in pork production even before buying the pigs. In order to secure the realisation of margins, gross margin insurance markets were established in the US. Operators in these markets carry the price risks of an individual pork producer for a premium. Premium subsidies are a tool used by policymakers to support the pork sector.

There are no futures markets for pigs, corn, or soy oil cake in Finland. No natural markets for securing gross margins have been established, but the EU agricultural policy is trying to imitate such markets by helping farmers to create the markets for risks. On these markets, indicators similar to market margins may represent the impact of price change to the income received by a farmer, and enable the establishment of a market for risk management. The long-term goal of the policy is not to maintain an artificial market,

rather the goal is to give an initial surge to the market and then move on to support the purchasing of risk management products in the footsteps of the American cousin.

Market margins

Market margins describe changes in the economic results achieved by a farmer by looking at price risks as weighted clumps that represent the impact of simultaneous changes in prices. In order to ensure transparency, the aim is to maintain the structure of the weights as simple as possible, just like the American cousin does.

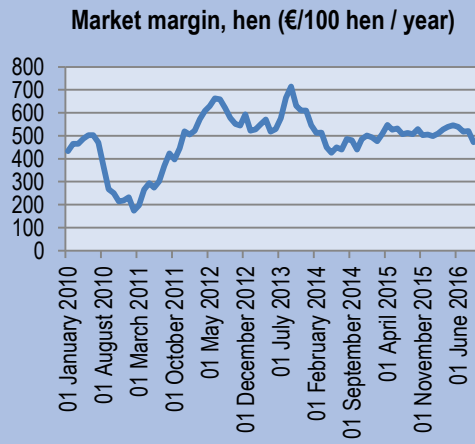
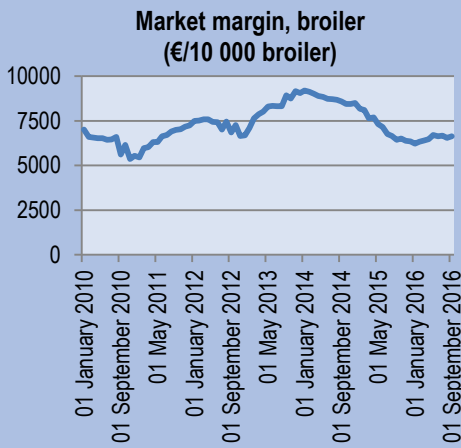
The market margin of pork production comprises three expense items and one revenue item. The market margin is calculated for one pig with a carcass weight of 83 kg. Pig feed consists of 38.3 kg of mixed feed and 213.6 kg of barley. To produce a pig, one piglet is also required. Changes in all prices have a simultaneous impact on the market margin of the pig.

The market margin of piglet production comprises two expense components (180 kg mixed feed and 740 kg barley) and one revenue component (9.5 piglets). The market margin is calculated per farrow.

The market margin of broiler production is calculated per a batch of 10,000 broilers. One batch will produce 17,400 kg broiler meat and will require 43,600 kg mixed feed and 10,000 broiler chicks. The components used in the market margin of broiler production cover all outputs and 78.6% of the variable costs. This makes it a good representation of the changes in the economic results caused by price changes.

The market margin of egg production is calculated per 100 egg-laying hens at an annual level. The market margin comprises four components: The producer price of eggs (1,680 kg), the price of feed barley (2,984 kg), the price of poultry feed mixes (726 kg), and breeding (86 breeding hens).

Market margins do not present the absolute level of profitability, rather they show the impact of changes in prices. The description of the production process is rough and it does not describe the production of any one farm in detail. The best way to use market margins is to multiply them with a farm-specific coefficient to make them correspond to the production of that particular farm. The essential element is that the market margin represents the change in the margin received by the producer. Market margins are calculated on a monthly level, but some of the components that they comprise are only published every three months. The publication days of the prices are 15 February, 15 May, 15 August, and 15 November. Market margins are updated at the same time as the price data. Market margins are maintained and published by Luke.



Market margins 1/2010–9/2016.

Publication: <http://jukuri.luke.fi/handle/10024/537484>

Market margins home page: <https://www.luke.fi/markkinamarginaalit/>

Chrus margin: <http://www2.econ.iastate.edu/margins/>

5. Agriculture and the environment

5.1. Environmental impacts of agriculture

Besides food production, agriculture has an important role in maintaining biodiversity and rural landscapes and providing recreational services. In addition to their positive effects, agricultural activities also have negative impacts on the environment, i.e. the soil, waters and air.

Soil

Environmental loading from arable land depends on the soil type, cultivation properties and crop rotations. Finnish soil contains no heavy metals, and its average phosphorus level is satisfactory, but acidity is increasing and the amount of organic matter is decreasing.

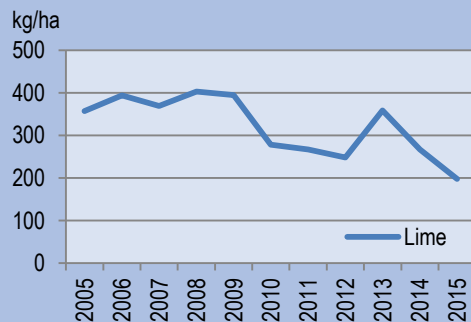
The phosphorus level in arable land is an indicator of both productive capacity and environmental loading. In Finland, the phosphorus levels have been rising until the present, even with considerable reductions in phosphorus fertilisation through, for example, the fertilisation restrictions under the agri-environment schemes. At present, the annual increase in phosphorus through purchased fertilisers is less than 6 kg/ha which is only a quarter of the 1995 level. The amount of phosphorus entering the land in animal manure (about 8 kg/ha) is higher than the amount of phosphorus contained in purchased fertiliser, and no significant reduction has taken place since Finland joined the EU in 1995.

Studies have shown that some further reduction in total phosphorus fertilisation (purchased fertiliser + manure) would be possible without a decrease in yields, except in

parcels where the phosphorus levels are particularly low. In the light of current knowledge, turning the phosphorus balance of arable lands into a negative one is the most efficient way to permanently reduce the phosphorus loading of waters.

The load on waters from arable farming is also influenced by the soil structure. Soil compaction reduces the permeability of the soil which increases the risk of nutrient surface runoff and erosion. It also weakens the nutrient intake of plants which lowers the nutrient utilisation rate. Poor permeability may also increase the release of greenhouse gases.

Only about 8% of the surface area of Finland is arable land. The ownership of arable land is decisive in terms of the long-term productivity of the land. Studies have shown that significantly less land improvement work is being carried out on leased areas than on lands owned by the farmer. The use of agricultural lime, for example, has halved from the levels before Finland joined the EU due to the increased share of leased land. The average application amount of lime for land improvement is now less than 200 kg/ha/year which is not enough to maintain the productive capacity of arable lands.



Quantities of land improvement lime used (kg/ha) in 2005-2015. Source: Evira.

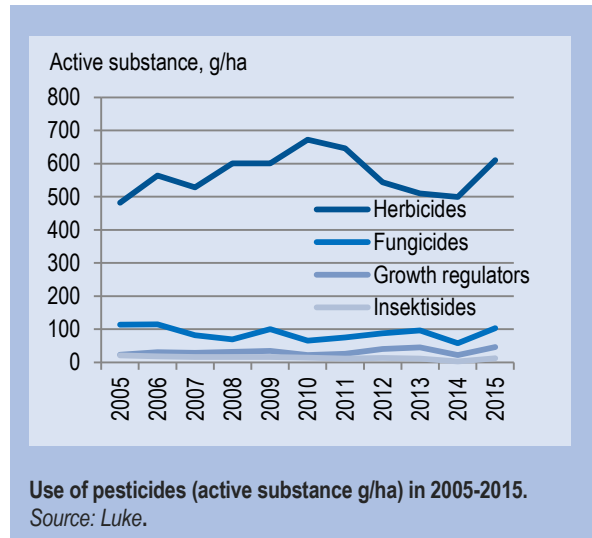
Loading of waters

Nutrients leach into ditches, rivers, lakes, and the sea from arable land, causing eutrophication of water bodies. This can be seen in the turbidity of the water, increased growth of algae, and mass blooming of toxic blue-green algae in the summer. Although the volumes of nutrients used per hectare have been significantly reduced, the eutrophication of waters continues, and measurements have shown no improvement in the state of water bodies.

The Finnish Environment Institute estimates that around 50% of the nitrogen loading and 60% of the phosphorus loading comes from agricultural sources. In the nutrient loading of the Baltic Sea, Finnish agriculture accounts for about 4% of the nitrogen loading and about 5% of the phosphorus loading. In the loading of the Archipelago Sea and coastal waters, the share of Finnish agriculture is much greater. The loading of water bodies is caused by both arable farming and livestock production. Because of the regional concentration of livestock production, the amount of manure produced is excessive in many places relative to the agricultural area utilised and the needs of the crops cultivated. The phosphorus contained in manure, in particular, has become a problem.

Use of pesticides

The use of pesticides in Finland increased until 2010, since then their use has declined slightly. Most of the pesticides used are products intended for preventing weeds (herbicides). The main reason for the previous growth in pesticide use was increased cereal monoculture and the wider use of non-tillage technology. Farmers also switched over to pesticides that need to be used in larger doses. How-



ever, on the European scale, the quantities of pesticides used in Finland are still fairly moderate.

Emissions to the air

Climate change poses new challenges to Finnish agriculture. Measures to adapt to climate change are changing the prioritisation of species and varieties and the relative profitability of different crops and production methods. Climate change is also influenced by agricultural activities, as agricultural production produces greenhouse gas emissions.

In 2013, greenhouse gas emissions from the agriculture sector represented about 10% of the total emissions in Finland. Most of them are due to the decomposition of organic matter in the soil (nitrous oxide emissions) and digestion of ruminant livestock (methane emissions), but manure processing and liming also cause emissions.

According to the United Nations Framework Convention on Climate Change (UNFCCC), carbon dioxide emissions from the soil and emissions from the energy consumption of farms are not calculated for the agriculture sector. Carbon dioxide emissions from the soil are report-

ed for the so-called LULUCF sector (Land Use, Land Use Change and Forestry). Emissions from the energy consumption of farm buildings, grain drying and agricultural machinery are reported for the energy sector.

Greenhouse gas emissions from the agriculture sector decreased by 15% during 1990–2013. The primary reason for the decrease is the decline in use of chemical fertilisers. The most significant decrease in greenhouse gas emissions from the agriculture sector occurred during the early 1990s. There were no significant changes in the 2000s.

The agriculture sector is excluded from emissions trading and the objective set for Finnish agriculture is that, by 2020, the greenhouse gas emissions will be reduced by 13% from the emission levels in 2005. This objective is difficult and expensive to achieve by reducing the use of fertilisers and by adapting the number of ruminants. If the consumption of dairy and meat products remains at the current level, the risk of production and thereby also emissions moving to other countries is high.

According to the 2014 report of the Finnish Climate Panel, the most cost-efficient measures to reduce agricultural greenhouse gas emissions include: diminishing the need to clear organic soil for cultivation, for example, by promoting the solid-liquid separation of manure; long-term fallowing or grass cultivation of organic soil; and reforesting arable lands that have become redundant in regard to production and food security.

In sectors excluded from emissions trading (traffic, agriculture, heating and waste management), obligations to reduce greenhouse gas emissions in the EU are allocated to the Member States using the Effort Sharing regulation. Throughout the EU, the collective target for these sectors for the second period (2021–2030) is set at

-30% on the 2005 emissions level by 2030. According to a decision published by the Commission in July 2016, Finland's target for the reduction of greenhouse gas emissions is 39% compared with the 2005 level. This target is very challenging to achieve as, for example, there is very limited potential for reducing emissions from the agriculture sector, and the measures of reduction are estimated to be expensive.

Biodiversity in farming environments

Biological diversity comprises the abundance of species, diversity of habitats, and intra-species genetic diversity. The decline in biodiversity is considered a serious environmental problem, as biological diversity is the foundation for functioning ecosystems. Without diversity, ecosystems are not capable of adapting to changes in the environment, such as climate change.

Besides biodiversity, it is also considered important to secure the functioning of ecosystems and the services produced by them. Ecosystem services refer to the tangible and intangible services derived by humans from nature. They are often studied in accordance with the CICES classification (Common International Classification of Ecosystem Services). In the CICES classification, they are divided into three main sections: provisioning, regulating and supporting, and cultural ecosystem services.

Agricultural production is based on the utilisation of biological diversity. Similarly, many wild plant and animal species have, over centuries, adapted to utilising agricultural environments created by man.

The positive impact of agriculture in enhancing biodiversity was at its greatest at the time when animal feed was produced on meadows and natural pastures. The growth of farm size since the 1950s, together with increased input intensity and farm-specific and regional specialisa-

tion, has led to a decline in the biodiversity of farming environments and increased the numbers of threatened species and habitats.

For some wild species growing in farming environments, changes in their habitats due to new and more efficient production methods have been too massive and rapid and they have not been able to adapt to the new conditions. In particular, organisms that depend on meadows and forest pastures have declined and become endangered due to the decrease in grazing and cattle husbandry. According to an assessment of threatened habitats, the highest share of these of the total number of habitats of a certain type is found in traditional biotopes, of which 93% are threatened.

However, in habitats maintained by agriculture, there are still numerous wild plant and animal species which benefit from farming activities, open arable areas and grazing livestock as well as from many measures related to the agri-environment scheme and non-productive investments.

Landscape and recreation value of arable environment

The countryside and rural margin areas around towns and cities with arable lands offer important recreation environments for Finnish citizens. Farming environments are important for outdoor recreation, especially in areas with a high proportion of agricultural land. Farming environments are commonly used for local recreation, especially in southern Finland.

On average, the Finns engage in outdoor activities close to their home 170 times per year, 35% of which take place in farming environments. This means a total of 230 million instances of outdoor recreation per year. Besides local outdoor activities, agricultural areas are also used for recreation involving overnight stays. The

average number of nature trips per year is 8, and the average total number of days spent on such trips is 25. Summer cottages and holiday homes are the most popular destinations. About a quarter of nature trips are made to areas of both agricultural and forest activities. Altogether, this means 10 million days a year spent on nature trips in farming environments.

As the aim is to make rural tourism a significant source of livelihood in the countryside, it is important to consider how to develop farming environments into a real attraction in rural tourism destinations. One way to promote landscape values and access to farming environments for outdoor recreation is through the agri-environment scheme. Studies have shown that the value of agricultural landscape is improved, in particular, by the presence of grazing animals in the landscape and the renovation of farm buildings located on open fields. Both of these landscape features are becoming less and less frequent because of the aim for higher efficiency in agriculture and regional differentiation of production sectors.

5.2. Agri-environmental regulation

In the new EU programming period 2014–2020, the baseline for environmental protection in agriculture continues to rest on the cross-compliance conditions, comprised of the requirements for good agricultural and environmental standards and the statutory management requirements. From the environmental perspective, the most significant element in the agricultural policy reform is the even stronger emphasis on, and recognition of, the linkage between agricultural support and the environment as an obligation, which is binding on all European farmers.

30% of direct payments by the EU are targeted at greening measures, including

conditions on ecological focus areas, crop diversification, and maintenance of permanent grasslands. As a concrete measure, farmers in Uusimaa and Varsinais-Suomi and on the Åland Islands must designate 5% of their agricultural area as an ecological focus area. Arable farming must be diversified to include two to three crops, depending on farm size. In addition, permanent grasslands must be maintained. Organic production is considered fulfilling the greening conditions, which means that it is entitled to the greening payment without the measures listed above.

Experiences of the new agri-environment climate scheme

The first new environmental commitments in line with the new programming period were made in spring 2015. In the new scheme, the former model, composed of basic, additional and special measures, was replaced by a parcel-specific system. In the new scheme, the farmer implements follow-up of soil fertility as a farm-specific measure and commits to complying with plant and soil fertility class values set for nitrogen and phosphorus fertilisation. Besides these farm-level measures, there are parcel-specific agri-environment measures concerning plant cover on arable land in winter, promoting biodiversity in arable environment, and the utilisation of manure and recycled nutrients.

Specific contracts are concluded, on more detailed and site-specific environmental measures, to reduce nutrient leaching, promote biodiversity, and reduce climate emissions. The measures concerning plant cover on arable land in winter and buffer zones as well as the measure concerning nature management fields are targeted on the grounds of water protection so that, in the catchment areas of rivers discharging into the sea, the measures are more demanding and the payment to farmers higher.

In 2015, a total of 45,624 farms applied for agri-environmental commitments. An agri-environmental commitment was made by around 86% of the active farmers who applied for the basic payment under direct payments. The commitment area was around 2.06 million hectares which is more than 90% of the agricultural land of the farmers who applied for the basic payment.

The funding of the Rural Development Programme for Mainland Finland 2014–2020 totals €8.3 billion. The share of the agri-environment-climate measure is €1,586 million. Around €225 million is planned to be used for the agri-environment climate scheme every year which is a little less than in the period 2007–2013. 42% of the scheme is funded by the EU.

In 2015, some of the parcel-specific measures in the agri-environment commitment considerably exceeded the target areas set for the 2014–2020 programming period. For example, twice as many buffer zones were established in 2015 compared with the requirements estimated in the water management plans.

In 2016, in order to secure adequate funding, restrictions were issued in a Government decree regarding certain parcel-specific measures eligible for environmental payments and the right to switch measures. The restrictions are based on the second amendment of the Rural Development Programme for Mainland Finland 2014–2020 approved by the Commission.

As of 2016, the compensation for measures concerning incorporation of slurry into the soil or the recycling of nutrients and organic matter is paid for no more than 60% of the farm's eligible arable land. For measures concerning catch crops or renovation plants, the restriction is 25%. It used to be possible to receive support for all arable land eligible for environment payments. As of 2016, farmers were also no longer able to register new buffer

zones. After the end of the 2016 application period for support, new zones concerning perennial environment grasslands and the management of runoff waters could no longer be registered.

Changes were made to the calculation of plant cover on arable land in winter. For example, calculations of the plant cover percentage will no longer include buffer zones, perennial environment grasslands and nature management field grasslands. At the same time, the new decree allows farmers to give up measures concerning plant cover, if their farm already has the maximum plant cover area in winter, and to switch measures. The decree gives more specific instructions regarding the selection of parcel-specific measures if the farm's special aid agreement has expired.

As of 2016, payments for the measure concerning renovation plants can only be made to farms that engage in crop rotation of potatoes, sugar beet, or outdoor horticultural plants on at least one hectare.

No changes were made to environmental contracts. This means that, in 2016, farmers and registered associations were entitled to apply for environmental contracts concerning the management of wetlands, maintenance of biodiversity of the agricultural environment and landscape, and husbandry of native breeds. Wetland management agreements were also open to corporations under water law.

5.3. Guidelines for water protection

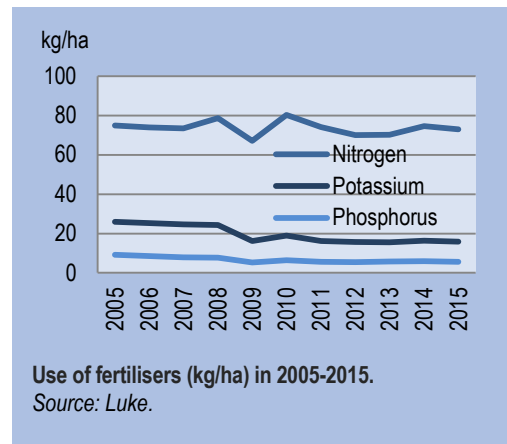
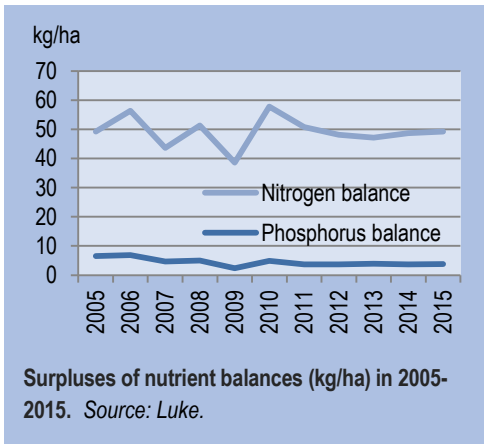
Nutrient loading from agriculture involves non-point source loading from over a million agricultural parcels with highly varied characteristics. Besides the physical characteristics, such as slope and soil type, water loading from a specific parcel depends on the weather conditions and cultivation and tillage practices.

The use of nitrogenous fertilisers is regulated by the revised Government Decree on Limiting Certain Emissions from Agriculture and Horticulture (1250/2014). The Decree implements the Nitrates Directive and applies to all farmers throughout Finland. The revised Decree aims to reduce the levels of nitrates from agriculture and horticulture leaching into waters, and the ammonia emissions into the air.

In 1995–2015, the fertiliser sales per hectare of cultivated land decreased from 92 kg to 75 kg for nitrogen and from 16 kg to 6 kg for phosphorus. During the same period, there was no decrease in the yields per hectare, which means that the nutrient balances have improved considerably. The trend is in the right direction considering both the efforts to reduce nutrient loading and the profitability of agriculture. We should bear in mind, however, that the average per hectare is composed of highly varied fertilisation volumes, which may have much higher loading potential in areas susceptible to erosion. Certain risk areas load the waters much more than the average.

In Finland, about 90% of the loading occurs outside the growing season. In this respect, too, the trend is the right one, as the voluntary agri-environment scheme and changes to legislation have increased plant cover in winter, which reduces erosion, and less manure is spread on the lands in the autumn.

Legislation regulating water and marine management in Finland comprises the Act on Water Resources Management (1299/2004), the Government Decree on Water Resources Management Regions (1303/2004), the Government Decree on Water Resources Management (1040/2006), and the Government Decree on the Organisation and the Development of the Marine Strategy (980/2011). This legislation is part of the national implementation of the Water Framework Directive.



The objective of the EU Water Framework Directive is to protect, improve and restore waters in order to prevent their status from declining and to secure a good status of the waters in the entire EU in 2015. According to the Water Framework Directive, the assessment of the status of waters is made by comparing the current status with an estimated natural state. The resolution also strives to prevent harmful substances from entering the waters, and to reduce damage caused by floods and drought.

In order to enhance water protection and achieve a good status of waters, a number of national and regional programmes and strategies have been launched in Finland. The Government Resolution on Water Protection Policy Outlines to 2015 was passed in 2006. It determined the national objectives for water protection and the measures for achieving a good status of rivers, lakes, coastal waters and ground water by 2015.

Reducing the nutrient loading that causes eutrophication was set as the key objective. According to the resolution, nutrient loading from agriculture was to be reduced by at least a third from the average in 2001–2005 by the year 2015. The objective was to reduce phosphorus loading by circa 3,000 t/year and nitrogen loading by circa 30,000 t/year.

Finland is divided into eight water management areas, each with a specific water management plan designed in 2009 for the area for 2010–2015. In December 2015, the Government approved new water management plans for 2016–2021 for the seven water management areas in Mainland Finland.

Objectives not achieved

The 2013 ecological assessment of surface waters accords a good or high status to 85% of the surface area of Finnish lakes and 65% of rivers. Only a quarter of coastal waters achieved the same status.

The objectives set in the first water management plans for the reduction in loading were not met either. In terms of agriculture, the positive news is that the nutrient balance of cropland has declined since the 1990s. Despite this, particularly as regards phosphorus, the soil reacts very slowly to changes in fertilisation. Therefore, even significant reductions in phosphorus fertilisation are not immediately reflected in the loading.

The concentration of livestock production and growing unit size are also a problem as regards meeting the objectives. Transporting manure is costly. Manure is still often spread through broadcast spreading instead of the more expensive method of incorporation of slurry into the soil.

In addition, manure is often spread based on the nitrogen need of the crop. This means that the phosphorus levels become too high for the needs of the plants and the loading potential increases. A new threat to water quality is climate change, which is expected to increase precipitation, especially outside the growing season.

5.4. Discussion topics and future perspectives

Developing organic production

Organic farming has already gained a strong foothold in Finland. In 2016, organic farming took place on around 241,000 hectares of fields. This is 10.5% of the total cultivation area. However, the market share of organic products is only about 2.5%, which means that the production chain is not working as it should be.

In 2010, the Country Brand Delegation set a target to increase the share of the organic cultivation area to 50% of the total cultivation area by 2030. Efficient organic production and nutrient economy would call for closer interaction between crop and livestock production and better organisation of nutrient cycling than we have at present.

In 2012, the Ministry of Agriculture and Forestry set their own, more realistic, target to increase the share of the organic area to 20% of the total cultivation area by 2020. In the Rural Development Programme for 2014–2020, a total of €326 million was allocated for supporting organic production and the support payments to organic farming were increased slightly from the previous programming period.

Greening

The new environmental requirements, which have been added to direct pay-

ments, the so-called greening measures, are sparking lively discussions. Greening measures refer to measures that go beyond the cross-compliance conditions but are more limited than the agri-environment measures. 30% of direct payments were targeted at greening measures. Farms engaged in organic farming or primarily grassland cultivation were granted full or partial exemption from greening measures. In order to avoid double funding, the coordination of greening measures and the new agri-environment climate scheme required clear distinctions in definitions.

In order to be eligible for support payments, farmers must comply with three greening measures:

1) Crop diversification: on farms of 10–30 hectares, farmers must cultivate at least two crops, and three crops on farms larger than 30 hectares. Farms north of the 62nd parallel and adjacent areas form an exception; they are required to produce only two crops on farms larger than 10 hectares. The diversification requirement does not apply to farms that cultivate more than 75% grassland if their remaining cultivation area is less than 30 ha.

2) Maintaining permanent grassland: monitored at a Member State or regional level.

3) At least 5% of the arable area of the farm must be a so-called ecological focus area. In Finland, fallow land, nitrogen-fixing plants, short rotation coppices, and so-called landscape features in accordance with cross-compliance conditions are accepted as ecological focus areas. The requirement for ecological focus areas may increase to 7% in 2018. Exceptions with regard to ecological focus areas have been provided for areas and farms that comply with certain requirements (e.g. predominantly forested areas and grassland-focused farms). In Finland, farms located

in Southwest Finland and Uusimaa or on the Åland Islands are required to have ecological focus areas. The ecological focus area requirement does not apply to farms in other regions, as they are exempted due to the area being predominantly forested.

The severity of the consequences for failure to comply with the greening measures increases gradually: after a two-year transition period, in addition to losing the greening aid, farmers may also lose a part of their basic payment. The Commission is conducting surveys on the experiences of the greening measures and will base decisions regarding the future of the greening measures on the results. Based on the preliminary results, the implementation of the greening measures is not considered a successful policy.

Permanent grassland

Maintaining permanent grassland is an objective across the entire EU area. The requirement to maintain permanent grassland as of 2015 applies to permanent grasslands according to the new definition. According to the Direct Payments Regulation (Regulation (EU) No 1307/2013 of the European Parliament and of the Council), permanent grasslands are agricultural lands that are used for cultivating grasses and other herbaceous forage and have not been included in the crop rotation of the farm in at least five years. A land parcel is classified as permanent grassland if it has been grassland continuously for the previous five years and it is also reported as grassland in 2016 (in accordance with the growth codes for permanent grassland of the Agency for Rural Affairs). In Finland, a large portion of the grasslands of dairy and livestock farms would be classified as permanent grassland if the parcel rotation only included grasslands.

The status of permanent grassland does not impose actual restrictions on use if

grass cultivation does not decrease throughout Finland. According to the interpretation of the regulation by the Commission, parcel-specific grassland measures such as riparian zones, grassland for green manure, nature management field grassland or perennial environment grasslands, do not imply a permanent grassland status for the land parcel. The status of permanent grasslands is monitored on a national level. If the area of permanent grassland decreases by 5% in the whole of Finland, farmers may be required to transform grassland parcels taken into another use back to grass cultivation.

Utilising agricultural nutrients

Around 33,000 tonnes of phosphorus fertilisers are used in Finland annually. A little over half of the phosphorus comes from manure and refinery sludge. About 230,000 tonnes of nitrogen fertilisers are used annually. Roughly a third comes from manure and refinery sludge. All in all, Finnish agriculture produces around 18 million tonnes of manure annually. The problem is, however, that concentrated livestock production often takes place in different areas from the arable farming that utilises manure. In order for transportation of manure to be profitable, the manure has to be processed.

In September 2014, a two-year project was launched to secure the efficient utilisation agricultural nutrients. The project also launched the section of nutrient recycling included in the national bioeconomy strategy. The aim of the project is to ensure the efficient utilisation of manure and other organic matter containing nutrients produced in Finnish agriculture by 2020. Central measures of the project include agri-environmental payments, training, guidance, investments, and support for enterprises and projects. The project is being carried out in close cooperation with farmers' organisations and other national,

regional and local actors. €6.5 million of the Rural Development Programme funds are allocated for supporting enterprises and projects that further nutrient recycling, particularly in the Archipelago Sea river catchment area.

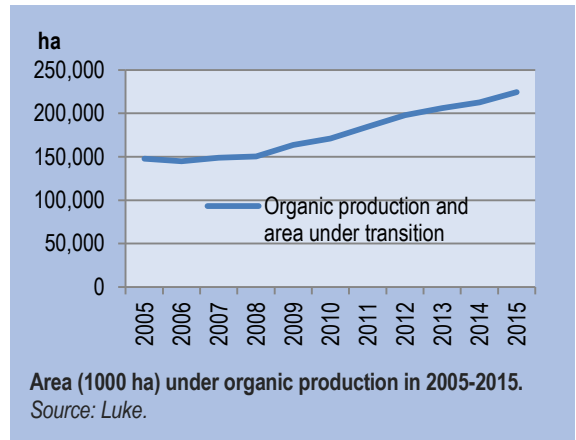
The nutrient recycling pilot programme, part of the spearhead project launched in 2016 by Juha Sipilä's government, brought more than €12 million to the development and testing of innovative technologies and logistics solutions. The pilot programme runs from 2016 to 2018.

Bioeconomy

Bioeconomy does not have one specific definition, and different actors highlight different aspects. For some, bioeconomy is about biotechnology, while others emphasise biofuels. Many perceive bioeconomy as the utilisation and processing of biomass, in which case bioeconomy refers to all production that produces, processes, and markets renewable resources as well to the consumption of products made from renewable resources. This includes the forest industry, the chemical industry, the fishing industry, the agriculture industry, forestry, the food industry, and the pharmaceutical industry. In addition, nature tourism can be classified as part of bioeconomy.

Bioeconomy strives to reduce dependence on fossil fuels and to maintain the diversity of ecosystems. Within the framework of green growth, it promotes economic growth and the creation of new jobs in accordance with the principles of sustainable development.

The Finnish Bioeconomy Strategy was published in 2014. The objective of the strategy is to generate economic growth and new jobs through the growing bioeconomy business and products and services of high added value while simultaneously maintaining the functionality of ecosystems in nature. Especially at the



initial stage, bioeconomy requires significant investments from society in research, education and the construction of the infrastructure.

Glyphosate discussion

The approval of products containing glyphosate in the EU was in force until the end of June 2016. Research institutions studying the negative effects of glyphosate have recommended that the product be classified as a probable human carcinogen. Glyphosate is the most widely used pesticide in the world and banning it would lead to extensive changes in conventional agricultural production.

The European Parliament supported extending the glyphosate approval as an agricultural pesticide for the next seven years. The European Commission proposed extending the approval for 15 years and the final decision on the matter lies with the Commission. The Parliament aims to restrict the pre-harvest use of glyphosate to enhance crop ripening, to commission more research on the product, and to train farmers on the safe use of the pesticide. The Commission extended the glyphosate approval until the end of 2017. The pre-harvest use of glyphosate to enhance crop ripening was not prohibited, but the use of the co-formulants (POE-Tallowamine) that enhance the activity of

glyphosate was banned. A decision regarding the future of the glyphosate approval will be made after the European Chemicals Agency (ECHA) concludes its classification review.

Invasive alien species

According to the EU Regulation (EU) No 1143/2014 on Invasive Alien Species, all Member States must apply effective management measures in order to eradicate or contain invasive alien species. The Act (1709/2015) and Decree (1725/2015) on Alien Species came into force at the beginning of 2016. The purpose of the act on managing the risk caused by alien species is to prevent and mitigate the adverse impacts of alien species on indigenous animal and plant species by, for example,

banning the importing or growing of the most invasive alien species and the releasing of them into the environment. Legislation stipulates the responsibilities of landowners and professional actors in preventing invasive alien species and alien species that may cause significant damage particularly in the Finnish conditions. The EU has prepared a list of invasive alien species of Union concern. There are established populations of four of the species (Sosnowsky's hogweed and Persian hogweed, American skunk cabbage and signal crayfish) in Finland. Additional invasive alien species of national concern that may cause damage particularly in the Finnish conditions are determined in the Government Decree.

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Appendix

Number of farms receiving agricultural support according to production line in 2000-2008.

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Crop farms	38,113	40,578	40,891	41,136	41,263	40,736	41,688	41,488	41,496
Dairy husbandry	22,564	21,026	19,839	18,561	17,427	16,399	15,002	13,732	12,635
Pig husbandry	4,303	3,979	3,807	3,646	3,385	3,149	2,959	2,722	2,477
Beef production	5,206	5,137	4,955	4,818	4,640	4,425	4,244	4,122	4,035
Poultry production	1,220	1,135	1,077	908	1,015	972	928	879	817
Other	6,490	3,510	3,380	3,450	3,355	3,396	3,927	3,878	3,773
Number of farms	77,896	75,365	73,949	72,519	71,085	69,077	68,748	66,821	65,233

Source: Finnish Agency for Rural Affairs

Number of farms receiving agricultural support according to production line in 2009-2016.

	2009	2010	2011	2012	2013	2014	2015	2016
Crop farms	41,195	41,114	40,730	39,609	39,717	38,693	36,607	35,987
Dairy husbandry	11,807	11,136	10,501	9,827	9,008	8,708	8,223	7,792
Pig husbandry	2,239	2,036	1,920	1,771	1,539	1,477	1,348	1,250
Beef production	3,932	3,789	3,745	3,633	3,490	3,469	3,403	3,385
Poultry production	769	724	696	589	568	563	551	546
Other	3,717	3,589	3,504	3,417	3,195	3,073	2,727	2,597
Number of farms	63,659	62,388	61,096	58,846	57,517	55,983	52,859	51,557

Source: Finnish Agency for Rural Affairs

Number of farms receiving agricultural support according to production line in 2016.

2016	Southern Finland		Eastern Finland		Middle Finland		Northern Finland	
	Number of farms	%	Number of farms	%	Number of farms	%	Number of farms	%
Crop farms	18,157	79,1	5,226	57,3	9,096	69,0	3,508	58,7
Dairy husbandry	1,861	8,1	2,266	24,8	2,104	16,0	1,561	26,1
Pig husbandry	635	2,8	69	0,8	352	2,7	52	0,9
Beef production	1,011	4,4	948	10,4	937	7,1	489	8,2
Poultry production	177	0,8	27	0,3	159	1,2	7	0,1
Other	1,124	4,9	585	6,4	527	4,0	361	6,0

Main regions of Uusimaa and Åland according to NUTS II have been included in Southern Finland.

Source: Finnish Agency for Rural Affairs.

Producer price index and index of purchase prices of means of agricultural production (2005=100)¹

	Producer price index of agriculture ²	The index of purchase prices of means agricultural production			
		Total index	Goods and services	Investment	Buildings
2014	131,8	138,4	142	126,1	128,5
2013	150,7	140,6	145,9	124,3	127,5
2012	140	137,5	142,5	122,9	127,1
2011	130,8	132,5	136,7	120,2	124
2010	115,2	118,1	119	115,7	118
2009	108,5	115,2	115,3	114,9	115,3
2008	120,9	125,4	129,5	113,2	119,9
2007	110,7	108,4	108,6	107,8	115,4
2006	105	103,6	103,7	103,5	105,8
2005	100	100	100	100	100
2004	102,4	97,3	98,2	95,8	96,2
2003	99,9	94,7	95,8	92,6	93,3
2002	104,6	93,3	94,8	90,4	91,8
2001	106,1	92,8	95,1	88,3	89,9
2000	100,9	90,8	93,4	85,6	87,8

¹ Indices are based on EU classifications.

² Incl. fur production.

Source: Statistics Finland.

Producer price index and index of purchase prices of means of agricultural production (2010=100)¹

	Producer price index of agriculture ²	The index of purchase prices of means agricultural production ³			
		Total index	Goods and services	Investment	Buildings
2016	106,7*	111,0	111,2	110,4	109,3
2015	109,4*	114,3	116,3	109,7	108,8
2014	113,6	116,2	119,2	109,2	109,1
2013	129,8	118,0	122,4	107,6	108,1

¹ Indices are based on EU classifications.

² Incl. fur production.

* preliminary information

³ The index of purchase prices - information included on this index was decreased in 2015.

From 2015 on the information is only published quarterly.

On the table the predicted index is presented.

Source: Statistics Finland.

Structural change in agriculture					
	Number of farms 1,000	Average ¹	Number of milk suppliers 1,000	Employed in agriculture ²	
		size of farms, hectares		1,000 persons	% of employed
2016	50	45	7	65	2,7
2015	51	44	8	70	2,9
2014	53	43	9	76	3,1
2013	54	41,5	9	76	3,1
2012	56	38,9	10	78	3,1
2011	62	37,4	10	80	3,2
2010	63	36,7	11	84	3,4
2009	64	35,9	11	88	3,6
2008	66	35	12	88	3,5
2007	67	34,4	13	87	3,5
2006	69	33,3	15	90	3,7
2005	70	33	16	91	3,8
2004	72	31,5	17	93	3,9
2003	74	30,6	18	99	4,2
2002	75	30	19	106	4,5
2001	77	29,1	21	112	4,7
2000	80	28	22	118	5,1
1999	..	..	24	121	5,3
1998	88	25	26	120	5,4
1997	90	24	28	130	6
1996	94	22,9	30	133	6,3
1995	100	21,7	32	141	6,7

¹ The compilation of farm statistics was renewed in 2010. According to the new Agricultural and Horticultural Enterprise Register, the economic output threshold for a farm enterprise is € 2 000. Approximately 4000 farms earlier included in the register now remain below the threshold.

² From 2005 based on new industrial classification TOL 2008.

Sources: Luke, Statistical services, Statistics Finland.

Number of animals in May and the average yield per cow.				
	Dairy cows	Yield per cow	Pigs	Hens
	1 000	litres	1000	1 000 pcs
2016	282	8400	1229	3561
2015	285	8323	1235	3521
2014	285	8201	1245	3645
2013	283	7977	1300	3432
2012	284	7876	1290	3172
2011	286	7859	1335	3304
2010	289	7896	1367	3394
2009	290	7850	1381	2926
2008	289	7767	1483	3190
2007	296	7796	1448	3134
2006	309	7646	1436	3103
2005	319	7505	1401	3128
2004	324	7404	1365	3069
2003	334	7251	1375	3016
2002	348	7117	1315	3212
2001	355	6932	1261	3202
2000	364	6786	1296	3110
1999	372	6443	1351	3361
1998	383	6225	1401	3802
1997	391	6183	1467	4152
1996	392	5993	1395	4184
1995	399	5982	1400	4179

Source: Luke.

	Unit	2013 €/unit	2014 €/unit	2015 €/unit	2016 €/unit
NATIONAL SUPPORT					
NATIONAL AID FOR SOUTHERN FINLAND, NORTHERN AID AND AID FOR CROP PRODUCTION					
AID PER LIVESTOCK UNIT					
Aid for suckler cow					
AB	€/LU	93	93		
C1	€/LU	300	300	300	300
C2	€/LU	300	300	300	300
C2 north. and archipelago	€/LU	376	376	376	376
C3	€/LU	451	451	451	451
C4	€/LU	636	636	636	636
Aid for male bovines > 6 months					
AB	€/LU	187	187		
C1	€/LU	422	422	422	520
C2	€/LU	430	430	430	520
C2 north. and archipelago	€/LU	506	506	506	620
C3	€/LU	582	582	582	700
C4	€/LU	767	767	767	1050
Aid for ewes and goats					
AB	€/LU	184	184		
C1	€/LU	390	390	363	363
C2	€/LU	398	398	369	369
C2 north. and archipelago	€/LU	474	474	426	426
C3P1–P2	€/LU	664	664	568	568
C3P3–P4	€/LU	745	745	629	629
C4P4	€/LU	956	956	787	787
C4P5	€/LU	956	956	787	787
Decoupled aid for pigs and poultry¹					
AB	€/LU	74	76	78	75
Farms below the farm specific limit²					
C1	€/LU	208	208	191	186
C2	€/LU	182	182	167	163
C2 north. and archipelago	€/LU	242	242	223	215
C3 and C4	€/LU	251	251	230	222
Farms above the farm specific limit²					
C1	€/LU	105	108	111	107
C2	€/LU	91	93	96	92
C2 north. and archipelago	€/LU	77	79	81	78
C3 and C4	€/LU	77	79	81	78

¹ As from 2009 support is paid as decoupled payment according to the farm specific reference quantity of 2007. Reference amounts in AB- and C-area are based on certain criterion.

² The farm specific differentiation of coupled support is applied in northern aid. The farm specific limit for small farms is 146 LU in area C1, 170 LU in area C2, 200 LU in area C2 north and in areas C3 and C4.

	Unit	2013 €/unit	2014 €/unit	2015 €/unit	2016 €/unit
Northern aid paid for slaughtered animals					
Male bovines C3–C4					
P1–P2	€/animal	131	131	131	131
P3–P4	€/animal	182	182	182	182
P5	€/animal	333	333	333	333
Heifers					
AB	€/LU	240	240		
C1	€/LU	498	498	498	473
C2	€/LU	498	498	498	473
C2 north. and archipelago	€/LU	580	580	580	555
C3	€/LU	650	650	650	625
C4	€/LU	793	793	793	768
Production aid for milk					
AB	cents/l	2,8	2,8		
C1	cents/l	7,7	7,7	7,7	7,9
C2	cents/l	8,4	8,4	8,4	8,7
C2 north.	cents/l	9,4	9,4	9,4	9,8
C3P1	cents/l	12,4	12,4	12,4	13,1
C3P2	cents/l	14,1	14,1	14,1	15,0
C3P3-P4	cents/l	16,7	16,7	16,7	17,9
C4P4	cents/l	21,4	21,4	21,4	23,1
C4P5	cents/l	30,6	30,6	30,6	33,4
AID FOR CROP PRODUCTION					
Northern hectare payment					
C1 area					
Wheat	€/ha	58	58	31	
Rye	€/ha	230	230	154	65
Starch potato	€/ha	204	204	154	100
Vegetables grown in the open	€/ha	535	535	535	325
Arable crops excl. cereals	€/ha	184	184	123	65
Protein crops	€/ha			69	39
Sugar beet	€/ha	154	154	154	100
C2 and C2P areas, archipelago					
Wheat	€/ha	58	58	31	
Rye	€/ha	230	230	154	65
Starch potato	€/ha	204	204	154	100
Vegetables grown in the open	€/ha	535	535	535	325
Arable crops excl. cereals (excl. C2 north)	€/ha	73	73	69	65
Protein crops (excl. C2 north)	€/ha			69	39
Sugar beet	€/ha	154	154	154	100
C3 and C4 areas					
Vegetables grown in the open	€/ha	535	535	535	325

	Unit	2013 €/unit	2014 €/unit	2015 €/unit	2016 €/unit
Aid for special crops in southern Finland					
AB area					
Starch potato	€/ha	100	100		
Vegetables grown in the open	€/ha	100	100		
Aid per hectare of livestock farms	€/ha	39	41		
General area payment C2–C4					
Cereals and other arable crops					
C2	€/ha	33	28	14	
C2 north and archipelago	€/ha	33	28	14	10
C3	€/ha	49	44	30	20
C4	€/ha	100	95	70	50
General area payment for young farmers C1–C4	€/ha	36	36	36	36
National aid for sugar beet, whole country	€/ha	350	350	350	350
Aid for greenhouse products, A and B areas					
over 7 months	€/m ²	10,3	10,5	9,7	9,6
2–7 months	€/m ²	3,8	4	3,7	3,6
Aid for greenhouse products, C1 –C4 areas					
over 7 months	€/m ²	10,6	10,6	10,0	9,7
2–7 months	€/m ²	4,1	4,1	4,0	3,7
Storage aid for horticultural products					
AB area					
Storages with thermo-control system	€/m ³	14,2	14,2	14,2	14,2
Other storage systems	€/m ³	8,8	8,8	8,8	8,8
C-areas					
Storages with thermo-control system	€/m ³	14,2	14,2	14,2	14,2
Other storage systems	€/m ³	8,8	8,8	8,8	8,8
Conversion coefficient of livestock units in national aid					
Livestock unit					
Suckler cows		1			
Suckler cow heifers, over 2 years		1			
Suckler cow heifers, 8 months–2 years		0,6			
Bulls and steers, over 2 years		1			
Bulls and steers, 6 months–2 years		0,6			
Ewes		0,15			
She-goats		0,48			
Horses					
- breeding males (horses ja ponies)		1			
- Finnhorses, at least 1 year		0,85			
- other horses 1–3 years		0,6			



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