FINNISH agriculture AND RURAL INDUSTRIES 2013

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Preface

The MTT Economic Research publishes a report on Finnish agriculture and rural industries every year, including current topics and prospects of the sectors covered and the most recent research information. This year's report again gives a comprehensive account of the operating environment of agriculture, trends in the agricultural and food markets, agricultural policy and its future, economic situation of agriculture, interaction between agriculture and the environment and socioeconomic development of the rural areas.

The report presents the various aspects of the economic development of agriculture and horticulture enterprises, including the preliminary figures for 2012. The profitability trend as a whole has been rising since the bottom figures in 2009. However, especially on crop farms but also in other sectors the variations in profitability due to considerable changes in input and producer prices have come to stay, and they are also reflected as variations in the liquidity of farms. Differences in profitability may be great even between quite similar farms, partly depending on their life cycle stage. With the more advanced analysis systems, in the future we will have a better understanding of the reasons behind the high and low profitability, allowing us to offer a wider range of tools for farm management, also taking account of the life cycle stage and varying information needs.

The operating environment and conditions of farms depend a great deal on the common agricultural policy of the EU, which is again being reformed. The reform preparations have taken longer than was expected, which means that the main elements of the reform will not enter into force until the beginning of 2015. The aim is to reach a political understanding of the content of the reform by June 2013. For Finnish agriculture the core issues in the reform are the overall level of EU support, relative weight between the two pillars of the CAP, possibility to apply coupled payments after 2013, and conditions for greening payments.

Of this year's special topics we wish to highlight the articles on caraway. Caraway seed production represents highly specialised small-scale production which in just a few years has become a true success story. Finnish caraway production is highly competitive and strongly export-oriented: almost all of the crop is exported, which is highly exceptional in Finnish agriculture. There is a lot to be learned from the good practices applied in the caraway production chain. The articles tell about caraway production and its profitability, highlighting the integrated supply chain that is the key to its success. The other special topics deal with the import dependence of our domestic food production, EU agricultural policy reform, need to revise the crop damages system, and costs and benefits of Baltic Sea protection.

The MTT wishes to thank Professor Jyrki Niemi and Research Secretary Jaana Ahlstedt, who compiled and edited the report, and all the experts involved in the writing process.

Helsinki 20 March 2013

Sari Forsman-Hugg
Director
MTT Economic Research

Contents

Special topics

1. OPERATING ENVIRONMENT OF AGRICULTURE

1.1. Agriculture and the food sector in the national economy

In Finland the total annual consumer expenditure on food and beverages is € 21.6 billion. The share of food and non-alcoholic beverages consumed at home is a little over a half of this, € 12.3 billion.

As the standard of living has risen, the share of food consumed at home in the consumer expenditure of Finnish households has decreased to about the same level as in the old EU countries. In 2011 this share was 12.2%, which is a little smaller than in the previous year.

When alcoholic beverages and eating out are included, food represents 21.5% of the consumer expenditure of households. The share of food consumed outside home is 5.9%, which is lower than in the old EU countries (7.4%).

The total value of the annual money flows in the food sector is about € 25.7 billion, when food exports and agricultural support payments are taken into account, in addition to the total private and public consumer expenditure.

Share of foodstuffs and non-alcoholic beverages in consumer expenditure of households, %.

	2010	2011
EU 27	12.9	12.9
EU 15	12.3	12.3
Italy	14.5	14.2
Norway	13.2	13.3
Portugal	16.4	16.8
France	13.5	13.5
Sweden	12.2	12.2
Germany	11.4	11.5
Finland	12.3	12.2
Denmark	11.3	11.4
Estonia	20.1	19.8
United Kingdom	9.1	9.1

Source: Eurostat National accounts.

Consumer expenditure on foodstuffs and beverages, € million.

	2010	2011	% change
Total	20,470	21,646	6
Foodstuffs*	10,575	11,172	6
Non-alcoholic beverages*	1,019	1,078	6
Alcoholic beverages*	3,350	3,424	2
Catering services (eating out)	5,526	5,972	8

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

Agriculture and horticulture

According to the national accounting, the gross value of agricultural and horticultural production in 2011 was € 6.6 billion, when production support of 2.1 billion is taken into account. The gross value of the production increased by 7.9% from € 6.1 billion in 2010.

Intermediate products account for a little less than a half of the gross value of agricultural production. In 2011 this share was € 3.2 billion, which is 14.1% larger than the year before. The main intermediate product items are fertilisers, feedingstuffs, electricity and transport fuels and various kinds of services in support of the production activities

The value added produced by agriculture and horticulture was 3.4 billion and its share in the Finnish GDP, 2.1%, was about the same as in 2010. Besides the weather conditions during the growing period, fluctuations in the product and input prices are reflected in the economic outturn of these sectors more clearly than before.

Agriculture is very capital intensive because of the various kinds of special machinery and buildings needed in the production. In 2011 the share of agricul-

ture in the total investments of the national economy was 3.2%, which is clearly higher than its share in the GDP.

Food processing

From 2010 to 2011 the gross value of the production of food industry grew from € 10.3 billion to 11.3 billion. The use of intermediate products increased from € 7.8 billion in 2010 to 8.6 billion and the value added created in food industry rose from € 2.5 billion to 2.7 billion.

The GDP share of the food industry was 1.7% in 2011. This was about 9.6% of the value added of the manufacturing industries, which is slightly higher than in the previous year (9.3%).

Measured by the gross value of the production and value added, food industry ranks as the fourth largest manufacturing sector in Finland, after machinery and equipment industry, electronics industry and paper industry. When measured by value added, food industry is the third largest after machinery and equipment industry and paper industry.

Food industry is raw material intensive: intermediate products represent more than 70% of the gross value of the production. Food industry purchases most of its raw material from the domestic agriculture and horticulture. Because of the transportation costs a significant share of our food industry is highly dependent on domestic raw material.

In 2011 the domestic investments of food industry totalled about € 350 million and their share in the total investments was about the same as the year before, 0.9%. The level of investments is clearly lower than the GDP share of the sector.

Domestic trade in foodstuffs

The trade sector sees to the final distribution of foodstuffs to the consumers. The value of production in the trade sector, i.e. its margin, is not as readily available as that of primary production and processing because in most cases only figures for sales and turnover can be obtained. In 2011 the turnover of the trade in daily consumer goods totalled € 15.7 billion, which was 4.4% higher than the year before. Besides foodstuffs the sales include other daily consumer goods and durables.

Foodstuffs require a great deal of handling, which is why production facilities and wages and salaries are significant items in the value added of the trade sector. Other major cost items are transportation and logistics and various kinds of business and real estate services.

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

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

Foreign trade in foodstuffs

The value of food imports (CN 1–24) grew by 9.4% to € 4.3 billion in 2011. The value of food exports rose by 17.2% to € 1.6 billion in 2011. From 2010 to 2011 the total goods imports grew by 16.6% and exports by 8.4%.

The share of food imports in the total goods imports (CN 1–99) decreased from 7.6% to 7.1% in 2011. The share of food exports in the total value of exports rose from 2.6% to 2.8%.

The most significant imported food products are beverages, including alcohol,

and fruits. Some of the imported foods are primary products which cannot be produced in Finland (coffee, cocoa, tea) or the quantities produced are not sufficient (fruit, vegetables). The export and import of products representing the same product categories, such as cheeses, beverages and confectionary, have also increased considerably.

Besides the finished food products, the food sector imports various inputs needed in the production, such as raw materials for processed foods and feedingstuffs, fuels and various kinds of chemicals. Most of the machinery and implements and their parts are also imported. Besides tangible goods, various kinds of import services are used in the business management, planning and research tasks. The Agrifood Research Finland MTT has estimated the value of imported inputs without machinery at € 4.9 billion and that of finished food products at 1.9 billion (in 2008).

Taxes and support in the food sector

The State functions in the food chain as it collects taxes and allocates financial support to agriculture. In addition to the value added tax, the consumers pay excise duties in the prices of foodstuffs and beverages, as well as energy taxes included in the production inputs. Income tax is collected in the food chain on wages and salaries and on capital income.

The tax revenue collected as VAT and excise duties totals about € 4.5 billion. The value added tax revenue from food is about € 1.4 billion. The value added tax revenue from restaurant services is estimated at about € 0.7 billion and that from retail sale of alcoholic beverages at about € 0.6 billion.

The VAT on food was rose from 12% to 13% in July 2010 and to 14% from the beginning of 2013. The VAT on restaurant services was lowered from 22% to 13% and raised to 14% in 2013. The value added tax revenue from food represents about 10% of the total value added tax revenue. When restaurant services and alcohol are included, the share of food commodities in the total value added tax revenue rises to almost 20%.

The excise duty on alcoholic beverages was raised once in 2008, twice in 2009 and again in 2012. The tax revenue from alcoholic beverages totals about € 1.4 billion. A total of about € 0.2 billion was collected as excise duties on confectionary, ice cream

GDP share of agriculture[1] and food industry (at basic price) and investments (at current prices).

Year	Gross domestic product				Share in investments	
	Agriculture million €	Food industry million €	Agriculture %	Food industry %	Agriculture %	Food industry %
2011	3,439	2,698	2.1	1.7	3.2	0.9
2010	3,346	2,534	2.1	1.6	3.2	0.9
2009	3,234	2,737	2.1	1.8	3.5	1.1
2008	3,012	2,471	1.8	1.5	3.1	1.1
2007	3,204	2,432	2.0	1.5	3.3	1.2
2006	2,857	2,269	2.0	1.6	3.3	1.1
2005	2,880	2,344	2.1	1.7	3.4	1.3
2004	2,804	2,318	2.1	1.7	3.4	1.1
2003	2,836	2,395	2.2	1.9	3.9	1.5
2002	2,907	2,384	2.3	1.9	4.3	1.6

[1]Agriculture including subsidies on production in addition to subsidies on products.
Source: National accounting 2002–2011e, Statistics Finland.

and soft drinks. The duty on confectionary and ice cream became applicable in 2011, and the duty on soft drinks was raised at the same time.

The various types of support to agriculture, a total of about € 2.1, billion, are funded by the EU, co-funded by the EU and from national funds, or paid from the national funds only. The EU contributions to agricultural support total about € 0.8 billion a year. In 2011 the contributions of Finland to the EU from the State budget totalled about € 1.8 billion.

Agricultural support is not directly visible in the consumers' food expenditure, but its impact can be calculated at about 2%.

Economy-wide effects of the food sector

Besides agriculture, food industry and the trade sector, many other sectors are involved in the food chain by producing goods and services for it. In practice the effects of food production extend all through the economy and different industries, also to the transportation, trade and energy sectors and water and waste management.

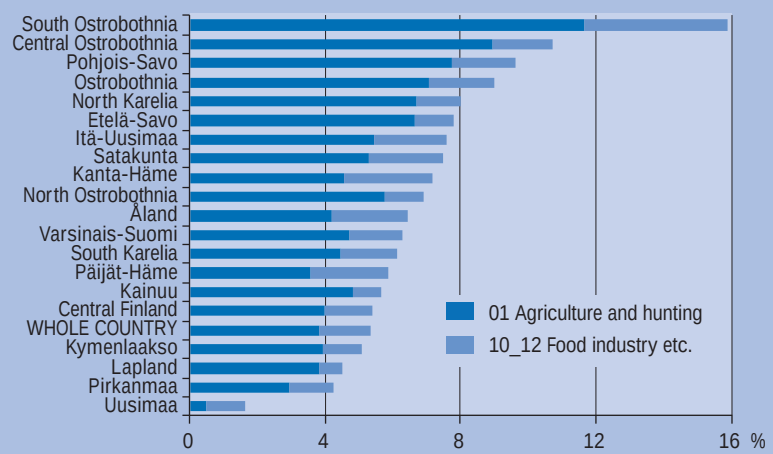
Households use income generated in food production for purchasing goods and services from sectors producing consumer goods. In the rural areas the economic impact of household consumption may be greater than that of input demand in agriculture.

Part of the investment effects flow abroad, especially through the purchase of machinery. The effects of building are more directly targeted to the regions themselves than investments in machinery. Besides agriculture and the processing industry, in recent years building investments have also been made in food trade.

Employment effects of the food chain

In 2011 the number of people employed in agriculture was 90,100, which is 3.6% of the employed labour force. This is 4,500 persons less than the year before. The number of people employed in agriculture has fallen in all regions along with the number of farms and increased substitution of machines for labour.

In absolute terms the number of people employed in agriculture is the greatest in the regions of South Ostrobothnia,

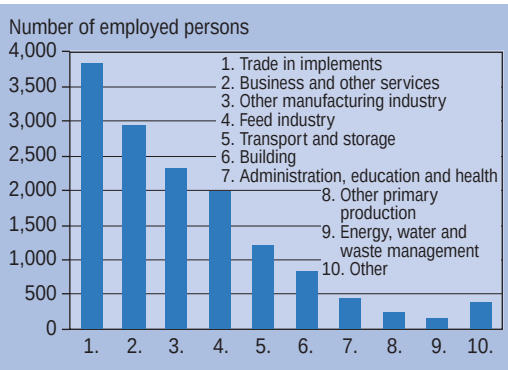


Employed of agriculture and food industry (%) in different regions in 2010. Source: Regional accounting, Statistics Finland.

Southwest Finland, North Ostrobothnia and North Savo, with a 40% share of the total labour force in agriculture. Proportionally the share of agriculture in the employed labour force is the highest in South and Central Ostrobothnia (11.7 and 9%), North and South Savo (7.7%) and coastal regions of Vaasa (7.1%). By purchasing production inputs agriculture also employs people in other sectors, especially in trade of implements, services and manufacturing industry, about 15,000 persons.

Food industry employed 38,300 persons, which is 300 persons less than the year before and 1.5% of the employed in all sectors. Almost a quarter of the jobs in food industry are in Uusimaa, 10% in South Ostrobothnia, 9% in Southwest Finland and 8% in Pirkanmaa. Proportionally food industry is by far the greatest employer in South Ostrobothnia (4.2% of the employed labour force) and Häme (2.6%).

While the number of jobs in primary production and processing are decreasing, more people find employment in services in the food chain. In 2011 the number of people employed in restaurants and catering services was about 61,500, which was 700 persons more than the year before. The trade in daily consumer goods employed 48,615 persons, which was about 1,800 persons more than in 2010.



Employment effect of the use of intermediate products in agriculture by sectors in 2010 (number of employed persons).

1.2. Rural enterprises

The Finnish countryside has changed quite dramatically, especially over the past fifteen years, with strong differentiation in the development trends in different types of rural areas. In many sparsely populated areas the population is decreasing and ageing rapidly, while the number of rural residents and enterprises has been growing in urban-adjacent rural areas.

Small rural enterprises can be divided into three groups: farms engaged in basic agricultural production and farm forestry, diversified farms with other business activities besides agriculture and farm forestry, and small rural enterprises with no connection to farms.

In 2010 the total number of enterprises in Finland was about 319,000. The number of small rural enterprises was estimated at about 140,300, of which 32% were engaged in basic agriculture, 14% were diversified farms and 53% were other small enterprises. Diversification of farms is much more common in Finland, the other Nordic countries and West European countries than in the southern and eastern parts of Europe.

Agriculture and farm forestry still constitute the most significant rural industry. The Finnish farm structure and changes which have taken place in this are presented in more detail in Chapter 1.3.

Diversified farms in Finland

In 2010 the number of farms practising other gainful activities besides agriculture was 19,500, which means that about 31% of the Finnish farms were diversified. Diversification into other activities besides agriculture has traditionally been quite common among farmers, but in the 1990s and 2000s new operations were launched more than ever before. In 2010, however, there was some decrease in the number of diversified farms.

Starting other gainful activities is often connected to changes in the operating environment of farms, creating new demand for the products and services, while new challenges to agriculture may have encouraged the farm families to seek new sources of livelihood. As regards the types of areas, most of the diversified farms are in urban-adjacent rural areas and remote rural areas.

The other activities on farms are usually strongly linked to farming and its resources, i.e. the farm resources are in joint use for activities in several sectors. In 2010 agricultural machinery, buildings, land areas or products and labour force were used for the other gainful activities on 87% of the diversified farms.

Diversified farms operate in various sectors. In 2010 the majority of them (70%) were engaged in services. One out of eight farms was engaged in manufacturing, 5% in primary production other than agriculture and 4% in trade. Many farms operate in several sectors, for example, in both contractual work and tourism.

The proportional share of activities practised by diversified farms has changed over the past decade. There has been some increase in the share of enterprises in the service sector, while the share of manufacturing has decreased. The number of farms in other types of primary production has decreased, which also reflects the general trends in these sectors. The numbers of, for example, reindeer herders, fur farmers and fishermen has decreased considerably over the past decade.

Primary production other than agriculture, horticulture and forestry comprises fishing, fish or crayfish farming, fur farming and reindeer herding. A total of 1,200 farms were engaged in these types of primary production, about a 1,000 of these as their main activity. The number of these farms has decreased slightly. The largest sectors are reindeer herding and fur farming.

About 4,850 farms were engaged in manufacturing industry, and on 2,750 of these it was the main activity. The largest individual sectors were energy production and further processing of foodstuffs or wood. About 700 diversified farms operated in the building sector, which was the main activity on 400 of them. The number of enterprises engaged in the building sectors has decreased quite a bit in the past few years, partly because of the decrease in building activities in general due to the economic recession. The number of diversified farms engaged in trade was about 1,550 and on about 850 farms this was the main activity.

Services were the main sector on about 13,500 diversified farms. The largest individual sector was contractual work (8,900 farms), which comprises work with agricultural and forestry machinery, bioenergy work, earthworks, snow ploughing and road maintenance. About 1,400 diversified farms operate in tourism. Other significant service sectors include riding and other ser-

Rural enterprises in Finland in 2000–2010.

Year	2000	2002/2003	2004/2005	2010	Change 2000–2010, %
Total	136,400	130,400	131,500	140,334	3
Basic agriculture farms	58,000	50,150	45,200	44,344	–24
Diversified farms*	21,800	23,550	24,300	19,530	–10
Enterprises with no link	56,600	56,700	62,000	74,450	32

** incl. horticulture enterprises*

Source: Information Centre of the Ministry of Agriculture and Forestry MMM/Tike. Register of small rural enterprises (www.mtt.fi/pienyritysrekisteri).

Number of diversified farms in 2000, 2005 and 2010.

Sector	2000	2005	2010
Diversified farms, total	21,838	24,295	19,530
Primary production other than agriculture and forestry	*744*	*1,815*	*981*
Fur farming	632	510	315
Reindeer husbandry	*	574	365
Industry	*4,786*	*3,53*	*2,747*
Food processing	1,065	684	479
Wood processing	1,349	889	554
Production of renewable energy	648	820	668
Peat production	311	217	239
*Construction***	*	*881*	*438*
Trade	*1,056*	*1,229*	*850*
Services	*15,019*	*16,547*	*13,793*
Tourism, accommodation, recreation services	2,272	1,865	1,728
Contracting	8,880	10,013	8,896
Horse husbandry services (renting of stables, horse training)	*	734	888
Other	233		721

** Different classification of sectors, this sector not accounted for in the year concerned*
*** Clearing, demolition and groundwork building included in machine contracting.*
Source: Information Centre of the Ministry of Agriculture and Forestry.

vices related to horses (a total of almost 1,200 farms), transportation (400 farms) and business services. About 170 diversified farms provide care services and on about 120 of these this is the main activity.

Other gainful activities on farms are usually quite small in scale. It is specific to individual farms how large a share of their turnover comes from other activities and what the labour input in this is. In 2010 their turnover was less than € 10,000 on about 40% of the farms. However, on 15% of these farms the turnover of other gainful activities was more than € 100,000. In 2010 employment in these other activities represented about 22,300 AWU. In 2010 the employment effect of other gainful activities was measured in a different way than before. For farmers, family members and partners to corporations only the labour input in other activities related to farming was asked. A total of 17,000 farms reported this kind of labour. About 9,100 people from outside the farms are employed in other gainful activities, in most cases on a part-time or seasonal basis.

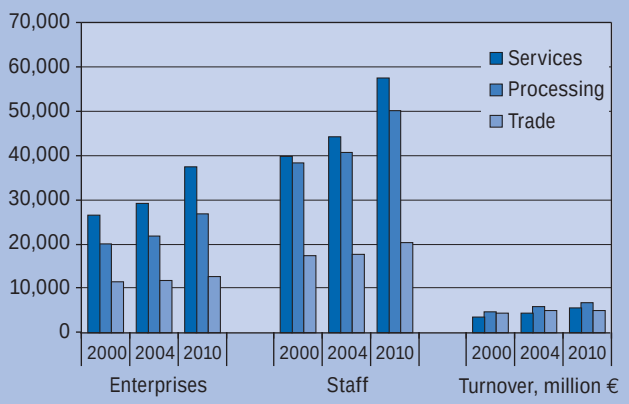
Other rural enterprises

There are regional differences in the number of small rural enterprises and in their structural development, which usually follow the general trends in the economy. It is estimated that about a third of the Finnish enterprises are located in the rural areas[1]. In 2010 the Register of Enterprises and Establishments included 81,000 rural enterprises[2] other than those engaged in agriculture and farm forestry, with a total labour force corresponding to 135,000 AWU and a total turnover of about € 18 billion. Of the small rural enterprises an estimated 74,500 operate with no connection to farming.

In 2010 about 46% of the small rural enterprises engaged in the services sectors, 16% in trade and about a third in pro-

[1] In this context rural area means areas by postal code districts where the population density is less than 50 persons/km^2.
[2] Small enterprise means an enterprise with a single place of business, turnover of at least € 8,409 and staff of less than 20.

cessing. About 5% were engaged in primary production other than agriculture and forestry. Since 2000 the number of enterprises, staff and turnover have increased in both service sectors and processing. In trade there was some decrease in the turnover from 2004 to 2010 (Figure). In the country as a whole the number of enterprises has grown, but there are considerable regional differences. The number of enterprises has grown the most in urban-adjacent rural areas, but in many peripheral areas the number of enterprises has decreased.



Number, staff and turnover corrected by the producer price index of small rural enterprises in the processing, trade and service sectors in 2000, 2004 and 2010.

The development of certain important sectors of rural enterprise is described below.

Energy production and bioenergy

In 2011 energy consumption in Finland totalled about 1.39 million TJ, which was 5% less than the year before. The main sources of energy are oil, nuclear power, coal and natural gas, but the role of the resources available in the rural areas for the production of bioenergy and other renewable energy is growing. Renewable energy sources comprise solar and wind power, hydropower and bioenergy and geothermal, wave and tidal energy. Bioenergy, i.e. biofuel, is derived from biomass growing in forests, mires and fields as well as from organic, liquid and gaseous biowaste suitable for energy production from communities, agriculture and industry.

In Finland bioenergy accounts for about a quarter of the energy consumption and about 80% of the renewable energy sources. According to the long-term Climate and Energy Strategy, the use of bioenergy in Finland should increase by 28 TWh by 2020.

Most of the bioenergy produced and used on farms consists of chips or fuelwood from forests. The most important energy crop in agriculture, reed canary grass, was cultivated on 10,000 ha in 2012, which is about 30% smaller than the year before. In 2010 about 149 farms were engaged in contractual work relating to bioenergy, which comprises the production of biodiesel, ethanol and biogas, and for 57 farms this was the most important activity in terms of their turnover.

Food processing

In 2010 there were about 2,900 food companies in Finland. The majority of food processing enterprises are in the rural areas. The field is strongly polarised into few large companies and numerous small enterprises. Most of the enterprises (71%) employed fewer than 5 persons. The most common sectors are the manufacture of bakery products and further processing of meat. In 2010 a total of 1,070 farms engaged in further processing of foodstuffs, and 650 of these were such that food processing was their main business activity. The most common types of food processing on farms are further processing of veg-

etables and berries, manufacture of bakery products, and slaughtering and further processing of meat.

Rural tourism

Rural tourism is the part of the tourism industry where the opportunities largely derive from resources characteristic to the countryside. The total number of rural tourism enterprises is estimated at 4,900 and their total turnover is about € 510 million. The follow-up by the theme group on rural tourism shows that in July 2007 the occupancy rate of rural accommodation facilities, 66%, was the highest per month. Before this the occupancy rate had been more than 60% in July 1999. The potential offered by rural tourism in the development of the rural areas has been understood for a long time, and the long-term development prospects should also be quite favourable. Responsibility is a priority theme in the development of tourism, and in this respect rural tourism has a lot to offer to the whole Finnish tourism industry.

Equine industry

In this context equine industry comprises the breeding and rearing of horses and care services for them, training, riding schools and horse-related tourism. Equine industry is one of the most rapidly growing businesses in the rural areas: about 75% of the business activities in equine industry take place on farms and 17% otherwise in the countryside. The estimated number of horses in 2012 was about 74,100. The total number of stables in Finland is about 16,000, of which about a quarter are companies. The annual money flows in the industry are estimated at about € 830 million and it is estimated to employ 15,000–16,000 persons. The estimated annual investments of the sector in the operating environment are about € 23 million.

Trotting is a very popular sport in Finland, with more than 200,000 people actively engaged in it. In 2012 about 7,500 horses started off at trotting races, the turnover of betting in horse races was over € 249 million, and about 718,000 spectators visited the trotting tracks to see the races. The number of spectators at the off-track betting points is almost 900,000. The number of riding schools and leisure riding stables approved by the Equestrian Federation of Finland is about 300. There are a total of about one thousand riding stables, of which about a half are enterprises that may be considered riding schools. About 160,000 people enjoy riding as a hobby, the majority of them adults.

Reindeer herding

Reindeer husbandry is a highly significant business in the sparsely populated rural areas in northern Finland. It is a source of livelihood as such, and it is also significant image factor for tourism and major aspect of the Lappish culture.

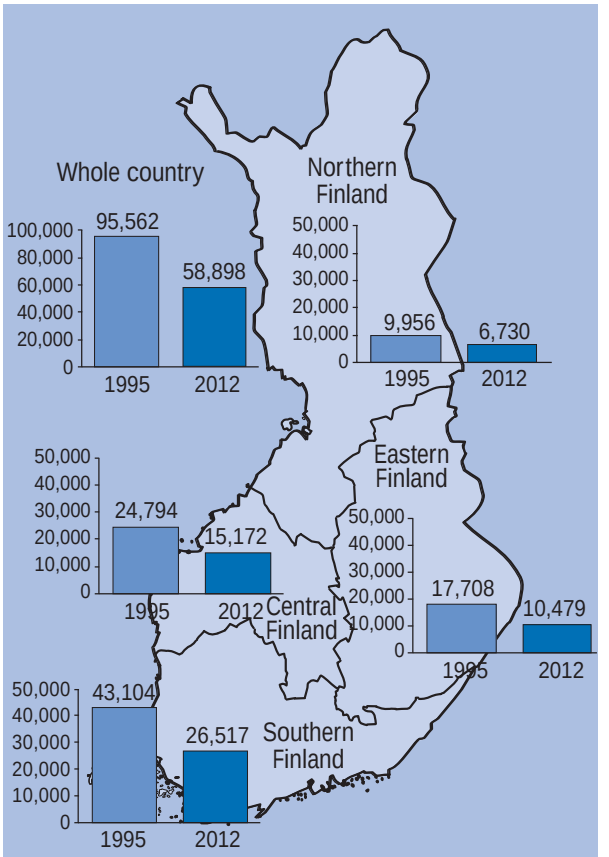
The number of reindeer has stayed about the same during the past decade, but in the very recent years there has been some decrease. In 2009/2010 the number of reindeer totalled about 196,500, of which about 100,000 were slaughtered. In recent years the production of reindeer meat has totalled 2.3–2.8 million kg.

The structure of reindeer husbandry has changed as the number of reindeer owners has decreased and the size of reindeer herds has grown. In the reindeer herding year 1994/1995 there were about 7,200 reindeer owners, while today their number is about 4,650. In the reindeer herding year 2008/2009 61.5% of the reindeer left alive at roundups, 119,000 animals, were owners by herders with over 100 animals. In the herding year 2010/2011 the average turnover of reindeer farms was about € 20,300 and their profitability coefficient was 0.38. On the largest reindeer farms (with over 230 animals) the average turnover was € 48,800 and the profitability coefficient was 1.06.

1.3 Finnish farm

Number and size distribution of farms

In 2012 the total number of farms (over 1 ha) which had applied for agricultural support was a little under 58,900. This was about 2,300 farms (3.7%) less than in 2011. In both absolute and relative terms the decrease in the number of farms was more rapid than the long-term average. During the seventeen years in the EU (1995–2012) the number of Finnish farms has fallen by more than 38% from 95,562 farms in 1995 by a total of about 36,664 farms. On average the number of farms has decreased at a rate of 2.8% a year. Proportionally the decrease has been the greatest in eastern Finland (41%) and the smallest in northern Finland (32%). In both southern and central Finland (39%) the number of farms has fallen less than in eastern Finland.



Number of farms receiving agricultural support in 1995 and 2012 (main regions of Uusimaa and Åland according to NUTS II have been included in Southern Finland). Source: Finnish Agency for Rural Affairs.

While the number of farms is decreasing, the average farm size has been growing. The average size of farms receiving agricultural support in 1995–2012 has grown by almost 70% from 22.8 ha of arable land to 38.6 ha.

The structural change is also reflected in the proportional share of the different size categories: in the past seventeen years the share of farms with less than 20 ha has fallen from 56% to 41% and the share of farms with more than 50 ha has more than tripled from 7% to 25%. Farms with more

Number of farms receiving agricultural support in 2002–2012.

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Whole country	73,386	72,000	71,100	69,088	68,766	66,821	65,292	63,716	62,450	61,153	58,898
Southern Finland[1]	33,375	32,771	32,245	31,272	30,967	29,945	29,368	28,694	28,098	27,578	26,517
Eastern Finland	12,935	12,630	12,498	12,121	12,173	11,812	11,501	11,218	11,033	10,808	10,479
Central Finland	19,023	18,656	18,458	17,986	17,947	17,574	17,119	16,650	16,177	15,771	15,172
Northern Finland	8,053	7,943	7,899	7,709	7,679	7,490	7,304	7,154	7,142	6,996	6,730

[1] Main regions of Uusimaa and Åland according to NUTS II have been included in Southern Finland.
Source: Finnish Agency for Rural Affairs.

Size class distribution and average arable area of farms receiving agricultural support in 2012[1].

Arable land	Southern Finland[2]		Eastern Finland		Central Finland		Northern Finland		Whole country 1995		Whole country 2012	
	Number of farms	%	Number of farms	%	Number of farms	%	Number of farms	%	Number of farms	%	Number of farms	%
< 10 ha	4,862	18	2,522	24	3,006	20	1,422	21	22,850	24	11,812	20
10–20 ha	5,065	19	2,427	23	3,386	22	1,219	18	30,698	32	12,097	21
20–30 ha	3,830	15	1,593	15	2,373	16	919	14	19,669	21	8,715	15
30–50 ha	5,104	19	1,868	18	2,858	19	1,269	19	15,414	16	11,099	19
50–100 ha	5,161	20	1,531	15	2,612	17	1,342	20	5,706	6	10,646	18
> 100 ha	2,369	9	486	5	842	6	523	8	784	1	4,220	7
Number of farms	26,391		10,427		15,077		6,694		95,121		58,589	
Average arable area, ha/farm	42.36		32.36		35.69		40.12		22.77		38.61	

[1] The figures do not include horticultural enterprises if they have no fields under cultivation.
[2] Main regions of Uusimaa and Åland according to NUTS II have been included in Southern Finland.
Source: Finnish Agency for Rural Affairs.

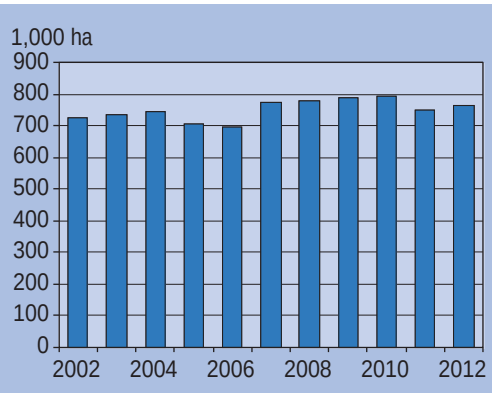
than 100 ha of arable land represent a little more than 7% of the Finnish farms.

About a half of the growth in the farm size in 1995–2012 has occurred through leasing. In 2012 the total cultivated arable area of farms receiving agricultural support was 2.273 million ha, and about 765,000 ha (almost 34%) of this was leased. In 1995 the share of leased area was 22%. In the 2000s the leased arable area has grown by about 11%. In 2011 there was some decrease in the leased area, but the next year it started to grow again. There is considerable regional variation in the leased area: in South Savo and Kainuu more than 39% of the arable area is leased, while in Central Ostrobothnia the share of the leased area is less than 29%.

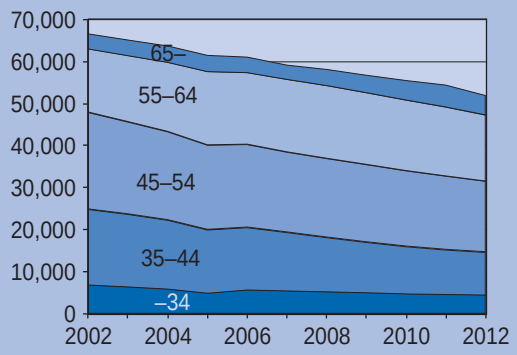
In 2012 the average size of base parcels was 2.43 ha, varying from over 3 ha in southern Finland to less than 2 ha in eastern and northern Finland. In recent years there has been hardly any change in the average size of parcels or the total cultivated area.

Finnish agriculture is almost exclusively based on family farms: in 2012 87.9% of farms receiving support were privately owned and 10.7% were owned by heirs and family companies and corporations. Cooperatives and limited companies owned 1.1%, general and limited partnerships 0.2%, and the State, municipalities, schools and parishes 0.02% of the farms.

The average age of farmers on farms receiving agricultural support was 51.7 years. Since 1995 the average age of farmers has risen by about three years. The age of farmers is the highest, over 53 years, in the Åland Islands and the lowest, 50.3 years, in Central Ostrobothnia. As the farm population is ageing, the share of young farmers is falling and the share



Area of leased arable land (ha) in 2002–2012. Source: Finnish Agency for Rural Affairs.



Number of farmers by age categories in 2002–2012. Source: Information Centre of the Ministry of Agriculture and Forestry.

of the older ones is growing. In 2001 the share of farmers over 55 years of age was 26%, but in 2012 their share was as high as 39%. During the same time the share of the under 44-year-old farmers fell from 38% to 28%.

Production structure of farms

Measured by the number of farms, the production structure of Finnish agriculture has changed considerably in recent years. The share of livestock farms has fallen while the share of crop farms has increased clearly. In 2012 27% of the farms which applied for support were livestock farms and 67% were crop farms, while in 1995 the share of livestock farms was 52% and that of crop farms was 39%.

In 2012 about 9,800 farms practised dairy husbandry as their main activity. In 1995–2012 the number of dairy farms fell by more than 22,200 farms, at a rate of about 6.7% a year. The share of dairy farms of all Finnish farms has decreased: in 1995 about 33% of all farms engaged in dairy husbandry as their main activity, but in 2012 this share was less than 17%. Dairy farms are more evenly distributed to all regions of Finland than the other sectors.

In 2012 about 3,630 farms (6.1% of all farms) specialised in beef production. In 1995–2012 the number of these farms fell by about 5,400, at a rate of about 5.2% per year. In 1995 9.5% of all farms specialised in beef production. The distribution of beef farms across the country is quite similar to the regional distribution of dairy farms.

The number of farms specialising in pig husbandry was about 1,770, which is about 3.1% of the farms that applied for support. Of the pig farms 480 specialised in piglet production, 669 farms specialised in pigmeat and 622 farms practised combined pig production. In 1995–2012 the number of pig farms fell by 72%, at a rate of 7.1% per year. In 1995 the share of pig farms was 6.5%. Most of the pigmeat production is located in southern and western Finland.

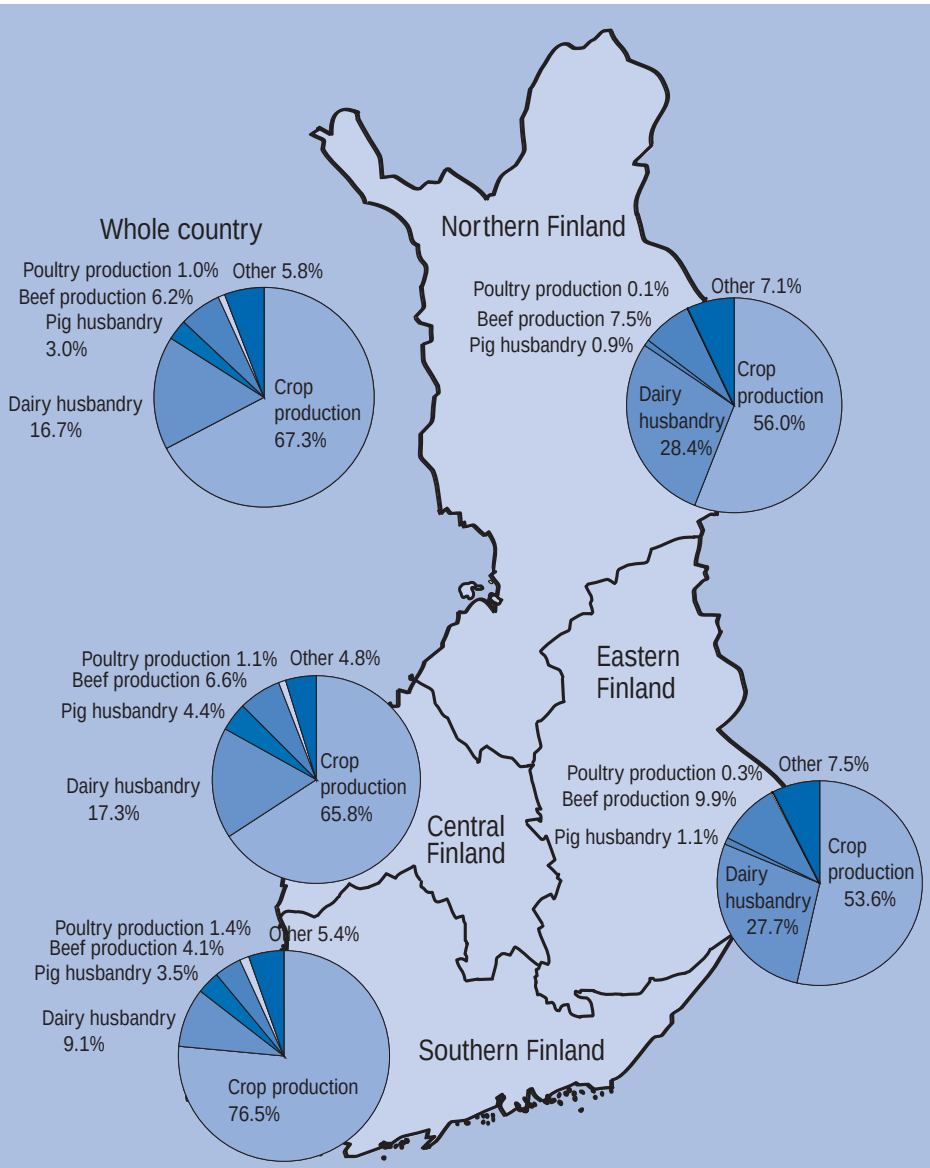
The number of poultry farms was 589, which is about 1.1% of the farms that applied for support. During the EU period the number of poultry farms has decreased the most, by a total of 73% at a rate of about 7.5% per year. The number of farms specialised in egg production has decreased the most. In 2012 about 48% of poultry farms specialised in egg production, 38% in poultry meat production and 14% were breeding units. In 2000 the respective shares were 68%, 21% and 12%. Most of the poultry farms are located in southern and western Finland.

In 2012 there were about 39,600 crop farms, which is almost 2,400 more than in 1995. In recent years, however, the number of crop farms has turned into a fall. Only the number of farms engaged in “other crop production” (e.g. hay) has increased, while the number of, for example, cereal and horticulture farms has fallen. More than half of the Finnish crop farms are in southern Finland and a quarter are in central Finland, but in recent years the number of crop farms and their share of all farms have grown the most in eastern and northern Finland.

In 2012 a total of about 3,400 farms (6% of all farms) engaged in other types

of production or activities, such as horse, sheep or goat husbandry or farm tourism. Over the past 17 years the number of these farms has decreased by more than 61%, at a rate of about 5.4% a year. In recent years the number of farms engaged in sheep and goat husbandry has fallen while the number of farms practising horse husbandry and other activities has been growing (see Chapter 1.2.).

Forest is an integral part of Finnish farms. In 2012 the average forest area of farms was 50.7 ha. Regional variation is considerable, however: in Southwest Finland the average forest area of farms is 31 ha, while in Lapland it is 108 ha.



Distribution of farms receiving agricultural support according to production line in 2012 (main regions of Uusimaa and Åland according to NUTS II have been included in Southern Finland). Source: Finnish Agency for Rural Affairs.

Caraway – a model example of an integrated supply chain

Csaba Jansik

The production and sale of caraway represents a small but exceptionally efficient supply chain in Finland. In just a few years it has grown into a success story in a country where in the crop production sector it is often difficult to look beyond the challenging production conditions in the northern latitudes. The success is largely based on a new way of thinking, collaboration through the chain, and systematic action.

Integrating enterprises as the driving force

There are three enterprises behind the integrated caraway supply chain: Trans Farm Oy set up in 1990 in Riihimäki, Arctic Taste Oy in Janakkala, and Caraway Finland in Närpiö in Ostrobothnia established in 2003. Besides marketing whole caraway grains, Trans Farm grinds and sterilises caraway and Caraway Finland extracts oil from it by distillation. Measured by weight this processing activity is very small in scale, representing only about 10% of the total volume, but the economic impact is quite significant as it allows to utilise batches which otherwise would not be fit for sale.

The three companies sold caraway and caraway products by their own brand names until 2005, when the two largest ones set up a joint marketing company, Nordic Caraway. This caused no changes to the established clientele, but since then the orders and sales have been managed in a centralised manner. A shared marketing company offers benefits in terms of the logistics and allows rapid deliveries with quality characteristics desired by the customers.

Despite the sales cooperation, the organisation of the first stages in the chain has been left to the individual companies. Trans Farm and Arctic Taste focus on production contracts with farmers in Häme, South-West Finland and Uusimaa regions while Caraway Finland operates in Ostrobothnia. Individual agreements have also been made with producers in eastern Finland.

The companies aim to cover almost all of their raw material need by cultivation contracts. The special production input in the chain, high-quality sowing seed, is also produced entirely under cultivation contracts. Besides cooperating in the sales, the companies participate in research projects aimed to increase the yield level of caraway. The varieties now used in Finland came from Central Europe in the 1980s.

Caraway is an attractive option for farmers

In Finland caraway is cultivated on about 1,500 farms, of which about a 1,000 are established producers that cultivate caraway every year. The rest either test caraway production on an occasional basis or may take breaks in the production. The reasons for caraway production include both additional income and crop rotation.

Farmers' interest in cultivating caraway also depends on cereal prices. In 2007 the area used for caraway production decreased as the cereal prices were high. Besides cereals, caraway competes with oilseed crops (oilseed rape, turnip rape, flax) for the cultivation area. Geographically caraway production is scattered to various parts of Finland, and it does not, for example, follow the common production zones for oil-

seed rape and turnip rape. It is well suited to the crop rotations applied in northern and eastern Finland as well. Decentralisation reduces the risk as the crop is not likely to fail or be seriously damaged in all parts of the country.

Predictability is highly important in the supply chain, which is why information on, for example, cultivation plans is collected well in advance. The integrated companies gather information from the farmers on the areas envisaged to be sown with caraway at the turn of the year. No crop is yet obtained in the following summer, but it is only in the second and third year that the caraway plants yield a crop.

Caraway production in Finland.

	Area 1,000 ha	Yield kg/ha	Volume in total million kg
2006	11.0	520	5.7
2007	17.7	370	6.1
2008	15.0	340	4.7
2009	9.8	310	3.3
2010	12.8	660	8.5
2011	16.8	620	10.4
2012	14.0	570	8.2

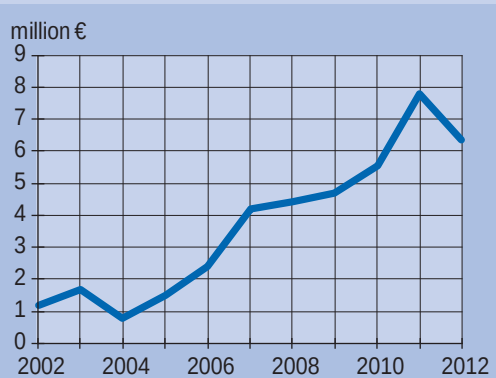
Source: Information Centre of the Ministry of Agriculture and Forestry

The price for caraway is set on an annual basis by negotiations between the sellers and buyers. The volumes are so small that, unlike for cereals, the prices are not officially quoted in any public exchange. The purchase price for caraway is paid to the producers in two instalments, which has proven a functioning system in the supply chain. The farmers receive a major part of the price in the first instalment, while the rest is paid retroactively at the end of the market season in the summer when the final average price is known.

The three companies have no large storage capacity, i.e. they are only capable of handling quite small batches at a time. Because of this, temporal organisation and adjustments are needed for accepting the deliveries. The times of delivery allocated to the producers vary from one year to another so that in the long run they are in an equal position as regards the timing of their deliveries.

The three companies also sort out the caraway crop, perform quality analyses and package the crop according to the customers' wishes. Traceability is an essential element in the transparent and functioning caraway chain in Finland. From the very beginning of the chain the companies keep batches from different producers in separate boxes holding about 1,000 kg, allowing to link the information on the producer to each batch.

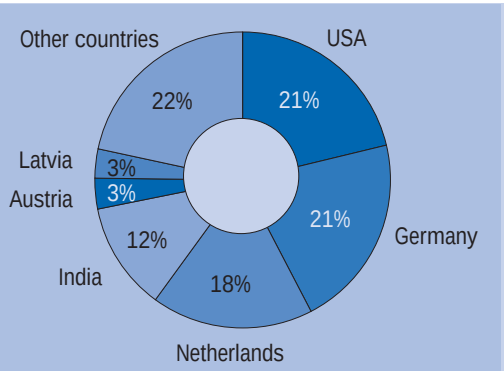
Samples are taken and quality properties recorded separately for the batches of each producer. Careful selection and combination of the final batches allows to meet the needs of each order and respond to highly accurate customer specifications. The foreign customers require efficient traceability and appreciate the system applied by the Finnish actors very highly.



Value of caraway exports in 2002–2012, million €. Source: Finnish Customs, Uljas database.

Success on international markets

The main customer groups for Finnish caraway are: (1) food companies, including meat, dairy, bakery, spice and alcoholic beverage companies and manufacturers of ready-to-eat foods and meals, (2) manufacturers of con-



Finnish caraway exports by destinations in 2011. Source: Finnish Customs, Uljas database.

sumer packages with a wide range of spice products that supply their products to retailers, and (3) spice wholesalers that supply spices to companies and mass users.

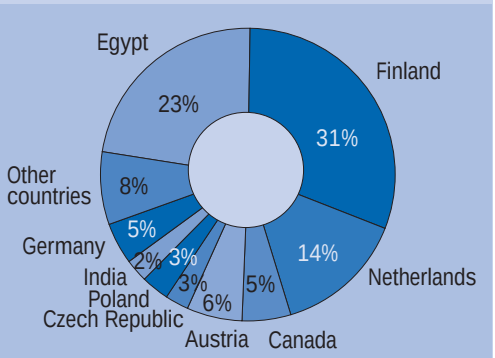
In the past few years the sales channels abroad have become shorter and simpler thanks to more efficient communication and exchange of information, which has caused companies engaged only in spice trading to drop out of the chain.

Finnish caraway has been exported to more than 40 countries. The main destinations are in Europe, the USA and India, but small volumes have also gone to the other Asian as well as Arab countries. Within Europe the transportation takes place using trucks, with varying package sizes. To the other continents the goods are sold in containers. Finnish caraway is truly a success story unparalleled by almost any other agricultural or food product, with a global market share of 20–30%. The main competitors have been Canada, the Netherlands, Egypt and some Central European countries. In 2011 the share of Finland of the global caraway export volumes was 28%, but in terms of the value of exports the share was 31%. The higher unit price indicates that the buyers value the quality of Finnish caraway. The main reason why caraway is bought from Finland, instead of being produced at lower cost in the developing world as is the case for many other products, lies in the production practice: it is not as labour intensive as the production of leaf herbs and the same machinery as that for regular cereal production can be used. The yield level in Finland is a little lower than in Central Europe, but the difference is much smaller than in, for example, winter cereals.

Unique way to organise the chain

The trump card of Finnish caraway on the international market is the higher quality than in the competing countries. The long growing season with abundant daylight raises the amount of essential oils and enhances the taste. The high-quality product is, however, only the other half of the success, while the other is composed of good marketing and services as well as the stable, integrated supply chain.

The main asset of Finnish caraway production is the unique organisation of the supply chain, where smooth collaboration allows highly professional, customised and flexible services to international customers. The long history of traceability in the chain increases confidence among the buyers. The good practices and experiences of this supply chain should be disseminated to the other sectors as well.



Share of certain countries in value of global caraway exports in 2011. Source: COMTRADE Statistics database.

2. AGRICULTURAL AND FOOD MARKET

2.1. Trends on the world market

The total world cereal production for the crop season 2012/13 is estimated at about 2,300 million tonnes, which is almost 50 million tonnes (2%) lower than in the record crop season 2011/12. The decrease was mainly due to the drought which affected yields of many important producer countries, especially maize crop in the United States and wheat crop in Russia, Kazakhstan, Ukraine and Australia.

In the crop season 2012/13 the world cereal consumption stays at about the same level as in the previous season 2011/12. The main reason why the growth stopped are the high prices, reflected especially in the use of cereal as animal fodder and for ethanol production. The total cereal consumption (2,326 million tonnes) is still higher than the production.

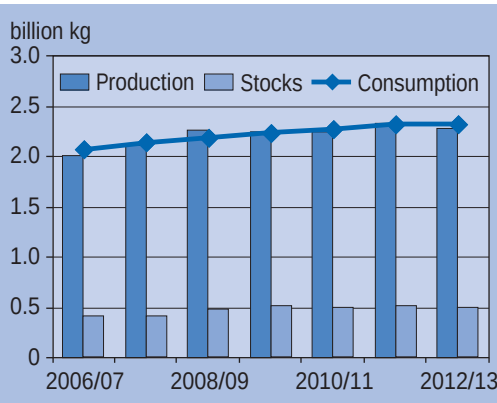
The world cereal stocks, i.e. the amount in storage in the beginning of the crop season left from the previous season, is estimated at 495 million tonnes, which would cover the total world consumption for 2.5 months.

Most of the world cereal crop is maize, wheat and rice. Rice and most of the wheat is used directly as food, while maize is in most cases used as animal fodder or raw material for the processing industry. Because of the growth in meat, milk and egg production as well as in the production of maize-based ethanol, maize has been the number one cereal in the world since 1998. In the crop season 2012/13 a total of 869 million tonnes of maize, 662 million tonnes of wheat and 487 million tonnes of rice was produced.

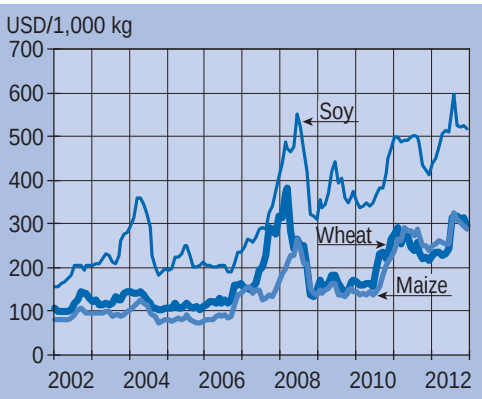
The three largest producer countries, China, the United States and India, account for almost a half of the world cereal production. In China the cereal crop of 2012/13 was estimated at 479 million tonnes, an all-time record for the country. In the United States the cereal crop totalled 354 million tonnes and in India it was 230 million tonnes. In the EU countries a total of 274 million tonnes of cereal was produced.

After the record year 2011 in cereal trading, in 2012 the volumes on world market fell to about the same level as in 2010. The total volume of world cereal trade was 298 million tonnes, which represents 13% of the world consumption. The largest importer was again Japan, with net purchases of 24 million tonnes mainly composed of maize for animal feed representing 73% of the total consumption in the country. The very densely populated South Korea imported 13 million tonnes of cereal, which also represented 73% of the consumption. In Egypt the imports of 14 million tonnes mainly composed of bread cereals accounted for 39% of the consumption and in Saudi Arabia the imports of 13 million tonnes, mainly feed barley, accounted for 87% of the consumption.

In 2012 China was on the list of the ten largest importers for a second year in a row, with cereal imports totalling 8 mil-



Trends in the world grain production, consumption and stocks in 2006–2012. Source: IGC.



World market price for maize, soy and wheat in 2002–2012. Source: USDA, CBOT, CBR.

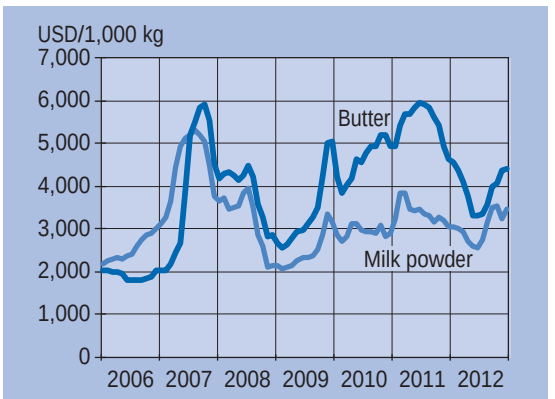
lion tonnes, which is slightly less than the imports of 11 million tonnes in 2011. In 2012 the cereal imports to China were composed of almost equal shares of maize, wheat, rice and barley, and they represented about 2% of the consumption of the country. The entry of China to the global cereal market, ending the country's self-sufficiency in cereals which lasted for years, drew quite a lot of attention among the market actors.

Increased globalisation was the most notable trend on the world milk market as well, driven especially by the increasing demand for milk products in many large and growing economies. This has also kept the milk prices at a relatively high level in the past couple of years. Milk producers in the main exporting countries (United States, EU-27, Australia and New Zealand) have responded to the growing demand by increasing the volumes produced quite strongly. Among the reasons for the growth in milk production in 2012 were the weather conditions in Oceania as the abundant rains replenished the depleted water supply, thus favouring the vegetation growth on pastures. In the main exporting countries milk production increased by more than 2% in both 2011 and 2012. In the preceding four-year period 2007–2010 the annual growth in the average milk production volumes in these countries was only about 1%.

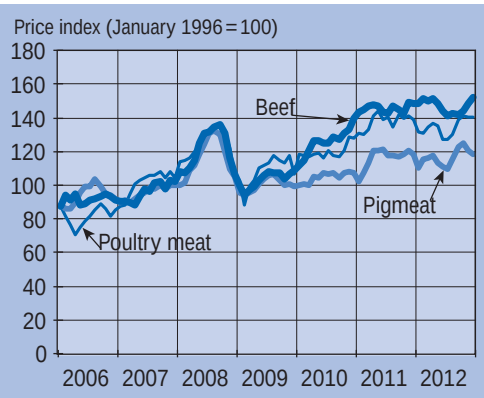
The growth in milk production led to a rapid increase in the export needs, which pushed the prices down in the early part of 2012. At the same time the demand especially in the significant milk producing countries in Asia and North Africa was quite low. Towards the end of the summer season 2012 the threat of drought in the United States caused the prices to rise again. Instability in the world economy increased the fluctuations in milk prices especially in Europe.

In the beginning of 2013 the situation on the world milk market seemed quite stable, fluctuations were quite moderate and no clear rising of falling trends could be observed. The expected quite small increase in milk production volumes in the main exporting countries are likely to lead to some increase in the prices during 2013.

The world meat market is adapting to the imbalance in demand and supply in the feed sector, which has caused the prices to vary very strongly. The global meat production has suffered from high feed prices and stagnated demand, and in 2012 it grew by less than 2% to 302 million tonnes. Most of the growth took place in the developing countries, which now rep-



Export prices of butter and skimmed milk powder in 2006–2012. Source: Canadian Dairy Information Centre.



World market price indices for beef, pigmeat and poultry meat in 2006–2012. Source: FAO.

resent about 60% of the world production. In 2012 almost all of the growth was in poultry and pigmeat sectors, while in both beef and sheepmeat production the growth remained modest.

2.2. Arable crops

In Finland the growing season of the year 2012 was cool and humid, but both the volumes and quality were about the same as the year before. Cereal prices rose towards the end of the year due to the weakening crop outlook in the world's most significant production regions. The total cereal crop in Finland was 3.7 billion kg, which is the same as in 2011, but there were changes in the shares of different cereal species.

Weather conditions

Like the previous year, the year 2012 started with snow in abundance. In certain areas the winter precipitation was the highest measured for decades. February was cold, but as a whole the winter was milder than usual. The summer of 2012 started quite early, but it was very rainy; in some places it rained 1.5 times the usual. The most abundant rainfall was measured on the southern coast, from northern Satakunta to Kainuu, i.e. central to north-eastern Finland, and in south-western Lapland, and the lowest in eastern and northern Lapland. The average temperature of the whole country in June-August was close to the long-term average. The average temperature for the whole year varied from 6 degrees in south-western Finland and the Åland Islands to –1 degrees in northern Lapland. In the autumn 2012 it again rained a lot, especially in western Finland and Lapland.

The lowest temperature of the year, –42.7 °C, was measured on 6 February in Inari in northern Lapland. The highest temperature, +31.0 °C, was measured on 30 July in Lieksa in North Karelia.

The thermal growing period was quite usual. In the south it started on 21–22 April and ended on 20–21 October. Thus in the south the growing season was 180 days, in eastern and western Finland it was about 170 days and in the north 130 days.

The effective temperature sum was a little below the average. In Jokioinen in south-central Finland the temperature sum accumulated was 1,299 °C (long-term average 1,320 °C), in Jyväskylä in central Finland it was 1,192 °C (1,191 °C) and in Rovaniemi in the north it was 889 °C (922 °C).

Areas and yields

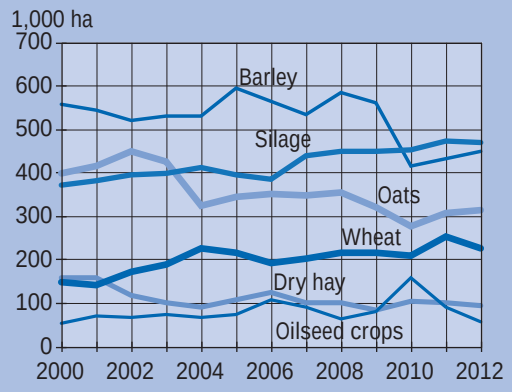
The utilised agricultural area in Finland is about 2.3 million ha, which is 6.8% of the total surface area and 7.5% of the land area. Compared to the average in the European Union, the share of agricultural area is very small in Finland.

In 2012 cereals were cultivated on about 1,036,000 ha in Finland. The cereal area was a little smaller than in the previous year. The total cereal crop was about the same as in 2011, when it was 3,668 million kg.

The area under feed cereals was about 786,000 ha in 2012 and the yield totalled 2,707 million kg. About 1,215 million kg

of this was barley. The cultivation area and total output of feed cereals grew slightly from the year before. The quality was better than in 2011.

About 69% of the feed barley crop reached a hectolitre weight of more than 64 kg, which is more than in the two previous years. There was again considerable regional variation in the quality. In Uusimaa in southern Finland 94% of the crop was above the hectolitre weight of 64 kg, but in North Ostrobothnia only 7% of the crop reached this hectolitre weight. The hectolitre weight of oats was also higher than the year before: as much as 99% of the crop was above the hectolitre weight of 52 kg, which is the minimum requirement commonly used by the feedingstuffs industry. 63% of the oats crop was above the hectolitre weight of 58 kg usually required for grits, while in 2011 only about a fifth of the oats crop was fit to be used for grits.



Harvested areas in 2000–2012, 1,000 ha.

The yield of malting barley in 2012 was about 367 million kg, which was 15% higher than the year before. About 261

Harvested areas and yields of main crops in 2011 and 2012.

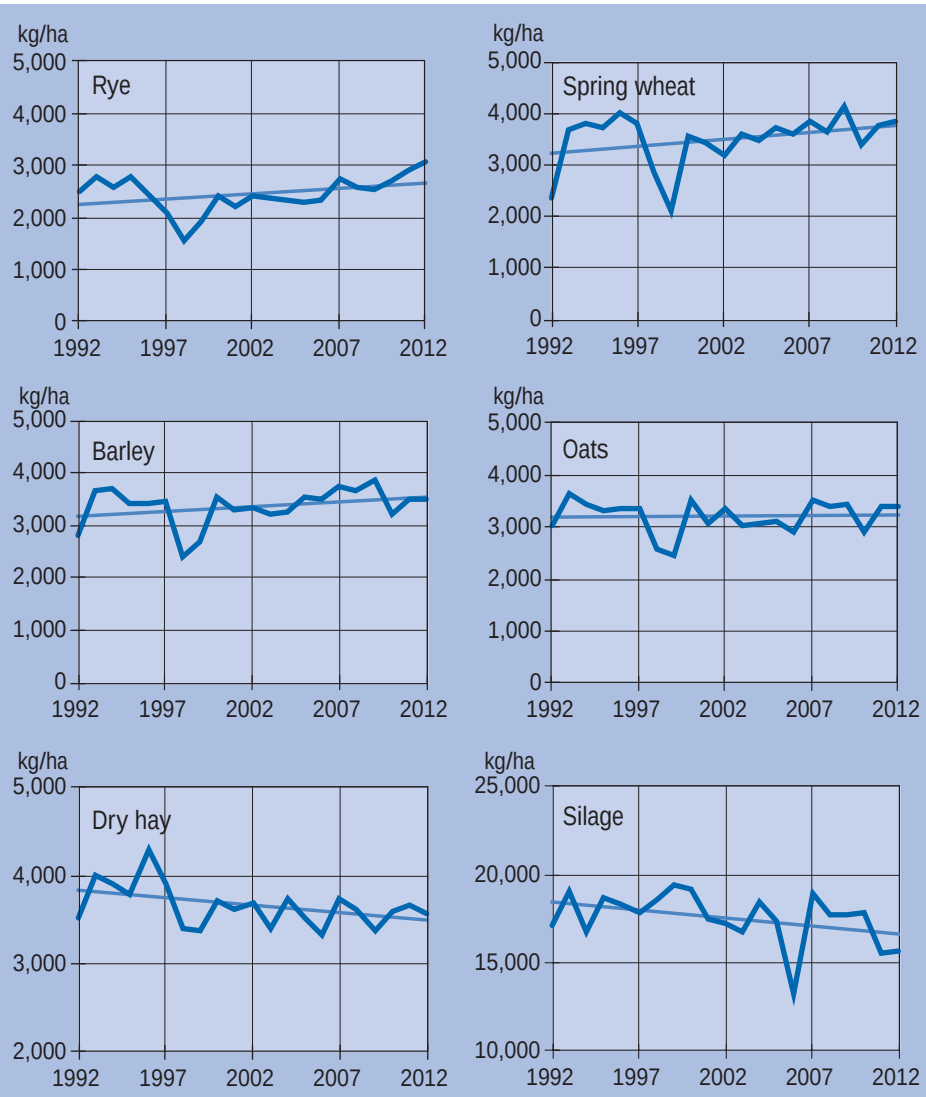
	2011			2012		
	Area 1,000 ha	Yield kg/ha	Total million kg	Area 1,000 ha	Yield kg/ha	Total million kg
Winter wheat	39.4	4,400	173.4	23.1	4,560	105.3
Spring wheat	214.0	3,740	801.4	204.2	3,830	781.6
Rye	26.9	2,910	78.4	20.7	3,090	64.1
Barley	432.0	3,510	1,514.3	451.2	3,500	1,581.0
Oats	308.2	3,390	1,043.1	313.8	3,420	1,073.1
Mixed cereals	19.4	2,950	57.2	20.9	2,540	53.2
Peas	4.8	2,500	12.0	4.0	2,320	9.4
Potatoes	24.4	27,580	673.3	20.7	23,650	489.6
Sugar beets	14.1	48,010	675.7	11.5	34,790	398.7
Dry hay	102.7	3,670	376.7	95.3	3,570	339.7
Silage	471.6	15,590	7,351.3	471.1	15,700	7,396.7
Green fodder	6.7	11,480	77.4	6.7	11,440	77.2
Cereals harvested green	57.2	4,190	239.9	68.0	3,890	265.0
Turnip rape	76.5	1,180	90.4	43.0	1,140	49.2
Rape	14.5	1,700	24.7	14.4	1,670	24.0
Caraway	16.8	620	10.4	14.0	570	8.2
Pasture	75.0			73.3		
Other crops	35.0			29.3		
Total	1,939.2			1,885.2		
Set aside and managed uncultivated arable land	275.7			267.3		

Source: Information Centre of the Ministry of Agriculture and Forestry.

million kg, 71% of the crop, fulfilled the protein content and grain size required for malting.

The total area under bread cereals was 248,100 ha and the total yield harvested was about 951 million kg. This was as much 10% lower than in 2011 due to the decrease in the cultivation area. The average yields of bread cereals were higher than the year before.

The total yield of winter and spring wheat was 887 million kg, of which 51% fulfilled the quality criteria for bread wheat. The yield of spring wheat was about 782 million kg and that of winter wheat about 105 million kg. The total yield of spring wheat grew from the year before but the area under winter wheat was 40% smaller than in 2011. The average yield of winter wheat was 4,560 kg/ha, which is above the average in 2011 and the long-term average. The quality of the crop was, however,



Yields of main crops in Finland from 1992 to 2012. Source: Information Centre of the Ministry of Agriculture and Forestry.

much weaker than in 2011. Of the spring wheat 55% was fit to be used as bread cereal, but only a fifth of the winter wheat crop was fit for this purpose. The main problem as regards the quality of the bread wheat crop was the low protein content, while the falling numbers of both spring and winter wheat were high and the hectolitre weights were good.

The total yield of rye, about 64 million kg, was 18% lower than in 2011. 86% of the crop was fit to be used as bread cereal. The area sown with rye in autumn 2012 was about 14,000 ha, which was about 27% (9,000 ha) less than the year before.

The silage area was about 471,100 ha, which is about the same as in 2011. The total yield was about 7,397 million kg, which is a little higher than the year before. The average silage yield of 15,700 kg/ha, was below the average. The dry hay area fell from the previous year to 95,300 ha and the total yield of 340 million kg was 10% lower than the year before. The average yield of dry hay was 3,570 kg/ha, which is lower than the year before and close to the ten-year average. The pasture area decreased from the year before to 73,300 ha

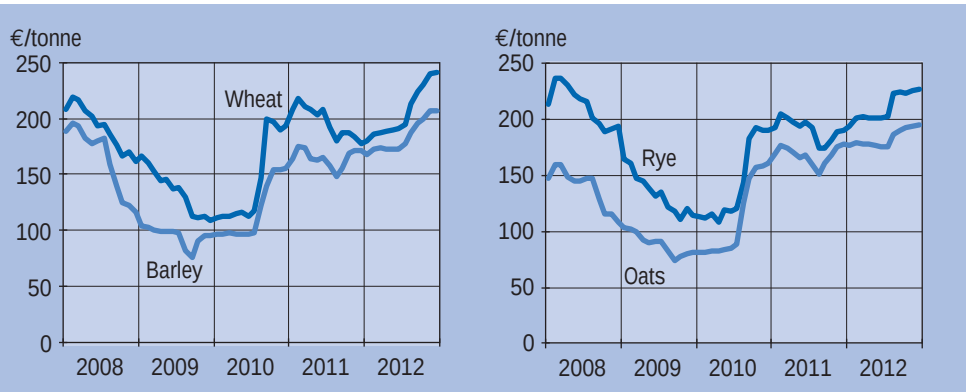
The potato yield of 2012 totalled about 490 million kg, which is as much as 27% lower than the year before. The potato crop was the weakest in 30 years. The main reasons for this were the decrease in the cultivation area, crop damages and low hectarage yields. The cultivation area of potatoes fell by about 15% to 20,700 ha.

The yield of sugar beets was also much smaller than the year before. The total yield of 2012 was as low as 399 million kg, which is more than 40% lower than in 2011. The average yield per hectare was 34,790 kg, while the long-term average in Finland is 37,630 kg/ha. The cultivation area decreased to 11,500 ha, which is about 2,600 ha smaller than in 2011.

The cultivation area of oilseed crops totalled about 72,000 ha, which is more than a third smaller than the year before. The total yield of 74 million kg was also about a third smaller than in 2011. Turnip rape was cultivated on 43,000 ha, which is only a little over a half of the turnip rape area in 2011. The total yield of turnip rape was 49 million kg and the hectarage yield of 1,140 kg/ha was below the long-term average. The hectarage yield of oilseed rape, 1,670 kg/ha, was close to the long-term average.

Market prices for arable crops

The prices on the Finnish cereal market rose in 2012. The prices on average were higher than the year before and the closing prices for all cereals were higher at the end of the year than in the beginning. The



Market prices of cereals in Finland from 2008 to 2012. Source: Information Centre of the Ministry of Agriculture and Forestry.

drought in North America and rains in Western Europe weakened the crop outlook, and news about the lower total yields to be expected turned the prices to an increase during the summer.

In January 2012 the price of feed barley was about 171 €/tonne. The price continued to rise during the year so that in December 2012 the average price of feed barley was 210 €/tonne. From January to December the price rose by almost a quarter, and the average price for the whole year was about 14% higher than in 2011.

The price of malting barley rose by only about 4% in 2012. By December 2012 the price had risen to about 222 €/tonne, from about 213 €/tonne in January. The average price of the year for malting barley was 215 €/tonne, which is about 9% higher than the average price in 2011.

The average price of oats in 2012 was about 184 €/tonne, which is 10% higher than in 2011. The price started to rise after August and by December it had risen to 193 €/tonne, which is 10% higher than in the beginning of the year.

The wheat price also rose during 2012. In the beginning of the year the average price for wheat was about 171 €/tonne, but by December it had risen to 233 €/tonne. The average price of 200 €/tonne was 6% higher than in 2011. The price of rye rose from 192 €/tonne in January to about 226 €/tonne in December. The average price of rye for the whole year was 214 €/tonne, which is almost 15% higher than that for 2011.

The prices for oilseed crops stayed at a high level all through the year. In 2012 the average price of turnip rape and oilseed rape was 468 €/tonne, while the average price in 2011 was 442 €/tonne. The prices were the lowest in the spring and the highest peak of about 496 €/tonne was reached in September.

The average price of ware potato was 160 €/tonne, while in 2011 the average price was 190 €/tonne. The potato prices were low until July-August, after which they started to rise rapidly. By December 2012 the price had risen to 290 €/tonne, which is more than 1.5 times the price in December 2011.

The cereal prices in Finland were below the prices paid in Central Europe all through the year. On the domestic market the prices are slow to react to a rise in the price level, while fall in the EU prices is quite rapidly reflected on the Finnish market. Strong fluctuations in the prices seem to have become a permanent feature on the cereal market, which means that farms should prepare for the market risks caused by these fluctuations better than before.

Market prices of cereals in Finland from 2002 to 2012, €/1,000 kg.

	Rye	Wheat	Barley	Oats
2012	213.58	203.49	186.72	186.21
2011	186.89	196.91	162.40	166.14
2010	159.71	147.39	112.58	115.71
2009[1]	134.15	131.95	93.93	86.41
2008	207.02	189.14	160.71	137.80
2007	192.19	159.90	145.80	149.73
2006	139.81	110.50	102.00	107.26
2005	118.41	106.20	99.51	87.13
2004	120.90	119.80	106.51	87.32
2003	124.88	126.66	105.57	92.21
2002	126.57	131.79	106.00	104.38

[1] Statistics has changed. Quality-adjusted price paid to farmers on delivery to first customer
Source: Information Centre of the Ministry of Agriculture and Forestry.

Market prices of cereals in 2011, €/1,000 kg.

	Rye	Wheat	Barley	Oats
Finland	186.9	196.9	-	166.1
Sweden	183.8	199.3	176.1	152.8
Denmark	171.8	193.3	196.0	174.5
Germany	201.7	206.7	-	182.1
Austria	156.4	137.5	-	126.8
England	-	210.4	178.8	198.9
Spain	183.6	211.7	194.8	181.2

Source: Eurostat.

Competitiveness to Finland from caraway

Timo Karhula

Caraway is a perennial plant with white flowers that is among the first plants that can be harvested towards the autumn. Caraway is cultivated for the good and strong aroma in the form of evaporating oil in the seed. The crop is the more valuable the higher the oil content is. In Finland the oil content may be as high as 5% by weight, which is much higher than in the competing countries.

Finnish caraway production is strongly export oriented: almost all of the crop is exported, which is quite exceptional in Finnish agriculture. The share of Finnish caraway on the global market is as high as about a quarter. The main destinations are in Central Europe, but Finnish caraway is also exported to other countries around the world. Whole or ground caraway seeds are used as spices in various foodstuffs. Oil extracted from the seeds may be used as aromatic substance in cosmetic or pharmaceutical industry.

In Finland the interest in caraway cultivation has grown over the past ten years. The average area under caraway per farm is 15 ha and the total area in Finland is 10,000–20,000 ha. The total caraway yield is 8–10 million kg. In recent years the return on caraway production at market price has been € 5–10 million.

The return on caraway production per hectare is lower than that of cereals, but so are the costs. However, considerable variation in the yields and prices creates greater economic uncertainty for caraway production than for other arable crops.

In the Finnish conditions the role of fixed costs in the total costs of the production is particularly important. In caraway production there is the additional challenge that no crop is produced in the first year. Like in the cultivation of other arable the main variable cost items for caraway are fertilisers and plant protection products.

Weaknesses in caraway production

The average yield of caraway is quite low, about 500 kg/ha in 2006–2011. The amount of caraway harvested per hectare may vary between 0 and 2,000 kg. The great variation in the yield is the main weakness in caraway production. Projects have been launched to improve the crop security and study the economic competitiveness of caraway production.

Usually caraway yields a crop in two years following the year of planting. In the first year when there is no crop the production is fully dependent on support and, in the other years, support represents 70% of the returns. Costs are a burden also in the year when no crop is produced. One solution to this problem has been under-sowing with cereal in the first year, which allows to divide the production costs between caraway and cereal.

Caraway is highly sensitive to weeds and plant diseases, which means that plant protection is very important in all years. Successful weed prevention improves the purity of the crop, and prevention of caraway moth *(Depressaria daucella)* is in practice needed every year when a crop is produced. The plant protection costs of caraway production are higher than those for cereals but lower than for turnip rape.

A feasible option

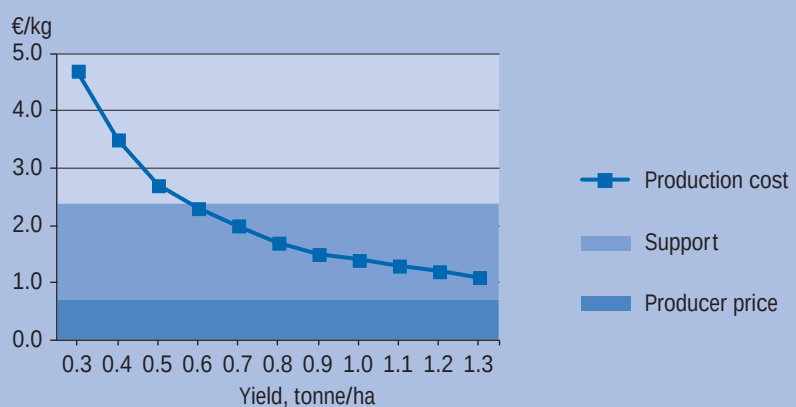
Caraway production is more profitable than cereal production, provided that the yield level is sufficiently high. A reasonable level of profitability, with a reasonable compensation for the farmers' labour input and interest on capital invested in the production, can be reached if the average yield is at least 600 kg/ha.

Crop security is the key for achieving profitable caraway production. The average yield should rise to 1,000 kg/ha in order that caraway production would rest on a sustainable economic foundation also in the long run. Support payments for caraway are not likely to increase from the present and producer prices may vary considerably between the years, while the producers have in fact managed to reduce the costs considerably in the past few years.

Increased variety to crop rotation

It is important to acknowledge that wrong kinds of savings may weaken the profitability of caraway production. Often chances to save are only found in variable costs, such as fertilisation and plant protection, but savings in these main inputs may lower the yield levels and impair quality. In recent year the Finnish caraway producers have managed to cut down the variable costs while still producing a good crop of a high quality. In the future more attention should be paid to fixed costs which are an economic burden even when there is no crop. This also applies, to some extent, to variable costs.

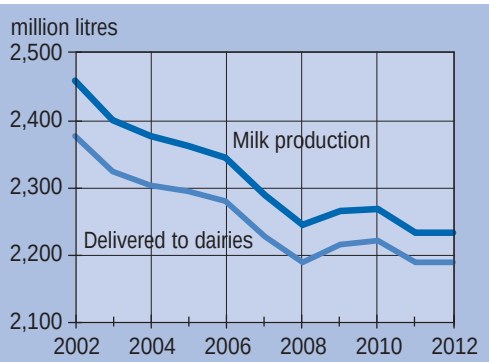
Caraway may be highly beneficial for crop rotations. It evens out the work load, is a good precrop, contributes to landscape diversity, and survives with relatively low fertilisation levels. Under-sowing with cereals reduces the burden caused by fixed costs in a year when no caraway crop is produced, while sufficient inputs in plant protection in the crop-yielding years guarantee a good crop of a high-quality. This is the preconditions for profitable caraway production in Finland.



Returns and costs per unit in caraway production as the yield level changes (t/ha).

2.3. Livestock production

Milk



Milk production and the amount of milk delivered to dairies in Finland from 2002 to 2012. Source: Information Centre of the Ministry of Agriculture and Forestry.

The amount of milk delivered to dairies in 2012 totalled 2,188 million litres, which was 1.2 million litres (–0.1%) less than in 2010. The production of organic milk totalled about 38 million litres (+20%).

In the quota period 2011/2012 milk production in Finland totalled about 2,186 million litres, which was 303 million litres (14%) short of the national quota. The Gallup Food and Farm Facts has forecast the milk output of 2013 to total 2,180 million litres (–0.4%).

In 2012 the number of milk producers decreased by 6%. At the end of the year milk was produced on 9,315 farms, of which 139 (+10%) were organic farms. The average dairy herd size grew by 1.8 cows to 29.5 cows in 2012.

The total number of dairy cows decreased by 1%, which was reflected in the number of calves born (–2.2%) and milk production volumes. The average milk yield per dairy cow rose by 0.3%.

In 2012 the production of butter totalled 41.4 million kg (–0.6%) and a total of 24.1 million kg (+9.4%) was consumed. The production and consumption of fat blends was about 17.4 million kg (+5.5). The production of liquid milk totalled 714 million litres (+1.3%) and the consumption was 694 million litres (+1%). The production of full-fat milk increased by 12.1%. The production of buttermilk totalled 62 million litres (–0.1%). A total of 123.5 million kg of yoghurt was produced (+0.5%) and the consumption was about 125.9 million kg (–2.4%). The production of cream increased by 8.9% and that of quark by 32.7%.

The production of processed cheeses totalled 18.2 million kg (–7.1%) and that of other cheeses 92.1 million kg (–8.4%). The most common cheeses were open-texture cheeses and Edam and Emmenthaler cheeses. Cheese consumption (incl. unflavoured quark) totalled 128 million kg (+5%). The production of fatty milk powder increased by 1.1% and that of fat-free milk powder fell by 0.7%.

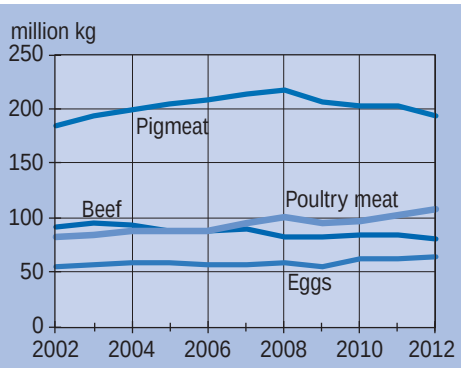
Even if the domestic milk consumption exceeds the production, considerable amounts of certain individual products need to be exported. A major share of fat contained in the milk produced in Finland is still used for the manufacture of export products. Instead, the protein fractions in milk find use in Finland.

A considerable share of butter and milk powders is exported. Butter exports fell by 12.9% to 21.5 million kg and the butter stocks grew to 2.8 million kg. Exports of milk powders grew by 23%. Milk powder imports increased but the volume was small. Yoghurt exports totalled 33.1 million kg (+8%) and imports 35.6 million kg (–3%). The imports of liquid milk totalled 53 million kg, which was 5% of the amount processed. Exports of liquid milk products grew by 15% and imports by 6%. Cheese imports totalled 61 million kg (+15%) and exports 46 million kg (–6%). Of the cheeses consumed only 53% were of domestic origin. Over the past 20 years the consumption share of imported cheese has grown by 1–2 percentage units a year.

Beef and sheepmeat

In 2012 meat production in Finland, including all farm animal species, totalled 381.7 million kg and consumption 403.6 million kg.

Of the production a total of 80.3 million kg was beef (–2.7 from 2011%). Beef consumption increased by 1% to 100.5 million kg, of which 22% was imported meat. The Gallup Food and Farm Facts has forecast that in 2013 beef consumption is about 100 million kg and domestic production 81 million kg.



Production of beef, pigmeat, poultry meat and eggs in Finland from 2002 to 2012. Source: Information Centre of the Ministry of Agriculture and Forestry.

The number of bovines slaughtered was 264,435 (–1.2%), of which 53% were bulls, 32% cows and 14% heifers. The number of bulls and cows slaughtered decreased by 1.6–1.7% from the year before, but the number of slaughtered heifers increased by 0.9%.

The increase in average slaughter weights has slowed down the fall in beef production volumes. In 1996–2010 the average slaughter weight of bulls increased by 71 kg but after that these has been some decrease. In 2012 the average slaughter weight of bulls was 337 kg, (–7 kg) and that of heifers was 244 kg (–4 kg). The average slaughter weight of cows was 282 kg.

The number of farms specialised in beef production was about 3,500, of which 2,000 had suckler cow production. The number of suckler cows has more than doubled during the 2000s. In May 2012 there were 58,000 suckler cows (+1.2%).

The average weight and number of calves sold for rearing (118,000) increased by about 1% from the year before.

In 2012 a total of 21.9 million kg of beef was imported to Finland and 0.9 million kg (1% of the production) was exported. Imports grew by 23% and exports were almost halved. The amount of beef in the stocks increased by 37% to 2.4 million kg. The total amount of beef imported from Poland, Denmark, Germany and the Netherlands accounts for about three-quarters of the imports. More than half of the processed beef product imports still came from Sweden, where Finnish meat companies also operate. Most of the beef exports went to Sweden and Estonia.

Of the other ruminants the production of sheepmeat fell by 8% to 0.8 million kg while the consumption totalled 3.6 million kg.

Pigmeat

Pigmeat production totalled 192.3 million kg (–4% from 2011). Pigmeat consumption was about the same as in the previous year, 195.3 million kg. The production has fallen for four years in a row. The Gallup Food and Farm Facts has forecast pigmeat production to fall to 188.9 million kg in 2013, while the consumption should stay about the same (195.4 million kg in 2013).

The number of pigs slaughtered in Finland was about 2.1 million (–5.5%). The average slaughter weight of fattening pigs rose to 88.1 kg (+1.1%). The average slaughter weight has risen by almost 6 kg in the past ten years. The number of sows slaughtered increased by 4% whereas the number of piglets sold (1.5 million) was about the same as in 2011. The average weight of piglets sold was 30.7 kg (–1.4).

In April 2012 there were about 133,136 sows in Finland (–5%) and 477,136 fattening pigs (+1.4%). The number of pig farms was about 1,800 (–9%). Since 2000 the number of sows has decreased by 28%, while the number of fattening pigs has increased by 18%. More than three-quarters of the production is located in Southwest Finland, Satakunta and Ostrobothnia,

In 2012 a total of 30.1 million kg of pigmeat was exported (–27%). Imports totalled 34.8 million kg (+25%). Thus the import volumes were higher than exports, while in 2010 the situation was still the opposite. Most of the exports went to Russia, Estonia, Sweden, New Zealand and South Korea.

Of the pigmeat consumption 18% was covered by imports, mainly from Germany and Denmark. Since 2000 especially Germany has considerably increased the production of pigmeat. Processed meats come mainly from Germany and Sweden.

Poultry meat

In 2012 poultry meat production in Finland totalled 107.4 million kg and consumption 101.4 million kg. The production grew by 5.8% and consumption by a little under 1% from the year before. About 92% of the poultry meat produced in Finland is broiler.

Broiler meat production totalled a little under 99.3 million kg (+6.2%) and that of turkey meat 8.1 million kg (+1.9%). At total of 91.6 million kg of broiler meat (+4%) and 9.4 million kg of turkey meat (–3%) was consumed. Besides these, small amounts of other poultry meats were produced and consumed. The production of turkey meat has decreased by more than a third from 2005.

According to the Gallup Food and Farm Facts, in 2013 the consumption of poultry meat rises to 104 million kg, of which 92 million kg is broiler meat and about 9.6 million kg is turkey meat. The production is forecast at 110.2 million kg, of which 99 million kg is broiler meat and about 8 million kg is turkey meat. The market outlook for broiler in the next few years seems more favourable than that for other production sectors, with mainly growth to be expected.

The number of broilers slaughtered increased by 6% from the year before, but the average slaughter weight (1.65 kg) was about the same. The number of turkeys slaughtered rose by 0.2% and the average slaughter weight of 9.3 kg was a little higher than in 2011.

Livestock production in Finland from 2002 to 2012.

	Dairy milk million litres	Beef million kg	Pigmeat million kg	Eggs million kg	Poultry meat million kg
2012	2,188	80	193	63	107
2011	2,190	82	202	63	102
2010	2,222	82	203	62	96
2009	2,215	81	206	54	95
2008	2,188	80	217	58	101
2007	2,226	87	213	57	95
2006	2,279	85	208	57	88
2005	2,293	84	203	58	87
2004	2,304	91	198	58	87
2003	2,323	94	193	56	84
2002	2,376	91	184	55	83

Source: Information Centre of the Ministry of Agriculture and Forestry.

In 2012 a total of 11.7 million kg broiler meat (+5%) and 3.5 million kg turkey meat (+17%) was imported to Finland. Most of the broiler meat imports were from Brazil, Denmark and the Netherlands. About 13% of the broiler meat and as much as 39% of the turkey meat consumption was covered by imports. Processed meats were imported from the same countries. Turkey meat was imported mainly from Brazil, the Netherlands and Poland as well as Germany. A major share of the carcass meat imports is boneless meat.

Broiler meat exports from Finland were 18.5 million kg (+14%) and turkey meat exports 1.8 million kg (–10%). The exports went mainly to the Baltic States, Russia and Hong Kong. Exports consisted mainly of pieces with bones.

The producer prices of the most important livestock products in Finland from 2002 to 2012 including production support (€/100 kg, milk €/100 l)[1].

	Milk	Beef	Pig-meat	Poultry meat	Eggs
2012	46.00	281	163	142	96
2011	43.90	253	146	131	96
2010	40.59	240	137	120	88
2009	40.11	247	141	124	87
2008	44.79	241	144	130	92
2007	39.05	221	132	114	77
2006	36.90	212	126	109	62
2005	35.55	205	128	114	60
2004	36.37	190	120	117	74
2003	37.31	186	115	117	80
2002	37.29	190	137	120	79

[1]Statistics of milk price has changed. Producer price is the average price paid to producers. Source: Information Centre of the Ministry of Agriculture and Forestry.

Eggs

The amount of eggs delivered to packaging in 2012 totalled 62.2 million kg. Besides this, about 1% of the production has gone to direct sale or farm household use. Egg production was about the same as the year before. The production of organic eggs increased by 45% and that of eggs produced in barn systems by 20%. The production in battery cages fell by 9%

Of the eggs produced 4% came from organic production, 33% from barn systems and 63% from enriched battery cage systems. From the beginning of 2012 eggs could no longer be produced in unenriched cage systems. This caused egg production to fall by about 8% in the early part of 2012, but the growth in the latter part led to an average growth of 10% for the whole year.

Egg consumption totalled about 56 million kg, which is 4.4% more than in 2011. Egg exports totalled about 11 million kg, which was about a fifth of the production. More than half of the exports went to Sweden. In 2011 a little more than 10 million kg of eggs were exported.

In November and December 2012 the number of chicks hatched was about 200,000, which is less than in the previous year. In April 2012 there were about 3.1 million laying hens in Finland (–4%).

Some increase in the production and consumption of eggs is forecast for 2013.

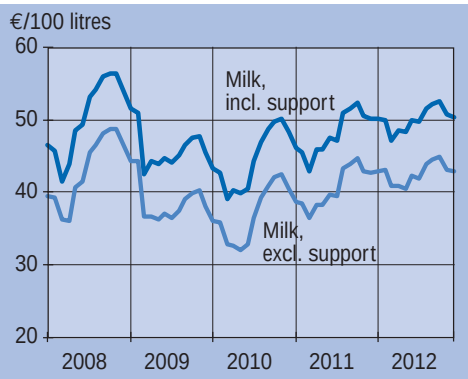
Producer prices

The market prices of livestock products in

Market prices for livestock products in selected EU countries in 2012, €/100 kg[1].

	Milk	Pigmeat	Beef (bull)	Poultry meat[2]	Eggs[3]
Finland	44.58	166.1	335.9	257.6	124.5
Sweden	35.49	169.7	375.2	242.6	210.6
Denmark	33.65	158.7	371.5	252.6	174.3
Estonia	29.88	169.9	278.5	-	132.4
Germany	31.44	173.8	392.2	251.3	157.2
France	32.12	161.1	385.7	226.7	156.3

[1]Milk the average price of January–October, other January–December, - information not available. [2]Sale price at slaughterhouse, [3]Sale price at packaging plant. Source: European Commission.



Producer price of milk in Finland from 2008 to 2012. Source: Information Centre of the Ministry of Agriculture and Forestry.

the EU influence their prices in Finland, but the Finnish prices have certain special characteristics. The market prices for pigmeat and milk, for example, vary less in Finland than in many other EU countries. In Finland there is oversupply in eggs, and their producer price has been low compared to the other parts of the EU. The prices paid to the Finnish milk producers are slightly higher than in the EU on average, and in Finland the seasonal variation in prices is also greater. Studies at the Agrifood Research Finland MTT show that the price changes observed on the European meat market are transmitted to the Finnish prices quite slowly.

In 2012 the average producer price for standard milk with quality premiums was 42.60 €/100 l (+5% from 2011). In addition, the average of 7.45 €/100 l was paid as production aid. The average price for grade I standard milk was 41.30 €/100 l, which means that the share of quality premiums in the price was 3.85 €/100 l. The final price for milk is determined when the dairies complete their financial statements and the retroactive payments based on the result are decided. In 2011 the average retroactive payment was 3.4 €/100 l.

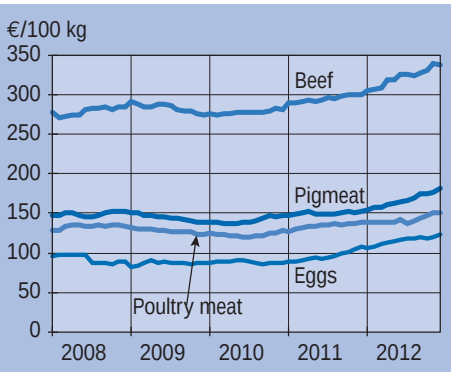
The average price paid to the producers for bull meat was 3.22 €/kg, which was 9% higher than the year before. The average price for all types of beef was 2.81 €/kg (+11%). The price of heifer meat was 2.67 €/kg and that for cow meat 2 €/kg. The beef prices in Finland were below the EU average. For bull meat the difference was 5%. In the long term the Finnish prices have been close to the EU average.

The prices paid for male calves fell and those of females rose by about 4%. The average price paid for a male colostrum calf was € 153 and that paid for a female calf was € 84.

In 2012 the average price paid for pigmeat was 1.64 €/kg (+11%). The average price paid for fattening pigs was 1.67 €/kg (+11%). The average price paid for piglets (30 kg) was € 66.82 (+16%). The Finnish prices for piglets were above and for pigmeat below the EU average.

The average producer price for poultry meat was 1.39 €/kg (+10%).

The average price for eggs was 1.16 €/kg. The prices paid for eggs produced in barns systems were 0.06 €/kg and the price for organic eggs almost 1.87 €/kg higher than that of eggs produced in battery cages. The price difference between eggs from battery cages and barn systems decreased during 2012.



Producer prices of beef, pigmeat, poultry meat and eggs in Finland from 2008 to 2012. Source: Information Centre of the Ministry of Agriculture and Forestry.

2.4. Horticultural production

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

Cultivation areas and horticulture enterprises

In 2012 the area of horticultural production in the open was about 15,800 ha. The area had been growing for five years, but now there was some decrease. The greenhouse production area was 335 ha, of which 211 ha was used for vegetable production and 124 ha for ornamental plants. The area under vegetables decreased both in greenhouses and in the open, and the areas under ornamental plants in greenhouses continued to fall as well. The production areas of berries and fruits were about the same as in 2011.

In 2011 there were a total of 4,300 horticulture enterprises in Finland, of which almost 3,400 were engaged in production in the open and a little under 1,600 were greenhouse enterprises. Some of the enterprises practice both outdoor and greenhouse production. From 2010 the number of horticulture farms fell by 190 enterprises. The total horticultural production area increased by more than 300 ha, which means that the remaining enterprises grew in size.

The most significant horticultural production area in Finland is Southwest Finland, with 19% of the enterprises practising production in the open and 22% of greenhouses. North Savo is an important berry production region, while most of the apple production takes place in the Åland Islands, south-western Finland and western Uusimaa. More than half of the greenhouse production is located in support area C.

Weather conditions

Berry and fruit plants were in good condition in the spring of 2012, benefiting from the abundant snow cover in the winter and steady temperatures in late winter and early spring.

The spring was cool and rainy. There was hardly any frost but the land dried very slowly, which delayed the planting of early vegetables. Because of the cool weather and especially the cold spell around Easter, the sales of seedlings and other horticulture products got a late start.

The growing period as a whole was quite cool and rainy. Vegetable production in the open suffered from the weather conditions and the volumes remained low.

Areas under horticultural production in 2006–2012, ha.

	2006	2007	2008	2009	2010	2011	2012
Production in the open, total	15,468	15,357	15,533	15,734	16,032	16,213	15,753
Vegetables grown in the open	8,327	8,405	8,146	8,378	8,731	9,034	8,562
Berries	6,470	6,283	6,300	6,278	6,206	6,094	6,100
Fruits	671	669	690	685	696	702	700
Greenhouse production, total	404	399	392	375	369	360	335
Vegetable production	243	242	240	231	231	226	211
Ornamental plants	161	157	152	143	138	134	124

Source: Ministry of Agriculture and Forestry, Support Register.

During the growing period especially lettuce and cabbages were at times in short supply. The wet conditions caused difficulties for machine harvesting of root plants, and in some places these had to be lifted manually.

Instead, the berry and fruit crop did not suffer too much from the cool and wet summer. Mostly the quality of the berry crop was quite good, and during the growing period there were no heavy rains which would have damaged the crop. Strawberries actually benefitted from the abundant rains and the berries were quite large in size.

Production in the open

In terms of the area garden pea is the most common vegetable, with a cultivation area of about 3,000 ha in 2011. This was almost 170 ha larger than in 2010. The second most common is carrot, which was cultivated on 1,660 ha. The two main crops represent almost half of the vegetable production area in the open. Other important outdoor vegetables are onion (1,120 ha) and head cabbage (610 ha). The main crops cultivated under production contracts with the processing industry are garden pea, carrot, beetroot and gherkin.

A little under 2% of the vegetable production area in the open was under organic production. In terms of the areas the most significant organic vegetables were carrot (51 ha), garden pea (24 ha) and onion (34 ha).

Strawberry is by far the most significant berry plant in terms of both the area and yield. In 2011 the cultivation area was 2,960 ha and the total yield was 13 million kg, which is the highest during the period from which statistics are available. The strawberry area grew slightly from the year before, but the number of strawberry farms continued to fall.

The second most important berries are black and green currants, which in 2011 were cultivated on about 1,410 ha. The cultivation area of raspberry and arctic bramble hybrid was about 350 ha. Black and green currants are also by far the most significant berries cultivated under production contracts with the processing industry, representing 76% of the contract production area. About 9% (530 ha) of the berry production area was under organic production, most of this under currants (316 ha) strawberry (115 ha) and raspberry (19 ha).

Areas under the most important horticultural products grown in the open and yields in 2011.

	Area ha	Yield kg/ha	Total 1,000 kg
Vegetables grown in the open			
Garden pea	2,998	2,087	6,255
Carrot	1,663	43,650	72,585
Onion	1,115	22,085	24,621
White cabbage	610	37,987	23,168
Cauliflower	283	10,424	2,947
Beetroot	435	32,789	14,253
Swede	423	37,013	15,646
Gherkin	200	49,030	9,786
Chinese cabbage	172	16,836	2,887
Other plants	1,180	11,636	13,732
Total	9,077	20,479	185,880
– share of contract production	1,863	26,590	49,537
Berries and apples[1]			
Strawberry	2,960	4,312	12,764
Black and green currant	1,411	1,225	1,728
Raspberries and raspberry-arctic bramble cross bred	350	1,986	696
Other berries	512	1,534	786
Total	5,233	3,052	15,974
– share of contract production	849	2,137	1,814
Apple	586	8,950	5,249

[1] *Crop yielding area*

Source: Information Centre of the Ministry of Agriculture and Forestry, Register of Horticulture Enterprises 2011.

The cultivation area of apples has been growing for the past ten years. In 2011 the crop-yielding area was 586 ha. The total yield has also been growing, but not as steadily as the area due to the annual variations in the crop. In 2011 apple production totalled 5.2 million kg.

Greenhouse production

In 2011 the total greenhouse area in Finland was 420 ha. Of this 60% was used for vegetable production and 35% for the production of ornamental plants. The other greenhouse plants include seedlings, cuttings and berries. Measured by both the cultivation area (114 ha in 2011) and total yield (40 million kg), tomato is by far the most important greenhouse vegetable. Cucumber was produced on about 64 ha with a total yield of 37 million kg. Artificial lighting is used on about 25% of the cucumber area and 20% of the tomato area. Potted vegetables, most of these lettuces, were cultivated on 26 ha. The production area of potted vegetables has grown steadily over the past 20 years.

The area under ornamental plants was 140 ha in 2011. In most cases various ornamental plants are cultivated in the same greenhouse. Measured by the number of enterprises the production of bedding plants is the most common type of production, with 610 enterprises. Potted plants were grown in 350 enterprises, bulbous flowers in 150 and cut flowers in 80. The number of ornamental plant producers has decreased steadily in the past few years. The number of producers of cut flowers has fallen the most, to only a fifth of their number 20 years ago.

Violet was the most common bedding plant in 2011, with a total production of 12 million. Violet accounted for 28% of the production of bedding plants. The second most common is petunia. Of the potted plants the most common was daffodil (3.2 million) followed by the Christmas flower poinsettia, whose production fell by more than 20% from the year before to 1.8 million.

The cultivation area of roses, 80 ha, represents 62% of the total area of cut flowers. The production of bulbous flow-

Areas under greenhouse vegetables (m^2) and yields (kg/m^2) in 2011.

	Area 1,000 m^2	Yield kg/m^2	Total 1,000 kg
Total[1]	2,426	34	81,439
Tomato	1,144	35	40,163
Cucumber	640	58	37,191
Other vegetables	643	6	4,086

[1] Does not include potted vegetables.
Source: Information Centre of the Ministry of Agriculture and Forestry, Register of Horticulture Enterprises 2011.

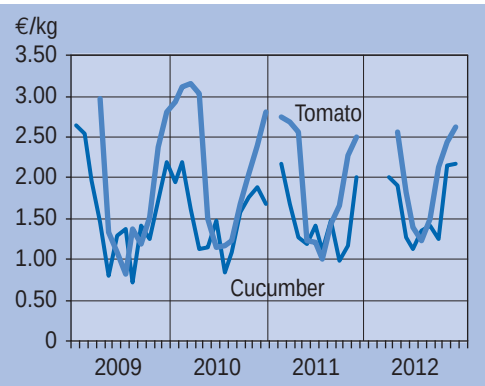
Producer prices for the most important horticultural products in 2006–2012, €/kg.

	2006	2007	2008	2009	2010	2011	2012
Greenhouse production							
Rose (€/unit)	0.41	0.42	0.47	0.46	0.47	0.45	0.45
Tomato	1.17	1.32	1.40	1.32	1.58	1.50	1.74
Cucumber	1.04	1.34	1.21	1.21	1.27	1.26	1.40
Production in the open							
White cabbage	0.37	0.58	0.56	0.42	0.49	0.48	0.52
Onion	0.44	0.60	0.48	0.43	0.56	0.57	0.56
Carrot	0.40	0.47	0.48	0.47	0.49	0.56	0.64
Strawberry	2.25	3.58	3.90	3.52	3.24	3.58	3.49
Apple	1.18	1.53	1.28	1.20	1.48	1.59	1.57

Sources: Kasvistieto Ltd., Glasshouse Growers Association.

ers continues to grow. In 2011 a total of 67 million bulbs were forced, of which 89% were tulips.

During 2012 there was hardly any building activity in the greenhouse sector. In the heating of greenhouses domestic solid fuels are increasingly used to substitute for oil-based fuels.



Producer prices for greenhouse cucumbers and tomatoes from 2009 to 2012, €/kg. Source: Kasvistieto Ltd.

Horticultural product market

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

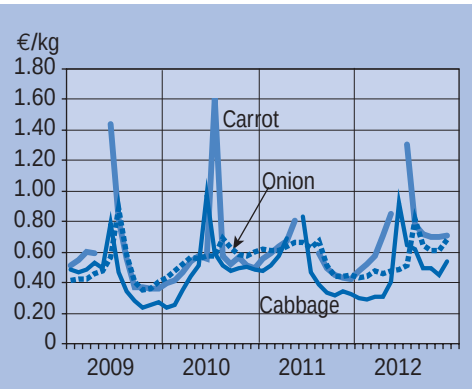
As regards the prices of storage vegetables such as carrot, head cabbage and onion it should be noted that they include the crop from two different seasons. In the early part of 2012 crop from the year 2011 was still being sold and it was not until the summer as the first early vegetables came to the market when the conditions of the crop season 2012 began to influence the prices.

The vegetable crop of 2011 and thus also the amount in storage was record high. There were enough domestic vegetables in stock well into the year 2012, which is why the imports fell from the year before. During the cool and wet growing period 2012 the prices of vegetables grown in the open stayed high as there was a shortage of supply. The volumes of cabbages harvested, in particular, were much lower than the year before, which was also reflected as higher prices towards the end of the year than in 2011.

In the cool weather conditions strawberries and raspberries ripened quite slowly and there was no congestion on the berry market.

The yield of apples was quite normal and the quality was good. In the early season the good crop in home gardens reduced the demand, but it stayed high as soon as the storage season got started. There were enough domestic apples in stock even for the Christmas market.

Greenhouse vegetables, mainly cucumber and tomato, have two clearly distinct price seasons. In winter, i.e. November-March, the crop comes from lighted, year-round production, while during the summer season vegetables are produced in the whole greenhouse area, also without artificial lighting. The supply is much greater in the summer season then in winter, production costs are lower,



Producer prices for certain vegetables grown in the open from 2009 to 2012, €/kg. Source: Kasvistieto Ltd.

and thus the prices are also lower.

In the summer almost all basic types of tomatoes on the market are domestic. However, the share of imports is growing as the special types of tomatoes such as cherry tomato, cluster tomato and plum tomato have become increasingly popular. The Finnish supply of special tomatoes has not grown enough to meet the demand. Now the self-sufficiency in tomatoes is about 60% and that in cucumber is slightly higher, about 70%.

Return calculation

The calculation of the total result of agriculture and horticulture was revised and turned into a total calculation based on profitability bookkeeping. The total calculation of horticulture is supplemented by a return calculation, because in the total calculations not all figures for the different horticultural production sectors can be presented due to the limited farm data. In both the total calculation and return calculation of horticulture the returns are calculated on an accruals basis. The returns are entered to the year when the crop was produced. In the case of storage products, for example, the value of the crop is entered to the year when the crop was harvested even if it were sold during the following year.

The return calculation of horticulture comprises the value of the crop produced at producer price and the calculated support payments for the horticulture production area and products in storage. Besides these returns, the total calculation includes other revenue items such as investment aids, returns on transmitted products, rents and sale of production inputs. The total calculation also includes the costs, while the return calculation is only concerned with the returns.

Return calculation of horticulture at current prices, € million.

	2006	2007	2008	2009	2010	2011	2012e
PRODUCTION IN THE OPEN							
Vegetables	82.1	99.7	96.6	102.2	106.9	130.8	129.6
Berries and fruits	37.0	46.7	55.4	54.2	48.1	66.1	64.3
Nursery production	30.8	31.7	30.0	32.1	34.1	34.1	34.1
Total	149.9	178.1	182.0	188.5	189.1	231.0	228.0
GREENHOUSE PRODUCTION							
Ornamental plants	93.8	98.7	99.0	97.5	88.1	82.8	79.4
Vegetables	140.8	135.9	147.7	150.4	151.9	176.1	165.6
Total	234.6	234.6	246.7	247.8	240.0	258.8	244.9
Return at producer price, total	384.5	412.7	428.7	436.3	429.0	489.8	472.9
SUPPORT PAYMENTS							
Support for greenhouses	39.1	38.2	37.3	36.5	36.5	35.6	32.9
Storage aid for horticulture products	1.9	1.8	2.0	2.1	2.1	2.0	2.0
Environmental support	16.9	9.4	9.0	9.0	9.1	9.3	8.9
Single payment	7.1	2.9	3.1	3.2	3.3	3.4	3.3
LFA support	7.2	2.9	2.8	2.8	2.9	2.9	2.8
Other support	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Total	73.1	56.1	55.1	54.5	54.8	54.1	50.8
RETURN ON HORTICULTURE, TOTAL	457.6	468.8	483.8	490.8	483.8	543.9	523.7

Sources: Information Centre of the Ministry of Agriculture and Forestry Tike, Support Register and Horticulture Statistics, Kasvistieto Ltd., Finnish Glasshouse Growers' Association.

2.5. Food market

Consumer prices

In 2012 the food prices in Finland rose by 5.2% from the year before. The annual change in the consumer price index was 2.8%, which means that the rise in the food prices was more rapid than the general inflation trend.

The food prices started to rise towards the end of 2010 and they kept on rising until the end of 2012. The prices often rise at the turn of the year when the new agreements negotiated between the food industry and retailers enter into force. During the summer months the price increases usually remain quite moderate.

The consumer prices for meat products rose by 8% between 2011 and 2012. The prices for beef and pigmeat rose by 12% and those for poultry meat by 6%. One reason for the higher pigmeat prices was the raise in the producer price.

In 2012 the consumer price for eggs was almost 20% higher than the year before. The prices for cereal products rose by 3% and those for dairy products by 5%. The price of liquid milk remained very stable during 2012.

Average consumer prices of some foodstuffs in January from 2011 to 2013, €/kg.

	2011 January	2012 January	2013 January
Wheat flour	0.55	0.61	0.68
Rye bread	3.74	3.83	3.80
Beef roast	12.75	14.26	16.56
Slivered pork	7.41	7.88	8.98
Chicken breast fillet	11.86	12.86	13.40
Light milk, €/litre	0.80	0.86	0.90
Emmenthal cheese	12.70	13.33	14.09
Eggs	3.11	3.44	4.27
Butter	4.00	5.68	5.98
Margarine	2.88	3.12	3.18
Tomato	4.68	3.93	3.59
Potato	0.80	0.67	0.98

Source: Statistics Finland, consumer price statistics.

Development of average consumer price index and the consumer price index of foodstuffs in Finland in 2000–2012, 2000 = 100.

	Price index of foodstuffs	Consumer price index
2012	134.4	124.1
2011	127.8	120.7
2010	120.9	116.7
2009	125.4	115.3
2008	122.9	115.3
2007	113.2	110.8
2006	110.9	108.1
2005	109.2	106.2
2004	108.9	105.3
2003	108.1	105.1
2002	107.4	104.2
2001	104.4	102.6
2000	100.0	100.0

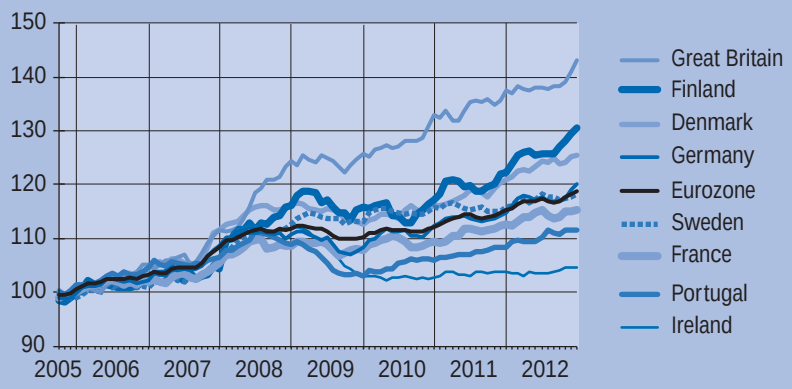
Source: Statistics Finland.

The consumer price for butter rose quite dramatically at the turn of the year 2011–2012, when the prices almost doubled from the year before. Instead, from January 2012 to January 2013 the consumer price for butter rose by only 2%.

The average consumer prices for berries and fruits were about 2% higher than in 2011. At the turn of the year 2012–2013 the prices rose considerably so that in January 2013 these prices were 11% higher than a year ago.

The consumer prices for vegetables rose by 5% and those for sugar by 11% in 2012. The consumer prices for potatoes, calculated as the annual average, decreased from 2011, but at the end of 2012 the prices rose by 25%.

During the 2000s the food prices have risen much more rapidly than the general consumer price index. From 2000 until 2012 the price of food rose by a little more than 34%, while during the same period the general consumer price index rose by about 24%. Relative to the level of earnings, however, food has become much cheaper as the wages and salaries have increased by about 55% since 2000.



Food prices (excluding VAT) in Finland and certain EU countries in 2005–2012.

According to the Statistics Finland, food prices in Finland are 16% higher than in the EU on average. However, in most Nordic countries food is more expensive than in Finland.

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

Based on the harmonised index of nominal consumer prices, the trend in food prices in Finland from 2005 until 2012 does not differ very much from the average of the euro countries. The main reason for this is the reduction in the value added tax in 2009, which caused the consumer prices for food in Finland to fall by 4.3%. Without the change in the VAT, among the EU-15 the Great Britain is the only country where the food prices have risen more than in Finland.

In 2006–2012 the consumer prices for food in the eurozone rose by 1–5% a

Average consumer prices of some foodstuffs in 2008–2012, €/kg.

	2008	2009	2010	2011	2012	Change % 2011–2012
Light milk, €/litre	0.87	0.89	0.79	0.84	0.87	3.45
Butter	5.78	4.59	3.86	4.66	5.84	20.21
Margarine	2.98	3.11	2.76	3.04	3.12	2.56
Emmenthal cheese	12.13	12.86	12.57	13.13	13.82	4.99
Beef roast	11.79	12.62	12.10	13.54	15.87	14.68
Pork fillet[1]	12.23	12.27	11.80	11.02	12.37	10.91
Chicken breast fillet	11.32	11.68	11.28	12.47	13.12	4.95
Eggs	3.01	2.99	3.00	3.25	3.93	17.30
Wheat flour	0.60	0.60	0.52	0.61	0.60	0.00
Rye bread, portion size	3.86	3.79	3.59	3.83	3.85	0.52
Tomato	3.63	3.58	3.67	3.18	3.24	1.85
Potato	0.74	0.76	0.76	0.68	0.83	18.07

[1] From 2011 pork tenderloin.
Source: Statistics Finland, consumer price statistics.

Consumption of milk products, margarine, meat and eggs per capita in 2001–2011, kg.

	Liquid milk[1]	Butter	Margarine	Cheese	Ice cream (litres)	Beef	Pigmeat	Poultry meat	Eggs
2011[e]	182.2	4.0	7.5	20.2	12.3	18.6	36.4	18.2	10.0
2010	183.3	3.3	7.5	19.0	13.6	18.6	34.9	18.2	9.8
2009	183.9	3.0	7.5	18.7	12.9	17.8	34.4	17.5	9.5
2008	186.0	2.8	7.5	18.4	12.6	18.2	35.3	17.2	9.4
2007	189.9	2.5	7.5	17.5	13.3	18.7	34.9	17.6	9.5
2006	183.9	2.8	7.5	19.1	13.7	18.5	34.3	15.8	9.3
2005	184.0	2.6	6.6	18.6	14.0	18.6	33.5	16.1	9.4
2004	186.2	2.8	6.6	18.4	13.2	18.6	33.8	16.0	9.4
2003	185.1	2.7	6.8	16.7	13.7	18.0	33.5	15.8	9.3
2002	190.0	3.0	7.6	16.6	13.5	17.9	31.9	15.4	9.7
2001	191.7	3.5	7.8	16.5	13.3	17.9	32.7	14.5	9.7

[1] Including liquid milk, sour milk products and cream.
Sources: Gallup Food and Farm Facts, Information Centre of the Ministry of Agriculture and Forestry.

year, except in 2009 when the prices fell by 2%. During the same period the annual increase in the food prices in Finland was 1–7%. Within Europe the food prices have risen the most rapidly in the more recent EU Member States, such as Hungary and Estonia, and in countries affected by economic crisis, such as Iceland. In 2012 the rise in food prices in Finland was 4% above the average in the euro countries.

International comparison of food prices is not as straightforward, however. The prices also depend on various kinds of special national characteristics and eating habits. For example, the fact that Finnish consumers value the domestic origin and are willing to pay a higher price for Finnish tomatoes and cucumbers than for foreign ones raises the price level of food shown in the statistics.

Besides the trends in food prices, in recent years there has been discussion on the distribution of the price paid by the consumer within the food chain. The share of the retail sector in the price paid by the consumer has grown while the shares of primary producers and the processing sector have decreased.

Wholesale and retail trade

The strong and steady growth of the sales volumes of daily consumer goods has continued over the past few years. In 2011 the value of the retail sales rose again considerably to € 15.3 billion. Since 1995 the value of the sales of daily consumer goods at nominal prices has risen by almost 78%.

The market structure of the Finnish retail sector has been concentrating for a long time, but before 1995 the pace was quite moderate. In 1980 the two leading chains controlled 58% and in 1995 62% of the market. In 2000 the combined market share of the two dominant chains S Group and Kesko was 66% but, according to AC Nielsen, by 2011 the share of the two largest chains had exceeded the 80% limit.

The structural change is also reflected in that the Finns are concentrating their food purchases to large retail units which manage an ever growing share of the daily goods sales. In 2011 the share of the sales of hypermarkets was as high as 27%, as Kesko opened six and S Group two new hypermarkets. In the beginning of 2012 the number of retail outlets for daily goods

Market shares of retail companies in 2002–2011.

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
S Group	31.1	31.1	34.3	35.9	39.9	41.0	42.4	43.2	44.1	45.2
K Group	36.0	35.8	35.3	35.9	33.4	33.9	33.7	34.2	35.0	35.3
Suomen lähikauppa*	12.9	12.7	10.0	10.8	11.9	11.9	11.3	10.2	9.0	7.8
Spar**	8.1	7.4	6.8	6.2	0.5	-	-	-	-	-
Lidl	-	1.8	2.8	3.7	4.1	4.7	5.0	5.1	4.8	4.8
Other companies	11.9	11.2	10.8	9.5	10.2	8.4	7.6	7.3	7.1	6.9
Total	100	100	100	100	100	100	100	100	100	100

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

– excluding specialist stores and shops in market halls – was 3,216. The number of small retail outlets, so-called village shops, in the rural and sparsely populated areas has halved since 1995.

Food industry

In 2011 the turnover of the food industry rose by as much as € 651 million to 10.8 billion. The main cause was the growing sales on the domestic markets, while exports were about the same as year before. Now that food consumption grows very little in Finland, the rise in the turnover means that the rise in the prices of cereal and other raw materials and costs which started in 2010 was transferred to the product prices in 2011.

The number of people employed in food industry increased for the first time since 2003. In 2011 the number of staff was almost 33,200, 620 persons more than the year before. As a result of the growth of staff by almost 2% and the considerable increase in the turnover the real turnover per person in 2011 rose by € 3,000 to 327,000.

There is considerable variation in the development of the turnover per person by sectors, but the figures for 2011 show some growth in all sectors since 1995, except for the category “other food products”.

At the prices of 2011 the real turnover of food industry per employee rose from about € 224,000 in 1995 to € 327,000, by 46%. In many sectors, such as meat, fish, vegetable oil, milling, feed and brewery industries the growth in the turnover was above the average.

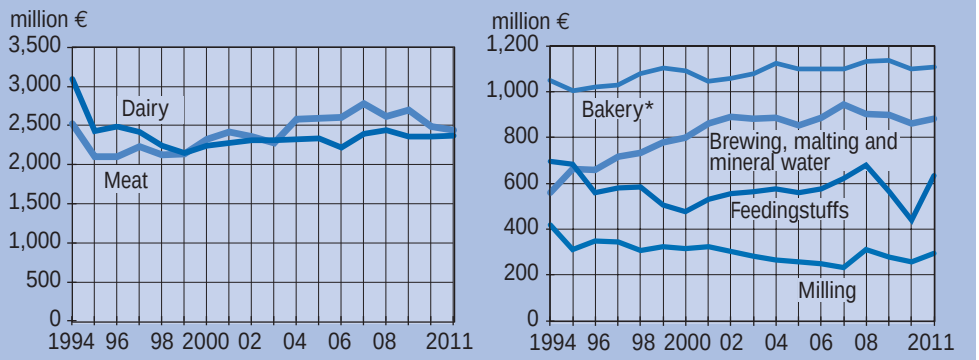
Higher efficiency is also reflected in the number of operative units. Especially large companies with nation-wide operations have in recent years started to concentrate their production geographically to few large units while closing down smaller units.

The two main sectors in the Finnish

Key figures on the Finnish food industry in 1995–2011.

	1995	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Turnover (at current price, billion €)	7.7	8.3	8.4	8.5	8.9	8.9	9.2	9.7	10.5	10.3	10.1	10.8
Turnover (at 2010 price, billion €)	9.7	9.4	9.4	9.4	9.8	9.7	10.0	10.2	10.7	10.4	10.1	10.8
Personnel (thousands)	44.9	38.6	38.0	38.2	37.5	36.7	35.9	35.7	34.6	33.5	32.6	33.2
Real turnover per person (at 2010 price thousand €)	224	252	255	255	271	274	287	296	319	321	324	327

Source: Statistics Finland, Finnish Enterprises 1995–2011.

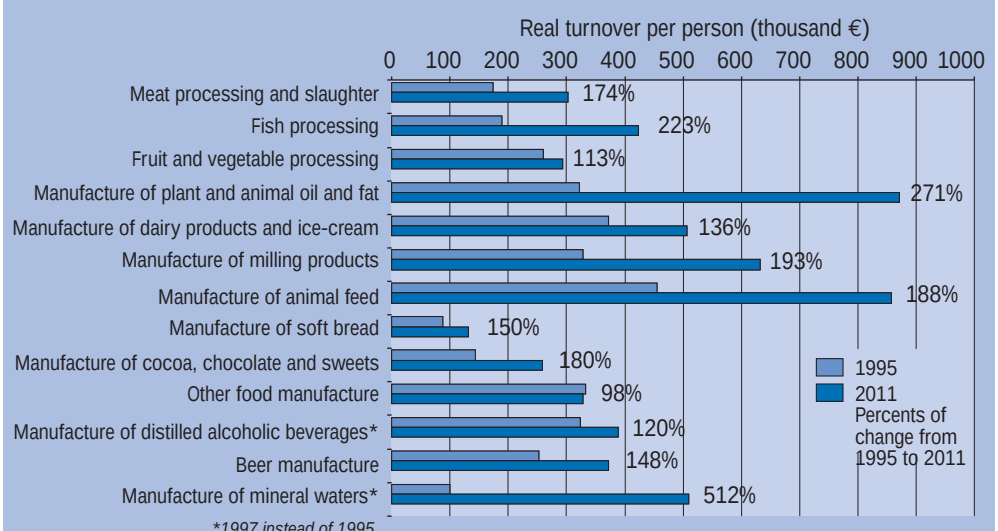


**Includes soft bread, crispbread and biscuit manufacture.*

Turnover of Finnish meat and dairy industry and certain other sub-sectors of food industry at 2011 prices.

food industry are dairy industry and meat processing. In recent years the trends in the dairy industry have been quite steady, while in meat processing the quite drastic changes in feed prices and difficulties on the export market have pushed the turnover down from the peak figures in 2007. High cereal and feed prices reduced the business result of the meat industry in 2011 as well. Milk production is much less dependent on cereal than meat production.

The value of the production in other cereal processing industries such as feedingstuffs, milling and bakery industries rose in 2011, which probably means that the rises in the raw material prices moved forward in the chain to product prices.



**1997 instead of 1995.*

Trend in the real turnover per labour in food industry by sectors. Sources: Statistics Finland, Finnish Enterprises 1995–2011, calculations by MTT.

Foreign trade

In 2012 the Finnish food exports stayed about the same as the year before. The value of food exports from Finland totalled € 1,595 million, which is just 1.2% higher than in 2011. The fluctuations in exports in recent years show that these are highly sensitive to changes in the market situation. The rapid rise in exports which started in 2006 stopped in 2009 due to the global economic crisis. In 2010–2012 exports to the Russian market recovered, but exports to the traditional EU markets started to fall in 2012.

Food imports increased again more than exports. In 2012 the value of food imports to Finland totalled € 4,598 million, which was almost 7% higher than in the previous year. Because of the rapid growth in imports the deficit of food trade rose by about € 271 million from € 2,731 million to € 3,003 million.

Traditionally the deficit has mainly been due to the high import volumes of fruit, vegetables, raw coffee, alcoholic beverages and tobacco. Quite a lot of cheeses and cereal products are also imported. In recent years the Finnish food industry has also been faced with competition in product groups that used to be dominated by the domestic production, such as meat and fish.

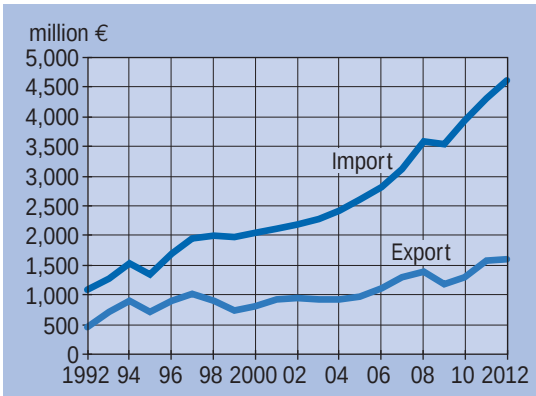
The statistics on foreign trade in agricultural products and food include raw materials of plant origin which never end up on the plate. Imports of palm oil for the production of biofuel were eight times higher in 2010 than in 2007, but in 2011 the imports fell to less than €109 million and further to 101 million in 2012. The main reason for this was the reorganisation of the raw material structure of biofuel production due to environmental and image reasons.

In 2012 certain changes took place in the geographical distribution of agricultural product and food imports. Most of the growth in imports still came from the EU Member States, while the share on non-EU countries fell to 27%. Almost 64% of the Finnish food imports come from the old EU countries. The share of the new Member States rose by one percentage point to 10%.

The recovery of the Russian market was the key to the growth in exports. In 2012 the value of food exports to Russia totalled € 425 million, which is 5% higher than the year before. Russia has for a long time been the main destination for Finnish food exports, with a share of 20–27%. More than half of the Finnish food exports have gone to the neighbouring countries, and in 2012 this share was about 57% (Sweden 17.6%, Estonia 8.6% and Norway 3.7%).

The most significant single product group in food exports is dairy products. In 2012 the value of cheese exports totalled € 169 million and the value of butter exports was € 91 million. These two represented 16% of the total food exports.

The exports of cereal products fell from 2011 to about € 150 million in 2012. Other important export articles are meat, alcoholic beverages and sugar and confectionary industry products.



Exports and imports of agricultural and food products (CN 01–24) in 1992–2012. Source: National Board of Customs, ULJAS database.

Domestic food production depends on imports

Marja Knuuttila, Agrifood Research Finland MTT and Eero Vatanen, University of Eastern Finland

We talk about Finnish food when food industry located in Finland processes domestic agricultural products into foodstuffs. However, foodstuffs that would be fully domestic exist only in our imagination, as today's agriculture and food production cannot succeed without imported inputs.

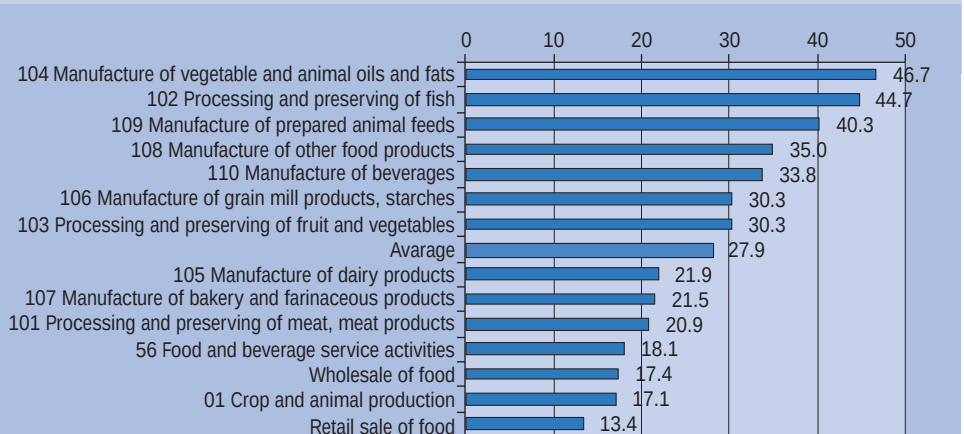
As regards the domestic origin of food we are mainly concerned with the raw material – we talk about domestic meat, milk and cereals and foods made from these. Besides these, arable lands, cows, processing establishments and employees are perceived as the main domestic inputs.

In reality purely domestic agriculture may be considered to have ended when tractors substituted for the work done by horses. Much of the human labour in the various tasks of the production chain has also been replaced by machinery and devices which depend on energy from foreign sources. The constant need to produce more per unit of arable land requires efficient use of chemical fertilisers and plant protection products. The same applies to plant protein in animal feed for livestock production. For all inputs purchased in Finland, imported inputs are used at some stage of their production.

Because of insufficient domestic energy production, fragmented production series and global distribution of labour, assessing the rate of domestic origin and self-sufficiency calls for a detailed scrutiny of the whole food production chain.

Rate of imports varies by sector

Production inputs of agriculture and food industry as well as food trade and catering services which see to the distribution of food in the final stages of the chain can be traced to find out the share of imports – including those used by domestic suppliers and those supplying inputs for them. The Agrifood Research Finland conducted a study to



Degree of imported inputs in the food sector in 2008 (%). Source: Knuuttila, M., Vatanen, E., Jansik, C. and Niemi, J. 2012. Elintarviketuotannon ja elintarvikemarkkinoiden riippuvuus tuonnista. MTT Reports 61. (Import dependency of food production and food markets, in Finnish with abstract in English).

find out the imports in the production of a total of 14 food chain industries individually, in aggregate and in total (including indirect imports) by means of the input-output data of the Statistics Finland and the output model. The special characteristics of input imports in the food trade sector were not examined but the rate of imports of the wholesale and retail trade as a whole was used.

The rate of domestic origin in food manufactured and consumed in Finland is 82% when all imported inputs used in the production and distribution are taken into account. Even if such a rate of domestic origin may be considered quite high, the use of imported inputs in the food sector and sectors manufacturing products for this means that Finland is dependent on foreign trade. The changing international distribution of labour in the production operations is reflected in the fact that, besides physical goods, growing amounts of various kinds of services are purchased from abroad.

Of the food chain industries the share of imported inputs is obviously the highest in those where the main raw materials are imported: oilseeds in the manufacture of plant and animal oils and fats (46.7%), fish in fish processing (44.7) and soy protein in the manufacture of animal food and feed (40,3). The manufacture of coffee and spices is almost completely dependent on the main raw material imports. The share of imports in these cannot be calculated separately but in the data they are included in the group of other foodstuffs, where the rate of using imported inputs is 35%.

Energy and chemicals imported

Regardless of the origin of the raw material, the food sector needs imported energy: electricity, fuel or heat. For this purpose the companies processing energy for final use in Finland import crude oil, coal, natural gas and nuclear fuels.

Besides energy, agriculture uses considerable amounts of imported chemicals. Of the total value of agricultural input imports of about one billion euros, the share of chemicals is about 320 million. In addition to pesticides for plant production, the chemical imports include ammonia as a source of nitrogen nutrient for the manufacture of fertilisers, where only the phosphorus raw material is domestic in origin.

In spite of the quite high value of imports in euros, the rate of imported inputs was relatively low in agriculture (17.1%) compared to other sectors. One reason for this is that the research data only covers the so-called intermediate inputs while in agriculture, as a very capital intensive industry, the inclusion of investment goods would raise the degree of imported inputs by about ten percentage units.

Most of the raw material processed in the milk and meat industries is domestic in origin. The main causes which raise their still relatively low rates of imports (21.9% and 20.9%) are the inputs needed for producing the domestic raw material.

Most of the value of food production is domestic

For the different food chain industries the rates of imports were calculated as the share of imports in the value of production because the different kinds of production inputs are commensurable only in terms of their monetary value. In 2008 the value of imported inputs in the food chain amounted to € 4.9 billion. Besides the imported inputs, imports on the food market comprise ready-made foods, with a value of €1.9 billion. Thus the value of the total imports of the food market was 6.8 billion, degree of total imports was 25% and the degree of domestic origin was 75%.

3. AGRICULTURAL POLICY

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

These are supplemented by national aids, which comprise the northern aid, national aid for southern Finland, national top-ups to the LFA payments and certain other aids.

3.1. Common agricultural policy of the EU

The common agricultural policy has been implemented since the 1960s through common organisations of the markets for specific products. The basic idea is that the fall of the prices within the EU below a certain level is prevented by means of public intervention, while the prices of imported foodstuffs are raised to the EU level through import duties. Oversupplies are exported to third countries by means of the EU export refunds.

The share of expenditure which arises from the common agricultural policy in the EU budget is very high indeed, about 40% of the total budget in 2013. It should be born in mind, however, that in the other sectors the integration does not go as wide and deep and there is no common policy in the same way as is being implemented in the agriculture sector through the CAP.

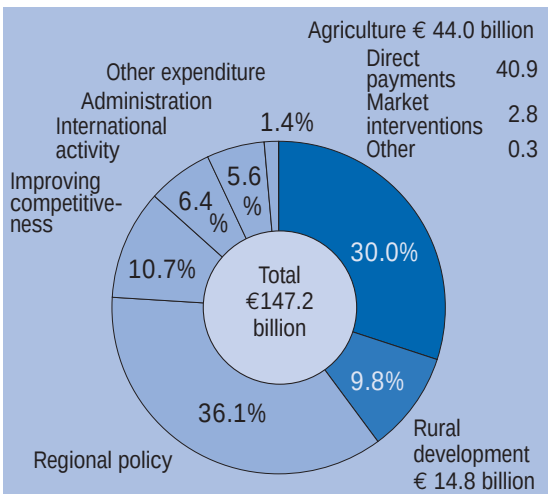
At present the common agricultural policy is comprised of the so-called first and second pillar. Most of the funding (75%) is allocated to the first pillar, mainly market support and single farm payments. The rest of the funding (25%) is used for rural development measures under the second pillar (Rural Development Programmes).

In the early 1990s most of the CAP funds were still used for export refunds of agricultural products and other market interventions. Since then, however, the common agricultural policy has been reformed several times and piloted into a more market-oriented direction.

CAP reforms since 1992

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

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



EU budget for 2012, € billion

and occupational safety were incorporated into the scheme.

In November 2008 the EU agriculture ministers decided on the latest reform of the common agricultural policy, also called the health check. The decision continues the earlier reforms and strategic outlines, aimed to increase the market orientation of EU agriculture. Decoupled payments will be applied even more widely and some of the remaining production restrictions are abolished to allow the farmers to respond better to the market demand.

Discussion on the content of the common agricultural policy to be implemented from 2014 got started when the European Commission finally gave the legislative proposals for the reform in October 2011. The reform proposals include matters relating to direct payments, common market organisations and rural development. As it seems now there should be no dramatic changes for the EU agricultural markets or production. Most of the proposed changes are to be considered fine- tuning, as well as follow-up to earlier reforms and outlines aimed to reduce the environmental load from agriculture. The preparation

Agricultural support by Member States in EU-27 per year in the programming period 2007–2013.

Country	Million euros per year on average	Support €/inhabitant	of which rural development support €/inhabitant	Share of MS of EU support for agriculture (%)	Share of MS of gross value added of agriculture in the EU (%)
Ireland	1,675	375	75	3.1	1.0
Greece	2,786	247	47	5.1	3.7
Denmark	1,097	199	12	2.0	1.6
Finland	864	162	56	1.6	0.9
Austria	1,304	156	67	2.4	1.8
Lithuania	504	155	77	0.9	0.5
Hungary	1,482	148	54	2.7	1.6
France	9,343	145	14	17.2	18.4
Spain	5,911	129	23	10.9	14.9
Estonia	173	129	76	0.3	0.2
Latvia	253	115	68	0.5	0.2
Slovenia	231	114	63	0.4	0.3
Sweden	1,025	110	28	1.9	1.0
Portugal	1,158	109	53	2.1	1.6
EU-27	54,450	109	25	100.0	100.0
Poland	4,065	106	49	7.5	5.5
Slovakia	559	103	52	1.0	0.3
Czech Republic	1,051	101	39	1.9	0.8
Luxembourg	50	101	26	0.1	0.1
Bulgaria	739	98	49	1.4	1.0
Rumania	1,944	91	53	3.6	4.7
Italy	5,368	89	20	9.9	16.7
Germany	6,939	85	14	12.7	10.2
Cypros	61	74	29	0.1	0.2
Great Britain	4,252	69	4	7.8	5.9
Belgium	669	62	6	1.2	1.6
Netherlands	932	56	4	1.7	5.5
Malta	15	36	26	0.0	0.0

Source: European Commission; Council regulation (EC) No 73/2009; Eurostat

has taken longer than was expected, which means that some elements of the reform will enter into force on 1 January 2014, while some will be postponed until 1 January 2015.

Distribution of EU support for agriculture

The agricultural policy of the EU was not originally designed for northern agriculture dominated by small farms, which is why Finland has to pay almost 60% of the support needed for agriculture from domestic funds and only 40% comes from EU sources. We can still say, however, that Finland has succeeded quite well in seeking funding from the EU. Relative to the value of agricultural production or population figures Finland has been one of the greatest net recipients of EU agricultural support in the programming period 2007–2013.

During the programming period 2007–2013 the average share of the gross value added in Finnish agriculture of the total value added of EU agriculture has been 0.9%, while during the same period Finland has received 1.6% of all EU support to agriculture.

Of the large EU countries the proportional share of EU support paid to France and Germany has been about the same as their share in the gross value added of EU agriculture. Instead, the share of Italy and Spain of the EU support payments has been much smaller than their share in the gross value added of EU agriculture. Only 1.7% of the EU support is paid to the Netherlands, while its average share of the gross value added of EU agriculture has been as high as 5.5%.

The support payments to Finland have also been greater than the share of Finnish population in the total population of the EU. During the programming period 2007–2013 Finland received EU agricultural support € 162 per citizen, while the average in the EU-27 was € 109 per citizen. Of this amount about a third, more than the EU average, has been rural development support, which is particularly important for Finland. During this period the EU support payments per citizen have been higher than in Finland only in Ireland, Greece and Denmark.

Of the largest recipients of EU agricultural support the payments to France and Spain per citizen are above the EU average, while those for Germany and Italy are below the EU average. During the period 2007–2013 EU agricultural support per citizen was the lowest in Malta, the Netherlands, Belgium and Great Britain.

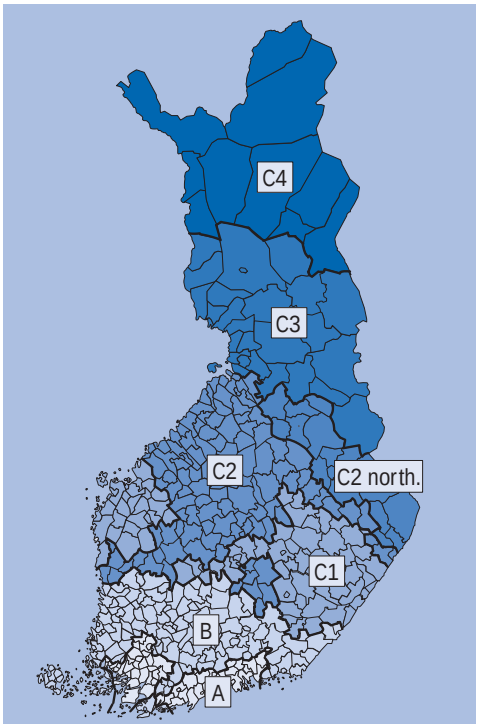
3.2. EU support payments in Finland

In 2013 the support under the common agricultural policy to the Finnish agriculture will total about € 1,326 million. This consists of the CAP support for arable crops and livestock (€ 539 million), less favoured area (LFA) payments (€ 423 million) and environmental support (€ 364 million). These are funded either by the EU alone or co-financed by the EU and Finland.

CAP payments are an integral element of the common market organisations and they are funded in full from the EU budget. The EU contributes a little more than a quarter of the LFA payments and environmental support. The rest is paid from national funds.

In 2013 the national aid for Finnish agriculture and horticulture will total about € 511 million. The national aid scheme comprises the northern aid (€ 306 million), national aid for southern Finland (€ 63 million), national top-ups to LFA payments (€ 119 million), and certain other national aids (€ 23 million).

Finland has been divided into seven support areas for the allocation of the payments. CAP support, environmental support, LFA payments and the national top-ups to these are paid in the whole country.



Support areas.

Northern aid is paid only in support area C. This has been divided into five areas for the differentiation of the aid. National aid for southern Finland (so-called aid for serious difficulties) is paid in areas A and B.

CAP support

Most of the so-called CAP support financed in full by the EU is paid through the single payment scheme adopted in 2003. In Finland the single payment scheme is implemented as the so-called hybrid model. Former CAP payments were converted into payment entitlements, which consist of a regional flat-rate payment and farm-specific top-ups.

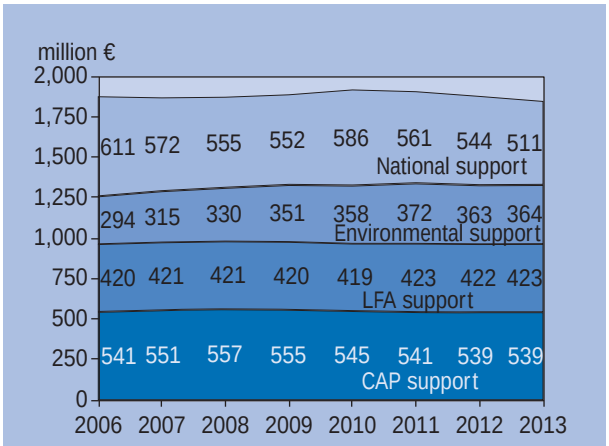
CAP support has two main components: decoupled single payments and payments which continue to be coupled to the production. In Finland about 90% of the CAP support was decoupled from the production in 2006. The CAP support for arable crops was decoupled almost completely. Under the single payment scheme, however, coupled support is still paid up to € 5.8 million a year for certain arable crops. Coupled support also continues to be paid for suckler cows, male bovines and ewes and starch potato.

According to the cross-compliance conditions included in the CAP support, the arable lands must be kept in good farming condition and minimum requirements for animal welfare and state of the environment must be met. Based on a national decision, any area set aside in Finland as managed, uncultivated arable area must be covered with grass in order to be eligible.

Less favoured area payments (LFA)

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

The amount of LFA support in Fin-



Agricultural support in Finland in 2006–2013, € million.

land budgeted for 2013 is € 423 million. The payment is 150 €/ha in area A, 200 €/ha in areas B and C1 and 210 €/ha in areas C2–C4.

A major overhaul of the LFA areas has been started in the EU. The objective of the reform, which should be completed for 2014, is the create a uniform LFA scheme for all Member States that takes the special conditions of different countries better into account.

Environmental support

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

The support scheme is comprised of the basic and additional measures and contracts concerning special measures. The main goal is to reduce the load on waters. Besides this, the aim is to restrict emissions into the air, mitigate the risks due to the use of pesticides and protect and manage rural landscapes and biodiversity.

The environmental support scheme is presented in more detail in Chapter 5.3 (pp. 71–72).

3.3. National aid

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

Northern aid

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

Northern aid consists of milk production aid and aids based on the number of animals and cultivated area. The northern scheme also includes the aid for greenhouse production, storage aid for horticultural products and wild berries and mush-

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

	2008	2009	2010	2011	2012prelim.	2013estimate
Total	1,308	1,323	1,322	1,335	1,324	1,326
CAP income support	557	552	545	541	539	539
Natural handicap payments	421	420	419	423	422	423
EU contribution	118	118	117	118	118	118
National financing	303	302	302	304	304	304
Environmental support*	330	351	358	372	363	364
EU contribution	92	98	101	107	107	107
National financing	238	253	257	265	256	257
EU financing, total	767	768	763	766	764	764
National financing, total	541	555	559	569	560	561

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

rooms and headage-related payments for reindeer.

Northern aid paid in 2013 will total about € 306 million. The most significant types of aid are the northern aid for milk production (€ 161 million) and northern aid based on livestock units (€ 100 million).

The effectiveness of the northern aid is evaluated every five years. In 2007 the European Commission commissioned an evaluation of how well the objectives set for northern aid have been reached and whether the means applied are still feasible and justified. Based on the results the Commission and Finland discussed the future and development needs of the northern aid in 2008.

As a result of the agreement reached in December 2008, the aids for pig and poultry meat production were decoupled from the production in 2009, but coupled payments continue to be applied in cattle husbandry.

National aid for southern Finland

The national aid for southern Finland, i.e. support areas A and B, is based on Article 141 of the Accession Treaty. This article has allowed the payment of aid due to serious difficulties resulting from the accession to the EU, but it does not define the concept of serious difficulties in any more detail or limit the duration of the measure.

The Finns have interpreted the article so that it gives the authorisation to the payment of the aid in the long term, while the Commission has seen it as a temporary solution.

Finland must negotiate with the Commission on the continuation of the aid based on Article 141 every few years. According to the outcome of the negotiations reached in November 2007, Finland may grant both national direct aids and raised investment aid for livestock production and horticulture in southern Finland until the end of 2013. Negotiations on the future application of the aid scheme from 2014 are conducted during 2013.

In 2013 the aid under Article 141 to southern Finland will total € 62.9 million, which is about 30% less than the € 89.6 million paid in 2009. The total amount of aid under Article 141 is reduced the most in the last two years of the period, with the greatest cuts in the aid for pig and poultry farms. In 2012 the total amount of this aid was € 74.9 million.

The structure of the aid under Article 141 has also changed. From 2009 onwards decoupled farm payments have been applied in pig and poultry sectors, mainly according to production quantities of 2007. Instead, the aid for ruminants will continue to be coupled to the production all through the current aid period.

The aid under Article 141 also contains investment aids and start-up aid for young farmers. Finland may continue to apply higher investment aids in sectors which are eligible for direct income payments under Article 141 (in particular, investments in dairy and cattle sectors and pig and poultry production).

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

	2008	2009	2010	2011	2012	2013 estimate
Total	554.7	552.0	586.1	560.8	544.0	511.0
Northern aid	327.4	327.5	335.8	333.5	328.2	306.0
National aid for Southern Finland	93.5	89.6	86.2	83.4	74.9	62.9
National supplement to the LFA support	119.3	119.3	119.0	119.3	119.3	119.3
Other national aid	14.5	15.6	45.6	22.4	21.6	22.8

National top-ups to LFA payments

National top-ups to LFA payments have been paid in the whole country since 2005 based on a tentative agreement reached in the negotiations between Finland and the Commission in 2003. The basic top-up paid for the arable area may not exceed 20 €/ha in areas A, B and C1 and 25 €/ha in areas C2–C4. A raise for livestock not exceeding 80 €/ha is paid for the arable area of livestock farms. In 2009 the payments totalled about 95% of the maximum according to the hectares. The total of the co-financed LFA payments and the national top-ups may not exceed the average of 250 €/ha.

3.4. Structural support for agriculture and farm relief services

Investment aid and early retirement

The agricultural investment aid and early retirement arrangements aim to promote the growth in farm size and reduce production costs. In practice these forms of structural aid comprise subsidised interest-rates, subsidies and state guarantees. In 2013 interest-rate subsidy loans mainly for financing production buildings on farms and acquisition of real estate and movables relating to the setting-up aid for young farmers may be granted up to € 250 million. The costs to the state from interest-rate subsidies will total about € 59 million in 2013.

In 2013 the investments in livestock buildings, setting-up aid for young farmers, building investments in greenhouses and building investments relating to renewable energy production are co-funded by the EU. Subsidies for other types of investments are financed nationally. The early retirement scheme offers the ageing farmers the opportunity to give up the farm or its production. In 2013 the national subsidies included in structural support are estimated to total € 95 million.

Setting-up aid for young farmers supports the transfer of farms to the next generation. In 2013 aid should be granted to about 500 farms. In 2012 setting-up aid was granted to 544 farms, which is about the same as in 2011 and 2010. In 2009 aid was granted to 495 transfers.

Farm relief services

Farmers practising livestock production on a full-time basis are entitled to 26 days off per year. The Ministry of Social Affairs and Health is responsible for the management, control and coordination of the services. The purpose of the services is to ensure that farming activities continue uninterrupted during the holidays, as well as the availability of substitute help in case of illnesses or accidents. In 2013 the funds used for the relief services to farmers and fur producers will total about € 224 million.

Number of objects of structural support and funds committed to these in 2008–2012.

	2008	2009	2010	2011	2012
Number of decisions on subsidies	3,473	3,289	2,771	2,537	2,205
– building in dairy husbandry	224	415	292	295	276
– building in beef cattle production	131	151	106	94	87
– horticulture investments	121	92	67	63	55
Number of setting-up aids	644	495	542	535	544
Funds committed, € million	108.5	98.1	95.7	77.3	73.0

Source: Ministry of Agriculture and Forestry

EU agricultural policy reform – Finnish perspectives

Jyrki Niemi

The common agricultural policy (CAP) of the European Union will again be reformed after 2013. The European Commission published its legislative proposals for the reform in October 2011. Comments on the proposals have been given by the European Parliament and Council as well as individual Member States. The aim is to reach a political understanding on the content of the reform by June 2013.

The CAP reform should have been completed by 1 January 2014, but now that the preparation schedule has been extended most elements of the reform will not enter into force until the beginning of 2015. Negotiations on the CAP reform are closely linked to the decisions on the future financial frameworks of the EU. The European Council adopted the next multi-annual financial framework for the period 2014–2020 at the meeting of 7–8 February 2013. This makes it possible to also proceed in questions relating to the content of the future agricultural policy.

The main issues for Finland in the reform are the total level of support payments funded by the EU, relative weight between the two pillars of the CAP, possibility to apply coupled payments and the proposals concerning the greening of the CAP.

Agricultural support in Finland should stay about the same

Finnish agricultural policy is based on EU support. In recent years these have represented about 70% of the total support payments to Finnish agriculture. The CAP payments include direct income payments under Pillar I financed in full by the EU as well as the EU part-funded support under Pillar II, of which in monetary terms the natural handicap payment (€ 420 mill.) and agri-environmental support (€ 350 mill.) are the most significant ones.

The decisions on financial frameworks by the European Council imply no major changes for the total level of EU payments to Finland for the period 2014–2020. Some decrease is to be expected in the direct income support to Finnish agriculture, but the payments under Pillar II will be raised by almost the same amounts.

At present Finland is allowed to pay about 10% of the direct EU support as coupled support. In the Commission's proposal this should stay about the same. Coupled EU support is particularly important for the supply of Finnish beef, which would fall even more rapidly if the support were decoupled from the production. Coupled support is also important for milk production in southern Finland, where the production has been decreasing for some time.

According to the Commission proposal, in the future about 30% of the direct income support of the EU would be targeted to the greening of agricultural support, involving diversification of farming and at least 7% of the area designated as so-called ecological focus area. On the whole the impacts of greening will remain quite small in Finland due to the comprehensive and broadly applied environmental support scheme.

Furthermore, when making the decisions on the financial frameworks the European Council emphasised that enough flexibility should be allowed for the Member States as regards the application of the greening measure. The Council also pointed out that the ecological focus areas must be implemented so that removing arable area from the production is not required, in order to avoid causing undue loss of income to farmers.

4. ECONOMIC SITUATION OF AGRICULTURE

4.1. Development of results and profitability of agriculture and horticulture

The MTT Economic Research calculates annually the result and profitability development of Finnish agriculture and horticulture. The results are based on the data of the about 900 bookkeeping farms, which are weighted so that they indicate the average results of the 42,000 largest agricultural and horticultural enterprises. These account for more than 90% of the output of Finnish agriculture. The individual revenue and expense items and support payments are allocated as returns and costs to the year of production in accordance with the accrual principle. Annual variations in the yields and returns and changes in prices and support payments are thus directly reflected in the annual profitability figures.

Increased variation

In recent years the operating environment of agriculture and horticulture has been more uncertain than before. Due to the global economic cycles and varying climate conditions fluctuations in the prices of raw materials and products are growing. This has been particularly clear in cereal prices since 2007. In autumn 2010 cereal prices almost doubled and the prices for livestock products rose as well.

The constant rise of the input prices has increased the costs and weakened profitability. The rise in the prices of energy, fertilisers and feedingstuffs has been particularly strong. In recent years the share of direct payments in the total return has decreased slightly to the average of about 37% and to about 50% on cereal, beef cattle and sheep farms in 2011. This means that the market prices still have a great impact on the income of farmers and profitability of enterprises.

In recent years there has been considerable variation in the yields as well. After the record cereal yield harvested in 2009 the yield of the following year was the smallest in a decade. In 2011 the yield was again above the normal, while the cool and rainy growing season in 2012 led to quite serious crop damages in some parts of the country.

Growing returns

The trend in the incomes and profitability of agriculture was very weak in 2008 and 2009 due to the poor market situation and unfavourable price relations. The financial situation tightened especially on crop, pig and cattle farms. In 2010 the rise in the cereal prices combined with the quite moderate increase in the costs improved the results of cereal and crop farms. Instead, in meat production the economic situation stayed poor due to the weak price relations.

In 2011 the average gross return of agricultural and horticultural enterprises was € 129,900, which is about 5% higher than the year before. The rise in producer prices and especially cereal prices increased the sales proceeds by 9%. The sales proceeds of crop production rose by 8% and those of livestock production by 11%. Support payments fell slightly to the average of € 48,400. As a result of the growth in sales proceeds the share of support payments in the gross return decreased to 37% in 2011. The support payments also include investment subsidies allocated to the years of service.

The rise in costs continued

In 2011 the production costs of agriculture increased by 3% to the average of € 153,900. The purchase prices of production supplies started to rise in autumn 2010 and on the annual level the prices were about 15% higher in 2011 than the

year before. The prices of energy products and fertilisers rose by almost a third and the high cereal prices increased the prices for purchased feed by a fifth. The supplies cost rose by 16%, mainly driven by the higher prices. On average production supplies represent about 24% of the total production costs.

When the costs had been deducted, the entrepreneurial income left as compensation for the labour and own capital of the farm family fell by 6% to the average of € 20,700 per farm. Entrepreneurial income is the compensation for the use of own resources in agriculture and horticulture, the 2,060 hours' labour input and own capital of € 298,300 invested in agriculture and horticulture.

When the wage claim for own labour and interest claim for own capital are deducted from entrepreneurial income we obtain the entrepreneurial profit, where all costs of the production are taken into account. This was again negative, € –23,700, but the losses were € 1,700 smaller than in 2010. The costs overran the returns by an average of 18%. The wage claim for own labour has been calculated using the recorded working hours and average hourly wages of agricultural employees (€ 14.10).

Since 2010 the interest rate in calculating the cost of own capital for individual farms has been based on the sum of the risk-free interest rate and farm-specific risk premium. The risk-free interest rate is the return on the five-year Finnish government bonds. The farm-specific risk premium is determined by a certain calculation method on the basis of the variation coefficient of the operating result percentage, equity ratio and relative indebtedness. The average interest rate for 2010 was 6.3% and for 2011 it was 5.3%.

Profitability stagnated

In 2011 the profitability of agriculture and horticulture was about the same as the year before. After having hit the bottom in 2009, profitability was again close to the average of the past decade. The average profitability ratio, obtained by dividing entrepreneurial income by the sum of the wage and interest claims, was 0.47 in 2011. This means that the entrepreneurs received 47% of the wages and interest set as the target so that the hourly wages were € 6.6 and the interest on equity was 2.4%.

On dairy farms the profitability ratio was 0.59, which is about the same as the year before, even if the entrepreneurial income was 3.5% lower. Rise in milk prices and growth in the farm size increased the gross return by 10%, while the rise in the costs stayed at 8%. The supplies cost rose by a fifth. The profitability of other cattle farms is still lagging behind: the profitability ratio fell to 0.40 and entrepreneurial income decreased by 16%.

The profitability of pig farms has been weak since 2008. In 2011 the profitability ratio was as low as 0.39 and the entrepreneurial profit fell to € –45,400. The entrepreneurial income of pig farms decreased by 12% to € 29,300, which was clearly below the average during the 2000s.

The profitability of cereal farms was very low in 2008–2009 as the market prices for cereals collapsed due to the economic recession, after having peaked in 2007. The market prices for cereals started to rise again and almost doubled during the autumn 2010, they stayed high all through the crop year 2010/2011 and continued to rise in the following crop year. The higher prices have eased the economic situation of cereal farms, even if part of the rise has gone to cover the increased costs. The profitability ratio of cereal farms rose to 0.41 in 2011 but that of other crop farms fell from 0.50 to 0.42. The entrepreneurial income left per cereal farm was € 11,200 and that of other crop farms was € 10,200.

Differences in profitability

The profitability ratio of the most successful farms (the group 'strong') was 0.84 and

the entrepreneurial income reached the average of € 40,840. In the poorest quarter of the farms (the group 'weak') the entrepreneurial income was negative, € –2,000 per farm, and the profitability ratio was –0.06. On the 'strong' farms the cultivated areas and livestock numbers are clearly larger than on the 'weak' farms.

There were also considerable differences in profitability between farms representing the same production type and economic size. On average-sized dairy farms the profitability ratio of the 'strong' farms was 1.03, but in the group 'weak' it was as low as 0.30. On the largest dairy farms in the 'strong' group the profitability ratio was 1.15. In the weakest quarter of the same economic size, however, the ratio was as low as 0.18.

There are no major differences in profitability between farms engaged in the same production type in different support areas. The differences in profitability between support areas are largely due to the production structure of the regions.

Hourly earnings and return on assets

When the interest claim for own capital is deducted from the entrepreneurial income, the average of € 5,400 were left as annual earnings in 2011. When this is divided by the 2,060 hours of labour of the farm family, the hourly earnings comparable to the hourly wages of employees are € 2.6. On average the annual earnings in 2005–2010 were € 7,000 and hourly earnings € 3.0. According to the forecast for 2012, the earnings should rise to € 9,300 and hourly earnings to € 4.6.

When the wage cost of own labour is deducted from the entrepreneurial income we obtain the net result left as return on equity, which in 2011 was € –8,360. When the net result is divided by the amount of own capital, the return on equity is –2.9%. The income tax on agriculture and horticulture has not been deducted as an expense from the net result.

In 2011 the return on assets of agriculture and horticulture was € –5,500. This is obtained by adding the interest paid to the net result. The average assets during the accounting period were € 390,000, and thus the return on assets was –1.4%. Among the production types the return percentage varied from 3.1% on poultry farms to –11.3% on farms with sheep husbandry and grazing livestock.

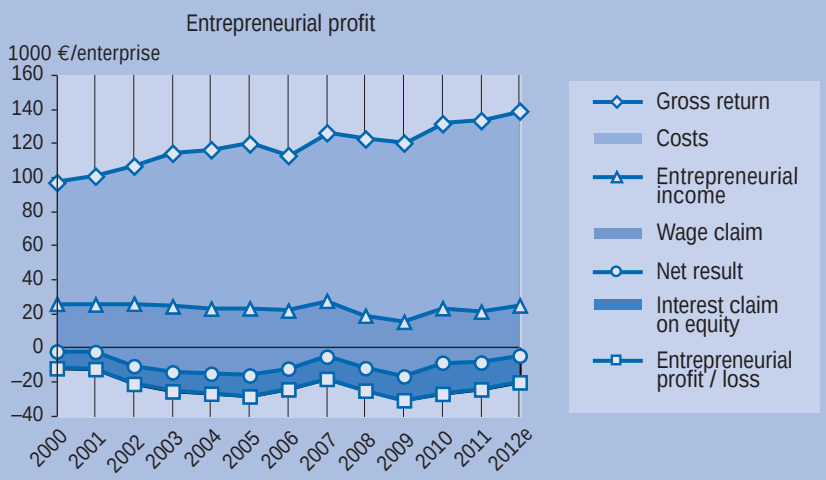
Solvency

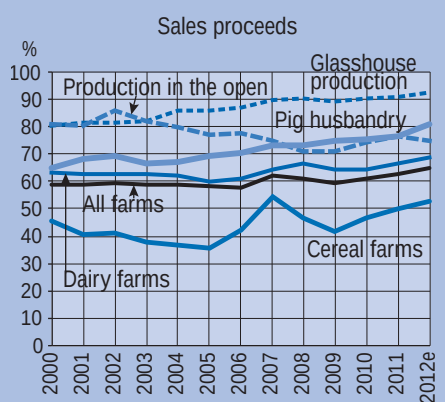
In 2011 the total assets of agriculture and horticulture enterprises were, on average, € 400,400 of which € 298,300 (75%) was own capital. The rapid growth in the farm size has increased the amount of capital. The amount of debt has grown even faster than the total capital, which has led to some decrease in solvency. Because of low profitability the financing of investments depends largely on external capital and investment subsidies. The amount of debt has more than doubled since 2000 so that in 2010 it exceeded € 100,000.

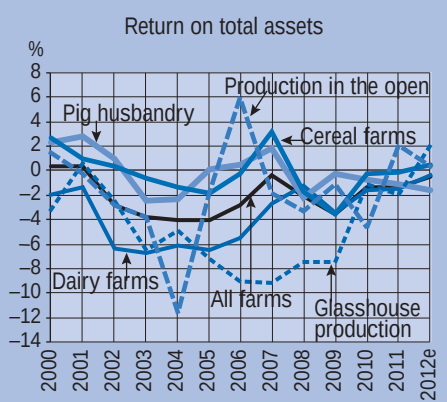
The equity ratio of agricultural and horticultural enterprises, i.e. the share of equity of the total assets, is quite good, 75%. The equity ratio is the highest on cereal farms, 86%, and the lowest in greenhouse enterprises, 39%. On pig farms the equity ratio is 73% and on poultry farms it is 53%. On these farms the amounts of both capital and debts are above the average.

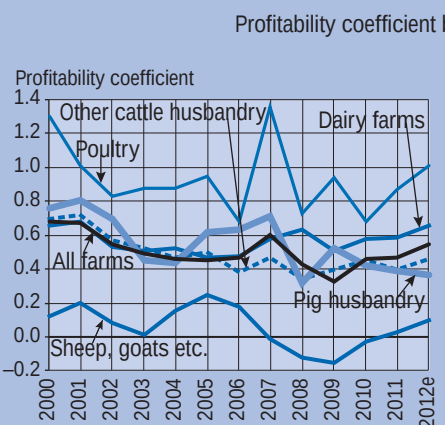
The amount of debts has grown more rapidly than returns, which is why relative indebtedness, i.e. the amount of debt relative to returns, grew from about 60% in 2000 to 79% in 2010. This ratio is indicative of the increased financial risk in enterprises, which has partly been reduced by the low interest rates.

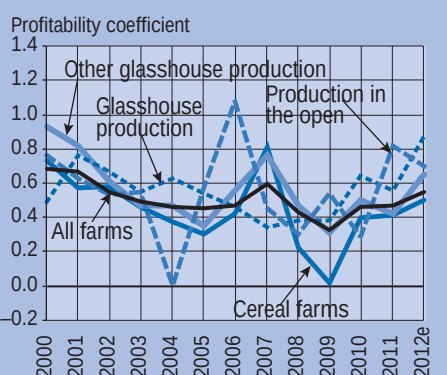
There are considerable differences in indebtedness between farms and production types. The indebtedness is the highest on farms with sheep and grazing livestock (107%) and lowest on pig farms (62%). On a little under 10% of the farms the











Result and profitability development of agriculture and horticulture enterprises in 2000–2012e.

amount of debts is more than double their income.

Liquidity

Even if the profitability figures of enterprises have been weak in recent years, their cash-based liquidity has not collapsed. In 2011 the cash returns from sales and support payments grew by 8% to € 127,100. The short-term expenses of the production increased by 9% from the year before to € 84,300.

Financial expenses of enterprises increased slightly while the taxes paid fell, which is why the financial surplus increased by 10% to € 35,200 per farm. Financial surplus can be used for investments, repayment of loans and private household expenditure.

The net amount used for investments was € 20,800 per farm, which is 4% less than in 2010. The amount of new loans taken out fell by 11% and repayments of loans were high, which is why the net change in the loans was as low as € 300.

Cash surplus grew by 15% to the average of € 15,500 per farm. This is the amount left from the business activities in agriculture and horticulture to be used for the private consumption of the farm family.

Preliminary results for 2011

According to the preliminary results for 2012, the average gross return of enterprises grew by 7% to € 139,100. Sales proceeds rose by 11% from the year before to € 84,400 while support payments stayed about the same, € 48,400 per farm. Production costs increased by 7% from the year before, mainly due to the rise in fertiliser and cultivation costs and, in livestock production, feed costs.

The results of enterprises improved clearly from the year before. The average entrepreneurial income increased by 20% to € 24,900 and profitability ratio rose from 0.47 to 0.55. When the costs of own labour and capital of € 45,100 are deducted from the entrepreneurial income, the resulting entrepreneurial profit is –20,200. The losses decreased by € 3,500 from the year before.

Profitability improved in all production sectors except for pig husbandry and horticulture in the open. Higher producer prices improved the profitability of dairy farms, despite the considerable increase in the costs. The entrepreneurial income rose by a fifth and profitability ratio rose from 0.59 to 0.66. The rise in the producer prices improved the results of cereal and other crop farms and poultry farms as well.

On pig and beef cattle farms the profitability has been very week for a number of years. Meat prices have risen during the past year, but this has not eased the financial position of farms. The rise in the prices of supplies increases the costs, and decrease in support payments is reflected in the result of pig farms. In pig husbandry the relative prices of meat and feedingstuffs was the weakest after the cost crisis in 2008, which caused the profitability of the sector to collapse and led to a decrease in the production.

The profitability ratio calculated in the forecast was 0.66 on dairy farms, 0.46 on other cattle farms, 0.37 on pig farms, 1.01 on poultry farms, 0.70 in horticulture in the open, 0.87 in greenhouse enterprises, 0.50 on cereal farms, and 0.65 on other crop farms.

The result and profitability figures for 2012 presented above are based on farm-specific forecasts calculated from the bookkeeping data, where changes in product and input prices and support as well as regional average crop yields have been taken into account. Agricultural support payments are the realised payments of the year. The farm size and production and input structure are assumed to stay the same as the year before, which means that the calculation model does not take into account the impact of productivity development on the results.

4.2. Economic development of Finnish agriculture and horticulture

The trends in the return and cost items as well as assets of Finnish agriculture and horticulture on the total level are being followed by the total calculation system introduced at the MTT Agrifood Research Finland in 2011. In this system the results for Finnish agriculture and horticulture as a whole are calculated from the farm-specific profitability bookkeeping data by weighting and summing up.

Besides the realised results, preliminary results for 2012 are calculated on the basis of the preliminary farm-specific results calculated by the forecasting system of the profitability bookkeeping (see Chapter 4.1). The results are available in the total calculation of agriculture online service of the MTT's EconomyDoctor website (www.mtt.fi/economydoctor/total_calculation).

Trends in the result

According to the forecast, in 2012 the gross return of agriculture and horticulture was almost € 5.9 billion and the production costs totalled about € 7.0 billion. The entrepreneurial profit obtained as the difference between the gross return and production costs, which indicates absolute profitability, was negative, –€ 1.1 billion.

When the costs due to farm family's labour input and own capital are excluded from the production costs we arrive at the entrepreneurial income left for these inputs. The forecast for the entrepreneurial income of 2012 is € 911 million, which is 24% more than the year before. The overall trend has, however, been decreasing all through the 2000s.

The entrepreneurial income varies a great deal between years especially in support areas dominated by crop production (support area A, in particular). In this area the entrepreneurial income forecast for 2012 is € 121 million, while in 2009 it was € 38 million and in 2007 € 190 million.

Specification of returns

Of the gross return of agriculture and horticulture forecast for 2012, about € 5.9 billion, a little more than € 2 billion (34%) comes from support payments. Support

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

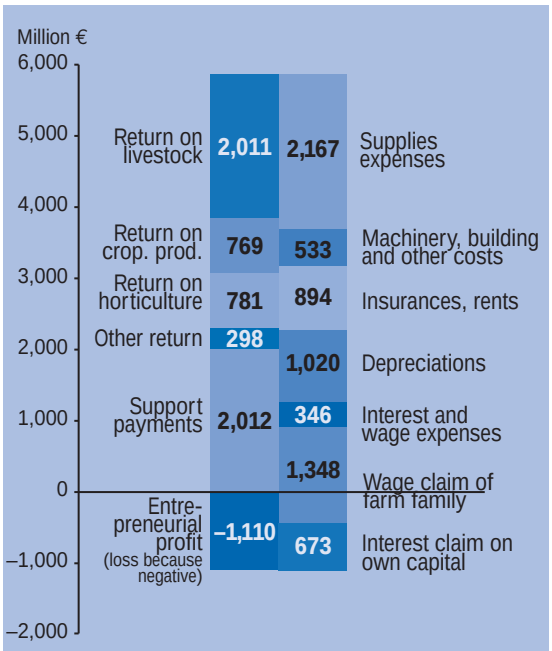
Year	Total return	Production cost	Entrepreneurial profit	Entrepreneurial income	Entrepreneurial income at 2012 prices	Profitability ratio	Return on total assets %
2012e	5,870	6,982	–1,110	911	911	0.45	–1.9
2011	5,518	6,788	–1,264	736	770	0.37	–2.8
2010	5,306	6,701	–1,390	811	885	0.37	–3.1
2009	4,939	6,511	–1,571	488	574	0.24	–5.1
2008	5,107	6,552	–1,440	595	716	0.29	–4.2
2007	5,049	6,192	–1,138	909	1,101	0.44	–2.8
2006	4,668	5,988	–1,316	737	918	0.36	–4.7
2005	4,652	6,018	–1,364	808	1,004	0.37	–5.5
2004	4,511	5,880	–1,368	762	962	0.36	–5.8
2003	4,558	5,867	–1,308	852	1,062	0.39	–5.6
2002	4,513	5,671	–1,155	964	1,203	0.47	–4.8
2001	4,416	5,202	–784	975	1,243	0.55	–1.6

payments also include the items of investment subsidies from earlier years targeted to the year 2012. Investment subsidies are allocated as returns alongside with the corresponding asset item depreciations.

The sales proceeds and other returns totalled € 3.8 billion in 2012. Return on livestock accounted for 52% and return on crop production for 20% of the gross return. Return on crop production does not include intermediate products produced and used on the farm, such as feed.

Return on horticulture represents 20% of the sales return. This includes sales proceeds from intermediate products sold as well. The return on crop production, livestock and horticulture also include the prices of products delivered outside the agricultural sector or used by the entrepreneur.

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



Specification of return and costs of agriculture and horticulture 2012e.

Specification of costs

According to the forecast for 2012, the production costs of agriculture and horticulture totalled about € 7.0 billion. The largest cost item, supplies cost of € 2.2 billion, accounted for 31% of the production costs. The depreciation cost of € 1.0 billion represents about 15% of the production costs.

The wage claim cost due to farm family's own work input calculated by the hourly wage claim of € 14.5 was about € 1.35 billion, which is about 19% of the production costs. This would be the cost to the farmer if the work had been done by hired labour. The wage claim cost is the only cost item that has fallen over the past 8 years as the number of labour hours has decreased.

In the revised profitability bookkeeping introduced in the accounting year 2010 the wage claim cost of own capital is calculated using a farm-specific, risk-based interest rate (see Chapter 4.1). The average interest rate of all farms was about 5.3% and the interest claim cost based on this in the forecast for 2012 amounted to € 673 million.

For a more detailed specification of cost and return items see p. 92.

Profitability in the country and support areas

The entrepreneurial income of about € 911 million in 2012 should cover the costs due to farm family's labour and own capital. The labour hours of farm families at an hourly wage of € 14.5 result in a wage claim cost of € 1.35 billion, while the own capital

of about € 13.4 billion gives an interest claim cost of € 673 million.

The profitability ratio of 0.45 is obtained by dividing the entrepreneurial income by the sum of the wage and interest claim cost. This means that the income covers 45% of the wage and interest claim cost. The compensation left for an hour of work by the farm family is € 6.5 and the interest on own capital is 2.4%.

If the total wage claim of € 1.35 billion is deducted from the entrepreneurial income of € 911 million, the return on own capital turns negative, to the level of –3%.

The profitability ratio of agriculture and horticulture in the total calculation has been about 0.1 units lower than the average profitability of the 42,000 largest Finnish farms obtained from the bookkeeping results.

Solvency

At the end of the accounting year 2012 the total capital invested in agriculture and horticulture totalled € 17.7 billion. About 82% of this was invested in long-term objects such as farming land, machinery, buildings and subsurface drainage.

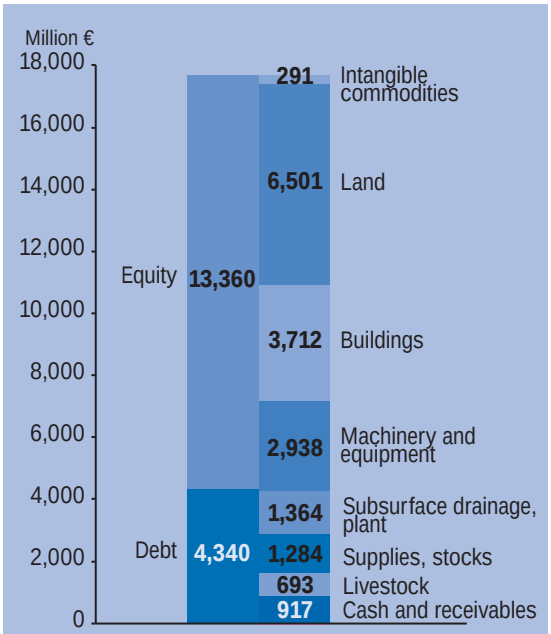
On the balance sheet the asset items have been valued at the current values and the investment subsidies or the investment reserves are not deducted from the value of assets. Depreciation cost of the fixed assets purchased by means of the investment subsidies is calculated and the subsidies are allocated as returns alongside with the corresponding depreciations in the result calculation.

Of the total assets about € 13.4 billion is farmers' own capital. On average, 75% of the total asset of the farm is farmers' own capital. The percentage share of own capital has stayed about the same during the 2000s. The total amount of liabilities was about € 4,3 billion at the end of 2012. Any debts of the farm family from forestry and other business as well as private household are not included in the debts of agriculture. The ratio of debts to gross return, i.e. relative indebtedness, is about 74%.

Weighting system

In the total calculation the results for the whole country are obtained by summing up the results of the bookkeeping farms. The total number of farms in Finland is 60,000 but the number of bookkeeping farms is only 910, which means that the figures for each bookkeeping farm are included several times in the calculation in accordance with the weighting coefficient determined for each farm.

The weighting coefficient of each bookkeeping farm indicates how large a number of farms in the production type and economic size class concerned the farm represents in the support area. The production type and economic size class are based on the standard outputs introduced in the EU in 2010.



Balance sheet of agriculture and horticulture 2012e.

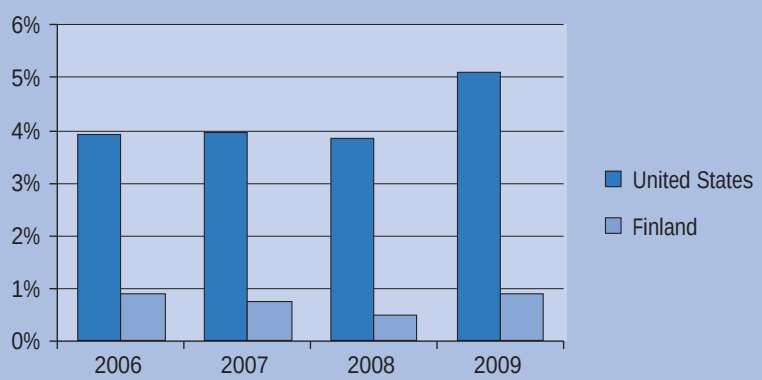
Crop damages – under-insured in Finland?

Sami Myyrä and Petri Liesivaara

In summer 2012 drought in the US Midwest led to damage whose compensations totalled among the highest in history. The most serious heat wave for fifty years caused about two-thirds of the cultivated area to suffer from drought of some degree. Every fifth acre suffered from severe drought. The economic damage to farmers, however, did not rise to insurmountable levels as the safety net offered by crop insurances proved sufficient cover.

The United States has a long tradition in covering crop damages by means of commercial weather insurance policies. The first commercial insurances were sold as early as in 1899. The state gained a more prominent role when the Congress introduced the first crop damage insurance scheme in the 1930s. The aim was to ease the position of farmers who suffered the most from the depression and effects of wind erosion. At first the crop damage insurance scheme was applicable to certain regions and crops only. The commercial crop damage scheme gained new interest in the 1980s when the state began to subsidize the premiums, at first by 30% of the price of the insurance. The deductible was set at 35%. The aim of the subsidy was to encourage farmers to shift from the free crop damage scheme offered by the state to commercial crop damage insurance policies.

In 2009 the value of the crop yield in the US rose to about 164 billion dollars and the premiums under the crop damage insurance policies totalled about 8.3 billion. The value of crop damage insurances relative to the value of the production was about 5%. The costs to the US federal government for subsidizing the crop damage insurance scheme totalled about USD 7 billion. The costs consist of a premium subsidy (5,198 million) paid directly to the farmers, administrative costs (1,602 million) and other costs (239 million). In the same year the value of the crop yield in Finland was about € 398 million and the funds allocated to crop damage insurances in the state budget was about € 3.4 million. In Finland the insurances represent about 0.85% of the value of the production, which means that, roughly speaking, the level of insurances in the



Crop damage insurances relative to the value of crop production in the United States and Finland. Sources: USDA, RMA, FCIC Financial Statements (http://www.rma.usda.gov/aboutrma/budget/costsoutlays.html) and Finnish Agriculture and Rural Industries 2012.

US is about five times that in Finland. Obviously there is some annual variation in the figures due to both changes in the value of crop production and insurance sales.

In the US the year 2011 was the first one when the financial support to agriculture through risk management tools was higher than the total amount of direct support paid to agriculture, and this seems to be the predominating trend also in the future. Both the Senate's Agricultural Reform, Food, and Jobs Act of 2012 and the Federal Agriculture Reform and Risk Management Act of the Committee on Agriculture cut the direct payments and shift the focus in subsidies towards crop insurances. The US agricultural policy and its great weight also impact on the negotiations of the World Trade Organization WTO and, through these, shape the policy instruments and support mechanisms usable in other countries. The EU agricultural policy is also following the changes taking place in the US policy and risk management is gaining more weight in CAP. The use of new, so-called index-based insurance products in insurance policies concerning crop risks in agriculture will also be approved in the EU.

Income stabilization tool employed in Canada

In the northern neighbour country of the US in Canada there are also quite comprehensive risk management programs provided to farmers. Besides the subsidized crop damage insurances there is a specific income stabilization tool "AgriStability". In this program, aimed to stabilize the income flow of farmers between the years, farmers' incomes are compared to their earlier average income. The deductible is 15%, i.e. if the farmer's income falls by more than 15% from the average in the past years, the farmer is entitled to compensation. Of the income losses below the threshold for the compensation paid to the farmer is 70%, and the amount to be compensated for increases along with the losses.

The income stabilization tool used in Canada offers protection against a fall in farmer's income independent of the production sector. However, the program offers no protection if the farmer's incomes fall steady from one year to another due to e.g. rising costs. The compensations under the program used in Canada have proven the most significant for small farms.

In spite of its name the Canadian income stabilization tool is a tool for subsidizing agriculture rather than an efficient risk management tool. Even if the farmers are paying for their participation in the program, the compensations are higher than what farmers pay to the program. This means that, basically, the income stabilization program is a tool for paying agricultural support to farmers. In practice, however, the efficiency of the program in transferring funds is quite low. In the end the program may in fact even increase income variation of a farm, although the aim was to stabilize incomes.

No common EU policy to compensate for crop damages

In Europe the main practices for preparing for crop damages, besides the production management actions by farmers themselves, include various kinds of joint funds of farmers and state compensations for crop damages paid on an ad hoc basis. In Europe (EU 27) these kind of ad hoc compensations for crop damages are being paid, on average, about € 920 million per year. In most cases the state contribution to the funds and disaster assistance has been organised through various kinds of programs. The total funding is comprised of the state and farmers' contributions and premium subsidy.

Often the support is targeted to re-insurance which is managed either directly by the state or through private insurance companies by means of state support.

In certain EU Member States the crop damage insurances are promoted trough specific legislation which prohibits the ad hoc compensations for crop damages paid by the state. In France, Greece, Spain, Austria, Portugal and Sweden, for example, farmers cannot get any kind of state compensations for crop damages if commercial crop damage insurances are available. In Romania the state compensations for crop damages are subject to the condition that the farmers themselves have first taken out an insurance against the most common crop risks.

Commercial crop damage insurances in Europe in 2009.

	Area insured 1,000 ha	Premium subsidies %
Austria	1,054	46
France	3,507	2.4
Italy	976	67
Luxembourg	26	50
Spain	5,850	41

Source: Risk Management and Agricultural Insurance Schemes in Europe. http://ec.europa.eu/dgs/jrc/downloads/jrc_reference_report_2009_09_agri_ins.pdf

Finnish crop damage scheme to be abolished. What next?

The crop damage scheme applied so far in Finland may be abolished at the end of 2013 in the context of the CAP reform. Finland is, however, applying for a two-year extension to the scheme. The European Commission gave the legislative proposals for the post-2013 common agricultural policy in October 2011. For crop damages the proposed measure is support for insurances. This would mean that, as from the beginning of 2014, farmers would purchase crop damage insurances in the same way as any other insurances from insurance companies that offer such products.

In the new scheme the public sector could support taking out the insurances by paying up to 75% of the price of the insurance product. The new insurance products would be designed and implemented in cooperation between the public sector and insurance companies following the principle of Public Private Partnership (PPP) so that the contribution by the public sector would render the insurance products marketable.

In the legislative proposal the European Commission also allows the Member States to introduce an income stabilization tool such as that applicable in the Canadian model. In this program the deductible is limited to 30%. The average income calculated from the past years would serve as the threshold for the compensations. Up to 70% of the income losses exceeding the 30% deductible could be compensated for.

When planning the future risk management tools for agriculture it should be born in mind that international agreements pose restrictions on financial support for insurances. The minimum allowable deductible, 30%, and the maximum compensation percentage, 70%, proposed by the Commission are in line with the rules of the World Trade Organization WTO. The maximum amount of the premium support, 75%, is above the maximum limits specified in the WTO agreements. Any compensations and supports exceeding the limits would be considered market distorting, which is why efforts are being made to restrict their use through the agreements. Violations of the WTO rules are, however, quite common. For example, the next US Farm Bill will most likely include financial support for shallow crop losses that in the crop damage insurances would be covered by the deductible.

5. AGRICULTURE AND THE ENVIRONMENT

5.1. Environmental impacts of agriculture

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

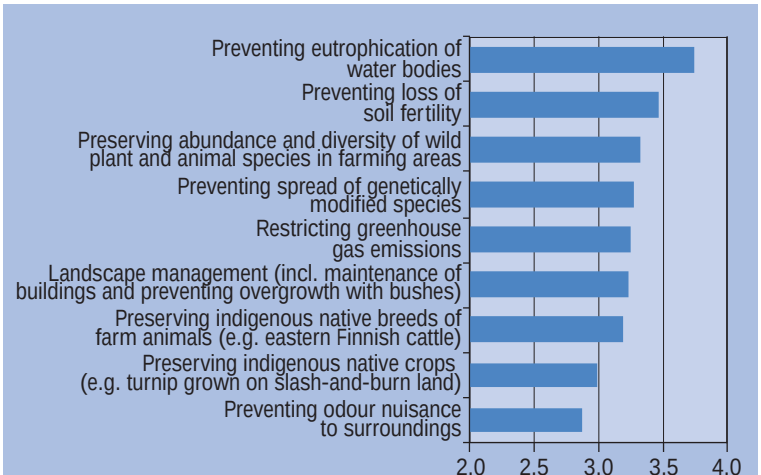
Based on an inquiry conducted in 2011, the Finns consider it particularly important to prevent the eutrophication of water bodies.

Soil

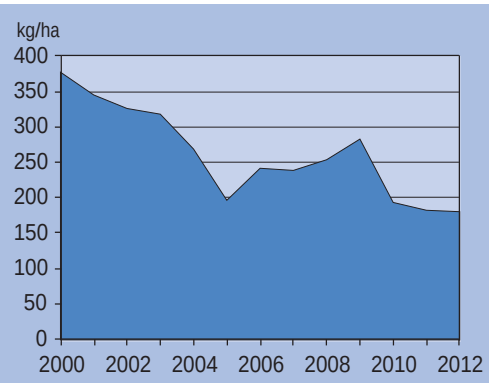
Environmental loading from arable land depends on the soil type, cultivation properties and crop rotations. Finnish soil contains no heavy metals, its average phosphorus level is satisfactory, acidity is increasing, and the amount of organic matter is decreasing.The phosphorus level in arable land is an indicator of both productive capacity and environmental loading. In Finland, the phosphorus levels have been rising up to the present, even if phosphorus fertilisation has been reduced considerably through, for example, the fertilisation restrictions under the agri-environment scheme. At present, the annual increase in phosphorus through purchased fertilisers is less than 6 kg/ha, which is only a quarter of the level in 1995. The amount of phosphorus entering the land in animal manure (about 8 kg/ha) is higher than the amount of phosphorus contained in purchased fertiliser, and no significant reduction has taken place in this since 1995. Studies have shown that some further reduction in total phosphorus fertilisation (purchased fertiliser + manure) would be possible without a decrease in yields, except in parcels where the phosphorus levels are particularly low. In the light of current knowledge, turning the phosphorus balance of arable lands into a negative one is the most efficient way to permanently reduce the phosphorus loading.

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

Only about 7% of the surface area of Finland is arable land. The ownership of arable land is quite decisive in terms



Views of the Finns on the importance of environmental problems.



Quantities of land improvement lime used (kg/ha). Source: Information Centre of the Ministry of Agriculture and Forestry.

of the long-term productivity of the land. Studies have shown that less land improvement work is being done on leased areas than on lands owned by the farmer. The use of agricultural lime, for example, has halved from the levels before Finland joined the EU. The average application amount of lime for land improvement is now less than 200 kg/ha/year, which is not enough to maintain the productive capacity of arable lands.

Loading of waters

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

The Finnish Environment Institute estimates that about 50% of the nitrogen loading and 60% of the phosphorus loading come from agricultural sources. In the nutrient loading of the Baltic Sea, Finnish agriculture accounts for about 3.8% of the phosphorus and 3.7% of the nitrogen loading. In the loading on the Archipelago Sea and coastal waters, the share of Finnish agriculture is much greater.

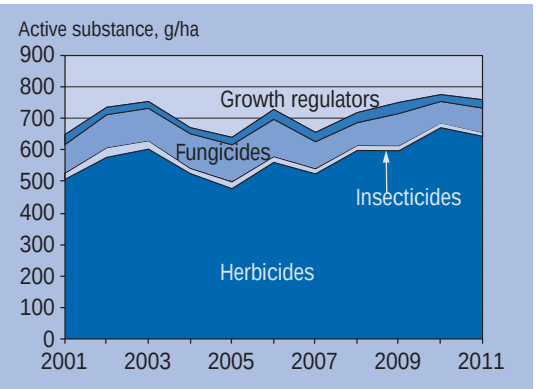
The loading of water bodies is caused by both arable farming and livestock production. Because of the concentration of livestock production, the amount of manure produced is excessive in many places relative to the utilised agricultural area and the needs of the crops cultivated. The phosphorus contained in manure, in particular, has become a problem.

Use of pesticides

The use of pesticides has been growing steadily since Finland joined the EU. Most of the pesticides used are products intended for preventing weeds (herbicides). The main reason for the growth is increased cereal monoculture and wider use of non-tillage technology. Farmers have also switched over to pesticides which need to be used in larger doses. On the European scale, the quantities of pesticides used in Finland are still quite moderate.

Emissions to air

Climate change poses new challenges to



Use of pesticides (active substance g/ha). Source: Information Centre of the Ministry of Agriculture and Forestry.

Finnish agriculture. The measures to adapt to climate change are changing the prioritisation of species and varieties and the relative profitability of different crops and production methods. Climate change is also influenced by agricultural activities. Greenhouse gas emissions from the agriculture sector represent about 9% of the total emissions in Finland. Most of them are due to the digestion of ruminant livestock, decomposition of organic matter in the soil and decomposition of manure. Minor emission sources include nitrogen fertilisation, liming of arable lands and the use of fossil energy in agriculture. A common feature in all emissions from agriculture is that it is difficult to reduce them without significant impacts on the volume of agricultural production.

The agriculture sector is excluded from emissions trading. The objective set for Finnish agriculture is that by 2020 the greenhouse gas emissions should be reduced by 13% from the emission levels in 2005. Through agri-environment measures, efforts are made to transfer peaty arable lands from continuous cereal production to the cultivation of grasses on a long-term basis. In other soil types, less intensive tillage practices or cultivation without tillage should also be preferred.

Biodiversity in farming environments

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

Besides biodiversity, it is also considered important to secure the functioning of ecosystems and the services produced by them. By ecosystem services, we mean the benefits derived by humans from healthy ecosystems, which can be divided into provisioning, regulating, supporting and cultural services. Biodiversity lays the foundation for ecosystem services as well.

Agricultural production is based on the utilisation of biological diversity. Similarly, many wild plant and animal species have over centuries adapted to utilising agricultural environments created by man. The positive impact of agriculture in enhancing biodiversity was the greatest at the time when animal feed was produced on meadows and natural pastures. The growth of farm size since the 1950s together with increased input intensity and farm-specific and regional specialisation has led to a decline in the biodiversity of farming environments and increased the numbers of threatened species and habitats.

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

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

Landscape and recreation value of arable environment

The countryside and rural margin areas around towns and cities with arable lands offer important recreation environments for the citizens. Farming environments

are important for outdoor recreation especially in areas with a high share of agricultural land. Farming environments are commonly used for nearby recreation, especially in southern Finland.

On average, the Finns engage in outdoor recreation close to their home 170 times a year, of which 35% takes place in farming environments. This means a total of 230 million times of outdoor recreation per year. Besides nearby outdoor activities, agricultural areas are used for recreation involving overnight stay. The average number of nature trips per year is eight and the average total number of days spent on such trips is 25. Summer cottages and holiday homes are the most popular destinations. About a quarter of nature trips are made to areas with both agricultural and forest activities. Altogether, this means 10 million days a year spent on nature trips in farming environments.

If rural tourism is hoped to become a significant source of livelihood in the countryside, farming environments should be developed into a real attraction in the rural tourism destinations. Studies have shown that the valuation of agricultural landscape improves, in particular, by the presence of grazing animals in the landscape and renovation of farm buildings located in open fields. Both of these landscape features are becoming less and less frequent because of the aim for higher efficiency in agriculture and regional differentiation of the production sectors.

5.2. Agri-environment in the Commission's proposals for CAP reform

The proposals for the reform of the EU's common agricultural policy for the new programming period 2014–2020 came out at the end of 2011. The baseline for environmental protection in agriculture continues to rest on the so-called cross-compliance conditions, comprised of the requirements for Good Agricultural and Environmental Condition and the Statutory Management Requirements.From the environmental perspective, the most significant element in the proposal is the even stronger emphasis on and recognition of the linkage between agricultural support and the environment as an obligation which is binding on all farmers through so-called greening. The Commission proposes that 30% of the direct payments would be used for greening measures, including crop diversification, permanent grassland and ecological focus areas. As a concrete measure, farmers should designate 7% of their agricultural area as an ecological focus area and arable farming should be diversified to include at least three crops. Permanent grassland area should remain the same as it was in 2003. Organic production is already considered fulfilling the greening conditions, which means that it is entitled to the greening payment without the measures listed above. Numerous comments on and suggestions for improvements in the proposals have been submitted and discussed at the Commission and the European Parliament. No agreement on the budgetary framework could be reached during 2012, which means that the launch of the agricultural reforms will be postponed by at least a year to the beginning of 2015.

The rest of Europe has not applied the environmental payments funded under the previous rural development programmes as widely as Finland has. This means that the upcoming reforms may even have a positive impact on the competitiveness of Finnish agriculture, as now all European farmers must commit to actions that reduce environmental loading, which have been a common practice in Finland for quite some time. Very likely the greening measures proposed by the Commission are going to restrict the production the most strongly in the most intensive farming regions of Europe. If implemented as they are at present, the reforms could also create the opportunity to apply some kinds of environment-based payments under

the first pillar while the "environmental support proper" funded under the Rural Development Programme could, in Finland also, be specifically targeted to the most environmentally sensitive farming areas.

5.3. Agri-environment scheme 2007–2013

Rural development in mainland Finland is funded from the European Agricultural Fund for Rural Development (EAFRD) and from national sources. The total public funding for the seven-year programming period is about € 6.6 billion, of which a third comes from the EU. The programme has four axes, of which Axis 2 includes the agri-environment and natural handicap payments, non-productive investments and promoting the welfare of farm animals. The funding for Axis 2 totals about € 2.3 billion.

The measures of the third agri-environmental programme implemented as from 2007 are quite similar to those in the earlier programmes. The programme consists of basic, additional and special measures. Farms in support areas A and B must undertake the basic measures plus one to four additional measures. In area C, no additional measures are required, and no more than two may be selected. The most popular additional measures have been more accurate nitrogen fertilisation of arable crops, different forms of plant cover on arable land in winter and calculation of nutrient balances. The number of farms committed to the agri-environment scheme fell slightly from the previous programming period, but it still covers more than 95% of the arable area.

The main objective of the agri-environment scheme is to reduce the load on waters. This is why most of the support is directed to measures which contribute to water protection. The role of the agri-environment payments in enhancing biodiversity is, however, greater than their share of the funding, because certain measures which are primarily targeted at water protection, such as field margins, filter strips, riparian zones and wetlands, also contribute to biodiversity.

Over the years, new measures have been included in the agri-environment scheme to improve its efficiency. The three new special measures included in 2008 concerned the incorporation of liquid manure into the soil, long-term grass cultivation on peaty arable lands and more efficient reduction in nutrient loading. The voluntary special measure concerning nature management fields was included in the programme in 2009. It was designed to compensate for the losses in nature and environmental values due to the abolition of compulsory set-aside from the single payment scheme. Nature management fields comprise perennial grasslands and biodiversity fields, the latter being further divided into game animal and landscape fields and fields sown with meadow plants. According to data from the Information Centre of the Ministry of Agriculture and Forestry, in 2012 the total area of nature management fields was 145,800 ha.

The changes to the special measures in 2010 include the following: The geographical area eligible for the contract concerning the management of multifunctional wetlands was extended to the catchment areas of rivers discharging into the Kvarken and Bothnian Bay. The annual site-specific support for the management of small valuable traditional biotopes (0.3–0.5 ha) was raised to 200 €/site from the earlier 135 €/site. The limits for the maximum acceptable costs of the contracts concerning special measures were revised.

In 2010, non-productive investments concerning the establishment of multifunctional wetlands was raised to 11,500 €/ha and the area covered by this measure was also extended to the catchment areas of rivers discharging into the Kvarken and Bothnian Bay. In small wetland sites (0.3–0.5 ha), the amount of investment aid is fixed

at 3,226 €/site. Support for non-productive investments in the first clearing and fencing of valuable traditional biotopes was differentiated according to the surface area of the biotopes. The amount of the investment support is 1,179 €/ha for sites with the maximum area of 3 ha, 910 €/ha for sites larger than 3 ha but no more than 10 ha, and 750 €/ha for sites of more than 10 ha.

Support for non-productive investments in the establishment of multifunctional wetlands and the first clearing and fencing of traditional biotopes and support for the special measures concerning the management of multifunctional wetlands and traditional biotopes may also be granted to beneficiaries other than farmers, provided that they follow the LEADER methodology.

Winter cereals were approved to fulfil the condition concerning plant cover in winter as from the winter season 2010–2011. The possibility to transfer some of the requirements now included in the basic measures (such as field margins and filter strips) to the cross-compliance conditions has been discussed, but no major changes are to be expected before the next programming period starting in 2015.

Evaluation of impacts of the agri-environment scheme

According to the mid-term report of the follow-up study on the impacts of the Finnish agri-environment scheme (MYTVAS 3) published in 2010, the nutrient loading potential of agriculture measured by nutrient balances has continued to decrease for both phosphorus and nitrogen during the terms of the agri-environment scheme, mainly due to the decrease in the use of artificial fertilisers. The decrease in the nutrient loading potential has not, however, been fully reflected in water loading from agriculture. Nitrogen loading has grown in almost all of the 22 catchment areas of rivers discharging into the Baltic Sea included in the model. The main reasons for this seem to be the growth in arable area, concentration of livestock production implying large quantities of manure in certain locations, increase in the land application of manure, and increased use of concentrate feed for livestock, which raises nitrogen levels in manure. Instead, the phosphorus drift from the river catchment areas to the Baltic Sea decreased during the whole period covered by the analysis (1985–2006), except in the Archipelago Sea. The measures which have the greatest potential to reduce nutrient loading of waters are fertilisation of arable crops and nature management fields among the basic measures and the additional measures concerning plant cover and fertilisation.

The greatest threat to biodiversity is the decrease in open or semi-open areas which are not used for farming purposes. The measures with the best potential in terms of biodiversity are some of the special measures and non-productive investments. Basic and additional measures alone do not significantly promote the preservation of biodiversity in agricultural environments. The overall conclusion of the mid-term report is that more regional, sectoral and farm-specific adjustment and customisation of the objectives, measures and support levels of the agri-environment scheme are needed due to the considerable regional differences in the state of agricultural environments and the needs of the society.

The environmental benefits of nature management fields were evaluated in 2012. The study showed that, thanks to the popularity and diversity of the measure, nature management fields are better suited to enhancing biodiversity than compulsory set-aside. Especially meadow fields and old meadow-like grasslands with the vegetation mainly composed of wild plant species clearly increase biodiversity in farming environments. However, these cannot be used to substitute for e.g. tradi-

tional biotopes because rarer plant species are not very common on nature management fields. At the moment, most of the nature management fields are quite similar to regular grassland or green manure grass, in which case the environmental benefits may remain small.

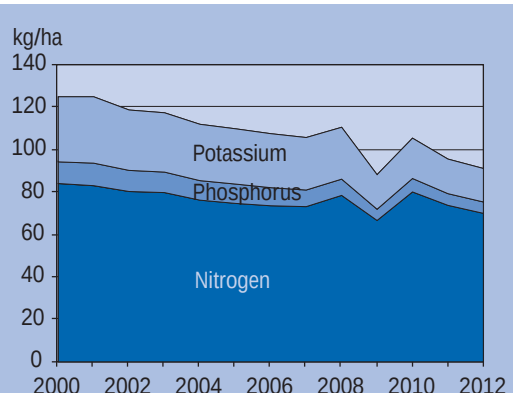
5.4. Water protection guidelines for agriculture

According to the Government Resolution on guidelines for water protection adopted in 2006, nutrient loading from agriculture should be reduced by at least a third from the average in 2001–2005 (phosphorus by 3,000 t/a and nitrogen by about 30,000 t/a). In addition to this, the EU Water Framework Directive sets even more detailed quality standards for specific water areas.The objective of the EU Water Framework Directive is to prevent the decline in the status of surface waters and groundwater, guarantee a good chemical and ecological status of waters by 2015, prevent harmful substances from entering the waters, and reduce damages caused by floods and drought. To meet these objectives, the Member States are obliged to introduce measures for specific water areas. For this purpose, Finland has been divided into eight water management areas, each with a specific water management plan designed for the area.

What do the objectives mean for agriculture?

Nutrient loading from agriculture is non-point source loading from over a million agricultural parcels with highly varied characteristics. Besides the physical characteristics, such as slope and soil type, water loading from a specific parcel depends on the weather conditions and cultivation and tillage practices. According to the Water Framework Directive, the assessment of the status of waters is made by comparing the current status with an estimated natural state.

Fertilisation is obviously one of the principal factors in nutrient loading, which is why it is also used as an indicator of the loading potential. In 1995–2012, the fertiliser sales per hectare of cultivated land decreased from 92 kg to 70.4 kg for nitrogen and from 16 kg to 5.4 kg for phosphorus. During the same period, there was no decrease in the yields per hectare, which means that the nutrient balances improved considerably. The trend is correct considering both the efforts to reduce nutrient loading and the profitability of agriculture. We should bear in mind, however, that the average per hectare is composed of highly varied fertilisation volumes which may have much higher loading potential in areas susceptible to erosion. Certain risk areas load the waters much more than the average. In Finland, about 90% of the loading occurs outside the growing season, which means that it is important to consider what happens between harvesting and sowing. In this respect, too, the trend is the right one as the voluntary agri-environment scheme and changes to the legislation have increased plant cover in winter, which reduces erosion, and less manure is spread on the lands in the autumn.



Use of fertilizers (kg/ha). Source: Information Centre of the Ministry of Agriculture and Forestry.

In areas where the loading from agriculture is the strongest, the reduction in the loading potential resulting from the agri-environment scheme will not be sufficient to reach a good status of waters by 2015. Especially as regards phosphorus, the soil reacts very slowly to changes and even significant reductions in the annual nutrient balance are not immediately reflected in the loading. The concentration of livestock production and growing unit size are also a problem as regards meeting the objectives. Transporting manure is costly and the decisions on spreading are often made based on the lowest cost or the need for nitrogen, which means that phosphorus levels may be too high for the needs of the plants and the loading potential increases. The pressure to improve the profitability of agriculture pushes towards more efficient production and larger units. A new threat to water quality is climate change, which is expected to increase precipitation especially outside the growing season.

5.5. New environmental payment scheme from 2015

A new environmental payment scheme is being designed in several working groups. The present model, composed of the basic, additional and specific measures, is to be replaced by a parcel-specific system. In the new scheme, the farmer should first implement a so-called start-up package, consisting of planning of environmental protection in farming and follow-up of soil fertility. The farmer should commit to complying with plant and soil type specific values set for nitrogen and phosphorus fertilisation and following the nutrient utilisation efficiency by means of nutrient balances. Besides these, there would be parcel-specific environmental measures to be selected concerning plant cover in winter and summer, enhancing biodiversity, and utilisation of manure and recycled nutrients. A specific contract would be concluded on more detailed and site-specific environmental measures to reduce nutrient leaching, increase biodiversity and reduce emissions to the air (e.g. riparian zones, traditional biotopes, preserving local breeds and species, etc.).

The programme should be ready to be launched at the beginning of 2014. Despite the one year's extension for preparing the new CAP regulations, the aim is to finalise the programme by autumn 2013 to have enough time to prepare its implementation. The programme has been circulated for comment in the spring of 2013. The main topics discussed during the process have been the same as before: limits for nitrogen and phosphorus fertilisation, percentages for the usability of animal manure, use of start-up phosphorus in fertile soil, and targeting the measures to the most environmentally sensitive areas.

5.6. Main topics and future perspectives

Competitive tendering in environmental protection

Competitive tendering procedures that are voluntary for farmers have been suggested as an alternative to the present agri-environment scheme or to supplement it. As a rule, the procedure is such that the society declares the types of environmental benefits it wishes to promote and invites the farmers to submit tenders on measures concerning these. In their tenders, the farmers express how high a compensation they will claim for the measures to be taken. The society ranks the tenders on the basis of environmental benefits to be gained and costs involved and selects sites to be included in the programme until the funds budgeted for the protection are used. This ensures cost-efficient allocation of the available funds. A study coordinated by MTT Agrifood Research Finland on the application potential of competitive tendering for targeting environmen-

tal protection measures in agriculture was completed in 2011. The project included the piloting of competitive tendering concerning the spreading of gypsum on arable lands to reduce phosphorus leaching. The study showed that competitive tendering could be incorporated into the common agri-environmental policy of the EU.

Strategy on Invasive Alien Species

Finland's National Strategy on Invasive Alien Species was completed in April 2012. Alien species are organisms which have spread in our country unintentionally through human action e.g. by rail, wooden packaging materials or ballast water of ships. Some of the species have been intentionally introduced by people to their gardens, as game species or for fish farming purposes. Of the alien species which have come to Finland (a little under a thousand) the majority pose no threat to indigenous species, but some are known to cause serious ecological and economic damage. In their new habitats, such invasive alien species may compromise the survival of indigenous species, spread diseases and alter the habitat structures. In total, there are 157 invasive alien species in Finland, and a significant percentage of these, more than 100 species, are agricultural and forestry species. Besides the dangerous plant pests, the so-called quarantine species, the Japanese rose, crayfish plague, giant hogweed, Spanish slug and American mink have been declared particularly harmful alien species in Finland. The objective of the National Strategy is to mitigate the threat and harm caused by invasive alien species present in Finland or which may enter the country. The most effective way of preventing invasive alien species is to take action as early as possible because it is extremely difficult to eradicate alien species which have established permanent and propagating populations.

Fourth assessment of threatened species in Finland

According to the assessment of threatened species in Finland conducted in 2010, the total number of species in our country is about 45,000, of which about a half are known well enough to assess how threatened they are. About one out of ten species is considered threatened. The majority of the threatened species live in forests as well as semi-natural and other habitats altered by human activity. Of the species which have become extinct the share of species that used to live in semi-natural and other habitats influenced by man is greater that that of forest species.

Manure, biogas and separation

Because of stricter environmental regulations, manure has become the most restrictive factor for the growth in the unit size of many farms. A research programme on manure financed by the Ministry of Agriculture and Forestry and completed at MTT Agrifood Research Finland in 2010 searched for solutions to problems caused by manure. Fractioning manure by means of a separator into solid phosphorus fractions and liquid nitrogen fractions would allow fertilisation which is closer to the real nutrition needs of the plants. However, efficient separators are costly and investments in them are not profitable without large volumes of manure to be processed. Biogas production would also require a scale larger than individual farms and other support through, for example, feed-in tariffs. Another problem is that animal manure has been defined as waste in the EU legislation, which means that smoke gases from the incineration process must be analysed and any impurities must be removed. This is why burning manure in farm-scale incineration plants is not an economically feasible option.

Preventing eutrophication in the Baltic Sea – is it worth the effort?

Lassi Ahlvik

The Baltic Sea is of great value for the people living in the coastal states. The sea offers various kinds of amenities and services to the people. All of us living in the catchment area use the Baltic Sea as a free dumping area, while for many of us the sea is also a source of livelihood, recreation and wellbeing. The varying uses of the sea may conflict with each other. Eutrophication caused by the growing nitrogen and phosphorus loading is a threat not only to the unique and valuable marine ecosystem but also to the wellbeing of the people who benefit from the services offered by the sea.

Eutrophication crosses national borders in the Baltic Sea region. Emissions to the sea come from a total of 14 different countries, which poses an additional challenge to water protection. Finland has been active in promoting the protection of the Baltic Sea in various international contexts. One of the main stepping stones in this work is the Baltic Sea Action Plan of the Baltic Marine Environment Protection Commission adopted by nine coastal states in 2007. The focus in the Action Plan is on ecological aspects. The reduction targets for nitrogen and phosphorus loading should restore the good ecological status of each marine basin by 2021. In the Marine Strategy Framework Directive the European Union has set the same target for its territorial waters by 2020.

Towards profitable and efficient marine protection

Besides the ecological considerations, the impacts of marine protection should also be viewed from the socioeconomic perspective. The socioeconomic impacts of the protection of the Baltic Sea were studied in the project "Protection of the Baltic Sea, costs, benefits and policy instruments", coordinated by the Agrifood Research Finland MTT. The main tool employed in the project was cost-benefit analysis for studying the economic profitability of marine protection. The costs of water protection were estimated on the basis of measures taken in agriculture and improvement in wastewater treatment. In the study the measures were designed on the grounds of cost-efficiency, meaning that the desired loading target was reached at the lowest possible cost. For assessing the benefits of protection to the society efforts were made to also take account of the services offered by the Baltic Sea whose price is not determined in the market. For this purpose a comprehensive valuation study was conducted in all coastal states of the Baltic Sea region.

The results show that, besides the ecological grounds, the implementation of the Baltic Sea Action Plan is also economically profitable as the benefits gained exceed the costs of the measures. The annual benefits from reducing eutrophication experienced by the people living in the coastal states totalled € 3.8 billion, while the costs of implementing the Action Plan were estimated at € 1.5–2.8 billion, depending on how the measures were distributed between the countries. The benefit gained by the Finns from improving the status of the marine environment totalled € 200 million a year. This means that there is no cause to lower the level of protection in the Action Plan, but for economic reasons it is also not sensible to increase the protection beyond the level set by the Action Plan. It is important to note that the recommendations for Baltic Sea

protection given by two different approaches, an ecological one where the focus is on a functioning marine ecosystem and a socioeconomic one which targets the wellbeing of the people, are very well in line with each other.

Instead, the structure of the Action Plan should be revised because, according to the results, the current emission limits for specific land ad sea areas are not cost-efficient. The total costs of implementing the plan could even be halved without significantly increasing the cost burden of any individual country. In a cost-efficient solution the most important measure for reducing the phosphorus load is to improve the standard of wastewater purification in Poland, Russia and the Baltic States and decrease phosphorus fertilisation especially in countries where this has historically been on a high level. For reducing the nitrogen load decrease in nitrogen fertilisation is the most important measure in the whole Baltic Sea region. Cost-efficiency is a beneficial target also from the ecological perspective as it means that the funds allocated for the protection are used in a way that yields the greatest possible improvement in the status of the sea.

Protection requires international cooperation

Even if the implementation of the Action Plan is economically profitable for the Baltic Sea region as a whole, the benefits and costs are very unevenly distributed among the different economic sectors, catchment areas and coastal states. The benefits and costs per country are presented in the table below. For the Baltic States, Poland and Denmark the implementation of the Action Plan does not appear as economically profitable. Close cooperation among the Baltic States is needed for effective implementation of the programme to achieve true and concrete improvements in the status of the Baltic Sea. Mechanisms are already in use in international water policy by which the cost burden can be more evenly divided between the countries. Such mechanisms include, for example, the structural and cohesion funds of the European Union for supporting wastewater purification in the Baltic States and Poland. Another way to proceed is through collaboration projects between countries, such as the south-western purification plant in St Petersburg completed in 2005 by means of part-funding from Finland, Sweden and the EU. Such practices need to be continued, while searching for new ways of promoting a fair and equal distribution of the costs of water protection.

Economic research of the protection of the Baltic Sea involves a great deal of uncertainty, but the core message is clear. The studies give solid economic reasons why the protection of the Baltic Sea should be continued in accordance with the objectives set in the Baltic Sea Action Plan. Failing to reach these objectives would cause significant socioeconomic losses. A functioning marine ecosystem offering wellbeing also for the future generations can only be secured by cutting down nutrient loading to a sustainable level.

Costs and benefits of implementing the Baltic Sea Action Plan by countries when the design of the measures is cost-efficient.

Country	Benefits million €/year	Costs million €/year	Net benefits million €/year
Sweden	838	211	627
Finland	201	52	149
Russia	473	106	367
Estonia	17	36	–19
Latvia	7	55	–48
Lithuania	16	83	–67
Poland	211	580	–369
Germany	1,870	99	1,771
Denmark	205	267	–62
Total	3,838	1,489	2,587

6. SOCIOECONOMIC DEVELOPMENT OF THE FINNISH COUNTRYSIDE

Finnish countryside has gone through various changes in the past few decades. Changes in the regional distribution of labour have led to increased differentiation both between the Finnish regions and within the rural areas. The role of other rural industries as employers has become increasingly important because of the constant decrease in the number of farms and jobs in primary production as a result of the structural change in agriculture. The strongest phase of this change was over by the end of the 1970s. The regional concentration of agriculture has continued since Finland joined the EU in 1995. This is a common trend throughout the developed world.

When compared to the rest of Europe, the main distinguishing feature for Finland is the very sparse population, with quite a narrow belt of urban settlement in the south. In the urban-rural typologies of EuroStat or the OECD, only the capital region belongs to the category of the most urban areas. Besides the very low population density, Finland is characterised by the large share of rural areas and long distances between the relatively small towns and cities. What is exceptional compared to other countries with a low average population density is that settlement extends to all parts of the country and even the remote rural areas are to be considered viable.

Three types of rural areas

Based on the OECD rural typology, 400 of the total of 432 Finnish municipalities were classified as rural in 2002, on the grounds that the population density is less than 150 inhabitants per square kilometre. In Europe Finland ranks among the top five countries as regards the share of the rural areas in the total surface area, total population and GDP.

A division of the rural areas into three types has been developed for analysing the differences and special features characteristic to the extensive rural area in Finland. This is the typology commonly applied in the Finnish rural policy. The typology is based on a multi-stage method which includes variables indicating the degree of rurality of the municipality, distribution of employment between areas, characteristics of the regional structure, structure of economic activities, farming and the nature of the development challenges. The three types of rural areas can be characterised as follows:

Urban-adjacent rural areas have the best development prospects. The inhabitants have access to employment in the nearby towns and cities and farmers and other entrepreneurs to diverse local markets. Most of these areas are in southern and western Finland, where the conditions for agriculture and diversification of the structure of economic activities in the countryside are the most favourable. Many municipalities in these areas have net immigration. This type is favoured especially by families with children. Thanks to the net immigration many municipalities in urban-adjacent rural areas, including small towns, are able to diversify their services and make investments, while still maintaining their economic viability. This is where the well-being is on the highest level.

Rural heartland areas are strong primary production areas. In certain areas there are also industrial centres or specialised primary production clusters, such as pig and poultry husbandry, fur farming and greenhouses. Often there are several medium-sized population centres close to rural heartland areas. Municipal centres

offer a variety of functions and services and most of the villages are viable. The majority of rural heartland municipalities are in southern and western Finland.

Sparsely populated rural areas are the most challenging ones in terms of regional development. For socioeconomic development there is often a risk of entering a vicious circle where the young are moving away, services are disappearing, agriculture is on the decline, there are not enough new jobs to substitute for the loss of traditional ones, the population is ageing and the economic bearing capacity of municipalities gets weaker. The short growing period and other constraints due to the natural conditions reduce the opportunities to develop primary production. Most of the municipalities in sparsely populated rural areas are in eastern and northern Finland.

Division of areas based on municipalities

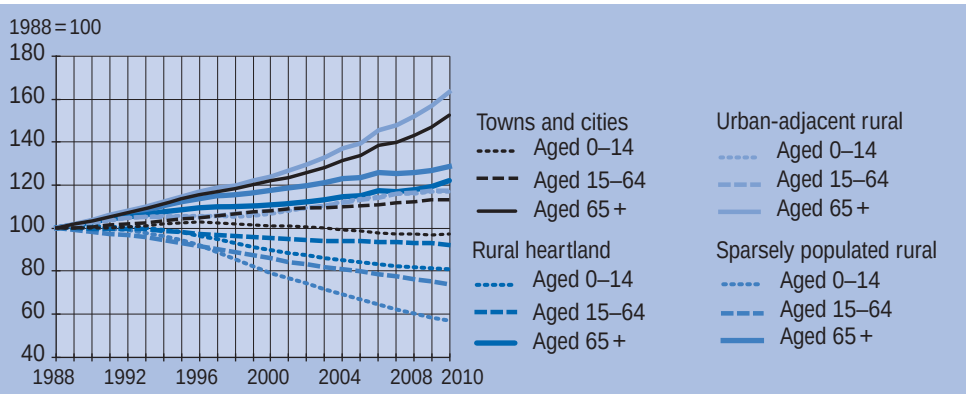
In the typology of areas in 2006 the 432 Finnish municipalities were distributed as follows: 58 urban municipalities, 89 urban-adjacent municipalities, 142 rural heartland municipalities and 143 municipalities representing sparsely populated areas. More than 1.3 million Finns live in the rural heartland municipalities and sparsely populated rural municipalities. Based on this classification a total of 374 municipalities were defined as rural in 2005 and these represented 42% of the total population and 94% of the surface area of Finland.

Since the typology of 2006 the changes in the structure of municipalities have continued. According to the most recent typology of 2010, the number of municipalities was 342 and in the beginning of 2013 it had fallen to 320. In the case of municipal mergers the typology is usually updated so that the type of rural area of the new municipality is the one where the municipality with the largest population among the old municipalities involved in the merger belonged. An individual municipality may belong to only one category in the typology, which means that the mergers weaken the regional accuracy of the typology. Mergers of municipalities, sometimes even to area comprising the earlier regions, have compromised the efficacy of the regional distribution based on municipalities in describing true regional variation.

Population

Special characteristics of Finland include a low population density, high share of rural areas and long distances between towns and cities. What is exceptional compared to other countries with a low average population density is that settlement extends almost to all parts of the country. Despite the concentration of permanent settlement, the populated area has expanded over the past 30 years. When the inhabited squares of square kilometres also take account of holiday homes, the number of squares representing inhabited areas has increased by more than 10% since 1980. Over the past 30 years the total number of squares with permanent settlement has in fact decreased by only a few percentage units despite the decrease in the number of inhabitants in areas that are losing population.

In recent decades people have moved to population centres and southern Finland, as well as to regional centres or areas adjacent to these. Within the municipalities people move first from sparsely populated areas to villages and then to village centres. Population centres with more than 100,000 inhabitants have grown the most, with centres where the population is 1,000–100,000 inhabitants ranking second. The population of centres with less than 1,000 inhabitants has also been growing fast, indicating the concentration of people within the municipalities to the municipal centres. The loss of population has been the strongest in sparsely populated areas.



Distribution of the population by age categories in different types of municipalities in 1988–2010 (Source of raw data: Rural indicators of the Statistics Finland).

The age structure of regions is a key factor in terms of regional development. Services and infrastructure as well as promoting economic activities require different kinds of solutions in different types of areas to secure the provision of welfare services, which belong to the basic rights of all citizens. *In general the regional population trend is one where the towns are growing and their population is getting older, while the sparsely populated rural areas are losing population and the remaining population is getting older.* What is noteworthy is that in urban-adjacent rural areas the number of both children and working-age people is growing. In this respect the situation of urban-adjacent rural areas differs clearly from that of the rural heartland areas and sparsely populated rural areas. The number of under 15-year-olds has been growing only in the urban-adjacent rural areas. Partly this is due to the expansion of the functional area of towns and cities beyond their administrative borders. In studies on the development of towns and cities it has often been observed that families move within the functional urban area as the children get older. People wish to raise their children outside the urban centres, which makes the urban-adjacent rural areas an attractive alternative. In sparsely populated rural areas population is decreasing in all age categories except for the over 65-year-olds.

After 2020 the share of over 75-year-olds is going to increase rapidly in all types of municipalities. In the capital region the share of the working-age population decreases a little less than in the other areas, mainly due to immigration, but the share of over 75-year-olds will be growing even more rapidly than in the rural areas. The ageing large generations cause a peak for a couple of decades, but this will even out as the smaller generations reach retirement age. The ageing population will be both better off and in better shape than before, as well as possessing significant experience, knowledge and skills. The impact of the ageing large generations depends a great deal on the development of the working life, residential environment and services and how well these are capable of responding to the consequences of population ageing.

Settlement and land use

The rural barometer of 2011 showed that most Finns are against denser or more integrated settlement. Rural areas are expected to gain in importance in the future, both for business and economic activities and as environments for permanent or holiday settlement. For both of these, a functioning infrastructure is needed. The Finns live

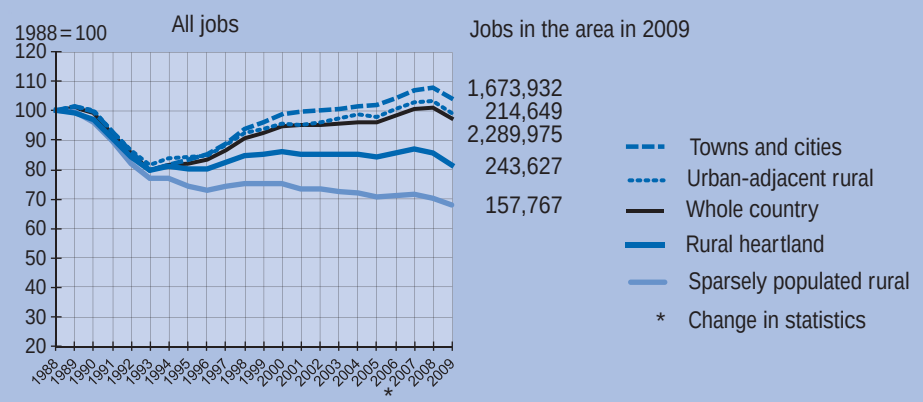
in the countryside more than before, on either permanent or part-time basis, and many people live in more than one place. The spacious settlement characteristic to our country is experienced as an important source of well-being. Space is not a scarce resource in Finland unless specific measures are taken to restrict its utilisation by land use or building legislation.

The strategic and guidelines for land use in the countryside must be such that they allow to maintain the renewal capacity of settlements and livelihoods and full utilisation of the potential there is, with due account for environmental and nature protection perspectives and respect for the special regional and cultural characteristics of the rural areas. In sparsely populated rural areas, in particular, specific solutions are needed when changing the infrastructure and organisation of services. In land use matters the special characteristics of sparsely populated rural areas need to be viewed separately with respect to, for example, services, settlement, business activities, functioning democracy and citizens' participation.

Jobs, labour force and their regional distribution

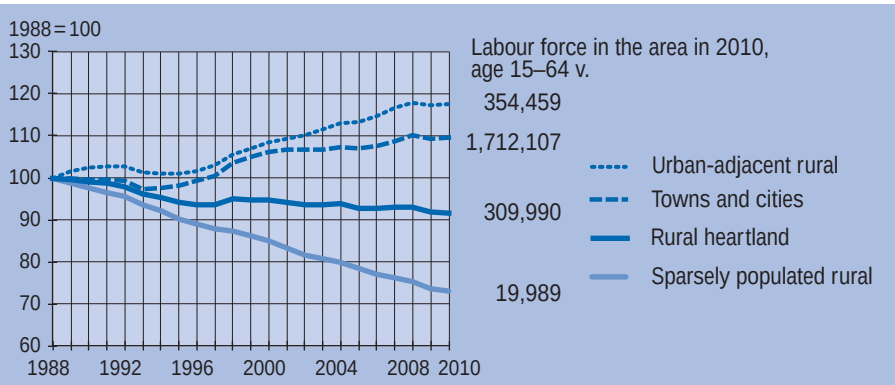
The number of jobs has grown the most in urban and urban-adjacent rural municipalities. The development of these two types of municipalities has differed from that in the rural heartland municipalities and especially in the sparsely populated rural areas. The economic depression of the early 1990s caused the number of jobs to fall in the whole country. From the late 1980s until the beginning of the 1990s the trend in the number of jobs had been quite similar in different types of municipalities, but since then the areas have become strongly polarised. In the present recession the situation seems again to be quite similar in different types of municipalities.

Proportionally the labour force has grown the most in urban-adjacent rural areas and in towns and cities, while in rural heartland areas and sparsely populated rural areas the labour force has decreased, with the greatest fall in the latter. In sparsely populated rural areas the labour force is small also in absolute terms. Since 2000 there has been more labour force in



Development of the number of all jobs by types of municipalities in 1988–2009, index for 1988 is 100, division of municipalities of 2010(Source of raw data: Rural indicators of the Statistics Finland).**

*** Here and in other figures showing the number of jobs the numbers before 2007 are based on TOL2002 classification and those after 2007 on TOL2008.*



Development of labour force in different types of rural areas in the whole country in 1988–2010, index for 1988 is 100, division of municipalities of 2010 (Source of raw data: Rural indicators of the Statistics Finland).

urban-adjacent rural areas than in rural heartland areas.

Measured by self-sufficiency in jobs the urban municipalities are clearly more self-sufficient than the other types of municipalities. Urban-adjacent rural areas are less self-sufficient in terms of jobs than the other types of areas and their self-sufficiency has also been decreasing. Measured by several indicators, however, well-being is the highest in the urban-adjacent rural areas. Working outside the home municipality creates a residential countryside where there is a distance between living and work in terms of both time and space. The income level per resident and thus also the municipal taxes paid may be quite high in the same area; people work elsewhere but taxes are paid to the home municipality. The regional GDP per resident may be quite low, in which case the consumption of rural enterprises and households is at least partly targeted to areas other than the home municipality.

Economic activities and production

Structural change in agriculture has been very strong in Finland. The productivity of the sector has grown and the number of farms has decreased. As a result, jobs in primary production now represent only a marginal share of all jobs also in the countryside and the role of other sectors, especially the service sector, has grown. The proportional significance of agriculture may still have grown in certain areas if the other sectors have also been declining.

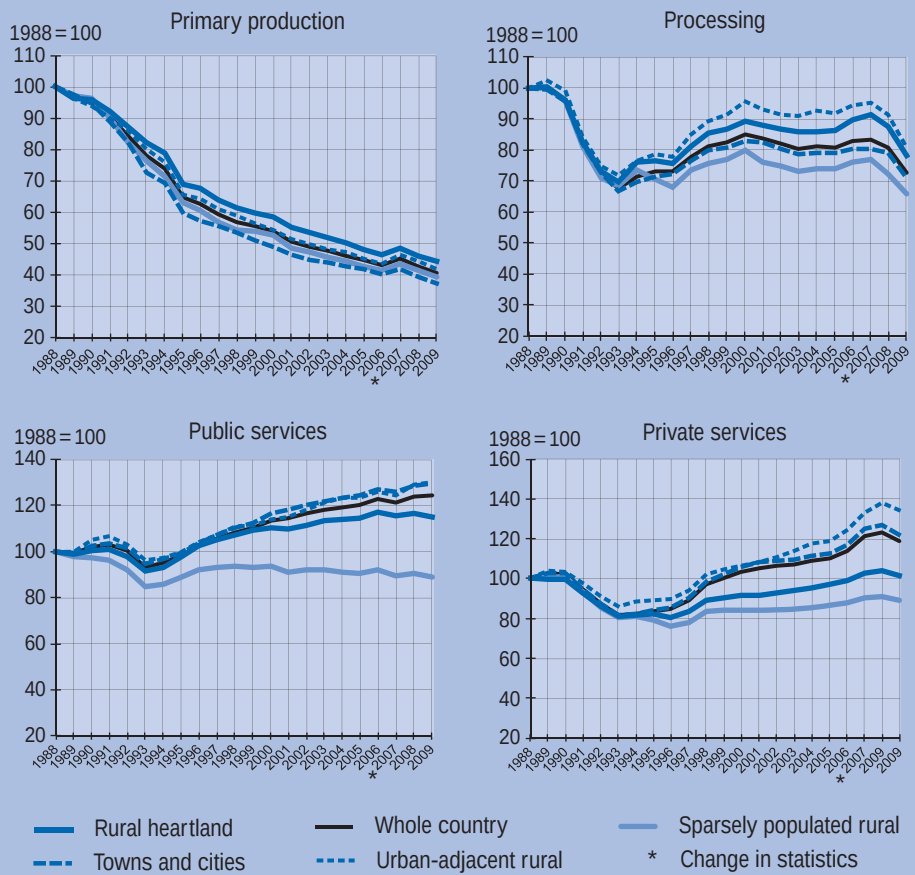
Development of economic sectors

The main message is that the number of jobs in primary production has decreased in the same way in all types of rural areas. Instead, the trend in the number of jobs in the processing and especially the private service sector has been more favourable in urban-adjacent rural areas than in the rural heartland areas and sparsely populated rural areas.

The recent history of Finland has seen dramatic changes in the development of agriculture and farm numbers. When the settlement operations after the Second World War had been concluded, there were a total of over 300,000 farms in Finland. The number of farms started to fall quite rapidly, and when Finland joined the EU in 1995 there were only about 100,000 active farms left. During the EU period the decrease has continued so that in 2010 there were about 61,000 farms to which agricultural support was paid. Still, there have been considerable differences in the structural development between different regions of Finland.

In the past decades the structural change of agriculture has been the strongest in eastern and northern Finland, where dairy husbandry has been a more dominant sector than in the other parts of the country. Agriculture is concentrating to fewer and fewer areas, especially to cereal cultivation areas in southern and western Finland, the same areas where the population and other economic activities are also moving. The number of farms has decreased the most in sparsely populated rural areas in eastern and northern Finland, where the natural conditions for primary production are weaker than in the rural heartland and urban-adjacent rural areas.

According to the rural indicators database of the Statistics Finland, in 2009 the share of jobs in primary production of all jobs in the country was about 3.9%, while based on the typology of 2010 the total of about 84,300 jobs in primary production represented about 10.7% of all the jobs in the rural areas. In 1988 the respective shares were 8.8% and 21.2%, and the number of jobs in primary production was almost 207, 000.The role of agriculture as an employer varies considerably between the types of rural areas: proportionally agriculture in urban-adjacent rural areas employs much less people than that in the other types of rural areas. The role of agriculture as an employer and jobs in primary production continue to fall, and in relative



Development of the number of jobs by types of municipalities in 1988–2009, index for 1988 is 100, division of municipalities of 2010 (Source of raw data: Rural indicators of the Statistics Finland).

terms the trends do not differ very much between the types of rural areas. The difference in value added is much greater than that in the number of jobs.

The share of jobs in primary production is still much greater than its share in total production. In 2010 agriculture and horticulture represented about 2% of the total value added of all economic sectors in Finland. This share has been falling rapidly as productivity has been growing more rapidly in other sectors than in primary production. It should also be born in mind that a major share of the total incomes of farm households comes from sources other than agriculture, and the significance of these other income sources has been growing steadily. In 2008 income from farming activities represented about 41% of the total income of farms. The share of agricultural income in the total income is the greatest in sparsely populated rural areas and smallest in urban-adjacent rural areas.

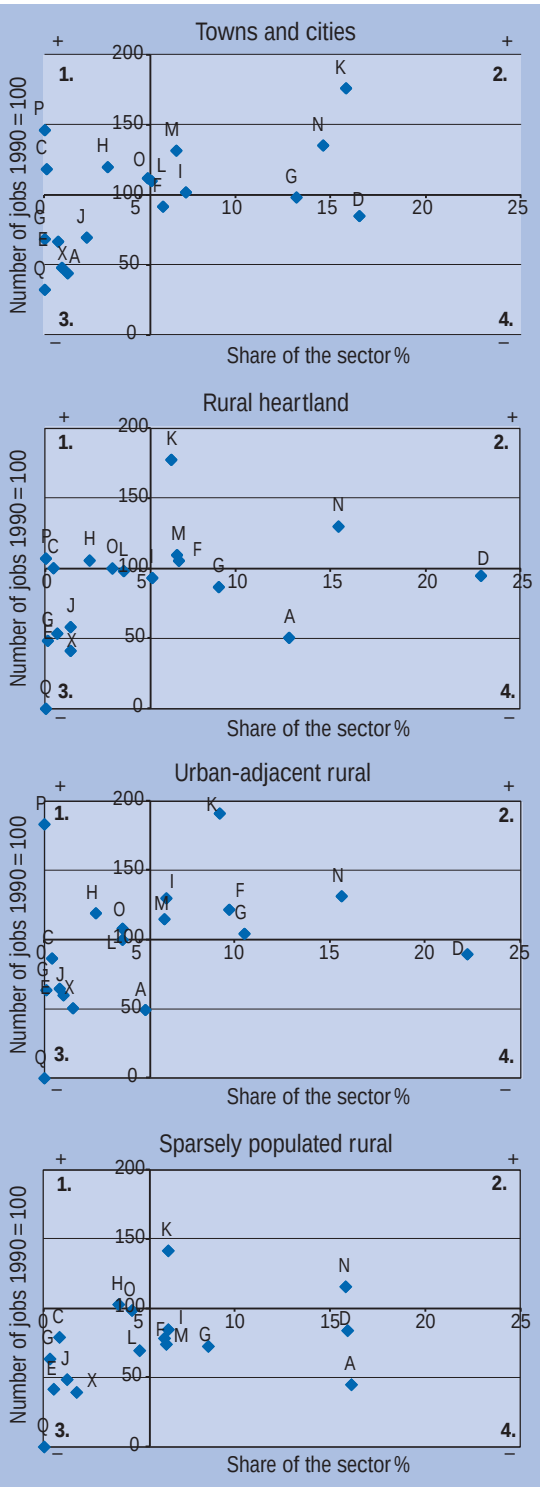
Proportionally the number of jobs in processing has increased the most in urban-adjacent rural areas and second most in rural heartland areas. Sparsely populated rural areas have been lagging behind in this development. Measured by the value added, processing is an important sector especially in towns and cities. Of the types of rural areas the value added created by processing is the greatest in rural heartland areas and the lowest in sparsely populated rural areas. In recent years the proportional trend in value added has been quite similar in the rural heartland and sparsely populated rural areas, except that the volumes are smaller in the latter. Food industry employs about 38,000 persons in Finland, and its share in the employed labour force (1.5%) is close to its share in the GDP. Almost a quarter of the jobs in food industry are in Uusimaa, but there its proportional share of the jobs is still very low. Southwest Finland, Pirkanmaa and South Ostrobothnia each employ about 10% of the people working in food industry. Proportionally the share of food industry in the employed labour force is the greatest in South Ostrobothnia, 3.6%. In Häme and Central Ostrobothnia about 2.5% of the labour force is employed in food industry.

The number of jobs in public services has increased more than the average in towns and cities and urban-adjacent rural areas. In sparsely populated rural areas the development has been very different than in the other types of areas, which in terms of the value added of the sector is also lagging behind the other areas. The public service sector is developing especially in towns and cities and urban-adjacent rural areas. Jobs in private services have increased in urban-adjacent rural areas and towns and cities, but especially the sparsely populated rural areas are far from the level before the economic depression of the early 1990s. The same applies to the development of the value added in the sector. Among the rural areas the development for both private and public services has been the most positive in the urban-adjacent rural areas. Sparsely populated rural areas have been losing jobs in public and private services, which in the other types of areas have been growing. In this respect the development has also been weak in rural heartland areas and the most favourable in urban-adjacent rural areas.

Even if the role of the service sector has become increasingly important in all types of rural areas, the differences in the structure of economic activities are obvious. In urban-adjacent rural areas the share of primary production of the jobs is the smallest and those of jobs in processing and services the greatest among the types of rural areas, while in the rural heartland and sparsely populated rural areas the role of primary production as an employer is still much more important.

Development of economic sectors in the regional context

According to the regional distribution of labour, there are more jobs in primary pro-



A Agriculture, game husbandry, forestry

B Fishery

C Mining and quarrying

D Manufacturing industry

E Electricity, gas and water supply

F Building

G Wholesale and retail trade

H Accommodation and catering

I Transport, storage and telecommunications

J Banking and financing

K Real estate, leasing, research and business services

L Public administration, defence

M Education

N Healthcare and social services

O Other personal and social services

P Employer households

Q International and foreign organisations

X Sector unknown

Share of jobs by sectors in 2007 and development since 1990 by types of municipalities.

duction in the rural areas, while towns and cities have more jobs in the trade, manufacturing and services sectors. The variety is greater in the rural areas, with most jobs especially in the rural heartland areas.

The significance of individual sectors can be examined in further detail by analysing the combined impact of the trend in the number of jobs and role of sectors in a fourfold table. The first quarter includes the growing sectors with quite small employment effect. In the second the role of the sector in the type of rural area is above the average and the sector is growing. Sectors in the third quarter have cut down their labour force and their employment effect is below the average. The fourth quarter consists of sectors with a high employment effect which have cut down their labour force.

In sparsely populated rural areas two sectors belong to the more favourable quarter: activities serving real estates, which also comprise leasing, research and business services, and healthcare and social services. The first of these is the fifth and the second the third largest employer in this type of rural area. The largest employer is still agriculture, but today it employs fewer people than before. The second largest employer is processing, which has also been losing jobs over the recent years. In sparsely populated rural areas there is one cluster of operations, accommodation and catering services and other social services, where there have been no major changes. Another cluster is comprised of sectors with small employment effect where the number of jobs has decreased. The most significant one of these is public administration.

In rural heartland areas there are more sectors in the most favourable quarter than in the sparsely populated areas. Besides the sectors which also succeed in sparsely populated areas this includes education and building, both also with quite a strong employment effect. The largest sector in rural heartland areas is manufacturing industry, where the number of jobs has decreased quite little. In absolute terms agriculture and game and forest management, i.e. primary production, are more significant in rural heartland areas than in sparsely populated rural areas, but proportionally their role is smaller. As an employer primary production has decreased less than in sparsely populated rural areas. The declining sectors are the same as in sparsely populated areas: financial and banking activities; electricity, gas and water supply and services and other public services. A decrease in a sector defined as unknown is mainly indicative of improved statistics.

In urban-adjacent rural areas there are five main success sectors: the number of jobs has increased the most in real estate, leasing, research and business service activities. Other successful sectors are education, transportation, building and healthcare and social services. The quantitative development of public services has been similar to that in rural heartland areas. The trend in jobs in primary production has been about the same as in other types of rural areas, but proportionally they are much less significant in urban-adjacent areas. In accommodation and catering services, which as such is quite a small sector, the trend has been positive.

In urban areas the most favourable quarter includes about the same sectors as in urban-adjacent rural areas. The main difference is the weaker trend in building in the urban areas.

Development prospects of regional economies and livelihoods

The economic activities of Finland are linked to the global economy and world trade, which means that exports are highly significant for the economy of our country. The Finnish economy can be characterised as open. The current location of economic activities and jobs is a result of the regional distribution of labour, where the development has been steered by the natural

conditions, raw material sources, transport networks and urbanisation. The circumstances during each individual period have determined which type of production is profitable and where. The structures are changing constantly, but new activities germ from older ones and in conditions created by these.

The structure of economic activities varies by types of rural areas, but differences are also due to the geographical location of each municipality within Finland. The diversity of activities is the lowest in sparsely populated rural areas and greatest in towns and cities. Where there is little diversity any changes in outside factors have great impact on the activities. If in addition to low diversity in the structure of operations the age structure is unfavourable and education level is low, the preconditions for renewal are quite poor. A diversified structure of activities and favourable age structure create stability and promote change and renewal of the activities.

The change in the structure of economic activities has been quite similar in different types of rural areas. The number of jobs in primary production has decreased and in many areas other economic activities have not substituted for the losses. Especially in sparsely populated rural areas the decrease in the population has led to a reduction in the demand potential, which is in turn reflected in the supply of commercial services. Population ageing changes the demand for services, but this does not necessarily create the kind of demand that would be commercially viable.

As regards the trend in the number of jobs, much more jobs have been created in the growing public and private service sector in towns and cities, urban-adjacent rural areas and in the country on average than in rural heartland and especially in sparsely populated rural areas. In sparsely populated rural areas public services have also been decreasing. This long-term trend is very likely to continue at least in the near future, obviously posing challenges for rural heartland areas and sparsely populated rural areas, in particular, where not enough jobs have been created in other sectors to substitute for those lost especially in primary production.

Using the concepts of the so-called staple theory we can talk about resource communities where the activities are based on the utilisation of the local resources. In Finland classic examples of these are areas with strong mining and forestry industries. Losing the diversity of the economic activities exposes the regional economies to fluctuations in the economic cycle and changes on the world market. If the ownership of the production is outside the area or even abroad, there is a risk of falling into the staple trap, meaning that the area is at the mercy of one single economic resource. An extreme example of this would be a town created in the desert by the gold rush that would become abandoned as the gold and influx of people created by this becomes depleted if no other basic sector of activities has evolved. Factors that may now trigger this kind of development include weakening competitiveness and decline in exports. We can also talk about a daughter company economy where the decision-making on the conditions and development of production are outside the region or abroad. If the production has been launched by means of technology brought from outside the area so that no independent development of the production, raising the value added or design of new products has taken place in the area, the risk of falling into a staple trap is imminent.

In the long run the development of sparsely populated rural areas depends on the demand for the resources available there and how these can be utilised. It seems that in developing the structures diversity and increased diversification will be the key factors in creating regional economies that endure the ravages of time.

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	Producer price index of agriculture[2]	The index of purchase prices of means agricultural production			
		Total index	Goods and services	Investments	Buildings
2012	138.0[e]	151.5	153.4	144.6	145.0
2011	129.2	146.0	147.2	141.5	141.5
2010	113.7	130.1	128.1	136.2	134.6
2009	107.2	126.9	124.1	135.2	131.5
2008	119.9	139.5	141.8	134.3	136.6
2007	109.3	122.1	119.1	129.0	132.1
2006	103.2	116.1	113.7	121.6	120.5
2005	98.9	110.8	108.2	116.8	114.0
2004	101.5	107.1	105.1	111.8	109.5
2003	99.0	104.2	102.5	108.1	106.3
2002	103.7	102.8	101.5	105.5	104.6
2001	105.2	102.2	101.8	103.1	102.4
2000	100.0	100.0	100.0	100.0	100.0

[1] Indices are based on EU classifications.
[2] Incl. fur production.
Source: Statistics Finland.

Structural change in agiculture.

	Number[1] of farms 1,000	Average[1] size of farms, hectares	Number of milk suppliers 1,000	Employed in agriculture[2]	
				1,000 persons	% of employed
2012	59	38.9	10	78	3.1
2011	62	37.4	10	80	3.2
2010	63	36.7	11	84	3.4
2009	64	35.9	11	88	3.6
2008	66	35.0	12	88	3.5
2007	67	34.4	13	87	3.5
2006	69	33.3	15	90	3.7
2005	70	33.0	16	91	3.8
2004	72	31.5	17	93	3.9
2003	74	30.6	18	99	4.2
2002	75	30.0	19	106	4.5
2001	77	29.1	21	112	4.7
2000	80	28.0	22	118	5.1
1999	..	..	24	121	5.3
1998	88	25.0	26	120	5.4
1997	90	24.0	28	130	6.0
1996	94	22.9	30	133	6.3
1995	100	21.7	32	141	6.7

[1] A farm refers to a unit with more than 1 ha of arable land that practises agriculture or other entrepreneurial activity.
[2] From 2005 based on new industrial classification TOL 2008.
Sources: Information Centre of the Ministry of Agriculture and Forestry, Statistics Finland.

Number of animals in June and the average yield per cow.

	Dairy cows 1,000	Yield per cow litres	Pigs 1,000	Hens 1,000
2012	284	7,876	1,290	3,172
2011	286	7,859	1,335	3,304
2010	289	7,896	1,367	3,394
2009	290	7,850	1,381	2,926
2008	289	7,767	1,483	3,190
2007	296	7,796	1,448	3,134
2006	309	7,646	1,436	3,103
2005	319	7,505	1,401	3,128
2004	324	7,404	1,365	3,069
2003	334	7,251	1,375	3,016
2002	348	7,117	1,315	3,212
2001	355	6,932	1,261	3,202
2000	364	6,786	1,296	3,110
1999	372	6,443	1,351	3,361
1998	383	6,225	1,401	3,802
1997	391	6,183	1,467	4,152
1996	392	5,993	1,395	4,184
1995	399	5,982	1,400	4,179

Source: Information Centre of the Ministry of Agriculture and Forestry.

Sales of fertilizers, kg/ha and hectarage yield, f.u./ha.

	Nitrogen kg/ha	Phosphorus kg/ha	Potassium kg/ha	F.u.yield (incl. straw) f.u./ha
2011–12	70.4	5.4	15.7	..
2010–11	74.1	5.6	16.2	..
2009–10	80.3	6.5	18.9	..
2008–09	67.1	5.3	16.2	..
2007–08	78.5	7.8	24.3	..
2006–07	73.5	7.9	24.6	..
2005–06	73.9	8.6	25.3	4,673
2004–05	75.0	9.2	25.9	4,826
2003–04	76.5	9.3	26.4	4,630
2002–03	80.0	9.8	27.8	4,478
2001–02	80.5	10.1	28.3	4,692
2000–01	83.2	10.8	31.1	4,531
1999–00	84.2	10.4	30.5	4,900
1998–99	81.0	11.0	31.1	3,146
1997–98	85.0	11.4	32.6	2,980
1996–97	86.0	11.8	32.5	3,816

Source: Information Centre of the Ministry of Agriculture and Forestry.

Results of the total calculation of agriculture in 2005–2012e at current prices, € million.

RETURNS, € million	2005	2006	2007	2008	2009	2010	2011	2012e
Farms represented	69,992	70,086	67,854	66,641	64,723	63,348	62,379	61,512
GROSS RETURN, € million	**4,652**	**4,668**	**5,049**	**5,107**	**4,939**	**5,306**	**5,518**	**5,870**
Return on crop production	**395**	**401**	**749**	**486**	**401**	**607**	**623**	**769**
Rye and wheat	59	81	164	91	60	133	156	205
Barley	96	112	266	161	125	148	144	174
Oats, other cereals	47	72	130	88	54	102	115	120
Oilseed crops	18	32	29	23	42	58	52	46
Grass fodder	32	17	73	45	30	73	60	86
Potato and sugar beet	128	74	78	65	74	66	69	105
Leguminous plants and other	14	14	10	13	16	28	27	32
Return on livestock	**1,612**	**1,599**	**1,657**	**1,868**	**1,787**	**1,787**	**1,916**	**2,011**
Return on cattle husbandry	1,079	1,117	1,154	1,275	1,223	1,188	1,320	1,397
Return on pig husbandry	343	308	300	319	335	311	407	405
Return on poultry	170	144	174	232	155	192	96	103
Return on sheep, goats, horses, etc.	19	30	28	43	73	96	92	106
Return on horticulture	**452**	**461**	**453**	**488**	**478**	**596**	**681**	**781**
Financial return	**13**	**13**	**13**	**16**	**12**	**12**	**13**	**13**
Other return	**220**	**206**	**231**	**254**	**256**	**252**	**245**	**284**
Support payments total	**1,960**	**1,988**	**1,947**	**1,995**	**2,004**	**2,051**	**2,041**	**2,012**
CAP support total	514	549	550	570	568	580	571	568
Natural handicap and environment payments	757	755	783	799	822	828	822	820
National and investment subsidy	741	735	649	690	658	696	684	662

COSTS, € million	2005	2006	2007	2008	2009	2010	2011	2012e
PRODUCTION COST	**6,018**	**5,988**	**6,192**	**6,552**	**6,511**	**6,701**	**6,788**	**6,982**
Supplies costs	**1,588**	**1,598**	**1,632**	**1,824**	**1,817**	**1,818**	**2,062**	**2,167**
Fertilisers, liming	185	191	194	212	306	205	238	259
Other crop production costs	305	283	305	321	322	310	334	360
Fuels	209	241	227	295	245	258	324	342
Electricity	106	133	135	156	158	223	265	270
Purchased fodder cost	434	423	441	524	453	449	518	538
Livestock cost	349	327	330	316	334	373	383	398
Machinery cost	**915**	**929**	**1,006**	**1,111**	**1,097**	**1,078**	**1,068**	**1,080**
Depreciations on machinery	549	564	598	664	646	607	611	611
Other machinery costs	366	366	409	447	451	470	457	468
Building costs	**321**	**340**	**386**	**400**	**377**	**415**	**416**	**425**
Depreciations on buildings	264	281	326	333	316	347	353	360
Other building costs	57	59	60	67	61	68	64	65
Other cost	**754**	**778**	**788**	**832**	**839**	**875**	**899**	**943**
Insurances	262	282	284	287	289	305	316	323
Rents	103	108	111	117	128	127	136	135
Other depreciations	46	46	48	49	49	47	49	49
Other costs	344	342	344	378	374	395	398	436
Labour costs	**1,815**	**1,686**	**1,653**	**1,610**	**1,632**	**1,631**	**1,553**	**1,589**
Wages paid	157	165	174	180	184	199	226	241
Wage claim	1,658	1,521	1,480	1,429	1,448	1,431	1,327	1,348
Interest costs	**624**	**656**	**726**	**776**	**749**	**885**	**790**	**778**
Interest expenses	110	125	159	170	138	115	117	105
Interest claim on own capital	514	531	567	606	611	770	673	673

FINANCIAL RATIOS	2005	2006	2007	2008	2009	2010	2011	2012e
RETURNS, € million	4,652	4,668	5,049	5,107	4,939	5,306	5,518	5,870
PRODUCTION COST, € million	6,018	5,988	6,192	6,552	6,511	6,701	6,788	6,982
Entrepreneurial profit, € million	–1,364	–1,316	–1,138	–1,440	–1,571	–1,390	–1,264	–1,110
Entrepreneurial income, € million	808	737	909	595	488	811	736	911
Profitability ratio	0.37	0.36	0.44	0.29	0.24	0.37	0.37	0.45
Return on assets %	–5.5	–4.7	–2.8	–4.2	–5.1	–3.1	–2.8	–1.9

Agricultural support[1].

SUPPORT FINANCED COMPLETELY OR PARTLY BY THE EU IN 2013, €/ha or €/unit							
Aid area	A	B	C1	C2	C2north	C3	C4
DECOUPLED CAP PAYMENTS, €/ha							
Single payment (regional flat-rate payment), €/ha	246.76	201.00	200.00	166.74	166.74	166.74	166.74
Farm-specific top-ups:							
Farm specific top up for bulls, €/livestock unit	44.10	44.10	44.10	44.10	44.10	44.10	44.10
Farm specific top up for steers, €/livestock unit	31.50	31.50	31.50	31.50	31.50	31.50	31.50
Farm specific top up for starch potato, €/tonne	12.38	12.38	12.38	12.38	12.38	12.38	12.38
Additional payment for milk, €/tonne of the reference quantity	17.14	17.14	17.14	17.14	17.14	17.14	17.14
Farm specific top up for sugar beet, €/tonne	92.82	92.82	92.82	92.82	92.82	92.82	92.82
Farm specific top up for timothy[2]							
PROTEIN AND OILSEED CROPS PREMIUM[3]	60	60	60	60	60	60	60
STARCH POTATO PREMIUM	560	560	560	560	560	560	560
CAP LIVESTOCK PREMIUM, €/animal							
Beef premium, bulls and steers	420	420	240	240	240	240	240
Beef premium, suckler cows and suckler cow heifers	160	160	80	80	80	80	80
Dairy cow premium	155	155	-	-	-	-	-
Ewe premium[4]	14.0	14.0	14.0	14.0	14.0	14.0	14.0
Quality premium for slaughter lambs[5]	30	30	30	30	30	30	30
LFA SUPPORT,€/ha[6]	150	200	200	210	210	210	210
LFA[7] - basic payment	20	20	20	25	25	25	25
- additional payment for livestock farms	80	80	80	80	80	80	80

ANIMAL WELFARE PAYMENT, €/LU	Basic conditions	Additional conditions
Bovines	50.00	17.00–57.00
Pigs	16.00	4.00–23.00

ENVIRONMENTAL SUPPORT, €/ha	Crop producing farm	Livestock farm
Cereal, oilseed crops, protein crops, grasses	93	107
Group 1 horticultural crops (outdoor vegetables etc.)	450	450
Group 2 horticultural crops (berries and fruits)	438	438
Nature management fields (perennial grasses)	170	170
Nature management fields (biodiversity)	300	300
Certain seed spice plants	181	181

Additional agri-environment measures: support areas A, B and C: reduced fertilisation 10 €/ha, more accurate nitrogen fertilisation of arable crops 23 €/ha, manure spreading during growing season 27 €/ha, plant cover in winter and reduced tillage 11 €/ha, nutrient balances 18 €/ha.
Additional measures only for areas A and B: plant cover in winter 30 €/ha, intensified plant cover in winter 45 €/ha, crop diversification 24 €/ha and cultivation of catch plants 13 €/ha.
Additional measures for horticulture (support areas A, B and C): more accurate nitrogen fertilisation of horticultural crops 90 €/ha, use of cover for perennial horticultural crops 256 €/ha and use of pest monitoring methods 144 €/ha.
Contracts concerning special agri-environment measures: support level 56–450 €/unit of payment.

[1] Includes payments for main products, which means that the table does not cover all support payments.
[2] The farm specific top ups for timothy paid in the whole country total 1.15 mill. €. The support is allocated according to a reference quantity which depends on the average support granted in 2007–2009.
[3] The premiums total 6.5 mill. €. The final level of the premium is determined according to the approved total area. Protein crops which entitle to the premium are field pea (food and fodder pea), field bean and sweet lupin. Mixtures containing more than 50% of the protein crop seed in the total amount of seed sown are also eligible. Premium is paid for the following oilseed crops: winter oilseed rape, winter turnip rape, spring oilseed rape, spring turnip rape, sunflower, oil flax, oil hemp and gold of pleasure (Camelina sativa). The premium is subject to the condition that at least 10% of the arable area of the farm is under the eligible crops or mixtures.
[4] Includes the top-up for less favoured areas 3.5 €/ewe. Milk producing animals 8.4 €/animal + top-up 3.5 €/animal.
[5] Premium is granted on the basis of slaughterings notified to the sheep and goat register for lambs with a carcass weight of at least 18 kg.
[6] In LFA scheme livestock farm is a farm with minimum stocking density of 0.4 LU/ha or the farm has at least 10 LU and the minimum stocking density is 0.2 LU/ha for the whole commitment period
[7] Top-ups to LFA payments are cut due to payment ceilings. In 2009 the payments were 98.3% of the maximum per hectare.

	Unit	2008 €/unit	2009 €/unit	2010 €/unit	2011 €/unit	2012 €/unit	2013 €/unit
NATIONAL SUPPORT FOR AGRICULTURE AND HORTICULTURE **NATIONAL AID FOR SOUTHERN FINLAND, NORTHERN AID AND AID FOR CROP PRODUCTION**							
Aid per livestock unit							
Aid for animal husbandry, suckler cows							
A and B	€/LU	73	83	83	83	90	93
C1	€/LU	295	300	300	300	300	300
C2	€/LU	295	300	300	300	300	300
C2north. and archipelago	€/LU	371	376	376	376	376	376
C3	€/LU	446	451	451	451	451	451
C4	€/LU	631	636	636	636	636	636
Aid for animal husbandry, male bovines > 6 months							
A and B	€/LU	187	187	187	187	187	187
C1	€/LU	414	414	414	422	422	422
C2	€/LU	422	422	422	430	430	430
C2north. and archipelago	€/LU	498	498	498	506	506	506
C3	€/LU	574	574	574	582	582	582
C4	€/LU	759	759	759	767	767	767
Aid for animal husbandry, ewes and goats							
A and B	€/LU	184	184	184	184	184	184
C1	€/LU	390	390	390	390	390	390
C2	€/LU	398	398	398	398	398	398
C2north. and archipelago	€/LU	474	474	474	474	474	474
C3P1–P2	€/LU	664	664	664	664	664	664
C3P3–P4	€/LU	745	745	745	745	745	745
C4P4	€/LU	956	956	956	956	956	956
C4P5	€/LU	956	956	956	956	956	956
Aid for animal husbandry, pigs							
A and B	€/LU	174	*)	*)	*)	*)	*)
C1	€/LU	210	**)	**)	**)	**)	**)
C2	€/LU	213	**)	**)	**)	**)	**)
C2north. and archipelago	€/LU	293	**)	**)	**)	**)	**)
C3	€/LU	293	**)	**)	**)	**)	**)
C4	€/LU	293	**)	**)	**)	**)	**)
Aid for animal husbandry, hens							
A and B	€/LU	172	*)	*)	*)	*)	*)
C1	€/LU	204	**)	**)	**)	**)	**)
C2	€/LU	207	**)	**)	**)	**)	**)
C2north. and archipelago	€/LU	293	**)	**)	**)	**)	**)
C3	€/LU	360	**)	**)	**)	**)	**)
C4	€/LU	360	**)	**)	**)	**)	**)
Aid for broilers and fattening poultry hens							
A and B	€/LU	157	*)	*)	*)	*)	*)
C1	€/LU	171	**)	**)	**)	**)	**)
C2	€/LU	177	**)	**)	**)	**)	**)
C2north. and archipelago	€/LU	263	**)	**)	**)	**)	**)
C3	€/LU	263	**)	**)	**)	**)	**)
C4	€/LU	263	**)	**)	**)	**)	**)

**) As from 2009 support paid as decoupled payment according to the farm-specific reference quantity of 2007. From 2009 the amount of support decreases by about 6.5% when aid per hectare for livestock farms is taken into account. In 2012 the payments were cut by 20% and in 2013 37%. The support level is 74 €/LU.*

***) From 2009 support paid as decoupled aid according to farm-specific reference quantity of 2007. In the area covered by northern aid the aid levels per LU in the reference quantity for 2013 were lowered by about two-thirds of the reduction in area AB. The farm-specific differentiation of northern aid is applicable to coupled aid per LU. In 2013 the aid level on small farms is 208 €/LU (under 146 LU) in area C1, 182 €/LU (under 170 LU) in area C2, 242 €/LU (under 200 LU) in area C2 north and 251 €/LU in areas C3 and C4. On large farms the aid is 105 €/LU in area C1, 91 €/LU in area C2 and 77 €/LU in area C2 north and areas C3 and C4.*

	Unit	2008 €/unit	2009 €/unit	2010 €/unit	2011 €/unit	2012 €/unit	2013 €/unit
Northern aid paid for slaughtered animals							
Male bovines C3–C4							
P1–P2	€/animal	131	131	131	131	131	131
P3–P4	€/animal	182	182	182	182	182	182
P5	€/animal	333	333	333	333	333	333
Heifers							
A and B	€/animal	144	114	144	144	144	144
C1	€/animal	269	269	299	299	299	299
C2	€/animal	269	269	299	299	299	299
C2north. and archipelago	€/animal	318	318	348	348	348	348
C3	€/animal	360	360	390	390	390	390
C4	€/animal	446	446	476	476	476	476
Production aid for milk							
A and B	cents/l	3.2	3.1	3.1	3.2	3.1	3.1
C1	cents/l	8.3	8.1	8.0	8.0	8.0	8.0
C2	cents/l	9.1	8.7	8.7	8.7	8.7	8.7
C2north.	cents/l	10.1	10.0	9.7	9.7	9.7	9.7
C3P1	cents/l	13.1	13.0	12.7	12.7	12.7	12.7
C3P2	cents/l	14.8	14.7	14.4	14.4	14.4	14.4
C3P3–P4	cents/l	17.4	17.4	17.0	17.0	17.0	17.0
C4P4	cents/l	22.1	22.2	21.7	21.7	21.7	21.7
C4P5	cents/l	31.3	31.4	30.9	30.9	30.9	30.9
Aid for crop production							
C1 area[1]							
Wheat	€/ha	47	47	47	47	38	38
Rye	€/ha	112	112	150	150	150	150
Malting barley	€/ha	70	70	-	-	-	-
Oil seed plants	€/ha	100	100	120	120	120	120
Starch potatoes	€/ha	133	133	133	133	133	133
Vegetables grown in the open	€/ha	348	348	348	348	348	348
Other arable crops excl. cereals	€/ha	100	100	120	120	120	120
C2 and C2north. areas[1]							
Wheat	€/ha	47	47	47	47	38	38
Rye	€/ha	112	112	150	150	150	150
Malting barley	€/ha	70	70	-	-	-	-
Oil seed plants	€/ha	27	27	47	47	47	47
Starch potatoes	€/ha	133	133	133	133	133	133
Vegetable grown in the open	€/ha	348	348	348	348	348	348
Arable crops excl. cereals	€/ha	27	27	47	47	47	47
C3 and C4 areas							
Vegetable grown in the open	€/ha	348	348	348	348	348	348

[1] *C area Northern aid.*

	Unit	2008 €/unit	2009 €/unit	2010 €/unit	2011 €/unit	2012 €/unit	2013 €/unit
Aid for special crops in southern Finland							
A and B areas							
Starch potatoes	€/ha	105	100	100	100	100	100
Vegetable grown in the open	€/ha	105	100	100	100	100	100
Aid per hectare of livestock farms							
A and B areas	€/ha	33	30	30	36	37	39
National aid for sugar beet	€/ha	350	350	350	350	350	350
General area payment C2–C4							
Cereals and other arable crops							
C2, C2north and archipelago	€/ha	30	30	33	33	33	33
C3	€/ha	46	46	49	49	49	49
C4	€/ha	97	97	100	100	100	100
Other crops							
C2, C2north. and archipelago	€/ha	35	35	33	33	33	33
C3	€/ha	51	51	49	49	49	49
C4	€/ha	102	102	100	100	100	100
General area payment for young farmers C1–C4	€/ha	36	36	36	36	36	36
Aid for greenhouse products A and B							
over 7 months	€/m^2	11.3	11.0	10.9	11.4	11.1	10.3
2–7 months	€/m^2	4.0	4.0	4.4	4.4	4.1	3.8
Aid for greenhouse products C1 and C2							
over 7 months	€/m^2	11.2	11.7	12.3	11.1	11.4	10.6
2–7 months	€/m^2	4.3	4.3	4.7	4.9	4.4	4.1
Aid for greenhouse products C2P							
over 7 months	€/m^2	11.3	13.2	11.7	12.3	11.4	10.6
2–7 months	€/m^2	4.3	4.3	4.7	4.9	4.4	4.1
Aid for greenhouse products C3–C4							
over 7 months	€/m^2	11.3	11.2	11.7	12.3	11.4	10.6
2–7 months	€/m^2	4.3	4.3	4.7	4.9	4.4	4.1
Northern storage aid for horticulture products							
A and B							
Storages with thermo-control system	€/m^3	13.6	14.2	14.2	14.2	14.2	14.2
Storages without thermo-control system	€/m^3	8.4	8.8	8.8	8.8	8.8	8.8
C areas							
Storages with thermo-control system	€/m^3	14.2	14.2	14.2	14.2	14.2	14.2
Storages without thermo-control system	€/m^3	8.8	8.8	8.8	8.8	8.8	8.8

Conversion coefficient of livestock units in national aid

Livestock unit		Livestock unit		Livestock unit	
Suckler cows	1	She-goats	0.48	Farmed mother mallards and pheasants	0.013
Suckler cow heifers, over 2 years	1	Sows, boars	0.7	Horses	
Suckler cow heifers, 8 months–2 years	0.6	Chickens, incl. mother hens	0.013	- breeding mares (horses and ponies)	1
Bulls and steers, over 2 years	1	Broilers	0.0053	- Finnhorses, at least 1 year	0.85
Bulls and steers, 6 months–2 years	0.6	Broiler mothers	0.025	- other horses 1-3 years	0.6
Ewes	0.15	Mother geese, ducks and turkeys	0.026		

Establishment of livestock units for fattening pigs, young breeding sows, young breeding boars, turkeys, geese, ducks and farmed mallards and pheasants

13 slaughtered fattening pigs	1 LU	585 slaughtered ducks	1 LU
13 young sows or boars sold for breeding	1 LU	1,375 slaughtered farmed mallards	1 LU
223 slaughtered turkeys	1 LU	1,375 slaughtered farmed pheasants	1 LU
325 slaughtered geese	1 LU		

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