

# Accession and income

Income Development in Agriculture at the early years of Finnish EU Membership

Martti Kankaanpää

## **Abstract.**

The EU membership meant liberalisation and opening of the agro-food sector for foreign trade in Finland. Those earlier almost closed markets are now open for European competition. Producer prices have fallen considerably. The level of aid to Finnish agriculture, which was already very high in 1994, rose sharply in 1995 by way of compensation for the lower prices upon accession. The decline in the number of agricultural holdings accelerated when Finland joined the EU. The Finnish agriculture has undergone and is going through a structural change. The structural change and the enlargement of the size of agricultural holdings, on the other hand, have been seen as remedies to increase or at least keep the farmers' income intact. The aim of this paper is to throw light on the income development in Finnish agriculture at the farm level in the first years of the Finnish EU membership. The data sources used are agricultural income statistics based on statistical farm registers and detailed and comprehensive tax data obtained from administrative tax databases. The changes of average agricultural income are described both at the statistical population level and in panel, i.e. at the level of those holdings which have prevailed in statistics throughout the whole research period. Moreover, this paper gives information on how the agricultural income of individual farms has changed between 1994 and 1997.

Statistical data sources strongly support the conclusion that a major part, if not the whole, of the positive income development at the farm level is due to the restructuring of Finnish agriculture. Those agricultural holdings which have stopped farming have been almost exclusively low agricultural income earners. New holdings entering the statistics are also low-income earners. Agricultural holdings which have prevailed in the statistics during the whole research period have had only a minor increase in agricultural income. In real terms the incomes per agricultural holding have declined. When resources have moved from those holdings stopping agricultural activity to farms still continuing to produce, some holdings, on the other hand, have managed to increase their agricultural income faster than the average agricultural holding.

## **Introduction**

In the past few decades Finnish agriculture has gone through an exceptionally dramatic structural change. This has been characterised by a decline in the number of farms and labour force, mechanisation and increasing efficiency of production, as well as specialisation both regionally and on individual farms. In 1974 there were 258,000 farms and the number of people employed in agriculture was about 287,000 (13% of the total employed labour force). 20 years later in 1994 there were only less than 115,000 farms and agriculture employed about 150,000 people.

As a result of the EU membership, pressures to increase the international competitiveness of farms and farm size have grown. Estimates on the direction of the structural change are quite consistent: the number of production units will decline, the

average farm size will grow and the labour input required by agricultural production will decrease (Niemi and Linjakumpu 1996).

Finnish agriculture has been based on family farms and has been characterised by a large number of small farms. The problem with small farms is the high capital expenses per quantity produced and high labour consumption. About 80% of farms are privately owned and the remaining 20% are mainly owned by family-owned businesses, family-owned corporations, family heirs and death estates.

### ***Change of the operational environment of agriculture***

Membership to the EU changed the operational environment of the Finnish food sector completely. In the closed economy before joining the EU the price of raw material was almost completely regulated. The Farmers' Organisation (The Central Union of Agricultural Producers and Forest Owners, MTK) and the state negotiated annually an agreement on the target prices of the main agricultural products. The food processing industry had to use this raw material due to border protection. Agricultural producers and the food industry were able to make their calculations and plans with a high degree of certainty as the price was known. In the new open economy, competition has increased at all levels. The shops can buy food from many different sources, and thus the domestic food industry must be able to respond to the competition from the single market. Raw material is also available both in the domestic market and the whole EU area. Thus the prices become adjusted at many different levels, and competitiveness in terms of prices is also required at each level. However, the Finnish food sector is not yet quite in the same position as the other EU countries due to the support paid during the transitional period (Kettunen 1996). The effects of the EU membership are the greatest at the entrepreneurial level. Farmers make their decisions on production on the basis of the current price, cost and support level. In this connection, the profitability of production and incomes are important factors. The possibilities to continue production depend on the profitability of production, i.e. the financial result. Farmers' incomes are ultimately decisive. Finland accession to the EU revolutionised farmers' income generation as the market prices dropped and the agricultural policy support systems were renewed. In 1995 the turnover tax system was replaced by the standard VAT system. The taxes paid by the agricultural industry on purchases of goods and services changed from non-deductible to deductible, which explains the marked fall in the price of intermediate consumption.

Table 1: Proportion of agriculture of GDP, employment and GFCF in 1980, 1985, 1990 - 1997

1980	1985	1990	1991	1992	1993	1994	1995	1996	1997
4.6	4.3	3.6	3.3	2.7	2.9	2.9	2.0	1.8	1.6
11.0	9.6	7.0	7.1	7.2	7.2	7.2	6.5	6.0	5.7
7.4	5.8	3.8	3.4	3.0	3.5	3.4	3.3	3.2	3.6

Data source: National Accounts 1975 – 1998. Statistics Finland

Table 2: Price changes of some products, %

	1995	1996	1997
Milk	-31.9	0.1	-0.0
Eggs	-66.9	47.7	-13.4
Beef	-40.9	-8.1	-6.1
Pork	-50.7	0.6	4.5
Wheat	-59.0	4.0	-3.2
Rye	-64.7	1.1	-1.6
Barley	-53.8	2.8	-1.3
Oats	-52.5	4.5	-4.3
Inputs	-21.9	2.3	2.7
Investments	-14.5	0.4	1.3

Data source: Monthly Review of Agricultural Statistics. Information Centre of the Ministry of Agriculture and Forestry

### **Statistical data sources**

The results presented in this paper are based on the Income and Tax Statistics of Agriculture and Forestry for the years 1994-1997.

The Income and Tax Statistics of Agriculture and Forestry are compiled as a total study. The statistical units consist of agricultural holdings which are administered by natural persons and have at least 2 ha of arable land under cultivation. The Statistical Farm Register, maintained by the Information Centre of the Ministry of Agriculture and Forestry, has served as the frame population. It covers all farms with at least one hectare of arable land in their management. Data on income are obtained from the database of the Finnish Tax Administration. The income data are merged with a holding by means of the identity number of the farmer. The income includes the earnings of both the farmer and his or her spouse.

The beginning of the Income and Tax Statistics of Agriculture and Forestry dates back to the early 70s when the farm register was established. The statistics are almost entirely based on administrative data. The statistics describe the structure and level of farmers' taxable income and changes in it.

When the structural change of agricultural holdings is measured by the increase in arable land, there are three factors involved, with partly opposite effects: 1) farms ceasing production are usually smaller, on average; 2) farms continuing production grow, on average; 3) farms starting production are usually smaller than average but they are much fewer in number than farms ceasing production. New farms starting their production are set up when farms are divided, for example. In this paper, the incomes of these groups are described separately.

Table 3 shows the appearance of agricultural holdings in the statistics. There are 64,743 farms which have prevailed in the statistics during the whole period. 11,350

farms quitted agricultural production before the Finnish EU membership and 1,272 farms entered the income statistics in 1997.

Table 3. The appearance of agricultural holdings in statistics

Included in statistics in 1994	Included in statistics in 1995	Included in statistics in 1996	Included in statistics in 1997	Number of holdings
0	0	0	1	<b>1 272</b>
0	0	1	0	259
0	0	1	1	1 697
0	1	0	0	878
0	1	0	1	126
0	1	1	0	359
0	1	1	1	3 054
1	0	0	0	<b>11 350</b>
1	0	0	1	273
1	0	1	0	213
1	0	1	1	479
1	1	0	0	8 931
1	1	0	1	1 725
1	1	1	0	4 828
1	1	1	1	<b>64 743</b>

0 = holding not included in statistics

1 = holding included in statistics

### **Structural change**

The following development is depicted in the Income and Tax Statistics of Agriculture and Forestry. As stated earlier, the definition of the statistical unit used in the statistics differs from that used in the farm register, but the development is similar. The number of farms has been declining as farms grow in size. This phenomenon is as well-known in Finland as in the European Union. Between 1980 and 1997, the number of farms fell by 49.7%, i.e. a loss of 77,500 farms in Finland, which means an annual loss of 4,600 farms, on average. Between 1980 and 1997, the agricultural sector in Finland lost over 25,000 farms of under 5 ha, which accounted for almost one third of the number of farms lost. The number of farms under 20 ha fell by 68.4%, i.e. a fall of nearly 90,000 farms. In the early 1990s, the decline slowed a great deal, the annual decrease being 2,700 farms. But in 1995, when Finland joined the EU, the fall in number accelerated. In three years the loss was nearly 24,000 farms, which means that almost every fourth farm ceased to exist.

While the number of small farms has declined, the number of farms of 30 ha and more has increased steadily. Between 1980 and 1997, the number of holdings of at least over 30 ha doubled in Finland. The trend towards a greater number of large farms accelerated in 1995, and in 1997 every fourth farm was larger than 30 ha, while in 1980 only every sixteenth holding had over 30 ha of arable land under cultivation. As the total arable land under cultivation has been relatively stable (around 1.9 million hectares) between 1980 and 1997, the changes in the average cultivated arable land per agricultural holding are strongly linked to the fall in the number of holdings. The average arable land per farm rose from 12.6 ha to 24.0 ha in 17 years. The percentage distribution of the number of farms by size class in 1980, 1994 and 1997 shows a tendency towards an increase in the average arable land under cultivation per holding (see Appendix I).

After joining the EU, the total arable land under cultivation of the farms included in the statistical population has fallen by over 3% from 1994 to 1997. Because the statistics used are pure income statistics they do not describe the changes in the volumes of agricultural output. As regards the changes at the national economy level, the production volumes of milk, beef and eggs have declined by 0.6%, 5.6% and 6.6%, respectively, from 1994 to 1997. During the same period, the volumes of pork and poultry output have increased by 7.4% and 33.8%. The harvested outputs of wheat, barley and oats were 37.6%, 7.8% and 8.1% higher in 1997 compared to those of 1994. The production resources of holdings which have finished agricultural production have for the most part moved to the farms still continuing production, or to new units.

Table 4: Changes in the number of holdings by size of arable land under cultivation

	Change	Average annual variations			Change		
	80-97	80-97	80-90	90-94	94-95	95-96	96-97
Arable land under cultivation							
2 – 4.9	-80.8	-9.2	-7.4	-1.7	-22.6	-33.2	-13.8
5 - 9.9	-76.9	-8.2	-7.1	-5.1	-19.8	-17.5	-9.9
10 – 19.9	-51.2	-4.1	-2.1	-4.6	-12.1	-10.3	-7.7
20 – 29.9	6.3	0.4	2.7	-1.5	-3.0	-4.8	-4.5
30 – 49.9	89.7	3.8	4.3	4.3	3.0	1.6	0.7
50 – 99.9	199.7	6.7	5.9	3.2	21.1	10.2	11.7
100 >	212.3	6.9	3.1	10.0	21.4	13.9	13.9
Total	-49.7	4.0	3.2	2.5	-9.9	-10.1	-5.0

#### **Average income development**

The examination below is much the same as in the report written by Mr P. Pyykkönen of the Pellervo Economic Research Institute (Pyykkönen 1999).

Table 5 describes the average agricultural income level of agricultural holdings according to the Income and Tax Statistics of Agriculture and Forestry between 1994 and 1997. The agricultural income measures the compensation for unpaid work, remuneration from land belonging to units and the yield arising from the use of capital. The taxation rules have allowed farmers to make a so-called adjustment deduction from 1995 to 1999. When this deduction is taken into account, the incomes from 1995 onwards are comparable with the income of 1994.

Table 5: Average agricultural income between 1994 and 1997

	1994	1995	1996	1997
Agricultural income	62 304	70 958	67 498	69 570
Adjustment deduction	0	4 256	4 702	4 801
Comparable income	62 304	75 214	72 200	74 371
Number of holdings	92 542	84 644	77 043	73 369

The average agricultural income level has risen by about FIM 12,000 from 1994 to 1997, i.e. by 19.4%. The steep rise in the agricultural income in 1995 is due to payments paid in compensation for the decline in the value of stocks held by farmers. Appendix II shows the income level development according to the production line of the agricultural holding. Only in those holdings farming poultry the average income level is lower in 1997 compared to 1994. Holdings farming cattle had a rise of over 20% in the average agricultural income level and holdings farming swine an increase of nearly 20% in 1997 compared to 1994. Holdings with production of raw milk and with cereal growing had an average rise in the income level of 10% and 5%, respectively. If the implicit price index of the GDP is used as the deflator, the income level has risen in real terms in all other production lines except poultry and cereal growing farms.

#### ***Farms which disappeared from the statistics in 1995***

A total of 11,350 farms included in the Income and Tax Statistics of Agriculture and Forestry in 1994 were no longer in the 1995 statistics. Over one third of finished farms had less than 5 ha of arable land under cultivation and 90% less than 20 ha. Less than 500 holdings with at least 30 ha of cultivated arable land had stopped farming.

While the finished farms were small in area, their agricultural income was also low. The agricultural income of a farm of less than 5 ha amounted to FIM 4,667. The average income of farms of less than 20 ha was just FIM 14,187. In 80% of closed farms the agricultural income did not exceed FIM 20,000. Some high-income farms have also ceased production. The number of farms with an agricultural income of over FIM 200,000 was 117, i.e. good one per cent of all finished farms.

In 45% of closed farms the production line was crop growing. In these production lines, the income level is clearly lower than in animal farms. Many animal farms may have also stopped livestock production between 1994 and 1997, but the production has continued as crop growing farms. This was not taken into consideration in this survey, as the production line was determined by the situation in 1994.

Those farms where agricultural production was only a secondary activity have stopped production very often. Their proportion of all finished farms is clearly the largest, as over one third of finished farms belong to this group. For over 20% of finished farms the production line was cereal growing. Every sixth finished farm was engaged in dairy farming.

#### ***Farms which entered the statistics in 1997***

The average agricultural income of 1,274 holdings which entered the income statistics in 1997 was only FIM 37,284. It was just one half of the income of those farms that had remained in the statistics from 1994 to 1997.

### **Average income development of continuing farms**

The following focuses on the income development of those farms that were included in the statistics during the whole reference period 1994-1997. The number of those farms is 64,743. The farms in the statistics for 1994-1997 numbered 92,542, 84,644, 77,043 and 73,369, respectively.

With the addition of the above-mentioned adjustment deduction, the incomes of 1995, 1996 and 1997 are comparable to the income of 1994.

According to a survey made on the Income and Tax Statistics of Agriculture and Forestry, the average agricultural income of farms continuing production grew by good FIM 11,000 in 1995. The reason for the income increase in 1995 was, as described earlier, payments made at the time in compensation for the decline in the value of stocks held by farmers. No accurate information is available on the average size of the compensation. If about 100,000 farms were recipients of this support, it would entail a compensation of over FIM 20,000 per farm. Without the stock compensation, the agricultural income would thus have fallen by about FIM 10,000. In 1996 the agricultural income per farm dropped by almost FIM 9,000 from 1995 and remained almost unchanged in 1997. The average agricultural income of continuing farms has thus grown by only 2.7% between 1994 and 1997. Table 6 describes the income development. In real terms, the agricultural income has declined by the same amount if the deflator used is the implicit price index of the GDP, similarly as in the calculation of agricultural income indicators.

Table 6. The average income development within those farms that have stayed in the statistics the whole period

	1994	1995	1996	1997
Agricultural income	75 847	81 350	72 418	72 830
Adjustment deduction	0	5 128	5 197	5 080
Comparable income	75 847	86 478	77 615	77 910
Number of holdings	64 743	64 743	64 743	64 743

Examined by production line, the average agricultural income has clearly decreased in poultry farms. This fall is even steeper in real terms. Egg production has suffered most during the whole EU membership. This survey includes 1,331 holdings engaged in poultry farming. In cereal growing farms the average agricultural income was also lower in 1997 compared to 1994, but only slightly. In real terms, the average agricultural income has declined. The survey comprises 15,179 cereal growing farms. Of the five production lines under examination, the average agricultural income has risen in agricultural holdings engaged in dairy, cattle and swine farming. The agricultural income of farms involved in dairy farming was, on average, 4.3% higher in 1994 compared to 1997. The number of farms included was 22,381. The average growth of 12.4% of cattle farming holdings is calculated from the income data of 4,247 farms. Swine farms included number 4,442, on the basis of which data the average agricultural income has grown by 11.9%. In real terms, only holdings farming cattle or swine have experienced an income rise.

Appendix III presents the income development of holdings continuing agricultural activity by type of production line.

### **Intra-farm income development**

The agricultural incomes of individual farms in 1994 and 1997 will be examined in the following. It would, of course, be possible to describe the entire income

development from 1994 to 1997, but only the years 1994 and 1997 are considered here in order to manage the material better.

The agricultural income has declined by over FIM 10,000 in more than 30,500 farms (47%). Less than one fifth have retained their income level (change less than FIM 10,000), and more than one third have increased their agricultural income by at least FIM 10,000. However, the change in agricultural income has been under FIM 30,000 for over one half of farms (56%). Only one third of poultry farms had an income change of under FIM 30,000 and only 40% of swine farms experienced an equally small change in income. In contrast, the income change was under FIM 30,000 for 67% of cereal growing farms. There are considerably more those who have retained their income level among crop growing farms than among animal husbandry farms. Changes in the incomes of crop growing farms were also smaller than in animal husbandry farms. The change in the agricultural income was smaller than FIM 80,000 in over 80% of farms, of which 75% were engaged in dairy farming, 63% in swine farming and 56% in poultry farming. As the agricultural income of farms engaged in animal husbandry are higher, on average, than that of crop farmers, the changes would be smaller when viewed as relative changes.

Examined by farm size class, over 90% of under five hectare farms had a lower income change than FIM 30,000. With the growth of farm size, the proportion of such farms fell so that the income change was this low for only 20% of over 100 hectare farms.

The income of more than 2,000 farms has dropped by over FIM 100,000, of which almost 40% were engaged in dairy farming, over 17% were cereal growing farms and 15% both swine and poultry farms. The large proportion of dairy farms is probably a consequence of their change of production line to crop growing, for example, which has lowered their agricultural income. Correspondingly, the income of over 2,400 farms has grown by at least FIM 100,000. Of these, over 40% were engaged in dairy farming, 20% in swine farming and 15% in cereal growing.

In every sixth poultry farm the income fell by at least FIM 100,000. Only more than five per cent of poultry farmers raised their agricultural income by over FIM 100,000. Of agricultural holdings engaged in swine farming, 10% increased their agricultural income by over FIM 100,000. More than one tenth of farms of over 30 ha raised their agricultural income by over FIM 100,000, while 7% of the same size farms lost at least FIM 100,000 of their agricultural income.

### **Conclusions**

Statistical data sources strongly support the conclusion that a major part, if not the whole, of the positive income development at the farm level is due to the restructuring of Finnish agriculture. From 1994 to 1997, the agricultural income of continuing farms rose by only 2.7 per cent, on average. However, the level of agricultural income level of all farms was, on average, 19.4% higher in 1997 than in 1994. In real terms the agricultural income of continuing farms has fallen by 2.7% when the implicit index of the GDP at market prices is used as a deflator. It should be noted that according to the income indicator 3 used by the EU, the change was -1.6% (Eurostat: Income from agricultural activity 1998. Studies and Research. Theme 5. Agriculture and fisheries).

When microeconomic data sources are used, it is possible to describe the effects of the structural change at the farm level. The considerably larger growth in the average income level compared to continuing farms is indicative of the fact that finished farms and starting farms have a smaller agricultural income than continuing farms. When



production resources, such as fields, have stayed almost unchanged and production volumes have not collapsed, with the exception of egg production, it can be safely assumed that the structural change will also increase the income of continuing farms. The used statistical data indicate this to be the case. But a very large number of farms has undergone income losses. Since this paper does not attempt to establish what kinds of farms have lost, whether they were “cooling down” until closing activities at the end of the transitional period in 1999, or whether they were farms with strong production investments, the question remains unanswered, to be addressed in other studies.

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## Appendix I

Number of farms in the management of physical persons according to size class of farm

Size, ha	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997
2 – 4.9	31 281	23 998	14 441	13 697	14 336	13 995	13 480	10 439	6 978	6 016
5 - 9.9	51 962	40 105	24 848	23 724	23 151	21 222	20 169	16 181	13 343	12 016
10 – 19.9	47 852	44 759	38 681	37 468	35 805	33 468	32 083	28 206	25 300	23 359
20 –29.9	15 266	16 554	19 833	19 561	19 019	18 635	18 390	17 842	16 986	16 226
30 – 39.9	7 460	8 735	11 330	11 512	11 894	12 692	13 432	13 829	14 047	14 151
50 – 99.9	2 007	2 407	3 552	3 626	3 725	3 881	4 035	4 885	5 385	6 014
100 >	236	232	319	330	361	423	468	568	647	737
Total	156 064	136 790	113 004	109 918	108 291	104 316	102 057	91 950	82 686	78 519
Average farm size	12.6	14.1	17.5	17.8	17.9	18.5	19.1	20.9	22.8	24.0
Total arable area under cultivat ion	1 963	1 922	1 972	1 957	1 942	1 934	1 946	1 921	1 881	1 881

## Appendix II

Agricultural income level development of holdings according to the production line

### II.1

Dairy farming	1994	1995	1996	1997
Agricultural income	99 862	108 260	100 987	105 113
Adjustment deduction	0	4 440	4 860	4 957
Comparable income	99 862	112 700	105 847	110 070

## II.2

Farming of cattle	1994	1995	1996	1997
Agricultural income	46 066	50 405	51 195	53 066
Adjustment deduction	0	2 879	3 219	3 524
Comparable income	46 066	53 284	54 414	56 590

## II.3

Farming of swine	1994	1995	1996	1997
Agricultural income	118 527	156 308	121 369	126 929
Adjustment deduction	0	12 925	13 752	14 120
Comparable income	118 527	169 233	135 121	141 049

## II.4

Farming of poultry	1994	1995	1996	1997
Agricultural income	120 260	121 283	107 832	100 205
Adjustment deduction	0	12 321	13 846	13 133
Comparable income	120 260	133 604	121 678	113 338

## II.5

Cereal growing	1994	1995	1996	1997
Agricultural income	42 254	46 219	41 263	41 120
Adjustment deduction	0	2 837	3 243	3 325
Comparable income	42 254	49 056	44 506	44 445

## Appendix III

Income development of holdings continuing agricultural activity by type of production line

### III.1

Dairy farming	1994	1995	1996	1997
Agricultural income	106 730	111 997	102 964	106 101
Adjustment deduction	0	5 350	5 372	5 245
Comparable income	106 730	117 347	108 336	111 346

### III.2

Farming of cattle	1994	1995	1996	1997
Agricultural income	52 527	54 819	53 677	55 325
Adjustment deduction	0	3 469	3 558	3 729
Comparable income	52 527	58 288	57 235	59 054

### III.3

Farming of swine	1994	1995	1996	1997
Agricultural income	127 721	166 144	125 152	128 031
Adjustment deduction	0	15 573	15 200	14 941
Comparable income	127 721	181 717	140 352	142 972

### III.4

Farming of poultry	1994	1995	1996	1997
Agricultural income	145 569	134 695	114 829	102 021
Adjustment deduction	0	14 846	15 304	13 896
Comparable income	145 569	149 541	130 133	115 917

### III.5

Cereal growing	1994	1995	1996	1997
Agricultural income	47 906	50 687	44 174	44 009
Adjustment deduction	0	3 418	3 584	3 518
Comparable income	47 906	54 105	47 758	47 527