E-yearbook of Food and Natural Resource Statistics for 2018

Statistical facts on agriculture, forestry, fisheries and hunting in Finland

https://stat.luke.fi/en/

Natural resources and bioeconomy studies 30/2019

Luke
NATURAL RESOURCES INSTITUTE FINLAND

Dear reader

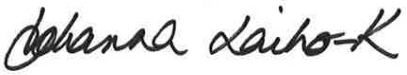
This is the fourth time the E-yearbook of Food and Natural Resource Statistics of the Natural Resources Institute Finland (Luke) has been published. The publication collates the key statistics for the Finnish food and natural resources economy and contains links to the up-to-date statistics database in our online service. The publication presents statistics for agriculture and the food processing industry, the forest sector, and the game and fisheries industry. The 'Bioeconomy in Finland' theme is covered for the first time in this year's publication.

Luke's statistical e-yearbook is available in the Natural Resources Institute Finland's statistics portal at stat.luke.fi/en/. Links to tables in the online service and in the statistics database provide access to up-to-date statistics. A printed version can be ordered via Luke's online shop.

The yearbook's editor-in-chief was Senior Statistician Tarja Kortesmaa, and the text was edited by Senior Communications Specialist Riitta Salo-Kauppinen. Several of Luke's statistical experts and researchers contributed to the contents and analyses presented in the publication. The layout was designed by Publication Specialist Irene Murtovaara and the infographics by Graphic Design Specialist Essi Puranen.

I would like to thank everyone who contributed to this publication and to Luke's statistics in general for their excellent work and know-how. Feedback and suggestions concerning the publication and our website can be sent by email to tietopalvelu@luke.fi.

Helsinki, December 2018



Johanna Laiho-Kauranne, Director of Statistics, Natural Resources Institute Finland

Twitter: @laihokauranne, @lukefinland

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Agricultural statistics for 2017

The number of agricultural and horticultural enterprises is decreasing steadily

There was a total of 48,562 agricultural and horticultural enterprises in Finland in 2017. The number of farms decreased by approximately 1,150 farms compared with the previous year. The average arable area on farms was 47 hectares. Farms located in the Uusimaa and Southwest Finland regions had the highest farm-specific arable area of 57 hectares. There was a total of just under 120,000 people working in agriculture and horticulture. Their workload equalled more than 60,000 person-years in total.

Milk production dipped slightly, but the production of organic milk increased

In 2017, milk production amounted to just under 2,336 million litres - one per cent less than the previous year. Organic milk production amounted to 62 million litres, an increase of 14% from the previous year. Egg production totalled just under 74 million kilograms. Egg production in enriched cages decreased by 3%, but production in barn and free-range hen houses increased by 8% and production on organic poultry farms by 16%.

Meat production lower than the previous year

Total meat production amounted to 398 million kilograms, which was just over one per cent less than in 2016. Poultry meat production increased by three per cent from the previous year to 129 million kilograms. However, beef production decreased by approximately one per cent and pork production by four percent. Organic meat production amounted to just under four million kilograms in 2017. Organic meat accounted for around one per cent of total meat production.

Cereals accounted for just under half the total utilised agricultural area

In 2017, the total utilised agricultural area in Finland amounted to 2,272,200 hectares. Of this, cereals accounted for nearly half, and feed grass almost a third. Of special crops, the cultivated area for broad beans equalled that for potatoes - 22,100 hectares. The cultivated area for rape, which amounted to 36,700 hectares, was much higher than for turnip rape, which amounted to 28,500 hectares.

Heavy rainfall weakened cereal quality

The total cereal harvest, 3.4 billion kilograms, was the second smallest in the 2000s. Part of the cereal crop remained unharvested due to the rainy autumn. The rye crop amounted to 113 million kilograms and was the highest since 1990. Rainy weather weakened the quality of wheat and rye in particular. The quality of malting barley and oats was good. The organic cereal harvest amounted to 95 million kilograms, of which roughly two-thirds was oats.

Large strawberry and apple crops

Outdoor vegetable production was lower than in the previous year and remained at 167 million kilograms. Carrots were the biggest crop, totalling 62 million kilograms. Greenhouse vegetable production totalled 87 million kilograms, of which cucumbers accounted for 43 million kilograms and tomatoes 39 million kilograms. The outdoor berry harvest increased to 17 million kilograms. Of this, strawberries accounted for just under 14 million kilograms, which was two million kilograms more than in 2016. The apple harvest was an all-time high, at 6.8 million kilograms.

Roughly half the cereals consumed by the industrial sector were used as feed

Finnish industry consumed a total of 1.4 billion kilograms of domestic and imported cereals in 2017. The feed industry consumed just under half of all cereals, and the food industry nearly one-third. The rest was consumed by other industrial sectors (e.g. for malting and the production of ethanol and starch). Barley consumption was the highest, at 550 million kilograms.

Average producer prices increased in 2017

The average producer prices for meat increased from the previous year with the exception of broiler meat, the price of which fell slightly. The producer price for milk increased slightly from the previous year. The producer price for eggs varied, based on the production method: the producer price for organic eggs increased from the previous year, but the price for cage eggs continued to fall. The producer prices for cereals increased from the previous year with the exception of rye, the price of which has been declining in recent years. In 2017, the producer price for food potatoes decreased to its level of a couple of years ago.

Agricultural land rents

The first survey of agricultural land rents was conducted in 2016. The average annual price paid by agricultural and horticultural enterprises for rented agricultural land was EUR 223 per hectare. Rates were highest in Southwest Finland at EUR 350, in Satakunta at EUR 297 and Åland at EUR 272 per hectare, and lowest in Lapland and Kainuu (EUR 100 and EUR 98 per hectare respectively).

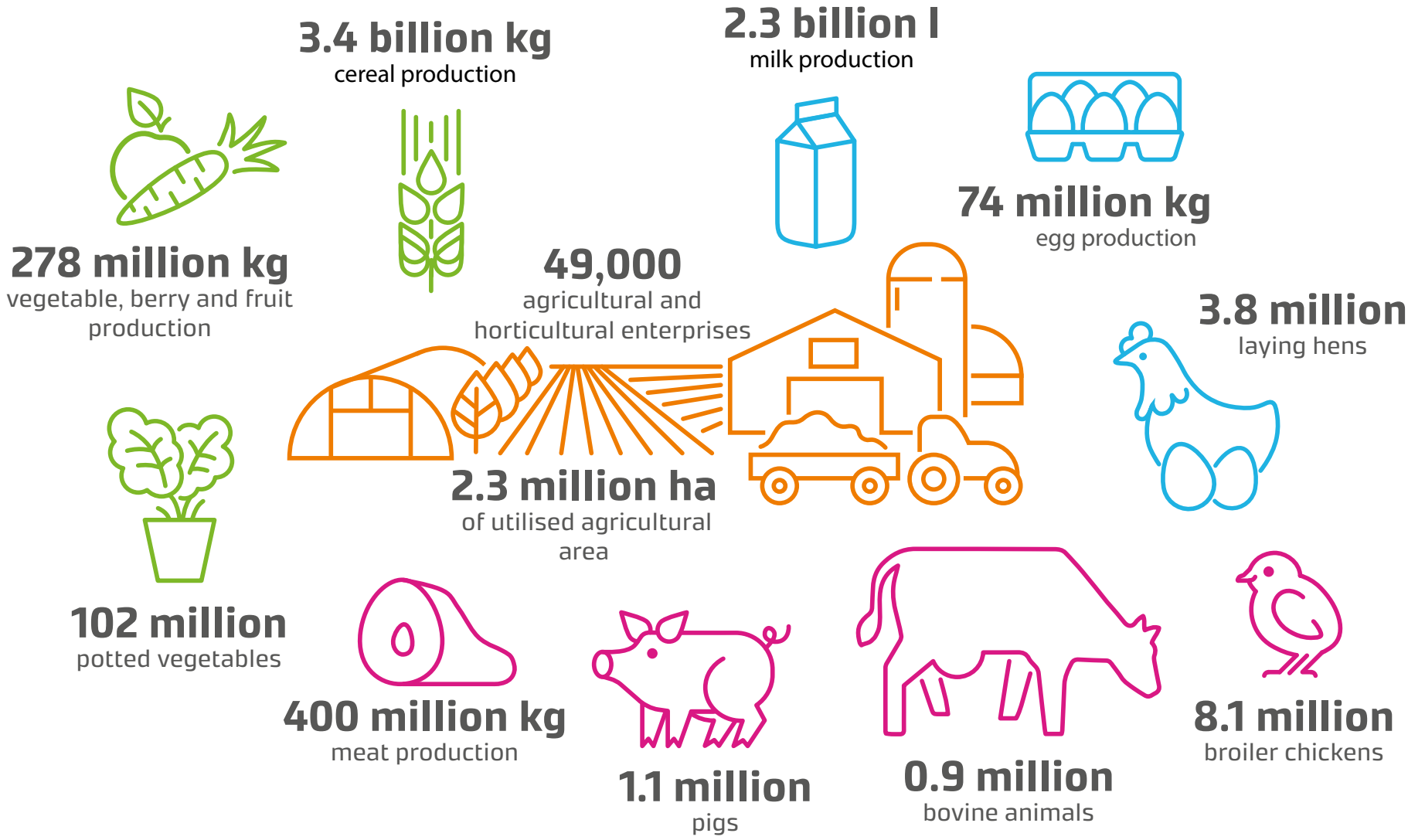
Profitability of agriculture continued to decrease

The profitability of agriculture continued to decrease in 2016. The result was the weakest in the 2000s. The profitability ratio of agriculture and horticulture decreased from 0.34 to 0.26. The return on assets was negative by over three per cent. In recent years, profitability has been the lowest on cereal farms and other crop production farms.

The consumption of milk kept decreasing

The consumption of milk decreased by an average of five per cent from 2016. The consumption of skimmed milk decreased the most, by over 14%. The consumption of poultry meat grew by six per cent compared with the previous year, and the consumption of beef by roughly one percent. In contrast, the consumption of pork decreased by almost four percent. The consumption of eggs remained the same.

Key figures of Finnish agricultural production in 2017



Structure of agriculture

The number of farms continued to decrease in 2017. At the same time, the average size of farms is growing, and the average age of farmers is increasing. The number of people working in agriculture and horticulture is also decreasing. Cereal production remained the most common primary production sector, although other plant production as the primary production line has clearly increased in recent years as farmers have moved from cereal cultivation to other crop plants.

The number of farms decreasing steadily

In 2017, there was a total of 48,562 agricultural and horticultural enterprises. The number of farms decreased by approximately 1,150. The average size of farms grew to 47 hectares. About 86% of farms were family-run, and just under 9% were farming syndicates. In addition, less than 3% of farms were run by heirs of the estate and less than 2% by limited companies.

Two-thirds of farms have crop production as their primary production line, and less than 30% of farms are classified as livestock farms. The rest of Finnish farms are mixed farms with no clear primary production line. Cereal production remained the most common primary production sector, and approximately 16,200 farms focused primarily on cereals. Other plant production as the primary production line has clearly increased in recent years. If this trend continues, other plant production will become the most common primary production line in the near future. Most livestock farms continue to focus on dairy cattle, which was the primary production line on approximately 6,700 farms. However, the number of dairy farms decreased by almost 600 compared with the previous year.

Average age of farmers was 52

The average age of farmers was 52 years in 2017. Farmers responsible for the management of farms owned by limited companies were the youngest; farmers responsible for farms owned by heirs were the oldest. Roughly 9% of farmers on family-run farms were under 35 years old, and around 27% of these farmers were over 60 years old.

▶ Structure of agricultural and horticultural enterprises

Agricultural and horticultural labour force

In 2016, just under 120,000 people worked in agriculture and horticulture. Their workload equalled more than

Number of agricultural and horticultural enterprises by production sector in 2010–2017

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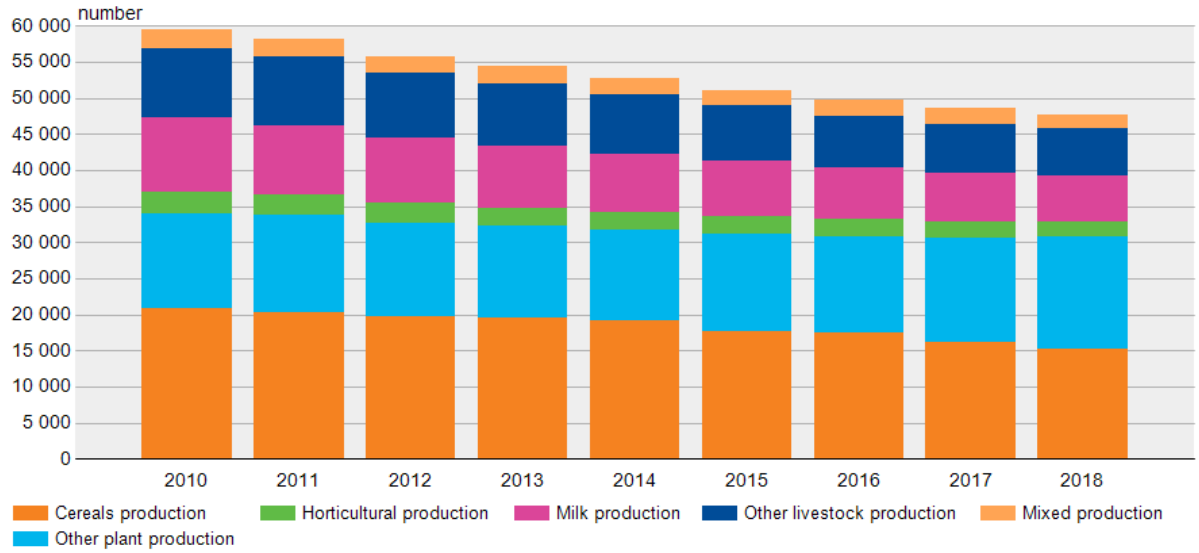
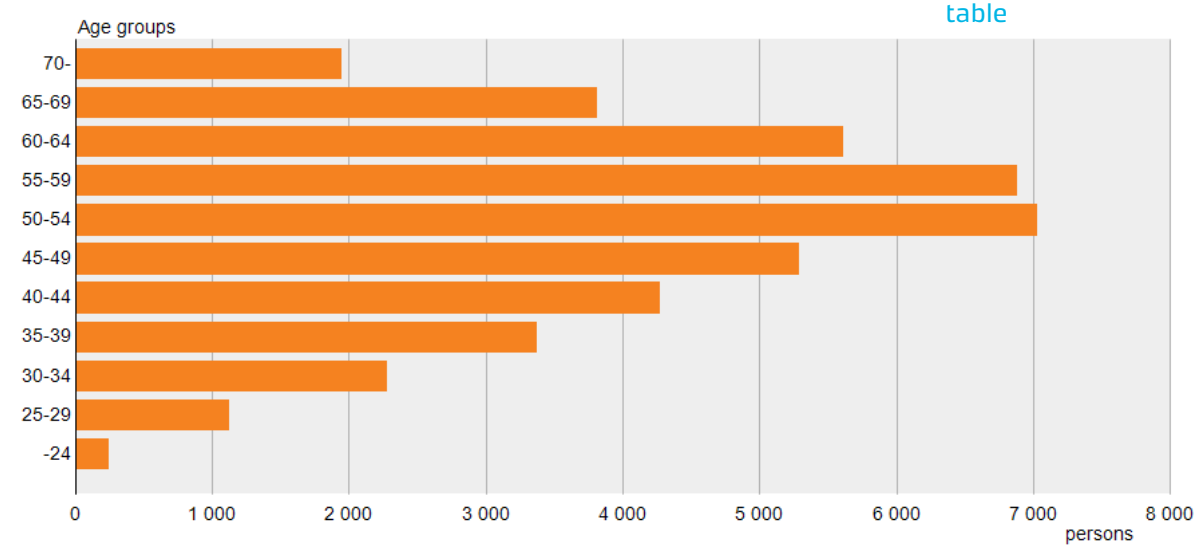
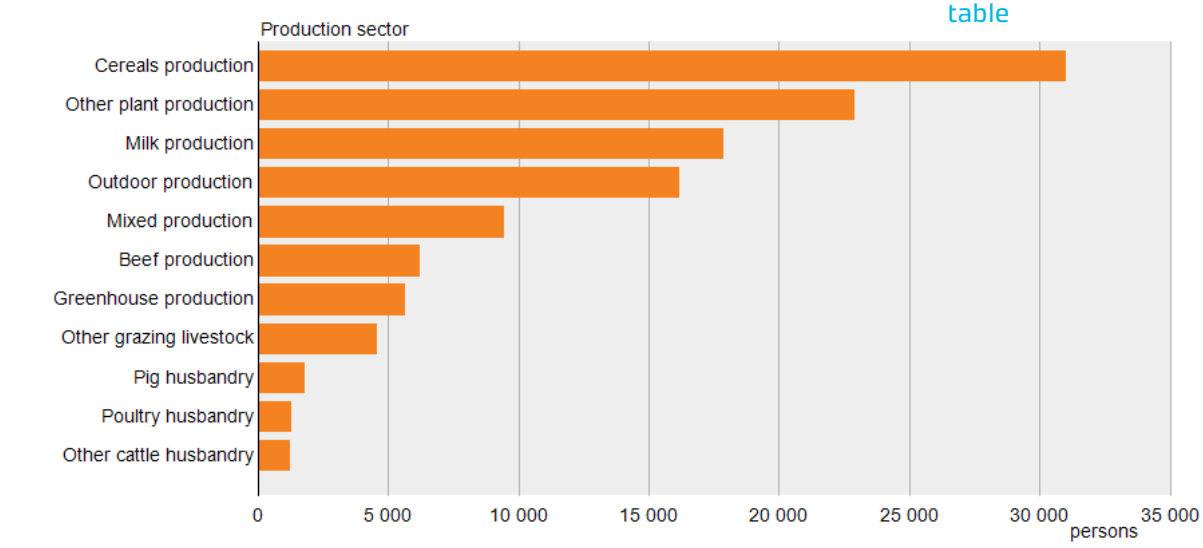


Number of farmers on privately owned farms by age groups in 2017 ▶ Background data as a table



Number of persons who worked in agricultural and horticultural enterprises ▶ Background data as a table



60,000 person-years in total. The number of people working in agriculture and horticulture, as well as their workload, has decreased since 2013, when the previous statistics for the agricultural and horticultural labour force were compiled.

More than 80% of farmers have a vocational degree, and 45% have a degree in agriculture. Roughly 30% of farmers completed vocational training related to farm operations during 2016.

Most work was carried out by farmers

Around 60,000 person-years were recorded in agriculture and horticulture in 2016. More than half of this work was carried out by family farmers and shareholders of group holdings, who recorded a total of 34,000 person-years. Family members comprised the second-largest group in the entire agriculture and horticulture labour force. They worked for roughly 14,000 person-years. Hired labour accounted for approximately 8,500 person-years. The workload of the short-term temporary labour force amounted to 5,000 person-years – higher than that of permanent employees. Horticultural farms in particular employ a lot of short-term seasonal labour. The annual workload in agriculture and horticulture has decreased by 16% since 2013.

In 2016, just under 16,000 foreign nationals worked in agriculture and horticulture, undertaking nearly six per cent of the work in this sector.

▶ Agricultural and horticultural labour force

Agriculture and horticulture work carried out on farms

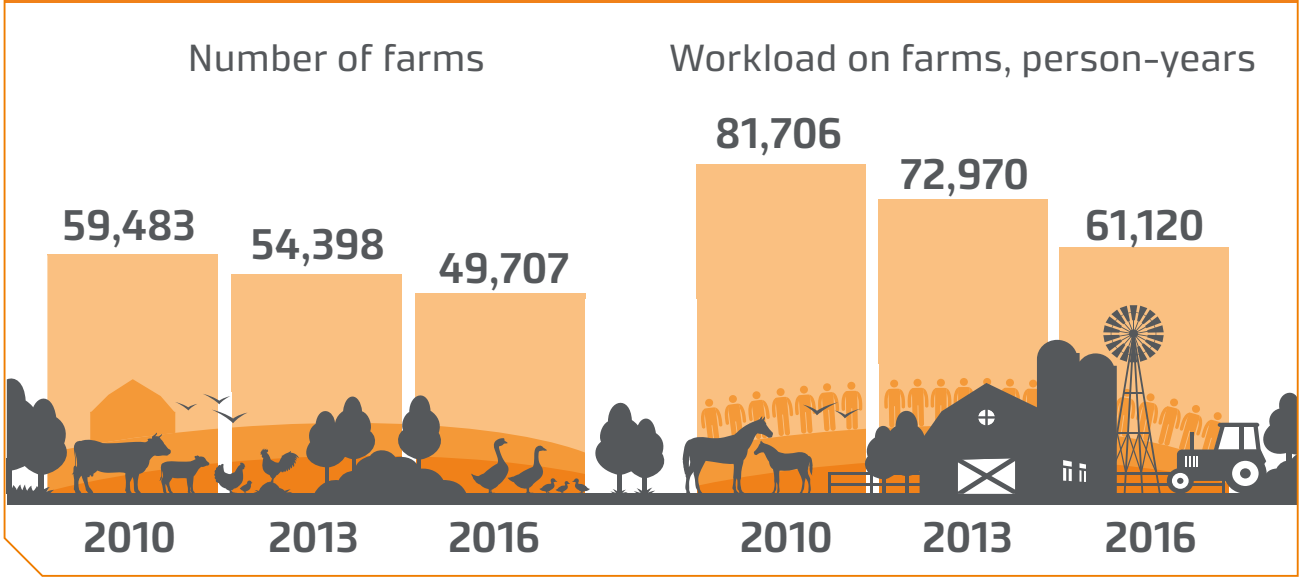


Photo: Janne Lehtinen / Luke

Use of advisory services and digital technologies

Advisory and producer organisations were the most important information source for agricultural and horticultural enterprises in 2016. These organisations are deemed the most important source by dairy farms. Trade journals and websites were the second most important information source. The latter were particularly important for cereal cultivation farms. The third most important information source was other farmers and other entrepreneurs in the industry. Farms most required new information about production methods and technology.

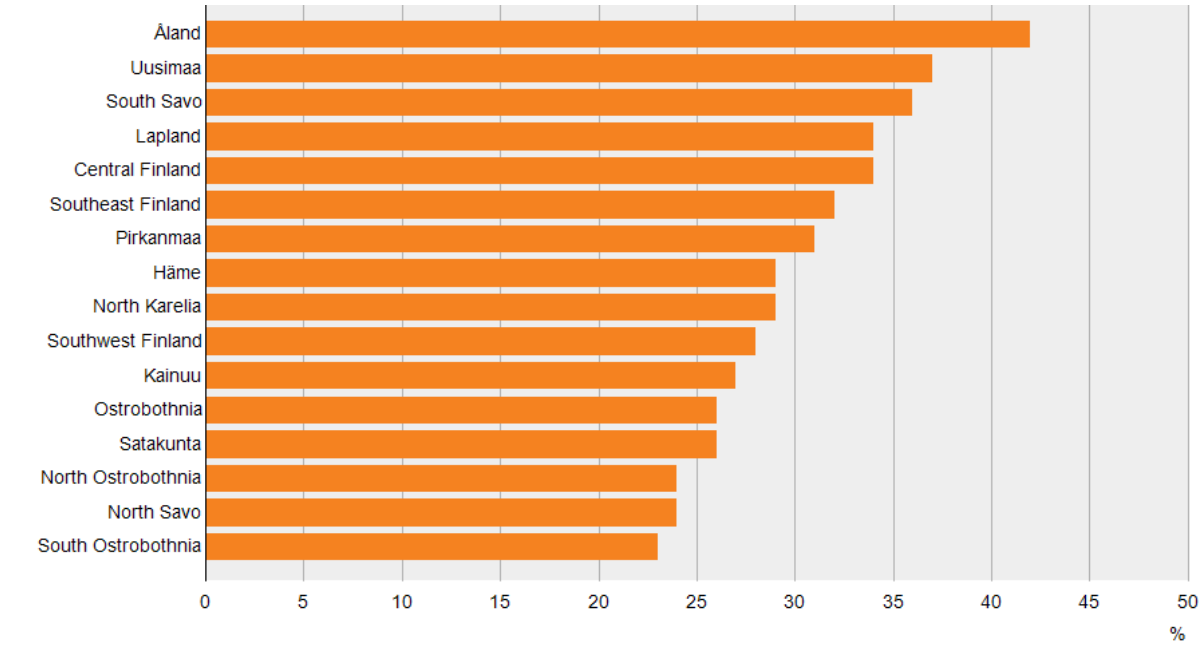
More than half of all agricultural and horticultural enterprises used a landline internet connection at their farm. Around three-quarters of farms used a mobile connection. Almost 80% of all farms had access to a sufficiently fast and reliable internet connection. Farmers in South Savonia and Central Finland were the most dissatisfied with their internet connection. Under ten per cent of all farms did not use the internet at all in managing their farm.

▶ Internet connections and access to information for agricultural and horticultural enterprises

Other entrepreneurship

Approximately 14,300 farms (30% of all farms) were engaged in other business activities in addition to agriculture and horticulture in 2016. The number of farms engaged in other business activities has decreased by

Diversified farms as percentage of all farms by ELY Centre in 2016



Background data as a table

around 2,500 since 2013, when the previous statistics for other business activities were compiled. The proportion of diversified farms has also decreased by two percentage points since 2013. Contracting was the most common form of other business activities, with roughly 7,100 farms engaged in contracting.

Other business activities employed approximately 23,000 people

In 2016, other business activities in addition to agriculture and horticulture employed approximately 23,000 people. The number of farms engaged in other business activities has decreased by roughly 6,500 since 2013. The proportion of diversified farms was the lowest among farms specialising in dairy cattle and pig production.

Almost half of all people working on farms in other business activities were family farmers or shareholders of group holdings. Other business activities employed 7,600 hired employees and more than 4,100 family members. Agricultural and horticultural enterprises spent roughly 9,000 person-years on other business. Family farmers and shareholders of group holdings spent nearly 4,000 person-years on other business activities, closely followed by hired labour. Compared to farmers and hired labour, family members spent considerably less time on other business activities (around 1,200 person-years).

Other entrepreneurship in agriculture and horticulture

Energy consumption of agriculture and horticulture totalled roughly 11,000 GWh

In 2010–2016, the energy consumption of agriculture and horticulture ranged between 10,000 and 11,000 GWh. Based on the consumption figures, the most significant energy source was wood chips (3,017 GWh), which are used in heating, closely followed by motor fuel oil (2,451 GWh), which is used in tractors and other machinery. In 2016, Finland's total energy consumption amounted to 379.5 TWh, of which agriculture and horticulture accounted for around three percent.

Heat production relies strongly on domestic energy

More than half of all energy consumed was wood- or peat-based. It is often possible to use a variety of fuels and fuel mixtures such as sorted waste cereal in solid fuel boilers.

According to a survey carried out in 2016, bought thermal energy amounted to 549 GWh, around five per cent of total energy consumption. Bought thermal energy is

typically wood- or peat-based, but energy production is outsourced to another company. This means that the agricultural or horticultural enterprise pays the energy supplier for the energy but not for the raw material utilised in energy production. The energy supplier may be an external company or a heat production company owned by the farm or horticultural enterprise.

Electricity is indispensable in agriculture

The significance of electricity for agricultural and horticultural enterprises is great. Farm technology mostly relies on electricity, as computers are increasingly responsible for controlling elements of production such as circulators, air conditioning, feeding and monitoring. One of the main consumers of electricity is greenhouse enterprises, which need electricity for grow lights during winters. Total electricity consumption in 2016 was approximately 1,727 GWh, i.e. 16% of total energy consumption in agriculture and horticulture.

Agricultural and horticultural enterprises also produced their own electricity, and are particularly interested in the use of solar panels. The energy sources included, for example, solar panels, biogas plants, wind power, heat pumps, and hydropower. In 2016, energy production on farms amounted to around 14 GWh, which accounts for roughly one per cent of total consumption.

Statistics on agricultural and horticultural energy consumption are compiled every three to four years in connection with the survey investigating the structure of agriculture. The latest survey was carried out in 2016, and the next one will be performed in connection with the 2020 agricultural survey.

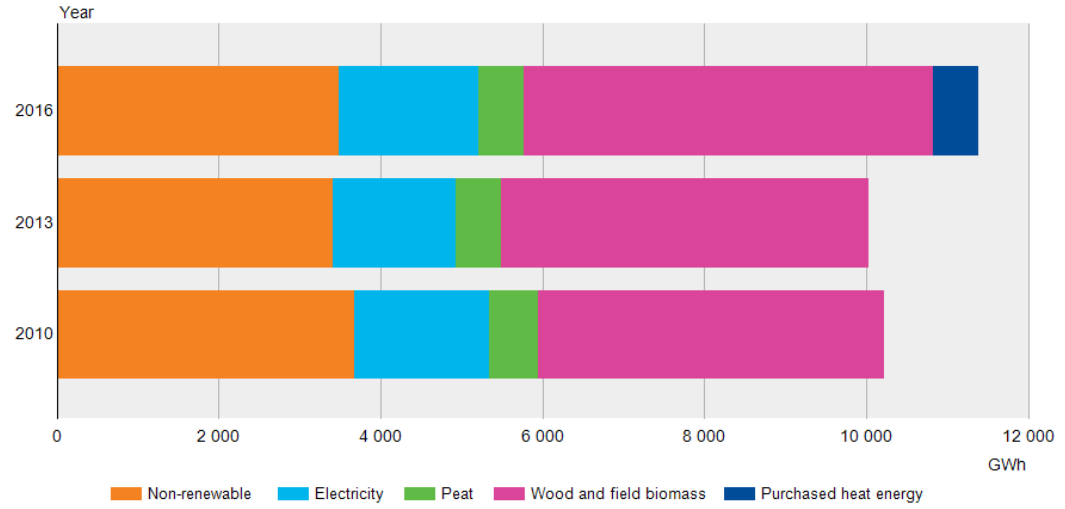
▶ Energy consumption of agriculture and horticulture

▶ Energy

Photo: Erkki Oksanen / Luke

Energy consumption of agriculture and horticulture 2016, 2013 and 2010

▶ Background data as a table



Livestock production

In 2017, the production of poultry meat and eggs continued to grow, while the production of milk, beef and pork decreased. Meat production decreased by around one per cent from the previous year. Overall milk production continued to fall, but organic milk production continued to grow. Egg production increased in 2017 to the highest level since 1995.

Organic milk production continued to grow

Milk production amounted to just under 2,336 million litres in 2017, one per cent less than in the previous year. Milk production decreased by three per cent during the first half of the year and increased by one per cent during the second half. Milk production adjustment aid that was paid for farms that cut down production had a partial influence on the decrease in milk production.

Organic milk production continued to grow. Organic milk production amounted to slightly over 62 million litres, which is 14 per cent more than in the previous year. Organic milk amounted to slightly less than three per cent of total milk production.

The number of dairy farms decreased by seven per cent during the year, meaning that approximately 500 farms ceased milk production. At the end of the year, there were 6,810 dairy farms in Finland. The number of dairy cows decreased: by the end of the year, the total number of dairy cows was slightly less than in the previous year. Average yields have increased each year, and in 2017, the average cow produced over 8,500 litres of milk. The volume of milk supplied to dairies was over 326,000 litres per farm.

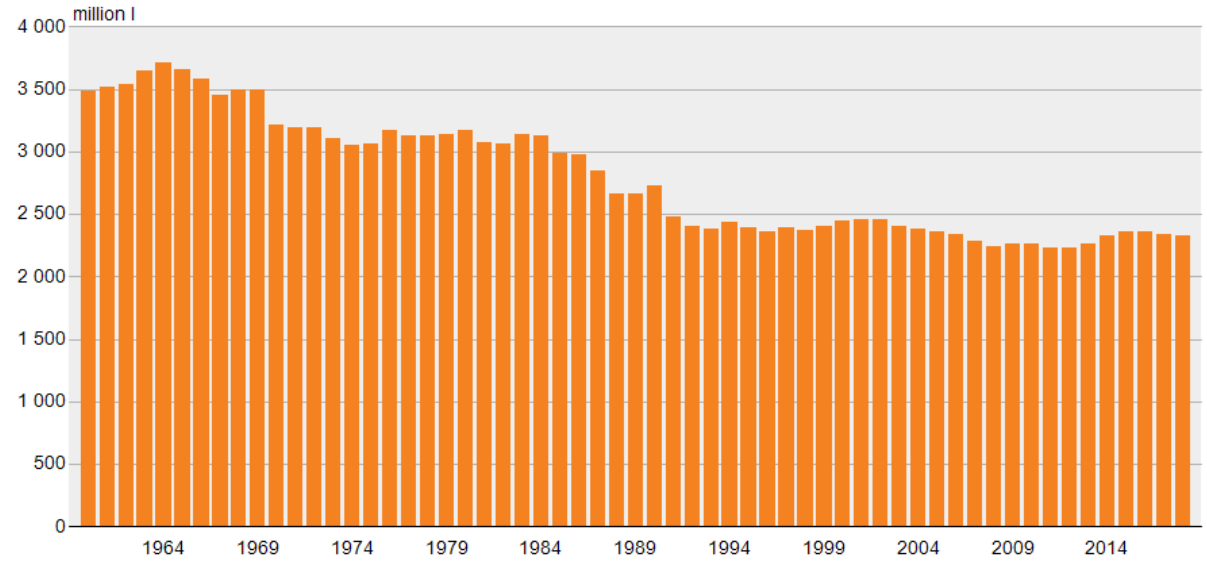
The largest milk producing municipality was Kuopio

Due to the municipal merger between Kuopio and Juankoski at the start of 2017, Kuopio became the biggest milk producing municipality in the country. Kuopio produced a total of 72 million litres of milk. The next biggest milk producers were Kiuruvesi, Kurikka and Kokkola.

There are milk producers all over Finland; the northernmost dairy farms are located in Utsjoki. Milk production is primarily concentrated in Northern Savonia and Ostrobothnia, which produce around 54% of all milk in Finland.

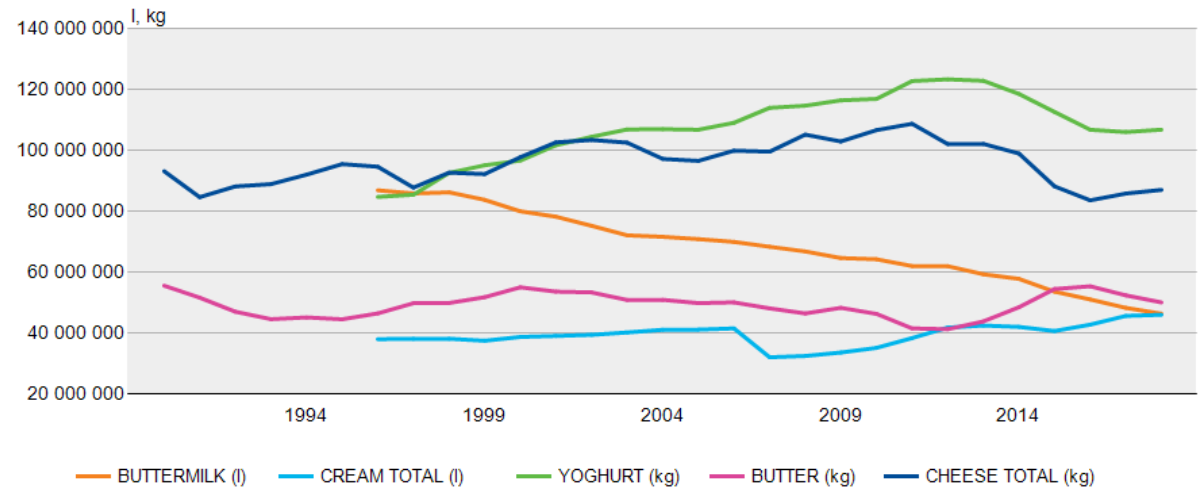
Total milk production 1960–2017

Background data as a table



Production of milk products 1990–2017

Background data as a table



Production of fresh dairy products and butter fell, while cheese production increased

The total volume of milk supplied to dairies in 2017 amounted to 2,297 million litres. Milk was used to make fresh dairy products, cheeses, butter and powders, for example. Some of the milk produced is consumed by manufacturers outside the dairy industry, such as ice cream and chocolate manufacturers.

The production of fresh dairy products amounted to approximately 870 million kilograms in 2017. The production of fresh dairy products has decreased in recent years, and last year it fell by around three per cent compared with the previous year. The production of milk, sour milk, yoghurt and viili (a type of curd milk) decreased, while the production volumes of cream grew. Of all fresh dairy products, milk accounted for 72%, yoghurt for 12%, sour milk for 6%, cream for 5% and other fresh dairy products for 5%.

Cheese production increased by three per cent compared with the previous year, and was around 86 million kilograms. Butter production fell by five per cent, amounting to just over 52 million kilograms.

Milk and milk product statistics

Milk production by area

Meat production decreased from the previous year

In 2017, meat production amounted to 398 million kilograms, which was just over one per cent less than in 2016. The production of poultry meat continued to grow, while the production of beef and pork decreased.

Another record in poultry meat production

Another record was broken in poultry meat production due to the growth in broiler meat production. Turkey meat production also grew slightly from the previous year. Slightly less than 129 million kilograms of poultry meat was produced, showing an increase of three per cent from the previous year. Last year the growth rate of production slowed down slightly from the previous years. Broiler meat accounts for just over 90% of total poultry meat production.

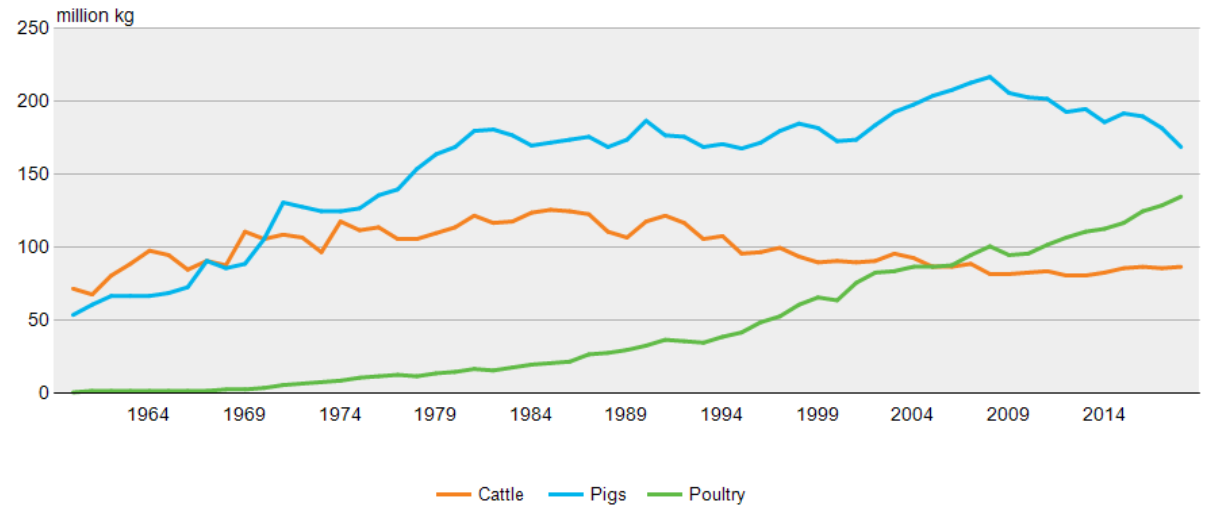
Beef production decreased

Beef production decreased by one per cent to 86 million kilograms. The slaughter volume of cows and bulls decreased while the slaughter volumes of heifers rose. The average carcass weight increased from the previous year The average carcass weight was 351 kilograms for bulls, 247 for heifers, and 288 for cows.

In recent years, domestic beef production has decreased with the decline in the number of dairy cows. An increase in the number of suckler cows and higher carcass weights have slowed the decline in beef production volumes. Since

Total beef, pork and poultry meat production 1960–2017

▶ Background data as a table



the compiling of statistics began in the 1950s, beef production volumes were at their highest in the mid-1980s, when 125 million kilograms of beef were produced.

As in the previous year, the biggest beef producer was Kiuruvesi, with 3.2 million kilograms, although Kuopio reached approximately the same figure. The third biggest producer was Kurikka.

Pork production continued to decline

Last year, just over 181 million kilograms of pork were produced, which was four per cent less than during the previous year. Slaughter volumes for pigs decreased to under two million, and the average carcass weight increased slightly to 90 kilograms. The production volume of pork has not been this low since the early 2000s.

Pork production decreased in the regions of nearly all ELY Centres. The biggest pork producers were Loimaa (12.8 million kg), Huittinen (12.3 million kg) and Nykarleby (10.3 million kg).

The number of pig farms has decreased rapidly. In 2017, there were approximately 1,100 pig farms, and the number of farms decreased by ten per cent from the previous year.

Organic meat production decreased

Organic meat production amounted to just under four million kilograms in 2017, ten per cent less than in the previous year. Organic meat production covers the organic production of beef, pork and lamb. Organic meat accounted for around one per cent of total meat production.

▶ Meat production

▶ Meat production by area

Egg production slightly increased from the previous year

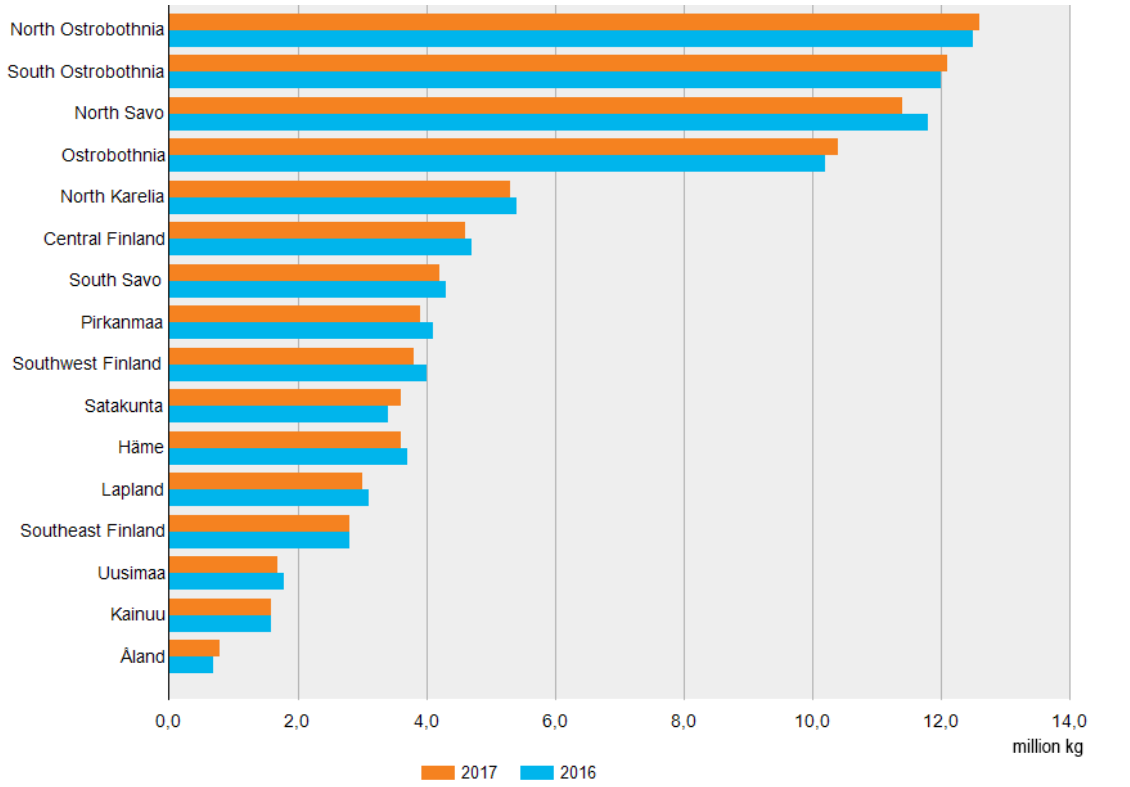
Egg production amounted to 73.5 million kilograms, one per cent more than in 2016. Production increased by four per cent during the first half of the year, and decreased by one per cent during the second half of the year. Egg production in enriched cages decreased by 3%, while egg production in barn and free-range hen houses increased by 8% and in organic poultry farms by 16%.

A total of 60% of eggs were produced in enriched cages, 34% in barn and free-range hen houses, and 6% came from organic poultry farms. Ten years ago, the corresponding figures were 79%, 19% and 2%.

▶ Egg production

Beef production by ELY Centre 2016 and 2017

Background data as a table



The number of dairy cows continued to decrease

In spring 2017, the number of cattle on farms totalled 893,200, which was almost two per cent less than a year earlier. Cattle were kept on a total of 11,180 farms.

The decrease in the number of dairy cows accelerated last year. Dairy cows numbered 274,950 in the spring of 2017, almost three per cent less than in 2016. The average number of cows per farm was 37 cows. Just over 400 farms had over a hundred cows, while 10 farms had more than 300. The average size of dairy farms has more than doubled over the last ten years.

The number of suckler cows has increased almost every year in the 21st century, and it has almost doubled in the last ten years. The number of suckler cows grew slightly to just over 60,000 last year.

The highest numbers of suckler cows and dairy cows were recorded in Northern Ostrobothnia and Northern Savonia.

The number of pigs continues to decrease

In spring 2017, approximately 1.13 million pigs were kept on 1,100 farms. This is eight per cent less than in the previous year. The number of sows decreased by ten per cent to 85,200.

The number of pigs has dropped by a fifth, and the number of sows by a third over the last ten years. The increase in the number of piglets has compensated for the decrease in the number of sows. The number of pigs has therefore not dropped as radically as the number of sows.

In 2017, there were pig farms in 176 municipalities. As in the previous year, the highest pig numbers were recorded in Huittinen, Nykarleby and Loimaa.

Chicken numbers were the highest in Southwest Finland and broiler numbers in Ostrobothnia

At the beginning of April, there were approximately 13 million poultry on farms. Broilers accounted for just over 60%, chickens for almost 30%, and turkeys, broiler breeder hens and other poultry for 10% of the total. Poultry were kept on just under 1,300 farms. The number includes all

farms that have at least one poultry bird. In other words, the total number also includes a large number of farms with only a few birds. Approximately 430 farms specialised in poultry production.

At the beginning of April, there were around eight million broilers on 140 farms. Overall, the number of broiler farms totalled around 190 farms.

The number of chickens on farms numbered just over 3.7 million. Over 65% of all chickens were kept on farms in Southwest Finland. Chicken numbers were the highest in Loimaa, Laitila and Oripää.

The number of farms with fewer than 50 chickens is quite high, more than 700. There were 125 farms with more than 10,000 chickens and 11 farms with more than 50,000 chickens.

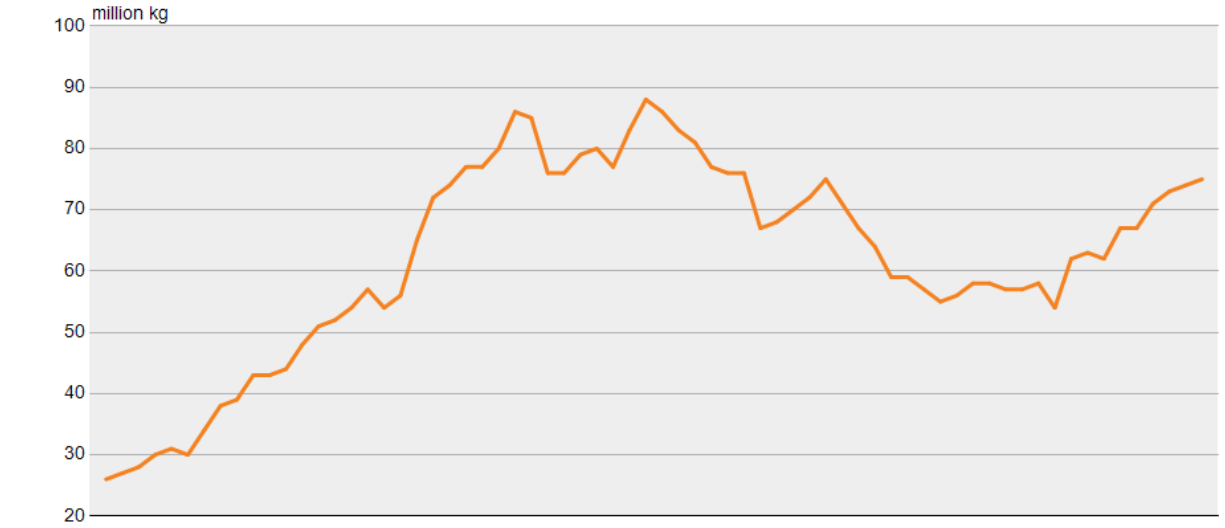
Sheep numbers dipped slightly

Sheep numbers dipped slightly last year, and there were just under 156,000 sheep in spring 2017. Sheep were kept on 1,420 farms. The number of sheep and sheep farms has been increasing in recent years as the sector has attracted new entrepreneurs.

Statistics show that sheep numbers were at their highest in the 1920s (1.7 million) and lowest in the 2000s (90,000). There are sheep farms all over the country. The highest sheep numbers are found in Southwest Finland, Ostrobothnia and Northern Ostrobothnia.

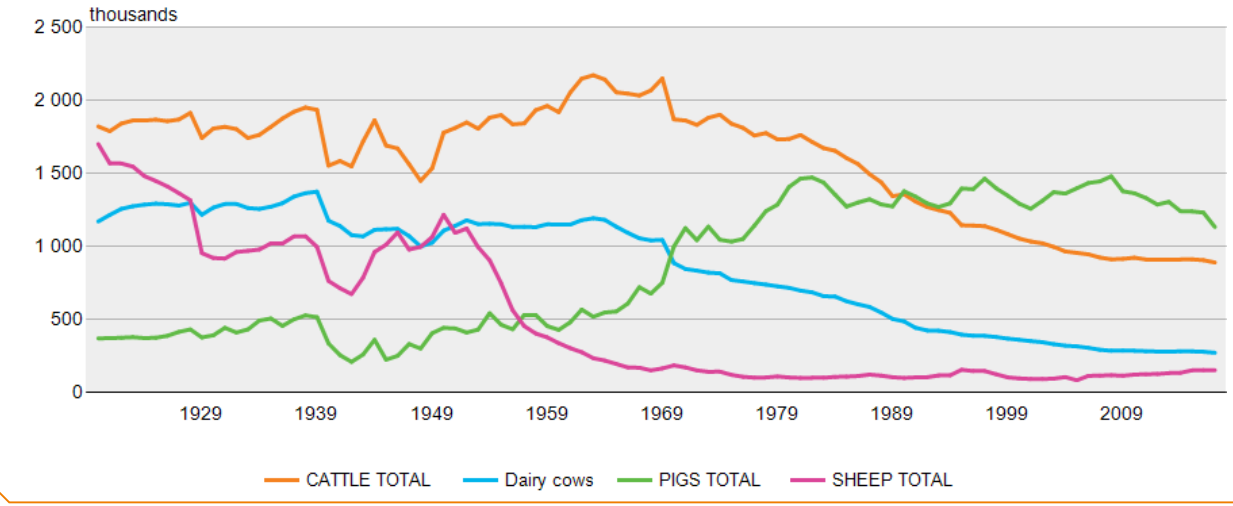
Total egg production 1951–2017

Background data as a table



Number of cattle, pigs and sheep 1920–2017

Background data as a table



Number of livestock

Livestock buildings and manure storages

Less than ten per cent of all farms exported manure outside the farm in 2016. Solid manure and slurry were exported to an equal extent. The number of importing farms was slightly higher than that of exporting farms. Roughly two million tonnes of manure were transported between farms.

The highest volumes of manure were transferred between farms in the regions of Southwest Finland, Southern Ostrobothnia and Ostrobothnia. Less than five per cent of all farms use processing methods that change the properties of manure. Composting was the most common processing method.

Livestock buildings and manure storages

Number of poultry 1997–2017

Background data as a table

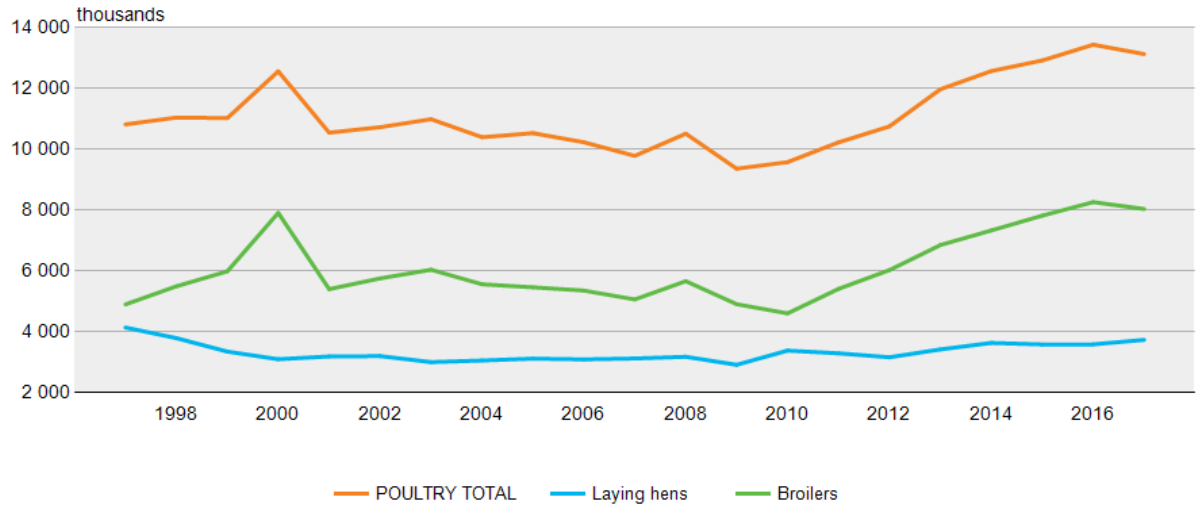


Photo: Tapio Tuomela / Luke

Arable crops

The 2017 harvest was poor, particularly in Eastern and Northern Finland. Significant volumes of cereal and protein crops remained unharvested. The total cereal harvest of 3.4 billion kilograms was the second smallest in the 2000s, with the exception of rye production, which recorded the highest numbers in almost 30 years.

Cereal cultivation area continued to decrease

In 2017, the total utilised agricultural area amounted to 2,272,200 hectares. Of this, cereals accounted for almost half (around 1,071,200 hectares). The cereal cultivation area decreased by three per cent from the previous year, i.e. the same amount as in 2016. This was due to the decrease in the cultivated area of barley.

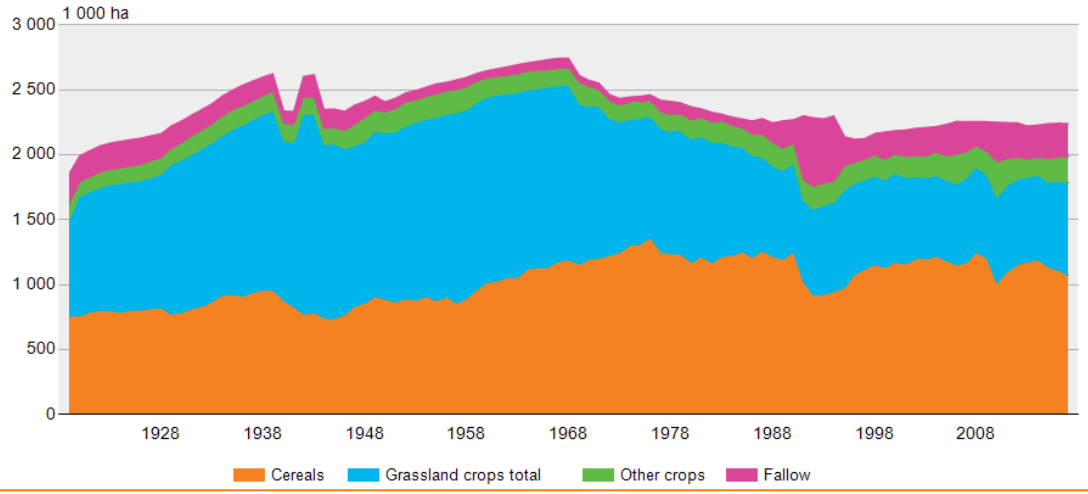
▶ Utilised agricultural area

The cereal harvest was reduced by large areas of failed crops

The rainy growing season and autumn weakened cereal quality and part of the cereal crop remained unharvested. However, the yield per hectare in the harvested area was higher than average, particularly for winter cereals. The average yield for rye, 3,920 kilograms per hectare, exceeded that for oats.

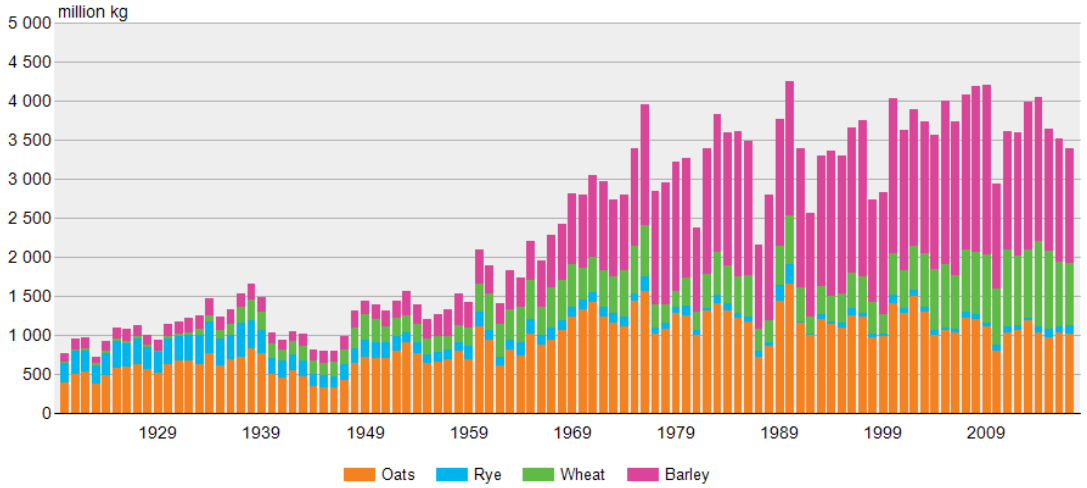
Cultivated area and fallow 1920–2017

▶ Background data as a table



Cereal harvest 1920–2017

▶ Background data as a table



Wheat and rye quality suffered from the heavy rainfall

The quality of the traditional bread cereals, wheat and rye, suffered from the exceptionally rainy end of the growing season. However, the quality of malting barley and oats remained good. Cereal quality varies greatly year-on-year, largely due to the varying conditions of the Finnish growing season.

Organic production focuses on fodder crops

The share of organic production in Finland is steadily increasing. The production of grass crops has increased the most. The organic production of silage feed has quadrupled in the last ten years. The share of oats in the total organic production of cereals is clearly highest: it accounts for more than half of total organic production.

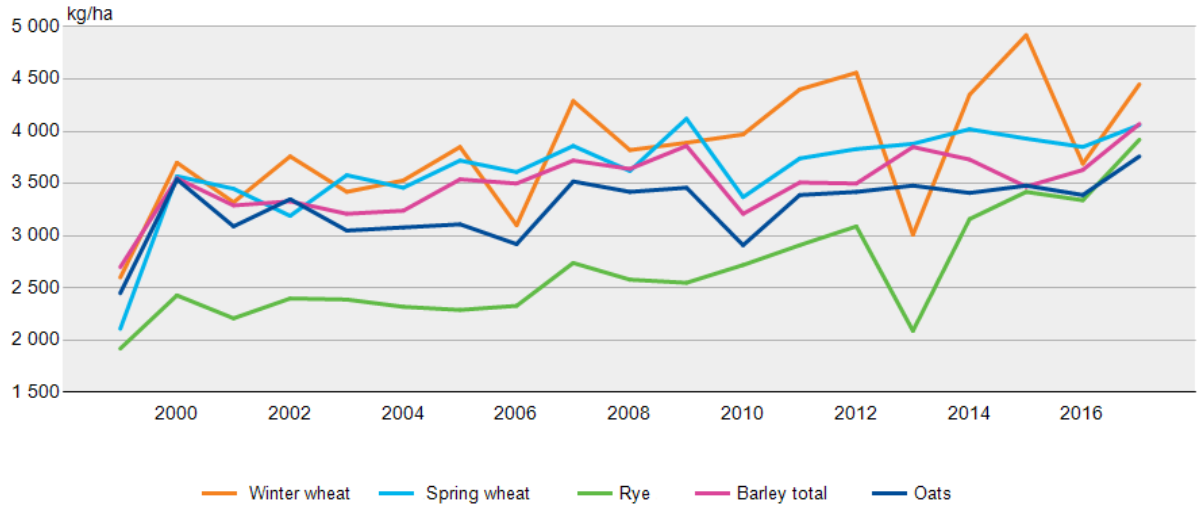
▶ Crop production statistics

▶ Organic production statistics

In 2017, the cultivated area for oats totalled 337 413 hectares, 8,255 hectares in Kouvola alone

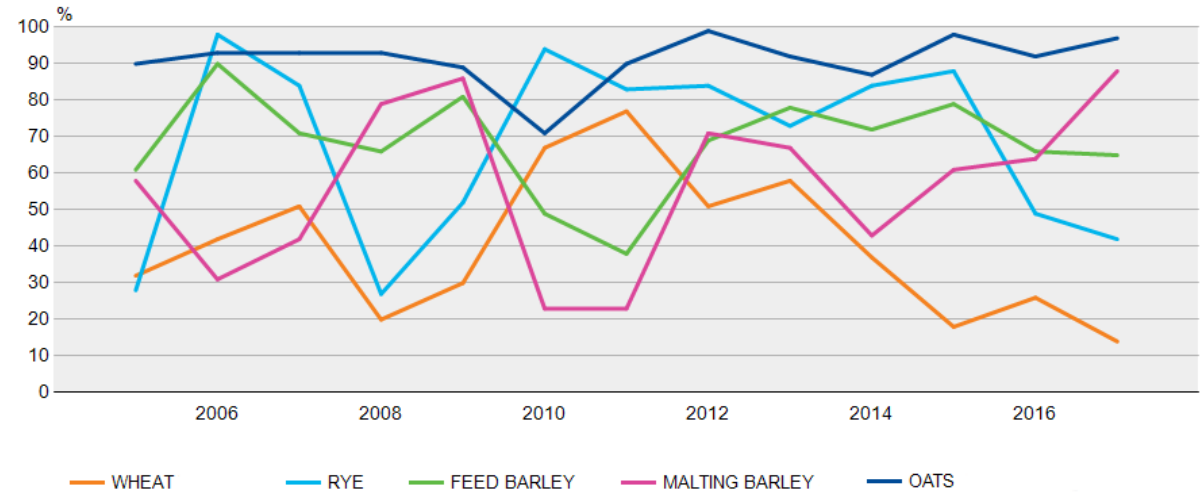
Yield of the main crops per hectare 1999–2017

▶ Background data as a table



Quality of the main crops 2005–2017

▶ Background data as a table



Total harvest and organic harvest in 2017.

Crop	Total harvest million kg	Organic harvest million kg	Organic harvest as a proportion of the total, %
Wheat	802	11	1.4
Rye	114	6	5.1
Barley	1,460	11	0.7
Oats	1,014	59	5.8
Mixed cereals	29	9	30.2
Turnip rape and rape	91	1	2.1
Potato	612	9	1.5
Silage	6,783	1,330	19.6

Farmland management and irrigation

Nearly 80% of the agricultural area was covered by plants or conservation tilled in winter 2015–2016. A little over 20% of the agricultural area was bare. In the harvest year 2015/2016, more than half of the cultivated area was ploughed. Approximately 30% of the total agricultural area was conservation-tilled, and just under 10% was directly sown.

In 2016, approximately 8,000 hectares of the field and horticultural area were irrigated. The irrigable area was nearly seven times higher than the irrigated area. Sprinkler irrigation is by far the most popular irrigation method, and nearly all water used in irrigation was surface water.

A total of 75% of all manure spread on fields was slurry or other liquid manure. With regard to slurry, 40% was injected during spreading, and roughly 13% was spread on the surface using a trailing shoe or similar spreader. The proportion of broadcast spreading was 30% and that of band spreading was nearly 15%.

More than 10% of the utilised agricultural area was grown in monoculture in the years 2014–2016, meaning that the same crop was grown in all three years (other than grassland or multi-annual horticultural or fallow crops).

▶ Farmland management and irrigation

Photo: Erkki Oksanen / Luke

Photo: Erkki Oksanen / Luke

Photo: Janne Lehtinen / Luke

Horticultural production

A total of 3,729 enterprises practised horticultural production in an area of 19,341 hectares in 2017. Greenhouse production accounted for 389 hectares of the total area. The most common production lines are outdoor production of vegetables and berries, with around 1,600 enterprises specialising in each. The vegetable cultivation area was almost twice as large as the berry cultivation area, and the production volume of vegetables was ten times that of berries. Fruit and berry production is significantly more labour-intensive than vegetable production because, while vegetable production requires hardly any manual work, fruit and berry crops are harvested manually.

The rainy summer hurt the outdoor production of vegetables, but strawberry production benefited from the heavy rainfall

Due to the rainy weather, the total harvest of outdoor vegetables was poorer than average, remaining at 167 million kilograms. Although the cultivation area for carrots - traditionally the largest crop by production volume - grew compared with the previous year, the total carrot harvest remained at 62 million kilograms, 10 million kilograms lower than in 2016. The onion harvest amounted to 26 million kilograms, while the harvest of cabbages totalled 23 million kilograms.

Distribution of outdoor production in 2017.

	Number of enterprises	Hectares	Production, 1,000 kg
Outdoor vegetables	1,695	11,803	167,873
Berries	1,627	6,348	17,081
Fruit	368	745	6,933
Seedlings	106	352	-
Cut flowers and ornamental foliage	73	93	-
Total outdoor production	2,984	19,341	191,887

Distribution of greenhouse production in 2017.

	Number of enterprises	Area, 1,000 m^2	Production, 1,000 kg
Greenhouse vegetables	515	2,215	87,322
Potted vegetables	79	322	9,416
Berries	41	41	89
	Number of enterprises	Area, 1,000 m^2	Production, 1,000 pieces
Ornamental plants	449	1,210	125,905
Bulbous flowers	88	-	79,106
Flowering potted plants	221	-	10,477
Green plants	33	-	324
Bedding plants	440	-	35,998
Seedlings and cuttings	175	145	-
Total greenhouse production	1,062	3,888	-

The fruit and berry harvest was good, which was largely thanks to the record apple harvest of 6.8 million kilograms. The harvest of the most important berry, i.e. strawberry, reached 13.8 million kilograms, while the raspberry harvest decreased from the previous year.

Production of tomatoes and cucumber concentrated in Ostrobothnia

The most common greenhouse crops are tomatoes and cucumber, which are cultivated year-round in greenhouses. Greenhouse vegetable production totalled 87 million

kilograms, of which cucumbers accounted for 43 million kilograms and tomatoes 39 million kilograms. The total production of tomatoes fell slightly compared with the previous year. This was partly due to a slight decrease in the cultivation area, but also to the increased cultivation of special tomato varieties, whose yield is lower than that of regular tomatoes.

The area of the ELY Centre for Ostrobothnia accounts for 92 hectares (58%) of the total greenhouse cultivation area and 58 million kilograms (71%) of the total production of tomatoes and cucumber. Potted vegetable production is strongly concentrated in the areas of three ELY Centres: in 2017, just under 69 million pieces of potted vegetables were produced in the regions of Southern Savonia, Southwest Finland and Satakunta, while the total production was 102 million pots.

Photo: Erkki Oksanen / Luke

The apple variety in the photograph is Discovery.
Photo: Matti Lahtinen / Finnish Fruit and Berry Farmers' Association.

Cut tulip is the No. 1 ornamental plant by production volume

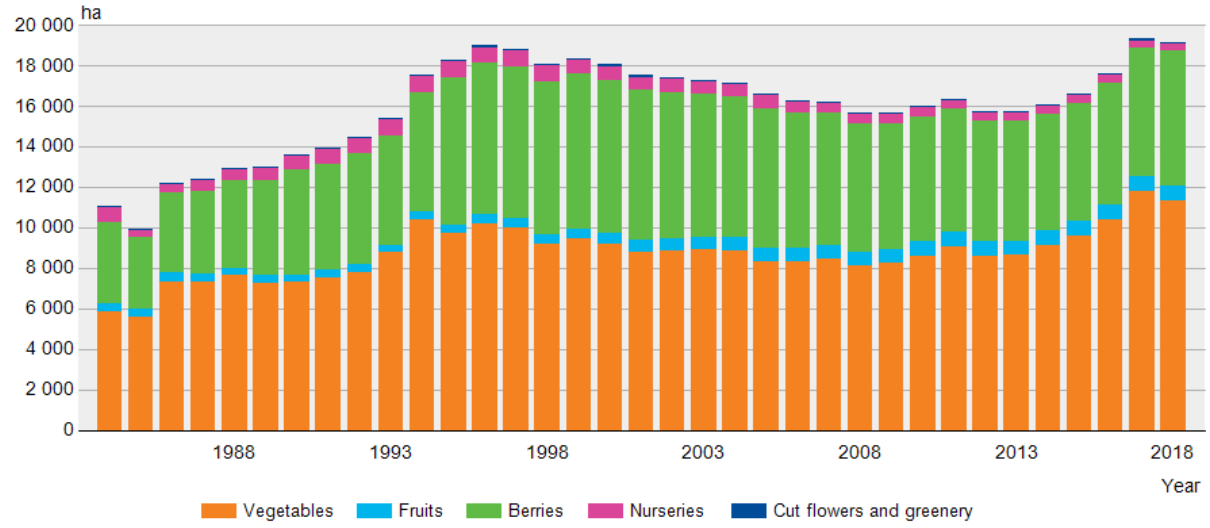
A total of 499 enterprises grew ornamental plants in greenhouses over an area of 121 hectares. The production volume of bedding plants amounted to 36 million flowers, while bulb production reached 79 million flowers. The core bulb production regions are Southern Savonia and Southwest Finland, which accounted for 94% of total bulb production in Finland. Cut tulips are the No. 1 species of bulbous plant with 73 million flowers sold. It is also the most popular ornamental plant during the winter season.

Compared with other ornamental plant production, the production of bedding plants is dispersed more evenly throughout Finland; however, the biggest producers are in Southwest Finland and Ostrobothnia. The pansy has been the most popular bedding plant for years. In 2017, total pansy production amounted to 10 million flowers. Of this, hanging pansy pots accounted for 300,000 pots. Overall, the total production volume of hanging flower pots was just over 400,000 pots.

▶ Horticultural statistics

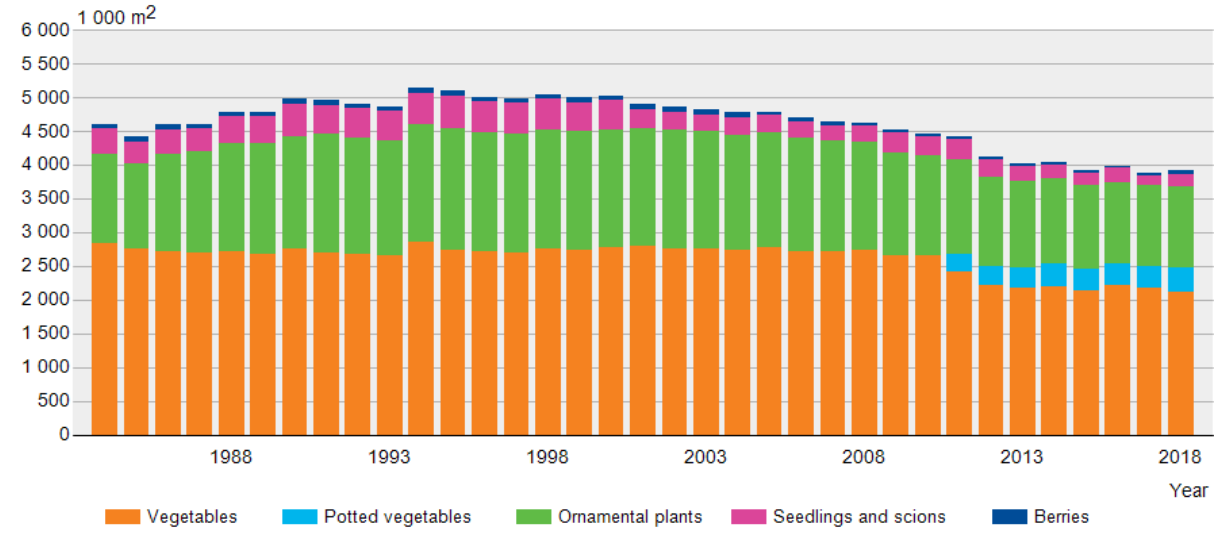
Distribution of outdoor production 1984–2017

Background data as a table



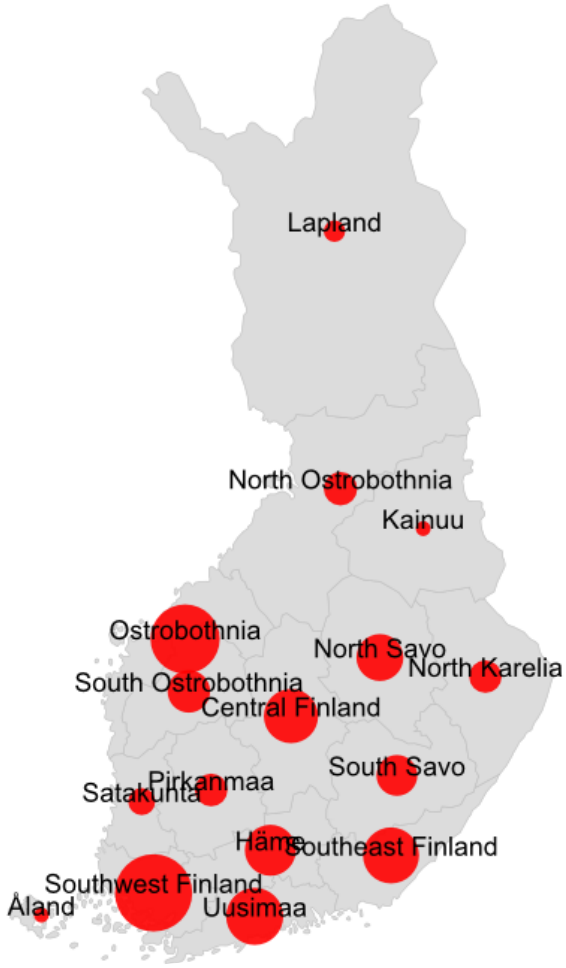
Distribution of greenhouse production 1984–2017

Background data as a table



Cultivation of bedding plants in greenhouses, 2017

Background data as a table



36 million flowers in total

Use and stocks of agricultural products

Two-fifths of the cereal harvest is mainly used as livestock feed on farms. The rest ends up in industrial processes or is exported.

Less cereal entering the market from farms

Cereal wholesalers and the industries that use cereals purchased a total of almost two billion kilograms of cereals from farms in 2017. The figure has decreased for three consecutive years. Farms' turnip rape and rape sales totalled 67 million kilograms, 10 million kilograms higher than the previous year.

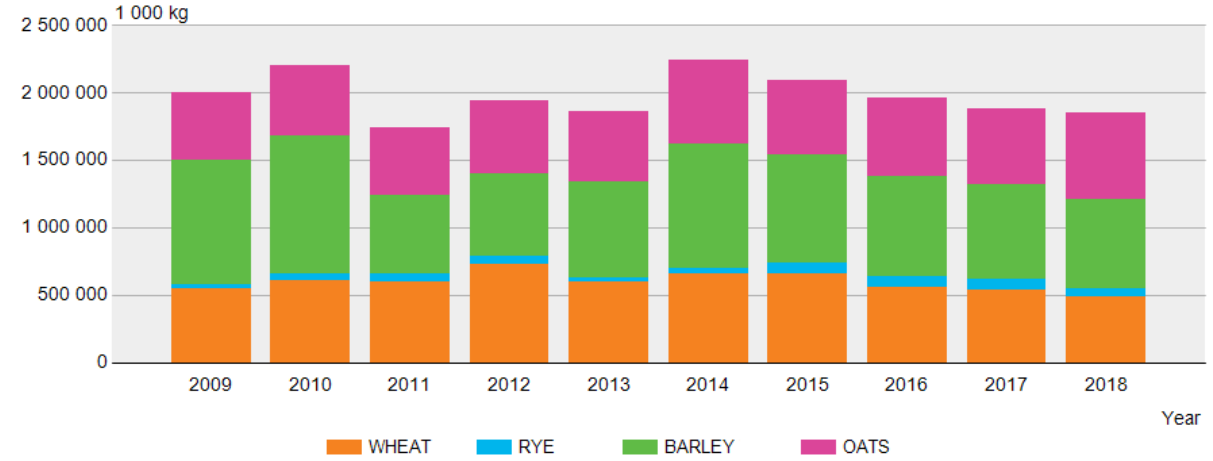
In terms of volume, farms' barley sales were the highest with 695 million kilograms. Of this, a quarter was malting barley, which was slightly higher than in the previous year. The rest was mainly feed barley, the volume of which decreased from the previous year for the third year in succession. Oat and wheat sales also reduced from the previous year. Oat sales were the second highest in 2017 (568 million kilograms). Wheat sales amounted to 535 million kilograms, of which just under half was bread wheat and the rest feed wheat. Rye sales increased to 88 million kilograms

Roughly half of cereals used as feed

Finnish industry consumed a total of 1.4 billion kilograms of domestic and imported cereals in 2017. The food in-

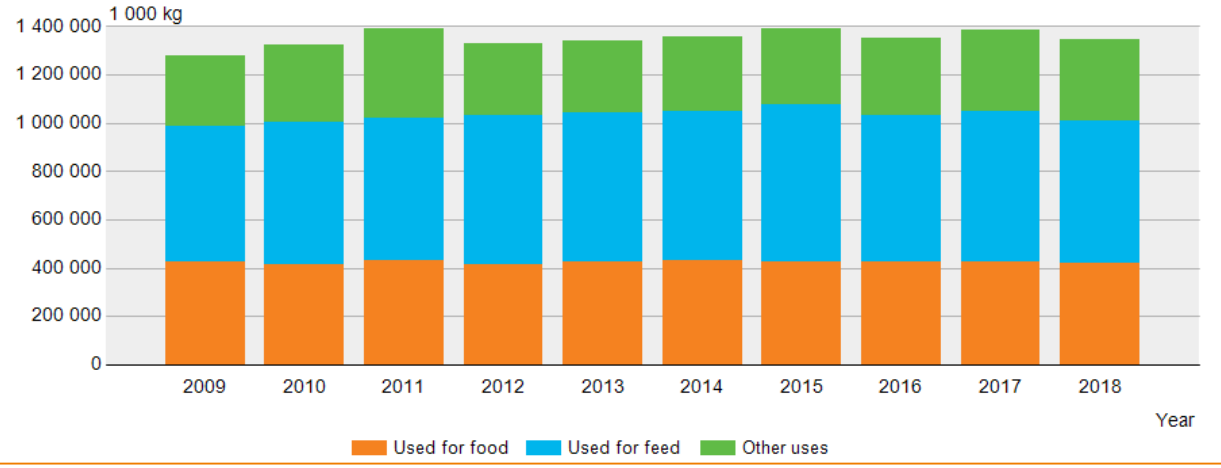
Cereals purchased from farms by industry and trade by year

Background data as a table



Cereals used by industry by year

Background data as a table



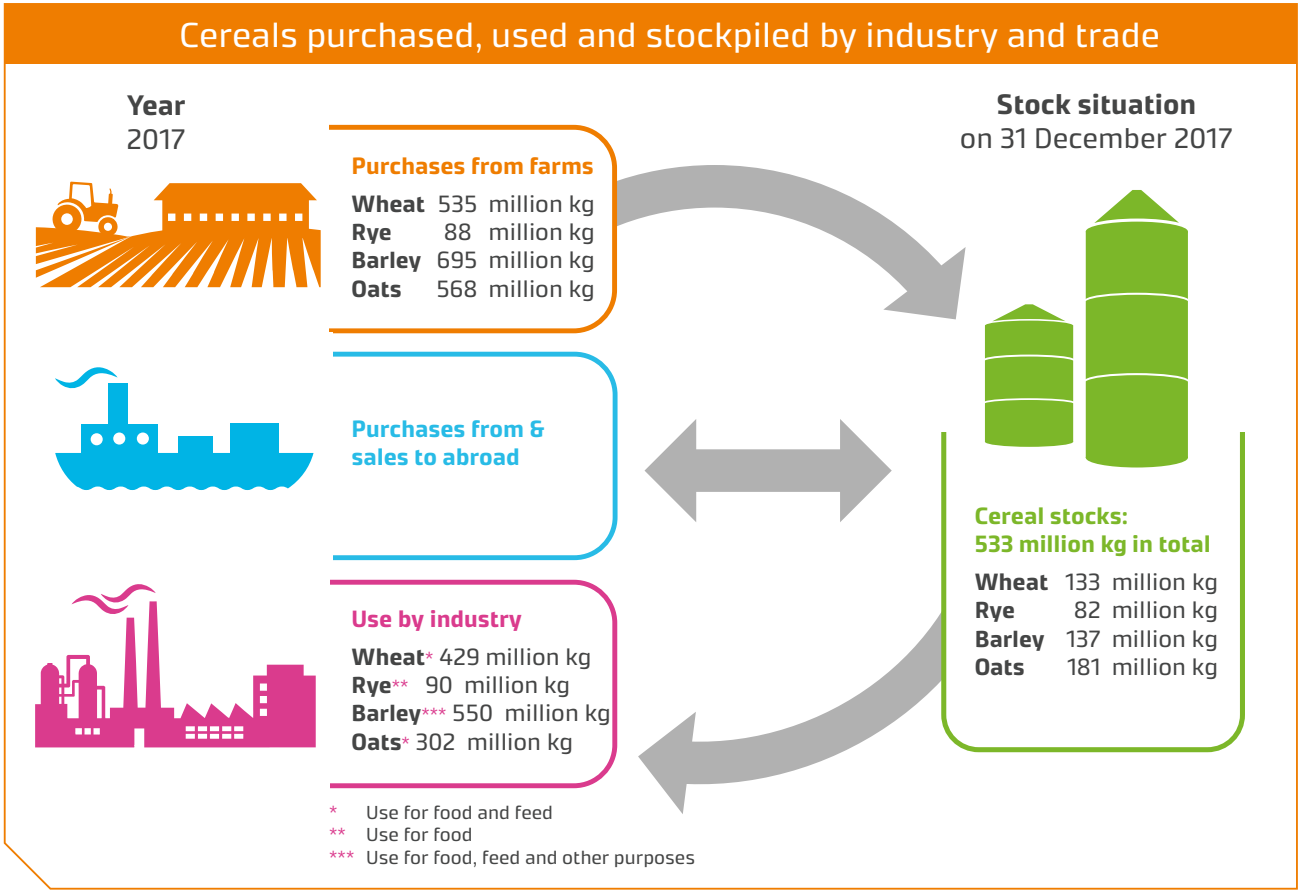
dustry consumed just under a third of all cereals, and the feed industry almost half. The rest was consumed by other industrial sectors. Other uses include, for example, malting and the production of ethanol, starch, glue powder and enzymes.

The cereal the industrial sector consumed most was barley, a total of 550 million kilograms, of which 40% were used to produce commercial animal feed. The food industry consumed a total of 11 million kilograms of barley. Other industrial uses of barley, including malting, amounted to 321 million kilograms of barley.

In 2017, a total of 233 million kilograms of wheat was used for food production (mainly milling products). This amount has decreased by around 40 million kilograms since 2009. In addition, around 196 million kilograms of wheat was used to produce animal feed. This amount varies year-on-year, and was last at this level in 2009.

Use of oats in food and animal feed production has steadily increased. The food industry consumed almost nine million kilograms more of oats than the previous year, i.e. 92 million kilograms in total. The food industry already consumes as much oats as rye. The feed industry consumed 210 million kilograms of oats, 12% less than the previous year but slightly more than two years ago.

Rye is a traditional bread cereal in Finland. The food industry consumed 90 million kilograms of rye, i.e. the same amount as the previous year.



Cereal stocks

At the end of 2017, industrial and commercial stocks of cereals amounted to 533 million kilograms of domestic and imported cereals. Oats had the highest stockpiles (181 million kg). Barley stocks amounted to 137 million kilograms, wheat stocks to 133 million kilograms, and rye stocks to 82 million kilograms. A time series for end-of-year and end-of-June stocks is available in the statistics database.

▶ Statistics on cereals purchased, used and stockpiled by industry and trade

Use of cereals on farms

In 2017, Finnish farms produced a total of 3.4 billion kilograms of cereal. This was the smallest harvest in seven years. Of the total production volume, almost 1.9 billion kilograms were sold to the market, the lowest figure in six years. The main reason for the reduction in the amount of cereal sold to the market was that the sales of barley and wheat had decreased for the previous three harvest years. In contrast, oat sales continued to grow and amounted to around 590 million kilograms during the harvest year 2017/2018. Rye sales vary greatly depending on the harvest year because the rye harvest also varies significantly year-on-year.

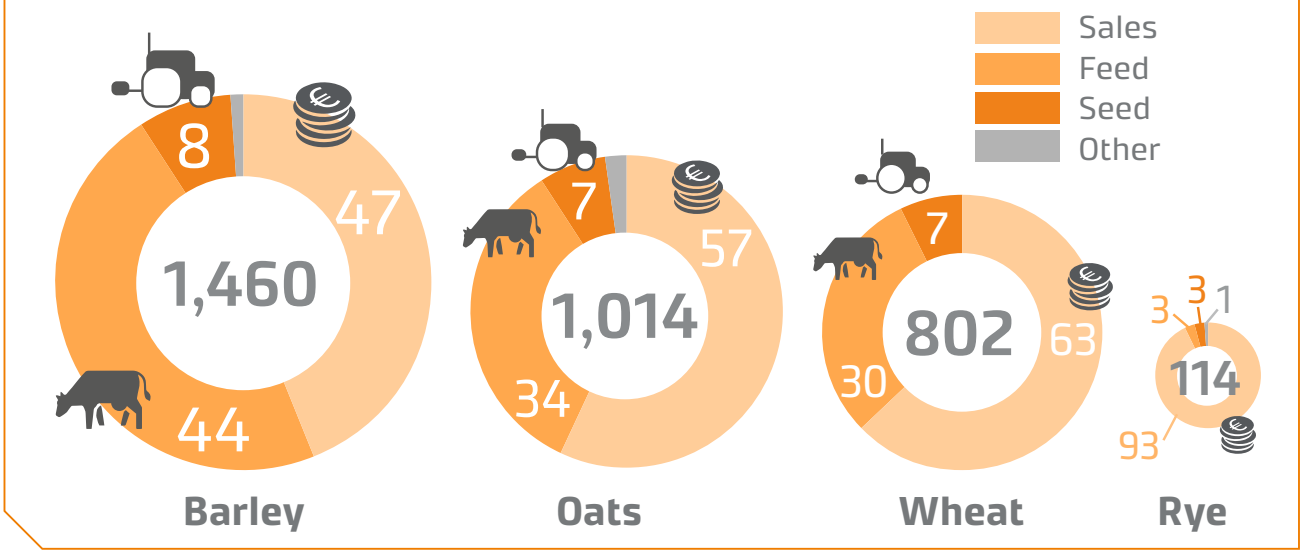
Farms reserved around 1.6 billion kilograms of the total 2017 cereal harvest for their own use. Most was used as animal feed (approx. 1.3 billion kg). Roughly 250 million kilograms of cereal was reserved for the next crop, i.e. for sowing purposes. A large proportion of the cereal harvest in stocks on farms at the beginning of the next crop year (at the turn of June/July) is usually reserved for use as feed. In recent years, these stocks have amounted to around 700 to 900 million kilograms.

▶ Use of crops on farms

Cereals balance sheet

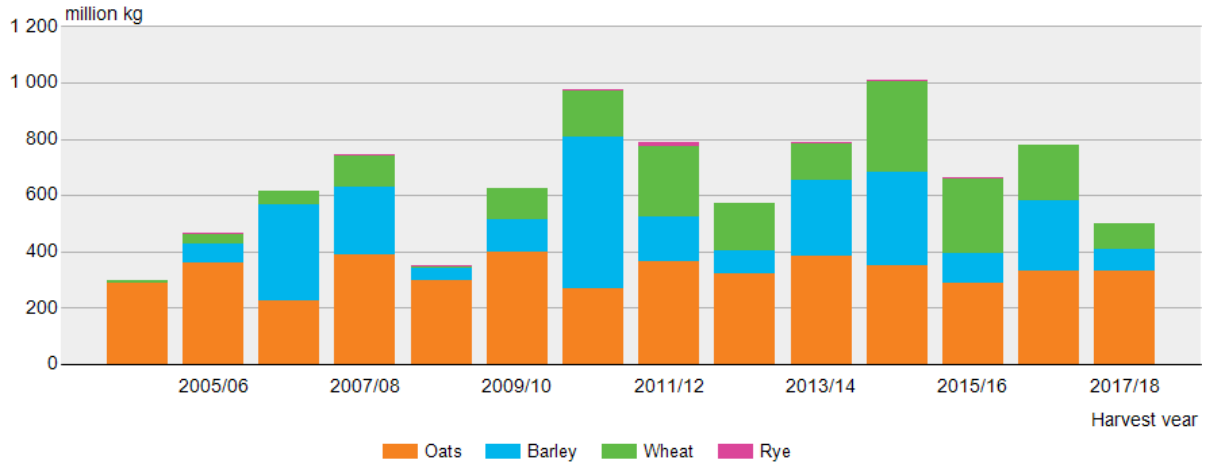
The domestic consumption of cereals totals around three billion kilograms annually. Use of cereals as feed on farms amounts to almost two billion kilograms when the 630

Use of cereals on farms in 2017 (million kg)



Export of cereals by harvest year

▶ Background data as a table



million kilograms used by the industrial sector to produce feed are factored in.

The food industry consumed one-eighth of all cereals

The variation in annual cereal volumes has little effect on the amount of cereals used for the production of milling products in Finland each year. For more than a decade, the amount of cereals used for the production of milling products has been at a level of 420–440 million kilograms per harvest year. The majority of this volume is wheat, although over the last 15 years, it has dropped from almost 300 million kilograms to around 230 million kilograms. During the same period, use of oats has doubled from around 44 million kilograms to 94 million kilograms. During the last harvest year, use of oats for the production of milling products exceeded use of rye, which remains at a steady level of 90 million kilograms.

Oats exports strong

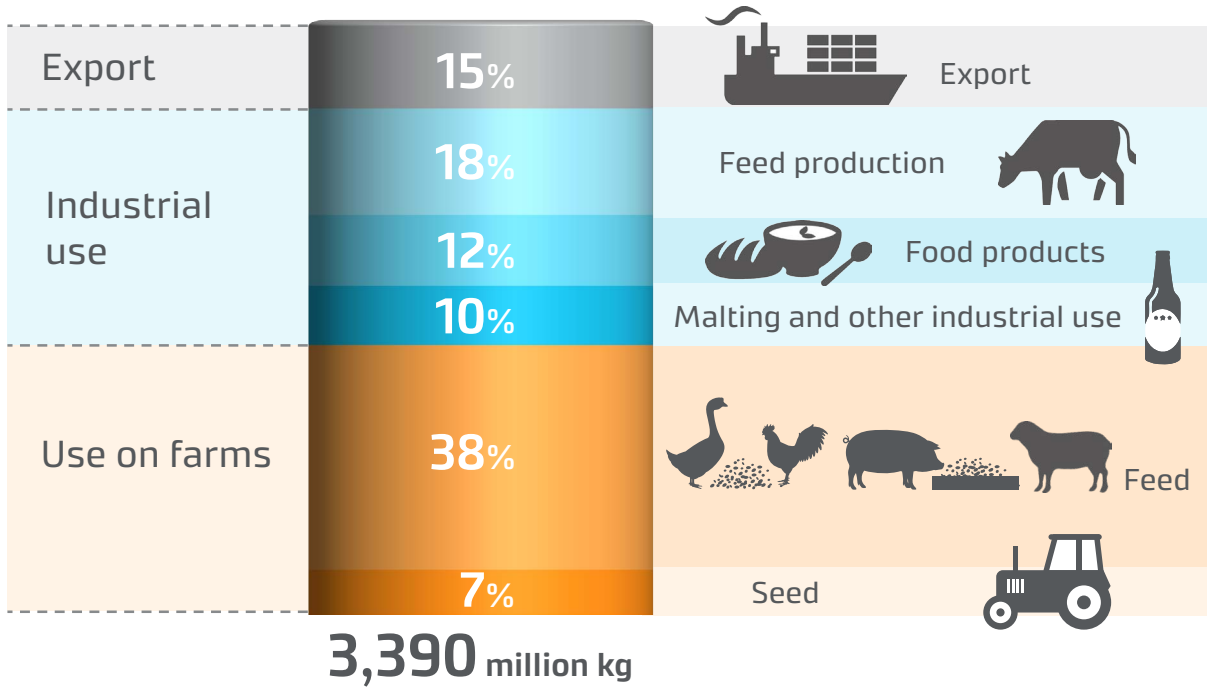
In Finland, cereal production volume has accounted for domestic consumption for decades. Only in rye production has the volume not always been sufficient to cover the needs of the domestic milling industry. In addition to rye, other cereals are also imported to Finland each year, but exports clearly exceed the level of imports.

During the harvest season 1 July 2017–30 June 2018, cereal exports totalled 500 million kilograms, the lowest amount since the harvest year 2008/2009. Oats (more than 330 million kg) constituted the majority of cereal exports. The export of oats remained at the level of the previous harvest year.

The variation in the annual volume of the cereal harvest has little effect on use of cereals in the industrial sector for the production of food or animal feed. It mainly affects exports and particularly the exported volumes of barley and wheat. During the harvest year 2017/2018, the export of barley was halved and the export of wheat dropped to just under a third compared with the previous harvest year.

▶ Cereals balance sheet

Domestic use of the 2017 cereal harvest



Producer prices for agricultural products

Average producer prices increased in 2017. According to a monthly review, the price increases mostly occurred towards the year-end.

The producer price for milk remained at the 2007 level

In 2017, producers were paid an average of 38.84 cents per litre for milk, slightly more than the previous year. The figure factors in not just the milk account price but also the annual adjustment payment.

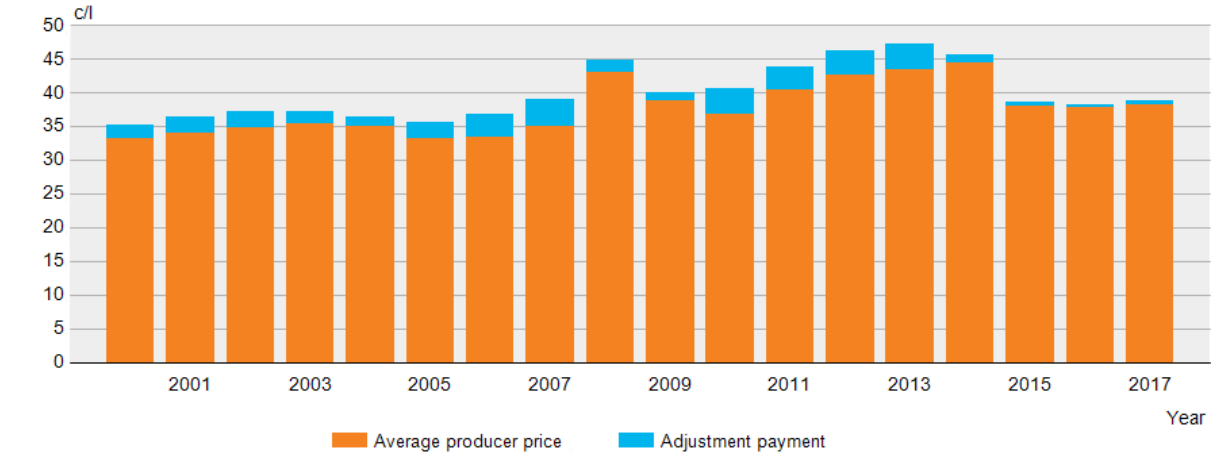
The producer price for milk peaked in 2013, but took a downward turn around the middle of 2014 due to weaker export markets. Dairy producers also received a smaller adjustment payment in 2014–2017.

The producer prices for meat mostly increased

In 2017, the average producer price paid by slaughterhouses for meat from bulls was EUR 3.40 per kilogram and for all beef in total EUR 2.98 per kilogram. Both figures increased compared to the previous year. For pork, producers were paid more than the previous year, i.e. EUR 1.50 per kilogram. The producer price for lamb was EUR 3.71 per kilogram, also slightly more than in 2016. On the other hand, the producer price for broiler meat decreased to EUR 1.29 per kilogram.

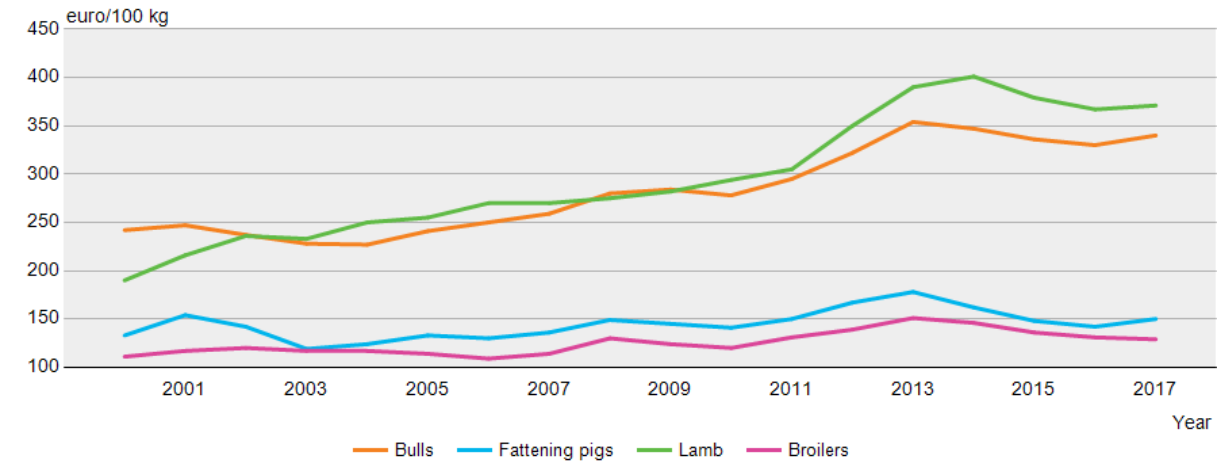
Average producer prices of milk by year

Background data as a table



Average producer prices of meat by year

Background data as a table



Producer prices for eggs varies depending on the production method

The average price paid to producers for class A eggs in 2017 was EUR 1.02 per kilogram, slightly less than the previous year.

In 2017, producers were paid EUR 1.07 per kilogram for barn and free-range eggs and EUR 0.83 per kilogram for enriched cage eggs. Starting at the beginning of 2018, separate statistics have been compiled on the producer prices for barn eggs and free-range eggs In 2017, the average price paid for organic eggs was EUR 2.63 per kilogram.

Producer prices for cereals mostly increased

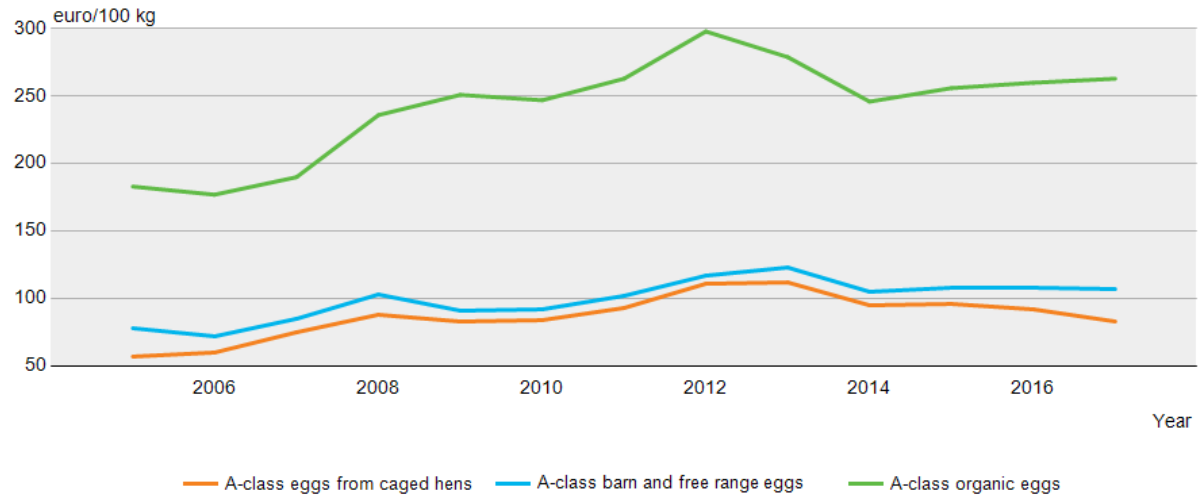
The average price paid to farmers for basic-quality wheat in 2017 was EUR 148 per tonne, which is six per cent more than in the previous year. Bread wheat fetched EUR 156 per tonne, and feed wheat EUR 139 per tonne. The producer price for rye dropped from the previous year to EUR 164 per tonne.

The average basic price for barley was EUR 138 per tonne and for oats EUR 135 per tonne. Both figures increased by around five per cent from the previous year. Malting barley fetched EUR 157 per tonne, and feed barley a little less, EUR 130 per tonne.

The average basic price of turnip rape and rape was EUR 383 per tonne in 2017, which was slightly more than during the previous year.

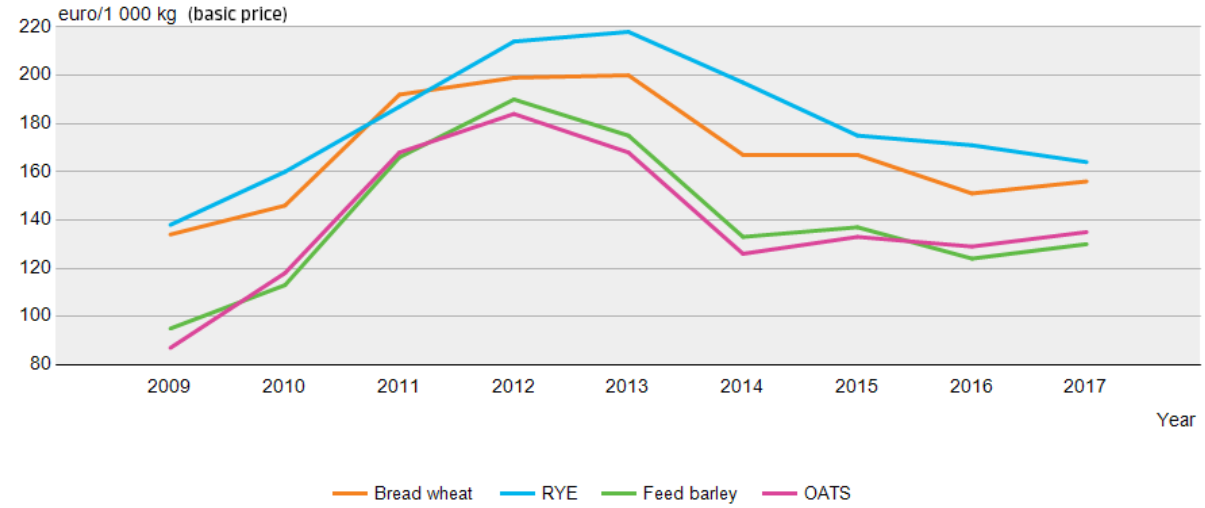
Average producer prices of eggs by year

Background data as a table



Average producer prices of cereals by year

Background data as a table



Producer prices for food potato slightly dropped

The average price paid to producers for food potatoes in 2017 was EUR 0.18 per kilogram, slightly less than the previous year. The average producer price for early potatoes varies greatly depending on the year. In 2017, it was EUR 0.59 per kilogram.

Producer prices are based on surveys

The producer price is the price paid to a farmer for an agricultural product excluding value-added tax. Information on producer prices is based on questionnaires sent to first-hand buyers, such as dairies, slaughterhouses, agricultural trade, industries that use cereals, and egg and potato packaging plants. The information is collected monthly, and it can be found on the statistics page.

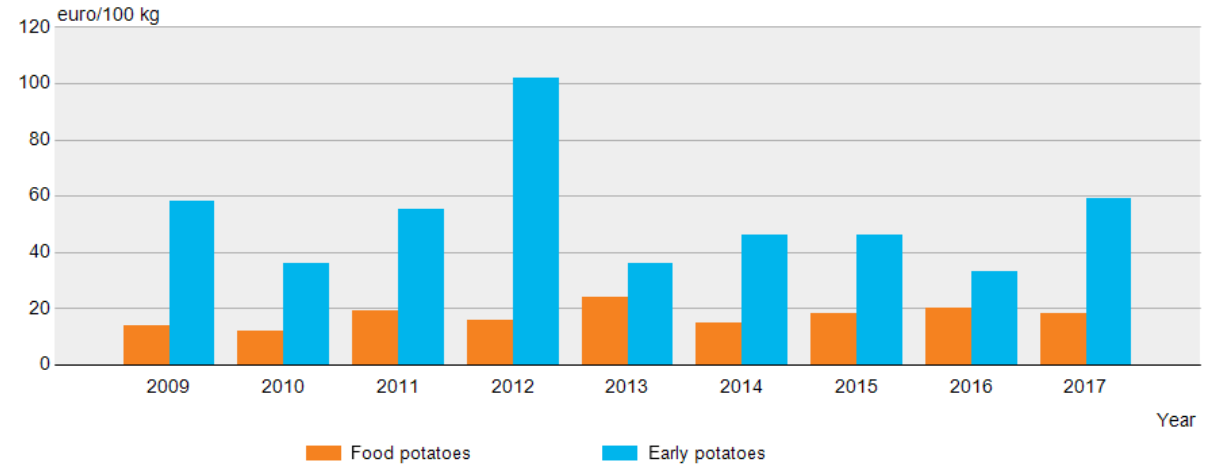
▶ Producer prices for agricultural products

Photo: Erkki Oksanen / Luke

Photo: Pekka Väisänen / Luke

Average producer prices of food potatoes by year

▶ Background data as a table



Agricultural land rents

In recent years, 60% of agricultural and horticultural enterprises have rented agricultural land. More than a third of all arable land has been rented.

Land rents by region, farm type and production line

In 2016, the average annual price paid by agricultural and horticultural enterprises for rented agricultural land was EUR 223 per hectare. Farm-specific and regional differences are quite high in rental prices: the rates varied from one euro to two thousand euros per hectare.

Regionally, the rates were highest in Southwest Finland (EUR 350 per hectare on average) and in Satakunta (EUR 297 per hectare on average). The average rate was the lowest in Lapland and Kainuu (around EUR 100 per hectare).

Rent for agricultural land was considerably higher for horticultural farms than the Finnish average at EUR 293 per hectare. Organic farms paid slightly higher rent compared to farms with regular production (EUR 227 and EUR 221 per hectare, respectively).

The classification by production line covers eleven sectors. Poultry and pig farms and horticultural farms paid more than EUR 300 per hectare for rented agricultural land, whereas for dairy and beef farms, the rents were approximately EUR 200 per hectare.

Further information on land rents by production line and farm type is available in Luke's statistics database.

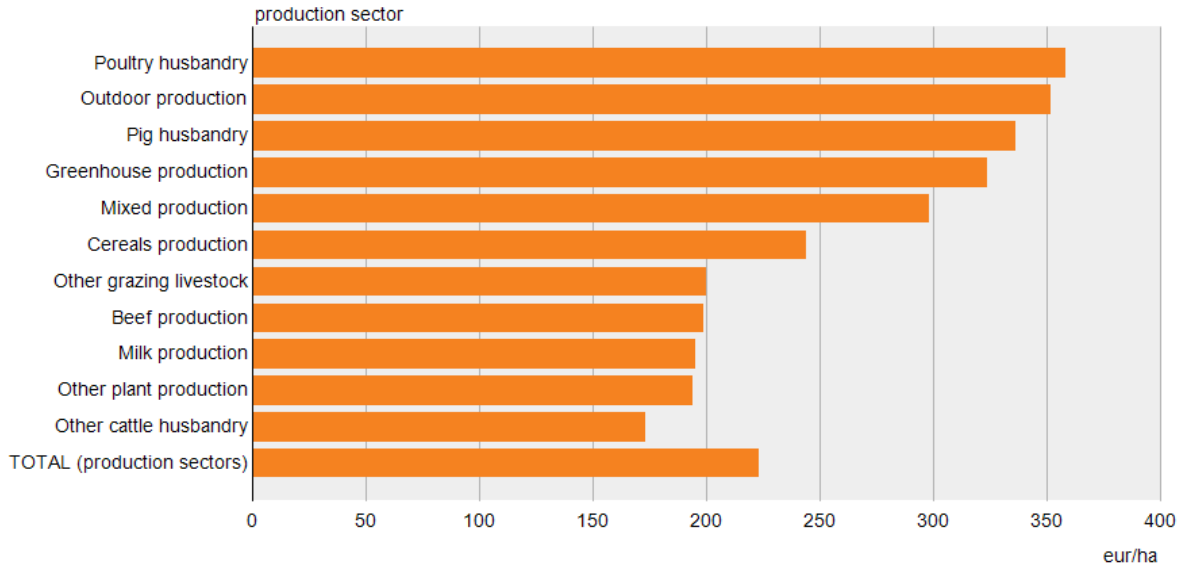
The statistics are based on surveys

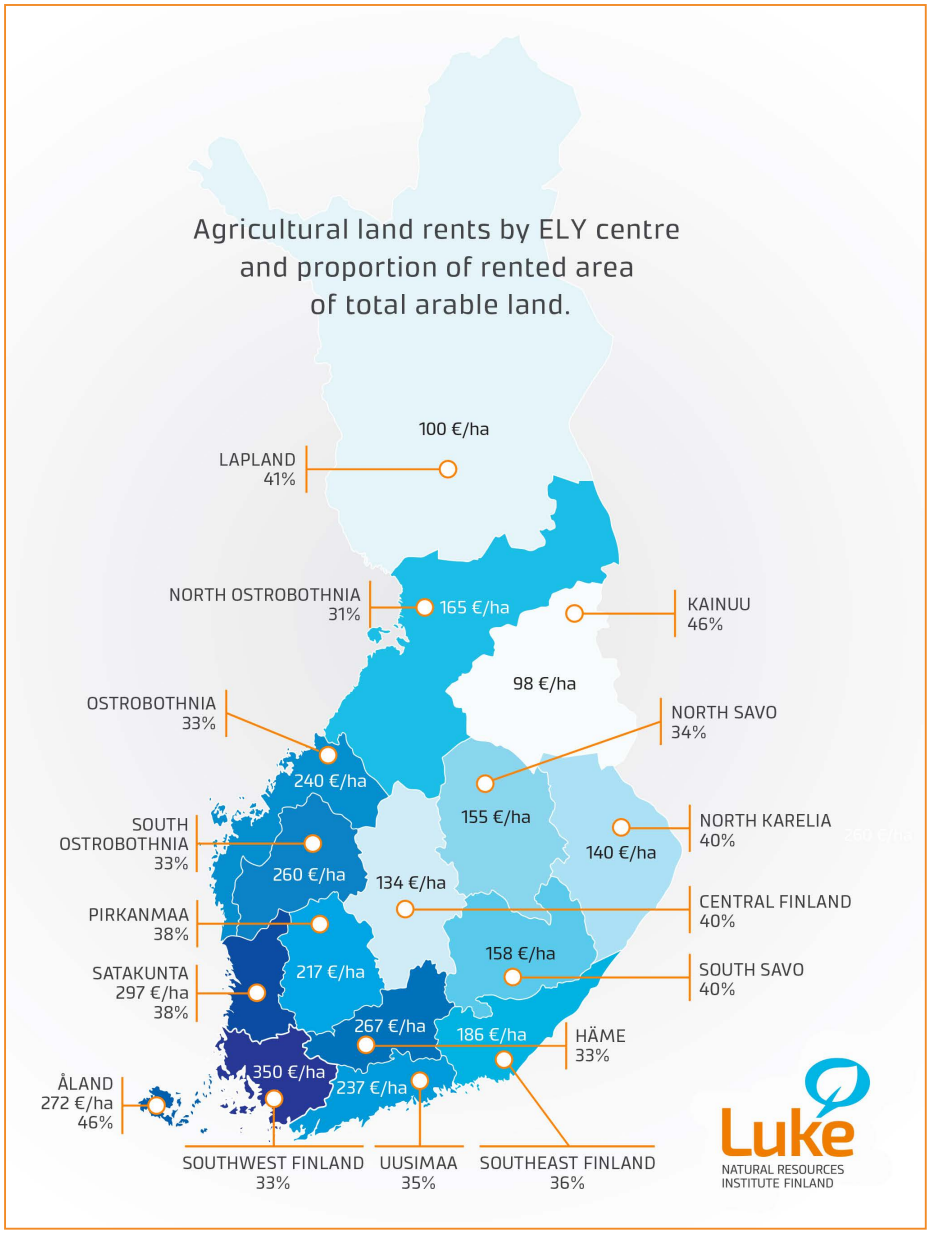
The 'Agricultural land rents' statistics are based on prices collated in connection with the autumn 2016 crop and

Photo: Janne Lehtinen / Luke

Agricultural land rents by production sector 2016

▶ Background data as a table





horticultural production surveys. The 'Crop production survey' is conducted every year and covers roughly 6,000 conventional and organic farms. Every year, some 3,100 farms engaged in horticultural cultivation in the open and in greenhouses participate in the 'Horticultural survey'.

▶ Agricultural land rents

Regional statistics by type of farm and production line are also available on map.

Photo: Erkki Oksanen / Luke

Profitability of agriculture

Luke's profitability accountancy monitors the economic development of agricultural and horticultural enterprises in Finland, on the basis of bookkeeping records compiled annually from 800 businesses.

On average, businesses operated at a loss

The gross revenue, i.e. the sum of agricultural production and subsidies, amounted to approximately EUR 150,600 per farm in 2016. However, agricultural production costs averaged EUR 181,900, which resulted in a loss of EUR 31,500 per farmer. The costs include family businesses' labour costs, which were calculated on the basis of an hourly rate of EUR 15.8, and interest on capital at 3.88%. Excluding these costs, the farm net income was EUR 11,200 in 2015.

Profitability ratio still low

The profitability ratio, which is a farm net income divided by the sum of labour and capital costs, was 0.26 on average. Farmers achieved 26% of the labour cost and interest targets, i.e. an hourly rate of EUR 4.1 for labour and 1.0% interest on capital. The average return on total assets was negative by an average of 2.5%. The size of agricultural and horticultural enterprises still continuing their operation has grown year after year, while smaller farms are ceasing their activities. Despite this, profitability has nevertheless been on the decline for the whole of the 2000s.

Profitability ratio of agricultural and horticultural enterprises

▶ Background data as a table

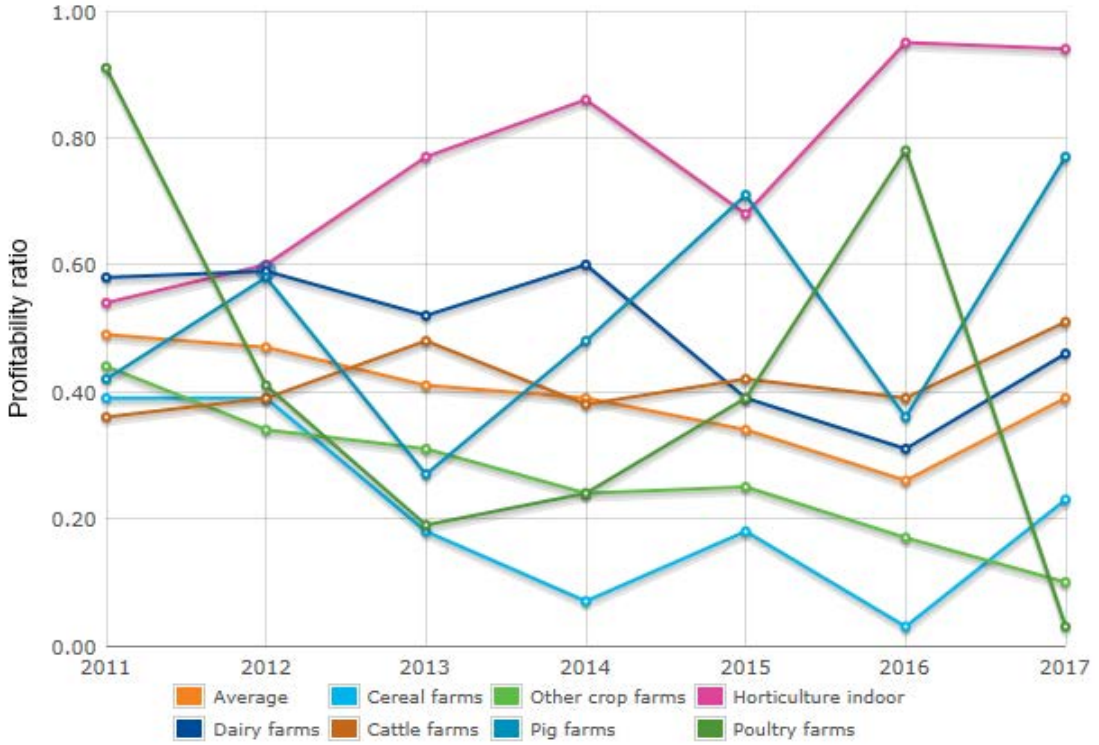


Photo: Yrjö Tuunanen / Luke

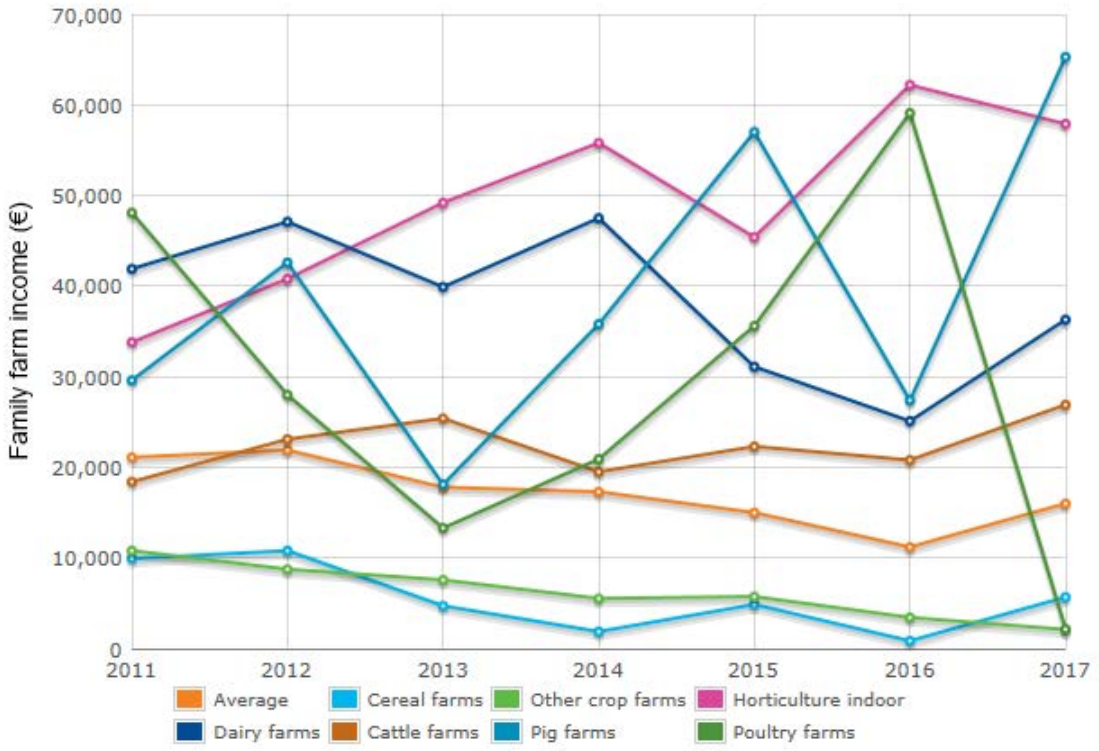
Differences between production lines

In recent years, profitability has been the lowest on cereal farms and other crop production farms: the profitability ratio has dropped to 0.1, and the average income per farm has remained in the range of a few thousand euros per year. On greenhouse and poultry farms, the profitability ratio has exceeded 0.75, and the average income has been in the range of EUR 60,000.

- Profitability of agriculture
- Economydoctor

Farm net income of agricultural and horticultural enterprises

- Background data as a table



Balance sheet for food commodities

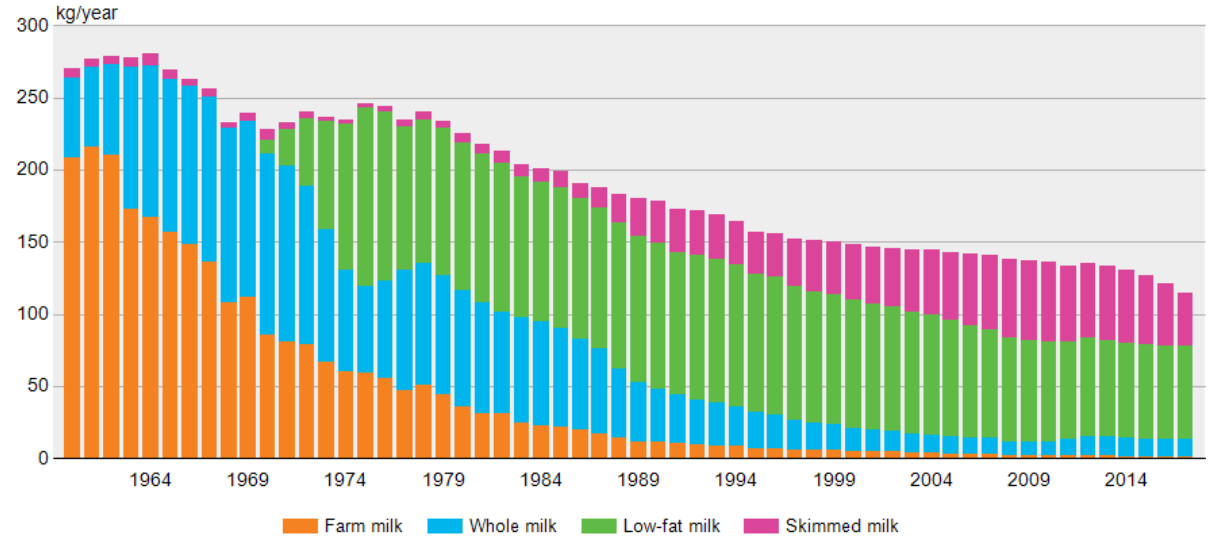
In 2017, people in Finland consumed an average of 160 kilograms of liquid milk products, 81 kilograms of meat, 80 kilograms of cereals, 65 kilograms of fruit, 64 kilograms of vegetables and 15 kilograms of fish.

The consumption of milk kept decreasing

Milk consumption decreased by an average of around five per cent from the previous year and amounted to a total of 112 litres (or 116 kilograms) per capita. There was a drastic decrease in the consumption of skimmed milk, more than 14%. The consumption of low-fat milk remained almost unchanged from the previous year, while the consumption of whole milk increased by seven per cent having been on the decline for a couple of years. Low-fat milk accounts for 57%, skimmed milk for just 32%, and whole milk for 11% of all milk consumption.

Consumption of milk per capita 1960–2017

Background data as a table



The consumption of sour milk and curdled milk (viili) decreased by approximately six per cent. The consumption of sour milk amounted to around nine kilograms and the consumption of viili to just under three kilograms per capita. The consumption of yoghurt remained roughly at the previous year's level (at 20 kg per capita on average). Cream consumption increased by approximately six per cent. In 2017, the total consumption of liquid milk products was 160 kilograms per capita, approximately four per cent less than in the previous year.

The consumption of cheese decreased by two per cent from the previous year to just under 26 kilograms. The consumption of butter was of the same order as in the previous year, 3.5 kilograms.

Poultry meat consumption continued to grow

The total consumption of meat remained roughly at the previous year's level, 81 kilograms per capita, when game and offal are also taken into account. The consumption of poultry meat increased by six per cent from 2016. The consumption has now been increasing for more than ten consecutive years. The consumption of beef also increased slightly – by around one per cent from the previous year. In contrast, the consumption of pork decreased by almost four per cent from the previous year. In 2017, an average of 19 kilograms of beef, 33 kilograms of pork and 25 kilograms of poultry meat was consumed per capita. Lamb consumption totalled 0.7 kilograms, reindeer meat consumption 0.4 kilograms, and horse meat consumption 0.3 kilograms per capita. The meat consumption figures reported in the balance sheet for food commodities

also include bones, i.e. they are reported as carcass meat. Typically, carcass meat contains 80% of boneless meat. In addition, the cooking loss ranges from 10 to 30%, depending on the product. The weight of cooked meat is around 50% of the weight of carcass meat.

Almost 12 kilograms of eggs were consumed per capita, roughly at the level of the previous year.

Oats a popular cereal in Finland

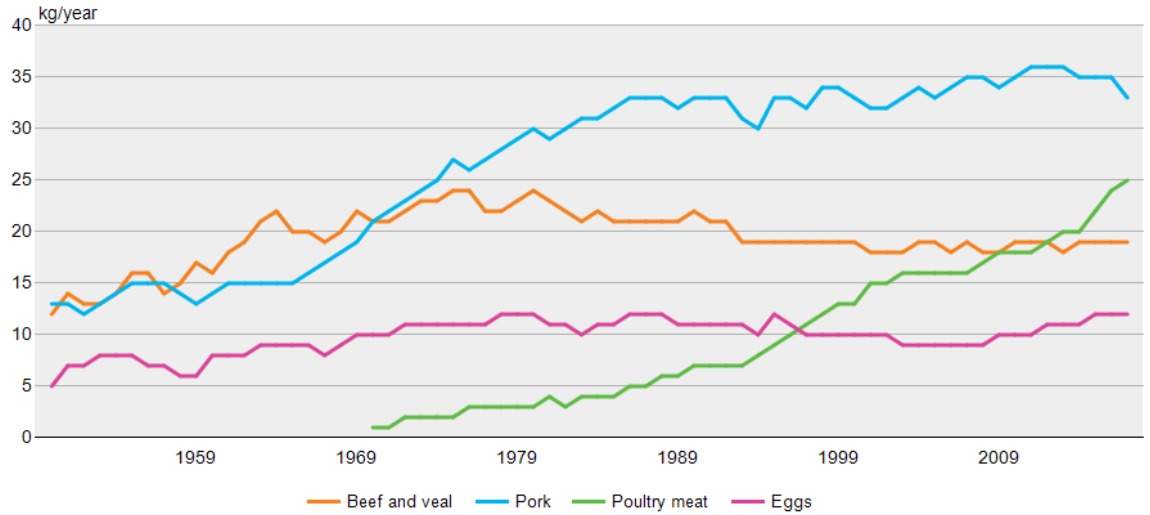
Total cereal consumption increased by just under one per cent from the previous year to 80 kilograms per capita. The consumption of oats increased by one kilogram to 7.3 kilograms and that of rice by 0.2 kilograms to 6 kilograms per capita. The consumption of wheat, rye and barley remained at the previous year's level. Wheat consumption totalled 44.5 kilograms, rye consumption 15.5 kilograms and oat consumption just under 2 kilograms.

▶ Balance sheet for food commodities

Photo: Erkki Oksanen / Luke

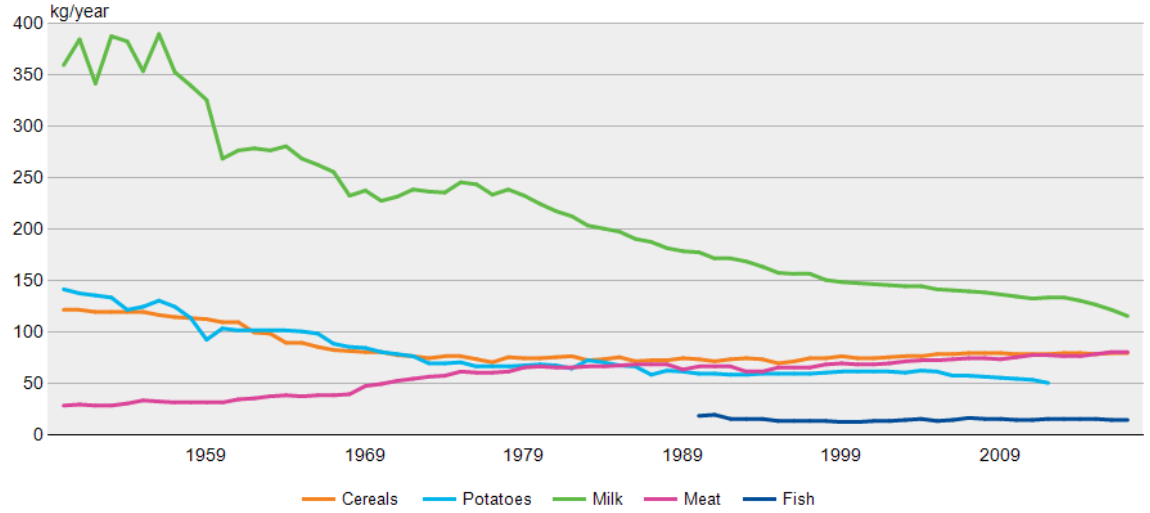
Consumption of meat and eggs per capita 1950–2017

▶ Background data as a table



Consumption of cereals, potatoes, milk, meat and fish per capita 1950–2017

▶ Background data as a table



Forest statistics

Photo: Erkki Oksanen / Luke

Forest statistics for 2017

The volume of growing stock continues to increase, but the estimated increment of growing stock decreased from the previous year due to the new calculation method.

On the basis of the NFI12 survey carried out in 2014–2017, the volume of growing tree stock in Finland totals 2.5 billion cubic metres. Compared with the previous inventory (2009–2013), the volume has increased by 117 million cubic metres. The annual increment of growing stock totals 107.0 million cubic metres, while the figure in the previous inventory was 105.5 million cubic metres. According to the latest estimate, the annual increment has slightly decreased from the estimate of 110 million cubic metres published last year. This is due to the new, more reliable assessment method adopted in 2018. The volume of decayed trees continued to increase in Southern Finland and decrease in Northern Finland.

Forest protection and biodiversity

The aim is to preserve and improve forest biodiversity with forest protection measures and by taking this goal into account in the management of commercial forests. Finland has a total of 2.7 million hectares of protected forest land and poorly productive forest land (12% of the total area of forest land and poorly productive forest land). Forest land accounts for 1.6 million hectares of this figure (7.7% of the total area of forest land). In commercial forests, biodiversity can be taken into account in forestry measures and by safeguarding habitats of special importance referred to in the Forest Act, as well as other valuable nature sites.

Total costs of silvicultural works were EUR 234 million

In 2017, the costs of silvicultural works amounted to EUR 211 million, and forest improvement costs totalled EUR 23 million. Of different work types, early and later pre-commercial thinning and improvement of young stands generated the highest costs, i.e. EUR 78 million in total. The estimated area treated with fellings totalled 688,000 hectares, of which clearcutting accounted for 144,000 hectares. Three-quarters (103,000 ha) of the forests regenerated with artificial regeneration were planted and quarter grown from seed.

Wood trade was very active in 2017

Real stumpage prices of industrial roundwood have remained relatively stable in recent years. In 2017, the real stumpage prices of roundwood slightly decreased from the previous year but showed signs of increasing towards the end of the year, when prices converted by using wholesale price index. Energywood prices also decreased compared with the previous year. Both industrial and energywood trade were more active than the previous year.

Removals and drain reached record-high levels

Wood demand continued to remain high in the forest industry in 2017 and resulted in industrial roundwood felling hitting a new record of 63 million cubic metres. A total of nine million cubic metres of roundwood was also harvested for energy production, meaning the total volume of harvested

roundwood amounted to 72 million cubic metres. The total drain of roundwood increased to 87 million cubic metres, around 20 million cubic metres less than the annual increment of growing stock.

Increased removals and wood prices improved the profitability of forestry

In terms of non-industrial private forestry, gross stumpage earnings continued to grow in 2017. The earnings of private forest owners totalled EUR 1.9 billion and those of forest industry operators and the state EUR 0.3 billion in total. In real terms, the operating profit in non-industrial private forestry increased by seven per cent to EUR 126 per hectare. This result was almost 17% higher than the average for the preceding ten-year period. The increase in real stumpage prices increased the real investment returns on wood production in private forests to 6.4% when prices were converted using the cost of living index. This is 2.5 percentage points higher on average than in the ten previous years.

Consumption of domestic roundwood by the forest industries record high

Roundwood consumption in Finland amounted to 80.6 million solid cubic metres in 2017. Most of this (69.7 million cubic metres) was used to manufacture forest industry products. Of the roundwood consumed by the forest industries, almost 90% (62.2 million cubic metres) originated in Finland, the highest amount so far. The consumption of solid wood fuels also reached a new record: 26.9 million solid cubic metres. Of this, 10.9 million cubic metres was roundwood, of which 6.5 million cubic metres was used as fuelwood in small-scale housing and 4.4 million cubic metres was burnt as forest chips manufactured from stemwood in heating and power plants. The consumption of forest industry by-products, wood residues, wood pellets, and recycled wood amounted to 16 million cubic metres.

Forest industry growth driven by paperboard, pulp and sawn goods

Forest industry production continued to grow in 2017, but the demand varied between the main product categories. The production of sawn goods and pulp increased by three per cent from the previous year, and paperboard production reached a new record high at 3.6 million tonnes. However, the downward trend in paper production continued and decreased by a fifth compared with the average for the previous ten years. Domestic forest industry investments amounted to just over EUR 0.9 billion. New investments especially in the production of chemical pulp and paperboard and strong export demand improved the profitability of the chemical forest industries. The profitability of the wood-products industries remained at the previous year's level.

Paper still the most important export product in forest industries

The value of exported forest industry products totalled nearly EUR 12 billion in 2017. Finland's goods exports amounted to almost EUR 60 billion, of which forest industry products accounted for 20%. The value of the pulp and paper industries' exports was just over nine billion euros and decreased by two per cent from the previous year. Exports in the wood-products industries totalled almost three billion euros and increased by six per cent from the previous year. Wood imports decreased by more than one-tenth from the previous year. Finland imported 8.7 million cubic metres of wood in 2017.

Key figures for the Finnish forest sector in 2017

Volume of growing stock on forest land and poorly productive forest land

2,473 million m^3

50% pine, 30% spruce and 20% deciduous trees

Annual increment of growing stock on forest land and poorly productive forest land

107 million m^3

Nearly double compared with the 1950s level

Artificial regeneration per year

103,500 ha

77% planted, 23% sown

Protected forests

2.7 million ha

12% of all forest land and poorly productive forest land

Roundwood removals

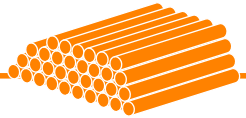
72.4 million m^3

+3% from 2016

Gross stumpage earnings

EUR 2.2 billion

+2% from 2016*



Roundwood consumption in forest industries

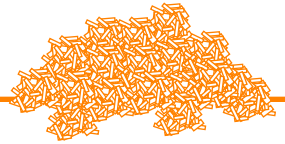
69.7 million m^3

of which 90% domestic wood

Labour force in the forest sector

59,000 persons

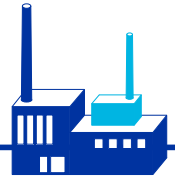
2% of the total labour force in Finland



Wood in energy generation

100.4 TWh

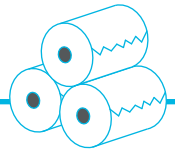
27% of total energy consumption



Forest industries' turnover from domestic operations

EUR 29.8 billion

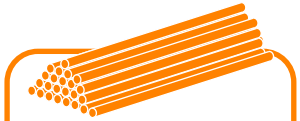
22% of the total turnover in the industrial sector



Export in the forest industries

EUR 12.1 billion

20% of total Finnish goods exports



Wood imports

8.7 million m^3

-11% from 2016

* Deflated using wholesale price index

Forest resources

Statistics on forest resources are based on the National Forest Inventories (NFI) performed by Luke. Forest inventories have been carried out since the 1920s. The inventories gather information on the area of forest, the amount, structure and growth rate of growing stock, forest damage, as well as on the silvicultural quality and biodiversity in forests.

The 12th National Forest Inventory (NFI12) started in 2014. The inventory lasts five years, but some results have already been calculated using the measurements of the first four years (2014–2017). The earlier data is based on the 11th National Forest Inventory, whose field measurements were carried out in 2009–2013.

The measurements carried out during the four years are insufficient to achieve reliable regional results. Regional forest resource results (excluding increment) calculated using the measurements of the last five years (2013–2017) have therefore been updated in the forest resource statistics available from Luke's statistical services.

Forests cover most of the total land area

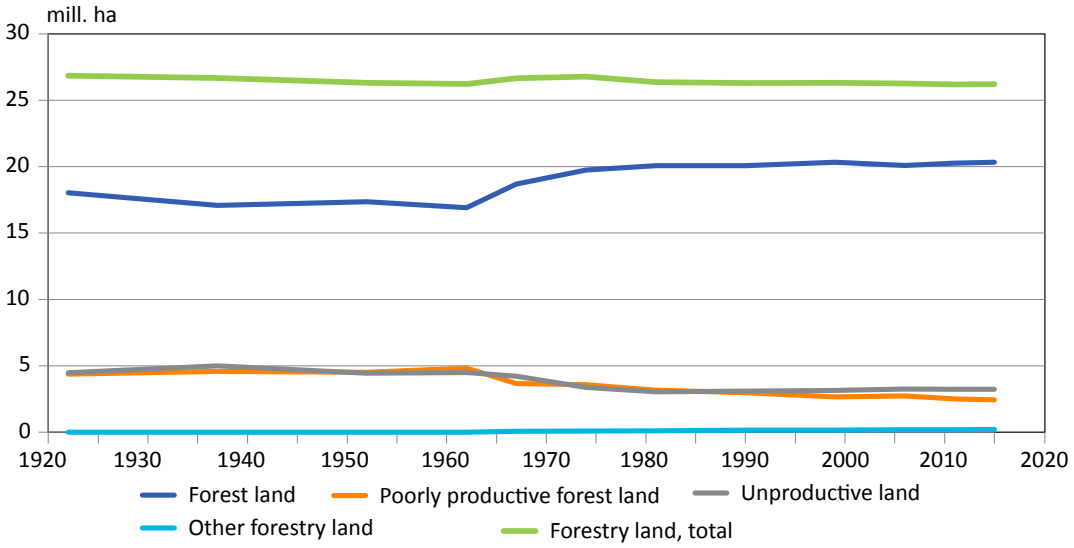
In the forest nomenclature, any land which has no special use purpose is considered forestry land; i.e. the land is not agricultural land or built-up land. Forestry land covers both land available for wood production and statutory or protected areas in which forestry activities are not allowed due to statutory reasons or decision by the owner.

Forestry land is further divided according to the productivity of the land into forest land, poorly productive forest land, and unproductive land. Forestry land also covers other forestry land, such as forest roads and permanent storage depots for timber.

Forestry land accounts for 86% of the total 30.4 million hectare land area of Finland. Most of this area (20.3 million ha) is forest land. Poorly productive forest land accounts for 2.5 million, unproductive land 3.2 million, and other forestry land 0.2 million hectares. In Southern Finland, forestry's share of the total land area is 78%, and in Northern Finland (i.e. in the regions of Northern Ostrobothnia, Kainuu and Lapland) 95%. Due to construction and similar activities, the forestry land area has slightly decreased over the last hundred years. Forest land increased in the 1960s due to draining of peatlands, but has since remained practically unchanged. According to the latest results, the area has increased by 54,000 hectares since the previous inventory.

Land classes on forestry land 1921–2017

▶ Background data as a table



Forestry is mainly practiced in forest land areas, of which 91% (approx. 18.5 million ha) is available for wood production. In Southern Finland, the area of forest land available for wood production amounts to 97%, while in Northern Finland, the same figure is 84%. This indicates that most of the protected areas excluded from wood production are located in Northern Finland. Poorly productive forest land is mostly excluded from wood production, and removals are scarce also in non-protected areas.

Half of all peatlands are drained and are currently mainly fully drained peatland forests

The share of peatlands of all productive, poorly productive and unproductive land is 33% (8.7 million ha). Of all peatlands, pine mires account for 59%, spruce mires 24%, and open marshes 17%. In Southern Finland, the share of peatlands of total forestry land is 26% and in Northern Finland 40%.

The total area of drained peatlands is 4.6 million hectares. In Southern Finland, 75% of the peatlands are drained, while the same figure in Northern Finland is 42%. A total of 70% of all drained peatlands in Finland are currently fully drained peatland forests. In Northern Finland, the same figure is only 54%. Drained heat forests which previously were partly peatlands cover 1.3 million hectares.

Draining of new peatland areas has in practice ceased, and only drainage maintenance is performed in already drained areas. The significance of peatland forests will increase in the forestry industries in the future as drainage areas are increasingly entering the final cutting stage.

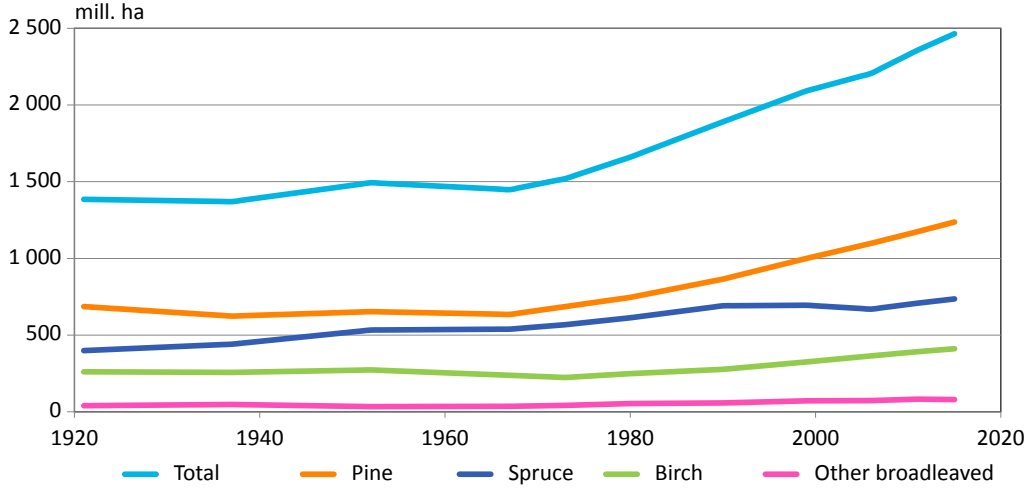
Photo: Erkki Oksanen / Luke

Volume and biomass of the growing stock continues to increase – the increase is mainly large-sized trees

The volume of tree stocks on forest land and poorly productive forest land totalled 2,473 million cubic metres, 117 million cubic metres more compared with NFI11. A third of the total increase of growing stock are trees that are at least 30 cm in diameter. The volume of trees under 20 cm in diameter has slightly decreased. The volume of pine has increased the most, but the volumes of spruce and deciduous tree species have also increased. The bi-

Growing stock volume by tree species 1921–2015

Background data as a table



omass of the growing stock (stemwood, branches, foliage, stump, roots) has increased by 76 million tonnes.

Half of the growing stock is pine, while spruce accounts for 30% and deciduous tree species (mainly birch) a fifth. 44% of the growing stock are trees under 20 cm in diameter, 36% have a diameter of 20–30 cm, while a fifth are over 30 cm in diameter. A total of 90% of the total growing stock volume is located on land available for wood production. Of the total growing stock, 76.5% grow in heath forests and 23.5% in peatlands.

The volume of the growing stock is 1.7 times higher than the level in the 1960s, because since that time, the annual increment has increased clearly more than removals. The volumes of pine and deciduous tree species have nearly doubled, while the volume of spruce is nearly 1.3 times higher. The volume of trees over 30 cm in diameter is now 2.2 times the volume in the 1960s.

The average volume of growing stock in the forestry land area is now 118 cubic metres per hectare, while in the late 1960s it was only 77 cubic metres. In heath forests, the volume of growing stock totalled on average 120 cubic meters and in peatlands 112 cubic meters per hectare.

Annual increment of growing stock still on the rise

The annual increment of growing stock on forest land and poorly productive forest land totals 107.0 million cubic metres. Compared with NFI11, there is an increase of 1.5 million cubic metres. The increment of pine has in-

Annual growth and drain of tree stocks 1921–2017

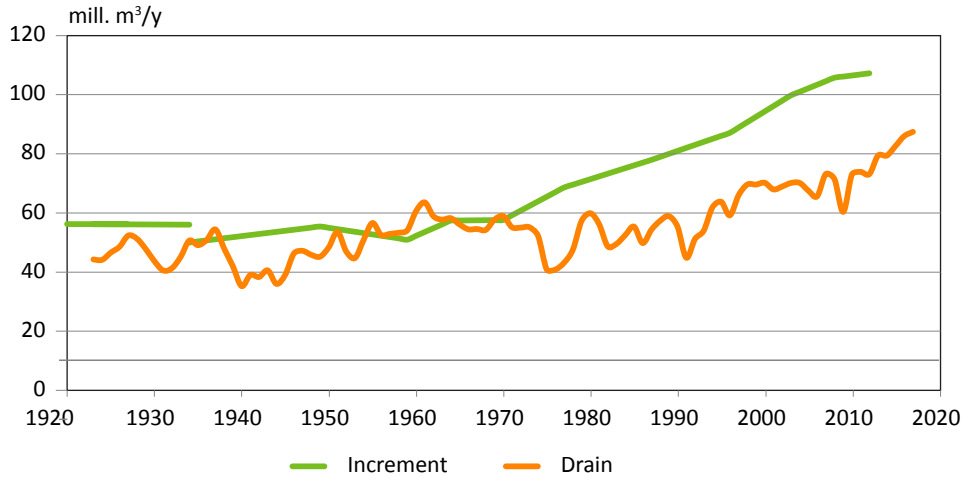


Photo: Erkki Oksanen / Luke

creased the most, and the increment of spruce and birch has also slightly increased, but the increment of deciduous trees has decreased. The annual increment on forest land totals 105.2 million cubic metres, i.e. on average 5.2 cubic metres per hectare.

According to Luke's statistics concerning total roundwood removals and drain, the annual drain in 2013–2017 totalled on average 82.7 million cubic metres, which is 77% of the latest increment results.

The annual increment of growing stock took a clear upward turn in the 1970s and is now almost double the increment of growing stocks of the 1970s. The increment of pine stock has increased the most, and the increment of deciduous tree stock has also more than doubled. The increment of spruce stock is now 'only' 1.4 times the level in the 1970s, but the large share of spruce in forest regeneration will likely increase the annual increment of spruce in the future.

The increase in the annual increment is mainly due to the drainage of peatlands, improved forest management activities and age structure of forests. There is now a growing number of young, 30–60-year-old, forests which are at their fastest growing stage and have large volumes of growing stock. The area of understocked forests has clearly decreased since the 1970s. Global warming has also accelerated the increment in growing stock. Over the last five years (2013–2017), forests have annually generated in excess of 20 million cubic metres of growing stock more compared with the volume removed or drained through natural processes.

Volume of dead trees increases in Southern Finland and decreases in Northern Finland

The volume of dead trees, which are important for biodiversity in forests, has increased in Southern Finland, totalling on average 4.4 cubic metres per hectare of forest land. In Northern Finland, the volume of dead trees has decreased compared with the previous inventory, but it is still higher than in Southern Finland, totalling 7.2 cubic metres per hectare.

- Website of the National Forest Inventory (NFI)
- Forest resources on Luke's statistical services
- Forest resource tables in the statistics database

Mean volume of dead trees on forest land

Background data as a table

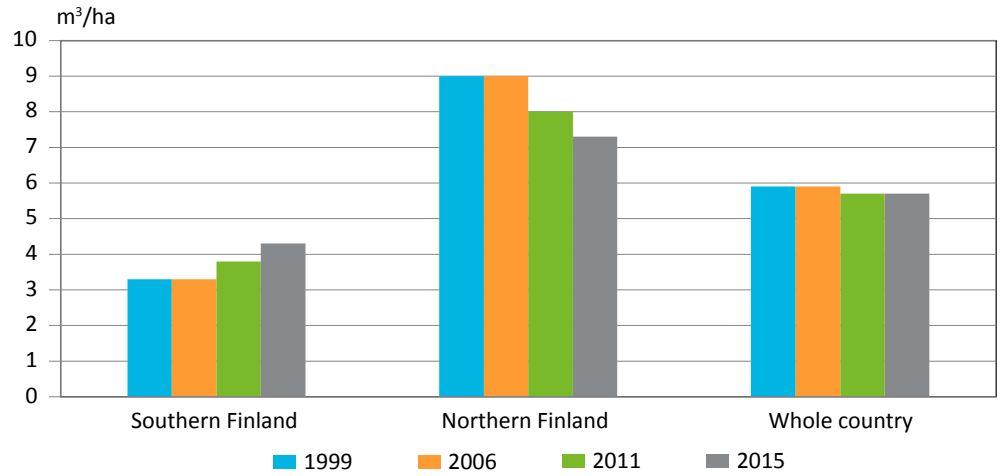


Photo: Erkki Oksanen / Luke

Forest protection and biodiversity

Finland has a total of 2.7 million hectares of protected forest land and poorly productive forest land (12.0% of the total area of forest land and poorly productive forest land). Forest land accounts for 1.6 million hectares of this figure (7.7% of the total area of forest land). Protected areas consist of statutory protected areas and biodiversity conservation sites in commercial forests.

Preserving and improving the biodiversity of forests is also taken into account in the management of commercial forests by, for example, safeguarding habitats of special importance according to the Forest Act and other valuable nature sites. From the point of view of enhancing forest biodiversity, the principle in removals and other forest management activities is to save deciduous trees, retention trees, decayed trees, and favour mixed forests and other activities promoting biodiversity.

Latest statistics compiled in early 2016

The latest statistics are based on the situation at the beginning of 2016. The definition of 'forest' used in the statistics is based on the combined area of forest land and poorly productive forest land. There are also separate statistics for forest land, and statistics that also cover protected water bodies.

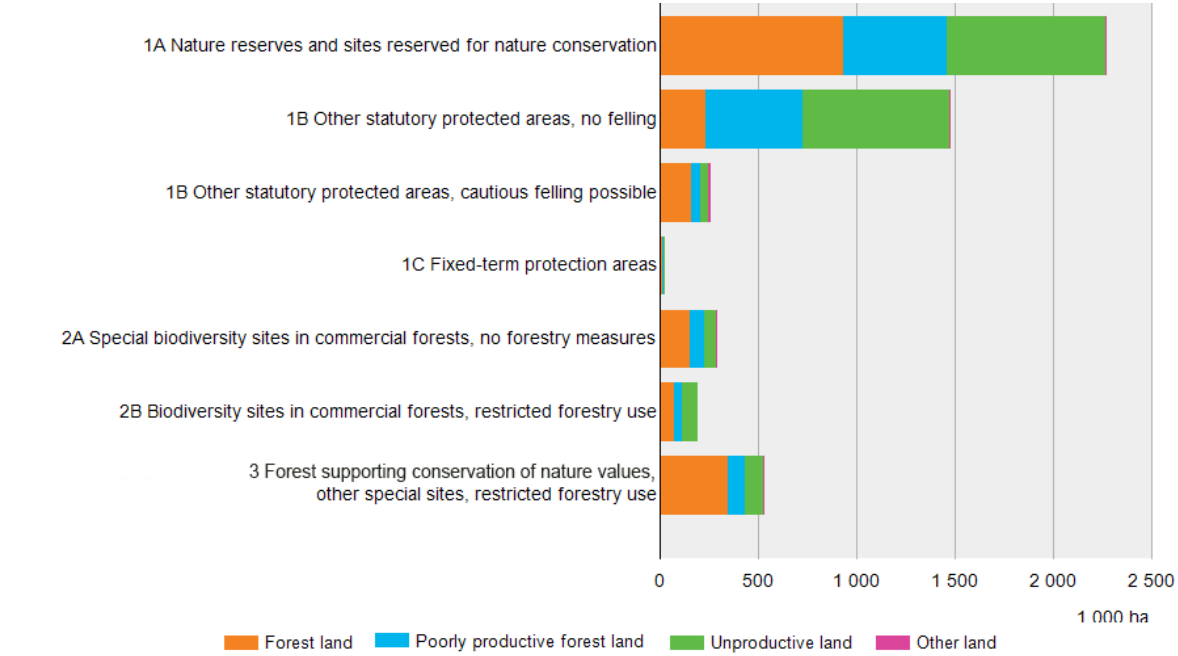
For statistical purposes, protected forests are classified into two main categories: 1. statutory protected areas and 2. biodiversity conservation sites in commercial forests. The statistics also cover 3. areas supporting conservation of nature values. These, however, are not regarded protected areas in the statistics. Further information about the classifications and background data are available from the provided infographics and from the website for the relevant statistics.

Statutory protected areas

Statutory protected areas encompass a total of 2.4 million hectares of forest land and poorly productive forest land, of which 1.3 million hectares is forest land. They cover 10.6% and 6.6% of the corresponding total areas, respectively.

Protected areas, biodiversity conservation sites in commercial forests, and areas supporting conservation of nature values on 1 January 2016

▶ Background data as a table



Protected areas and biodiversity conservation sites in commercial forests on 1 January 2016

	ALL FINLAND				SOUTHERN FINLAND				NORTHERN FINLAND			
	Forest land		Forest land and poorly productive forest land, total		Forest land		Forest land and poorly productive forest land, total		Forest land		Forest land and poorly productive forest land, total	
	Area (1,000 ha)	%	Area (1,000 ha)	%	Area (1,000 ha)	%	Area (1,000 ha)	%	Area (1,000 ha)	%	Area (1,000 ha)	%
1A + 1B + 1C + 2A + 2B Protected forests, total	**1,553.1**	**7.7**	**2,737.2**	**12.0**	**454.7**	**4.1**	**549.1**	**4.8**	**1,098.3**	**12.0**	**2,188.1**	**19.4**
1A + 1B + 1C Statutory protected areas, total	**1,331.6**	**6.6**	**2,402.3**	**10.6**	**397.6**	**3.6**	**471.3**	**4.1**	**934.0**	**10.2**	**1,931.0**	**17.1**
1A Nature reserves and sites reserved for nature conservation	934.2	4.6	1,455.5	6.4	250.8	2.3	300.4	2.6	683.4	7.5	1,155.1	10.3
1B Other statutory protected areas - no felling	230.8	1.1	723.9	3.2	28.2	0.3	32.6	0.3	202.6	2.2	691.3	6.1
1B Other statutory protected areas - cautious felling possible	156.8	0.8	206.2	0.9	109.7	1.0	124.9	1.1	47.1	0.5	81.3	0.7
1B Other statutory protected areas, total	387.6	1.9	930.1	4.1	137.9	1.2	157.4	1.4	249.7	2.7	772.7	6.9
1C Fixed-term protection areas	9.8	0.0	16.8	0.1	8.8	0.1	13.5	0.1	0.9	0.0	3.2	0.0
2A + 2B Biodiversity conservation sites in commercial forests, total	**221.5**	**1.1**	**334.9**	**1.5**	**57.2**	**0.5**	**77.8**	**0.7**	**164.3**	**1.8**	**257.1**	**2.3**
2A Special biodiversity sites in commercial forests, no forestry measures	152.7	0.8	225.1	1.0	23.0	0.2	31.0	0.3	129.6	1.4	194.2	1.7
2B Biodiversity sites in commercial forests, restricted forestry use	68.8	0.3	109.8	0.5	34.1	0.3	46.9	0.4	34.7	0.4	62.9	0.6

The most strictly protected areas include, among others, national parks and strict nature reserves, as well as private nature reserves and areas governed by nature conservation programmes. Statutory protected areas can also cover other permanently protected areas, and in some of these sites cutting for nature management purposes or cautious cutting that does not compromise the objectives of nature conservation may be allowed. The smallest category is fixed-term protection areas.

Photo: Erkki Oksanen / Luke

Biodiversity conservation sites in commercial forests

Biodiversity conservation sites in commercial forests are found across 0.3 million hectares of forest land and poorly productive forest land (1.5% of the total area of forest land and poorly productive forest land). Of this, forest land accounts for 0.2 million hectares (1.1% of the total area of forest land).

In some of these sites selection cutting for nature management purposes or cuttings that does not compromise the nature values at the site may be allowed.

Areas supporting conservation of nature values

Areas supporting conservation of nature values include other special areas subject to forestry restrictions, such as forests designed for recreational use and special areas for reindeer husbandry and Sámi culture. Of these areas, forest land and poorly productive forest land account for a total of 0.4 million hectares, of which 0.3 million hectares is forest land. Areas supporting conservation of nature values are not considered protected areas in statistics.

Most forest protection is statutory and concentrated in the north

The majority of protected forests are located in nature reserves established pursuant to the Nature Conservation Act and in areas designated as nature reserves under nature conservation programmes adopted by the Government, as well as in wilderness reserves based on the Wilderness Act.

The majority of protected forest land and poorly productive forest land is located in Northern Finland, where protected areas amount to 2.2 million hectares, or 19.4% of the total area of forest land and poorly productive forest land. Forest land account for 1.1 million hectares of this (12% of the total area of forest land). Southern Finland has approximately 0.55 million hectares of protected forest land and poorly productive forest land (4.8% of the total area of forest land and poorly productive forest land). Forest land accounts for 0.45 million hectares of this figure (4.1% of the total area of forest land). A total of 87% of protected forest land and poorly productive forest land and a total of 83% of forest land are located on state-owned land.

The METSO programme is voluntary

The area of protected areas has increased in recent years thanks to conservation measures implemented on state-owned and private land on the basis of the Forest Biodiversity Programme for Southern Finland METSO, as well as land use decisions made by Metsähallitus, such as those related to natural resources planning.

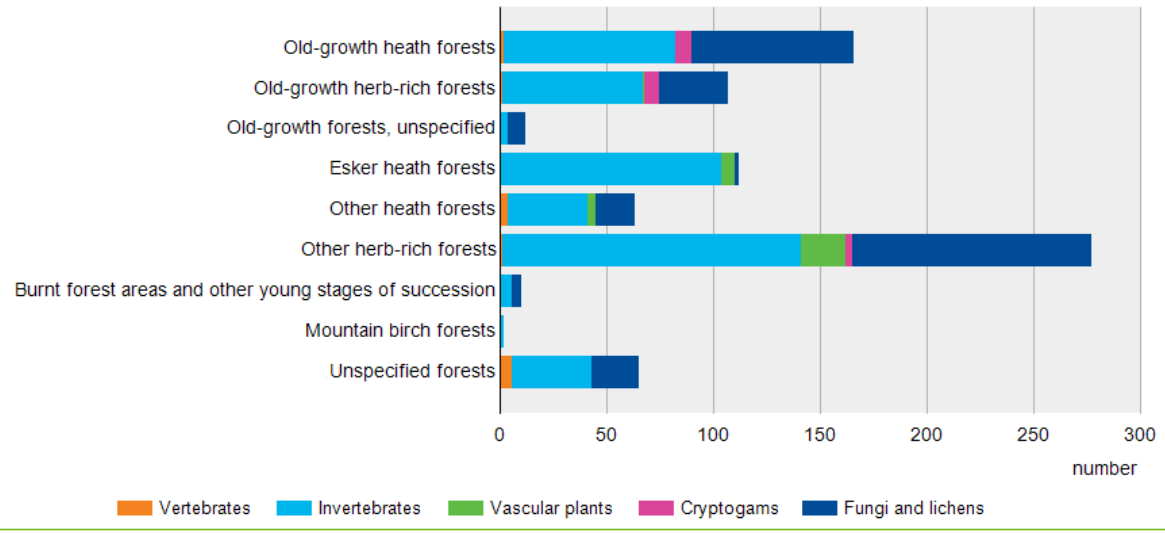
The METSO programme is based on volunteering of landowners, and it is implemented through permanent and temporary measures. Between 2008 and 2017, new conservation areas have been established on land owned by private landowners, municipalities, parishes and private corporations. In addition, a total of 64,540 hectares of state-owned land have been protected under the programme.

The Finnish Forest Centre has taken advantage of the Act on the Financing of Sustainable Forestry by imposing environmental forestry subsidy agreements on around 38,000 hectares of land and implemented nature management projects across around 4,700 hectares of commercial forest. In addition, restoration activities have been carried out particularly in state-owned forests.

The aim of the METSO programme is to expand the network of nature conservation areas by a total of 96,000

Number of threatened species by habitat 2010

Background data as a table



hectares and in addition to that to safeguard biodiversity on a total of 82,000 hectares area in private, commercially managed forests with fixed-term contracts and nature management projects by 2025. By the end of 2017, two-thirds of the conservation area goal was achieved, and half of the goal for biodiversity sites.

More than a third of threatened species in Finland are forest species

The fourth evaluation of threatened species in Finland was completed in 2010. According to the results, there are approximately 45,000 species in Finland, of which less than half are known well enough to assess whether they are endangered. A total of 2,247 species were classified as endangered, and of these, forest is the primary habitat for 814 species and peatlands for 104 species.

Almost half the endangered forest species live in herb-rich forests, and just over one-third in old forests. Compared with earlier evaluations, the number of evaluated and threatened forest species has increased.

Biodiversity of commercial forests is promoted through a variety of measures

Forest protection is not alone enough to prevent deterioration of biodiversity in forests. Therefore, the aim is to also avoid activities threatening biodiversity in the management of commercial forests, as well as to enhance structural characteristics that are important in terms of biodiversity. As felling volumes increase, the significance of such measures continues to increase.

The aim in commercial forests is to safeguard the habitats of special importance referred to in the Forest Act and other sites with high nature values. Sites that should be preserved include, for example, the immediate surroundings of springs, brooks and other small water bodies, herb-rich forest patches and swamps, swamps with a sparse tree stand, heathland forest islets located in undrained peatlands, steep bluffs and the forest lying directly underneath.

Biodiversity in forests and threatened species are also taken into account in removals and other forest management activities. Examples of activities promoting biodiversity include:

- retaining and increasing the number of deciduous trees, retention trees, decayed trees
- favouring of mixed forests
- ensuring diversity in tree species and age classes and forest density.

Results of nature management in commercial forests

The Finnish Forest Centre assesses each year how nature management has been taken into account in felling activities in commercial privately owned forests. In 2017:

- The characteristics of valuable nature sites were retained in 92% of cases.
- The volume of retained growing stock totalled an average of 150 cubic metres per hectare, of which six cubic metres was deadwood.
- The average size of valuable nature sites was 0.4 hectares.

Photo: Erkki Oksanen / Luke

- The volume of growing stock retained in clearcutting sites totalled on average 2.7 cubic metres and the volume of deadwood 0.6 cubic metres per hectare.

The volume of deadwood has been monitored in forest resource inventories since the late 1990s. Since then, the average volume per hectare has increased from 2.8 cubic metres to 4.4 cubic metres in Southern Finland. In Northern Finland, the volume has decreased from 9.5 cubic metres to 7.2 cubic metres per hectare.

A total of 10% of forests on forest land are dominated by deciduous tree species, and the volume of deciduous trees is at least a quarter of the area in 12% of all coniferous forests. Biodiversity is further enhanced by the fact that majority of Finland's forests have generated naturally from indigenous tree species and elements.

▶ Forest protection

▶ Forest biodiversity

▶ Forest resources

Silviculture

The total cost of silviculture and forest improvement was EUR 234 million in 2017. The cost of silvicultural works amounted to EUR 211 million, slightly more than during the previous year. However, investments in forest improvement decreased by nearly half from the previous year to EUR 23 million. The statistics for silvicultural and forest improvement works describe the areas of works carried out in forests and the associated unit and total costs. The statistics cover a wide range of work types, of which only the most important will be discussed here.

Silviculture refers to a chain of activities from forest regeneration operations through tending of young stands all the way to improvement of young stands before the next commercial felling. Forest improvement works involve far-reaching measures designed to promote the regeneration of forests, increasing wood production capacity by improving growing conditions and ensuring year-round harvesting of wood.

Early and later pre-commercial thinning and improvement of young stands generated the highest costs

Of different work types, early and later pre-commercial thinning and improvement of young stands generated the highest costs, i.e. EUR 78 million in total. The area with early and later pre-commercial thinning and improvement of young stands totalled 189,000 hectares, showing a decrease of two per cent from the previous year.

Early and later pre-commercial thinning involves the removal of competing tree species and ground vegetation and the thinning of crop-trees. The total area of early and later pre-commercial thinnings was 146,000. This is still undertaken almost exclusively manually: use of mechanical methods remained under one per cent.

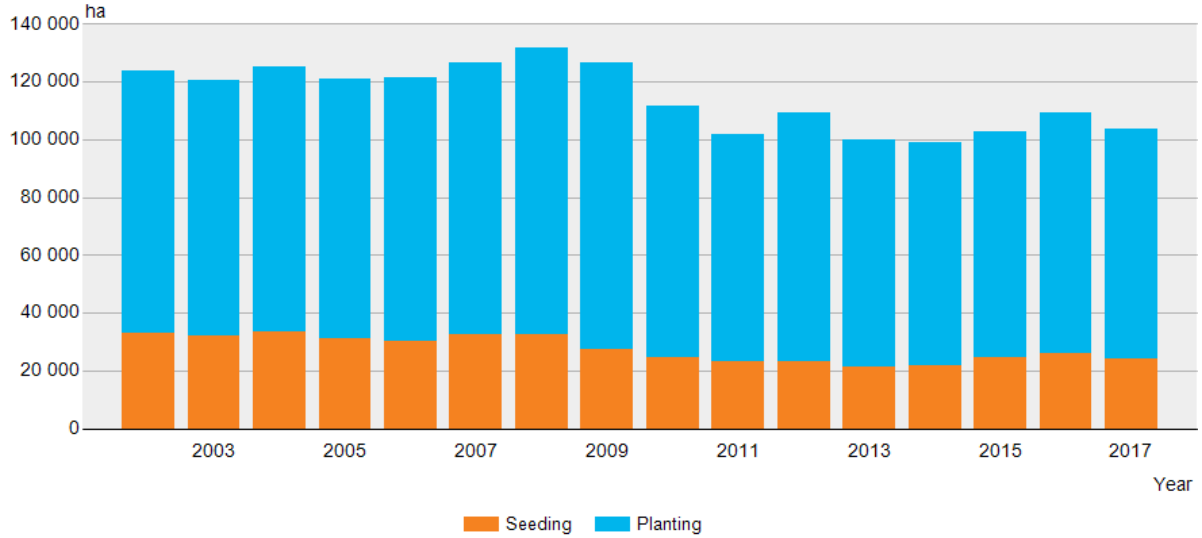
The area where there was improvement of young stands was 43,000 hectares. Improvement of young stands involves clearing and thinning stands that have become poor in quality.

Artificial forest regeneration area totalled 103,000 hectares

The cost of artificial forest regeneration was EUR 48 million. Artificial forest regeneration means cultivating a new generation of trees either by seeding or planting. Of the

The area of artificial regeneration

Background data as a table



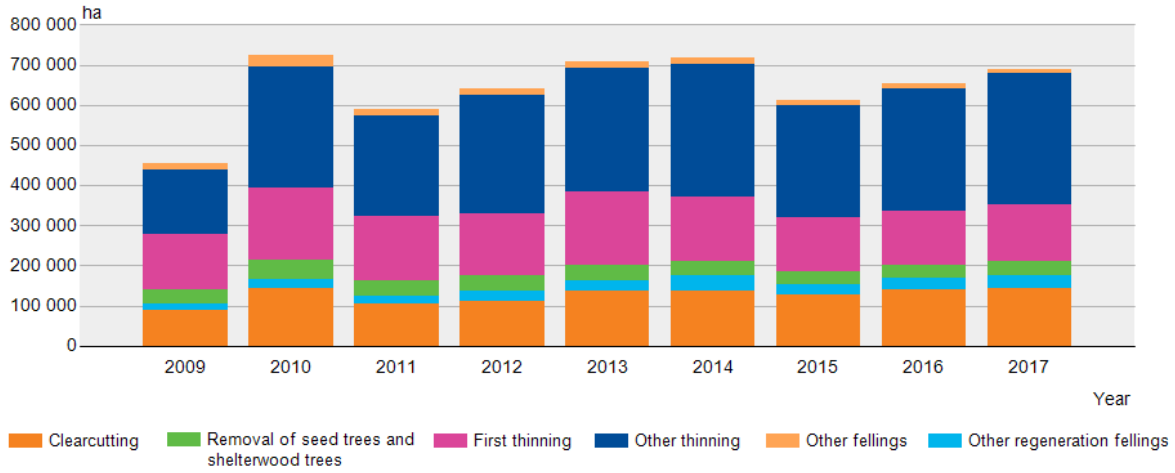
two cultivation methods, planting is clearly more popular than direct seeding. Seeding only accounted for 13% of total artificial forest regeneration costs.

The area of artificial regeneration amounted to 103,000 hectares, five per cent less than the previous year. Of this area, 79,000 hectares were planted and 24,000 hectares were grown from seed. The proportion between planting and direct seeding remained at the previous year's level.

Of the forest planting area, two-thirds were allocated to spruce, and 28% to pine. Birch accounted for 5% of this area. In forest planting, use of mechanical methods has not yet increased, because almost all the forest planting area was planted manually.

In forest seeding, use of mechanical methods was common. In mechanical seeding, a new forest is typically established by spreading the seeds using a combined seeder/soil preparation machine, which enables both soil preparation and seeding at the same time. In the 2000s, the proportion of mechanical seeding increased from around 50% to the current level of around 80%. In 2017, the total area sown using mechanical seeding methods was 19,000 hectares, while the area sown manually totalled 5,000 hectares. The most common tree species regenerated by direct seeding is pine.

Area treated with fellings, based on notifications of forest use ▶ Background data as a table



The most common method of soil preparation was mounding

On naturally and artificially regenerated stands, the growth of a new generation of trees is supported by the clearing of regeneration areas and soil preparation. The total cost of these work types amounted to EUR 41 million.

The total cost of soil preparation was EUR 35 million in 2017. Soil preparation means the breaking of the soil to provide favourable conditions for the germination of tree seeds or for the growth of planted seedlings. Soil preparation was carried out across 105,000 hectares, two per cent more than the previous year. The most popular soil preparation method was mounding, which accounted for two-thirds of the total soil preparation area. Disc trenching accounted for 22%, and patch scarification for 10%

After regeneration felling, small trees can often remain at the felling site and harm the growth of the seedlings. These trees can be cleared from the stand before or after the regeneration felling. The cost of the clearing of regeneration areas amounted to five million euros, and a total of 34,000 hectares was cleared.

Forest growth and vitality can be improved by fertilisation

In 2017, the costs of forest fertilisation totalled EUR 16 million, of which two-thirds resulted from fertilisation for growth. Fertilisation for growth is considered the most effective silvicultural measure in terms of economic profitability on certain sites. The area treated with fer-

tilisation for growth was 35,000 hectares. The purpose of remedial fertilisation is to improve the balance of soil nutrient levels. The area treated with remedial fertilisation was 15,000 hectares.

The area treated with fellings was 688,000 hectares

The area treated with fellings was estimated at 688,000 hectares. The statistics for the area treated with fellings are based on notifications of forest use, which forest owners must submit before the start of the planned fellings. The notification is valid for three years of the date of lodging, so the fellings notified may not be carried out during the same year as reported in the statistics. Furthermore, the notification does not obligate the reporter to perform the planned fellings. Despite this, notifications of forest use reflect the implemented fellings well.

Felling aimed at thinning or the removal of seed trees and shelterwood trees accounted for 73% (502,000 ha) of the total area treated with fellings. The regeneration felling area was 176,000 hectares, of which clearcutting accounted for 144,000 hectares. With regard to forest regeneration, clearcutting was clearly more common than natural regeneration (natural regeneration fellings amounted to 32,000 hectares).

Changes to the compilation of statistics for silviculture and forest improvement

The statistics for silviculture and forest improvement include work carried out on private, commercial and state-owned forests. Since 2015, the statistics have not included work carried out independently by forest owners in their own forests, as it is not recorded in the statistics from material collected from forest service providers.

The statistical classifications for different types of silvicultural work were revised in 2015. The purpose was to simplify the classification system and to react to developments in silvicultural techniques. This meant dropping certain rarely used activities (such as pruning) from the statistics and combining statistical subcategories. For example, afforestation of arable land and supplementary planting of seedling stands are now included in planting. To react to the increasing mechanisation of silvicultural works, they were divided into manual and mechanical works. The changes made have made comparisons with earlier statistics slightly more difficult.

Volume and costs of silvicultural and forest improvement works

The table below shows the volumes and costs of the most important silvicultural works. A more detailed breakdown of costs can be found on the statistics website.

▶ Silvicultural and forest improvement work

Volume and costs of silvicultural works in 2017.

	Volume, 1,000 ha	Unit cost, EUR/ha	Total cost, EUR million
Clearing of regeneration areas	34	153	5.2
Initial clearing of intermediate felling areas	71	272	19.4
Soil preparation	105	336	35.3
Direct seeding	24	252	6.0
Planting	79	534	42.0
Early and later pre-commercial thinnings	146	403	58.4
Improvement of young stands	43	460	19.4
Fertilisation	50	319	16.0
Repelling root-rot disease	111	85	9.4
Forest improvement work	.	.	23.0

The statistical survey included separate questions for unit costs and total costs by type of work, which is why the volume of work multiplied by the unit cost does not necessarily add up to the total cost.

Wood trade

Wood trade picked up in 2017. The trade of industrial roundwood increased by five per cent from the previous year, and the trade of energywood by more than a quarter. The real stumpage prices for industrial roundwood decreased from the previous year in real terms but showed signs of increasing towards the end of the year. The prices of all energywood species also dropped.

Luke compiles statistics for wood purchased from non-industrial private forests

The wood trade statistics contain data on wood purchased by the forest industry from non-industrial private forests through standing sales or delivery sales. The majority of wood from non-industrial private forests is purchased through standing sales. Standing sales involve the buyer felling and transporting the wood to a roadside storage area, and the wood is charged for according to stumpage prices. Delivery sales involve the forest owner felling the trees and transporting the wood to a location along a long-distance delivery route. The roadside price includes a charge for the harvesting involved.

Luke compiles statistics for both industrial and energywood trade. The main focus in the statistics is on the prices of wood, but they also contain information about the volume of wood purchased.

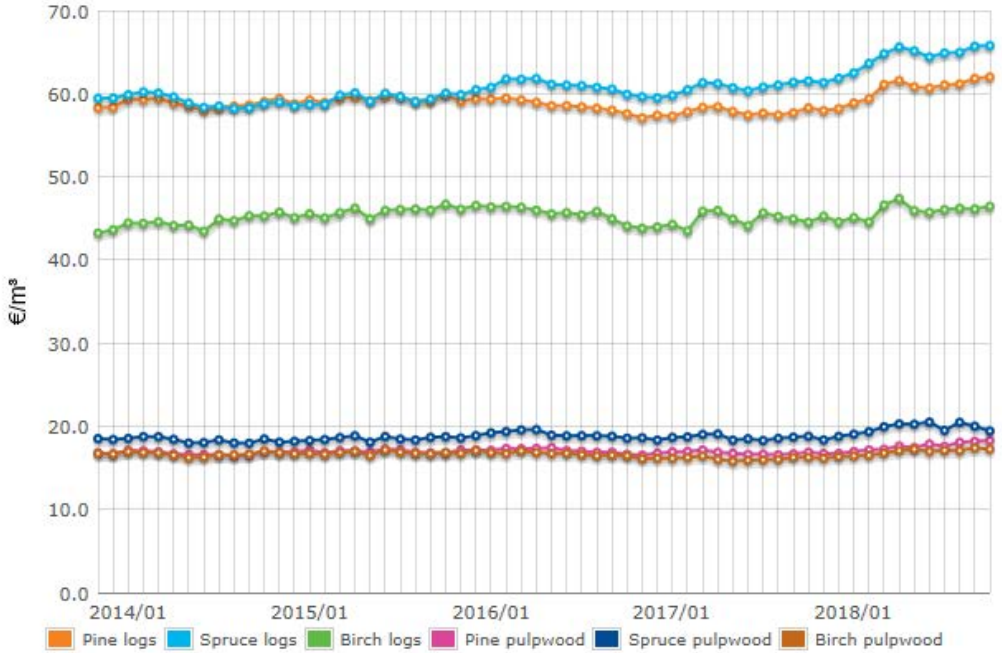
Industrial roundwood trade covers all wood purchased from non-industrial private forests intended for the manufacture of forest industry products. Energywood trade encompasses wood purchased for making forest chips, which can be used to fuel heat and power plants. Statistics for energywood trade have been compiled since 2014.

The prices of industrial roundwood started to increase in 2018

The wood price changes are discussed here in real terms, but the prices given in the statistics database of Luke are nominal values.

Real monthly stumpage prices of roundwood from non-industrial private forests (deflated using wholesale price index)

▶ Link to release



Stumpage prices by roundwood assortments in 2017.

Product	Stumpage price EUR/m³	Increase/decrease in real terms	
		compared with the previous year, %	on the average of the previous 10 years
Pine logs	54.9	-1.7	-6.4
Spruce logs	57.8	-0.5	-3.4
Birch logs	42.7	-2.0	-5.6
Pine pulpwood	15.9	-2.0	-5.1
Spruce pulpwood	17.7	-2.1	-12.4
Birch pulpwood	15.3	-3.6	-6.3

Roadside prices by roundwood assortments in 2017.

Product	Roadside price EUR/m³	Increase/decrease in real terms	
		compared with the previous year, %	on the average of the previous 10 years
Pine logs	57.8	-3.1	-6.1
Spruce logs	59.3	-1.2	-2.4
Birch logs	48.1	-2.5	-4.6
Pine pulpwood	27.7	-5.2	-12.1
Spruce pulpwood	30.1	-4.6	-10.4
Birch pulpwood	28.0	-6.4	-12.9

Real prices of industrial roundwood have remained stable in recent years but showed signs of increasing towards the end of 2017. In early 2018, the real prices of logs increased sharply. The most recent significant price peak for roundwood occurred in 2007.

In 2017, pine logs fetched an average of EUR 54.9 and spruce logs EUR 57.8 per cubic metre in standing sales. The variation in the annual average real price of pine and spruce logs has remained under two euros during the past five years. The stumpage price for spruce pulpwood was EUR 15.9 and for spruce pulpwood EUR 17.7 per cubic metre. In 2017, the real stumpage price for roundwood was lower than in the previous year. The average price of logs decreased by one per cent, and the average price of pulpwood by two per cent.

Photo: Erkki Oksanen / Luke

The price of wood is affected by the felling method

Depending on the tree species, the stumpage price of logs was EUR 7–10 and the stumpage price of pulpwood EUR 3–4 lower when harvested by means of thinning than when harvested by regeneration felling. With regard to pulpwood harvested by first thinning, the corresponding difference was EUR 6–8. In Northern Finland, the price of wood is lower than in the south.

The roadside prices of wood are on average higher than the prices in standing sales. The price difference is the largest for pulpwood, but for logs, the stumpage price and the roadside price can be quite close to one another. Depending on the tree species, the roadside price for logs is typically around EUR 2–5 higher than the stumpage price. For pulpwood, the roadside price is EUR 12–13 higher than the stumpage price.

The roundwood trade statistics are based on the wood prices written into wood trade contracts between buyers and sellers. However, wood trade can involve other conditional pricing components, or the buyer can offer, for example, certain forest services to the seller as part of the trade. Potential additional pricing components or forest services are not included in the roundwood price statistics. Some companies engaged in wood trade also offer the stem pricing alternative. However, statistics are currently only compiled for log, pulpwood and small-diameter log prices.

Wood trade was very active in 2017

Wood purchases from non-industrial private forests by the forest industry totalled 43 million cubic metres in 2017. Wood trade was active and grew by five per cent from the previous year. Half of the roundwood purchased by the forest industry was pulpwood. Of the different types of wood, spruce timber and pine pulpwood were traded the most, 11 million cubic metres each.

As wood trade figures are not rounded up to correspond to the total non-industrial private wood trade in Finland, the wood volumes recorded in statistics only represent the wood trade of companies included in the statistics. Data collection was extended in 2013 and 2016, meaning that the wood volumes recorded for those years caused a break in the homogeneity of the time series. It is estimated that the statistics cover around 90% of all industrial roundwood purchased from non-industrial private forests. This means that the roundwood purchases included in the statistics account for most non-industrial private wood trade in Finland. Data for wood trade statistics are collected from large and medium-sized forest industry companies, as well as from forest management associations.

Percentages of different felling methods of the volume of roundwood sold by standing sales in 2017.

Product	Regeneration felling, %	Thinning and first thinning
Pine logs	80	19
Spruce logs	90	9
Birch logs	77	22
Pine pulpwood	41	58
Spruce pulpwood	66	33
Birch pulpwood	48	52

The shares do not total 100%, because the felling method is unclear for a small proportion of wood sold in standing sales.

After felling, purchased wood is later also reported in the commercial roundwood removal statistics. In 2017, a total of 51.7 million cubic metres of commercial roundwood was felled from non-industrial private forests. According to the wood trade statistics, 84% of this volume was purchased from non-industrial private forests in the same year. This difference results not only from the differing coverage between the wood trade and felling statistics but also from a delay between wood trade and felling events. This means that wood trade and felling can be recorded for different years. In addition, the volume of trees marked for cutting is typically underestimated by roughly 10% in wood trade agreements.

▶ Industrial roundwood trade

Most roundwood is sold by standing sales

Standing sales accounted for 85% (36.7 million cubic metres) of non-industrial private wood trade. In standing sales, approximately half of the roundwood was logs.

Around two-thirds of wood sold by standing sales originated in regeneration fellings. Thinning accounted for 28%, and first thinning stands for 4%.

Delivery sales (6.2 million cubic metres) were mostly of pulpwood, with logs representing only 27%.

Energywood prices decreased

In 2017, an average of EUR 3.5 was paid to forest owners for energywood in standing sales and EUR 20.6 per cubic metre in delivery sales. While the average nominal prices remained at the previous year's level, in real terms they dropped by four per cent.

The average price for pruned stems sold in standing sales was EUR 4.4 per cubic metre. The average price for logging residue was EUR 3.2 per cubic metre, while unpruned stems fetched EUR 1.5, and stumps EUR 1.3. In real terms, the price for pruned stems dropped by two per cent, and the price for logging residue by five per cent compared with the previous year.

In delivery sales, the average price for pruned stems was EUR 23.3 per cubic metre, two per cent less than in the previous year. The price for logging residue dropped by three per cent to EUR 15.1 per cubic metre.

In addition to the price paid by buyers, forest owners can also receive state subsidies for their small-diameter stands paid for silvicultural works in young forests and the harvesting of small trees. Although these subsidies affect decision making concerning such stands and the financial results of the forest owners, they are not included in the statistics for energywood. In 2017, subsidies paid for eligible sites totalled EUR 430 per hectare. If the volume of pruned or unpruned stems harvested from such a site totalled, for example, 50 cubic metres per hectare, subsidies amounted to around EUR 9 per cubic metre.

Energywood trade picked up

The wood procuring organisations participating in the data collection purchased in total 3.6 million cubic metres of energywood from Finland in 2017. This corresponds to roughly half the total amount of forest chips consumed by heat and power plants. The volume recorded in the statistics returned to the levels of 2014 and 2015, more than a quarter higher than the previous year.

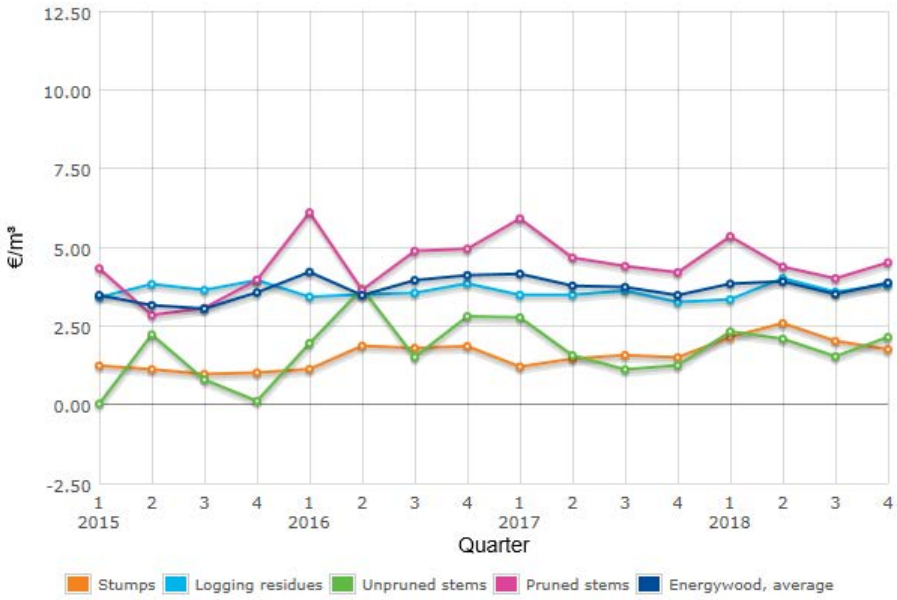
Half of all energywood purchased in 2017 was logging residues, and two-fifths were pruned stems. Unpruned stems and stumps remained at 10%. 71% of all energywood trades reported in the statistics came from standing sales. The share was 86% for logging residues and 60% for pruned stems. These figures remained almost unchanged from the previous year.

Energywood prices in 2017.

	Standing sales EUR/m³	Increase/decrease compared with the previous year in real terms, %	**Delivery sales** EUR/m³	Increase/decrease compared with the previous year in real terms, %
Average	3.54	-4	20.56	-4
Pruned stems	4.44	-2	23.27	-2
Logging residue	3.24	-5	15.08	-3
Unpruned stems	1.47	-31	19.14	-9
Stumps	1.34	-17	11.46	-18

Prices of energywood in standing sales at prices for the last quarter (deflated using the wholesale price index)

Link to release



Energywood trade

Removals and drain

Increased wood demand in the forest industry resulted in industrial roundwood felling hitting a new record high in 2017 of 63 million cubic metres. A total of nine million cubic metres of roundwood was also harvested for energy production, which means that the total volume of harvested roundwood amounted to 72 million cubic metres. This accounts for 86% of the total sustainable felling potential in Finland. The total drain of roundwood was 87 million cubic metres, which is around 20 million cubic metres less than the annual increment of growing stock.

Roundwood felling continued to increase

Wood demand continued to remain high in the forest industry in 2017 and resulted in industrial roundwood felling hitting a new record high of 62.9 million cubic metres. This volume was 1.1 million cubic metres, or 2% higher than the previous year and 17% higher than the average for the preceding ten-year period. Roundwood was also imported for industrial use. The imported volume of 8.3 million cubic metres was 12 per cent lower than the previous year.

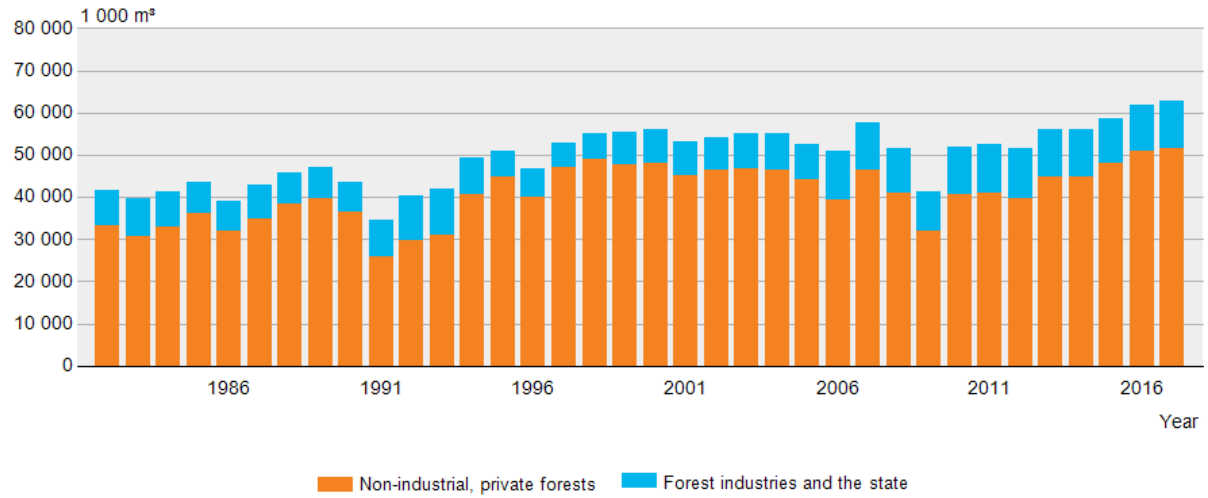
In 2017, fellings of sawlogs totalled 27.2 million cubic metres, while fellings of pulpwood amounted to 35.7 million cubic metres. The volume of logs increased by five per cent from the previous year, while the volume of pulpwood remained at the previous year's level. Compared to the previous ten years, log removals grew by a fifth, while pulpwood removals increased by 16%. Spruce accounted for the majority of log removals (14.6 million cubic metres), and pine for pulpwood removals (16.5 million cubic metres).

Four-fifths of industrial roundwood originated in non-industrial private forests

The majority (82%) of domestic wood for industrial purposes and export was sourced from non-industrial private forests, 51.7 million cubic metres in total. A total of 44.1 million cubic metres of timber, four per cent more than in 2016, accumulated from standing sales in non-industrial private forests, while the volume of delivery sales shrank by 13% to less than eight million cubic metres. The total volume of roundwood removed for the industrial sector from forestry companies' own forests and state-owned forests amounted to 11.3 million cubic metres. The figure is five per cent higher than that for the previous year.

Industrial roundwood removals by ownership category 1982–2017

Background data as a table



Highest felling volumes in Savonia and Central Finland

In 2017, the highest industrial roundwood felling volumes were reported in the regions of Southern and Northern Savonia and Central Finland. The quantity of industrial roundwood felled in Southern Savonia totalled 7.0 million cubic metres, 6.4 in Central Finland, and 6.2 in Northern Savonia.

Costs of harvesting and long-distance transportation of roundwood

In 2017, the unit cost of mechanical harvesting totalled EUR 10.59 and the unit cost of long-distance transportation EUR 8.14 per cubic metre. The wood procurement overheads of domestic roundwood delivered on-site to the factory amounted to EUR 2.78 per cubic metre. Thus, the total unit cost of wood procurement was EUR 21.51 per cubic metre. When the total felling volume of industrial roundwood is multiplied by the total unit cost, the total cost of the industrial roundwood procurement chain amounts to around EUR 1,350 million.

The total costs of the wood procurement chain, i.e. harvesting and long-distance transportation of roundwood, are based on the performance and cost data submitted by the major forestry companies and Metsähallitus. The unit price for wood procurement is the sum of the unit costs per cubic metre of wood harvesting and long-distance transportation added with the overhead costs.

Total removals exceeded 72 million cubic metres

In addition to roundwood sold to the forest industry and to the export market, the total felling volume also covers wood harvested by forest owners from their forests for their private use, as well as roundwood harvested for energy production. The volumes (million m^3) of the aforementioned categories were as follows in 2017:

Total removals	**72.4**
Roundwood, of which	**63.3**
- forest industry and exports	62.9
- wood sawn for household consumption	0.3
Energywood, of which	**9.2**
- fuelwood for small-scale housing	6.5
- forest chips for heat and power plants	2.7

The majority of the felling volume comprised logs and pulpwood harvested for raw material for forest industry products or for exports: 63.3 million cubic metres in total (87%). A total of 9.2 million cubic metres of roundwood was also harvested for energy production. Of this amount, just over two-thirds were used as fuelwood in small-scale housing and almost a third as forest chips in heat and power plants.

Photo: Erkki Oksanen / Luke

2017 was the third consecutive year in which the total felling volume increased by more than two million cubic metres, and the felling volume reached a new record high. The figure was ten million cubic metres, 17% higher than the average for the preceding ten-year period.

Logging residue and stumps were also utilised as forest chips

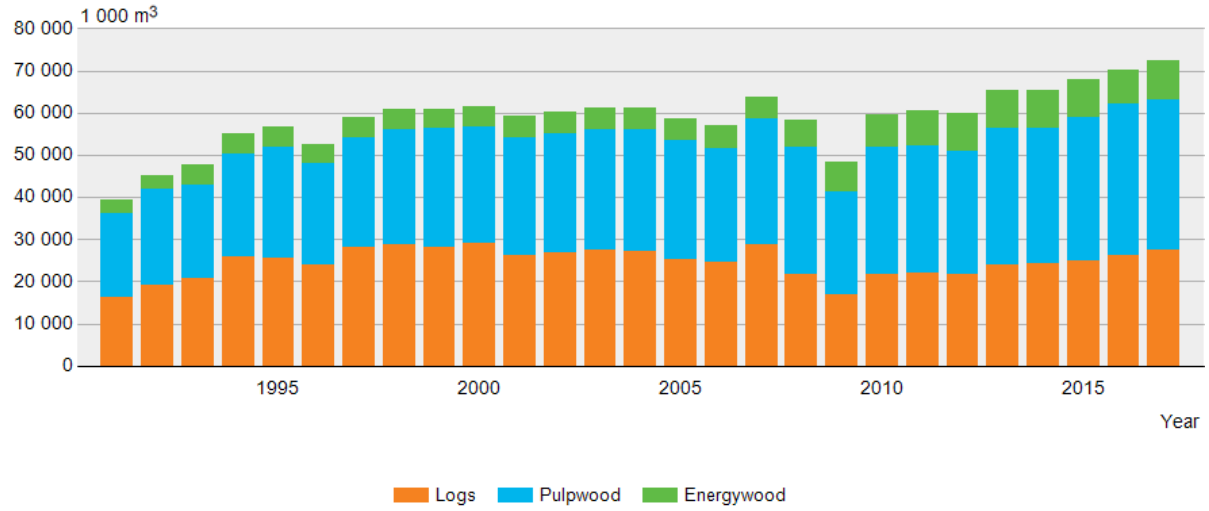
In addition to roundwood, 2.4 million cubic metres of logging residue and stumps were also harvested from forests for use as forest chips in heat and power plants. However, this volume is not included in the total felling volume, which only covers roundwood removals.

The total drain was 87 million cubic metres

The total drain is calculated by adding the roundwood left in the forests in connection with felling and the unused natural deadwood to the total felling volume. In 2017, removal waste and natural drain totalled 15 million cubic metres, meaning that the total drain increased to 87.2 million cubic metres. Most of this wood was pine (40%). Spruce accounted for 34% and deciduous trees for 26%.

Total roundwood removals 1991–2017

Background data as a table



The total drain for 2017 was two per cent higher than the previous year. In addition, it was 16% higher than the average for the preceding ten-year period.

The total volume of growing stock in forests increases when growth exceeds drain. The growth of Finnish forests has exceeded total drain every year since 1970, which means that the volume of wood has grown continuously. According to the latest surveys, the annual increment is approximately 107 cubic metres, so in 2017, the growth of forests exceeded total drain from removals and natural drain by nearly 20 million cubic metres.

Felling potential

Based on the 2013–2017 National Forest Inventory, the maximum sustainable felling potential of Finnish forests has been estimated at approximately 84 million cubic metres of roundwood per year between 2015 and 2024. Of this, industrial roundwood (i.e. logs and pulpwood) accounts for 77.2 million cubic metres. Roundwood for energy production (including fuelwood for household use) accounts for 7.1 million cubic metres. Approximately 16 million cubic metres of roundwood logging residue and stumps can also be harvested for energy production in the form of forest chips each year.

In 2015–2017, total removals of roundwood amounted to an average of 70.3 million cubic metres per year, which means that 83% of the total sustainable felling potential was utilised. Removals of roundwood in 2017 totalled around 72 million cubic metres, which means that the use rate of the total sustainable felling potential increased from the previous years to 86% (76% for logs and 93% for small-diameter trees).

Further information is available from the statistics home page

- Industrial roundwood removals and labour force
- Industrial roundwood removals by region
- Harvesting and long-distance transportation of roundwood
- Total roundwood removals and drain
- Felling potential estimates

Photo: Erkki Oksanen / Luke

Stumpage earnings

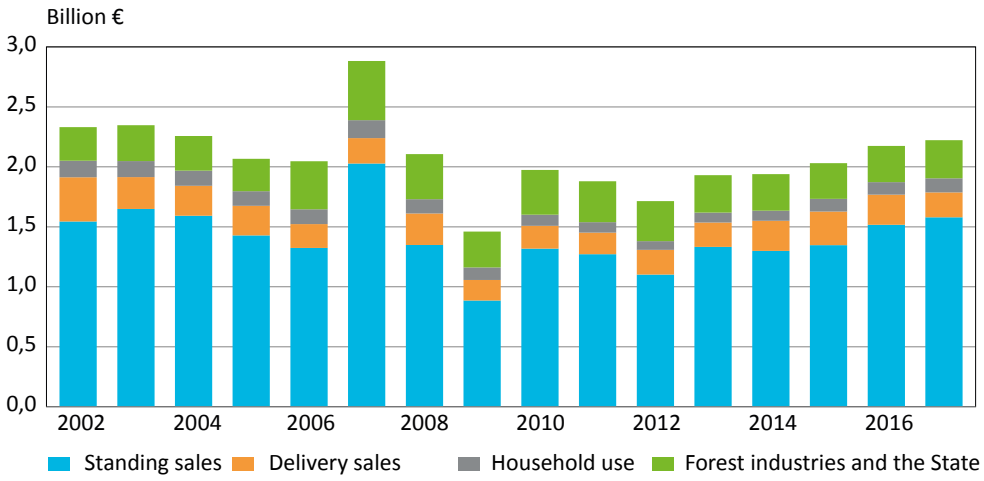
Gross stumpage earnings continued to increase in 2017. This increase was particularly attributable to the increase in the share of pine logs in standing sales and in fellings carried out by forest industry companies and the state. Spruce also maintained its position as the most important tree species in terms of earnings. Logs made up almost 70% of the earnings.

In 2017, gross stumpage earnings increased from the previous year by EUR 150 million to EUR 2.23 billion. The earnings of private non-industrial forest owners totalled EUR 1.91 billion (86%). The stumpage earnings of the forest industry and the state totalled EUR 318 million. Stumpage earnings were the highest in the same regions as the previous year: EUR 270 million in Southern Savonia and EUR 231 million in Central Finland.

Felling increased by around two per cent from the previous year. Earnings were more affected by the fact that harvesting of pine logs accounted for around 80% of the felling volume increase. Although the nominal stumpage prices increased by 1.1–4.2% from the previous year, in real terms prices decreased by 0.5–3.7%, when the inflation rate was calculated using the wholesale price index. Compared with the previous year, stumpage earnings increased by two per cent in real terms.

Gross stumpage earnings by source 2002–2017 at 2017 prices

▶ Background data as nominal prices



Stumpage earnings have continued to increase for six consecutive years

In real terms, stumpage earnings increased by 12% compared with the ten-year average. Private forest owners' earnings were up by 14%, but those of the forest industry and state fell by 1.5%.

The increase in the harvesting of pine logs increased the share of earnings from logs by one percentage point to 69%. Spruce continued to be the most important tree species for earnings, with a share of 46%. In Ostrobothnia and Northern Finland, where most forests owned by the forest industry and the state are located, pine was the most important tree species.

▶ Stumpage earnings

▶ Gross stumpage earnings by ownership category and by region 2017

▶ Gross stumpage earnings by ownership category 2002–2017

Profitability of non-industrial private forestry

The operating profit in non-industrial private forestry continued to increase in 2017 and amounted to EUR 126 per hectare. The investment return from wood production increased clearly over the long-term average to more than six per cent.

The operating profit in non-industrial private forestry improved by almost a fifth compared with the ten-year average

The operating profit of non-industrial private wood production per forest hectare increased to EUR 126 in 2017. In real terms, it improved by 7% compared with the previous year and was almost 17% higher than the average during the preceding ten-year period. This increase is particularly attributable to the increase in the harvesting of pine logs, but stumpage prices also increased when prices were converted using the cost-of-living index.

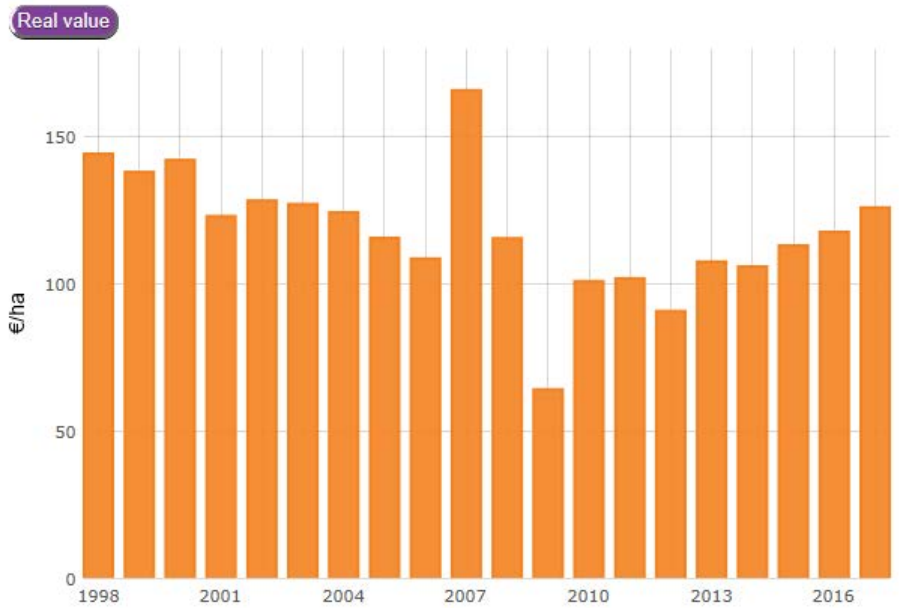
In Southern Finland, the operating profit increased by EUR 10 to EUR 165 per hectare, and in Northern Finland (Northern Ostrobothnia, Kainuu and Lapland) by EUR 8 to EUR 49 per hectare. In Tavastia Proper, Päijänne Tavastia, South Karelia and Kymenlaakso the operating profit was more than EUR 220 per hectare. In Lapland, the operating profit was EUR 32 per hectare.

The total earnings from non-industrial private wood production were EUR 143 per hectare in 2017. These earnings include gross stumpage earnings calculated on the basis of the quantity and stumpage price of wood from commercial roundwood and energywood felling and harvesting for private use.

The total cost of non-industrial private wood production remained at EUR 21 per hectare and totalled EUR 278 million, of which investments in wood production accounted for EUR 16 per hectare. These investments also include just under three euros per hectare of work performed by forest owners. Investments were one per cent lower than the average during the preceding ten-year period. State subsidies for wood production remained at four euros per hectare and totalled EUR 53 million.

Operating profit in non-industrial private forestry 1998–2017 at 2017 prices (wholesale price index)

Link to release



- Operating profit in non-industrial private forestry
- Operating profit in non-industrial private forestry 1991–2017
- Operating profit in non-industrial private forestry by region 2015–2017

Increase in the stumpage prices increased investment returns on wood production to over six per cent

In 2017, the real increase in stumpage prices (when the prices were converted using the cost-of-living index) also increased the investment returns on wood production in non-industrial private forests clearly above the ten-year average for the first time in years. The return was 6.4%. This is around two percentage points higher than in the previous year and more than three percentage points higher than in the average for the ten previous years.

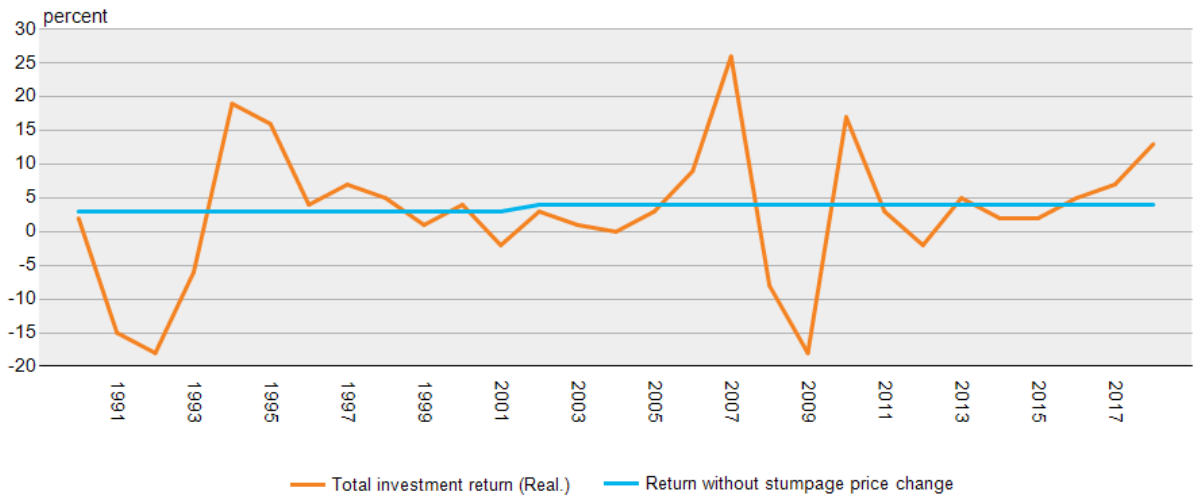
The impact of stumpage prices on the increase was 2.1 percentage points. The increase was primarily attributable to earnings from wood sales, which accounted for 4.0 percentage points. The value of net increment increased returns by 0.7 percentage points, and state subsidies for wood production by 0.1 percentage points. Wood production costs decreased total returns by 0.6 percentage points.

The investment return from wood production is a return index where the factors producing the return referred to above are divided by the value of assets. The value is calculated by multiplying the volume of standing trees by standing sales prices. In 2017, the value of non-industrial private forests, calculated using the above method, totalled EUR 45.5 billion.

- Forest as an investment
- Investment return in wood production by region 2012–2017
- Investment returnin wood production 1990–2017

Investment return in wood production 1990–2017

- Background data as a table



The last time an increase in stumpage prices had a clearly positive impact on profit was in 2010 as a result of corrective actions taken after the decline in 2009.

Wood consumption

Roundwood consumption in Finland amounted to 80.6 million solid cubic metres in 2017. The volume, however, was the fourth largest ever. The majority of roundwood (69.7 million cubic metres) was used to manufacture forest industry products. The remaining 10.9 million cubic metres was burnt in energy generation as fuelwood in small-scale housing (6.5 million cubic metres) and as forest chips manufactured from stemwood in heating and power plants (4.4 million cubic metres). A total of 25.9 million cubic metres of forest industry by-products and wood residues was used for various purposes.

Forest industries' wood consumption increasing

Of all roundwood consumed in Finland in 2017, the majority (almost 90% or 69.7 million cubic metres) was used to produce forest industry products. As a result of the positive trend in the forest industries and commissioning of new capacity, consumption of roundwood continued to grow for the fifth consecutive year. Compared to the previous year, consumption increased by three per cent. Consumption was at its highest in 2006, when it amounted to 75.5 million cubic metres. The consumption of forest industry by-products, mainly sawmill chips and dust, in the manufacture of forest industry products amounted to 9.8 million cubic metres.

Consumption of domestic roundwood record high – share of imported roundwood decreasing

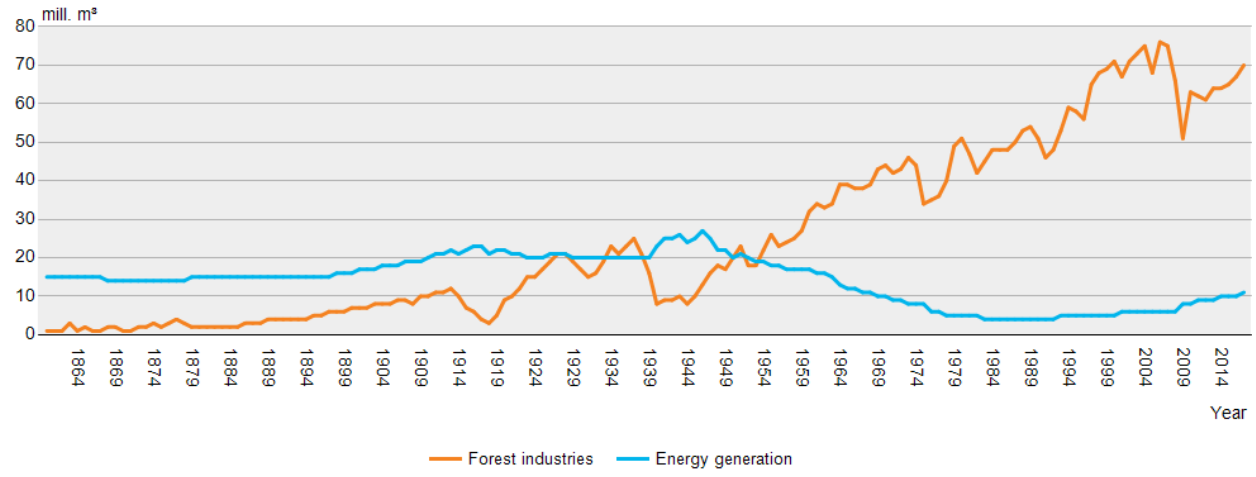
The forest industries processed a total of 62.2 million cubic metres of domestic roundwood. This amount was 3.3 million cubic metres or 6% more than in the previous year and more than ever before. Instead, the consumption of imported roundwood continued to decrease, dropping by 12% from the previous year to 7.5 million cubic metres. Domestic roundwood accounted for nearly 90% of the forest industries' total roundwood consumption, the highest ratio in nearly 40 years.

Chemical pulp industry the largest user of roundwood

The consumption of roundwood increased from the previous year in all forest industry branches and in all roundwood assortments. The most roundwood was consumed by the chemical pulp industry, i.e. 32.5 million cubic metres, the highest amount in the industry so far. Consumption by the sawmilling industry increased to 26.3 million cubic metres. The most important roundwood assortments used were pine pulpwood (17.2 million cubic metres) and spruce logs (14.4 million cubic metres).

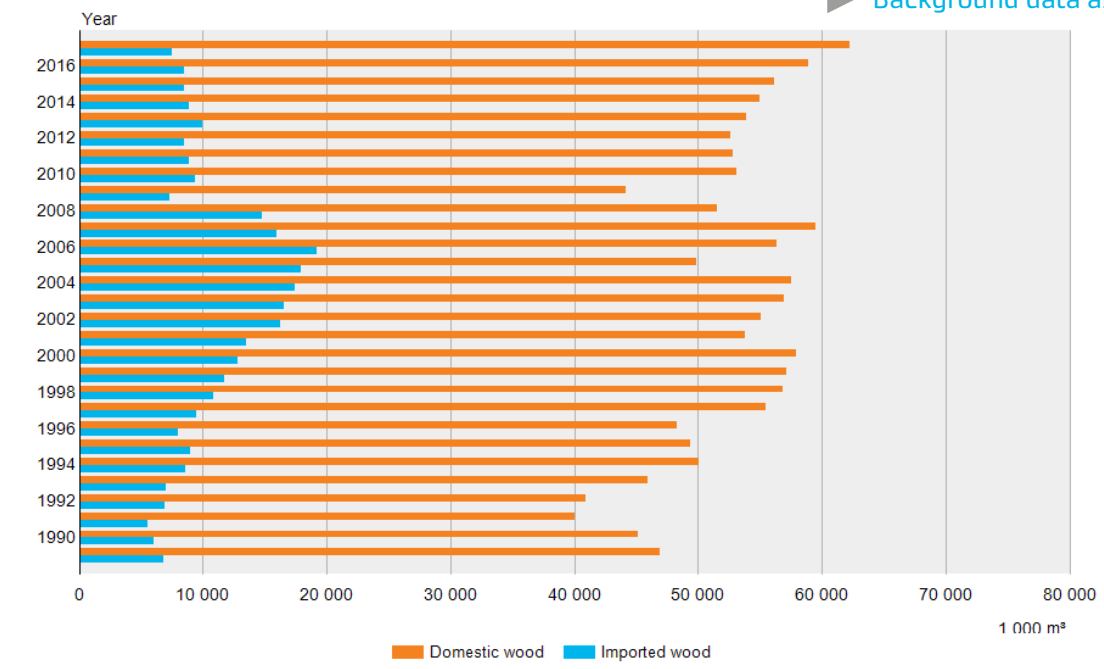
Roundwood consumption 1860–2017

Background data as a table



Forest industries' domestic and imported roundwood consumption 1989–2017

Background data as a table



Wood consumption in energy generation increased

More wood fuels were consumed in Finland in 2017 than ever before. According to preliminary data of Statistics Finland, the total consumption of wood fuels exceeded the limit of 100 terawatt-hours (TWh) for the first time. Of this, the burning of black liquor comprised 43, solid wood fuels used in heating and power plants 38, the small-scale combustion of wood 17 and other wood fuels 2 TWh. Wood fuels represented the most important energy source in Finland, accounting for 27% of total energy consumption and three-quarters of the consumption of renewable energy.

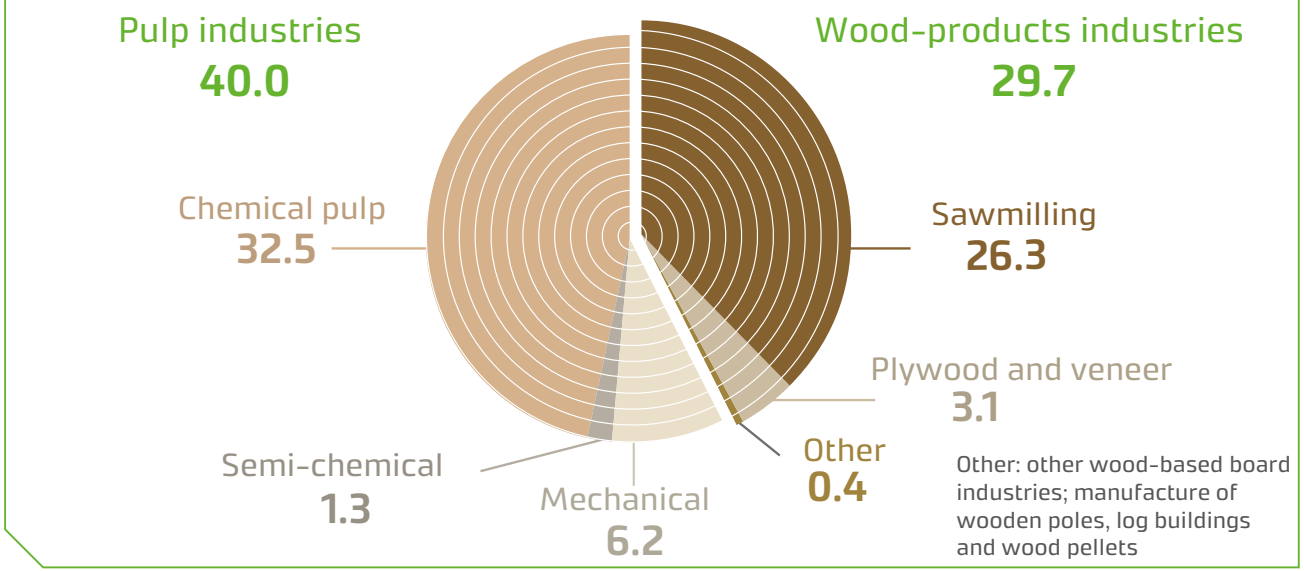
Photo: Erkki Oksanen / Luke

Solid wood fuel consumption reached a record level

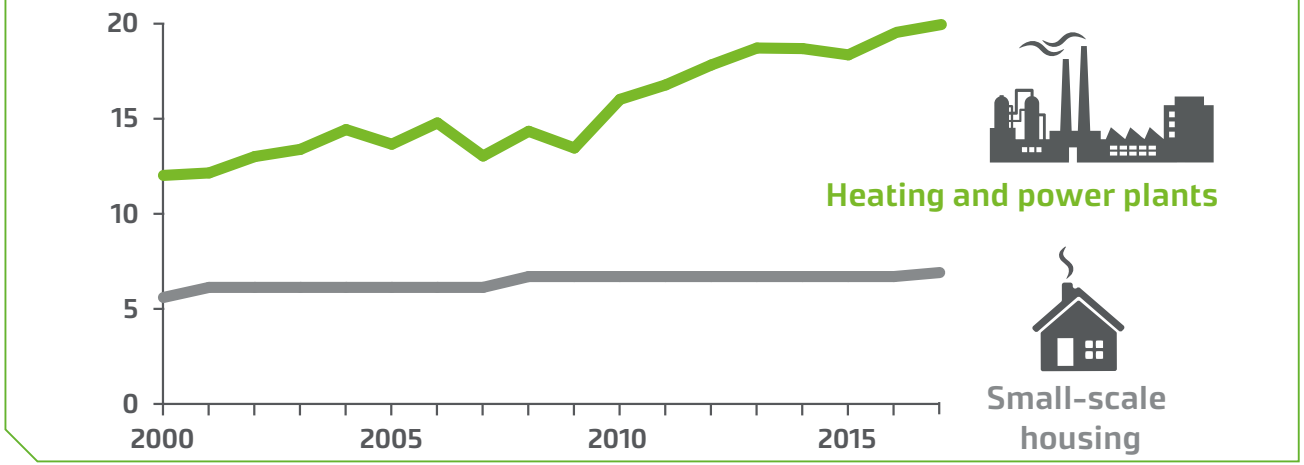
The consumption of solid wood fuels reached a new record, 26.9 million solid cubic metres. Of this, roundwood accounted for 10.9 million cubic metres, while the remaining 16.0 million cubic metres comprised forest industry by-products and wood residues, as well as recycled wood and wood pellets.

Heating and power plants consumed a total of 20 million cubic metres of wood as forest chips (7.2 million cubic metres) and as forest industry by-products and wood residues (12.8 million cubic metres). Bark comprised the most significant solid by-product. It covered two-thirds of all by-products, i.e. 7.7 million cubic metres. Small-scale housing consumed 6.9 million cubic metres of fuelwood, of which roundwood accounted for 6.5 million cubic metres while the remaining 0.4 million cubic metres comprised recycled wood, forest industry by-products and wood pellets. Fuelwood consumption in small-scale housing has increased by three per cent since 2008, when the previous statistics were compiled, and almost a quarter over a 25-year period. Of the roundwood consumed in small-scale housing, smallwood accounted for two-thirds, logwood for one-sixth and forest chips for one-tenth.

Roundwood consumption by the forest industries by branch of industry in 2017, million m^3



Solid wood fuel consumption, million m^3



Forest chips consumption falling behind target

Use of forest chips, the product planned to act as the driver of increasing renewable energy use in Finland's previous energy and climate strategy, has remained nearly unchanged in recent years, and Finland is falling behind the goals set for their use (12–13 million cubic metres in 2020). However, the goals of the new energy and climate strategy released in 2016 are high: the aim is to consume 14–18 million cubic metres of forest chips per annum in 2030, of which 3–4 million cubic metres will be used to manufacture liquid wood-based biofuels and the rest in energy generation. In 2017, a total of 7.8 million cubic metres of forest chips was burnt, three per cent less than the previous year.

- Total wood consumption
- Forest industries' wood consumption
- Wood in energy generation
- Fuelwood consumption in small-scale housing
- Energy

Forest industries

Most indicators measuring forest industry activities showed a positive trend in 2017. As in the previous year, growth was driven by paperboard, wood pulp and sawn goods. Domestic forest industry investments amounted to just over EUR 0.9 billion, indicating an increase in real terms of 15% from the average investment level during the preceding ten-year period. The profitability of the pulp and paper industries improved from the previous year, while that of the wood-products industries remained at the previous year's level.

Production still booming

In 2017, forest industry production increased by an average of three per cent compared with the previous year. Demand varied between the main product categories: the production of sawn goods, plywood, wood pulp and paperboard increased, but the long downward trend in paper, the most important product category in terms of export value, continued. The average growth rate in all manufacturing industries was five per cent.

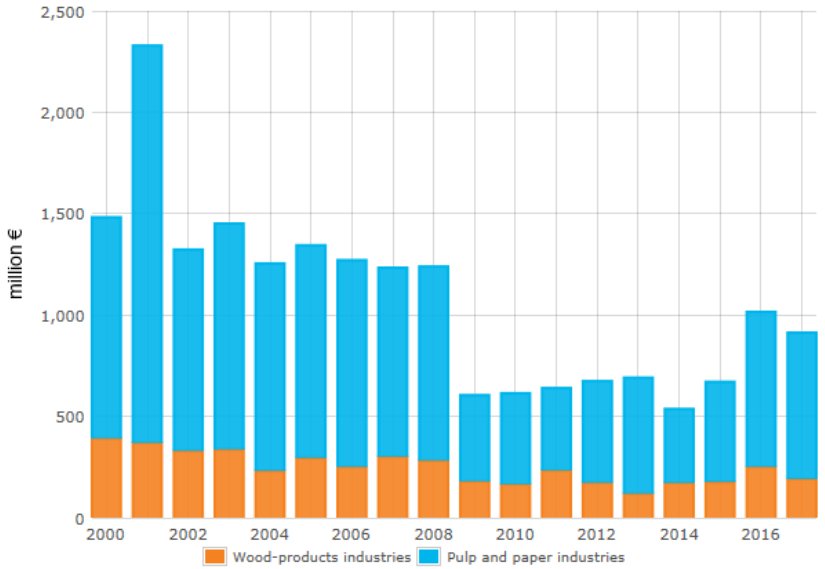
The production of sawn goods increased by three per cent to 11.7 million cubic metres. Last time this volume was exceeded in 2007. The growth was mainly attributable to increased demand in Asia, particularly in China. Domestic consumption has remained at the level of 3.2 million cubic metres in recent years. The production of plywood (1.2 million cubic metres) was nine per cent higher than in the preceding year. The share of softwood plywood has settled to a range of two-thirds.

Digitalisation, an increase in electronic trade and new consumption habits are changing the structures of the pulp and paper industries. The global demand for printing and writing paper has decreased, which is also reflected in the steady decline in production volumes in Finland throughout the 2010s. In 2017, the production of paper amounted to 6.7 million tonnes, a fifth less than the average for the preceding ten-year period. On the other hand, the production of paperboard reached a new record in 2017: 3.6 million tonnes. This represents an increase of up to a quarter compared with the long-term average. Pulp production (7.7 million tonnes) increased by 11%.

As the volumes of paper grades fall, the gross and added value of forest industry production also decreases. For

Investments of the forest industries in Finland 2000–2017
(EUR million at 2017 prices)

Background data as nominal values



Data concerning 2017 is preliminary (January 2019).

Key indicators for the forest industry in 2017.

	Unit	2017	Increase/decrease	Increase/decrease, average in
Forest industry production			2017/2016, %	2007–2016, %
Sawn softwood	million m^3	11.7	3	15
Chemical pulp	million t	7.7	3	11
Paper	"	6.7	–2	–21
Paperboard	"	3.6	9	25
Turnover of the forest industries*	EUR billion	29.8	4	21
Wood-products industries	"	6.9	2	3
Pulp and paper industries	"	22.9	4	28
Investments of the forest industries*	EUR million	913	–10	15
Wood-products industries	"	191	–24	–7
Pulp and paper industries	"	722	–6	23
Investment rate, forest industries	%	20	–3 % points	+2 % points
Profitability of the forest industries	Operating margin, %	8.1	+0.6 % points	+1.5 % points
Wood-products industries	"	4.9	+0.1 % points	+1.0 % points
Pulp and paper industries	"	9.0	+0.7 % points	+1.5 % points
Forest sector labour force	1,000 persons	58.8	–7	–16
Forestry	"	21.0	–4	–12
Wood-products industries	"	21.0	–11	–17
Pulp and paper industries	"	16.9	–3	–20
Value added, forest sector*	EUR billion	8.4	2	9
Forestry	"	3.8	2	18
Wood-products industries	"	1.3	0	–2
Pulp and paper industries	"	3.3	2	4

*Preliminary data.
Turnover, investments, profitability, and added value: increase/decrease in real terms, deflated using wholesale price index (1949=100). Investment rate: value of investments / value added at current prices in the industry (both data retrieved from national accounts). Operating margin, % = (operating income – operating costs) / operating income x 100 Sources: Statistics Finland, Finnish Forest Industries Federation and Finnish Sawmills Association.

example, in 2016, the added value of forest industry production totalled EUR 3.8 million, less than half the level in the peak year of 2000 in real terms. Forest industries invest in research and development less than other industrial sectors. In 2017, R&D investments by the forest industries amounted to EUR 95 million, representing only 0.3% of the sector's domestic turnover (EUR 29.8 billion). The average for all manufacturing industries was 1.9%.

Capacity increases in pulp and paperboard production

Forest industries make the second biggest investments after the technology industry. After the recession in the early 2010s, forest industries' domestic investments are growing. In 2017, the total investments in the sector amounted to EUR 0.9 billion, of which four-fifths were made in the pulp and paper industries. In real terms, the investments increased by 15% compared with the average for the previous ten years. This increase is mainly due to capacity increases in the pulp and paperboard industries. The investment rate of the forest industry (value of investments in relation to value added) was the same as the average for the manufacturing industry, at 20%.

Profitability of the pulp and paper industries improved

The profitability indicators of the forest industries, namely the operating margin, and net and total results, took an upward turn in 2017. However, profitability increased only in the pulp and paper industries, while the profitability of the wood-products industries remained at the previous

year's level or marginally below. New production capacities and strong demand improved the profitability of the chemical forest industries to nine per cent of the operating margin. In the wood-products industries, the operating margin remained at five per cent.

The total results for the pulp and paper industries improved by more than three percentage points to 8.5% of the operating income. In the wood-products industries, the figure was 3.5%, a decrease of 0.2 percentage points from the previous year. In 2017, the profitability of the forest industries was slightly weaker than the average in the manufacturing sector.

The financial position of both the wood-products and pulp and paper industries has improved significantly compared with previous years. While at the beginning of the 2010s, total debts in the forest industries exceeded their domestic turnover, in 2017, depts dropped to 61% of turnover. The pulp and paper industries are more heavily in debt than the sawmilling or wood-based panels industries. Another financial position indicator, the equity ratio, has also improved. In 2017, the equity ratio in the forest industries was 57%, while in manufacturing industry it amounted to 49% on average.

Forest sector labour force continues to decrease

The downward trend in both forestry and the forest industry labour force continued in 2017. The forest sector employed a total of 59,000 persons, around 4,000 fewer than in the previous year. Employment has decreased rapidly: at the turn of the 21st century, the sector employed nearly 100,000 persons.

Not even the record-high felling volumes have had positive effects on the development of forestry labour force. In 2017, a total of 21,000 persons worked in forestry, four per cent less than in the preceding year. Of the forestry labour force, around 11,000 persons were wage earners and salaried employees. The fall in employment was due to, for example, improved labour productivity and organisational changes in the forest sector, which have reduced the numbers of salaried employees in particular.

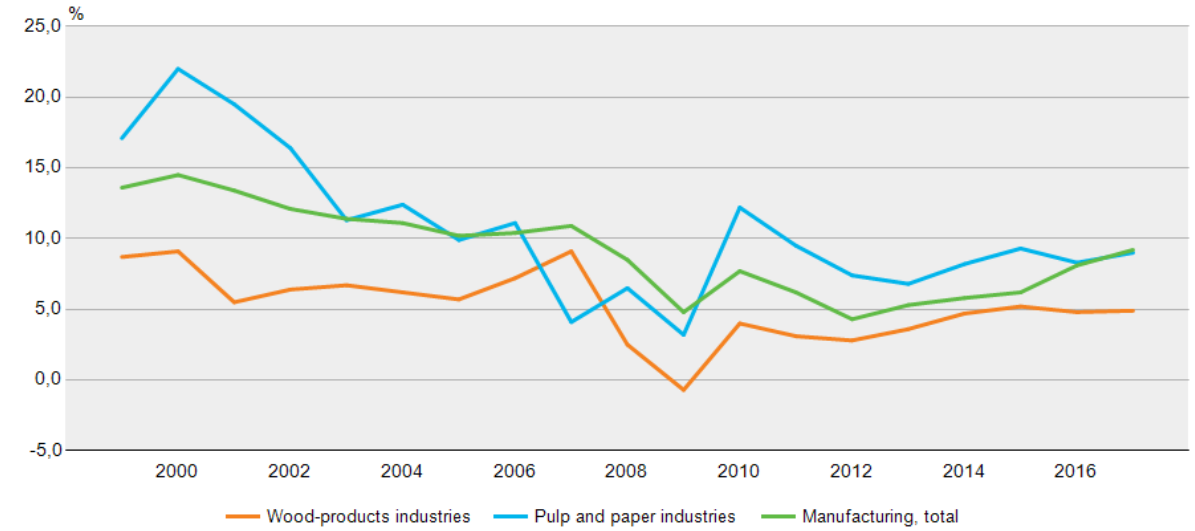
The forest industries employed a total of 38,100 persons, while the figure for the previous year was 41,000. Employment decreased particularly in the wood-products industries (by 11% compared with the previous year). In pulp and paper production, the drop was less severe (-3%). The average unemployment rate in the forest sector was 7.8%, while the corresponding average figure in the national economy was 8.6%. Data on employment in the forest sector are based on the Labour Force Survey by Statistics Finland.

▶ Forest industry

▶ Labour force in the forest sector

Profitability of the forest industries in Finland 1999–2017 (operating margin, % of operating income)

▶ Background data as a table



Foreign trade by forest industries

The value of exported forest industry products totalled nearly EUR 12 billion in 2017, i.e. roughly the previous year's level. Finland's goods exports were nearly EUR 60 billion, showing an increase of 10% from the previous year in real terms. The volume of wood imports decreased by just over one-tenth from the previous year and totalled 8.7 million cubic metres.

Paper maintained its position as the most important export product in the forest industries.

The value of exported forest industry products totalled nearly EUR 12 billion in 2017. In 2017, forest industry products accounted for one-fifth of Finland's total goods exports. The proportion of forest industry products from all exports of goods decreased from the previous year by two percentage points.

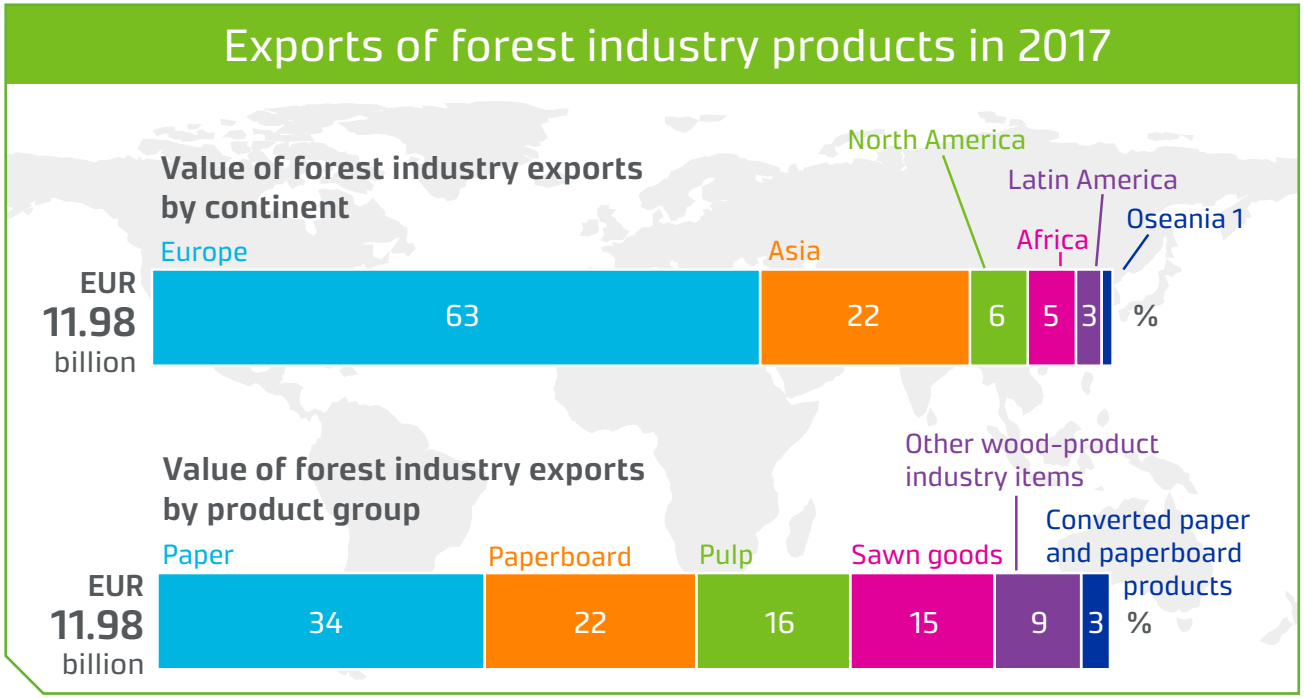
The exports value in the pulp and paper industries was slightly over EUR 9 billion and accounted for 76% of the export earnings of forest industries. In real terms, the value of exports decreased by two per cent from the previous year. Compared to the average for the previous ten years, the value of exports has decreased by three per cent. Paper exports made up just over one-third of the total export earnings of the forest industries. The total value of paper exports was a little more than EUR 4 billion, a decrease of 9% from the previous year in real terms.

The value of paperboard exports totalled EUR 2.7 billion, an increase of 5% from the previous year in real terms. The third most important export product was pulp. Its export value was nearly EUR 2 billion, an increase of six per cent in real terms.

The value of exports in the wood-products industries was EUR 2.9 billion. In real terms, it increased by six per cent from the previous year. Compared to the average for the previous ten years, exports in the wood-products industries increased by 14% in real terms. The most exported products in the wood-products industries were sawn goods at a value of EUR 1.8 billion.

The majority of forest industries' export earnings come from Europe

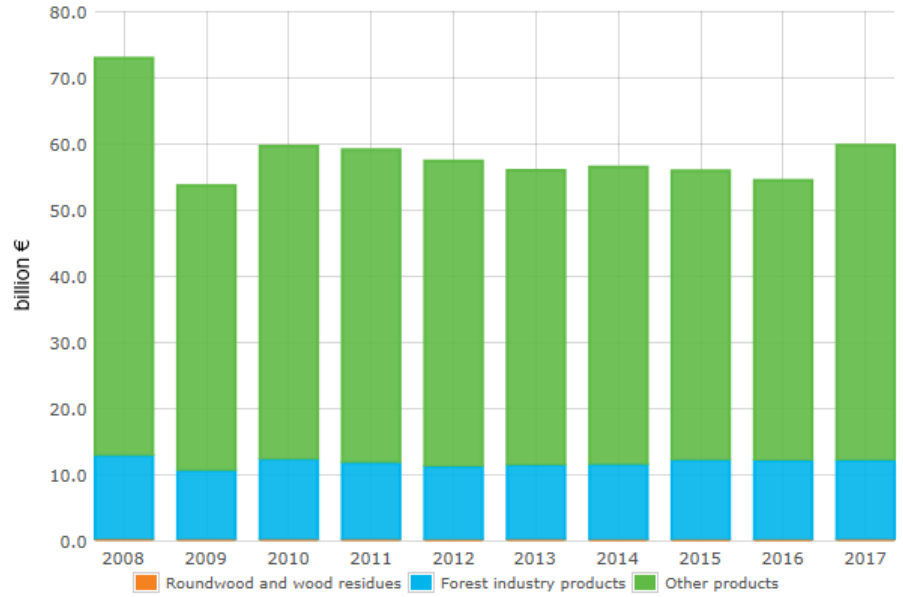
Europe accounted for 63% of total export earnings, representing a drop of three percentage points compared with the previous year. Asia's share increased to 22%. Regarding exports of paper and paperboard, Germany was Fin-



Export by country

Finland's goods exports 2008–2017 (deflated using wholesale price index)

Background data as nominal prices



Forest industry exports in the most important product groups in 2017.

		Increase/decrease in real terms, %		
	Value of export 2017 EUR billion	compared with the previous year	on the average of the previous 5 years	on the average of the previous 10 years
Finland's goods exports	**59.7**	**9.7**	**6.7**	**-0.7**
Forest industry products, of which	**12.0**	**0.2**	**4.1**	**0.6**
Paper	4.0	-8.7	-14.3	-24.2
Paperboard	2.7	5.5	19.2	26.2
Pulp	2.0	6.1	18.6	36.2
Sawn goods	1.8	5.5	20.1	26.5
Plywood	0.6	5.0	10.4	5.8

land's most important trading partner. A little more than one-third of earnings from pulp exports came from China. The highest amount of sawn goods was exported from Finland to China which comprised 18% of total exports.

Wood export volume increased

The value of wood exports totalled EUR 101 million, and the wood export volume 1.4 million cubic metres. The wood export volume increased by more than one-tenth from the previous year. The assortments with the highest export volumes were pulpwood (42%), logs (32%) and wood chips (13%). In total, 77% of all exported wood was exported to Sweden, followed by Egypt (5%) and Germany (4%).

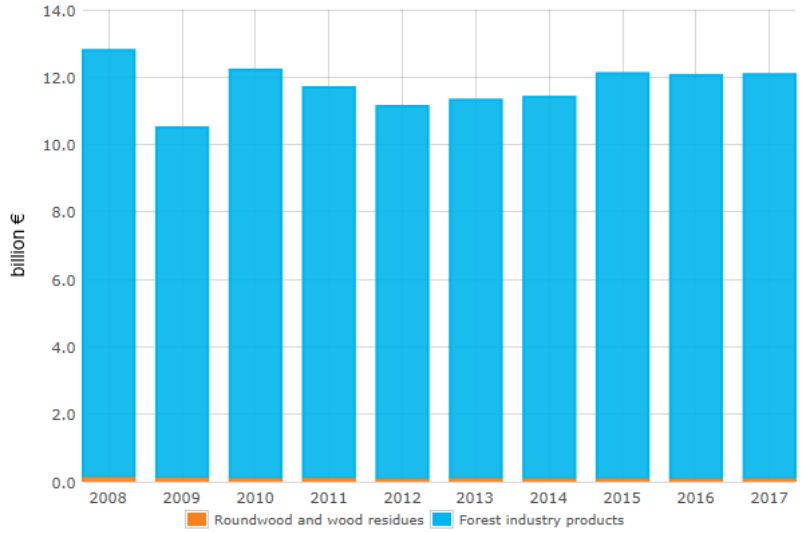
Wood imports continued to decrease

Finland imported 8.7 million cubic metres of wood in 2017. The wood import volume decreased by more than one-tenth from the previous year. Compared to the average for the previous ten years, wood imports decreased by 27%. Of all imported wood, pulpwood accounted for more than half, wood chips for 31% and logs for 8%. Wood residues accounted for five per cent.

Compared with the previous year, the volume of imported pulpwood decreased by 18%, and that of imported logs by 23%. The volume of imported wood chips increased by 7%. Russia is clearly the most important country for imported wood, accounting for 85% of all wood imported. The remaining imported wood comes almost exclusively

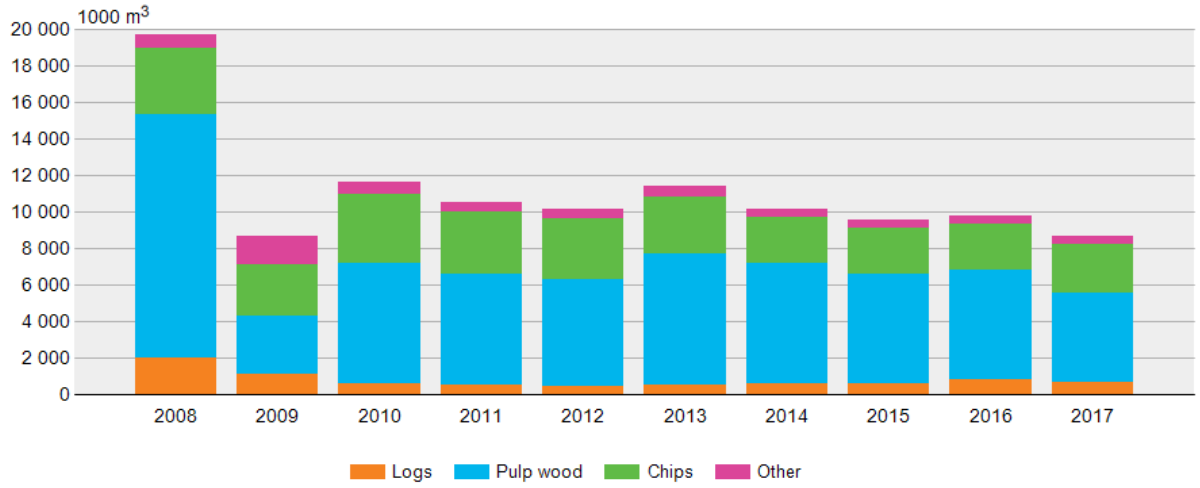
Exports by the forest industries 2008–2017
(deflated using wholesale price index)

Background data as nominal prices



Wood imports 2008–2017

Background data as a table



from the Baltic countries. Estonia accounted for 9%, and Latvia for 4% of total wood imports. The value of wood imports was EUR 324 million.

Finland imports considerably less forest industry products than it exports.

In 2017, the export value of forest industry products totalled EUR 1.4 billion. Articles with the highest import value were pulp, wooden furniture and converted paper and paperboard products. Finland's key trading partners were Sweden (accounting for 18% of the value of imports), Estonia (14%) and Brazil (13%). The most important forest industry articles imported were paperboard from Sweden and wooden furniture from Estonia. Imports from Brazil were almost exclusively of pulp.

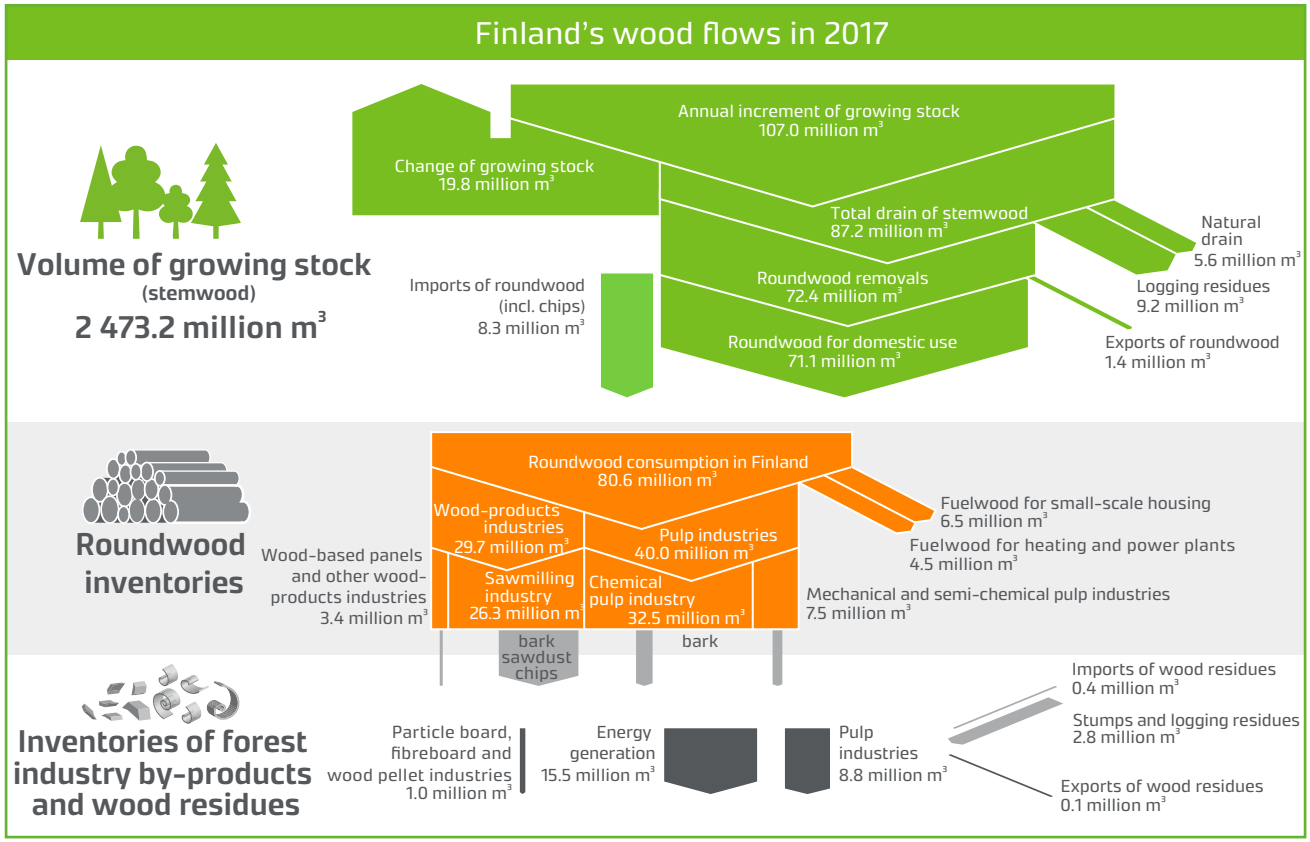
Foreign trade by forest industries

Finland's wood flows in 2017

The total volume of the growing stock (stemwood only with bark) in Finland's forests currently amounts to 2,473 million cubic metres. The majority of roundwood felled from our forests is used as raw material in forest industries, and the rest is mainly used in energy production. In addition to stems, branches and stumps are used for energy production, but the green (roundwood production) and orange (roundwood consumption) sections of the figure only include stems. By-product flows and wood residue flows also include other parts of trees.

The annual increment of growing stock has risen to 107.0 million cubic metres of roundwood. In 2017, 87.2 million cubic metres of stemwood was drained from Finnish forests, mainly as a result of fellings. In addition to fellings, the drain of stemwood consists of natural drain (naturally dead trees). The difference between growth and drain (19.8 million cubic metres) remains in the forest to add to the wood inventory.

The volume of roundwood for domestic consumption (79.4 million cubic metres) is calculated as the volume of roundwood removals (72.4 million cubic metres) plus imports and minus exports of roundwood. Domestic consumption of roundwood in Finland amounted to 80.6 million cubic metres and thus exceeded the volume of roundwood for domestic consumption, which means that the roundwood inventories decreased by 1.2 million cubic metres. Roundwood is temporarily stored in roundwood inventories and is later consumed as raw material for domestic forest industries or energy generation.



The grey colour at the bottom of the diagram depicts the volume of solid wood residues left after industrial processes or originating from other sources. They are primarily used to produce energy or as raw material in the pulp industry.

Fisheries and hunting statistics

Photo: Pekka Salmi / Luke

Fisheries and hunting statistics for 2017

Poor catches for coastal commercial marine fishers

Finland's commercial marine fishing catch amounted to 155 million kilograms in 2017. Baltic herring accounted for 134 million kilograms, and sprat for 16 million kilograms of the total. The total catch of these species stayed at the previous year's level, but the catch decreased in the Bothnian Sea and increased in the southern Baltic Sea and in the Gulf of Finland. The majority of fishermen used gillnets or trap nets to catch perch, European whitefish, pikeperch, salmon, and pike close to the shore. Poor weather conditions and problems caused by seals have also affected fishing, and the catch of coastal fishermen was again exceptionally low.

Vendace is the most important fish species in commercial inland fishery, followed closely by pikeperch

The reported commercial inland catch reached a record high in 2017: the fish catch totalled 6.5 million kilograms, and the crayfish catch amounted to 825,000. The total value of the catch was EUR 15.3 million. However, this record may not necessarily reflect the reality, as the catch statistics for the previous years are not directly comparable with the statistics for 2016 and 2017. Vendace accounted for approximately half the total inland fishery catch. Recorded pikeperch catches have experienced strong growth in the 2010s. Vendace and pikeperch accounted for two-thirds of the total value of the commercial fishery catch. Signal crayfish was the third most valuable inland species.

The recreational catch amounted to 30 million kilograms

Fish caught using a gillnet, fish trap, pot or creel, or a trap net accounted for a little more than half the total recreational catch, while fish caught with a spinning rod, a fly rod or by trolling amounted to just over a quarter, and fish caught using a rod and line, a tip-up or a jig accounted for one-sixth of the total catch. The number of fishermen using a rod and line, a tip-up or a jig has reduced. In 2016, fish caught using a rod and line, a tip-up or a jig amounted to just over half the catches made in the early 2000s.

The marine and inland catch totalled 191 million kilograms

Fishing is a recreational hobby for one in four Finns and a source of income for some 4,000 commercial fishermen. Three-quarters of the total catch in 2017 comprised Baltic herring and sprat caught by commercial marine fishermen. After Baltic herring and sprat, the largest catches were of perch, pike, pikeperch and vendace, which were all important species both in terms of commercial fishery and recreational fishing.

The value of food fish production grew

Approximately 14.6 million kilograms of fish was farmed for human consumption in Finland in 2017, the value of which amounted to EUR 80 million. While the volume stayed at the previous year's level, the value increased by around EUR 10 million compared with 2016. Rainbow trout accounted for 13.6 million kilograms, European whitefish for 0.8 million kilograms, and other species for approximately 0.2 million kilograms combined of the total farmed food fish volume. In addition, around 52 million fish fry of different ages were reared on fish farms and natural nutrition ponds, the value of which totalled EUR 26 million.

stat.luke.fi/en/

The processing volume of salmon imported from Norway decreased

Of all fish used as raw material for processed products in 2017, 51 million kilos were of a domestic origin and 28 million kilos were imported. The total amount, 79 million kilos, was nearly the same as in 2015, when the previous statistics for fish processing were compiled. The processing volume of salmon imported from Norway decreased by nearly seven million kilos to under 25 million kilos.

The producer price for salmon caught at sea highest in the 2000s

The average price for salmon caught at sea totalled EUR 6.35 per kilogram and was highest in the 2000s. Other valuable fish species include pikeperch and burbot, fetching EUR 5.98 and 4.73 per kilogram respectively. The producer price for Baltic herring sold for human consumption was EUR 0.24 per kilogram, while Baltic herring sold for animal feed fetched EUR 0.18 per kilogram. Producer prices for farmed European whitefish and rainbow trout were EUR 10.17 and 5.63 per kilogram respectively.

Re-export of Norwegian salmon boosted the foreign trade in fish

A total of 116 million kilograms of fish and fish products were imported to Finland in 2017. The total value of imports was approximately EUR 510 million. Finland exported around 77 million kilograms of fish and fish products, the value of which totalled EUR 148 million. The volume of imports increased by almost 15%, while the value of exports increased by more than 8% from the previous year.

Fish wholesale was the largest segment in terms of revenue

There were 1,779 fishery businesses in 2016, and the total revenue of the fishery industry was EUR 901 million. The fishery industry produced EUR 146 million in value added and provided 2,502 person-years of work in employment. Fishing companies accounted for 73% of all fishery businesses. Fish wholesale was the largest revenue segment. Fish processing provided the most employment.

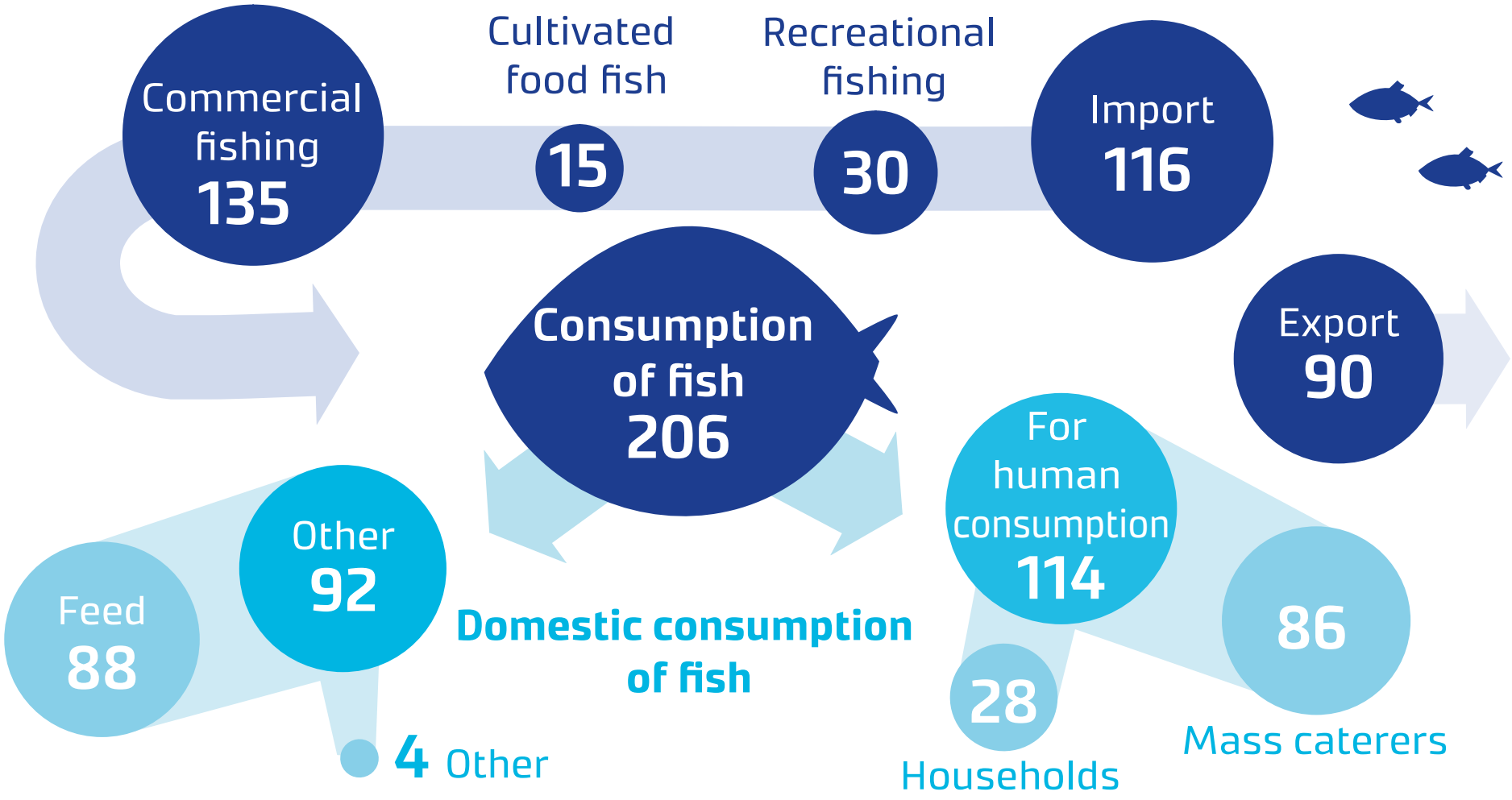
Consumption of imported salmon increased

The most important domestic species in terms of consumption was farmed rainbow trout (1.2 kg per person), while farmed salmon was the most consumed imported fish (4.0 kg per person). The consumption of imported salmon increased by nearly 14% from the previous year. Of wild-caught domestic fish, vendace was the most consumed (0.61 kg per person), followed by pike (0.44 kg), perch (0.41 kg), pikeperch (0.40 kg), Baltic herring (0.31 kg) and European whitefish (0.29 kg).

The small-game bag decreased

A total of some 306,000 hunters paid the annual game management fee in 2017. Approximately two-thirds of them actually engaged in hunting. The small-game bag decreased by a fifth, while the deer bag increased compared with 2016. The grouse bag decreased the most, i.e. by 40%. Around as many waterfowl were hunted as in the previous year, but the number still decreased by 20% compared with the average for the five previous years. Of all game species, the most hunted were common wood pigeon (approximately 210,000), mallard (approximately 180,000) and raccoon dog (150,000).

Supply and consumption of fish in Finland in 2017 (million kg)



Commercial marine fishery

Finnish-registered fishing vessels caught a total of 155 million kilograms of fish at sea in 2017. The economic value of the catch according to producer prices totalled EUR 36 million. Although the catch was three million kilograms smaller than the previous year, it was still the second highest reported catch ever.

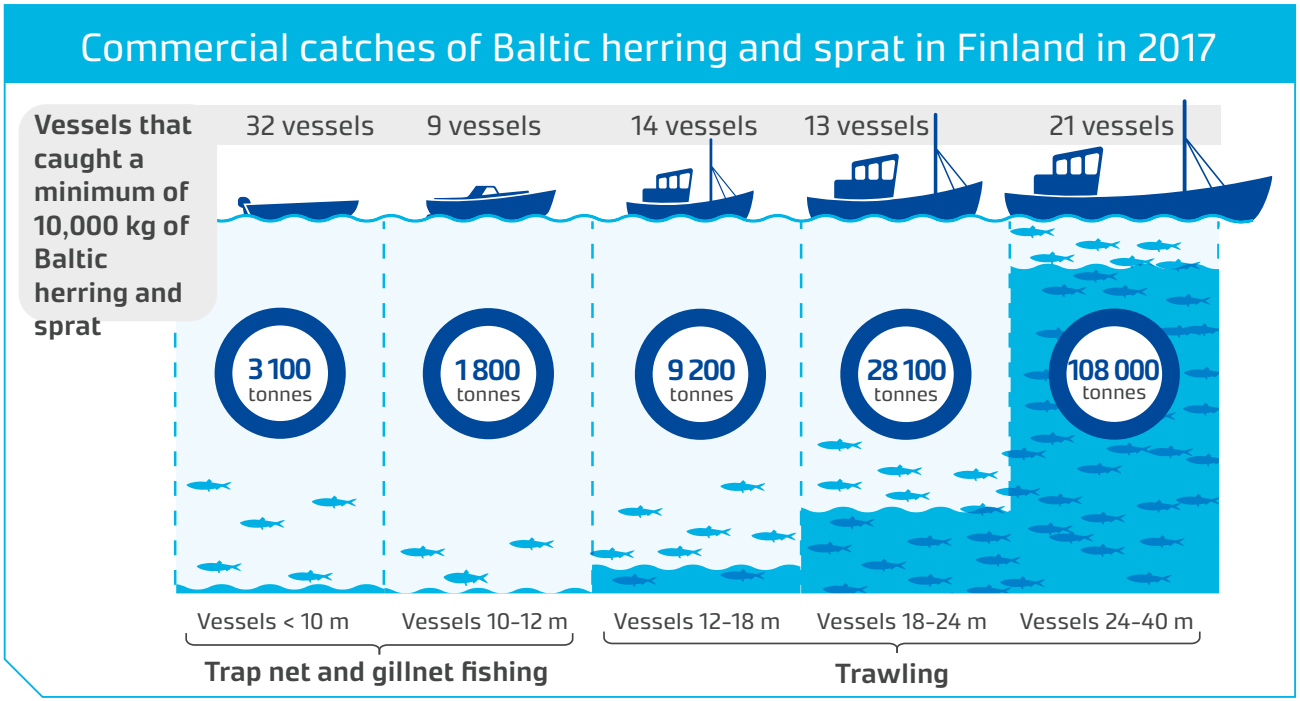
Abundant catches of Baltic herring and sprat offshore - poor catches on the coast

Both in terms of quantity and value, Baltic herring was by far the most important species. It accounted for nearly 90% of the volume and 70% of the value of the total commercial catch. The Baltic herring catch was almost exclusively caught by large trawlers offshore, and part of the catch was landed in Swedish, Danish and Estonian ports. The second most common species was sprat, which was mainly caught as a by-product of Baltic herring. The majority of the Baltic herring was caught in the Bothnian Sea, while the majority of the sprat was caught in the Gulf of Finland, Archipelago Sea and Bothnian Sea. Baltic herring and sprat fishery is very centralised: roughly ten vessels caught half the total catch. Overall, around a hundred operators caught significant volumes of Baltic herring and sprat.

The majority of commercial marine fishermen used gillnets or trap nets to catch fish. In terms of value, European whitefish was the third most important species in commercial marine fishery after Baltic herring and sprat, followed by pikeperch, perch and salmon. European whitefish was caught from the entire marine area stretching from the Gulf of Finland to the Bothnian Bay, and a total of 80% (or around 1,300) of all commercial fishermen reported European whitefish catches. In relation to the observation period that began in 1980, catches of European whitefish, pikeperch, perch and salmon in 2017 were smaller than average, and catches of salmon and European whitefish were the smallest so far.

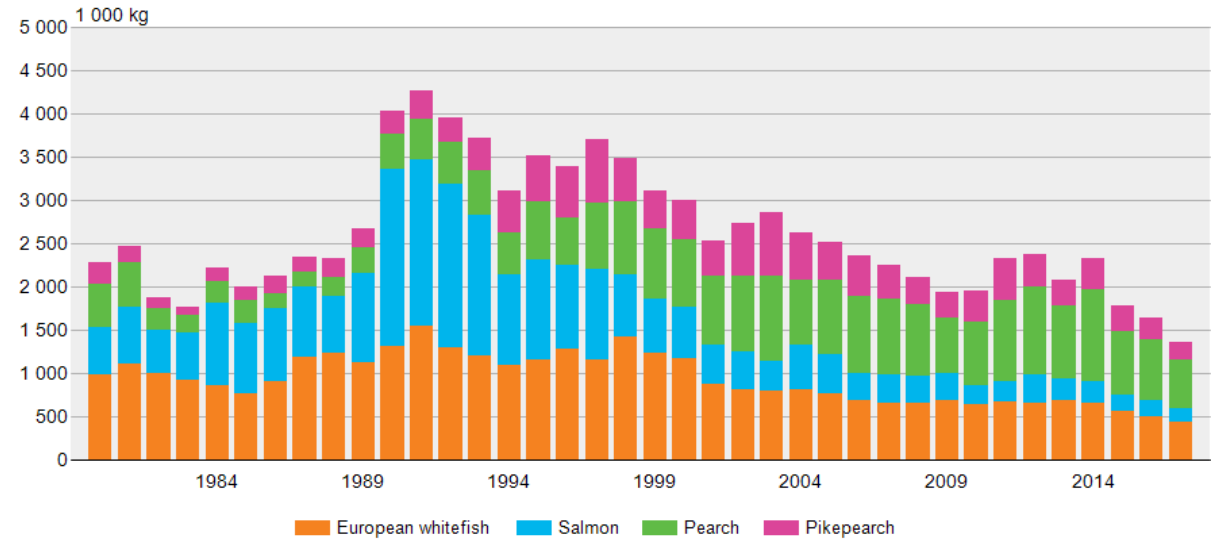
Variations between catches and fishing effort

Official statistics for Finland's commercial marine fishery catch sizes have been compiled since 1953. During that time, fishing techniques have become considerably more efficient, and the total catch has grown from 40 million to more than 150 million kilograms. Catches of many species, such as Baltic herring, sprat, cod, and salmon, have significantly fluctuated in recent decades. The Baltic herring catch for 2017 was over four times larger than



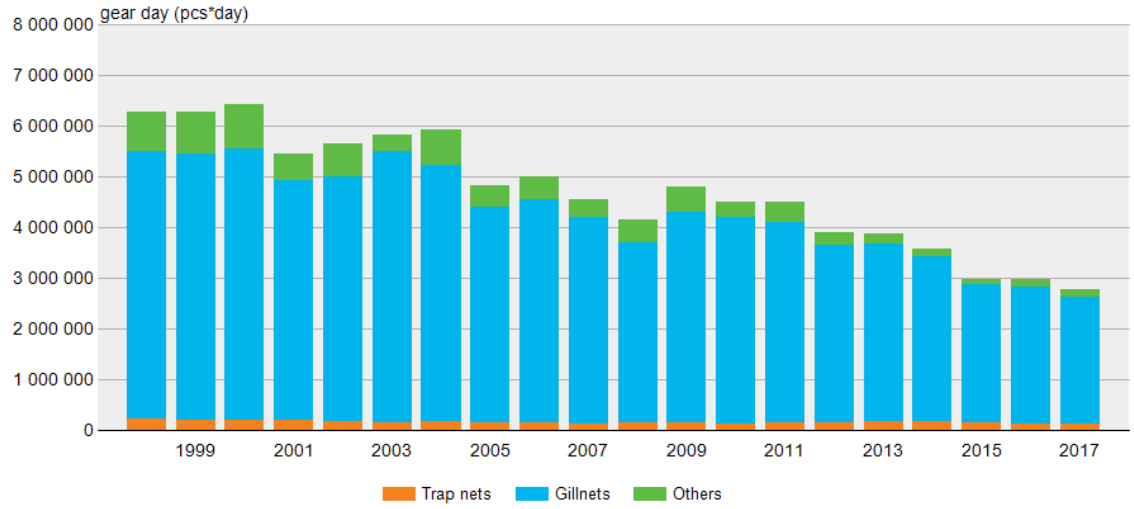
Catches in commercial marine fishery 1980–2017

Background data as a table



Fishing effort in commercial marine fishery 1998–2017

Background data as a table



in the 1950s, and the sprat catch has grown nine-fold. In contrast, cod and salmon numbers have decreased. Cod catches were at their largest in the 1980s, and up to thirty times larger than in 2017. Salmon catches were at their largest in the 1990s, and the 2017 catch amounted to just under one-tenth of the record catch. Fishing quotas apply to Baltic herring, sprat, cod and salmon, which means that annual country-specific fishing quotas regulate their catch volumes. In Finland, the country-specific fishing quotas for Baltic herring, sprat and salmon have been allocated operator-specifically since 2017.

Along with the development of fishing techniques and the status of fish stocks, the demand for fish used as animal feed has affected most the levels of the Baltic herring, sprat and cod catches. Coastal catches have also been affected by reduced fishing and nuisance animals. The numbers of both active fishermen and fishing days have reduced. The number of days spent on gillnet fishing halved in the period 1998–2017, while the number of days spent on trap net fishing reduced by 40% in the same period.

Sale of fish requires registration

The new Fishing Act entered into force from the beginning of 2016. The previous register of professional fishermen was replaced by a new register of commercial fishermen, to which anyone who catches fish for the purpose of sale must belong. Commercial fishermen are entitled to use special fishing gear and larger amounts of fishing gear, which has encouraged other fishermen to register. In 2017, the register included a total of 2,491 commercial

marine fishermen. At the beginning of the 1980s, there was no extensive register of the number of commercial fishermen, but it has been estimated that the number of fishermen was twice that today, i.e. over 4,700 fishermen. The number of fishermen is likely to continue to decrease because the average age of fishermen is high.

The register of fishing vessels included a total of 3,217 vessels, of which 1,469 were actually used for fishing. To estimate the profitability of fishery, these vessels were classified in five categories according to vessel length and fishing method used. A total of 1,372 fishing vessels under ten metres long and 41 between ten and twelve metres used passive fishing gear, i.e. gillnets and trap nets. The remaining 56 vessels were trawlers in three size categories.

In the figure on the right, commercial fishermen are classified as follows: Group I comprises fishermen whose average turnover for fishing during the last three accounting periods exceeds EUR 10,000; Group II comprises the remaining commercial fishermen.

▶ Commercial marine fishery

Commercial marine fishermen 1980–2017

▶ Background data as a table

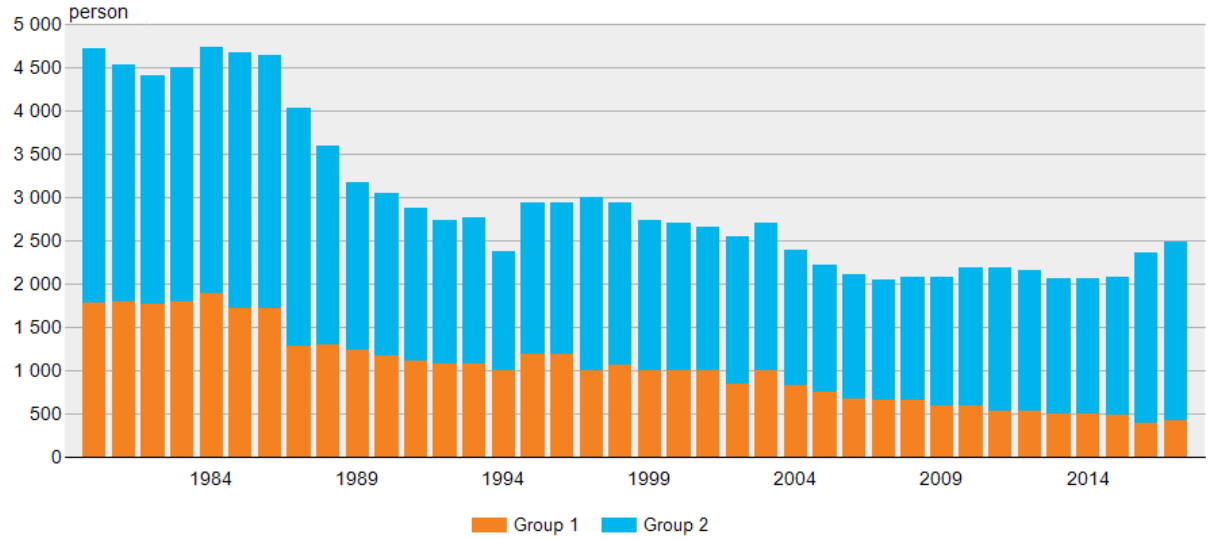


Photo: Pekka Salmi / Luke

Commercial inland fishery

The commercial inland fishery catch for 2017 reached a record high of 6.5 million kilograms. The total value of the catch was EUR 15.3 million. The new Fishing Act, which entered into force at the beginning of 2016, required all fisherman engaged in catching fish or crayfish in inland waters for the purposes of sale to enlist in the register of commercial fishermen. Statistics are now more extensive than previously, and data concerning crayfish catches, for example, have become more precise. However, comparability with previous years' statistics has suffered.

The new Fishing Act multiplied the number of registered fishermen

The new Fishing Act required fishermen engaged in commercial inland fishery to register from the beginning of 2016. This meant that all persons engaged in fishing in inland waters for the purposes of sale must enlist in the register of commercial fishermen maintained by the ELY Centre. They are also required to maintain a fishing journal and report their catches to Luke at least once per calendar year. This reporting obligation also applies to crayfish, the European river lamprey and the amount of roe caught in accordance with the Act on food and natural resource statistics (laki ruoka- ja luonnonvaratilastoista 562/2014).

By the end of 2017, the commercial fishermen's register contained almost 1,800 fishermen or fishing companies, divided into two categories based on their turnover. Group I comprises almost 300 fishermen, whose average turnover accrued from fishery during the last three accounting periods exceeds EUR 10,000. Group II comprises other commercial fishermen.

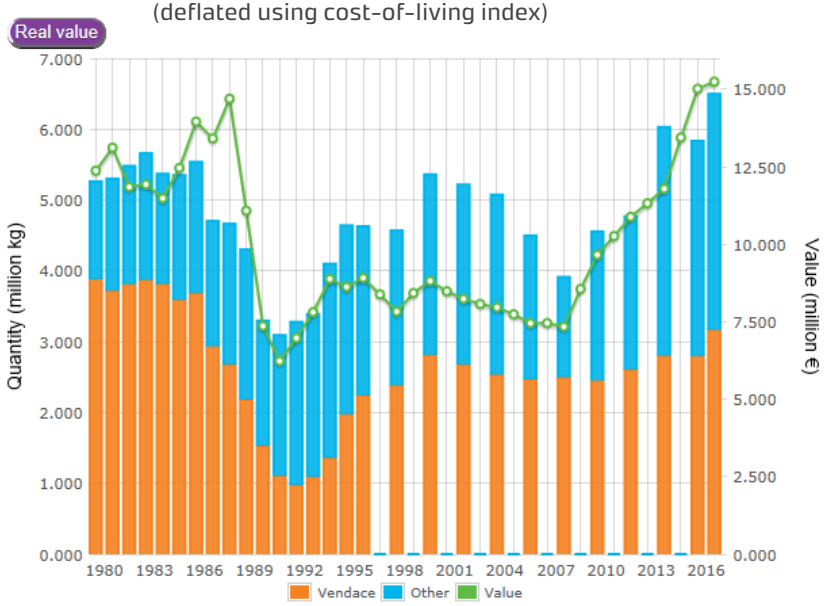
From 2016, Luke has compiled annual statistics for inland commercial fishery on the basis of data submitted by the registered commercial fishermen. The previous statistics were compiled every second year and were based on a separate survey targeted at the 550 fishermen who were then in the register.

Only commercial fishermen have the right to use fishing gear intended for commercial fishing. Such fishing gear includes trawl and nets whose total length per fishing or boating party exceeds 240 metres or 100 hooks. Due to the fishing gear restrictions, persons other than commercial fishermen may also have joined the commercial fishermen's register. The statistics compiled cover the catches

Volume and value of commercial inland fishery catch 1980–2017

(deflated using cost-of-living index)

Link to release



of all fishermen enlisted in the commercial fishermen's register, irrespective of whether the catch was sold.

The status of vendace continues to be strong

Vendace is the most important species for commercial inland fishery. It comprises approximately half the volume and over 40% of the value of the total catch. According to the statistics for 2017, the volume of vendace exceeded three million kilograms for the first time. Although the stock fluctuations that are typical for vendace also cause fluctuations in catch volumes and vendace sizes, catch volumes have been relatively constant throughout the 21st century at around 2.5 to 3 million kilograms

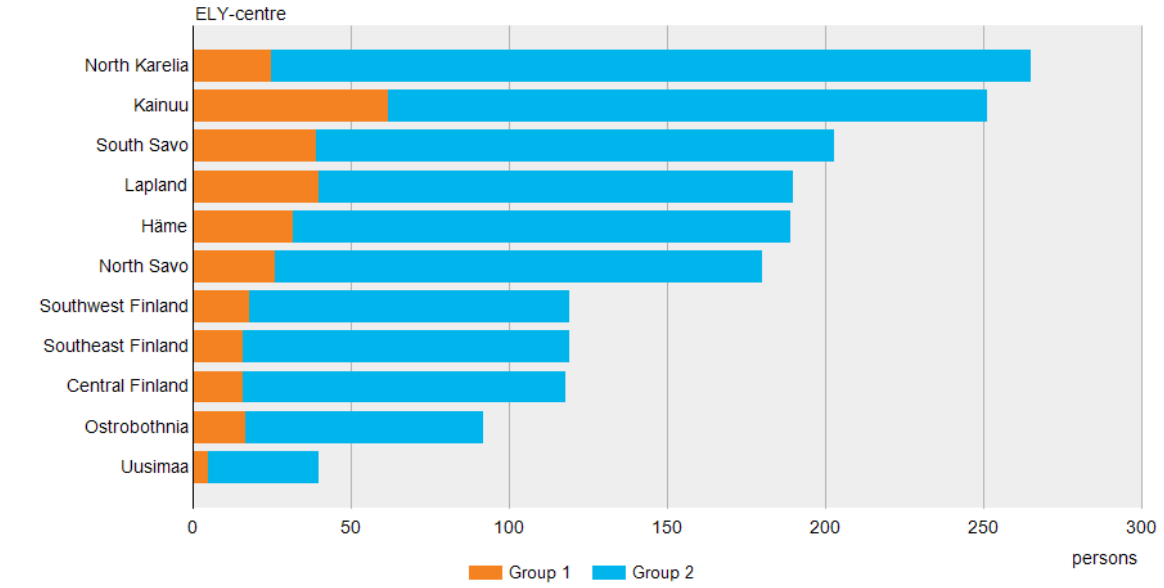
Pikeperch catches continue to grow

Pikeperch catches have grown by around 60% compared with 2014. Since the price per kilogram for pikeperch is high, in recent years, pikeperch has become the second most valuable freshwater fish species in Finland. The value of the pikeperch catch amounted to around EUR 4.5 million in 2017, while the value of the vendace catch was EUR 5.8 million.

Compared with previous statistics, pike catches have also experienced strong growth in 2016 and 2017. In particular, the volume of fish caught using a gillnet has increased for both pikeperch and pike. This indicates that the real reason behind the increase in catch volumes may be attributable to the extension of the registration obligation to fishermen who only sell fish occasionally. In 2017, vendace and pikeperch accounted for around two-thirds of the total value of the catch.

Commercial inland fishermen by fishery unit in 2017

▶ Background data as a table



Crayfish another important species

Signal crayfish was the third most valuable inland species: the value of the catch amounted to EUR 1.1 million in 2017. In terms of commercial catches, signal crayfish has passed noble crayfish. Signal crayfish accounted for roughly 95% of the volume and around 90% of the value of the total crayfish catch.

▶ Commercial inland fishery

Read more

- ▶ Commercial inland fishermen now required to report their catches (in Finnish)
- ▶ Vendace monitoring at Luke
- ▶ The 2016 crayfish season was expected to be good and, according to statistics, it was (in Finnish)

Recreational fishing

The catch made by recreational fishers totalled approximately 30 million kilograms in 2016. Fish caught using a gillnet, fish trap, pot or creel, or trap net accounted for a little more than half the total catch, while fish caught with a spinning rod, a fly rod or by trolling amounted to just over a quarter, and fish caught using a rod and line, a tip-up or a jig accounted for one-sixth of the total catch.

Gillnets provide a variety of species

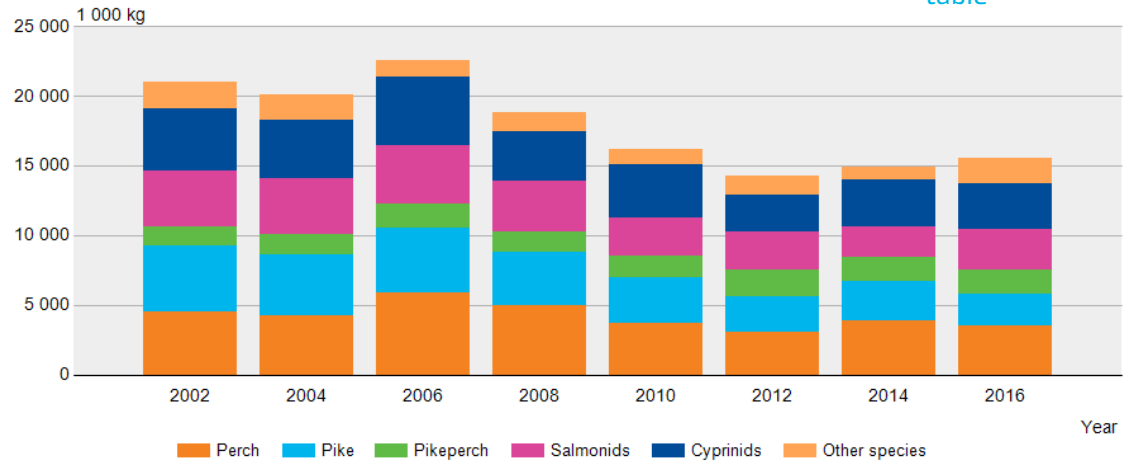
The volume of fish caught using passive fishing gear has decreased by a quarter from the early 2000s, from around 20 million kilograms to roughly 15 million kilograms. Gillnets enable catching a variety of fish species: in 2016, the most common species were perch, pikeperch, pike, European whitefish, bream and roach. The most common species caught using fish traps were perch, pike and cyprinids.

Rod and line catch pikeperch and perch most

Fish caught using a spinning rod or a fly rod or by trolling totalled almost eight million kilograms, roughly the same amount as in the early 2000s. The share of pikeperch of the total catch has clearly increased. Pike, pikeperch and perch accounted for 84% of the total rod-and-line catch in 2016.

Fish catch using a gillnet, a fish trap, a pot or creel, or a trap net

Background data as a table



Fish catch using a spinning rod or a fly rod or by trolling

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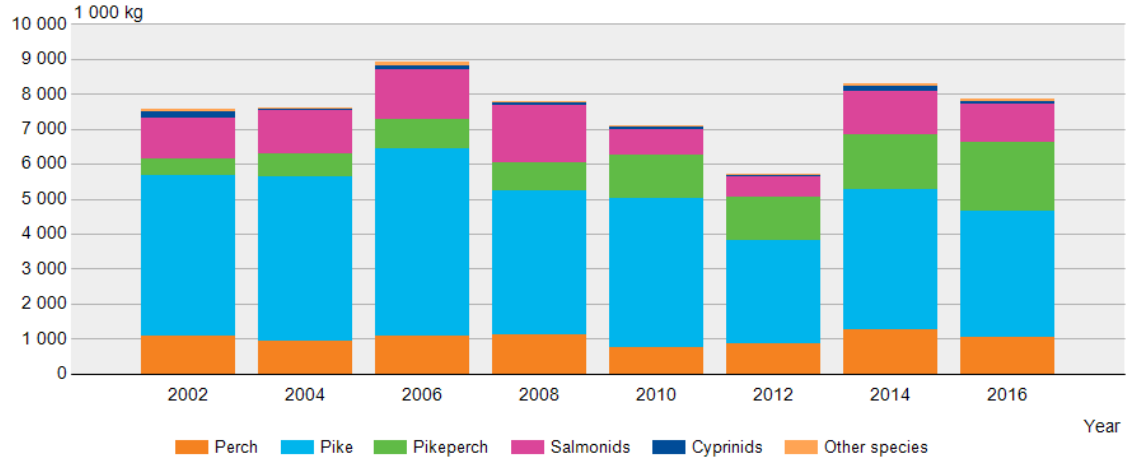

Fish catch with a rod and line, a tip-up or a jig

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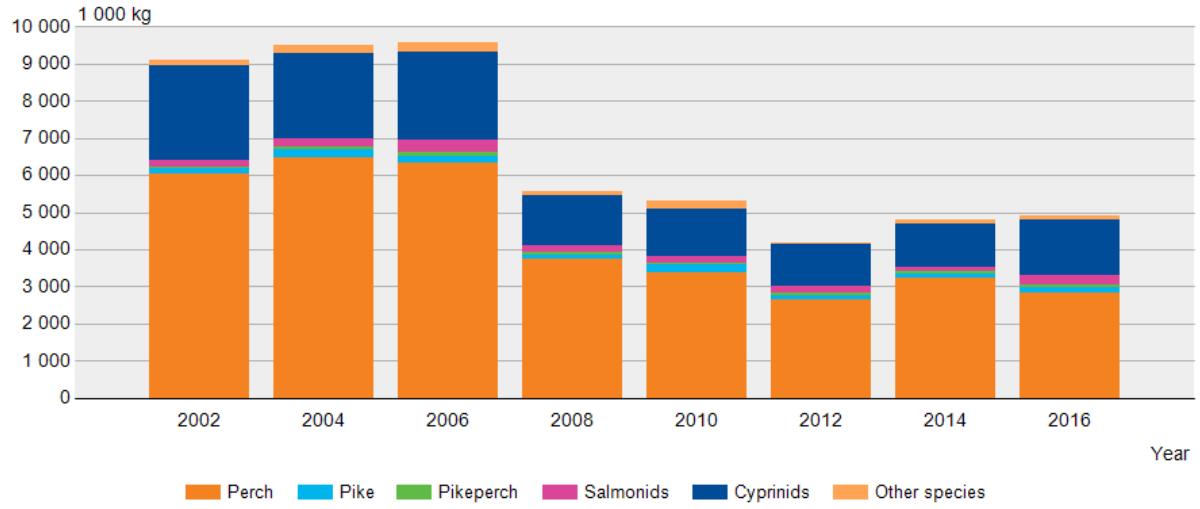


Rod and line, tip-up and jig provide perch and cyprinid catches

Fish caught using a rod and line, a tip-up or a jig totalled nearly five million kilograms in 2016. Catching fish with a rod and line, a tip-up or a jig is part of everyman's rights. The catches mainly comprise perch and cyprinids. Rod and line continued to be the most popular fishing gear in 2016. Roughly 60% of all fishermen use this method. However, the number of fishermen who use a rod and line has decreased by almost a third compared with the early 2000s. The number of fishermen engaged in ice fishing has also reduced, but to a lesser extent. The change has been more drastic in catch volumes: in 2016, fish caught using a rod and line, a tip-up or a jig amounted to just over half the catches made in the early 2000s.

The share of different fishing gear in the total recreational catch

- gillnet, fish trap, pot or creel, and trap net 53%
- spinning rod, fly rod and trolling 27%
- rod and line, tip-up or jig 17%
- other fishing gear 3%

Recreational fishing

Total catch in Finland

'Commercial fisherman' refers to a person engaging in fishing activities for the purpose of sales and reporting fishing as their exclusive or partial source of income, while 'recreational fisherman' refers to a person who engages in fishing as a recreational hobby. In 2017, the register of commercial fishermen comprised roughly 4,300 fishermen engaged in fishing activities at sea, in inland waters or both. The number of recreational fishermen was estimated to be roughly 1.5 million in 2016.

The total catch amounted to 191 million kilograms. Of this, nearly 80% were Baltic herring and sprat caught at sea by commercial fishermen. After Baltic herring and sprat, the largest catches were perch, pike, pikeperch and vendace, which were all important species both in terms of commercial fishery and recreational fishing.

Finland has compiled catch statistics since the 1950s. During the observation period, the catches of Baltic herring, sprat, cod and salmon especially have fluctuated significantly. This fluctuation has been due, for example, to the demand for fish used as animal feed, variations in fish stocks and fishing quotas, and developments in fishing technology.

Baltic herring and sprat from the sea, European whitefish, perch, pikeperch and salmon close to the shore

A total of 134 million kilograms of Baltic herring and 16 million kilograms of sprat were caught in 2017. The majority of the Baltic herring was caught in the Bothnian Sea, and the majority of the sprat in the southwest marine areas and in the Gulf of Finland. Both species were mainly caught by trawling offshore and by a few dozen vessels. However, the majority of commercial fishermen used gillnets or trap nets to catch, for example, European whitefish, perch, pikeperch and salmon close to the shore. Poor weather conditions and problems caused by seals have also affected fishing and the catch of coastal fishermen remained low.

Vendace is the most important species in inland fishery

In terms of both quantity and value, vendace is by far the most important species in commercial inland fishery, and it has also become a popular catch among recreational fishermen. The vendace catch for 2017 totalled 4.4 million

Finnish fishery catch 1980–2017

Background data as a table

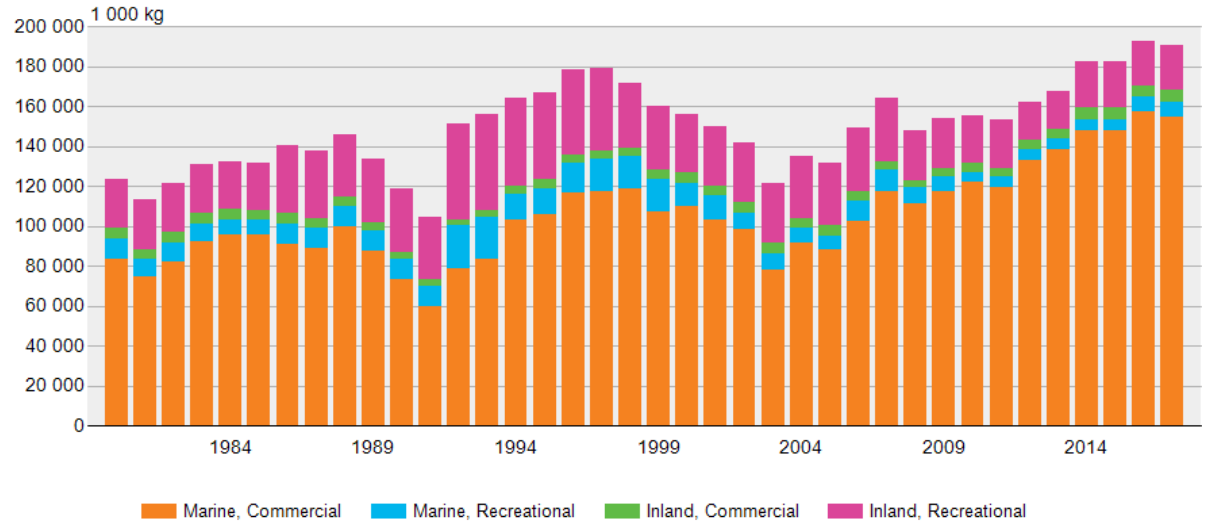


Photo: Pekka Salmi / Luke

Finnish fishery catch 2017 (1,000 kg).

	Commercial			Recreational			Total		
	Marine	Inland	Total	Marine	Inland	Total	Marine	Inland	Total
Perch	570	197	767	2,195	5,448	7,643	2,765	5,645	8,410
Pike	189	327	516	1,117	5,588	6,705	1,306	5,915	7,221
Sprat	16,088	0	16,088	0	0	0	16,088	0	16,088
Pikeperch	197	710	907	314	3,577	3,891	511	4,287	4,798
Smelt	910	480	1,390	0	0	0	910	480	1,390
Bream	497	379	876	802	661	1,463	1,299	1,040	2,339
Salmon	159	2	161	96	335	431	255	337	592
Burbot	42	56	98	149	403	552	191	459	650
Vendace	303	3,168	3,471	24	881	905	327	4,049	4,376
Whitefish	437	116	553	1,194	529	1,723	1,631	645	2,276
Baltic herring	134,133	0	134,133	389	0	389	134,522	0	134,522
Roach	320	746	1,066	622	2,477	3,099	942	3,223	4,165
Ide	24	0	24	137	274	411	161	274	435
Trout	24	7	31	232	242	474	256	249	505
Cod	191	0	191	5	0	5	196	0	196
Other fish species	421	310	731	246	1,637	1,888	667	1,947	2,619
Total (species)	154,506	6,499	161,005	7,523	22,056	29,579	162,029	28,555	190,584

kilograms, of which 80% was caught by commercial fishermen. Vendace is principally caught from inland waters, but small vendace catches were also made in the Bothnian Bay. Commercial fishermen caught vendace by trawling and purse seining, recreational fishermen by gillnets.

Recreational fishermen caught perch and pike

After Baltic herring, sprat and vendace, perch and pike catches were the largest. Perch and pike were also the most important species in recreational fishing, accounting for roughly half the total recreational catch of 30 million kilograms. Roughly 90% of the perch and pike catch was made by recreational fishermen. The majority of the perch and pike catches in recreational fishing were caught using rod and bait, while the majority of the catches in commercial fishery were made using gillnets and trap nets.

▶ Total fish production

Aquaculture

Approximately 14.5 million kilograms of fish were farmed for human consumption in Finland in 2017. Of total production, rainbow trout accounted for 93%, and European whitefish for 6%. The volume of food fish production has remained at the same level for the last three years. However, its value has increased compared with the previous year due to the high price paid for rainbow trout.

The volume of rainbow trout remained at last year's level

In the early 1990s, the volume of rainbow trout production totalled roughly 19 million kilograms, but it has gradually decreased into the 2010s. Only around 10 million kilograms of rainbow trout was farmed for sale in 2011. For the previous three years, the production level has remained at roughly 13.5 million kilograms per year.

Fish farming volumes are strongly regulated by the national environmental permit scheme. According to the Finnish Aquaculture Strategy, the aim is to support the growth and development of aquaculture by taking environmental objectives into account. The goal is to increase production volume in Mainland Finland to around 20 million kilograms by 2022. This could be achieved, for example, through new fish farming technologies, the placing of farms in more open marine areas and utilising fish caught from the Baltic Sea as fish feed. The aim of increasing use of fish from the Baltic Sea is to avoid increasing the nutrient load by recycling the nutrients originating in the Baltic Sea.

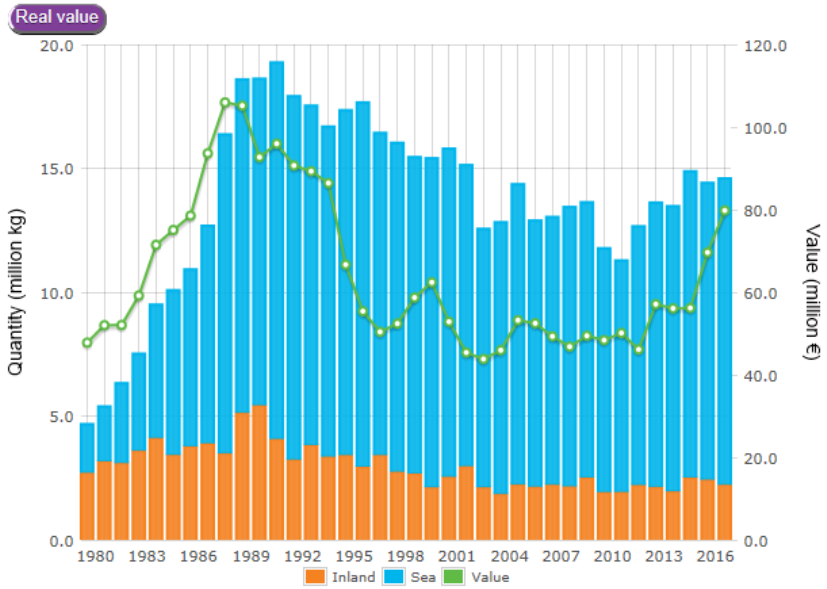
The price for farmed fish has increased

Over the last two years, the producer price for rainbow trout has been high due to the situation in global salmon markets. The value of fish farming increased in 2016 and 2017, although the production volume remained roughly at the previous year's level. Over the last ten years or more, the number of food fish enterprises engaged in fish farming activities has dropped by around a third.

Most food fish come from Åland

In Finland, the farming of rainbow trout is concentrated in the regions of Åland and Southwest Finland. Åland accounted for nearly 60% of total food fish production in sea areas and roughly half the total Finnish production (including inland production). A total of 85% of all food

Quantity and value of food fish production 1980–2017 ▶ Background data as nominal values



Volumes of ungutted fish (deflated using cost-of-living index)

fish was produced in sea areas, of which Southwest Finland accounted for around a third. Production in Åland increased slightly, and production in Southwest Finland decreased slightly compared with the previous year.

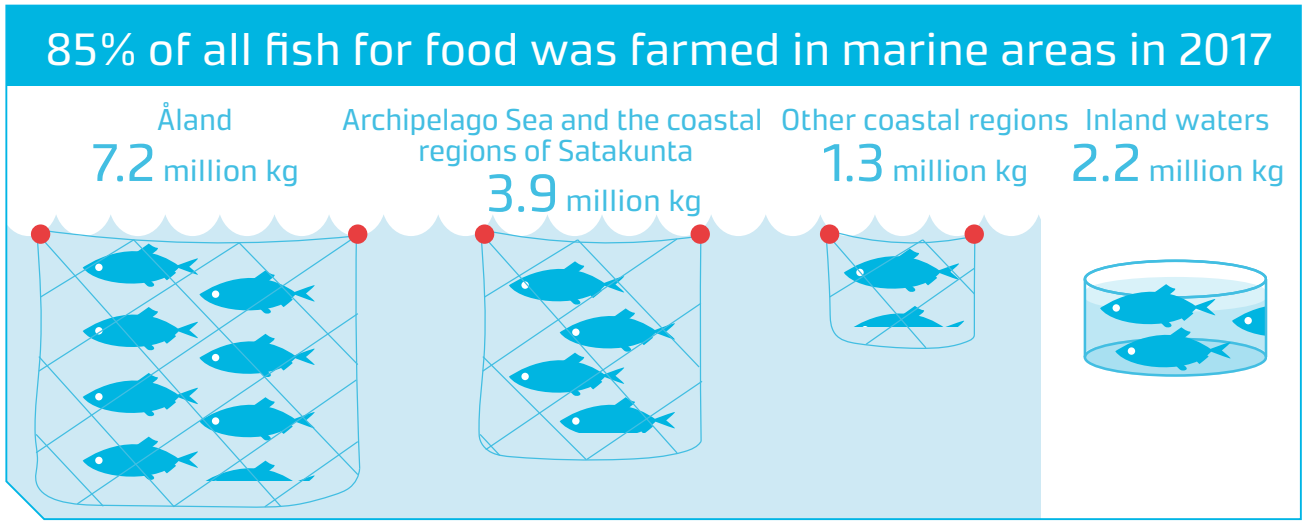
The Inland Finland share of total food fish production amounted to around 15%. The majority of food fish farmed in inland waters came from Northern Finland. Central Finland produced less than half the volume of fish produced in Northern Finland. Since 2000, the volume of fish produced for human consumption in inland waters has ranged between 1.9 and 2.5 million kilograms.

Roe production amounted to just under half a million kilograms

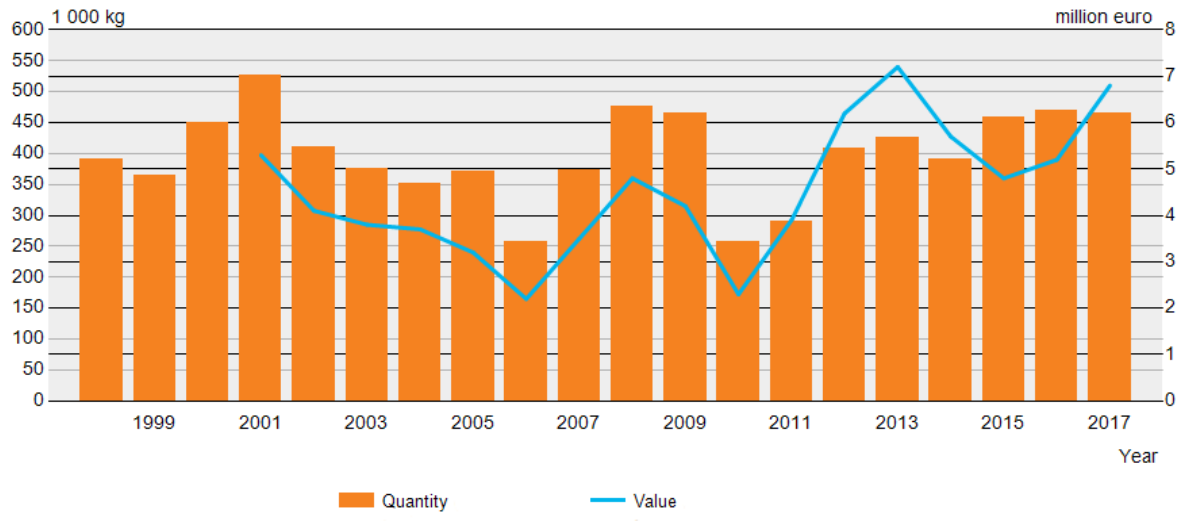
The roe produced for human consumption was almost exclusively (99%) rainbow trout roe, but small quantities of European whitefish and sturgeon roe were also produced. The season for rainbow trout roe typically extends from October to March. The proportion of roe in total rainbow trout production amounted to around three per cent.

Environmentally sustainable fish farming technologies

Most of the food fish farmed at sea is raised in net cages, while the majority of fish farmed in inland waters is raised in tanks. Finland also has some fish farms using recirculation technology. Recirculation technology saves water, as the same amount of water is filtered and circulated multiple times. In 2017, just under half a million



Quantity and value of rainbow trout roe production 1988–2017 ▶ Background data as a table



kilograms of food fish was produced on Finnish recirculation fish farms.

Around 90 million fish fry were produced for stocking purposes

Fish juveniles are produced to restock fish populations in water bodies, as well as for farming for human consumption. In 2017, there were around 180 natural nutrition pond enterprises in Finland, which especially produced European whitefish and pikeperch juveniles for stocking purposes. The farming of fish fry for stocking purposes is an important sector of aquaculture.

Roughly 15 million European whitefish juveniles, excluding newly hatched fish, were produced for stocking purposes. The quantity of pikeperch juveniles was the second largest produced, at around seven million. The stocking volume of Atlantic salmon amounted to 1.6 million, while the volume of sea trout totalled around one million. Around 0.2 million freshwater salmon and 1.5 million freshwater trout were also produced for stocking purposes.

Farming of signal crayfish forbidden

High volumes of signal crayfish were produced for stocking and human consumption in the 1990s. However, the EU Regulation on Invasive Alien Species, which entered into force in 2016, identified signal crayfish as an invasive alien species, and the farming of signal crayfish is therefore now forbidden.

▶ Aquaculture

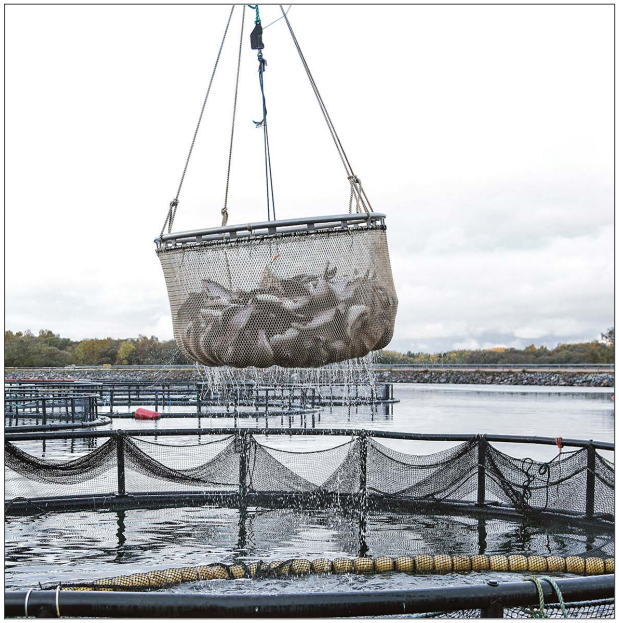
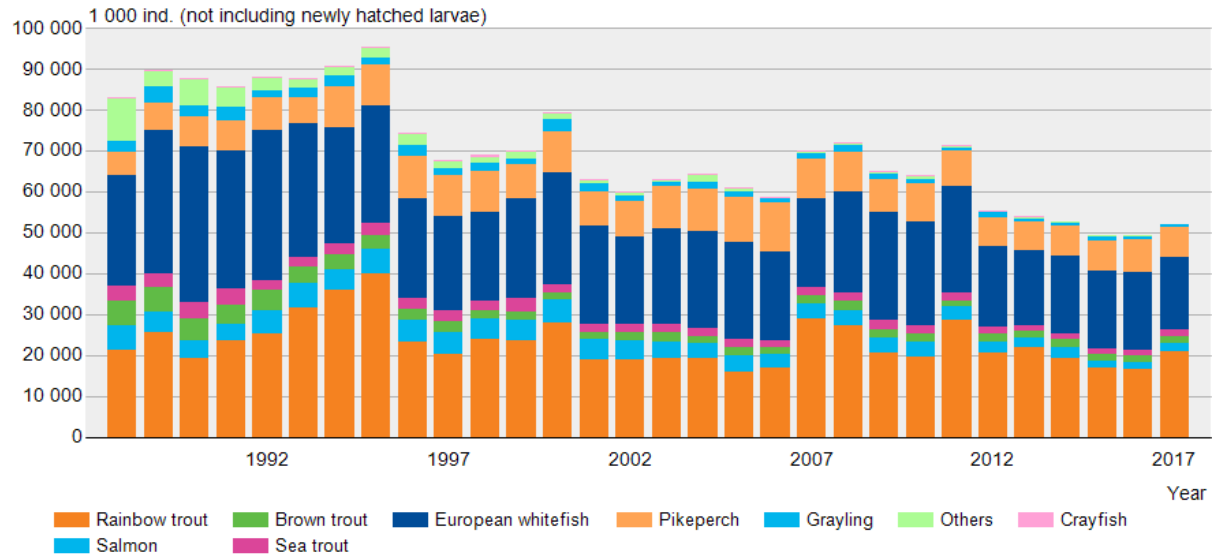


Photo: Omer Levin / Luke's photo archive

Production of fish juveniles 1988–2017

▶ Background data as a table



Fish processing

Of all fish used as raw material for processed products in 2017, 51 million kilograms were of a domestic origin and 28 million kilograms were imported. The total, 79 million kilograms, was nearly the same as in 2015.

The amount of full frozen Baltic herring and sprat for export increased by nearly seven million kilograms, from nearly 14 to more than 20 million kilograms. The Baltic herring was followed by the salmon, rainbow trout and whitefish in the processing industry. These four species accounted for 96% of all fish-based raw material.

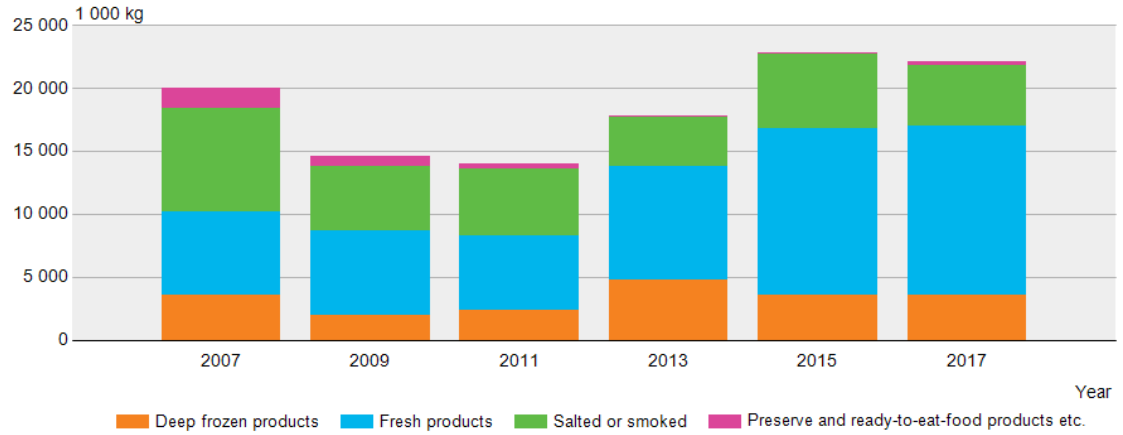
The processing volume of salmon imported from Norway decreased by nearly seven million kilograms to under 25 million kilograms.

A total of 19 million kilograms of domestic and imported fish each was processed into fillets and other fresh products. Moreover, 13 million kilograms of fish, more than half of which was domestic fish, were used for highly processed products.

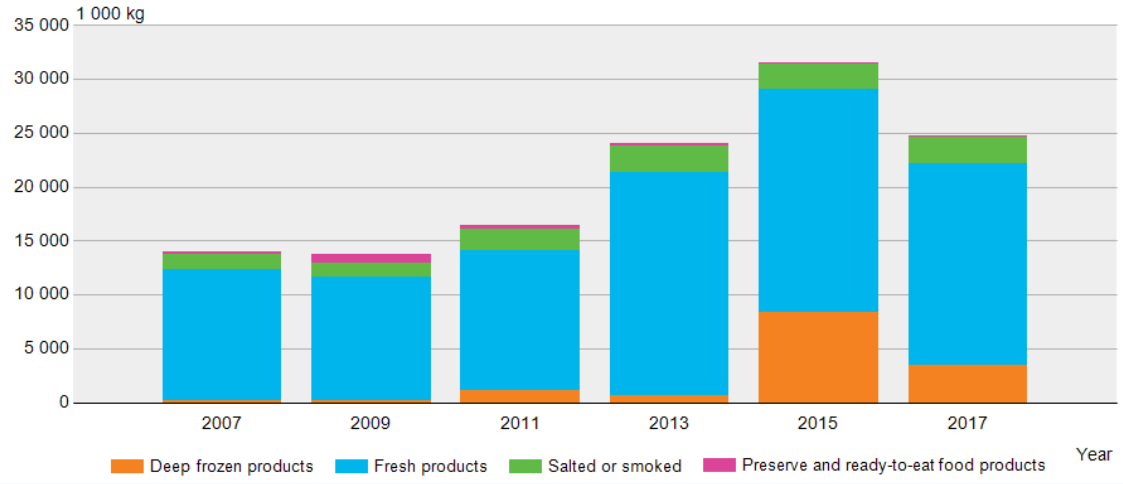
There were 143 fish processing enterprises, of which 23 processed more than half a million kilograms. These accounted for 93% of the total volume of processed fish.

▶ Fish processing

Rainbow trout used in fish processing by end product ▶ Background data as a table



Salmon used in fish processing by end product ▶ Background data as a table



Producer prices for fish

Producer prices for fish mostly increased in 2017 compared with 2016. The price for salmon amounted to EUR 6.35 per kilogram and was the highest in the 2000s, as was the producer price for farmed rainbow trout, i.e. EUR 5.63 per kilogram. The price for Baltic herring intended for industrial use remained at the same level as in 2016, but the price for Baltic herring intended for human consumption continued to decrease.

The price for Baltic herring depends on size

In economic terms, Baltic herring is the most important commercial fishery species due to the large catch quantities. The majority of the Baltic herring catch is produced for animal feed in the fish farming and fur industry. The producer price for Baltic herring used as feed, EUR 0.18 per kilogram, is significantly lower than the price paid for Baltic herring intended for human consumption, i.e. EUR 0.24 per kilogram. According to catch volumes, sprat is the second most important fish species, and its price is similar to the price for Baltic herring intended for industrial use. The sprat catch is almost exclusively used as animal feed.

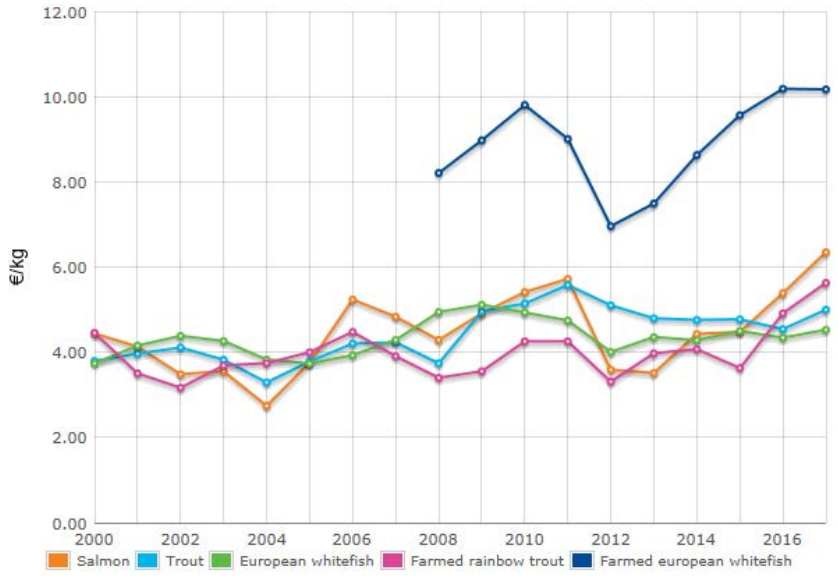
Baltic herring intended for human consumption is classified in different size categories, based on the number of Baltic herring in one kilogram. The price paid for larger Baltic herring is usually significantly higher than the prices fetched by smaller Baltic herring, which are closer to the price paid for Baltic herring intended for industrial use. For example, the price paid for larger Baltic herring intended for human consumption (12–17 fish/kg) was EUR 0.77 per kilogram, while smaller Baltic herring (33–60 fish/kg) fetched EUR 0.17–0.18 per kilogram.

The prices for salmon and farmed rainbow trout continued to grow

In 2017, producer prices for Baltic Sea salmon and farmed rainbow trout continued to increase for the second consecutive year to a record high in the 21st century. The price for farmed European whitefish remained roughly at the level of 2016, EUR 10.17 per kilogram. The price for European whitefish caught at sea was EUR 4.53 per kilogram.

Real producer prices for salmonids, exclusive of VAT (deflated using cost-of-living index)

Background data as nominal prices

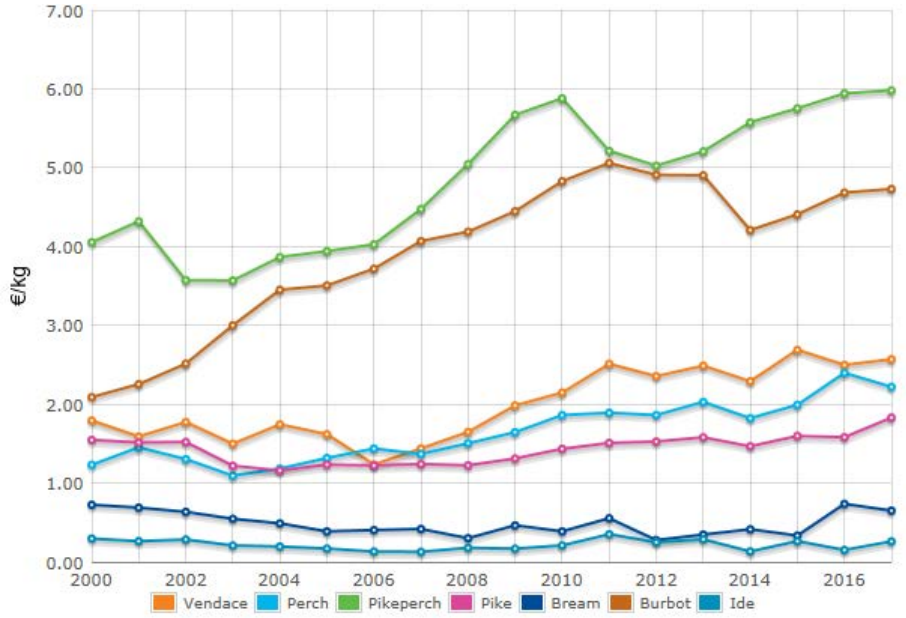


Prices for gutted fish

Photo: Pro Fish Association

Real producer prices for other species, exclusive of VAT (deflated using cost-of-living index)

▶ Background data as nominal prices



Prices for ungutted fish

Other fish species

In addition to salmonids, other valuable fish species included pikeperch and burbot, fetching EUR 5.98 and 4.73 per kilogram respectively. These prices have remained almost unchanged compared with 2016. The price for each species has significantly increased in the 2000s. Other important fish species were perch (EUR 2.22 per kg), pike (EUR 1.83 per kg) and vendace (EUR 2.57 per kg). Of these, the price for pike increased compared with 2016, while the price for perch fell slightly. The price for cyprinids remained significantly below one euro per kilogram.

▶ Producer prices for fish

Foreign trade in fish

A total of 116 million kilograms of fish and fish products were imported to Finland in 2017. The total value of imports was approximately EUR 510 million. Finland exported around 77 million kilograms of fish and fish products, the value of which totalled EUR 148 million. The volume of imports increased by almost 15%, while the value of exports increased by more than 8% from the previous year. The value of imports was EUR 109 million, and the value of exports roughly EUR 90 million, higher than during the previous year.

Re-export of Norwegian salmon boosted the foreign trade in fish

The increase in the value of fish exports was due to an increase in the value of exports of fresh whole salmon imported from Norway and re-exported to other European countries from EUR 8 million to EUR 96 million. Exports totalled 15 million kilograms.

In 2017, the total volume of imports increased by 14 million kilograms compared with the previous year. The amount of fish imported for human consumption grew by more than 17 million kilograms. Overall, products imported for human consumption accounted for 79% of the total imports and 96% of its value.

The Nordic countries and Estonia are the most important trade partners

Fish and fish products were imported from 65 countries. Some three-quarters of total imports came from the Nordic countries, roughly 14% from other European countries and just under 10% from outside Europe. The most important country by far in terms of the total import value is Norway, which accounted for 57% of the total value of imports, followed by Sweden, Denmark and Estonia.

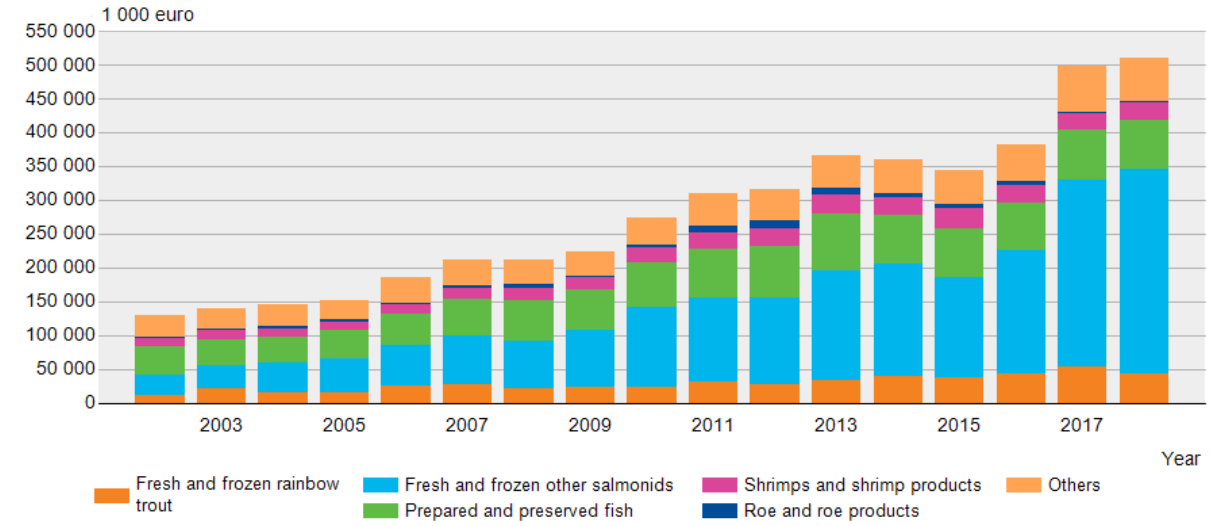
Fish and fish products were exported to 34 countries. Just under half of total exports were destined to the Nordic countries, more than 50% to other European countries and only one per cent outside Europe. By monetary value, the most important export destination was Estonia, followed by the UK, France, Poland, Denmark and Lithuania.

Norwegian salmon was the most important import item

The imports of fresh Atlantic salmon from Norway totalled around 42 million kilograms in 2017. It was the

Value of imported fish products suitable for human consumption by product group

▶ Background data as a table



most important imported fish product. The total value of salmon imports (EUR 254 million) increased by 50% compared with the previous year. The import of Atlantic salmon from Norway has grown five-fold and the value almost ten-fold over the last 15 years.

In addition to Atlantic salmon, the most important products imported from Norway in 2017 for human consumption were shrimps and herring products and canned herring.

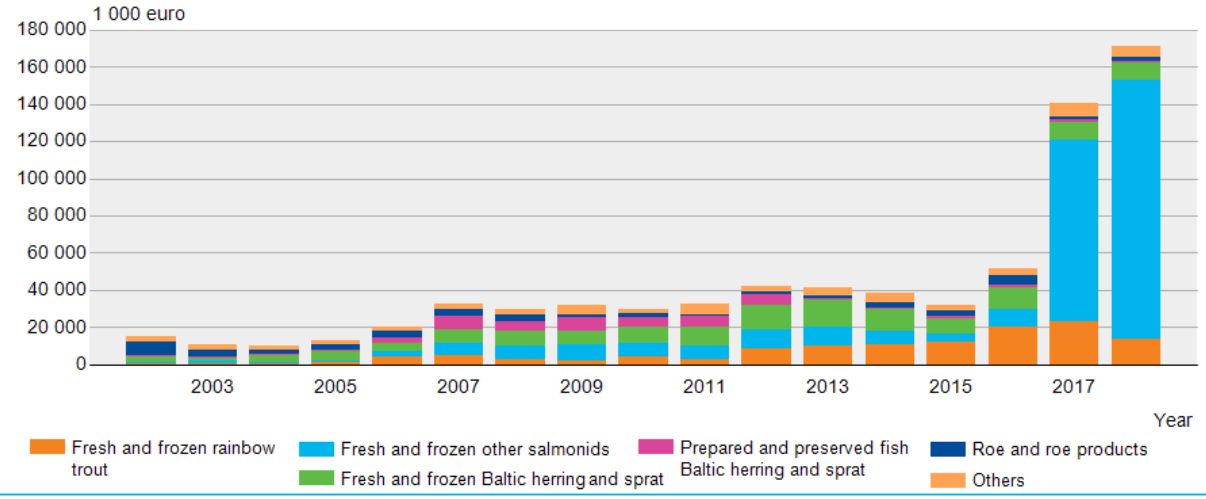
Rainbow trout from Sweden and a variety of products from Denmark

Imports of fish and fish products from Sweden totalled 15 million kilograms, of which the share of fresh whole rainbow trout was just over eight million kilograms, with a value of EUR 45 million. Compared with the previous year, imports of rainbow trout from Sweden decreased by nearly two million kilograms. Imports of fish products from Denmark totalled just under eight million kilograms, of which half was sold for human consumption. Imports from Denmark also covered a variety of fish product and canned fish, frozen fish products of different species, crustaceans, molluscs, etc. Products other than fish and fish products, such as crustaceans and molluscs, accounted for around three per cent of total imports and six per cent of its value.

Salmon and rainbow trout the most valuable export articles

In monetary terms, the most important export article was salmon due to the re-export of fresh whole Norwegian salmon to Europe; the export value amounted to over EUR 95 million. Over half of all fresh whole salmon was exported to the UK and France. In 2017, the exports of fresh and frozen rainbow trout totalled EUR 23 million. Although the volume of exported rainbow trout (almost 4 million kg) did not change significantly, the export value of rainbow trout increased by around three million euros compared with the previous year. The most important rainbow trout destination countries were Estonia, Belarus and Poland.

Value of exported fish products suitable for human consumption by product group



Background data as a table

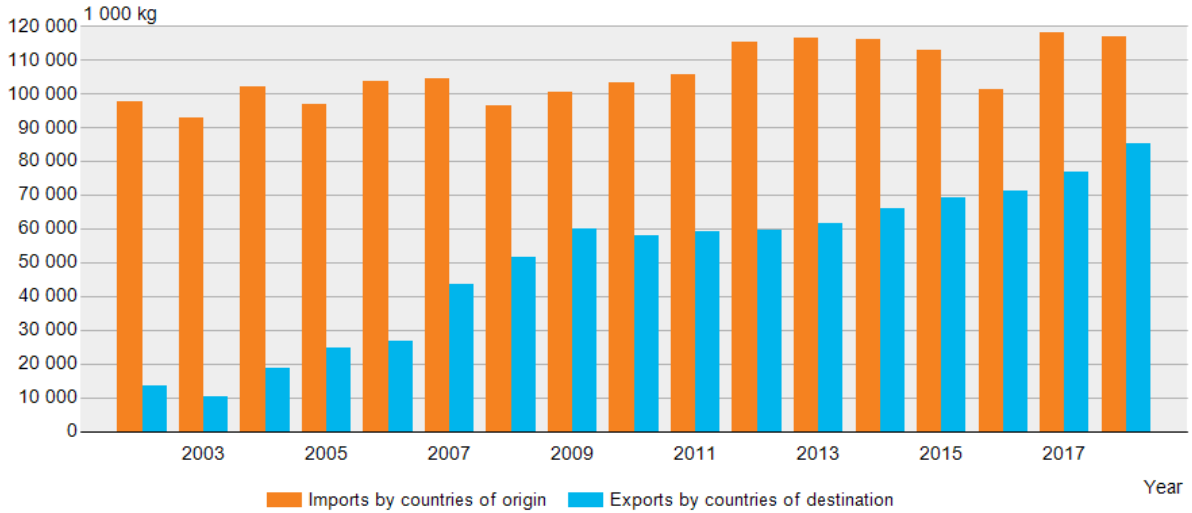
Baltic herring and sprat were exported to Denmark

After salmonids, the most important export articles were fresh and frozen Baltic herring and sprat, fish eggs and related products, and fish sold for use as animal feed. Export volumes of fresh Baltic herring and sprat decreased by nine million kilograms compared with the previous year, to just under 16 million kilograms. In contrast, exports of frozen Baltic herring and sprat grew by almost two million kilograms, to some 20 million kilograms. Baltic herring and sprat were mainly exported to Denmark (around 29 million kg). Products intended for human consumption accounted for around 80% of the total export volume and 90% of the value.

Foreign trade in fish

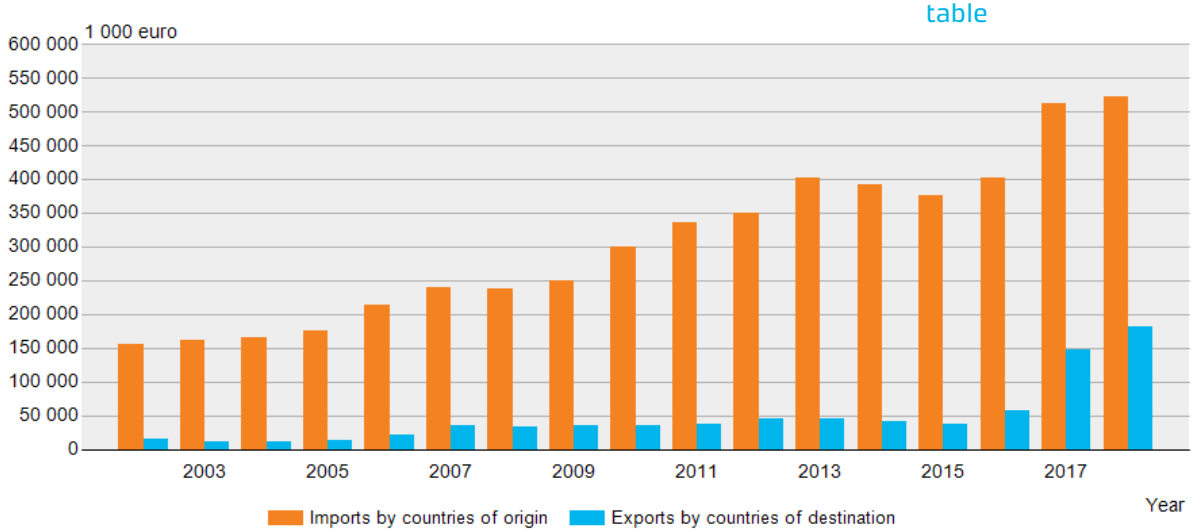
Quantity of imports and exports of fish and fish products 2002–2018

Background data as a table



Value of imports and exports of fish and fish products 2002–2018

Background data as a table



Photographs: Erkki Oksanen / Luke

Profitability of fisheries

In 2016, fishery revenues increased. Although revenue of fishing companies decreased, other fishery sectors managed to increase their revenues. Despite the reduction in revenues, the net result of fishing improved by a quarter, mainly thanks to the improved profitability of large trawlers. Aquaculture companies also improved their profitability. Revenues from fish processing, as well as the net result, slightly improved. Wholesale revenues were even higher than revenues from fish processing, and the profitability of the sector also improved. Retail revenues also increased and the net result improved after the loss in 2015.

Fishery revenues increased

In 2016, there were 1,779 companies operating in the fisheries industry. The majority of the companies in the industry (73%) were fishing companies. The total revenue of the fishery industry amounted to EUR 901 million, an increase of 7% from 2015. The added value produced by the fishery industry increased by one-fifth to EUR 146 million. Fish trade and fish processing are very centralised, meaning that the ten largest companies produce clearly more than 80% of the total revenue in these segments.

Fish processing provided the most employment

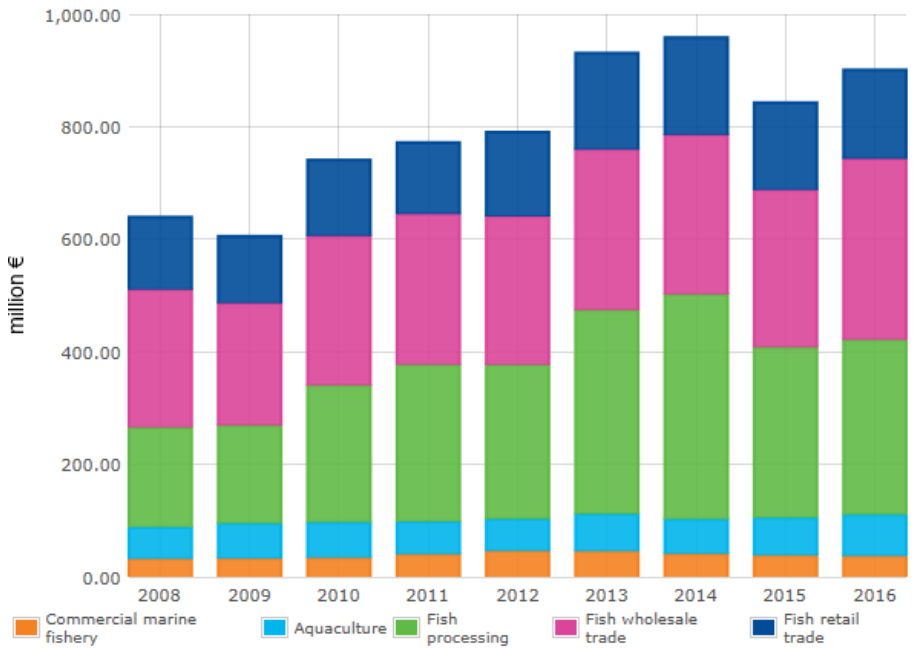
The fishery industry provided 2,052 person-years of employment. Fish processing provided the most employment: 30% of the entire industry. The number of person-years increased in fish trading, while the number of person-years decreased in fish processing and primary production.

Fish processing and wholesale are the fishery industry's largest segments

After one year of decrease, revenue in the fishery industry showed an increase in 2016. Fishing companies were

Total real income of commercial marine fisheries, aquaculture, fish processing, fish wholesale, and fish retail

▶ Background data as nominal income



the only segment where revenue decreased: the revenue of the other fishery industry actors increased. Wholesale fish revenues increased the most, i.e. by 15%. Fish wholesalers achieved the largest revenues in the fishery industry in 2016: EUR 322 million. Revenues from fish processing amounted to EUR 311 million.

Revenues and profitability of aquaculture companies improved

In 2016, there were 173 companies with aquaculture as their main line of business in Finland. The aquaculture companies are divided into five categories based on their main production orientation. The categories are: marine food fish production, freshwater food fish production, recirculating aquaculture systems, hatcheries and nurseries, and ponds.

Photo: Erkki Oksanen / Luke

The segment provided 340 person-years of employment. The profit from aquaculture increased by ten per cent, to EUR 74 million. More than half the profit from aquaculture companies, some EUR 43 million, came from food production in sea areas. The business of companies in this size class was also the most profitable. The net result showed a profit in almost all forms of production, and the profitability of the entire segment improved.

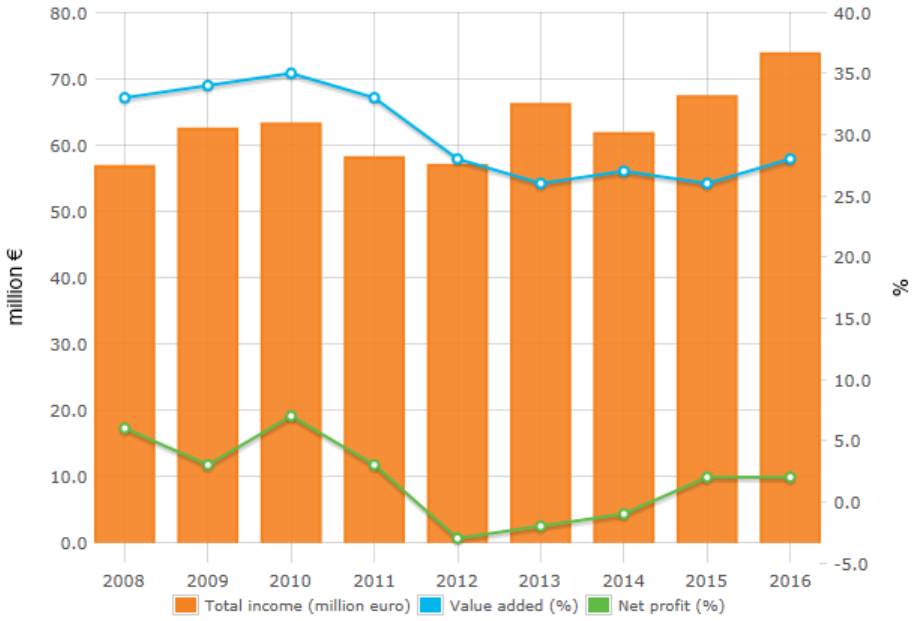
Aquaculture companies made net investments totalling over eight million euros. Marine food fish producers made the highest investments, totalling around 1.2 million euros. However, net investments made in food fish production at sea and in inland waters decreased but grew in juvenile production and in fish farming in natural nutrition ponds. The solvency and liquidity of companies in the segment were mainly good or satisfactory.

▶ Profitability of fishery

▶ Economydoctor

Real development of total income, value added and net profit of aquaculture companies

▶ Background data as nominal income



Fish consumption

In 2017, Finnish people consumed just over four kilograms of domestic fish and almost ten kilograms of imported fish per person. The consumption of domestic fish was converted into fillets, while the consumption of imported fish was primarily calculated according to the product weight.

Consumption of imported salmon increased

The most important domestic species in terms of consumption was farmed rainbow trout (1.2 kg per person), while of imported fish, farmed salmon was the most consumed (4.0 kg per person). The consumption of imported salmon increased by nearly 14% from the previous year.

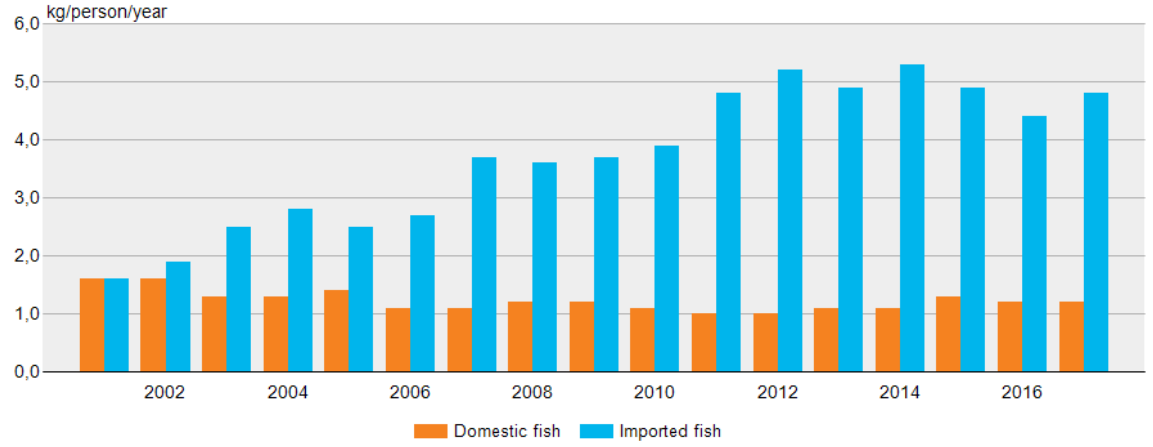
Of wild-caught domestic fish, vendace was the most consumed, i.e. 0.61 kilograms per person, followed by pike (0.44 kg), perch (0.41 kg), pikeperch (0.40 kg), Baltic herring (0.31 kg), and European whitefish (0.29 kg).

With regard to the consumption of imported products, farmed Norwegian salmon was followed by canned tuna and other tuna products, farmed rainbow trout, frozen pollock, and shrimps and shrimp products.

▶ Fish consumption

Consumption of domestic rainbow trout and imported salmon and rainbow trout 2001–2017

▶ Background data as a table



Domestic fish consumption by origin

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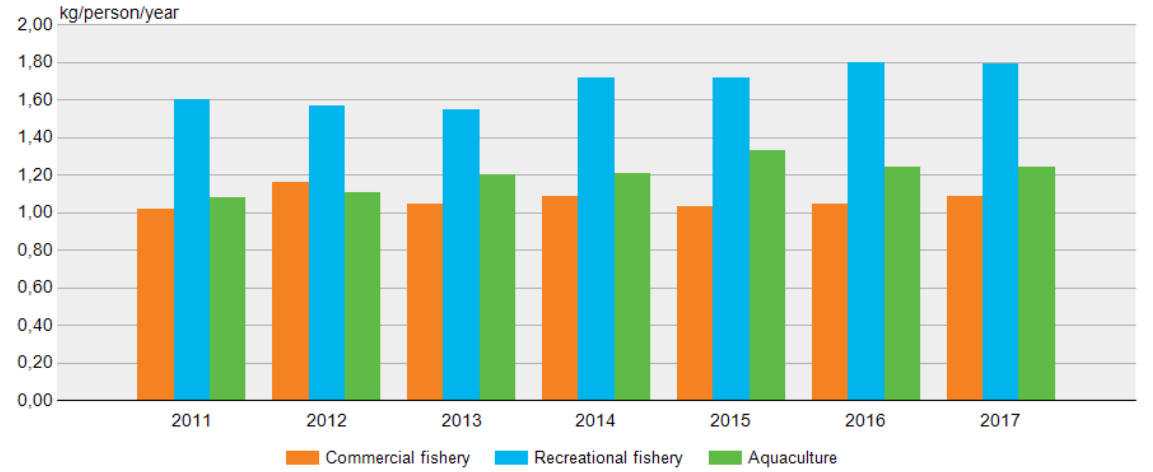


Hunting

Approximately 300,000 hunters pay the game management fee each year in Finland. Of them, two-thirds spend at least one day hunting per year. The number of hunters has remained at roughly the same level as in previous decades, but in recent years, the number of hunters who actually engage in hunting has decreased. This has also reduced the size of the small-game bag.

The number of female hunters has increased

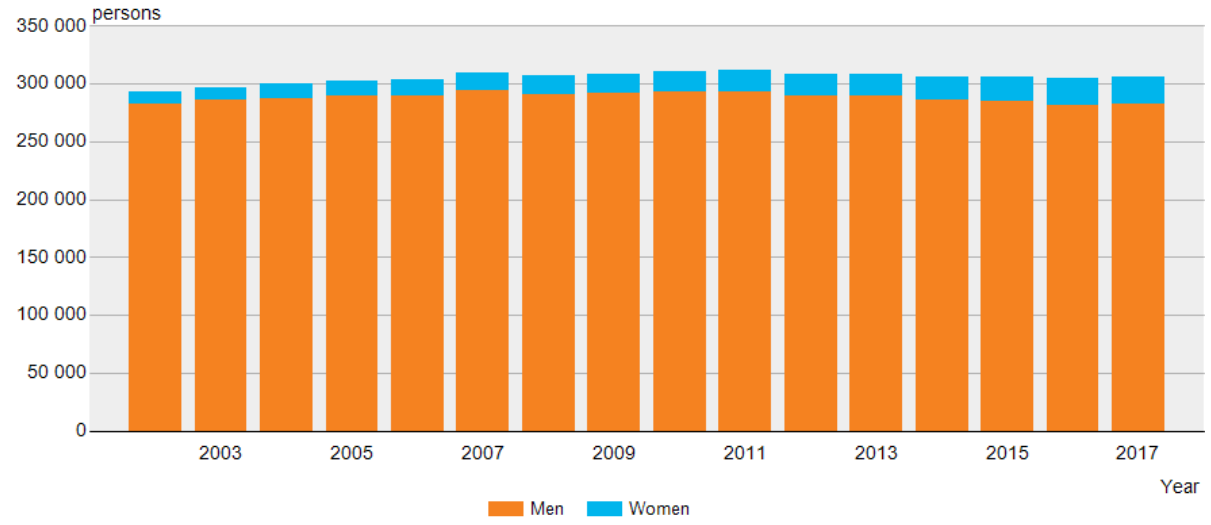
Traditionally, hunting has been considered a highly masculine activity, but now an increasing number of women are also interested in hunting. During this decade, the number of male hunters has slightly decreased, while the number of female hunters has grown. In 2017, approximately eight per cent of all hunters were women.

The number of bird hunters has decreased

During the current decade, the number of hunters hunting waterfowl has steadily decreased. The number of grouse hunters has also reduced over the last three years. Since 2010, the number of grouse hunters has dropped by a third, and the number of waterfowl hunters by a quarter. Grouse stocks fluctuate significantly. In recent years, stocks have remained small, which may partly explain the smaller grouse bags compared with previous years.

Photo: Erkki Oksanen / Luke

Number of hunters who paid game management fees 2002-2017 ▶ Background data as a table



The number of deer hunters has varied less than the number of small-game hunters, and has increased from the previous year for the last two years. In 2017, the number of grouse and waterfowl hunters amounted to around 80,000 people, and the number of deer hunters to roughly 117,000 people.

Small-game hunters accumulated a total of three million hunting days

Roughly half the hunters who responded to a hunting survey reported having spent fewer than ten days small-game hunting in 2017, although on average, small-game hunters spent around 20 days hunting per year. Nearly 70% of hunters using passive hunting gear such as traps reported having spent at least ten days hunting.

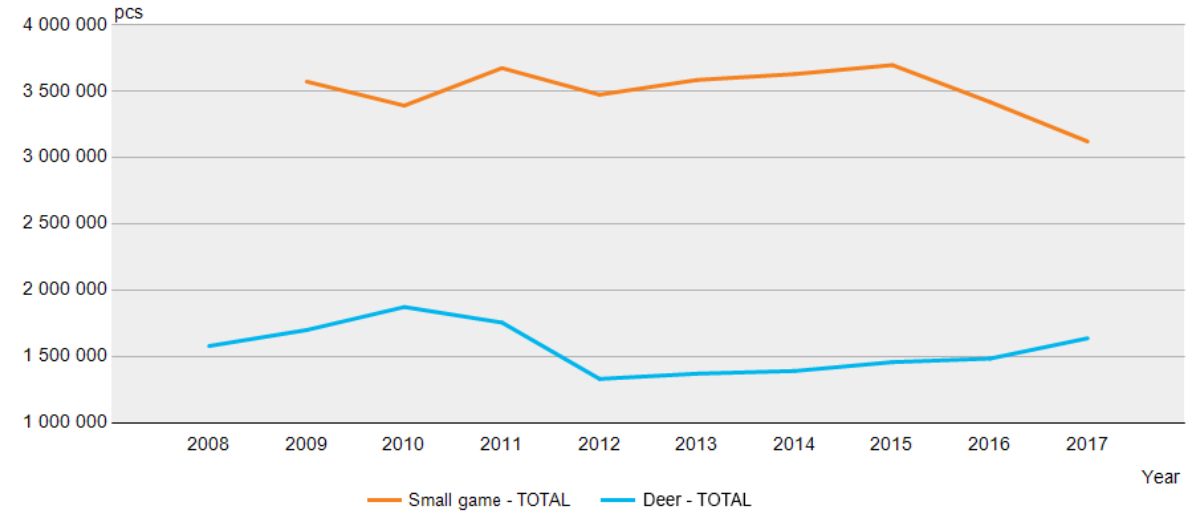
Deer hunters accumulated a total of 1.6 million days hunting. Roughly half of them reported spending at most 12 days hunting.

Small-game bag decreased and the deer bag increased

In recent years, the small-game bag has decreased but the deer bag has increased. Deer stocks have also increased, which has enabled the issuing of more hunting licences for deer. A well-planned reduction of deer stocks helps to manage deer stocks and keep damage caused by deer at a reasonable level. Unlike other deer species, hunting of roe deer does not require a separate hunting licence, but any deer caught must be reported to the Finnish Wildlife Agency.

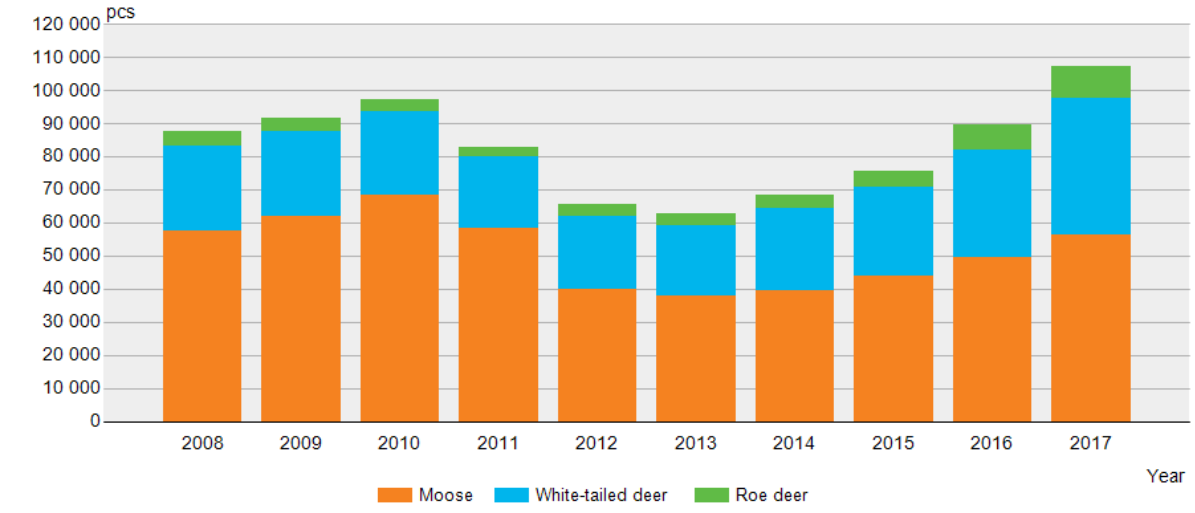
Total number of days spent by hunters on small-game and deer hunting

Background data as a table



Deer bag 2008–2017

Background data as a table



The reduction in the small-game bag is mainly due to the reduction in the waterfowl and grouse bags. The stocks of many waterfowl species have dramatically declined, and from 2020, any birds caught from around ten waterfowl species must therefore be reported to the Finnish Wildlife Age. Mallards, goldeneyes and teals account for the majority of the waterfowl bag. The reporting obligation will not cover these species.

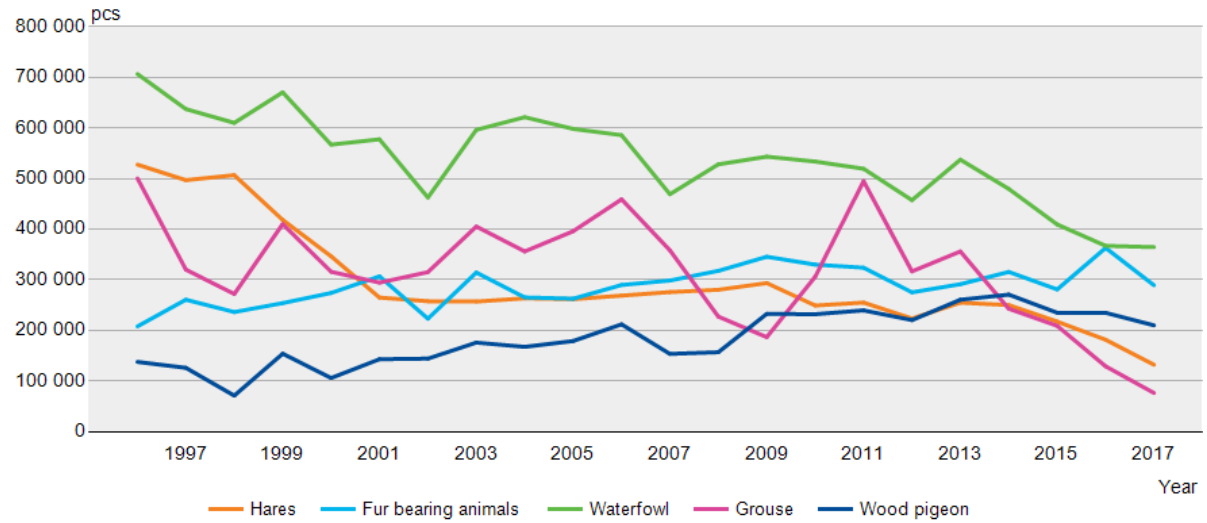
The hare bag has also significantly reduced. During the last three years, the mountain hare bag has almost halved. According to Luke's snow track calculations, mountain hare tracks have reduced in certain regions.

The fur animal game bag has hardly changed over the last ten years. The most hunted species was the raccoon dog, whose game bag has ranged between roughly 150,000 and over 200,000 animals. The raccoon dog bag increased significantly in the 1990s and even in the 2000s, but in the 2010s the numbers have stabilised.

In 2017, the most hunted species was wood pigeon (over 200,000 birds), followed by mallard (around 180,000 birds) and raccoon dogs (around 150,000 animals).

Small-game bag 1996–2017

▶ Background data as a table



▶ Hunting

Photo: Luke's photo archive

Bioeconomy in Finland

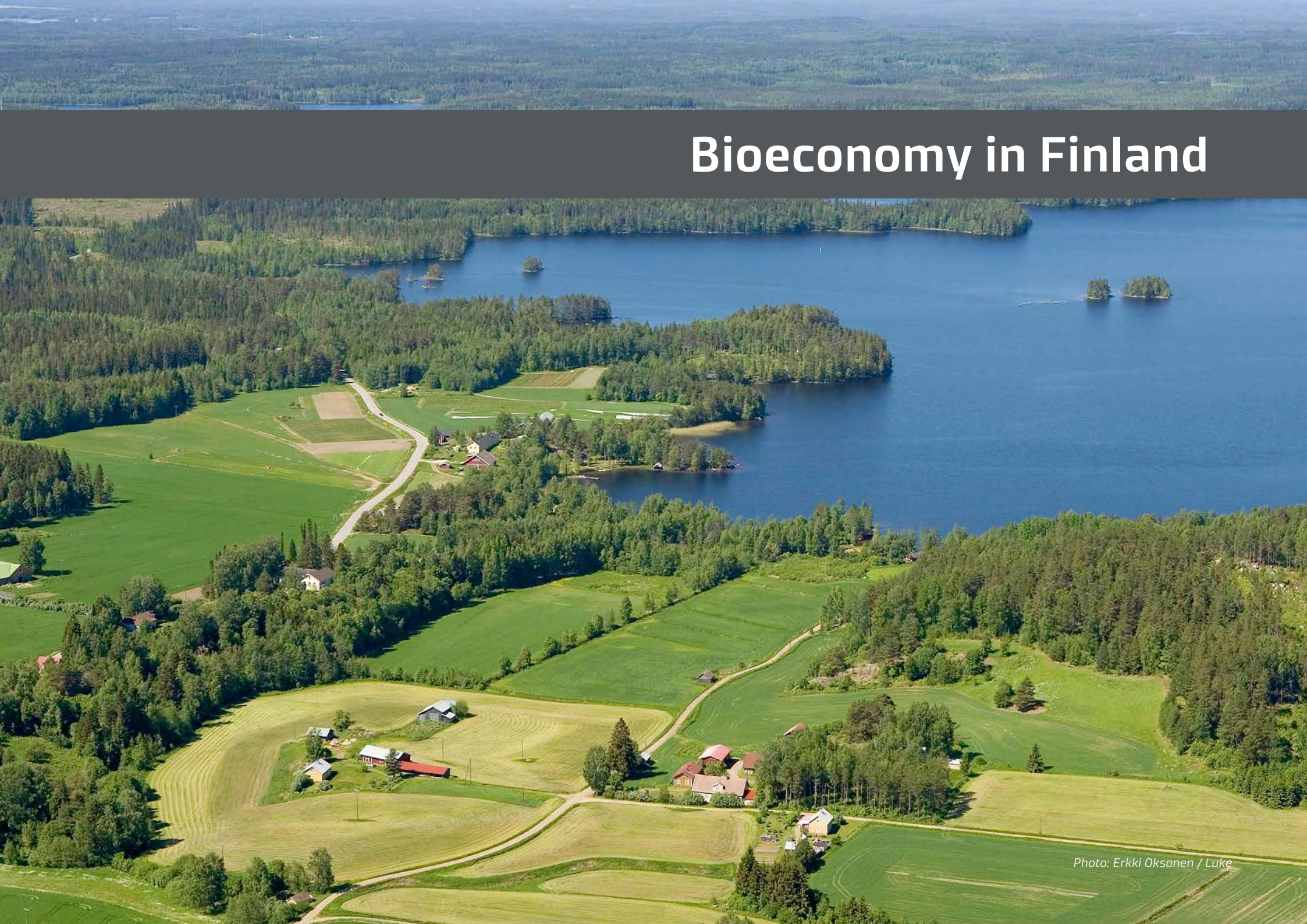


Photo: Erkki Oksanen / Luke

Bioeconomy in Finland

According to the Finnish Bioeconomy Strategy, drawn up in 2014, **bioeconomy** refers to an economy using renewable natural resources to produce food, energy, products and services. The most important renewable natural resources include the biomass in forests, soil, fields, bodies of water and the sea, as well as fresh water. The bioeconomy strategy seeks to reduce dependency on fossil natural resources, prevent the impoverishment of ecosystems and promote economic development and create new jobs in compliance with the principles of sustainable development.

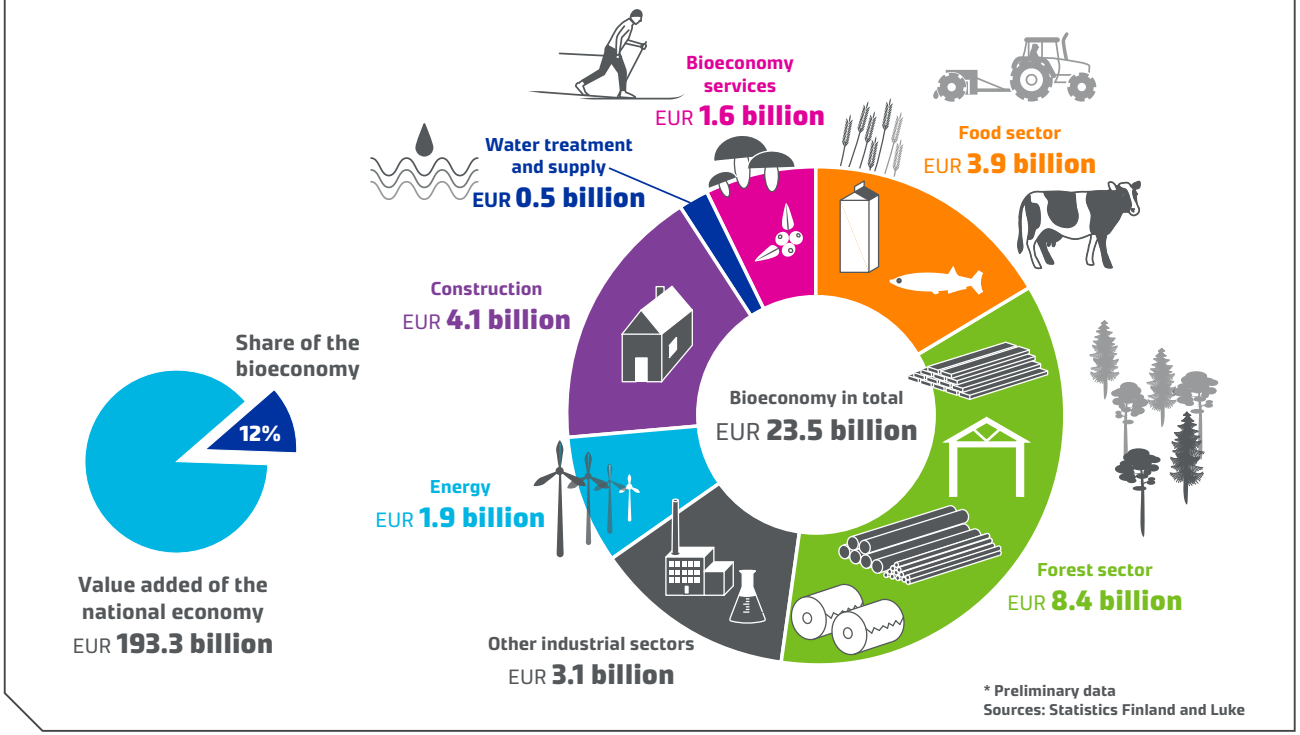
In 2017, sectors in the bioeconomy represented 16% of all products manufactured in the national economy. The total output of the bioeconomy sectors amounted to EUR 67.7 billion in 2017, an increase of six per cent from the previous five-year period in real terms. Sectors in the bioeconomy produced a total of EUR 23.5 billion (+9%) in value added. The number of people employed in the bioeconomy was 315,000, i.e. around the same number as the average for 2012–2016.

- Bioeconomy output 2010–2017
- Bioeconomy investments 2010–2017
- Persons employed in the bioeconomy 2010–2017

The traditional food and forest sectors have maintained their position as the strongest pillars of the Finnish bioeconomy, although in recent years higher growth percentages were achieved in other sectors, such as wood construction and renewable energy production. Recreational use of nature and the use of other bioeconomy services are also increasingly important.

The significance of forest bioeconomy is higher in Finland than in any other EU Member State. In 2017, the forest sector represented 38% of the total output of the bioeconomy and 36% of the value added. These proportions have remained fairly stable in recent years. Forest industries have particularly invested in increasing capacity in the paperboard and pulp industries. Forestry output was

Value added of the bioeconomy by sector, 2017



increased due to record-high felling volumes. Bioeconomy products represent approximately one-third of all goods exported from Finland, and within the bioeconomy, forest products alone make up nearly 70% of the total value of exports.

In 2017, the food sector employed a total of 121,000 persons, which accounts for almost 40% of the total employment in the Finnish bioeconomy. The largest individual sector was agriculture with 81,500 people employed. The food sector accounts for almost a third of the total investments of EUR 5.7 billion made in the bioeconomy. In 2017, investments in agriculture amounted to EUR 1.1 billion.

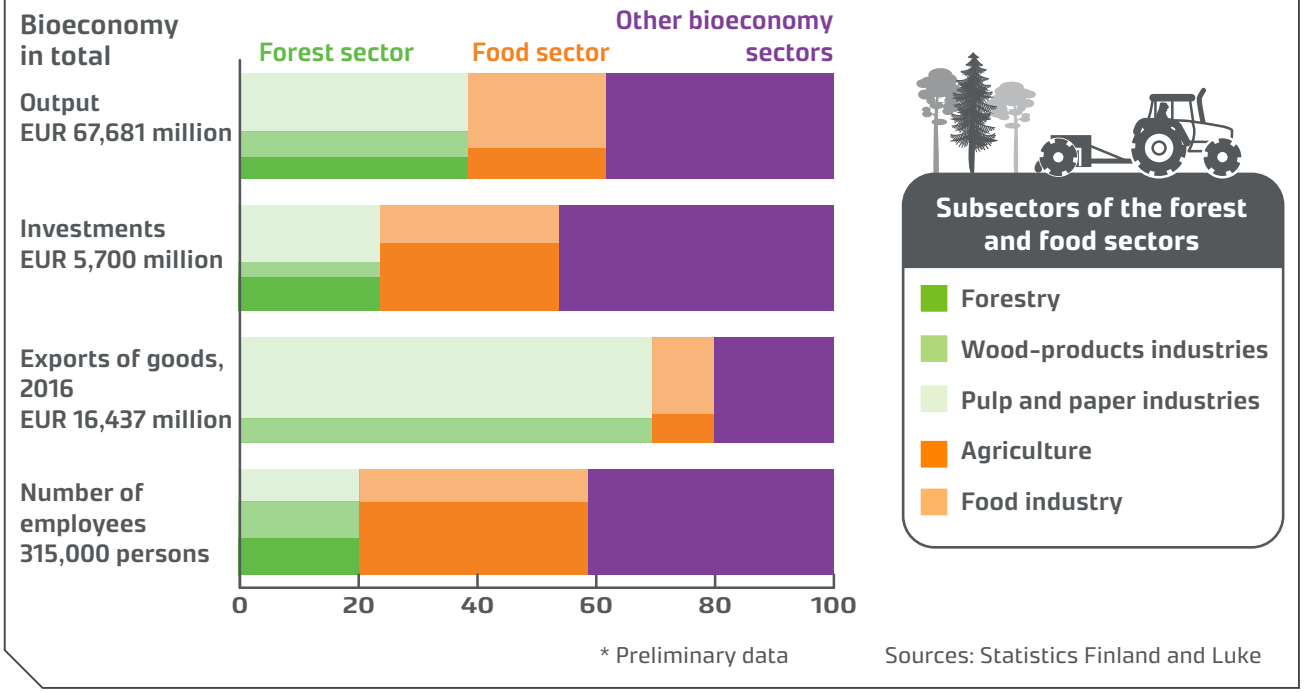
Sectors regarded as the 'blue bioeconomy', i.e. professional fishing and aquaculture, the fish processing industry and recreational fishing, represent less than 1% of the output and value added of the bioeconomy.

According to the Finnish Bioeconomy Strategy, the goal is to push our bioeconomy output to EUR 100 billion and the number of people employed by 100,000 by 2025. These goals are ambitious. In the 2010s, the output, value added and investments of the bioeconomy have increased significantly, but this has not affected employment.

The statistics on agriculture, forestry, and fishing and hunting, produced by Luke, are important data sources for the national accounts drawn up by Statistics Finland. Statistics Finland is also responsible for the drafting of the bioeconomy calculations on the basis of the national accounts. The two organisations are jointly in charge of developing the methodology and substance of Finnish bioeconomy statistics.

- Finnish bioeconomy in numbers
- Bioeconomy tables in the statistics database

Forest and food sectors in the Finnish bioeconomy, 2017



* Preliminary data

Sources: Statistics Finland and Luke

Links to statistical services

Luke's statistical services: *https://stat.luke.fi/en/uusi-etusivu*

Luke's statistics database: *http://statdb.luke.fi/PXWeb/pxweb/en/LUKE/?rxid=f8344f88-1f3d-433a-917c-09bd5cde6af4*

Instructions for using the database: *https://stat.luke.fi/sites/default/files/tilastotietokanta_ohje_evuosikirja_2018.pdf*

Statistics Finland: *http://stat.fi/til/index_en.html*

Eurostat database: *http://ec.europa.eu/eurostat/data/database*

FAOSTAT Statistical database: *http://faostat3.fao.org*

Eurostat agricultural statistics: *http://ec.europa.eu/eurostat/web/agriculture/overview*

Agricultural statistics for Sweden: *http://www.jordbruksverket.se/omjordbruksverket/statistik.4.67e843d911ff9f551db80003060.html*

Global Forest Resources Assessment 2015 – Country Reports: *http://www.fao.org/forest-resources-assessment/documents/en/*

State of Europe's Forests 2015 Report: *http://www.foresteurope.org/*

State of Europe's Forests database: *http://w3.unece.org/PXWeb2015/pxweb/en/STAT/STAT__26-TMSTAT1/*

FAO Forestry Statistics: *http://www.fao.org/forestry/46203/en/*

UNECE Forestry and Timber: *http://www.unece.org/forests/welcome.html*

Forest statistics for Sweden: *https://www.skogsstyrelsen.se/statistik/*

European Commission Fishery Statistics: *https://datacollection.jrc.ec.europa.eu/*

ICES Fishery Statistics: *http://www.ices.dk/marine-data/dataset-collections/Pages/Fish-catch-and-stock-assessment.aspx*

FAO Fishery Statistics: *http://www.fao.org/fishery/statistics/en*

Fishery statistics for Sweden: *https://www.havochvatten.se/hav/samordning--fakta/data--statistik/officiell-statistik.html*

Photo: Erkki Oksanen / Luke

EDITORS
Tarja Kortesmaa, Riitta Salo-Kauppinen

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FORESTS: Antti Ihalainen, Aarre Peltola, Jukka Torvelainen, Elina Mäki-Simola, Olli Salminen, Esa Uotila, Esa Ylitalo, Martti Aarne, Eeva Vaahtera

FISH AND GAME: Pirkko Söderkultalahti, Leena Forsman, Mika Rahikainen, Pentti Moilanen, Antti Takolander, Markku Kärnä

BIOECONOMY: Martti Aarne

LAYOUT Irene Murtovaara

PHOTOGRAPHS: Luke's photo archive, Janne Lehtinen, Omer Levin, Jari Lindeman, Erkki Oksanen, Pekka Salmi, Yrjö Tuunanen, Tapio Tuomela, Pekka Väisänen, Matti Lahtinen / Finnish Fruit and Berry Farmers' Association, Pro Fish Association.

INFOGRAPHICS
Essi Puranen

stat.luke.fi

Natural Resources Institute Finland (Luke)
Statistical Services
Latokartanonkaari 9
FI-00790 HELSINKI

Switchboard +358 29 532 6000
firstname.lastname@luke.fi
www.luke.fi

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