

**MTTL**

**Finnish Agriculture  
and  
European Integration**



**Edited by  
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Agricultural Economics Research Institute

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# **FINNISH AGRICULTURE AND EUROPEAN INTEGRATION**

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## **Preface**

Research on the integration of Finnish agriculture into the EC has been conducted at various institutes for about two years. This publication is an interim report of the results of the research projects financed by the Ministry of Agriculture and Forestry. Negotiations are still going on and many important questions which will have major effects on agriculture are still open. High costs due to the unfavourable natural conditions and the resulting high producer prices hamper the integration. Regional support, which is important for the farmers in the remote eastern and northern parts of the country, is not applied to the same extent in the EC as in Finland. What the fall in the prices is, and the regional support available, will ultimately determine the destiny of Finnish agriculture. After we have answers to these questions, we can do a more thorough analyses of the possible effects of integration.

There are different views on the integration. The Government is determined about the usefulness of the accession to the EC, but many people are against integration. Specifically, the farmers are concerned about the changes and difficulties brought about by applying the CAP in Finland. Therefore, they prefer to remain outside the EC. The aim of researchers is to produce as objective information on integration as possible. That may not be possible in all cases. Therefore it is necessary to emphasize that the authors are solely responsible for the views and ideas presented in the articles. Those views are not necessarily consistent with the views or aims of the Government. It is, however, our belief that the papers give valuable information on the questions which integration is raising.

I want to thank Jaana Ahlstedt, Helena Jokinen and Reijo Pirttijärvi for the assistance in preparing the publication. All authors want to thank Eric N. Sims for reading the manuscripts and making valuable corrections and improvements to the texts.

Helsinki, May 15, 1993

Lauri Kettunen



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# GENERAL CONDITIONS OF AGRICULTURE AND PROBLEMS OF INTEGRATION

LAURI KETTUNEN

**Abstract.** Natural conditions are unfavourable for the Finnish agriculture. The growing season is short and temperatures are lower than in Western European countries. Yield levels are relatively low, which raises the production costs in plant production. That further increases feed costs in animal production. The structure of agriculture is also unfavorable for farming. Farms are small and often scattered in most parts of the country.

Producer prices are about 30% higher in Finland than in Denmark, from where the competition is going to be most intense. Most input prices are, however, about the same as in most EC countries, but feed prices are clearly higher in Finland than in the EC.

If Finland joins the EC, it has to adopt the CAP. Producer prices will fall and the price and income support systems will have to be modified or ceased. Profitability of farming will decrease considerably. Finnish agriculture will face great difficulties in adapting herself in the European integration.

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**Index words:** Integration, yields, costs, adaptation, Finland

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## 1. Trade policy and reasons for integration

The Finnish economy is very dependent on foreign trade. Foreign trade has been approximately one third of the gross domestic product, even though it has fallen to about a quarter currently. Finland supports, in general, free trade in the world economy. In order to guard her trade interests Finland made an agreement with the European Free Trade Area (EFTA) in the 1960's and later became a full member. She also has a special agreement with the European Community (EC), which insures a relatively "free" trade of industrial goods with other EC countries. The European Economic Area (EEA) agreement will expand the integration. Agriculture, however, is outside these trade agreements. There are only a few international agreements concerning the trade of agricultural products. Most notable is the General Agreement on Trade and Tariffs (GATT).

Even though EEA agreement will go quite far in promoting integration, a deeper integration with the EC is considered necessary in many sectors of the economy in Finland, particularly in the area of industry, which wants to have equal conditions for marketing in Europe. Basically it is a question of achieving equal economic competitiveness with other member nations, but some other non-economic factors may also be important for an exporting country in penetrating into foreign markets. Foreign investments into Finland is considered more probable, especially if she is a member country. It is also believed that economic policy is more easily conducted in the EC. A common currency might save resources by reducing transaction costs. There are, of course, opposite views on the all arguments presented above.

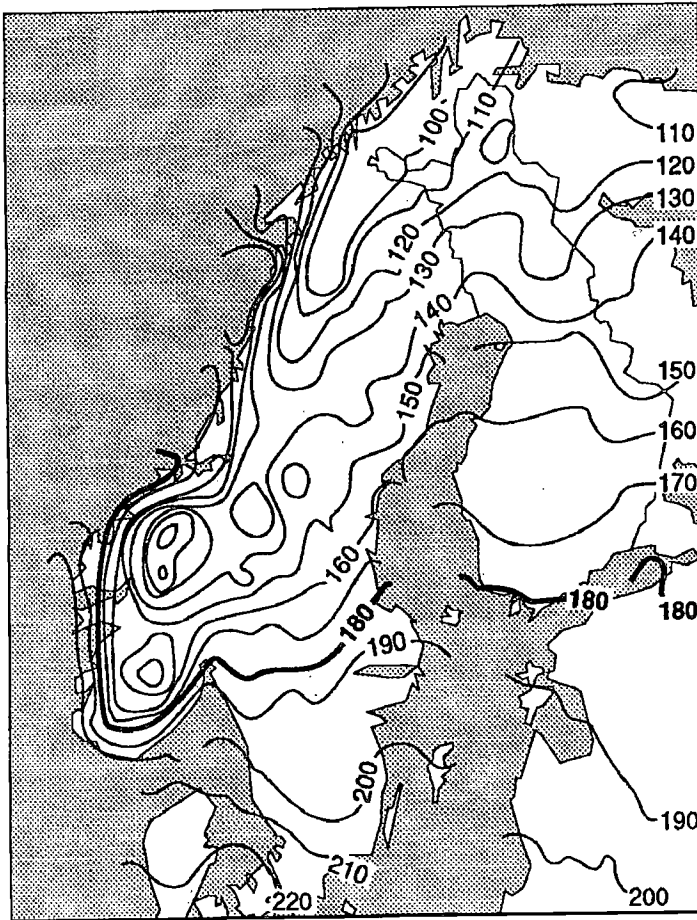
The Government of Finland applied for membership in the EC in March 1992. It became evident as early as the summer of 1991 that EC membership might become as fact. From the very beginning it was clear that agriculture would be the most difficult matter for the accession. The price level is significantly higher in Finland than in the EC, support to agriculture is relatively larger in Finland than in the EC, regional support to agriculture is more developed in Finland than in the EC and the food industry is less effective than in the EC. A total collapse of agriculture appeared to be evident as a result of integration. This launched several research projects to examine thoroughly the future of Finnish agriculture in EC. In addition, more knowledge of the EC's Common Agricultural Policy (CAP) first had to be acquired.

Two large research areas were identified:

- a) What are the potential effects of the common agricultural policy on agriculture and horticulture, and
- b) by which means agriculture and horticulture can be practiced if Finland joins the EC.

These problems are being tackled, as is seen in the following articles, by studying first the legislative differences of the Finnish agricultural policy and the CAP. Second, econometric and programming models are applied to study the effect of the decrease in prices on production and the structure of agriculture. Third, a detailed cost analyses have been made to examine what type of savings are brought about by the membership and what type of adjustments in the cost structure are possible to lower the costs and to improve the competitiveness of agriculture. Fourth, what type of support to agriculture is applied in the EC and what parts of the CAP can be applied in Finland and how much additional support Finnish agriculture needs to survive in the EC. Last, horticulture is examined accordingly. Various other studies, which support the main research, have been done at the universities and other research institutes in Finland.

This article gives background information which is believed to be useful to the reader to understand the studies presented in the publication. Natural conditions for



*Figure 1. The length of the growing season, days.*

agriculture are discussed first. Finnish agricultural policy is outlined and necessary adjustments brought by the CAP are evaluated. Some general comments on the problems are presented at the end of the paper.

## **2. Natural conditions for farming**

### **2.1. Climate**

Finland is situated between the 60th and 70th latitudes and is the northernmost country in the world. Climate, however, is not so unfavourable as the geographical location might imply. Due to the Gulf stream, the average temperature is about 6

centigrades higher in Finland than on the same latitude in other parts of the world. Thus, farming is possible in almost the entire nation. Conditions for agriculture are harsh in the northern parts of the country, but some agriculture is practiced there, too. The length of the growing season varies considerably. It is 180 days on the southern coast, but only 130 days in Lapland. However the daily growing time is longer, since the radiation lasts nearly the whole day in Lapland in the summer. This partly equalizes the growing conditions in different parts of the country.

The effective temperature sum (measured above 5 degrees Celsius) decreases as one moves towards north. In the southernmost parts of Finland it is 1 300C°, in the middle Finland about 1 000C° and in Lapland about 700C°. Therefore, only a few crops like hay and potatoes can be grown in Lapland. In the southern Finland the options are wider, even though important feed crops like maize and alfalfa (lucerne) cannot be grown in Finland at all.

There is frost occasionally in western and northern parts of the country, but the damages are relatively small. There is a compulsory state supported crop damage scheme which compensates the losses due to the frost or other natural reasons like drought and rains (VALMARI 1980).

The precipitation is 550 - 650 millimeters per year and it is larger than the evaporation (PÖLKKI 1986). The precipitation is mostly sufficient and only a little irrigation is applied to vegetables and potato fields. It might, however, be profitable on dry areas. The seasonal distribution of rainfall is unfavourable. It rains more in the fall than in the spring. This pattern of rain fall causes considerable hardship. For example, some crops suffer from drought in the southern parts of Finland in the spring, whereas the rains may disturb harvesting in the fall and spoil the quality of the crop. In some years a part of crop may go unharvested due to bad weather.

Snow covers the fields in the winter. This can be favourable or unfavourable. It protects the crops and improves the quality of soil, but it may also damage the winter crops. Actually, the Finnish weather conditions are not very well suited to growing winter crops. So, their share in total crop output is very small. The advantages of cold winters is that they restrain the plant diseases and the population growth of insects.

The weather conditions are unstable in Finland. The length of the growing season and precipitation varies from one year to another and the yields vary considerably. Big annual variations make the decision making in farming extremely difficult.

## **2.2. Soil**

The glacial period has greatly affected the formation of soil in Finland. Ice moved great amounts of surface and when the ice melted these loose soils gathered into high hills. The flowing water moved loose soils along rivers and as a result, fruitful

Table 1. The cultivation and yields of main crops in 1990<sup>1</sup>.

	Area 1,000 ha	Yield 100 kg/ha		Area 1,000 ha	Yield 100 kg/ha
Winter wheat	35.6	38.6	Green fodder	31.6	182.2
Spring wheat	144.3	33.9	Silage	223.8	193.0
Rye	81.1	30.1	Oil seeds	65.3	17.9
Barley	485.5	35.4	Other crops	47.8	
Oats	453.4	36.7	Pasture	131.6	
Potatoes	41.0	215.0	Fallow	182.2	
Sugar beets	31.6	356.0	Other arable land	310.1	
Dry hay	278.7	43.3			
Arable land, total				2,544.2	

<sup>1</sup> Yields were close to the long term trend.

areas were formed at the deltas of the rivers. Otherwise, land is bare and rocks are visible in some places. Since the weather is cold the formation of humus is slow. In the soil classification, Finland belongs to the podsol-area, which includes areas in Asia, Europe and North America (PUUSTIÄRVI 1976). Precondition for this type of soil is a cool and wet climate. Soil is sour. Only big plants can effectively utilize the nutrients of the soil on these lands. Conifers are the dominant plants on these areas. The formation of peat is typical in these areas, too (TURTOLO & JAAKKOLA 1987).

Table 2. The use of fertilizers and pesticides in Finland and EC-countries, kg/ha<sup>1</sup>.

	Fertilizer		Pesticides	
	a	b	a	b
Finland	210	200	0.82	0.78
Denmark	254	234	2.26	2.08
Germany	371	254	2.41	1.65
France	319	198	4.84	3.01
Netherlands	646	302	20.46	9.56

<sup>1</sup> per cultivated land a) excluding pasture b) including pasture.  
Source: OECD environmental data, Compendium 1991, Paris 1991.



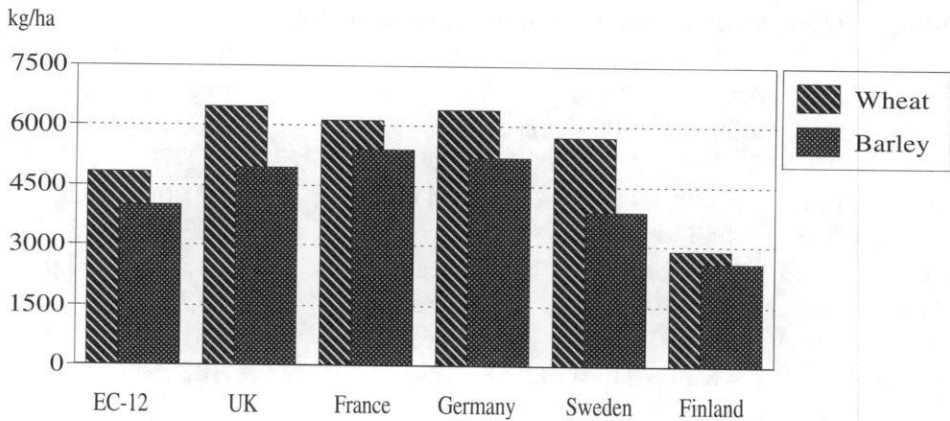


Figure 2. Yield level of wheat and barley in Finland and in various EC-countries, on average in 1987-1990.

About 74 per cent of the land belongs to mineral lands and the rest to organic lands. Of the mineral lands, 30 per cent are sand lands and 19 per cent clay lands. Organic lands are peat or mould soils. Soil is generally poor and, fertilizers are needed in farming. Drainage is usually necessary, too.

### 2.3. Yields

Due to the unfavourable natural conditions in Finland the yields are about 40-50 per cent lower than in Central Europe. Even within the nation regional differences are large. Plant production concentrates in south and west Finland, while grass growing is dominant in eastern and northern parts of the country. Winter crops, which usually give higher yields than spring crops, are of minor importance.

The most common crops are barley, oats, dry hay and silage. They cover about 60-70 per cent of the cultivated land. Wheat and rye are cultivated to meet the domestic demand. There are no real natural pastures, but they are usually cultivated.

The use of fertilizers is lower in Finland than in Central European countries. Climate does not allow any further benefits from higher application of fertilizers. In the future, plant breeding might produce varieties which can use more fertilizers than the present crops. Environmental considerations also cause a lower use of fertilizers. Eutrophication and ground water pollution can be found in some areas of Finland.

The amount of pesticides used is relatively small in Finland due to the cool weather conditions. Residues in food are very rare, and food can be considered very "pure".

*Table 3. Acreage, the number of farms and the average size of farms in 1929-1990.*

	Arable land 1,000 ha	Number of farms 1,000	Average size ha
1929	2,240	249.2	8.9
1941	2,296	245.8	9.4
1950	2,431	305.3	8.0
1959	2,633	331.3	7.9
1969	2,699	297.3	9.0
1975	2,501	248.7	10.1
1980	2,463	224.7	11.0
1985	2,420	200.5	12.1
1990	2,544	199.4	12.8

Source: Years 1929,1941,1950,1959,1969. Official statistics III: 44,55 and 68. Census of the corresponding years. Farm register from years 1975, 1980 and 1985.

Low yields, compared to Central European countries, is one of the main reasons for the problems of Finnish agriculture. Production costs per unit of crop production are high, and affect the feeding costs in animal production.

## **2.4. Structure of agriculture**

The arable land area as well as the number of farms reached their maxima in the 1960's. New land was still cleared at that time. The average size of farms dropped to a low level after the second world war due to the resettlement of population into the agricultural sector.

The structural change has been slow and the average size of all farms is only about 13 hectares of arable land. Farms have forest land of 35 hectares on the average. There are about 200,000 farms in Finland, but currently only about 126,000 are in active production. Their average size is 17.6 ha. Agriculture is based on family farms. There are only few larger farms, which are owned by the state, communes, and the church.

The number of farms has been decreasing since the end of the 1960's. This is a natural phenomenon in all developed countries. Farms are still relatively small and, a further decrease in the number of farms is probable. Economies of scale are quite possible in Finnish agriculture.

*Table 4. The distribution of farms into farm size classes and the average farm size (over 1 ha) in 1991.*

	All farms		Producing farms	
	1,000 ha	%	1,000 ha	%
1-4.9	69.0	34.5	19.2	15.3
5-9.9	43.0	21.5	26.2	20.8
10-19.9	47.4	23.7	41.0	32.5
20-49.9	35.6	17.8	34.7	27.5
50-	5.0	2.5	4.9	3.9
Total	200.0		126.1	
Arable land area				
1,000 ha	2,579.0		2,226.3	
Farm size ha	12.9		17.6	

Source: Agricultural census in 1959, Farm Register of 1980 and yearbook of farm statistics 1991.

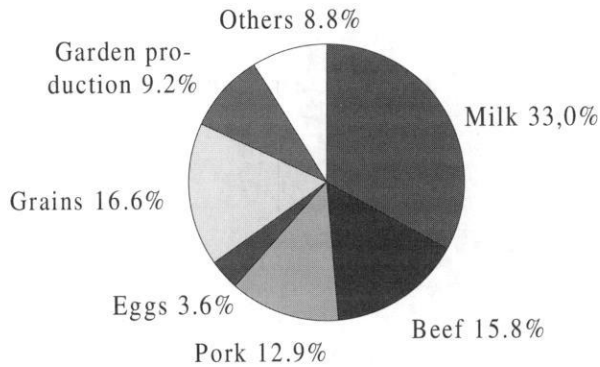
Animal production is the main output in Finland. Milk production is about 1/3 of the total value of agricultural production. Beef is an integral part of dairying. Together they make about half of the farming in terms of value. Pork production is also a dominant line of production.

Crop production is about 15 per cent of the total production. Feed grains (barley and oats) are the main products. Horticulture accounts for about 4 per cent of the total production.

*Table 5. Population in agriculture and forestry in 1950-90.*

	Agriculture		Agriculture and forestry	
	1000	%	1000	%
1950	1,375.4	34.1	1,667.5	41.4
1960	1,140.9	25.7	1,408.2	31.7
1970	675.9	14.7	809.0	17.6
1980	354.5	7.4	438.8	9.2
1985	258.2	5.3	340.0	6.9
1990	169.2	3.4	195.3	3.9

Source: Statistical yearbooks of Finland in 1980 and 1987.



*Figure 3. Distribution of production by value in 1992.*

The agricultural employment is 7 per cent of the total employment in Finland. This may be considered either high (compared to western countries) or low if the evolution since the 1940's is taken into account. General economic development (mechanization) has been the reason for the decline of agricultural population.

### **3. Prices**

Finnish producer prices are clearly above the corresponding EC-prices. The floating of the Finnish markka makes exact comparisons difficult. The difference between Finnish and EC prices has been narrowing all the time and the present situation is much more favourable for agriculture than what it was in the summer 1991 before the first devaluation of markka. Still, Finnish producer prices are 30-50% higher than EC prices.

Price and direct support to agriculture raise the final price paid to farmers for their products. In the 1992, the total support was about FIM 4.0 billion or about 16% of the total value of agricultural production (FIM 24.8 bill.). This cannot be easily directed to different products since it is distributed as a general hectareage subsidy to almost all farmers as a low income subsidy and as a price subsidy. Milk production is the most supported line of production.

Input prices are, in general, slightly higher in Finland than in EC countries.

*Table 6. Some producer prices in Finland, Denmark and Germany in 1991 (at exchange rates as of March 1, 1993), FIM/kg (milk FIM/liter)<sup>1</sup>.*

	Finland <sup>2</sup>	Denmark	Germany	Netherlands	France
Wheat	2.26	1.18	1.19	1.16	1.14
Barley	1.77	1.14	1.07	1.14	0.99
Milk	3.23	2.59	2.33	2.25	2.04
Pork	18.06	8.96	10.14	10.53	11.69
Beef <sup>3</sup>	26.92	23.25	23.08	22.31	22.79
Exchange rate		0.94	3.62	3.22	1.07

<sup>1</sup>Source: EUROSTAT 1990 <sup>2</sup>Target prices, March 1, 1993, the price of milk with all price support.

<sup>3</sup>Bull's meat

However, the prices of seeds and purchased feed in animal production are high in Finland. The explanation for this is obviously in the high domestic feed grain prices. A large country with a sparse population makes the infrastructure costs high which, in turn, raises the prices of the agricultural inputs.

#### **4. Incomes**

Although producer prices are high compared to other nations, farm incomes are lower than incomes in other sectors of the economy. Productivity of agriculture is low due to the unfavourable natural conditions and the farm structure. Only the larger farms earn incomes comparable those in other sectors of the economy. The average wage income of a skilled industrial worker was FIM 99,500 in 1990 which is significantly higher than the per capita income of farmers (see Table 7). Particularly, the per capita incomes in agriculture are much lower than in other sectors. But, if disposable incomes are calculated, farm families' incomes are about the same as in industry.

Agriculture provides only half of the income of farm families. Farm family members usually work outside the farm, and consequently, wages make about 30% of their income. In addition, forestry gives the farmer extra earnings. Examining the large share of pensions in the family farm income, it is obvious that the structure of farming is impacted by the advanced age of most workers in this sector.

*Table 7. Distribution of income of farm families according to source of income (1990 tax statistics).*

	Income FIM/farm	%
Agriculture	67,614	45.7
Forestry	11,196	7.6
Wages	44,097	29.8
Other	11,066	7.5
Pensions	14,023	9.5
<b>Total</b>	<b>147,996</b>	<b>100.0</b>

Source: Tax and income statistics of agriculture in 1990.

## **5. Policies**

In many aspects Finnish agricultural policy and the CAP are similar. Administrative prices are applied in both programs. Supply is regulated in order to keep producer prices at a desired level. Foreign trade policy supports this target. Imports are regulated and exports are subsidized. In addition, state support is utilized to secure farmers incomes.

There are, however, differences in practical implementation of these two policies. Three areas of agricultural policy are discussed here to demonstrate the differences and examine what changes are needed (KETTUNEN 1992):

- 1) price and income policy
- 2) production policy
- 3) structural policy

These policies are conducted by the Finnish Government according to the guidelines given by legislation and negotiations with the farmers' unions.

### **5.1. Price and income policy**

Price policy is the core of the Finnish agricultural policy. Producer prices are determined by the negotiations between the state and farmers' unions. A frame-



work for the negotiations is given by the Farm Income Act passed by the Parliament. The Act determines the procedure for the negotiations. They have to be held between the state and the farmers' unions.

There are two main parts in the negotiations. First, the increase in the costs due to the rise in the input prices is fully compensated to the farmers. Second, the farm income which is compensation for the farm family's labour and own capital is increased. The final outcome of negotiations is a lump sum increase in the total return. In fact, the negotiations determine the total price level, which is composed of target prices (market prices) and price and income support to farmers. The state support paid through the state budget is now about 15% of the total return of agriculture.

Target prices are set for the main agricultural products (milk, beef, pork, mutton, eggs, rye, wheat, feed barley and feed oats). The Government is responsible for regulating markets so that the target prices are achieved as exactly as possible.

The formation of producer prices is regulated by exports and imports and export subsidies. If prices are falling due to increasing supply, export licenses and corresponding subsidies are given to export firms. Imports are used to cover any excess demand in case of a shortage of goods. There are no intervention stores, even though the State Granary has a responsibility to, balance domestic cereal markets at stable prices.

The policy measures have been rather successful. The producer prices have been close to the target prices set in the negotiations. The cost compensation and the increase in farm income have raised producer prices at a similar pace as prices have risen in the whole economy. Real produce prices have been rather constant except in recent years when direct support instead of prices have been raised.

## **5.2. Production policy**

Production policy concentrates mainly on supply control. Overproduction has been persistent for a long time and the goal of the Government has been to eliminate this problem. The Farm Incomes Act includes stipulations as to exactly what part of overproduction is subsidized by the state. The act gives so called production (export) ceilings. Any exports that exceed these production ceilings have to be exported at the full expense of farmers. The production ceilings are declining through time and thus compelling the farmers to reduce production.

Compulsory fallowing is one of the most effective means to manage production. Each farm has to fallow at least 15 per cent of the arable land in order to be eligible for the so called hectareage support of about FIM 500 per ha or it has to pay extra export fee of FIM 1,000 per ha. Extra fallowing is supported by a special hectareage allowance. Clearing of a new land is made unprofitable by a high penalty.

Production of milk and eggs is regulated by individual production quotas which effectively prevent any increase of production.

Voluntary schemes have been applied occasionally to curtail production of milk, pork and eggs. In contrast, beef production has been supported by a special premium on heavy carcasses. This has been considered necessary to maintain beef production, since it might fall rapidly with the declining stock of dairy cows.

### **5.3. Structural policy**

Structural policy is aimed at improving the structure of agriculture. The main means have been low interest rate loans and/or direct aid for acquiring a farm or a part of it, and the assistance for investments in machinery and implements in order to improve the farming efficiency. A new scheme to support the establishing of side-line activities of agriculture (tourism, fur raising, fishing etc) is being developed.

There have been restrictions on establishing of large animal production units which have hampered the structural development. The original argument for this policy was the desire to prevent any industrial type of production, but later the policy became a means to curtail production. Quotas for milk and egg production have similarly slowed down structural development. The size of farms in milk production is too small for effective production. There are few larger milk farms since the policy has prevented establishing of farms over 20 cows.

## **6. The changes in the policy when entering EC**

If Finland joins EC it has to adopt the Common Agricultural Policy. This means fundamental changes in the Finnish policy. Domestic price policy must be ceased and the producer prices will be determined by internal EC markets. Finnish prices will evidently fall considerably even though transportation costs make a natural border barrier which can help to keep a slightly higher price level in Finland compared to the average EC price level. A positive feature of the new policy would be the shift of the support from the Finnish state budget to the EC budget. Overproduction would no longer be the responsibility of the Finnish government. Of course, Finland has to pay into the EC budget a considerable fee.

Finland has developed a comprehensive system to equalize income differences due to regional and size factors. Support is paid to milk and meat producers based on their geographical location. The support increases as one moves to the north. Low income farmers get income support which is determined by the acreage and

the number of animals on the farm. These two systems form a considerable part of the farmers income and they are an effective way to equalize income differences. The Less Favoured Area (LFA) support of the CAP does not meet the comprehensiveness of the Finnish regional support system, thus, integration would be detrimental to low income farmers in the eastern and northern parts of the country.

Finnish production policy would have to be modified. Fallowing would, however, continue as a part of the reformed CAP. Voluntary schemes to reduce production may become necessary in the EC in the future, a measure which Finnish farmers are already familiar with. The structural policy of the EC may not differ very much from the Finnish policy. However, increasing production on individual farms is not allowed by EC's support which may hamper the structural reform which is so critical in Finland to improve the profitability of existing farms.

The effects of the change in the policy on the Finnish agriculture are discussed in detail in the following articles.

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## PRINCIPLES OF AGRICULTURAL POLICY IN FINLAND IN RELATION TO THE CAP OF THE EC

JUKKA KOLA

**Abstract.** In Finland, as well as in most western European countries, agriculture is a closed and subsidised sector. At a same time, however, small, open economies, e.g. the EFTA-countries, depend heavily on international trade and are in general in favour of free trade. The protectionist development in a farm sector is explained by e.g. historical, food security and political reasons. This article (1) describes the significance of Finnish agriculture in the European context, (2) identifies the primary factors behind and objectives of the Finnish agricultural policy and its political economy framework, (3) compares them with the premises of the Common Agricultural Policy (CAP), and (4) evaluates how the objectives could be adjusted to the CAP in the case of the membership in the European Community (EC). Political economy of decision making in agricultural and overall socio-economic policy has clearly been in favour of food security in Finland. Rural population as well as family farm income and structure are among the central objectives calling for agricultural protectionism. In the integration process of the European Economic Area (EEA) and the enlarging EC, Finland inevitably has to revise her traditional agricultural policy. However, she could also be able to require some changes in the CAP of the EC, or on the GATT Uruguay Round, through e.g. an enhanced emphasis on public goods, positive externalities and environmental aspects of agriculture.

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**Key words:** agricultural policy, political economy, food security, Finland, EC

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### 1. Introduction

In most European countries, agricultural policy has commonly aimed at securing a fair standard of living and income level for farmers. In order to achieve the goal, governments have protected and subsidized a farm and food sector, which, in turn, has resulted in increased output and expensive surpluses. However, reasons to stimulate and/or protect domestic agricultural production could have been different originally, or have developed with various emphases in the course of time, including the waves of protectionism in the depression eras of 1880-1900 and the 1930s, and the post World War II era (TRACY 1989).

Small, and often high-cost production countries have mainly striven for national food security and income parity without any major aspects of comparative advantage. Large, more cost-efficient agricultural countries have searched for competitiveness and expansion on world, or e.g. intra-Community, market shares by utilising low-cost, large-volume characteristics of agriculture. In the EC, the concept of income parity has been important in Germany, whereas France or Denmark, strong exporters, have given a greater emphasis on productivity and the achievement of additional market shares (FRANKLIN 1988, p. 21).

The background for these choices seems to be clearly different: one of politics and one of economics. The classification is ambiguous, however, because the reasons and relations in the political economy of different countries are complex and country-specific. In each country, or a group of countries, decisions in the political economy framework have created and maintained diverse agricultural sectors. They extend from no-farm-support New Zealand via moderate subsidiser of the United States and stronger subsidiser of the EC to the interesting group of protectionist Nordic and Alpine arch-subsidisers of agriculture, e.g. Finland, Norway and Switzerland.

The integration process in Europe, including the EEA and the possible enlargement of the EC, as well as the ever-continuous GATT Uruguay round, provide an appropriate setting for the analysis of political economy of food security and protectionism in small, non-EC countries, especially Finland. In the EFTA-countries, agriculture is commonly considered the sector to face the most fundamental changes in the process of European integration and liberalisation of world agricultural trade (e.g. MICHALSKI and WALLACE 1992).

Most likely small countries have to revise some of the protectionist trade policies safeguarding the farm sector due to increased both domestic and international pressures. On the other hand, such a development is quite natural, because small, open economies, e.g. the member countries of the EFTA, depend overall heavily on international trade. They are advocates of free trade in the GATT. Yet, the agricultural sector has remained very protected in the 'arctic and alpine' EFTA-countries, with the recent exception of Sweden and her agricultural reform in 1991. E.g. FRANKLIN (1988, p. 39) proposes that the Nordic countries together with Switzerland and Austria are wealthy enough to maintain a highly protected farm sector of poor productivity and cost-efficiency. This applies also to another wealthy country on the other side of the world, i.e. Japan, which has strongly protected the arcane devotion to self-sufficiency in rice (HAYAMI 1988).

In addition to farm income and food security, neutrality and non-alliance, rural population, and family farm structure are major factors calling for agricultural protectionism in Finland. But, the CAP of the EC does not allow trade barriers within the Community; it should be a single market. This is a serious problem and requires fundamental adjustment and new strategies for agricultural policy and

agriculture as such, from farmers to production factors, from human to physical capital, in Finland.

The outline of the article is the following. First, the role of Finland in agricultural production and trade is evaluated in absolute and relative terms in relation to the EC. In the second part, a comparative description of the level of protectionism in Finland and in the EC is presented through various measures of support and subsidies. Political economy and reasons behind food security and inherent protectionism are outlined in the third section.

Then, objectives and means of the Finnish agricultural policy and its political economy framework are compared with the premises of the Common Agricultural Policy. The final chapter evaluates how the Finnish objectives could be adjusted to the CAP in the case of the membership in the European Community.

## 2. The role of Finland in agricultural production and trade in Europe

Finland is a minor player in agricultural production and trade in relation to the EC and its major agricultural export producers, France, Denmark, and the Netherlands (Table 1). Depending on a product, Finnish agricultural output is only about 1-3

*Table 1. Output of agricultural products in Finland and Sweden in comparison to the EC.*

	Share (%) of EC agricultural output		Self-sufficiency			
	Finland	Sweden	Finland	Sweden	Denmark	EC
Milk	2.7	3.0	134	100	209	-
Butter	3.2	3.9	184	122	194	-
Cheese	2.0	2.4	138	93	340	-
Beef	1.5	1.9	110	95	209	100
Pigmeat	1.3	2.3	111	112	351	103
Eggs	1.6	2.6	133	105	72	102
Cereals	2.0	3.5	131	123	140	120
Sugar	1.2	2.6	81	110	265	123
Potatoes	2.2	3.1	108	89	97	100

Sources: Yearbook of Farm Statistics, Finland; Agricultural Situation in the Community, 1991 Report.



*Table 2. Agricultural structure in Finland and other Nordic countries in comparison to the EC.*

	Farm size arable ha	% -distribution			Dairy herd size, cows	% -distribution		Piggeries pigs	% -distribution	
		<20	20-49	>49		<20	>19		<200	>199
Finland	13	77	20	3	11	92	8	128	76	24
Norway	10	86	13	1	12	92	8	13	100	-
Sweden	29	57	28	15	21	70 <sup>1</sup>	30	107	84 <sup>2</sup>	16
Denmark	33	43	40	17	33	31	69	295	62	38
France	31	49	33	18	23	56	44	75	91	9
Germany	18	69	25	6	16	68	32	68	90	10
Netherlands	17	68	27	5	36	30	70	452	48	52
EC-12	16	80	14	7	17	70	30	58	94	6

<sup>1</sup> classification: 1-25 and >25 cows; <sup>2</sup> classification: 1-249 and >249 pigs.

Sources: Yearbook of Farm Statistics, Finland; Agricultural Situation in the Community, 1991 Report.

per cent of EC-12 production. The highest share is in milk and butter, as well as in oats and rye within the cereals group. Finnish agriculture is small in terms of structure, too. The average size of all about 200,000 farms is only 13 hectares of arable land and the average herd size of about 40,000 dairy farms is 11 cows. Moreover, the size distribution of Finnish farms is heavily distorted towards small farms, and only three per cent of all farms has more than 50 ha of arable land and less than one per cent of all dairy farms has more than 30 cows. These figures are clearly below those of e.g. Denmark (Table 2), which could be a major competitor and among the first to penetrate to agricultural markets in Finland.

Even though the southern member states of the Community are excluded, table 2 indicates the heterogeneity which prevails in the agricultural sectors within the member countries of the EC, and between the EC and the Nordic countries. Diversity is substantial in terms of structure only, not to mention the differences in e.g. production lines, levels of farm income and price (in spite of the common price level and mechanism), and food processing industry.

In terms of the self-sufficiency rates (Table 1), there seems to be quite limited import demand in Finland for traditional crop and animal husbandry products. However, there is more scope to gain market access for those EC products which are not produced at all or are produced only to a very limited extent in Finland, e.g. wine, fruit, vegetables. With respect to the product mix and self-sufficiency, the southern member states of the Community would apparently benefit more than the northern EC members from the single market of the possible EC-17. However, cost-efficiency aspects, on which the effective and intensive agricultural producers of the northern EC rely in their search for new markets, may alter these prospects.

New market outlets are important for a country like Denmark, which has a

*Table 3. Agricultural and food exports and imports of Finland by a trade region in 1986-1991, shares in %.*

Region	Exports			Imports		
	1986	1989	1991	1986	1989	1991
EFTA	14.3	20.5	18.0	15.9	16.2	16.7
- Sweden		14.2	13.4		7.9	9.1
EC	18.4	23.1	23.7	28.8	37.8	42.2
- Denmark		3.3	3.6		7.7	6.5
- Germany		4.2	4.5		4.8	6.4
Eastern Europe	40.8	35.0	18.8	3.3	3.4	3.1
Others	26.5	35.0	38.0	52.0	42.6	38.0
- USA		10.9	15.1		6.8	6.0

Source: Finnish Food Industries Federation.

strong orientation to and dependence on agricultural exports. If the agreement is reached on the GATT Uruguay round to cut subsidized exports 21 (or 24) per cent, new members of the EC will face a strong pressure from the old members to swallow their surpluses, which have then to be absorbed intra-EC to a larger extent than earlier. At the moment, about half of the Danish food and agricultural exports go to the third countries. Finland is already an important export target for Denmark. In Finnish food imports, the share of the EC is almost the same as that of the other countries without the EFTA, and it has increased steadily from 1986 (Table 3). The share of the group of non-European countries, including in particular North- and South-America, in Finnish food imports has decreased rapidly. As an export destination for Finnish food and agricultural products the significance of the former Soviet Union has collapsed, which has impeded management of excess supplies in Finland.

### **3. Comparative description of protectionism via various support indicators**

The principles of efficient resource allocation and comparative advantage may suggest that the present extent of 'arctic and alpine' agriculture is somewhat too large. The geographical, climatic, spatial and structural disadvantages increase risks and costs of agricultural production in Finland, or in Norway and Switzerland. In order to maintain the extent of relatively cost-inefficient, closed agricultural

sectors, 'arctic and alpine' countries have delivered abundant agricultural support. Because of their reasonably small size in terms of both a potential export destination or an excess supplier, small countries have not run into major conflicts in trade issues with the traditional agricultural exporters. And if they have, they have looked for exceptions in international trade agreements, which has been quite possible in particular because agriculture has not been included in the earlier GATT rounds concerning the removal of trade barriers.

Small countries like Finland have not been alone in these protectionist and support efforts. Large countries, in addition to their domestic support measures, have also required exceptions for agriculture during some major developments of multilateral international agreements of trade and agricultural policies. In fact, it has been in the large countries' interest to keep agriculture out of the GATT rounds, at least until the Punta del Este meeting 1986, which introduced a major change, i.e., agriculture was finally supposed to lose its special status and all agricultural policies were to be subject to multilateral negotiations and scrutiny. Not surprisingly, agricultural subsidies and protection have been a big problem during the Round, which was intended to be completed in 1990.

The United States and the European Community have been the key players in the negotiations. With respect to the negotiation position, the EFTA-countries, especially the Nordic countries acting together, have usually been supportive to the the EC in the Uruguay round. In 1990, however, the EC rejected the compromise proposal of Sweden because of some strategic reasons related to e.g. the base period. Although the United States, mainly backed in turn by the CAIRNS-group, has concentrated their attack against lavish farm subsidies of the EC, the most urgent need to reform agricultural policies is in the EFTA countries (and Japan), according to the level of agricultural support (Table 4). Even if subsidies are adjusted to wealth, the burden of agricultural support and protection is very high in Finland, Norway and Switzerland (last column of Table 4). Nevertheless, the resistance to reform is particularly strong in these countries, except in Sweden since the 1990 reform. In terms of phasing out of trade distorting subsidies, an interesting detail is a \$22,000 subsidy for a U.S. farmer in relation to \$13,000 in the EC and \$30,000 in Finland, or the OECD (1992) estimate that the highest increase in total and per head transfers to agriculture from consumers and taxpayers to producers in 1991 over 1990 is in the United States, both absolutely (total \$7.8 billion, per head \$28) and relatively (10%), and not in the EC or EFTA.

Table 5 indicates that in the case of the EC membership and application of the CAP Finland will face the most serious adjustment problems in crop production, whereas Sweden has better competitiveness in crops. In addition, the support levels expressed in net percentage PSEs are much higher in pigmeat and end eggs production in Finland than in the EC. Instead, PSEs for milk and beef are quite close to those in the EC, and Sweden. Rural and regional policy aspects are also more

*Table 4. Agricultural support in the Nordic countries and in the EC in 1991.*

	Net PSE %	Per farmer PSE, US\$'000	Per hectare PSE, \$	Transfers to agriculture		
				total \$bln	\$/head	% of GDP/head <sup>1</sup>
Finland	71	30	2,527	5.9	1137	7.6
Norway	77	38	3,303	4.2	987	5.9
Sweden	59	34	935	3.6	416	2.7
Austria	52	12	889	4.1	524	3.9
Switzerlan	80	32	1,982	6.4	925	5.2
EC	49	13	784	141.8	409	3.7
USA	30	22	98	80.8	318	1.5
Japan	66	17	8,422	63.2	510	3.3

<sup>1</sup>own calculation, based on GDP and PPPs in 1989. Source: OECD 1992.

important in milk and cattle production than in pigmeat and poultry production both in Finland and in the EC, which makes it easier to justify the need for special support measures especially for dairy farms.

In Finland expenditure on farm price and income support accounts for 6% of total government budget, but in the EC, agriculture takes the lion's share of the Community budget (Table 6). On the other hand, the Community budget excludes many sectors of the society and economy. Consequently, agriculture as the most

*Table 5. Support by agricultural products in the Nordic countries in comparison to the EC.*

	Percentage PSE in 1991			
	Finland	Norway	Sweden	EC
Livestock products <sup>1</sup>	66	76	60	44
Milk	76	83	74	69
Beef	60	71	51	54
Pigmeat	53	51	36	8
Eggs	40	48	53	-3
Crop products <sup>2</sup>	84	86	56	60
Wheat	84	84	50	61
Oilseeds	98	-	63	67
Sugar	73	-	55	67
All products <sup>1</sup>	71	77	59	49

<sup>1</sup> net percentage PSE; <sup>2</sup> gross percentage PSE. Source: OECD 1992 (preliminary 1991 PSEs).

*Table 6. The cost of agricultural policy in Finland and the EC in 1990.*

	Finland		CAP of the EC
Net expenditure; ecu mill. (FIM <sup>1</sup> mill.)	1,285	(8,997)	26,318
% of budget	6		59
% of GDP	2		1
per capita, ecu (FIM)	257	(1,800)	105

<sup>1</sup> ecu = FIM 7; March 1993.

deeply integrated sector is disproportionately represented. In fact, the agricultural budget is only about 1% of Community GDP. In Finland, agricultural expenditure is about 2% of GDP, which is less than the contribution of agriculture to GDP, i.e. 3%. Budgetary costs of agricultural support could not be regarded unbearable in relation to e.g. GDP or total government outlays in such economies as the EC or U.S (e.g. FRANKLIN 1988, p. 12). Nevertheless, the absolute sums of agricultural support and inherent income transfer are high enough to bring about criticism on the amount and reasons of public support to and strict protectionism of agriculture, domestically, e.g. budget constraints or negative externalities of intensive agriculture, and internationally from e.g. GATT, OECD and individual trading partners.

## **4. Political economy of agricultural policy in Finland**

### **4.1. Pressure for changes**

Political economy of decision making helps to explain why we have such agricultural policies as we do, and why they have persisted without any major changes even after many arguments for high support have lost their real meaning in the course of time. The relative strength of special interest groups plays a key role. Comparative advantage of production is not, indeed, the only factor that matters. Other factors are e.g. history, past and present policies, and values and beliefs in relation to e.g. the special position of agriculture and farmers as providers of a basic need. The farm lobby, i.e. producers and their organisations, supply and processing industries, merchants, and bureaucrats, has presented arguments in an efficient way in Finland, as well as in most western countries.

The changes are not easy to introduce due to political economy, and ambiguous causes and consequences of reforms. Inconsistency between the micro and macro interests is apparent in terms of public and private interests. It is widely acknowl-

edged that freer trade generates greater economic efficiency as a whole. However, in the first phase, someone is usually made worse off in the process, and, in the second phase, the assumed compensation from gainers to those who lose hardly takes place. If greater efficiency is solely emphasized and distribution of the efficiency gains ignored, this is no problem. But in real life it becomes a major problem in political economy of decision making.

Economic and structural effects on agriculture of the possible application of the CAP would be harder for Finland and Norway than for Sweden according to the comparative advantage aspects (see also Table 4 and 5). Consequently, farmers strictly oppose joining the EC in Finland and Norway, whereas Swedish farmers prefer the application of the CAP to the 1990 domestic reform of agricultural policy. The Swedish reform appears to be somewhat ill-designed with respect to e.g. phasing out export subsidies, which are in the very core of the means of the CAP and the money flows of the EAGGF. The CAP reform in May 1992 did not change this emphasis. In Finland, or Norway, no major changes in agricultural policy have thus far taken place. However, the Farm Income Act is currently (spring 1993) under revision.

In order to examine the background and reasons behind the past and present agricultural policy in Finland, the political economy model provides an applicable framework. Preferential political policies are regarded as public goods, which are supplied by politicians and bureaucrats, and demanded by special interest groups. In the western countries, agricultural policy and its goals have been widely accepted in different strata of the society, due to e.g. food security, positive externalities or altruism. Some determinants of political economy of decision making can be identified as follows:

- historical continuity
- inertia in decision making
- theory of representative voting (DOWNS 1957), campaign contribution sources, and disproportionate representation of farm lobby in legislative institutions
- governments tend to correct market failures by favouring the politically powerful (BECKER 1983)
- individual rent-seeking of decision-makers
- cognitive limitations of consumers, taxpayers etc.
- collective action of well-organised, homogenous group of farmers (OLSON 1990)
- special characteristics of food and farming, farm fundamentalism
- global food shortage and regional supply-demand balance

Although agricultural policies have been formulated long ago, they have been maintained without any major changes due to historical continuity and inertia in



decision making. This tendency is also strengthened by cognitive limitations and bounded rationality of consumers, i.e. consumers do not know real effects and costs of agricultural policy. Decisions of the representatives are hardly formulated on the basis of their own, and their constituency's general consumer status alone. Instead, they are interested in individual rent-seeking, i.e. keeping their jobs, in the short run. Politicians are able to explain their distorted behavior by ambiguous positive externalities and public goods, i.e. benevolence, of diverse private policies they support as if they were public policies of common interest. Often, the decision has to be made between a large, but heterogeneous group, e.g. consumers, taxpayers or environmentally concerned voters, and a small, but well-organized, homogeneous group, e.g. farmers, whose collective action is very efficient. In trade liberalization, the potential losers, e.g. a few farmers, are determined to exhibit a strong opposition. The gains, instead, are usually widely dispersed over millions of indifferent consumers, whose willingness to pay in order to force the change to take place is substantially smaller than that of the producers in order to prevent the change from occurring. To date, consumers have posed no match for farmers and farm lobbyists in the arena of pressure groups competing for political influence in Finland.

To complement the political economy analysis, the game theory can be an appropriate tool to further examine and explain Finnish agricultural policy. Especially the annual farm income negotiations between the state and the producers (see KETTUNEN 1992), can be dealt with the approach of non-cooperative game theory (GIBBONS 1992) with characteristics of a) bilateral bargaining, b) dynamic (rather than static) game, c) perfect (rather than Nash) equilibrium with (almost) perfect (rather than imperfect) information. This approach is an obvious alternative for future research in this field to further enhance common knowledge and understanding of the players, their rules and strategies, and the game called agricultural policy as such.

## **4.2. Food security and protectionism in Finland**

Food security in terms of 100% self-sufficiency has been the central goal of agricultural policy in Finland. Self-sufficiency has a special meaning in Finland, because extraordinary efforts have been required to achieve it in comparison with countries enjoying more favorable natural conditions and steady historical and social development. A strategic reserve of production capacity has not been considered sufficient in Finland, but the goal has been continuous self-sufficiency in basic food stuffs. Another reason of great importance for food security has been the political neutrality of Finland. In crisis situations, she does not have political or military allies.

Parallel to food security, the other important goal has been to secure the level and development of farmers' income, and to equalize income disparities within agriculture. The income objective is determined to a large extent in an operation environment and a structure based on family farms. The concept of family farms is somewhat ambiguous, but the significance of the concept has been crucial. Family farms have been considered to cherish the positive externalities of agriculture, to guarantee stable supply of food stuffs without being too susceptible to fluctuations in the market, to manage the farm forests in remote areas in the best interest of the entire economy, and to be a stabilising force in the society. Moreover, they have many advantages in terms of flexibility in adjusting to changing conditions through low transaction costs. The 3F-triangle in the foundations of the Finnish farm policy is quite obvious: food security - family farms - farm forests.

Maintaining rural employment and population has been the third goal of great importance, although its background has varied in the course of time. It reflects the strong influence of regional policy in Finland and in all Nordic countries. In addition to the goals of labour and social policy, national security, in terms of utilization of resources in the whole country of long distances and sparse population, has been taken care of by regional policy.

The achievement of the three central goals, i.e. self-sufficiency, income parity, and rural population, is based on the means price and income support policy as well as border protection in Finland. They have secured the price and sales guarantee for the entire farm output in the whole country, independent of the domestic consumption level. It is quite self-evident that when an attempt is made to achieve several, and quite different, goals by using mainly one and only means, price support, problems will arise in terms of e.g. goal conflicts. Moreover, productivity objectives or consumer interests have been neglected to a large extent.

Originally, the fundamental causal relationships of Finnish agricultural policy can be derived from as far as the World War II and the first post-war decade (KOLA 1991). At that time, decisions were made under extremely exceptional conditions and lack of alternatives. Especially the increase in the number of small farms due to the resettlement process are reflected to the present-day situation. Expansion of agriculture supported the goals set for agricultural production and resettlement. These operations also supported the security strategy in terms of maintaining inhabitation in the remote areas. Agriculture, at the cost of its internal development, acted as the society's buffer necessary for the adjustments in the difficult situation. As a result, agricultural structure became unfavourable in Finland. More resources, especially land and labour force, were tied to agriculture. The rapid structural development and rationalization of agriculture, which started immediately after the war in other Western European countries, could not take place in Finland.

Farmers and their organisations have maintained their power, even long after the key arguments for high agricultural support and protectionism have lost their

real force, and even though the decision making framework involves more and more interest groups, e.g. consumers, input supplying and output processing industries, domestic and foreign merchants, and environmentalists. Farmers are nowadays small in number also in Finland, but their voting behaviour is very active and concentrated by the one and only producer organization, the Central Union of Agricultural and Forest Producers (MTK). It enjoys of a high degree of membership (72%) and close linkages to the agribusiness cooperatives of a high market share in e.g. milk and meat. Middlemen, like agribusiness, should overall be taken into a fuller account in political economy analysis because they are important and influential lobbyists (ALSTON & CARTER 1991). Now, under the threat of drastically changing conditions due to the EC and the CAP, Finnish farmers worry also about the assumed small role of MTK and about Finnish special problems and interests in the Comité des Organisations Professionnelles Agricoles (COPA), which was founded in 1958 by the six original members of the EC.

Nevertheless, politicians, who usually perform cost-benefit calculations for potential votes, often favour the well-organized farm interest groups. In fact, the official decision making process of agricultural policy has been quite stable and supported by the consensus policy in Finland. Agricultural policy and its goals have been widely accepted in the Finnish society. In this connection it is worth noticing that the two opposites on agricultural issues, the Center Party of rural population and the Social-Democratic Party of wage earner-consumers, have been together in government almost continuously for the past few decades up to 1987. In 1987 the Center Party exceptionally was left in opposition, but it returned to the government after a land-slide victory in parliamentary elections in 1991, and the Social-Democratic Party was left to opposition. Expectations for agricultural policy reform were quite high in 1987 when pro-consumer parties of right-wing Coalition Party and left-wing SDP formed the government. This, or any other less significant change in government coalitions, has altered agricultural policy hardly at all, however. The return of the Center Party in 1991 implied a continuation of the long pursued agricultural policy. In Finland, historical continuity seems to be an especially important factor. The reasons may also be stronger than in many other countries.

## **5. Objectives of agricultural policy in Finland and the EC**

The three central goals of Finnish agricultural policy have been self-sufficiency, income parity, and rural population. In order to maintain those goals, price and income support as well as border protection in the form of variable import levies and import licensing have been the primary means (KOLA 1991). They have secured

the price and sales guarantee for the entire farm output in the whole country, independent of the domestic consumption level. This has resulted in over-supply and export subsidies in the same way as in the EC.

According to a very general comparison of agricultural policies in the EC (FEARNE 1991; RITSON 1991) and Finland (KETTUNEN 1992), the basic principles and means seem to be quite similar. The policy has been producer-oriented in both Finland and the EC. The consumer interest, represented by e.g. the BEUC in the EC, has been very subdued due to e.g. heterogenous and inconsistent argumentation. The basic objectives and means of agricultural policy in Finland and the EC can be listed as follows:

#### Objectives

- to stabilise markets
- to assure adequate food supply for consumers (at a reasonable price level)
- to ensure a fair standard of living and income for farmers

#### Means

- price support
- export subsidies
- border protection
- quantitative restrictions on production

However, differences exist especially with regard to the means by which the income objective is intended to be achieved. Clearly, productivity of agriculture is stressed more in the EC than in Finland. The promotion of structural development, technical progress, and optimum utilisation of production factors represents the characteristics of (productivity) development support in the EC, whereas so-called maintenance support of existing structures of both production and regional allocation predominates in Finland.

No national self-sufficiency in the EC is naturally a big difference from Finland. The strong Community preference reduces by no means the need for a fundamental change in agricultural policy of Finland with this respect. Moreover, Finland has relied more on non-tariff barriers to trade in her border protection, whereas the Community employs tariff barriers in the form of variable import levies. They are, in fact, regarded as the cornerstone of the CAP (FRANKLIN 1988, p. 90), because they prevent exporters from exploiting any competitive advantage by price-cutting and insulate the Community producer from the world market. Apparently, the idea of protection is the same in Finland and the EC regardless of whether the means are non-tariff or tariff barriers to trade. The difficulty for Finland is the level of agricultural prices and costs of production, which is almost twice as high as it is in the Community. The price and cost difference and disadvantage is widely dealt with in other articles of this publication.

Differences prevail also in the emphasis of different objectives of agricultural policy, which are often wider in scope than agriculture only. In addition to national self-sufficiency in basic food stuffs, Finland has put more emphasis than the EC in her agricultural policy on e.g. the following principles:

- income distribution policies to even out disparities between farms and regions
- regional policies and rural policies
- maintaining of rural population
- family farm orientation
- linkage between farms and remote national resources, e.g. forests in Finland

The reform of the CAP in May 1992 tends to alter policy slightly towards the 'Finnish practice'. It could be advantageous for Finland to emphasize even more the rural population and employment aspects as well as extensive and ethical characteristics and positive externalities of agriculture in the core of her policy. Since the 1980s, wider adoption and underlining of rural policy has underpinned the position of regional policy among the central goals of agricultural policy. Agriculture is still the central factor in the comprehensive development of the countryside, and the regional differences are substantial (KOLA 1992). Immobility of labour force and lack of alternatives are serious problems.

## **6. Concluding remarks: Possibilities in converging the objectives and means of agricultural policy at the national and Community level**

Maintenance of food security and rural population has been a key principle of agricultural policy in Finland. Food security has served as a background for arguments for e.g. farm income and support, as well as rural population. Joining the EC would change the principle fundamentally as there is no national self-sufficiency objective in the EC, only the Community preference in line with the common markets and common financing of agricultural market mechanisms through the EAGGF.

Another reason of great importance for food security has been the political neutrality of Finland. The issue of neutrality and its real contents are also to be set under consideration in the possible EC membership. The issue of food security has been important also in the other Nordic countries. However, Norway has long been in the NATO, and Sweden has reformed her agricultural policy towards a smaller emphasis on food security in the 1990s. The future role of the NATO, or the WEU has to be taken into consideration in terms of the broader concept of security in Finland, too.

New definitions and objectives for food security, and support for productivity development in agricultural policy in Finland have to be set under formulation. Domestic and international pressure may have reached the level to facilitate a shift from expensive over-reliance to lower reliance on e.g. cereals in Finland. In fact, principles are under re-evaluation in a government working group in the spring 1993. An attempt is made to direct agricultural policy towards the EC principles of e.g. minimum prices for producers. Currently, in order to cope with the CAP, there is an urgent need to promote the economic, productivity and structural development of agriculture through major revisions in agricultural policy. More efficient targeting of farm and rural support, including present and future credit systems, and changes in intergenerational transitions of farm firms and agricultural taxation towards the practices applied in the EC would mitigate the adjustment problems of Finnish agriculture. The economic depression and uncertainties related to the possible EC membership have impeded the making of even the most essential decisions to alleviate present and expected adjustment problems.

In addition, increasing environmental concerns and sustainable development emerge as an opportunity for Finland in reformulation of European or global agricultural policies. Economic fluctuations affecting also agricultural policy are temporary, but the green trend seems to be a permanent phenomenon. Perhaps the CAP, and the GATT, would also become greener. It would alleviate the obvious adjustment problems of Finland.

For potential new member countries like Finland it is useful to remember that there are substantial differences in agricultural sectors and in the significance of agriculture within the EC. Moreover, diversity would substantially increase, if the EFTA-countries with specific arctic-alpine conditions were to join the EC. The Common Agricultural Policy has to take diverse aspects and needs into account, and it has to develop in response to changing internal and external requirements. When Finland apparently faces changes in her agricultural policy due to the possible application of the CAP, she could also bring some new aspects and emphases to the CAP of the European Community.

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## AGRICULTURE AND FOOD INDUSTRIES IN THE FINNISH NATIONAL AND REGIONAL ECONOMY

SEPPO AALTONEN

**Abstract.** This article attempts to briefly describe the overall situation of the agriculture and food industry in Finland. Special emphasis has been placed on the prominent role of the agri-food sector on rural areas of the country. The share of agriculture has decreased rapidly, both in employment and income in the national economy as a whole. This trend is well-known in all western industrial countries, however, Finnish circumstances differ remarkably from those of many central European countries. Finland is a country of long distances and exceptionally vast rural areas. This emphasizes an important role of agriculture in the rural development. In contrast, food industry plants are mainly located in urban areas. After the implementation of direct farm support to a greater extent during the recent years, Finnish agriculture has become more dependent on the state budget resources. Therefore, essential decreases in agricultural production and state support will cause, firstly income losses for farmers, and secondly, rural areas will also lose a major part of their state aid currently received from agricultural activities.

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**Index words:** Agriculture, food industry, rural areas, employment, agricultural support, farm debt, Finland

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### 1. Agriculture

As in other industrial countries, the significance of agriculture in the national economy has diminished in Finland. Whereas agriculture accounted for nearly 10 per cent of GDP in 1960, its share was no more than 2.6 per cent in 1992. If forestry, which is closely related to agriculture, is included, their combined share of GDP rises to 5.4 per cent. The corresponding figure in 1960 was as high as 20 per cent.

About thirty years ago, the agricultural workforce accounted for one third of the working population. At present, agriculture employs slightly more than 7 per cent, and forestry 1.4 per cent of the total labor force. In the 1960's and 1970's, the rapid expansion of the manufacturing and service sectors greatly increased the demand



for labour. At the same time, new methods of production started to be introduced in agriculture, reducing the demand for agricultural labour. This marked the beginning of migration from the countryside to urban centres.

The drift from the land involved mainly the young age groups and was at its most vigorous in eastern and northern Finland. This resulted in the aging of the agricultural population; in 1990, more than 40 per cent of the farms were owned by a farmer older than 55 years of age. The average age of farmers was 51 years, and that of full-time farmers nearly 47 years, respectively (ANON. 1992a).

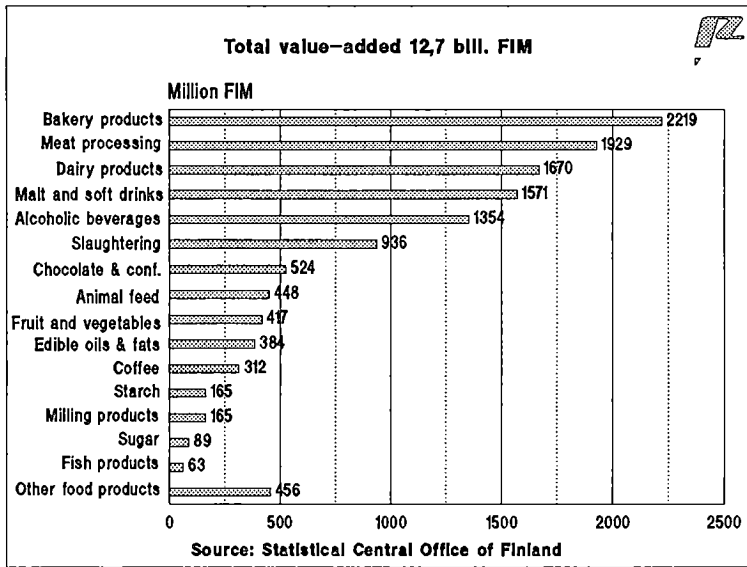
While the agricultural population has been rapidly declining, those remaining in farming have increasingly had to supplement their income through activities outside agriculture. Today only 42 per cent of farmers are engaged in farming on a full-time basis. A large proportion of farms are now in the hands of part time-farmers and pensioners. Even so, Finnish agriculture is still dominated by family farming.

Of the subsidiary activities closely related to agriculture, the most important are forestry, fur farming, and horticulture. About half of the private forests are owned by farmers in Finland. Regional differences are, however, large: forestry is an important source of income, especially in the middle and eastern parts of the country. Fur farming is located mainly in western Finland, while horticulture is concentrated in the southern and southwest parts of the country. As a comparatively new and expanding industry, fur farming has been subject to risk, as changes in world market conditions have an immediate impact on the price of Finnish pelts. In recent years fur farming has been reduced due to unfavourable international market developments (see also AALTONEN and TORVELA 1989).

## **2. Food industry**

The food industry is of great importance in the Finnish national economy. Of all the industries, food production ranks third, regardless of the criteria applied, after metal manufacturing and wood industry. The gross value of production was about FIM 50 billion in 1991, while the value-added of the food industry was nearly FIM 13 billion. Total employment was slightly over 50,000. This accounts for about 2 per cent of the total employment of the country, and about 12 per cent of the total employment in the Finnish industry.

The major product groups in food industries, in terms of value-added, were in 1991: slaughtering and meat processing (22.6%), beverages (22.8%), bakery products (17.5%), dairy products (13.2%), chocolate and confectionery (4.1%), and animal feed (3.5%) (see Figure 1, ANON. 1992b, 1992c).



*Figure 1. Food industry production in Finland in 1991, in terms of value-added.*

Raw materials used in production are largely of domestic origin (about 85%). The number of food producing companies in Finland was about 1,350 in 1990. The greatest majority of them, however, are small family owned bakeries (ANON. 1991).

A special feature in the Finnish food industry is the dominant role of cooperative firms owned by agricultural producers. The percentage shares of these firms over the marketed quantities of agricultural products in 1991 were: milk, 93 per cent; meat, 69 per cent; eggs, 70 per cent; and grain, 53 per cent. In addition, the corresponding share of the sales of agricultural production inputs was as high as 45 per cent.

### **3. Agro-food sector as an employer**

Although the volume of the labour force in agriculture has fallen on farms, the overall impact of agriculture and forestry on the economy has not decreased in the same proportion. The multiplier effects of agriculture and forestry, which generate work in other sectors, have increased in the other sectors, e.g. industry, trade, and transport. However, most of the industry, which depends on agriculture and forestry, is nowadays located in urban areas, and thus provides only a marginal addition in employment for rural municipalities and, in particular, rural areas.

Agriculture, farm forestry, food industry, and all related activities are still important employers in the Finnish economy. Although the direct contribution of these sectors to the national income has declined, indirect employment and income effects have, however, increased. The most current research, based on input-output analysis, examines the year 1985. At that time, altogether about 370,000 people were employed in the agro-food sector (production, processing, transport, trade, etc.) based on domestic agricultural production. The share of agriculture of this total workforce was 60 per cent and food industry made up 12 per cent. Those sectors that manufacture and deliver production inputs and services to agriculture and food industry have also a prominent impact on employment, altogether 28 per cent of the total employment of those 370,000 people (RUOTSALAINEN 1989).

A rough estimate has been made (Figure 2) on the present total employment of the Finnish agro-food sector in 1992. The biggest change since 1985, has taken place in the number of farmers and other farm labour. The indirect employment effects of agriculture have most likely decreased much less than the number of farmers. The total employment remains still high: about 310,000 - 320,000 people derive their earnings, directly or indirectly, from the domestic agricultural production.

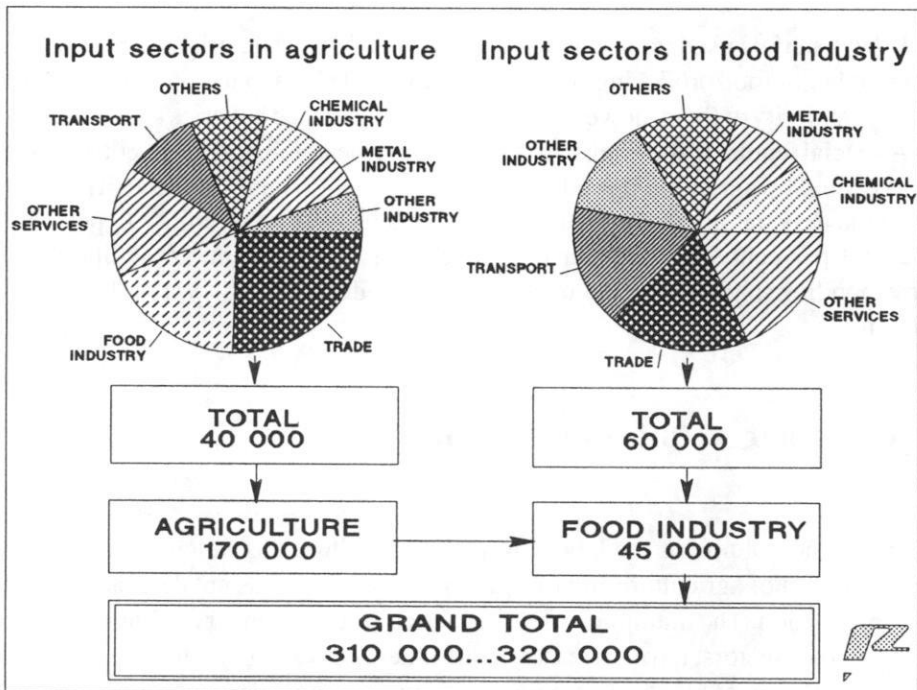


Figure 2. An estimate on the employment effects of the Finnish agro-food sector in 1992, based on the domestic agricultural production.

While no current figures are available, it is not possible to estimate accurately the total contribution of the agro-food sector to the Finnish GDP. However, agriculture, food, drink, and the tobacco industry alone accounted for nearly 5 per cent. If forestry is added, the total share is 7 per cent.

#### **4. Special features of the Finnish agro-food sector**

Due to the country's northern location, Finnish agricultural production is characterized first and foremost by high costs of production. Moreover, the country's population, about 5 million, constitutes a rather modest basis of demand for domestic agricultural produce. Although, statistically, Finland is one of the most sparsely populated countries in Europe, 16 inhabitants per square kilometre (the corresponding figure for the EC countries is 104), the population is, nevertheless, heavily concentrated in the towns and cities of southern Finland. By contrast, agricultural production is distributed fairly evenly throughout the country, apart from Lapland, where reindeer husbandry is an important industry.

The low density of population, combined with long distances, cause extra transport costs at all levels of activities, in agriculture, processing, and deliveries of production inputs and products. According to some international comparisons, the volume of annual product transports is more than double per inhabitant in Finland as compared to the central European countries. This should be kept in mind when comparing the Finnish food sector and her competitiveness to the corresponding sectors in other countries.

A country of a sparse population and long distances has some benefits, too. The low density of population and of traffic spare our plants from excess lead and cadmium. According to several studies, the quantities used per acreage of fertilizers, herbicides, and pesticides in Finnish agriculture are very low compared with those of most central European countries. This is why the majority of Finns regard domestically grown food as pure, high quality products and prefer these over imported ones.

#### **5. Food imports exceed exports**

Both agriculture and related food industries are highly oriented to satisfy domestic demand of food. Although agricultural surpluses have been a problem since the 1960's, Finland's foreign food trade is rather limited in quantity. Finland's food imports are far more diversified than her exports. Imports consist primarily of foodstuffs, which for climatic reasons, cannot be produced at home. These products

include coffee, tea, fruits, vegetables, various feeding stuffs, and in certain years, grain. A substantial part of the food imports originates from developing countries. In 1992, the total value of Finnish food imports amounted to FIM 5.6 billion or slightly over 6 per cent of the total Finnish imports. The corresponding figure for Finnish exports of agricultural produce and foodstuffs was nearly FIM 2.6 billion, equivalent to 2.5 per cent of the total value of Finnish exports.

Of the imports, 43 per cent came from EC-countries, 16 per cent from EFTA-countries, 4 per cent from Eastern bloc countries, and the rest, 37 per cent, from numerous other countries. Of the exports, respectively, 25 percent went to EC-countries, 17 per cent to EFTA-countries, 30 per cent to Eastern bloc countries, and the remaining 28 per cent to other countries (ANON. 1993a).

Domestic agricultural markets have been traditionally sheltered, like in all western countries, against the foreign food imports. This is done in Finland by means of quantitative restrictions, tariffs, and to a smaller extent, by import fees. Finnish exports to the low priced world markets require export subsidies higher than in the EC, because of higher cost price level in Finland. Export costs are jointly paid by the government and farmers. During recent years the rapidly increased burden of farmers' export costs has, of course, strongly decreased farm profitability and farm incomes.

In the near future, there will be radical institutional changes in foreign trade practices of agricultural products. The government is aiming at reduced export subsidies and will phase them out in the middle of the 1990's. Simultaneously, import protection is altered by replacing QR's with tariffs and variable import levies comparable with the EC practices. These decisions have been made solely from the government's point of view. Finnish agriculture and food industry may, in fact, be very adversely affected by these policy changes if a balance in the

*Table 1. Finland's foreign trade in foodstuffs in 1992.*

	Imports		Exports	
	FIM mill.	Per cent	FIM mill.	Percent
Free trade products	2037.9	34.6	1030.1	39.0
Other food manufactures	824.8	14.0	372.3	14.1
Dairy products	80.5	1.4	565.7	21.4
Primary products, total	2582.6	43.9	642.3	24.3
Fodder	358.9	6.1	29.5	1.1
<b>Total</b>	<b>5884.7</b>	<b>100.0</b>	<b>2640.0</b>	<b>100.0</b>

domestic agricultural product markets are not simultaneously achieved. The low competitiveness of the Finnish agri-food sector does not bear any extra burdens caused by changes in institutional practices.

## **6. Agriculture plays an essential role in the regional economy**

The role of agriculture in the national economy will be easily underestimated by introducing its modest contribution to GDP. In Finland, the real significance of agriculture can be found at the regional level. Agriculture, and farm forestry operated by farm families continue to be the single most important sector in the rural areas. In many remote rural municipalities, the number of people engaged in agriculture and forestry still account for over half of the total labour force. These sectors have also undergone major restructuring in the last decades; nowadays, production is highly specialized, and many jobs, which used to be carried out on the farm, are now done in other sectors.

The following paragraphs briefly describe the regional significance and differences of agriculture, and related industries in Finland, in 1990. Only direct employment effects are concerned since there are no figures available for indirect effects at the regional level.

In 1990, the average share of agriculture of the total workforce was 7.4 per cent. Including the corresponding shares of forestry (1.6%), fishing and hunting (0.1%), the share of the labour force amounted to 9.1 per cent. And further, if also food, drink, and tobacco are included, the total figure accounted for 11.5 per cent. It is worthy of notice that this high share of employment is mainly based on the domestic primary production, while the major part of the imported foodstuffs are products ready for consumption (ANON. 1993b).

At the regional level, the relative importance of the agriculture and food industries vary widely. The role of agriculture is highest in the middle, eastern and western parts of the country (see figure 3 and map appendix). In the same regions, farm forestry is also an important source of employment. The food industry is, however, located mainly in the southern and western parts of Finland. According to studies (RUSKA 1988, RUOTSALAINEN 1989), a special problem of the most remote regions (numbers 5-8, 10-11, for example), is that these regions lack both production input plants and food processing plants. Thus, a major part of production inputs are imported to these regions, and, both agricultural and forest primary products are exported outside the district in order to be processed. This is the main reason why the employment effects, as well as positive income effects, are low in these regions.

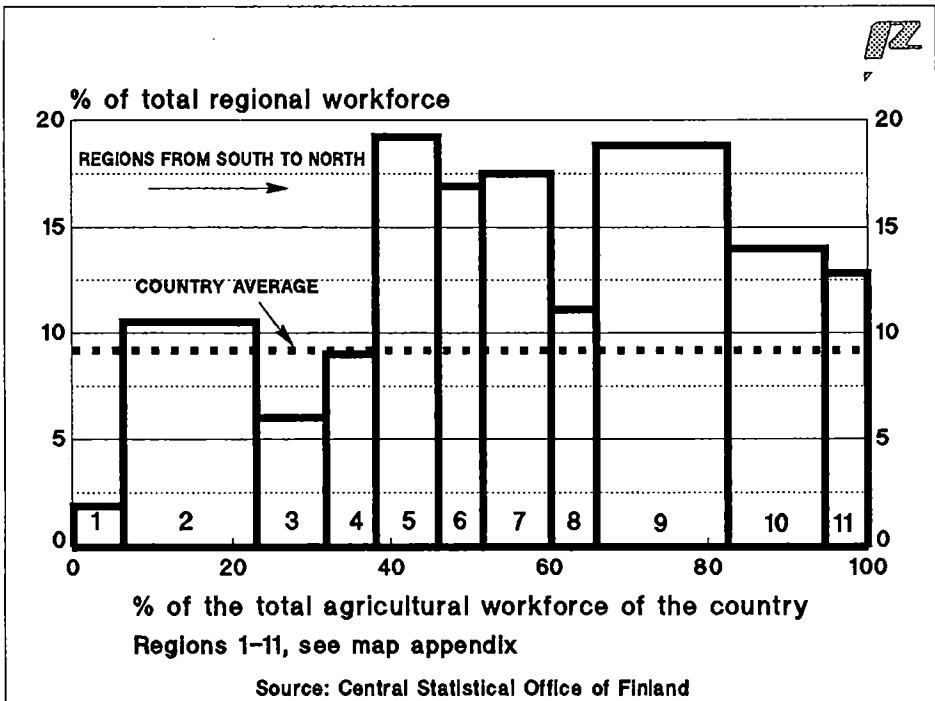


Figure 3. The proportion of the agricultural workforce by region, in 1990.

According to the national accounts, the south and southwest Finland are, in nominal terms, the most important regions as far as agricultural and food production are concerned. The value-added in agriculture for the three southern districts (regions no. 1-3) accounted for more than 40 per cent of the country's total, in 1990; the food industry in these areas contributed nearly two thirds, respectively. However, these two sectors contributed together only 5 per cent of the total value-added in the regions in question (ANON. 1993b).

As can be seen in figures 3 and 4, agriculture and food industries are rather heavily concentrated in the south and southwest Finland, especially the food industries. However, the more north and northeast one goes, the more important agriculture and food industries become, in relative economic terms. If statistics were more detailed and included only rural areas, we would find that in several regions agriculture and food processing accounts for half of the employment. These regions are the ones that are far from urban centres, which makes it impossible to successfully practise part-time farming, in combination with an urban occupation.

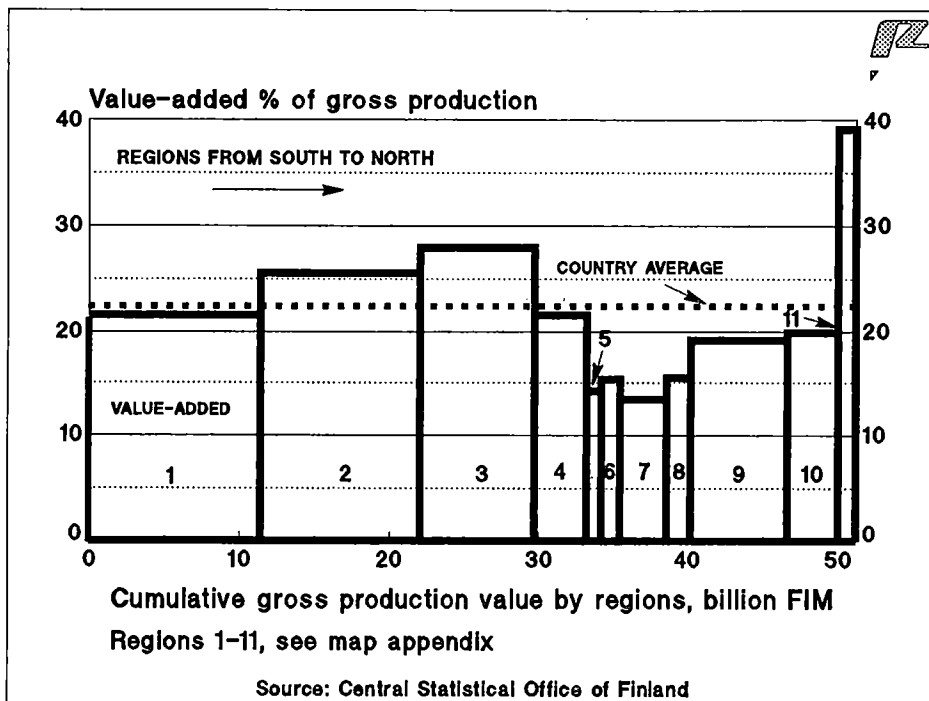


Figure 4. Regional distribution of the food industry, in terms of value-added, in 1990.

## 7. Rural areas highly dependent on agriculture and state aid

Finnish rural areas are still highly dependent on agriculture. In contrast, food industries are now located mainly in urban areas and do not give many employment possibilities to the rural population. The dependency of the rural areas on agriculture is pronounced by the fact that a major part of the current state support is allocated to rural areas, through agriculture.

The basic reason for supporting agriculture in Finland is to equalize regional production costs that vary from region to region due to different natural handicaps. Regional support is mainly given through price supplements, in particular for milk and beef. Recently, there has been a tendency to increase direct support to farmers. This has been carried out along with the suggestions of the OECD and the GATT, and to decrease the pressure to raise domestic food retail prices. However, this has made agriculture more and more dependent on the state budget resources.



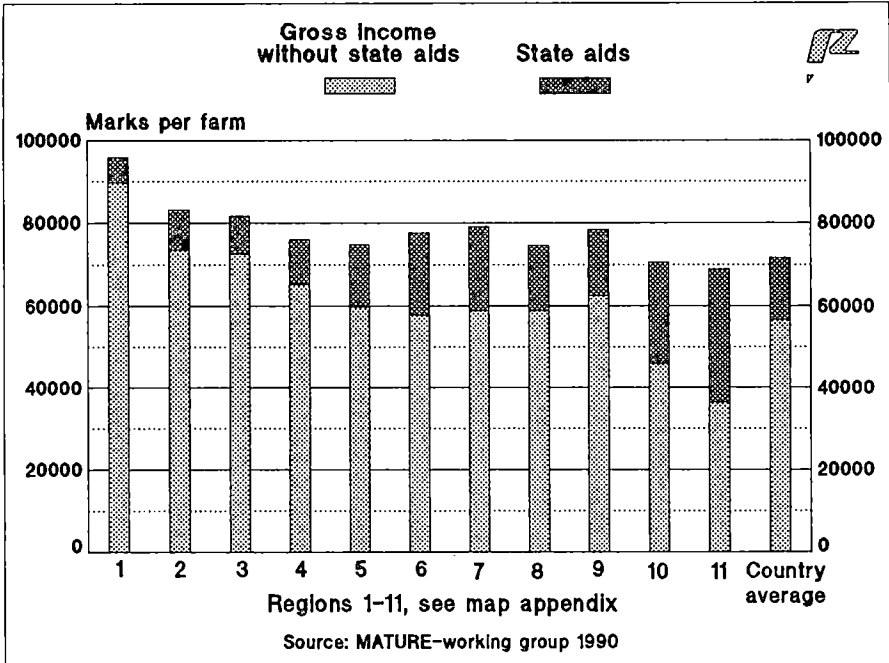


Figure 5. Agricultural gross income and state aids by region, in 1990.

For the agricultural incomes at the farm level, state support is crucial in the middle, eastern, and northern parts of Finland. In the northernmost province of Lapland, the amount of support is approximately half of the gross agricultural incomes per farm. In the eastern provinces, this ratio is a quarter, but only 10-15 per cent in south Finland. For agriculture as a whole, about 20 per cent of the gross income is derived from various forms of state aids (ANON. 1990)

For animal production, more than 30 per cent of total agricultural incomes originates from the state aids, with the exception of pork production, in which the corresponding share is less than 10 per cent. In general, state support is the most important for small farms having 10-20 hectares of arable land.

However, due to the recent trend of an increased direct support paid, e.g. according to acreage, all regions have become increasingly dependent on the state budget. According to the statistics of the Central Statistical Office of Finland (ANON. 1992d), a rather large share of support is allocated to the southern provinces (no. 1-3). In 1990, these provinces received about 40 per cent of the total amount of agricultural support, the province of west Finland (no. 9) nearly 20 per cent, but for those eastern and northern regions (no. 6-7, 10-11), in which the relative importance of support is the highest, they received altogether only one quarter of the total.

This very rough comparison shows that the volume of agricultural production mainly determines the regional allocation of support. After the year 1990, this trend has been essentially strengthened due to increased acreage support. It is clear that even the best Finnish regions of agricultural production are getting more and more dependent on state aids, and at the same time, very vulnerable to changes in the agricultural support policy.

## 8. High indebtedness of Finnish farms

Finnish farms are heavily in debt. In 1991, the agricultural debts totalled FIM 27 billion, which is close to the total annual gross incomes in agriculture. Annual net farm income is about FIM 7 billion.

The total volume of debts are distributed unevenly by regions. The largest shares of them are in west and southwest Finland, where the most agricultural production is located. Three provinces (no. 2, 9 and 10) contribute roughly half of the total farm debts. By production branches, the highest debts are in the pig and poultry farms, measured both in absolute and relative terms (ANON. 1992e, 1992f).

There are variations in indebtedness between farms for other reasons, too. In particular, a shift of the farm from the older generation to the younger, e.g. from a father to his son, increases farm debts. This is mainly due to payments paid by

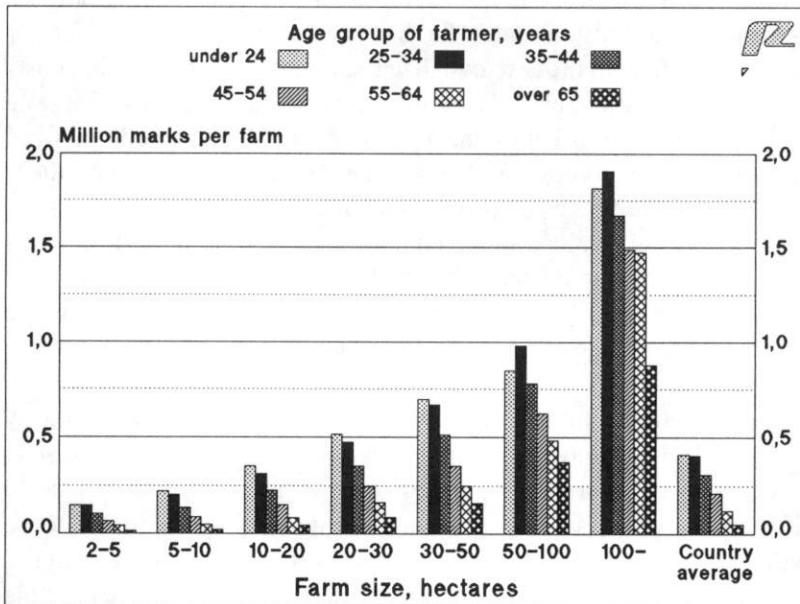


Figure 6. Agricultural debts by farmer's age and farm size in 1990.

a young farmer to his retired parents, sisters and brothers, and on the other hand, due to various investments made by a young farmer on his farm after “the purchase”. The consequences are the following: the younger a farmer, the higher the debts (see Figure 6).

The high debt burden of farms owned by young farmers can be regarded as a serious threat for Finnish farms in the future. This threat is a reality if Finland joins the EC. In this situation agricultural producer prices are expected to decrease far more than those of production input prices. Due to a high debt burden on large farms, their profitability will be weakened more than on smaller farms. In this economic situation, which farms will actually survive, the smaller ones without debts or the larger ones with a high debt burden?

## 9. Conclusions

Agriculture, as well as food industries are important to Finland. As in other western industrial countries, the share of agriculture has decreased rapidly, both in employment and income in the national economy as a whole. However, Finnish circumstances differ remarkably from those of many central European countries. Finland is a country of long distances and exceptionally vast rural areas. Agriculture plays a prominent role in rural development. There are still several rural regions in Finland in which nearly half of the employment is based on agriculture.

Agriculture in Finland is also a sector that has been supported by state aid for decades. This has been done in order to equalize the agricultural production costs that differ from region to region, because of different natural handicaps. The state support has had a very positive effect for the incomes of smaller and medium-sized farms, in particular in animal production, and in the middle, eastern and northern parts of the country. Agriculture has, however, become highly dependent on state aid, and simultaneously very vulnerable to changes in agricultural support measures. Recently, Finnish agricultural policy-makers have preferred direct support measures instead of the regionally differentiated price supports, mainly used in the past. This change has also made even the best production regions more and more dependent on state aids.

The current situation in Finnish agriculture and rural areas can be briefly summarized in the following way: first, Finnish agriculture is closely tied to state support, and second, vast, sparsely populated rural areas are closely related to agriculture. If there are essential changes in agricultural policy measures, these rural areas will lose a major part of their state aid derived through agriculture. Agricultural production will be reduced, in particular, after Finland's possible entry into the EC. If farmers will not be compensated for the economic losses of

decreased agricultural producer prices and agricultural production, rural areas will lose their vitality.

The Finnish food industry is based primarily on domestic raw materials. Thus, the relation between domestic agriculture and the food industry is very close and tight. If the domestic agricultural production is rapidly reduced, the food industry should be able to replace domestic raw materials, to a great extent, by the foreign produce in order to survive. This is, however, not possible to a large extent in many branches of the food industry (e.g. dairies, meat processing). The future scope of the Finnish food industries that process basic agricultural products will therefore depend essentially on the changes on the volume of Finnish agriculture. In contrast, a minor part of the food industry that is very effective and operates on the basis of imported raw materials (e.g. chocolate and confectionery), is not very dependent on policy changes.

In the case of agriculture, the relative share of employment and the value-added is the biggest in the eastern and middle parts of Finland. The situation is not the same in the food industry: the three southernmost provinces contribute almost two thirds of the value-added and the employment, as well. The importance of the food industry is already of minor importance in major parts of Finland. The reality of today is that many remote areas first import inputs for their agricultural production, and are also obliged to transport primary products produced outside the district for processing. These phenomena can be called "production leaks" and "processing leaks". The concrete results of these leaks are those described above, the indirect income and employment effects of primary agricultural and forestry are smaller than in southern and western Finland.

A possible Finnish entry to the European Community will bring with it an essential threat; there is a danger that Finnish agriculture and those industries closely related to it will be reduced drastically. A reduced agricultural production will adversely affect those remote rural areas where agriculture is still very important.

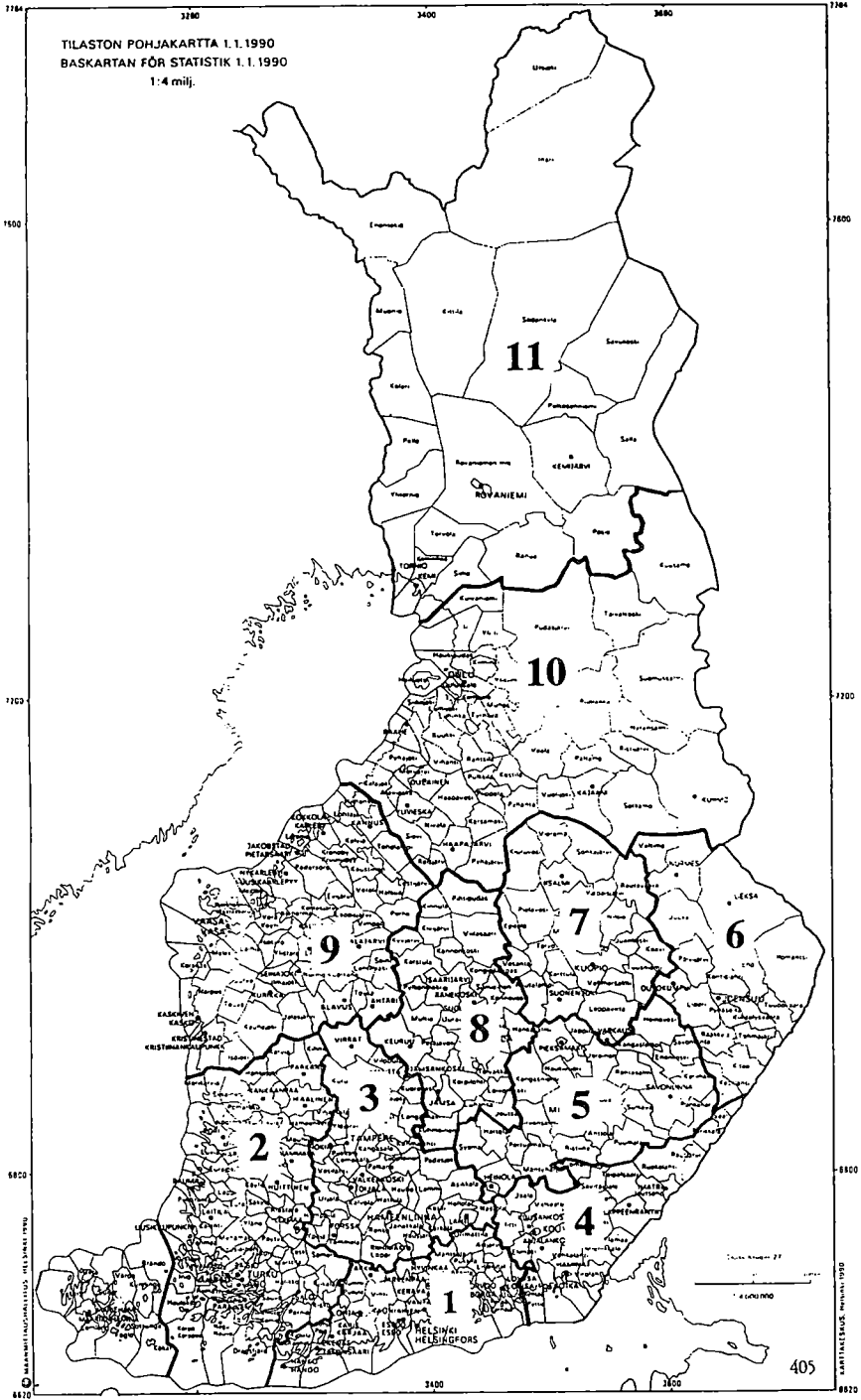
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**Map appendix:** Regions and their numbers used in the figures 3-6.



## GRAIN PRODUCTION AND THE CAP

### - The competitive consequences of the CAP reform

JUHA MARTTILA

**Abstract.** It is argued that only the largest and most efficient Finnish grain farms will be able to manage in the EC market. This article integrates the short run asset fixity of agriculture with the fundamental change of the production environment. The first conclusion is that farm family income of the most successful farms producing more than 92 tons of grain per year would be reduced almost 40% by the current CAP reform scheme compared to the previous CAP. It is the consequence of large capital intensity and informational problem in the determination of hectareage compensations. The income level of the smallest farms would drop to a negative level. Second, the short run analysis reveals a very critical situation for most of the largest grain farms. Due to high indebtedness, the farms with the highest probability of succeeding in the long run will experience a crisis if price and support levels of the EC are too rapidly adapted. Therefore, an adjustment period is needed before entering the CAP to assist farmers through the period of change.

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**Index words:** grain production, profitability, Finland, EC, CAP reform

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## 1. Introduction

Two-years of debate about the possibilities for Finnish agriculture in the EC has often culminated with discussion about the grain production. It has been said that Finnish grain production will not be able to survive with the complete removal of border protection between Finland and the EC countries due to low level of yields and the inefficient structure of production. All previous studies indicate that cereal production has the worst capabilities to adjust to the EC agricultural policy.

The weak position of Finnish grain production compared to that of animal husbandry is clearly shown by various production cost comparisons and farm level profitability studies (see MARTTILA & NIEMI 1992). For example, KOLA et. al. (1992) argues that grain production will be economically irrational even on the largest

Finnish farms due to low yields and today's heavy capital burden. Part-time farming is seen as the only alternative in securing an adequate income level and financing future farm investments through other sources of income. KETTUNEN (1992) concludes that the continuation of grain production is considered possible only in the best areas in Southern Finland.

Despite the intensive discussion, quantitative estimates of the volume of Finnish grain production under the CAP situation have been reported in only a few studies. This can be seen as a short run consequence of the widespread elements of the "farm problem". These include, for instance, the agricultural treadmill, increasing returns to size, imperfect competition, and fixed-asset theory (TWBETEN 1970). This complicated set of elements, characteristic of the farm sector, will make past estimates very biased when the production environment fundamentally changes under the CAP. However, two examples of a very short list of quantitative estimates can be mentioned. According to VAITTINEN (1992) the EC membership would reduce crop production about 70% in the short run and 90% in the long run. These estimates are based on econometric partial equilibrium models. Furthermore, the applied general equilibrium model simulations of TÖRMÄ (1993) paint an even more bleak picture. He predicts that over 70% of grain production would be lost in the short run, and long run effects would put an end to all grain production. Both studies are based on presumption that Finland will adapt the current CAP.

However, the core of the EC grain policy mechanism was altered by the Council's CAP reform agreement in 1992 (REG. 1765/92 and 1766/92). Through the combination of price adjustment, direct subsidisation and set-aside, the CAP attempts to cut the growing surplus of grain and to turn the policy measurements toward more social aspects. The new regime for grain policy will come into force gradually between the 1993/94 and 1995/96 marketing years. Thus, it will probably be applied at the time of accession of the new member countries like Finland.

According to the new regime, a single intervention price will apply to all kinds of grain. This price will be 100 ECU per ton in 1995/96 which means a 32-36 per cent reduction compared to buying-in prices in 1992/93. At the same time, a single target price will go down to 110 ECU which is only half the target prices of feed grains in Finland. Income losses will be compensated by the payments per hectare calculated on the basis of regional productivity. The compensation payment for grain will be 45 ecu per ton in 1995/96, and this will be paid only to farmers who have a 15% rotational set aside. Small producers who grow less than 92 tons are exempt from the set aside. Although the final reform agreement was a compromise and a slightly weakened version of the former proposal of MacSharry (COMMISSION 1991), the new mechanism will drastically affect the farms profitability in some circumstances.

The intention of this paper is to analyse both the farm level effects of the CAP reform and the short run profitability of grain production farms in the CAP reform



environment. The main focus will be the conflict between production efficiency and the regulation system of the reform in terms of equity, incomplete information, risk aversion and asset fixity. The short run effects are investigated using a panel data set of very specialized Finnish grain farms. The final sections summarize the results with comments on possible extensions.

## **2. Some implications of the CAP reform**

Area reduction and compensatory payments are the main elements of the CAP reform. Respectively, the first is adopted to cut growing surpluses in grain production, and the latter to compensate market price reduction. In this chapter, some farm base implications of these policy changes are considered.

The acreage reduction programmes in Europe have been insignificant compared to those in the United States. In the USA the voluntary set-aside program was introduced in the late 1980's, but the effect has been very slight in cutting overproduction. Farmers are eligible to receive loans and deficiency payments if they remove a specified percentage of their normal crop acreage. Therefore, it is possible to examine the impact of these programs by reviewing the American case. ERVIN (1988) points out the weaknesses of area controls for supply management. Farmers participating in programmes use their lowest net return areas for the set aside. Furthermore, they may apply more inputs to their remaining area. It is also possible that the farmers not participating may farm their area more intensively if they expect that area reduction will raise market prices in the future. The same results are partially observed in the Finnish fallowing program. The new EC system attempts to avoid these problems because the scheme is obligatory and a rotational set-aside is only permitted in principle.

Payments per hectare for fallowed area are set to the level of regional area productivity in the CAP reform system. Productivity is based on the average yields between 1986/87 and 1990/91 with the years with the highest and the lowest yields not taken into consideration. If the goal is equity, the most attractive scheme would be to determine the productivity of each individual farm and base compensation on the productivity of each farm. This, however, would entail a large budget due to the research and supervision costs.

Due to large variation in area productivity, even in the small regions, a voluntary set-aside would lead to the problem of adverse selection. The situation can be conceived as a game of incomplete information about the productivity of land. First, the government sets compensation based on the average regional productivity. Then the farmer, who has better information about productivity, reacts to the set-aside policy. In the most extreme case, only "bad" farmland would be taken out

of cultivation. Analogously, the efficiency of the obligatory program can be reduced by informational problems, even in the case of rotational set-aside. Moral hazard (see ARNOTT & STIGLITZ 1988) arises in the enforcement of the set-aside because the performance of the farmer is too costly to be observed completely. The individual farmer must participate in the program, but he can vary the intensity of farming every year and, still vary the output of his farm. Thus, the instruments of the CAP reform policy can lead to coordination failures due to informational problems.

Another aspect appears if there exists a behaviour like risk aversion on the individuals affected by the area reduction program. Some implications can be expanded to the case of compensatory amounts which are used in compensating market price reductions. These schemes stabilize annual changes in returns, and the risk benefits depend on, among other things, the degree of risk aversion of farmers. Thus, when the government or any other institution is setting the optimal level of compensation, there is the question of determining exactly how risk averse farmers are. Many of the econometric studies of agricultural supply response which include risk variables have been published, for example the pioneering work of JUST (1974). Expectations often have a fundamental role in these models.

Existing uncertainty, both in annual yields and in the price level, and portfolio theory can be used to explain a preference among risk averse producers for product diversification (FRASER 1990 & 1991), and for price cuts compensated by direct support. Thus, the compensatory payments of CAP reform will reduce the variability of the net returns of all farms, and reduce the expected level of net returns on farms which exceed the average productivity. The lower the rate of risk aversion and the higher the expected return of uncertain production; the more unprofitable is this stabilization scheme for the successful farmer. Conversely, farmers that are very risk adverse would prefer the new system of hectare payments because it reduces the variability of income. This result follows from standard economic behaviour and the method of compensation under the CAP.

In addition, the reform package will make the utilization of product complementarity possible. For example, the land laid idle may be used to grow commodities which are not primarily intended for and consumed by humans or animals, for example grain and oilseeds for bio-ethanol and chemicals. The productivity of farmland can also be improved by a rotation system. If both farmers' risk aversion and product complementarity are taken into account, the Pareto superior compensation would be set below the level of average productivity. This will be partly obtained in the course of time, because the premiums of the CAP reform are calculated on the historical data, and annual progress in productivity is not being taken into account.

Finally, the reform of the agricultural policy can result in farm level problems if there exist any fixity of farm assets. According to the traditional definition, an

asset is fixed when its marginal value product in its present on-farm use neither justifies the acquisition of more of it, or its disposition (HSU & CHANG 1990). The fixity theory supposes that there is a gap between the acquisition cost and the salvage value of a resource. JOHNSON & PASOUR (1981) have criticized this divergence because it is inconsistent with the theory of efficient asset markets. However, if we are looking at the agricultural sector, the regional disintegration of production leads to the fixity of land and farm buildings. Furthermore, the salvage value of agricultural machines is quite low in the shrinking markets. Also the same can be said for the value of farm family labour. Thus, these adjustment costs will reduce the farm profitability when the production environment rapidly changes.

In this study, the following simple investment rule is defined (see VASAVADA & CHAMBERS 1986): agricultural investment is positive if the asset's acquisition cost, at the margin, is less than value in use on the farm. Likewise, if the asset's resale value exceeds the value in use on the farm, it pays to disinvest. Factors are "trapped" in their current uses when the farm value is less than the acquisition cost but exceeds the resale value. Further, when the resale value of capital and farm family labour inputs approach zero the probability of trapping in extreme fixity is increasing. We observe these effects in the short run adaptation of Finnish grain farms (chapter 4) to the environment of the CAP reform.

### 3. The data<sup>1</sup>

In the previous studies (e.g. KETTUNEN & MARTTILA 1992), the nature of multi-product firms has caused problems in cost allocation between different products. Therefore, the farm data of this study only includes farms which are very specialized in grain production. The data consists of bookkeeping farms participating in the agricultural profitability survey which had a gross return from grains accounting for over 75% of the total gross return of agriculture in 1989 and 1990. Thus, the data consists of the accounting statistics of 56 farms. This has been expanded to cover the business years 1988 and 1991, too.

The farms have been divided into three groups by taking account of the determination of the fallowing system of the CAP reform. The annual grain production of small farms is less than 92 tons. Large farms produce between 92 and 184 tons per year, and very large farms produce more than 184 tons. Table 1 shows the basic statistics of these three groups.

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<sup>1</sup>The assistance of the Bureau for Profitability Studies of the Agricultural Economics Research Institute, especially Leena Riepponen and Seppo Holmström in data collection, is gratefully acknowledged.

*Table 1. Farm size, production and assets by farm groups, on average in 1988-1991.*

	Small farms	Large farms	Very large farms
Arable land, ha	18.2	36.3	93.3
of which grain area, ha	16.0	30.3	79.8
Grain production, tons	53	117	301
-"- , tons/ha	3.33	3.85	3.77
Capital input, FIM 1000/ha	31.6	32.3	31.6
Labour input, hours/ha	48.6	36.1	30.0
Debts, FIM 1000/ha	11.2	8.4	10.5
Share of farms, %	29	44	27
Share of production, %	11	25	64

The mean farm size is 46 hectares and the median is 36 hectares. The sample distribution skews sharply to right like the actual distribution of all Finnish farms. According to the AGRICULTURAL CENSUS (1990), the farms which had more than 10 hectares arable land and specialized to grain production were distributed such that only 10% had more than 50 hectares, 29% had 25-50 hectares, and 61% had less than 25 hectares. Thus, the farms in this sample are clearly larger than Finnish farms on average.

These farms have reached high hectareage grain yields compared to other Finnish farms. In spite of this, the yield level is decisively lower than in the most efficient countries in the EC. In 1991, for the farms included in this study, the hectareage yield of the largest groups was 4.5 tons per hectare, and small producers reached 4 tons per hectare. In 1988, the yield for the sample remained at 2.7 tons per hectare.

The average capital input reaches its maximum at the medium farm size, while the average labour input decreases with the increase in farm size. The debt-capital ratio of the medium farms is clearly the lowest. Many farms have become deeply involved in debt through transfers of ownership to a descendant and the expansion of the farm size. These factors will play an important role in the analyse of next chapter.

Farm family income is used as an economic indicator of profitability. It is calculated by deducting from the gross return the production costs, excluding taxes, interest claim for capital and the value of the labour supplied by the farmers and their families. Because the capital and labour inputs have varied slightly during the four-year period, farm family income offers a good approximation of annual

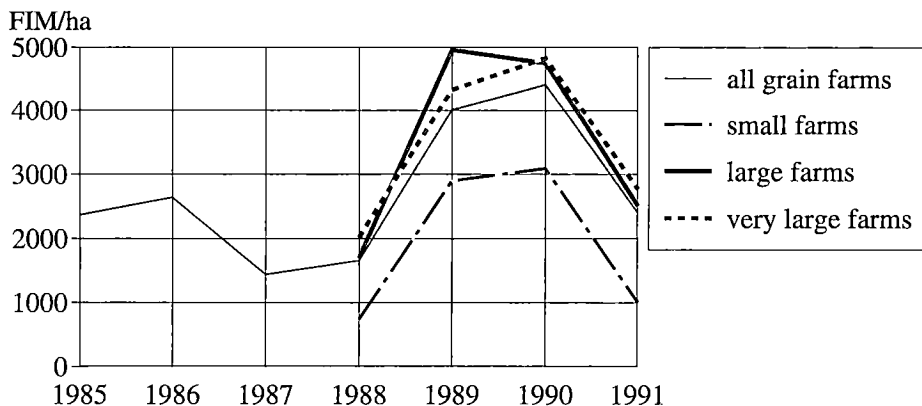


Figure 1. Farm family income of the selected farms and all bookkeeping farms specialized in grain production, FIM/hectare.

changes in profitability. The level of farm family income per hectare of the farms of this study is presented in figure 1. At the same time, it is compared to longer term farm family income of all bookkeeping farms specialized in grain production.

Large variation in the annual profitability characterizes the economic situation of Finnish grain farms. The low farm family income in 1988 was more than doubled during the next two years. Although the hectareage yields were at a record level, incomes dropped drastically in 1991 when a mandatory fallowing system came into effect, and producer prices were lowered by export costs charges. Small farms, producing less than 92 tons, have been in the poorest position. Farm family income has varied between FIM 800 and FIM 3,000 per hectare, while larger farms have received almost FIM 5,000 during the best years. The results of all the bookkeeping farms reflects similar income levels as the farms in the sample.

#### 4. Quantitative results

The aim of following analysis is to estimate the effect of the EC membership on the profitability of grain farms. Linear homogeneity of production and cost functions with regard to arable land is assumed in adaptation in the new set aside scheme of CAP reform. Positive effects of land complementarity are not taken into consideration. Capital costs are fixed at the current level. Furthermore, the price of seed is lowered with respect to price cuts of grain.

Figures 2,3 and 4 show the level of farm family income in three alternative settings. First, the price level of grain is fixed at the buying-in level during 1988-1991 (the previous CAP). A fallowing scheme is not included in this alternative. Second, under the CAP reform situation, farms producing more than 92 tons are forced to reduce their area by 15 % of the current plantings. Compensatory amounts and other premiums are calculated individually according to the regional area productivity of each rural centre. So, Finland is divided into 20 separate areas, and payments per hectare are determined just like in the EC. These vary between FIM 1,150 per hectare in the rural centre of Nylands svenska and FIM 800 per hectare in the rural centre of Keski-Suomi. Produced grain is sold at the intervention price of 100 ECU per ton. The green exchange rate used in this content is 1 ECU=7.8 FIM. Finally, in the third alternative (CAP reform + LFA), it is assumed that farmers are entitled to compensatory allowances (102 ECU per hectare) of the less favoured areas. It is not paid for the area cultivated by wheat. KUHMONEN et al. (1992) estimate that only a very restricted share of arable land in Finland fulfill the stipulations of the current regime. Thus, there is a need for rearrangements in this alternative.

Results reveal that successful farmers with above-average yields will not be sufficiently compensated by the new regime for the EC grain policy. Farm family income of the CAP reform exceeds the result of the previous CAP only in 1988. In other years, the gap raises to the level of FIM 500 per hectare on average. Even if less variation in income due to the reform is preferred by a risk averse producer, the drop in income does not conform to the principles of equity. The situation is extremely alarming because these efficient farms are supposed to have the best competitiveness in the future EC situation.

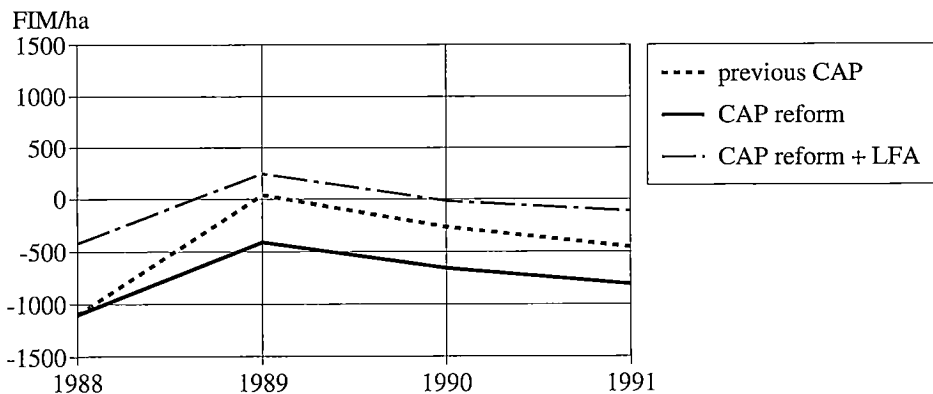


Figure 2. Farm family income of small farms (less than 92 tons per year) in the case of the previous CAP, CAP reform and compensatory allowances of LFA, FIM per hectare.

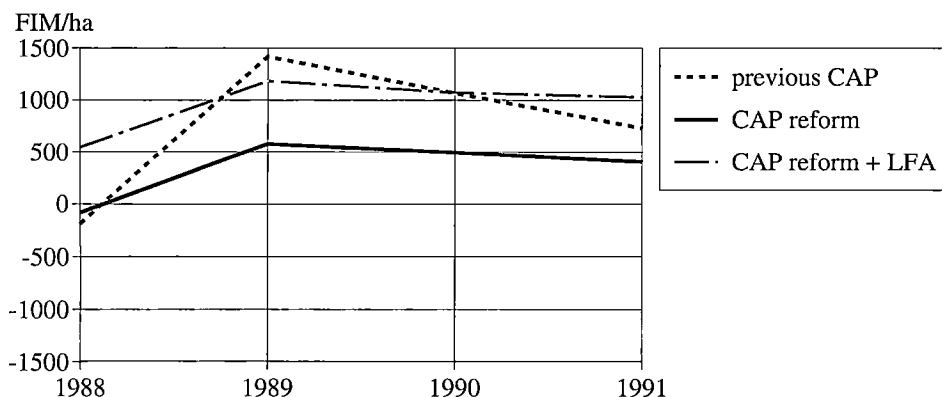


Figure 3. Farm family income of large farms (92-184 tons per year), FIM per hectare.

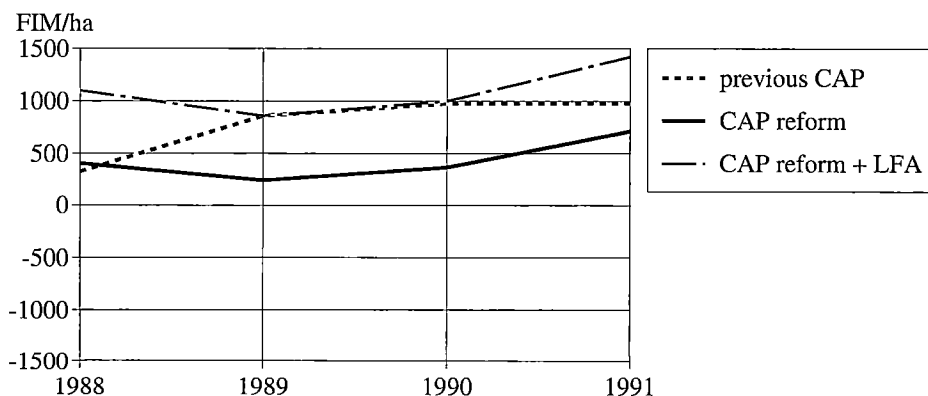


Figure 4. Farm family income of very large farms (more than 184 tons per year), FIM per hectare.

The smallest farms receive a farm family income which is clearly below the zero level under the CAP reform regime. The effects of instituting the price and support level of the CAP reform would constitute FIM 1,900-3,800 lower incomes compared to the realized incomes between 1988 and 1991. Even if they would be entitled to compensatory allowances of LFA, farm family income comes up to be positive only in 1989. Revenues generated by these farms at LFA support level would be grossly inadequate in terms of incomes and investment prospects.

In the same manner, introducing the CAP reform would cause a FIM 1,800 per hectare cut in the 1988 level of farm family income received by large farms. However, the gap approaches FIM 4,500 in the most extreme cases in 1989 and 1990. During the most successful years, the pricing mechanism of the previous CAP might produce an even higher level of income than a combination of reform and LFA aid.

Not even the largest farms will have promising prospects in the potential EC situation, although the received farm family income remains positive in all alternatives. As a result of CAP reform, not only are the variations of incomes nearly equalized but the trend of annual changes in incomes are reversed (see Figure 1). The outcomes received in 1989 and 1990 turn to be lower than 1988. This is a consequence of the sharp expansion of rye cultivation in 1989 and 1990 which would be a totally irrational development at the EC prices. Furthermore, the cultivation of oilseeds exceed the general level in 1988, and the new oilseed market regime of the EC seems to offer a quite competitive position for these farms, compared to the grain regime.

The calculations indicate that joining the CAP, even modified by the LFA support, would have a particularly severe impact on the Finnish farms specializing in cereal production. Table 2 shows the very short run effects on the number of farms and on the production of grain. Furthermore, the reduction of the use of farm capital and labour is presented. Estimates are based on the assumption that production is totally ended due to a crisis in financing, for example, if revenues do not cover the level of variable costs and interest payments. The resale value of farm

*Table 2. Reduction of the use of farm assets, production and number of farms when the assets' resale value is zero (incl. farm family labour), as a percentage of 1988-1991 values.*

Farm size		Small	Large	Very large	All farms
Capital	CAP reform	-44	-13	-36	-28
	+ LFA	-15	- 0	-15	- 9
Labour	CAP reform	-40	- 9	-37	-27
	+ LFA	-12	- 0	-13	- 8
Production	CAP reform	-42	-11	-38	-29
	+ LFA	-12	- 0	-16	-10
Farms	CAP reform	-38	-12	-27	-23
	+ LFA	-12	- 0	- 7	- 5



capital and farm family labour is assumed to be zero, and assets are trapped totally in their current uses. This creates the very short run starting point for the dynamics of adaptation for the grain sector.

The findings show that 23% of the farms have an incentive to stop production immediately, if the policy follows the regime of CAP reform. The share of capital and labour inputs used by these farms is even higher which leads to 29% reduction in the volume of grain production. The adaptation of the LFA scheme would clearly reduce the number of farms which will fall below the break-even level in this extreme case. However, the production of grain would reduce by 10% even in this alternative.

Farms in the weakest position are more capital intensive than farms on average. These farms have high debt-to-asset ratios due to large investments based on the expectations according to the favourable domestic price development. The short run cut in production would be 38% of total grain output for the very large farms which have the heaviest burden of debts. The number of farms would reduce slightly which indicate that the worst problems are generally encountered by the largest farms even in this group. Financial crisis will arise when prices and the support level drops, even though these farms are believed to be the most capable of surviving in the long run. In comparison, the cut in production on large farms would be only 11% due to a reasonable balance of contracting debts.

Next, total capital fixity is assumed in the second procedure (Table 3). Farm family labour input is assumed to have, however, an alternative value of FIM 30 per hour in off-farm uses which means a total annual value of FIM 40,000 on

*Table 3. Reduction of the use of farm assets, production and number of farms when the resale value of capital is zero and the alternative value of labour is FIM 30/h, as a percentage of 1988-1991 values.*

Farm size		Small	Large	Very large	All farms
Capital	CAP reform	-95	-40	-65	-59
	+ LFA	-75	-19	-35	-34
Labour	CAP reform	-98	-50	-76	-70
	+ LFA	-86	-23	-38	-40
Production	CAP reform	-93	-42	-71	-63
	+ LFA	-57	-19	-32	-32
Farms	CAP reform	-94	-44	-67	-64
	+ LFA	-75	-20	-27	-38

average. The amount of farm family labour input is supposed to be totally indivisible, so if the salvage value at the margin exceeds the value in use on the farm, it pays to disinvest all units being used in agriculture. This very restricted investment rule can be justified when the strict time dependence of agricultural work is taken into account.

Despite the low wage claim for agricultural work, the results indicate dramatic losses of grain production. Volume of production would be reduced from 42% on large farms to 93% on small farms. The largest farm size would face 71% cut in production. Totally, the reduction would be 63%, if the CAP reform scheme is adopted. On the other hand, compensatory allowances paid by the LFA system would improve their position so that only half of the previous cut would be withdrawn. The effects on small farms would be fatal, even in this case.

In the pure CAP reform scheme, 64% of farms, 70% of agricultural employment and 59% of agricultural capital would be lost in the very short run. Of course, the most labour intensive production is punished by these assumptions. In any case, it is possible to estimate more fundamental short run changes in production and structure by allowing greater flexibility of agricultural assets. The fixity depends heavily on the time interval of the adjustment period. The length of time when the "farm problem" dominates will determine the adjustment path of grain production in the long run.

## **5. The future of grain production**

The short run estimates present a very difficult situation for Finnish grain farms in adaptation to the CAP. The unit costs of production exceed the price and support level of the EC mainly due to the low yield level and unfavourable farm structure. Furthermore, the implications of the CAP reform tend to be very harmful for the most efficient farms.

The long run effects will depend ultimately on the fixity of farm assets. Especially, the potential for reallocation of arable land will be the key factor in the adaptation process. Without a stabilization program, large amount of grain farms will fall into a financial crisis, even in the very short run if agricultural prices drop. Increasing the supply of land and decreasing land prices will accelerate the rapid structural change. The scattered location of Finnish farm land will be a very restrictive element in this aspect.

According to the study of KETTUNEN & MARTTILA (1992), the unit costs of grain production would fall to the competitive level if farm size clearly exceeds 100 hectares. The heavy indebtedness of these farms is a particular problem which usually has not been considered in the profitability studies. An adjustment period, when farms can operate at the current or slightly decreasing price level, is needed

to avoid short-sighted foreclosures on large farms that would be able to succeed in the long run.

The eventual need for larger grain farms in the future is based on the cost structure of production. For example, the share of capital costs is three times higher in grain farming compared to pork production (ALA-MANTILA 1992). A scale effect seems to be very significant in machinery and building costs. According to the bookkeeping farms analyzed in the previous chapters, the sharp reduction, for example, in tractor costs can be achieved through the growth of farm size. The cost level of small farms exceeds FIM 900 per hectare while very large farms reach the level of FIM 500 per hectare. The same effect can be observed with respect to the other capital expenditures.

Even in the largest grain farms it would be impossible to achieve an adequate income level without other sources of income. The very large farms of this study would receive total farm family income of average FIM 41,000 per year in the alternative of CAP reform, and application of LFA's support system would increase it to FIM 100,000 per year. Practically, even the expansion of farm size would have to be financed by using outside sources of income. Forestry would represent an important source of additional income in some cases. However, farmers typically own very restricted amounts of forest land in the main regions of grain farming. The actual part-time farming, or farming as a "hobby", can play a crucial role in the future of Finnish grain production. The starting point for this kind of development is very limited because part-time farming does not have a stable and accepted status in the current Finnish agriculture partly due to the previous agricultural policy. In the extreme cases, the combination of farming with off-farm employment would be more an attempt to maintain a particular lifestyle than an actual farm survival strategy for the future.

Despite the possible growth of farm size, there still exists the basic problem of low yields in Finnish grain production. In the major producer countries of the EC, average yields have increased more rapidly than in Finland during the last two decades. The most substantial growth in yield in the EC has been recorded by common wheat. In particular, there has been a steady shift away from lower yielding spring wheats toward higher yielding winter varieties. In Finland, the very progressive pricing policy between feed and bread grains has restricted this kind of development. If the price gap is reduced, there can arise the need for a shift toward the winter varieties of feed wheat also in Finland. The economic risk of quality variations is decisively lower than before.

The future production of bread grains seems to be very critical. The new intervention price system of the EC will cut minimum prices to the level of feed grains. However, large amounts of high quality wheat are imported to the EC as a differentiated product. The price of imported grain exceeds domestic prices due to variable import levy. These elements will cause a great deal of uncertainty in producer prices of bread grain. Long term contracts between milling industries and

farmers would offer a decisive way to reduce price uncertainty, and assure that a part of production would continue in Finland.

Finally, it has been noted that the basis for the compensation payments and set-aside premiums of CAP reform would have a harmful effect on the most effective grain farms. The division of this study into 20 separate areas is too broad for the Finnish conditions. Of course, there is a chance for many alternatives, because the EC countries themselves are authorized to arrange this regionalization. Multi-regionalism should be considered, if a useful basis for the compensation would be the yields achieved on each individual farm. Furthermore, the payments per hectare are not planned to be revised in accordance with the annual progress in productivity. Although the evident reduction of marginal cultivation areas and possible technical development, e.g. in the form of higher yielding winter varieties, would increase yield levels in Finland, it would not be compensated by the hectare aid. Some of the same informational problems will be faced, if Finnish farming is granted any special arrangements in the support systems of the CAP.

## 6. Conclusions

The new regime for the EC grain policy has an ambitious goal in controlling output. First, the program of area reduction is closely tied to the set-aside scheme. According to previous experience, the problem of adverse selection would arise due to farmers' strategic behaviour in the sense that the lowest net return land is fallowed. This will reduce the social benefits of supply management. Therefore, all of arable land is eligible for rotational fallowing in the new program. Second, the reduction of grain prices is intended to promote more extensive farming. Farmers' income losses are compensated by hectare support under this program.

The empirical results from the Finnish bookkeeping farms reveal that the efficient producers will not be sufficiently compensated on the basis of the CAP reform scheme. The amount of compensation payment is derived from the regional area productivity. Thus, these farms with above-average yields would receive about FIM 500 per hectare lower farm family income compared to the price level of the previous CAP. The new system will equalize the annual incomes and reduce risk, but it produces slightly better results only during the worst years.

Small farms, which produce less than 92 tons per year, have no economic reason to continue production, even if they were entitled to the LFA support system in the EC. Larger farms would receive positive farm family income, but the level would be dramatically lower than in the present situation. Off-farm incomes are needed to secure the desired income level and finance future investments.

The short run effects of the EC membership are estimated by assuming total capital fixity. If there is no alternative value of farm family labour, the volume of

grain production will be reduced by almost 30% immediately. The cut in production will exceed 60%, when less fixity of labour is allowed. Very large farms seem to be the most vulnerable to the sudden changes in market prices. These farms have the heaviest burden of debts due to large investments based on the expectation of favourable price development. An adjustment period and stabilization scheme are needed to avoid a threatening financial crisis of the largest farms most capable to manage in the long run.

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# CHALLENGES FACING THE FINNISH LIVESTOCK SECTOR AS REGARDS TO THE INTEGRATED EUROPEAN MARKET

JYRKI NIEMI

**Abstract.** Application of the Common Agricultural Policy (CAP) to Finland, assuming EC membership, will fundamentally affect the country's livestock industry. This study examines and measures the impacts of such a change upon producers' earnings. The characteristics and specific problems likely to be met by the main individual branches of the processing sector are also discussed. Particular attention is directed to the dairy and pork sectors. It is concluded, that if the producer prices are at the same level with the EC countries, the income of livestock farmers will be severely affected even though input prices would be lowered to the EC level. Adjustment to farm sizes more appropriate to modern technology is essential if productivity is to be increased and costs reduced. Individual firms in the livestock industry have differing views on the Finland's competitive position, some locational factors seem positive, others negative. To survive in the single market firms will need a strategy adapted to their particular market whether local or international.

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**Index words:** EC, CAP, Finland, livestock farming, production costs, profitability

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## 1. Introduction

The prospect of the EC-membership has generated considerable discussion and research analyzing its possible impact on the Finnish agricultural sector. Several studies have documented the effects of integration on agricultural production, agricultural prices, producer income and trade. This article attempts to provide information on the effects of membership on the Finnish livestock sector.

About three-fourths of Finland's total agricultural production derives from livestock farming. The most important product in the area of livestock farming is milk. Currently, it accounts for 35 per cent of the total return of agricultural production and its importance is magnified by the close linkages that exist with the

beef sector. Beef is mainly a by-product of milk production. The share of cattle production rises to about half of the total value of production when beef is taken into account.

Pig farming accounts for 14 per cent and poultry farming 5 per cent of the total return from agricultural production. In addition small amounts of mutton are produced in Finland. Pork and eggs are produced by specialized farms. Pig and poultry farming are, however, less important in rural policy than dairy farming.

If Finland becomes a member of the EC, the present national policies will disappear and they will be replaced by the Common Agricultural Policy of the EC. The internal prices for livestock products in the EC are in general lower than in Finland. In the case of milk, the producer price in Finland has been 40 to 50 per cent higher than the average producer price in the EC-countries. The producer prices of beef and pork have been about 70-80 per cent higher. Therefore, the EC-membership would cause a drop in the price received by producers. In addition, potential suppliers of livestock products from the existing EC-countries, e.g. Denmark and Germany might be able to penetrate into the Finnish market.

This naturally gives rise to some questions: What would be the situation for Finnish livestock production in case market conditions change? How will production and consumption develop in the future? What will be the effect of lower producer prices on profitability, and how would changes in agricultural policy affect markets for Finnish livestock farming? These questions form the basis for this article, the purpose of which is to identify the strengths and weaknesses of Finnish livestock sector within the single European market.

For the policy makers interested in assessing the effects of accession, it is important to identify the specific market conditions for the commodities in question. Therefore, the effects of accession must be considered in light of the market structure and conditions prior to entry, and the ability of markets to adjust to the changing environment. Since the food marketing system accounts for about 70 per cent of the consumers expenditures for food, how efficiently and effectively this system performs obviously affects the survival prospects of farming. Especially, the competitiveness of the domestic processing level will increasingly affect the profitability of livestock farmers.

Initially, certain features of Finnish livestock industry, such as its structure and productivity, are briefly outlined (section 2). The next section (3) presents production cost comparisons between Finland and Denmark. It is followed by calculations of the impact of EC membership upon producers' earnings. Section 5 examines some of the major developments affecting the structure and performance of the processing sector as it moves into the single market. The final section summarizes the findings.



## 2. The Finnish livestock sector

### 2.1. Outline of the dairy industry in Finland

The dairy industry can be broadly divided into two main categories: the on-farm sector and the processing sector. The basic product, milk, serves both as a consumer product and as a raw material for a wide range of dairy products, each with its own distinct manufacturing process, end uses and marketing requirements. This current outline of the Finnish dairy industries proceeds in two stages, the first concentrating on production of raw milk on farms, the second on the utilisation of that milk by the processing arm of the industry, and the disposal of dairy products in the market.

Finland has witnessed considerable technical advances in dairy production since 1960. Partly this reflects biological improvements in animal husbandry, the extension of artificial breeding, animal health measures and the introduction of high yielding breeds. And partly this reflects improvements in farm management or the application of improved inputs.

Table 1 outlines changes in the total number of animals, yields and production of milk over the period 1960-1990. The number of dairy cows has declined by almost 60 per cent since the early 1960s. The long-term decline in cow numbers was, however, offset by increases in yield per cow, so that overall production between 1961 and 1990 decreased by only about 20 per cent. The numbers in the table indicate the tremendous improvement in productivity.

A second important aspect is that herd size per farm has increased and dairy farms have become more specialized. The structure of the dairy sector has

*Table 1. Dairy cow numbers and production in Finland 1960-1992.*

Year	Number of dairy cows (thousands)	Yield per cow litres	Milk production mill.litres	Number of holdings
1960	1,153	2,955	3,384	243,412
1965	1,138	3,277	3,655	240,051
1970	969	3,680	3,213	189,901
1975	773	3,997	3,065	127,574
1980	720	4,478	3,174	91,355
1985	627	4,812	2,988	65,752
1990	490	5,547	2,730	45,489
1992	428	5,613	2,400	36,474

drastically changed over time. In 1980 there were still 90,000 farms with dairy cows (Table 1), but their number has fallen by more than 50 per cent in the last 10 years. The 1990 agricultural census recorded altogether 45,000 dairy farms with more than two cows. And the rapid structural change continues. The number of holdings has declined by almost 20% since 1990. In 1992 there were 36,000 dairy farms delivering milk to the dairies.

Most dairy farms are privately owned and owner operated. Farm size has only increased slowly, as current agricultural policy does not favour big enterprises and farm amalgamation is rare because of the high cost of land (KETTUNEN1993). The average dairy herd size is 11 cows. Less than 20 per cent of all farms have more than 15 cows, and farms with over 50 cows are practically non-existent.

In 1970, only 15 per cent of the dairy cows were located on farms with more than 15 cows. By 1990 about 40 per cent of the dairy cows were located on farms of more than 15 cows. However, only 3 per cent of the dairy cows are currently in the herds of 30 or more which economists consider to be the herd size at which significant reductions in fixed costs can be achieved from structural improvements (KÖGL & PLESSER 1988, BELOTTI et al. 1991). Figure 1 compares in detail the size structure of Finnish dairy farms with that of the northern EC countries.

Production structure has changed over the course of time so that the share of milk has decreased, whereas that of meat has increased. Still in the 1960's almost

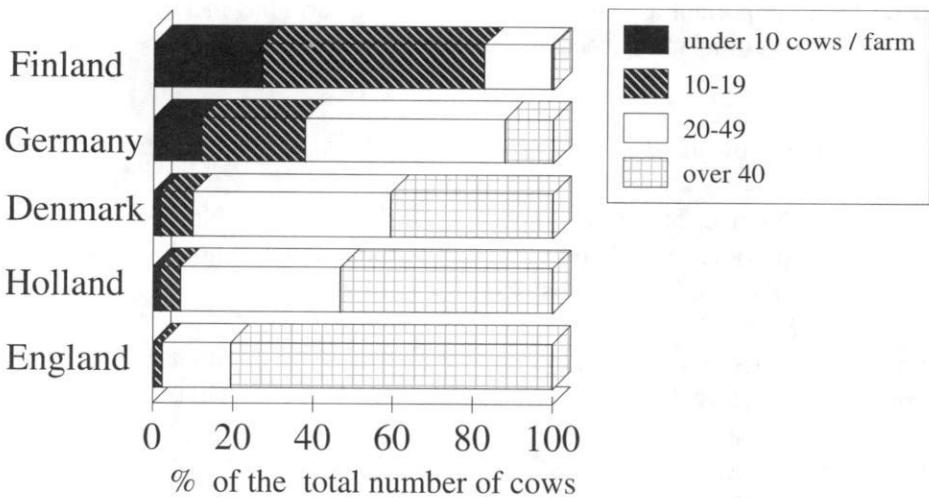


Figure 1. Distribution of dairy cows according to the farm size in Finland and in some EC countries in 1990.

all farms produced milk, but currently about half of the farms are engaged solely in crop production. Regionally, until recent years, milk production has shifted from southern Finland to the other parts of the country. Therefore, southern Finland is mainly characterized by crop cultivation as well as specialized pig and poultry production.

Milk is mainly produced far away from densely populated districts in areas from which population traditionally migrates to southern Finland. These are regions with limited earning opportunities outside the agricultural sector. The on-farm alternatives to dairying in these regions is limited by the low yields in crop production. Whereas the farms in the southern Finland can profitably cultivate permanent crops or can obtain income from non-agricultural sources, many of the small and middle-sized farms in the remote regions have little alternatives than to devote their labour solely to dairying.

The fact that dairying is not as capital intensive or land extensive as many alternative farm enterprises makes it well suited to smaller farms in remote areas, with limited land but with an excess of labour (CLOUGH & ISERMEYER 1985).

The main dairying regions are the central Finland districts. This regional distribution for dairying is crucial to Finland's interest in dairy policy and, while a comprehensive account of regional factors can not be given in the space available here, further considerations of regional aspects is necessary to understand Finnish milk market policy.

Finnish dairy farmers manage their herds so that dairy factories can process milk throughout the year. Feed, provided by a mixture of hay, grass silage, various fodder crops and concentrate feeds, must be either stored or purchased for use throughout the winter. Finnish dairy farms also require a relatively high capital investment in buildings, not only to store feedstuffs during the winter but also to house animals, machinery and other inputs for the various farm operations.

Meat production is an important aspect of dairy farming in Finland, so the use of dual purpose breeds is well-established. The composition of the Finnish dairy herd in terms of the main breeds used has been relatively stable over a considerable period. The dairy stock is predominantly Ayrshire. Friesians are becoming increasingly common, however, and one in five cows is now of this breed.

The dairy industry in Finland has traditionally been heterogeneous and the number of dairies has been large. Without attempting to identify in detail many of the important structural changes and issues associated with the Finnish milk market, several need to be identified.

In the Finnish dairy industry, more dramatic structural change has occurred in the processing sector than at the producer level. In 1970, dairy processing was dominated by small dairies. Over the past 20 years, however, concentration within the industry has reduced the number of dairy processing plants by three-quarters. The concentration process is partly due to the fact that many very small dairies were no longer able to maintain a minimum level of profitability.

Apart from the reduction in the absolute number of dairy factories, there were notable shifts in the size structure of the industry. In 1970, dairies with a plant capacity of less than 2,500 tonnes per annum comprised about 60 per cent of the total butter production, and virtually none of dairies had a capacity exceeding 5,000 tonnes. But by 1990, the dairies with a capacity of more than 2,500 tonnes accounted for about 80 per cent of the total production. Figure 2 compares the size structure of Finnish dairies with Danish and German ones in 1989.

Most of the Finnish fluid milk is pooled by producer co-operatives which engage in the collection, processing and distribution of milk. Cooperative dairies process and market about 90 per cent of the nation's total milk production. Dairies have, in practise, cooperated so that the co-operative dairies have formed a common central co-operative firm, Valio. Valio has been responsible for exporting and importing, excluding fluid milk produce, also marketing at home the products, which the members have processed.

Table 2 shows the utilisation of whole milk and skimmed milk in Finland over the period 1970-90. The proportion of whole milk being converted into butter remained more or less constant over the period, whereas the amount of milk converted into cheese has increased substantially.

A final aspect of substantial importance to the dairy industry are changes in the consumption patterns. First, the demand for high fat dairy products has fallen drastically. While a shift in favor of low-fat products has partially offset this decline, the total per capita consumption has not declined accordingly.

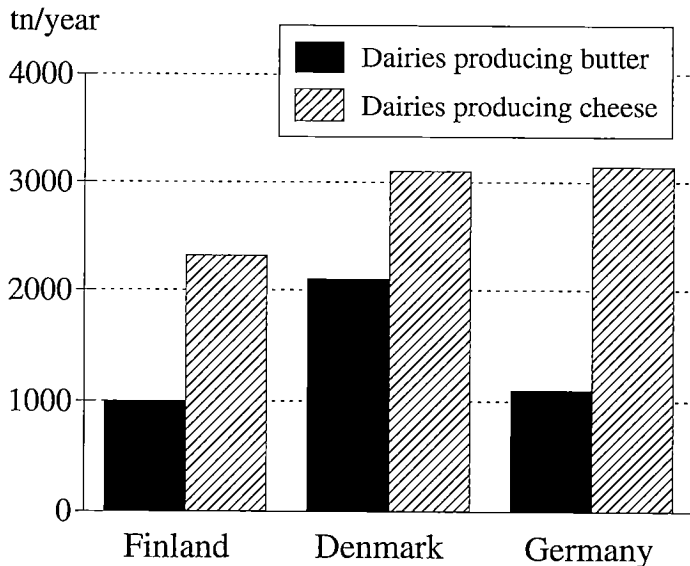


Figure 2. The average plant capacity (tonnes per year) of the dairies producing butter and cheese in Finland, Denmark and Germany in 1989.

Table 2. Whole milk utilisation in Finland 1970-1990 (thousand tonnes).

Year	1970	1980	1990
Total utilisation	2,900	3,050	2,700
Liquid market	175	190	188
Processed into butter	86	73	56
Processed into cheese	36	73	83

From a trade perspective, the Finnish dairy industry is still domestic-market oriented and Finnish dairy production has little or no effect on the European markets because its consumption and production volumes, or even trade flows, are insignificant compared to the Community. For many products, the value of Finland's exports have been less than 2 percent of the value of EC exports. As a whole, Finland's position in the European trade varies according to the domestic market balance in dairy production. In 1991 Finland produced 2.5 percent of the EC's milk, the corresponding proportion for butter was 2.9 percent.

## 2.2. Outline of the meat industry in Finland

Meat production is an important component of the Finnish agro-industrial system. Swine is the main meat specie raised in Finland, representing half of the total output of meat. Several important structural aspects in the meat sector have changed over the recent historical period. Between 1960 and 1990 pork production increased by 250 per cent compared with a beef production increase of 70 per cent. Per capita consumption of beef has averaged around 20 kg per year over this same period compared to a pork consumption which increased from 13 kg in 1960 to 33 kg in 1990. Thus pork has become relatively more important to the meat sector over the last three decades.

The size of enterprises has increased and the number of farms has declined. Perhaps the most significant structural aspect of hog production has been the growth in relatively capital intensive hog operations with a capacity to handle more than 600 hogs per year. As a percent of total produced volume, this type of farms accounted for virtually none of the production in the early 1960's but by late 80's accounted for more than 60 per cent of the volume. However, Finnish piggeries are still small by international standards.

In 1990, about 11,000 farms have pigs, with a total number of about 1 377,000 pigs. Finnish pig farmers tend to specialize in either piglet production or feeder pig finishing. About 8,000 of the pig farms produce pigmeat. Piglet production is the

main source of income on 3,000 farms. Farms specializing in piglet production are generally smaller. These piggeries typically own less than 30 sows, yet currently sustain full-time incomes owing to the high price of piglets. Only one in three of the piggeries is equipped to handle more than 300 pigs at a time. Piggeries are mainly located in southwestern and western Finland.

Figure 3 compares in detail the size structure of Finnish piggeries with that of the northern EC countries. In Finland only 19 per cent of the pigs were located on farms with more than 400 pigs. In contrast, in Germany about 40 per cent and in Denmark 75 per cent of the pigs were located on farms of more than 400 pigs.

Specialization is just beginning in the case of beef production. Fewer than 10,000 farms currently specialize in beef production and most beef is still a by-product of dairying. Most beef cattle are the result of crossing dairy cows with beef bulls. Only a few pure beef breeds are to be found at present.

Broilers are produced by a small number of farms. The poultry sector has been subject to tremendous structural change. Production has become concentrated more than any other line of livestock production. Large automated structures for production contributed to large increases in labour productivity.

The slaughtering and meat processing industry is one of the most important sectors of the Finnish food industry. The gross value of slaughtering is about FIM 5.6 billion per year and the meat processing about FIM 8.8 billion per year.

The restructuring process of the Finnish slaughtering and meat processing industry has been rapid during the recent years. Currently, the meat processing industry in Finland is quite concentrated. The industry has seen high levels of

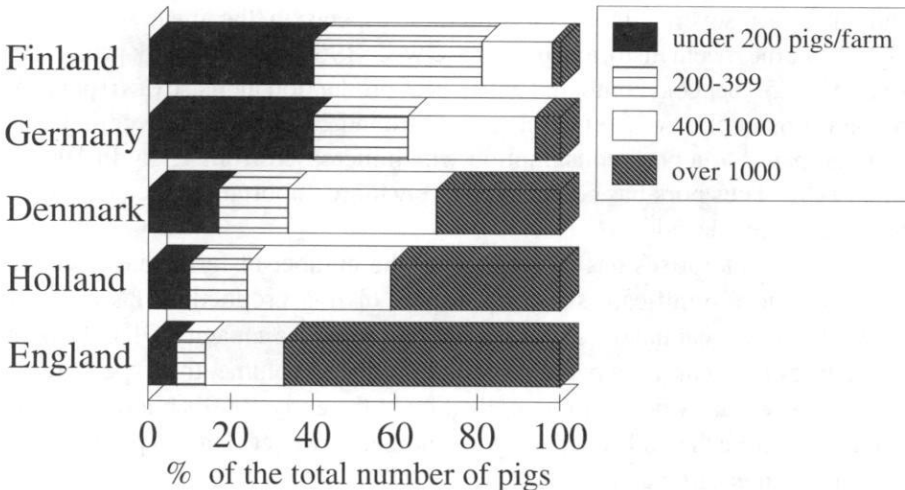


Figure 3. Distribution of pigs according to the farm size in Finland and in some EC countries in 1990.

investment, mainly in automation of the production process. Rationalization has involved the concentration of production in a smaller number of units with increased meat-handling capacity so as to reduce production cost. The average production in the Finnish slaughterhouses is about 50,000 carcasses per year.

There are about 90 meat processing plants in Finland licenced by the Ministry of Agriculture and Forestry. The processing industry is divided into co-operative owned and private ones. Cooperative companies process and market about 70 per cent of the nation's total meat production and private companies 30 per cent. The co-operative companies have established a joint venture, TLK-trading for their meat export and import activities.

Most of the meat processing industry in Finland serves domestic market. Import and export plays only a trivial role. During 1990 about 12,500 tonnes of meat and 8,300 tonnes sausages were exported.

### **3. Production cost comparisons**

How well Finnish livestock farming proves able to adapt to the Common Agricultural Policy (CAP) depends mainly on how competitive it is in the EC markets. Perhaps the single most widely used gauge of competitiveness is production cost, or then landed cost, the latter being production cost plus transport costs. This is a popular approach because non-experts find that they can understand the figures.

Actually calculating production costs is, however, more difficult than talking about them. There are two fundamental problems in making cost-of-production studies. One concerns finding a representative sample. Cost-of-production studies are required to take national diversity in production costs into account. Costs differ greatly between regions, and among farms within a region. Which cost should be used? The second problem arises because, in the case of many agricultural commodities, a high proportion of the total production costs are not directly attributable to a single enterprise. There is also the problem of allocating general fixed costs (see STANTON 1986).

In addition, it is very difficult to make direct comparisons of production costs within individual countries without raising questions about the validity of the comparisons. One major criticism levelled at production cost is their failure to consider exchange rate adjustments.

The following provides a comparative analysis of production costs for milk and pork between Finland and Denmark. Denmark was chosen to be the comparison country for the following reasons: efficient livestock production, thriving agricultural export industry, and advantage in penetration into the Finnish market.

In Finland, production cost estimates are based on information obtained from what are called bookkeeping farms. These farms provide annual information on farm incomes, expenses and returns. It should be noted that these farms are larger and more efficient than the average Finnish farm. The emphasis is on the whole farm business rather than on individual enterprise accounts as such. On more specialized farms, however, it is possible to calculate the average production costs by distributing total costs among key commodities in some way.

The Danish figures are based on information collected by the STATENS JORDBRUGSØKONOMISKE INSTITUT (1992) from what are called Farm accountancy data network (FADN) farms. These farms represent more or less the Danish average.

Table 3 compares the cost of producing milk in Finland and Denmark, using 1993 exchange rates. Milk production in Finland suffers because of its unfavourable structure. The average herd size (11 cows) is only a third of the Danish size (KOLA et al. 1992b). The unfavourable climate affects production costs indirectly because of the high cost of feed and buildings. Even so, the yield per cow, at 5,713 kg, is almost as high as in Denmark.

Farm bookkeeping shows that production costs decrease from FIM 3.42/l to 2.67/l as herd size increases from 15 to 31 cows (Table 3; producer price FIM 3.23/l). Correspondingly, production costs in Denmark decrease from FIM 2.63/l to FIM 2.36/l as herd size increases from 21 to 45 cows. In Denmark, the producer price is close to FIM 2.50/l (EUROSTAT 1992).

The farm models (ALA-MANTILA 1992) indicate that production costs per litre of milk decrease on an index scale of 100-83-73-65 with a herd size of 8-16-32-60 cows respectively. There is also a significant drop in labour costs, which fall from 33 per cent with the smallest herd to 26 per cent with the largest.

Feeding practices will be changed if the price ratio between feed grain and concentrates to farm-produced roughage changes substantially, as can be expected if Finland joins the EC. The need for change is underpinned by the fact that roughage production costs are not likely to alter. If Finland does become an EC member, the price of milk will drop by about 20-30 per cent on average and feed prices, with the exception of roughage, by 50 per cent. The feed unit requirement would therefore be met by feed grain and concentrates rather than silage, use of which relies on the high nitrogen input that is converted to protein in grass.

In the case of pork, production costs are 50% lower in Denmark than in Finland. The price of feed plays an important role in the profitability of Finnish pork production, accounting for 65 per cent of total costs. In EC countries, the price of feed is only half of the Finnish level. If Finland becomes an EC member, Finnish producers would benefit from lower feed costs, and this would eventually result in lower production costs.

Using farm models, NIEMI and MARTILA (1992) studied pork production costs if there were a hypothetical 50 per cent cut in feed prices. A fertility rate of 22 piglets per sow per year and a feed conversion rate of 2.7 f.u./meat-kg were used to



*Table 3. Production costs for milk in Finland and Denmark in 1990, FIM/litre.  
(Rates of exchange: April 1993 on average)*

	Finland		Denmark	
Number of cows	15	31	21	45
Arable land, ha	24	63	22	45
Cost item:				
Variable	1.26	1.05	1.05	1.02
of which purchased fodders	0.51	0.36	0.57	0.55
Equipment <sup>1)</sup>	0.46	0.38	0.44	0.44
Building <sup>1)</sup>	0.18	0.17	0.11	0.11
Labour <sup>2)</sup>	1.21	0.77	0.72	0.50
Interest claim (5%)	0.31	0.30	0.31	0.29
Production cost of milk	3.42	2.67	2.63	2.36
Producer price of milk	3.08	2.82	2.45	2.45
Direct support	0.21	0.11	0.07	0.09

<sup>1)</sup> Incl. depreciations, maintenance and contract operations.

<sup>2)</sup> Hired labour and farmer's wage claim.

calculate optimal production costs. The most efficient Finnish farms can actually boast these figures. The calculations were based on feeder pig production farms with 50 and 100 sows and feeder pig finishing farms with 500 and 1,000 pig places. The finding was that the price of a pig would drop from FIM 380 to about 280. If the feeder pig finishing farm bought pigs from a pig production farm with 100 sows at a production cost of FIM 260, the cost of producing pork would be as follows: with 500 pigs 9.04 FIM/kg; 1,000 pigs 8.59 FIM/kg (Table 4).

The production cost for pork correlates with the size of the pig farm and the production technology, as well as with feed cost. Larger pig farms and more advanced technology result in lower production costs because of labour savings and a higher feed conversion rate (KÖGL and PLESSER 1988). Denmark is more efficient because its pig farms are larger, i.e. it has utilized economies of scale. The fact that Finland's pig farms are relatively small means production costs are high.

Since pork production is very dependent on feed costs and adapts more easily than milk production, feeding practices will be changed if the price ratio between feed grain and concentrates to farm-produced grain alters substantially, as can be expected if Finland joins the EC.

*Table 4. Production cost for pork in combined production in 1990 and after making a 50 per cent feed price reduction, FIM/kg.*

Number of pigs	150	500	1,000
Cost item:			
Feed	9.26	9.21	9.17
Other variable	0.50	0.50	0.49
Labour	2.64	1.81	1.58
Fixed	2.32	2.12	1.93
Total	14.72	13.64	13.17
After 50 per cent feed price reduction	10.09	9.04	8.59

#### **4. Farm level profitability**

There are various complications involved in using production costs as a measure of performance, where defining the labour costs of a farming family presents a major difficulty. This is why the impact of EC membership on the prospects of Finnish farms has also been assessed in terms of profitability (KOLA et al. 1992a, NIEMI & MARTTILA 1992). The calculations represent the annual return on capital and farm labour input to bookkeeping farms specializing in different sectors of production. The proportion of return on labour and capital input balanced against liabilities is a relatively useful indicator of the consumption allowance and resultant profit margin of a family earning virtually all its income from farming.

How return on labour and capital input would be affected by a drop in the price of agricultural goods and production inputs to the Danish level are also investigated. Table 5 represents the formation of revenues on labour and capital input for southern Finnish dairy farms of varied sizes in 1989, with corresponding hypothetical figures for the Danish price level. Here the lower level of return is chiefly accounted for by a cut in the price of milk, beef, and sold grain. Variable costs are reduced accordingly through a corresponding drop in the price of items such as fodder, seed and fertilizers. The decline in fixed costs is largely attributable to the reduced cost of machinery and transfer to the European VAT system. PIETOLA (1991) estimates that latent turnover taxes currently account for about 8% of the cost of dairy farming in Finland.

*Table 5. Labour and capital income of milk farms in 1989 and after price reductions of agricultural products and inputs to the Danish level, FIM/year.*

Number of cows	10-14	15-19	over 20
Finnish price level			
Returns	259,800	391,300	589,700
Variable costs	74,600	131,400	186,200
Fixed costs exc. interest	67,700	93,400	157,100
Labour and capital income	117,500	166,500	246,400
Danish price level			
Returns	199,600	303,200	451,100
Variable costs	52,900	91,700	132,000
Fixed costs exc. interest	61,000	84,100	141,400
Labour and capital income	85,700	127,500	177,700
Liabilities	200,900	290,000	478,200

The return generated in 1989 by large farms with herds of over 20 head of cattle was over twice that of smaller farms with less than 15 head of cattle. Larger farms have over double the amount of capital and debts tied up in agriculture, whereas total labour outlays are virtually the same for all farm sizes. For all sizes of farm the annual labour input is that of two workers. Large farms with 20-30 head of cattle substitute labour outlays with modern production technology. With higher revenues, larger farms have more scope for investment. Nevertheless, because production restraints have virtually put a freeze on structural expansion, their investment opportunities have been limited to what often results in surplus mechanical capacity (MARTTILA & NIEMI 1992).

Introducing Danish price levels would see a 25 per cent cut in the 1989 level of return on labour and capital input. Moreover, it should be taken into account that milk produced in the northern regions of Finland is currently subsidized with price supplements. The profitability of northern dairy farms would therefore be hardest hit were a standard price level to be adopted. The farms least adversely affected

would be those for which purchased fodder constitutes a major cost item, and those with lower fixed costs and fewer debts. Such farms are generally owned by established farmers. The only obvious means of sustaining an adequate level of income in the face of a clear decline in financial return per head of cattle is through expansion, to which the scattered parcelling of field plots currently poses major obstacles (MARTTILA & NIEMI 1992).

Pig farming has less priority in rural policy than dairy farming. Most of Finland's piggeries are located in prime farming country, and their profitability is superior to that of other sectors (MTTL 1992). Nevertheless, figure 4 shows how the effect of instituting Danish price levels on pork prices and production costs would constitute a serious profitability crisis for pig farmers. The heavy indebtedness of pig farmers, amounting to many times that of dairy farmers, is a particular problem. The annual interest payable on debts by certain groups of farmers would alone exceed their return on labour and capital input.

Different types of pig farms are examined separately, as Finnish pig farmers largely tend to specialize in either piglet production or feeder pig finishing. Farms specializing in pig production are generally smaller. These piggeries typically own less than 30 sows, yet currently sustain full-time incomes owing to the high price

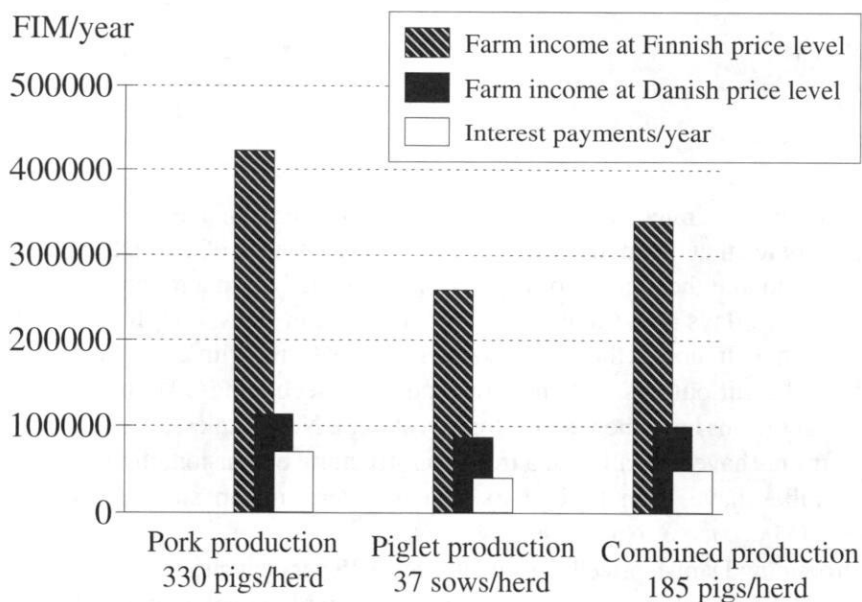


Figure 4. Labour and capital income and interest payments per year in different Finnish pig farms at Danish price level.

of piglets. Revenues generated by these farms at Danish price levels would be grossly inadequate in terms of incomes and investment prospects. Indebtedness is an especially serious problem among feeder pig finishing farmers, whereas they would probably be structurally competitive were they permitted to expand and progressively move into pig production. By all indications, combined production is the way of the future. On Finland's largest combined farms, labour costs are well in line with the manpower provided by a farming family and with returns on labour input (MARTTILA & NIEMI 1992).

Calculations for overall performance indicate that pig farming has considerably less promising prospects on the European market than the cost estimates cited in section 3 would imply. This is because cereal farming practised in conjunction with pig farming shows inferior cost-effectiveness, which weakens the overall profitability of the farm. However, the abundance of field area available per head of livestock indicates that Finnish pig farmers have ample space for sustainable expansion. In the EC's top producer countries, expansion prospects may be limited by space restrictions (SHAGAM 1990).

## **5. Performance of the livestock industry beyond the farm gate**

Since the food marketing system accounts for about 70 per cent of consumer expenditures for food, how efficiently and effectively this system performs obviously affects the welfare of farmers. The possible EC membership raises many important questions for the Finnish livestock industry. New demand will be placed for the domestic processing sector. Specific developments affecting the structure and performance of the processing sector include changes in : (1) structure and channels of trade; and (2) consumer lifestyles leading to growth in food safety concerns. These changes affect the type, quality, price and variety of foods consumers purchase. They also increasingly affect the characteristics of farm products, e.g. leaner hogs and cattle (HANDY & MANCHESTER 1990). All of these changes mean that manufacturers are looking for altered products or different products from farmers and farmers must adjust to the changed demand facing them.

Competition in the processing sector will be particularly intense in terms of production cost. Processing costs between the two countries are, however, difficult to compare, not only because of companies' reluctance to part with such information, but also because factors such as wage levels, currency exchange rates and the cost of milk as a raw material distort the comparison.

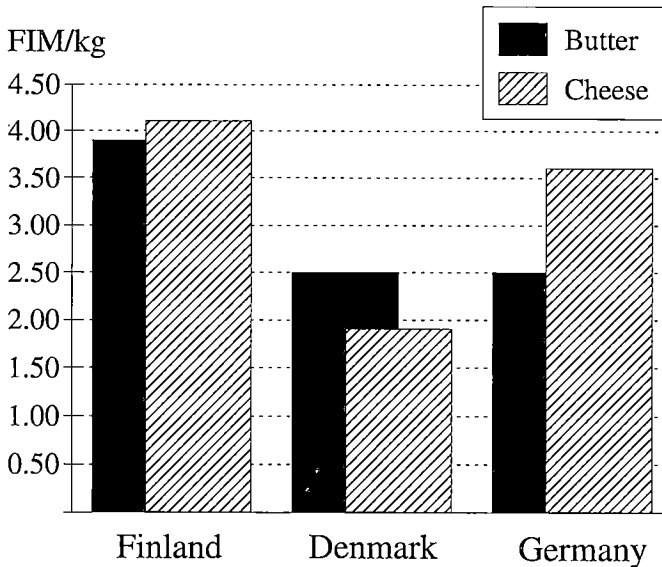
In the livestock industry the cost structure is heavily biased towards raw material costs, which are about 70 per cent of the total costs. The raw material costs of Finnish food processors are on average about 50 per cent higher than the average costs in existing EC countries. Labour costs are about 13 per cent of the total costs.

Figure 5 presents processing costs without raw material costs for butter and cheese, showing that in 1989 the processing costs of these products in Denmark were approximately 50-60 per cent of their respective costs in Finland (WIDERI 1991). However, although this shows that Denmark clearly has a competitive advantage in butter and cheese production, it says nothing about the relative efficiency of processing in the two countries.

Economies of scale in processing, and accompanying opportunities for utilising by-products, might be expected to improve the efficiency of dairy processing. Another factor which affects processing efficiency through the utilisation of plant capacity, is seasonality intake.

An examination of value-added in processing or analysis of processing margins would give a better indication of relative efficiency. But at present, returns and processing margins are set somewhat artificially both in Finland and the EC, along with the producer price of milk. It is also difficult to obtain representative or average figures, particularly in different product mixes contributing to their overall profits.

International comparisons show that the productivity of labour in the Finnish livestock industry has been behind the livestock industries of the northern EC countries (KALLINEN 1986, ALA-PEIJARI 1987).



*Figure 5. Processing costs without raw material costs for butter and cheese in Finland, Denmark and Germany in 1989.*

An evaluation of processing efficiency is, however, beyond the scope of this article: suffice to say that low productivity makes Finnish processing less efficient, but in long-run context, entry into the EC is likely to foster a more competitive Finnish livestock industry, increasing technological adoption and lowering costs.

Research undertaken by the Institute for Business Administration (LTT 1992) showed that individual firms in the food industry have differing views on the Finland's competitive position, some locational factors seem positive, others negative. To survive in the single market firms need a strategy adapted to their particular market whether local or international.

New technology needs to be applied to reduce production costs and design new products and develop markets to respond to consumer demands in terms of price, quality, convenience, etc. Innovative processing, packaging and distribution methods are needed to broaden the use of animal products and greater effort is required in developing foreign markets for such products.

The consumption of livestock products will grow to some extent. However, imported products continue to increase their market shares and at the same time there will be numerous difficulties in increasing exports.

## **6. Concluding remarks**

Finland has about 35,000 dairy farms, with smaller average herd size but higher average annual milk yield/cow (5,600 l versus 4,700 l) than in the EC as a whole. While all 35,000 Finnish milk producers are currently considered competitive, though their average incomes vary among the farms, the future position is very dependent on various externally determined factors that it is hard to predict. Finnish milk prices are at present above the EC average and the competitiveness of Finnish dairy sector is weakened chiefly through unfavourable climatic conditions and predominantly small-scale farm structure. Future developments will therefore depend on how successful it is at overcoming these handicaps. Adjustment to farm sizes more appropriate to modern technology is essential if productivity is to be increased, and cost reduced.

Finnish pig production also suffers from a poorer production structure and less market integration than its rivals in the EC countries, particularly Denmark and the Netherlands. While larger producers may hold their own in this situation, smaller producers need to work more closely together if they are to maintain their share of the pigmeat market after joining the EC.

Present restrictions on herd size are major factors making the Finnish pig sector less competitive than those in the Netherlands and Denmark. Farmers must also become more specialized. In future they must become much better informed and

react more flexibly to market changes. A more integrated system of marketing with quality control through all stages of production and greater co-operation among producers is necessary if Finnish producers are to retain their share of domestic market. The advisory services must also be more closely oriented to the needs of commercial specialized producers and less oriented merely to the implementation of government policies

The possible EC membership raises many important questions for the food industry, too. Competition will be particularly intense in terms of production cost and quality of the food products. Individual firms in the food industry have differing views on the Finland's competitive position, some locational factors seem positive, others negative. To survive in the single market firms need a strategy adapted to their particular market whether local or international.

New technology needs to be applied to reduce production costs and new products and markets develop to respond to consumer demands in terms of price, quality, convenience, etc. Innovative processing, packaging and distribution methods are needed to broaden the use of animal products and greater effort is required in developing foreign markets for such products.

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## THE LFA-SCHEME IN FINLAND - POOR CRITERIA OR GOOD REGIONS?

TUOMAS KUHMONEN

**Abstract.** This article analyses the only significant instrument for regional agricultural policy in the EC, the aids for mountain and hill farming, and farming in certain less-favoured areas, which has been applied since 1975. The existence of permanent natural handicaps should entitle a region to become classified as a support region and to receive annual income aids to preserve agriculture and regional structure. These types of handicaps extensively exist also in Finland, but the technical criteria used for defining the support areas are found to be unsuitable for the exceptional conditions that exist in most parts of Finland. A short transition period, as such, would necessitate a "maintenance" type of solution - mainly income aids - for the adaptation problem of the Finnish farm sector, in the case of EC membership, instead of the "development" oriented support for structural changes. Also, the size of the income losses and the limited possibilities for affiliate industries in the Finnish rural regions means that the emphasis should be on income aids.

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**Index words:** Less-favoured areas, agricultural support, Finland, EC, CAP

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### 1. Introduction

The original package of the Common Agricultural Policy of the 1960's was heavily concentrated on price and market policy. The role of the other main measure, structural policy, was very limited before the early 1970's. Application of the competition rules on state subsidies in agriculture implied that national income, or operating aids, were not allowed. The only acceptable important measure, to address agricultural income problems, was investment aids in order to promote structural changes and to increase productivity.

In the early 1970's, connected to the British entry to the Community, the historical hill farming system of the United Kingdom - which the British wanted to remain - challenged for the first time the paragraphs in the Treaty of Rome, where "the social structure of agriculture" and "structural and natural disparities between

the various agricultural regions” were to be taken into account in the common policy. The support system for hill farming was transformed to the Community-wide system in 1975, when the framework directive was launched for supporting agriculture in mountain regions and in less-favoured agricultural production regions (“LFA-support”).

Since then, other income or operating aids have been implemented in the EC (e.g. temporary income aids since 1989, direct hectare support for crops since 1993), but the LFA-support has remained as the only instrument of regional agricultural support policy for the basic agricultural products.

## **2. EC support system for mountain regions and less-favoured agricultural regions**

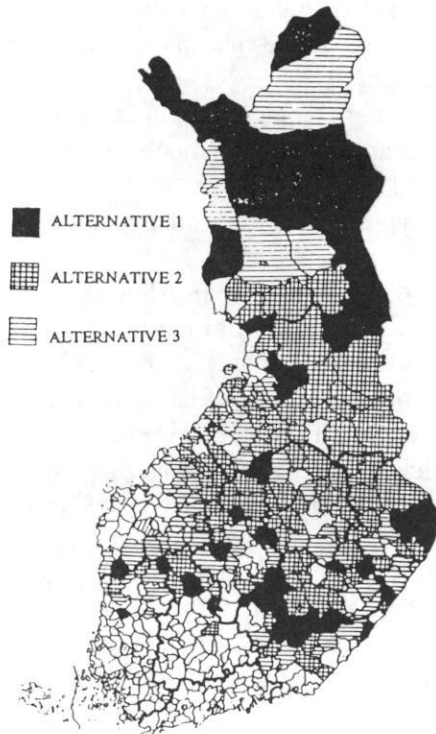
The goal of the EC support system is to maintain a minimum population of those areas, which are characterized by permanent natural handicaps. By paying farmers annual allowances and higher investment aids, their incomes are raised to preserve their standard of living. In this way, both farming and habitation of these marginal areas will be preserved, which will also support the infrastructure, countryside, and surrounding landscape (Directive 75/268/EEC, art. 3).

The nature of the natural handicap can be a mountain location, an infertile land or some regionally limited special reason. In mountain regions, the natural handicap limits the possibilities for using the land and increases the cultivation costs through shortened growing season, or because of steep slopes. The second group, less-favoured areas, are characterized by infertile land, which is reflected by low economic results and by the threat of depopulation. The third, specific and regionally limited handicap, can be caused, for example, by island position, salty soil, or strong winds. The Commission has developed some rather detailed framework criteria to define the areas.

As soon as the region is classified as a support region, an annual compensatory allowance can be paid to farmers. The allowance is 20.3 - 102 ECU per Livestock Unit, or per hectare (in regions with a specific handicap, up to 121,5 ECU). Also, the investments aids are raised by 10 percentage points up to 30% or 45% grant equivalent in these regions. Some other minor special advantages exist as well.

### 3. EC support regions in Finland

In Finland there are hardly any mountain regions fulfilling the selection criteria of the Commission (in COM (74) 2222). Some regions with specific handicaps exist, but the most important subgroup would be the category of less-favoured farming areas. Strictly applied, about 6% of the Utilised Agricultural Area (UAA) of Finland would qualify as a support region, because the disadvantage factor of each region is related to the national average of Finland. In other words, only the most backward municipalities - where there is only a small share of the Finnish farms - fall into a support category. If the income condition would be relaxed, because of the present strong regional support system in Finland, then about 26% of the UAA would qualify (see figure 1).



*Figure 1. The less-favoured regions in Finland according to the Commission criteria.*

Note: In alternative 1 all the criteria are strictly applied. In alternative 2 the income criteria is relaxed, and in alternative 3, the yield level and employment criteria are relaxed to some extent.  
Source: KUHMONEN et al. 1992 (annex 2)

The most distinct differences of the Finnish regions, in relation to the present Community areas, were found to be (KUHMONEN et al. 1992):

- 1) the share of agricultural land in total area is much lower in Finland, leading to more dispersed structure, increases in cultivations costs, and rational co-operation between farms becomes more difficult,
- 2) population density in Finland is only one-fourth of that in the support regions of the EC-10,
- 3) the share of agriculture (and forestry) in employment - and the dependency on these activities - is much higher than in the EC,
- 4) the structure (size) of farms is comparable with the southern member States, whereas the structure of production - indicating open competition position on the markets - is in conformity with the structurally favourable northern Community,
- 5) the length of the growing season in the best Finnish production regions is roughly half that of the Community average,
- 6) the yield levels are on the Mediterranean levels and correspond to only half of the Community average,
- 7) unlike in the north-western Community, the Finnish less-favoured areas lack extensive livestock rearing and have much smaller farm size than the better areas, and
- 8) the Finnish regions have suffered from depopulation during the last decade.

As such, the situation is rather peculiar. Although, most Finnish regions have very backward conditions, in relation to the northern Community with similar production structures, only a small share would be entitled to the regional support when compared to the northern Member States, where more than half of the UAA qualifies as a support region. There are several reasons why this contradiction exists. At first, the technical criteria relate the criteria to the national average; the relative position of different national regions inside the Community are not compared. Secondly, in the present Member States, agriculture is spread more or less evenly throughout the regions. In Finland, the fields are rather strongly concentrated in the southern and western parts of the country, which simultaneously constitutes the best region, to which the other parts are compared. So, the present Community criteria are not the best ones to be applied in such exceptional circumstances that exist in northern Scandinavia.

In this respect, critical notes have already been made concerning the EC scale definition of the support areas: TAMMINGA et al. (1991, p. 73) conclude that "the type of specialization and polarization is completely different for the main geographical areas of the EC. Thus 'natural handicaps' and consequently Less Favoured Areas cannot be defined in a uniform way for the EC as a whole".

## **4. Poor criteria or good regions?**

### **4.1. Elaboration of the LFA-directive and related regulations**

Given plots of agricultural land of different productivities, other factors being equal (land demand, distance from the markets, cultivation practises), cultivation of the poorer plots will yield lower incomes. If the economic environment of the farmer is equal in all cases (e.g. regional labour markets and regional earnings) and the profitability of the alternative uses is equal as well, the poor plots are the first ones to be left idle or transformed to other productive uses. By compensating for the income difference with a subsidy (in whatever form), production can also be maintained in the poorer plots. In practise, the different local conditions, labour markets, distance to markets, and food increased also play a role.

The directive begins by identifying the increased costs, or lower incomes of farms in the support regions. Literally, in mountain regions the emphasis is more on increased costs, and in less-favoured areas the emphasis is on lower incomes. By accident or not, this has a logical base, even though higher costs automatically imply lower incomes. In mountain regions it tends to be more difficult to switch from agriculture to other occupations, since the density of economic activities is rather low. In other less-favoured areas of the present Community the possibilities for other occupations are better and, therefore, the importance of income level in agriculture in relation to the regional income level in general becomes more pronounced.

So, there can be several approaches to the “heart” of the problem. On the other hand, one can try to find out the extra costs of the support regions relative to normal areas not receiving support. This approach, however, tends to forget the differences in farm structures, regional income levels, and other factors. Another approach would be to start with the fact that all the extra costs are included in the structure and economic results of the present farms. The amount of income from agriculture, in relation to the regional incomes, should then be raised to a reasonable balance with the aids, where in the first approach there should be compensation for the cost difference. The result need not necessarily deviate much between the two approaches. According to Article 19.1 of Regulation (EEC) 2328/91, the amount of the compensatory allowance should be fixed - within the limits - “according to the severity of the permanent natural handicaps”.

The analysis done on the present Community support regions shows that the selection process also includes political compromises, along with the objective criteria which are applied. The setting of the Directive 75/268/EEC and the implementing Regulation (EEC) 2328/91 then can be analysed in two phases. In

order to become classified - in principle - as a support region the area should, at first, be dependent on the agricultural activity and, secondly, the existence of the agricultural activity on those areas should not be able to survive without permanent operating support.

#### 4.2. Are the Finnish regions dependent on the agricultural activity?

The dependency of the regions on the agricultural activity has both direct and indirect forms. In figure 2, the effects of direct dependency are investigated by arranging the Finnish municipalities after their dependency on the farm activities (agriculture and forestry). Regions, in which the share of these primary industries in employment is less than 20%, have about 40% of the respective employment. But regions, in which the share is above 20%, have about 60% of the agricultural

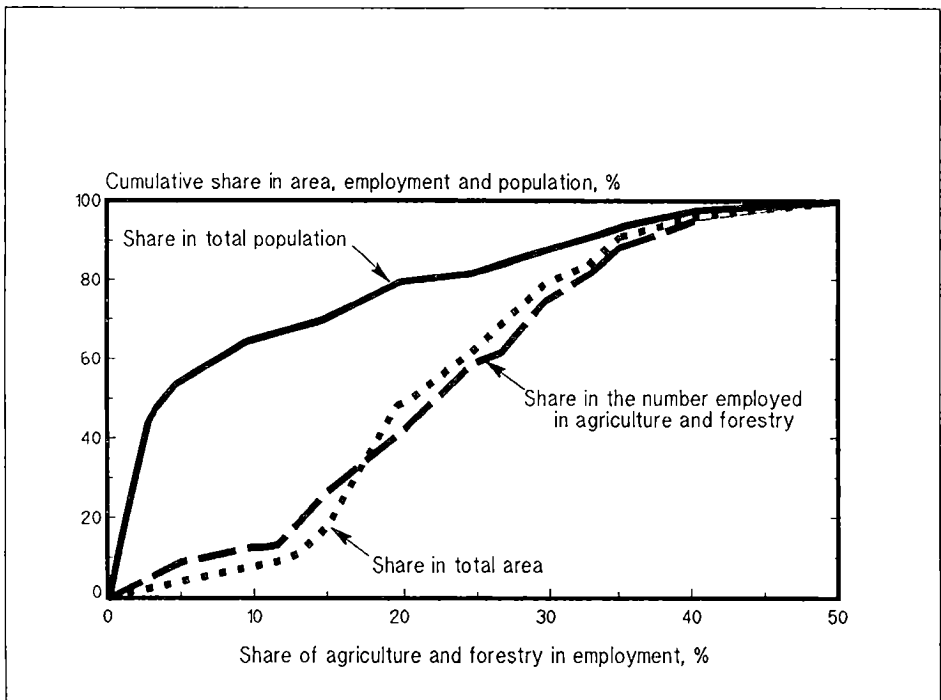


Figure 2. Dependency of the Finnish regions on the agricultural activity in 1989: cumulative shares of regions in area, population and farm labour force arranged after the share of agriculture and forestry in employment, by municipality.

employment, and they represent about 55% of the total area of Finland. Still, only about 20% of the population lives in these regions. So, there are large sparsely populated agricultural areas in Finland, which are still very much dependent on the primary production. The multiplicative effects still enhance this dependency.

On the other hand, the possibilities to compensate for the diminishing agricultural employment in these regions tends to be very limited. Their natural local demand potential is small and the distance (transportation costs and distance from the markets) requires very strong measures in order to create new profitable industries. The amount of local demand is shown in figure 3. The amount of purchasing power is reflected by the taxable incomes per square kilometer, which is plotted against the dependency rate of the region (municipality) on the agricultural employment.

It can be clearly seen that the local demand on the true agricultural areas is very limited and that the margin is very sharp in relation to the more densely populated

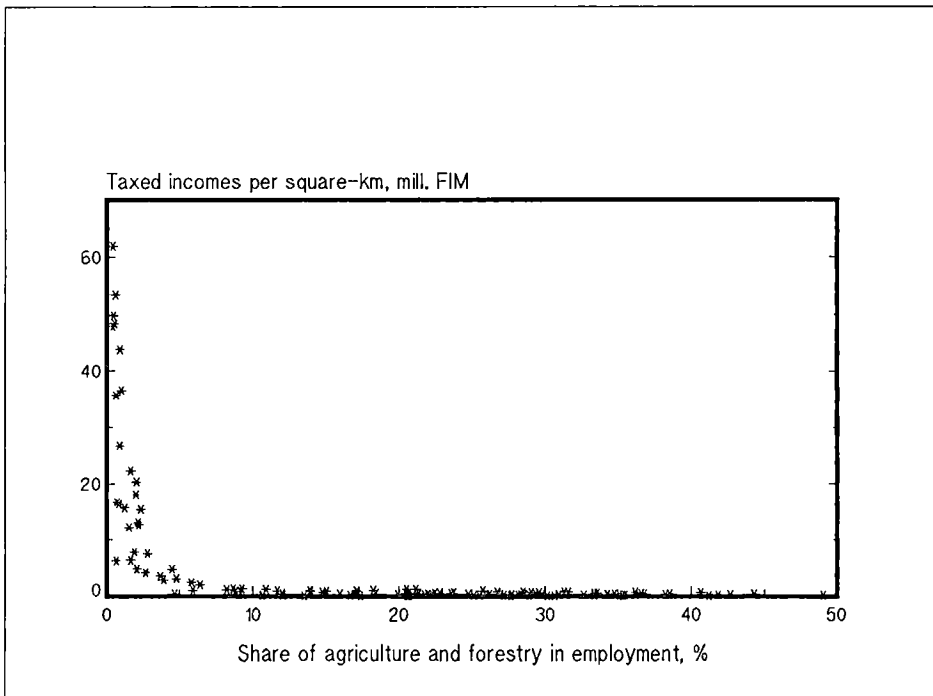


Figure 3. The amount of local purchasing power per square kilometer in regions after their dependency on the agricultural employment. The figure excludes four cases above FIM 70 mill.



areas. This differs rather strongly from the present Community regions, in which population and purchasing power are much more evenly distributed.

### 4.3. Is regional support essential to maintain agriculture in remote regions?

For decades Finland has had an extensive support system to balance regional and intra-sectoral income differences, besides the financial support for structural changes (farm enlargement, generation shift, productive investments). In terms of the EC competition rules, a majority of the subsidies are given without special conditions for change that would yield permanent improvements. As opposed to the original EC philosophy, the focus is on operating and income aids. These have helped to stabilize the regional setting of the farm sector.

The forms of support are numerous (see e.g. KETTUNEN 1993, KUHMONEN 1992) and support regions of different subsidies are overlapping. Therefore, the support intensity varies quite a lot, even between very small regions (municipalities). The

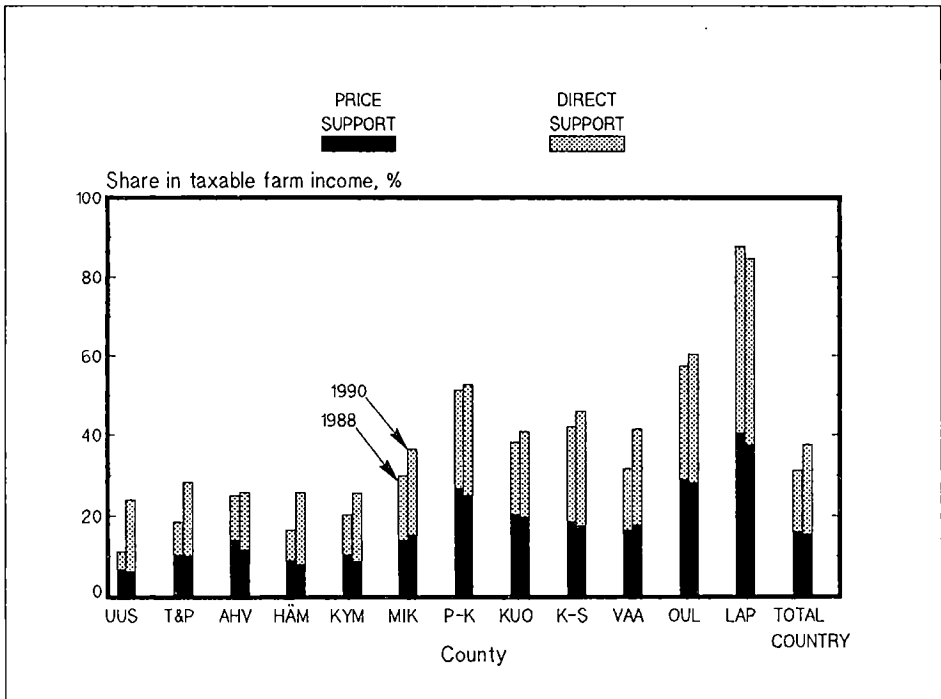


Figure 4. The share of price supports and direct supports in net farm incomes, by county, in Finland in 1988 and in 1990, %. Source: ANON. 1992

outline of the support regions is based on complex objective criteria (yield, soils, climate, structure, incomes) and extensive studies, but the solutions have also been affected by political influences.

In 1990, the share of incomes comprised by price subsidies - which are paid by the state - varied from below 10% in the southern parts of the country, up to 40% in the County of Lapland. The direct agricultural subsidies, in turn, contributed about 15-20% of the taxable net farm income (from agriculture and forestry). In northern Finland this share was half of the income. In the northernmost parts of the country the state supports, together, comprise more or less all the net income from agricultural activities. These considerations are shown in figure 4, which reveals the growing dependency of farmers on the state budget. It is quite obvious that the agriculture in these regions is heavily dependent on the subsidies.

## **5. Ways to get ahead**

If Finland became a member of the EC, and she would apply the present EC agricultural, regional and rural policies, many regions would encounter enormous difficulties. The loss of sales income, caused by the disappearance of the present border protection and by the elimination of national price-supports, and lowered direct supports, would be about 20-60%, depending on the product, the region and the currency rates. The respective cost savings could be smaller (mainly in feed and seed).

On individual farms the loss of incomes can be compensated by increasing the farm size or by off-farm activities. To compensate for such a large cut in income, the farm would, in many cases, have to double, triple, or more the hectares and the production. This kind of policy has both financial and physical, as well as, managerial (personal) limitations. The same limitations apply also to new affiliate industries.

But on a regional level, only increased production or new activities would imply any compensation for the lost regional incomes, since pure redistribution of production between farms does not offset the loss of lower (internal) price levels. The proper functioning of the economic theory - allocation of resources to other more productive uses - can be critically assessed for these kinds of regions. Unlike most of the Community LFA-regions, many Finnish regions have already suffered from depopulation -despite the strong regional support in agriculture and the strongly biased regional and rural policy towards these areas.

## 6. Conclusions

The Finnish regions largely fulfill the characteristics to be classified as mountain areas or less-favoured agricultural areas. The Commission criteria for technical classification are not suitable for these regions, since they differ essentially from the present Community areas. Also, the present level of aid is too low. Both the severity of the handicaps and the required relative income level in agriculture, in the Finnish areas, necessitate essentially higher support intensities than provided in the present EC Regulations.

The need of special treatment of areas like Finland, in connection with the possible application of the present Common Agricultural Policy, can be considered within the framework of figure 5. The longer the period for gradual transition to the new economic environment, the greater the share of the farm income problems which can be placed on the structural changes in progress (farm size, productivity, off-farm affiliate activities). Also, a greater share of the regional employment problems can be solved with rural and regional policies, if effectively applied.

In case of a short transition, many farm with existing debts and responsibilities would face finance problems and find it impossible to begin with structural changes. Young farmers with heavy farm take-over debts - but with good farms - would be at risk first. So, in general, a short transition period would require the special treatment, in the form of income aids: for supporting "maintenance" and not "development". Also, the physical character of the regions - especially very limited potential for new activities - means that emphasis would naturally lie in the form of income aids.

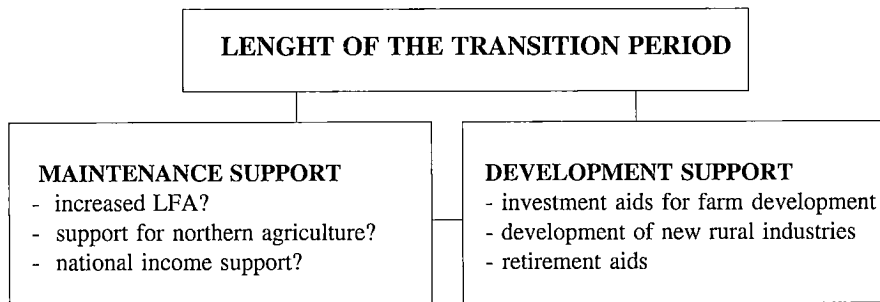


Figure 5. The framework of special treatment. Source: KUHMONEN 1993.

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## HORTICULTURE IN FINLAND

TAINA VESANTO & SIRPA LEHTIMÄKI

**Abstract.** Finland's membership in EC would considerably change the structure of activity for horticultural production. Finnish production has to adjust to stiff competition with the EC-countries and to EC products being available in our own markets year round.

In this study the location of cultivation, areas, production quantities and employment in horticultural production in Finland are described. Also the main characteristics and the impacts of natural conditions are reported. The structure of Finnish production and production costs are compared to that of some other European countries. The EC common agricultural policy for horticulture and Finland's present organization are also reviewed.

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**Index words:** Horticulture, Finland, EC, markets

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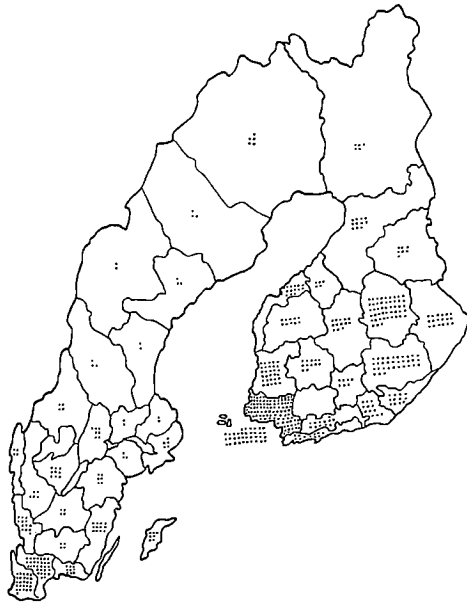
### 1. General

In Finland the area for professional horticultural production "on field" is about 14,000 hectares and the total heated greenhouse area about 400 hectares (ANON 1992e). The value of the horticultural production in terms of producer prices was, in 1991, more than FIM 2 billion (Table 1). The total value of horticultural production in Finland is equivalent to that of Sweden and Denmark.

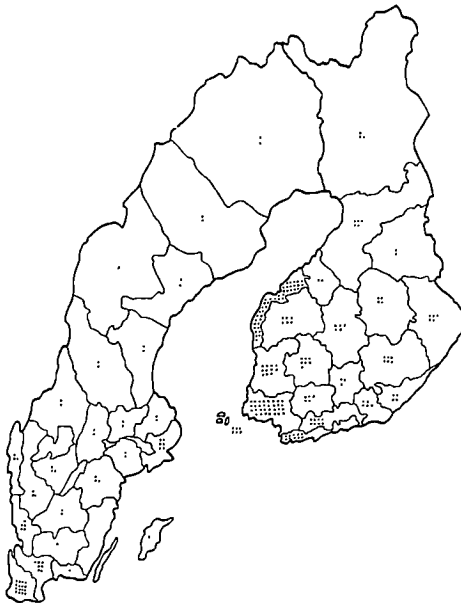
#### 1.1. Location of cultivation, areas, production quantities and employment in horticultural production

In Finland there are about 10,000 horticultural enterprises altogether. The horticultural branch provides employment especially in the developing districts and rural areas (Figures 1a, 1b and 2). Horticulture employees more than 13,000 permanent workers and also more than 13,000 workers as a seasonal labour force (ANON 1992g).

The horticultural enterprises in Finland are located all over the country. Natural conditions, soil and local climate have guided site selection.



*Figure 1a. Location of open land horticultural enterprises in Sweden and in Finland. 1 point = 20 enterprises. Source: ANON. 1991a, ANON. 1992e.*



*Figure 1b. Location of greenhouse enterprises in Sweden and in Finland. 1 point = 20 enterprises. Source: ANON. 1991a, ANON. 1992e.*

Table 1. The value of horticultural production at grower prices, FIM bill.

	The Netherlands 1990	Denmark 1990	Sweden 1990	Finland 1991
Greenhouse production	17.38	1.87	1.13	1.28
Vegetables	5.63	0.19	0.27	0.59
Cut flowers	7.43	0.16	0.18	
Potted plants	4.32	1.52	0.42	
Ornamentals total				0.69
Bedding-plants			0.14	
Small plants			0.13	
Field vegetable production	7.20	0.74	0.68	0.75
Vegetables	2.49	0.19	0.35	0.32
Fruit and berries	1.56	0.16	0.21	0.33
Nursery products	1.40	1.29	0.11	0.10
Flowerbulbs	1.75			
Total	24.58	2.61	1.81	2.03

The figures have been changed into Finnish marks according to the rate of exchange quoted by Suomen Pankki (The Bank of Finland) in 1990, 1 NLG = 2.1053 FIM, 1 DKK = 0.6197 FIM, 1 SEK = 0.6479 FIM (ANON. 1992f).

Sources: ANON. 1991a, ANON. 1992d, BRUCHEM 1992, CHRISTENSSON 1992

Greenhouse vegetables are cultivated mostly on the western coast of Finland, especially on the coast of the Bothnia-district, where about half of all the greenhouse vegetables in Finland are produced. Cultivation of cut flowers and potted plants is distributed evenly over the entire country (ANON 1993e).

Open field vegetables are cultivated on the largest areas in Western Finland and also in Eastern Finland. There is substantial berry production in Eastern and Southern Finland. Fruit cultivation has concentrated into Southwestern Finland, Ahvenanmaa and the Archipelago of Turku.

### Greenhouse vegetables

From the total area of Finland's greenhouse cultivation about two thirds are devoted to vegetable cultivation and one third to flower production.

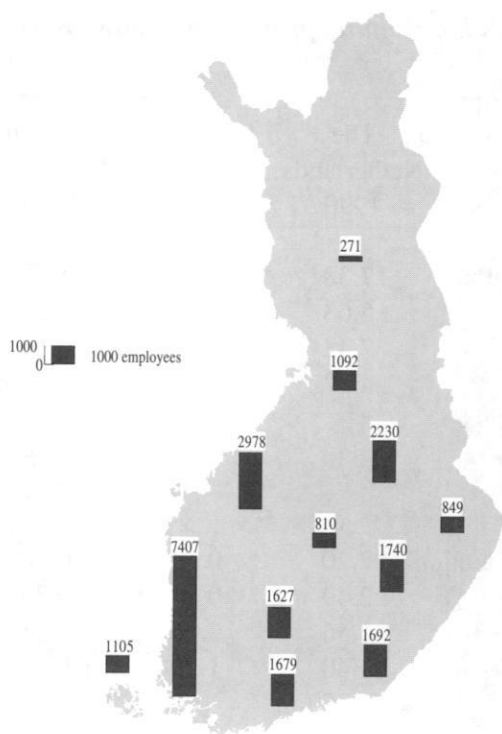


Figure 2. Employment in horticulture by region. Source: Horticultural Information Centre (Finland).

In 1991 the total amount of greenhouse vegetables produced in Finland was a little over 56 mill. kg. Also, 23.4 mill. kg of potted vegetables were produced. Among the greenhouse vegetables tomatoes and cucumbers are the most cultivated by area. The total cultivation area for the two is about 60% from the total area of the greenhouse vegetables (ANON 1992e).

### Flowers and plants in greenhouse

About 76 ha of Finland's greenhouse area is committed to the cultivation of cut flowers. Roses and chrysanthemums and various bulb flowers are the most cultivated cut flowers.

Almost 11 million flowering potted plants were produced in Finland. Also, approximately a half a million foliage plants were grown. Poinsettia, begonia, african violet and chrysanthemums are the most grown potted flowers.

Almost 35 million bedding plants were produced in 1991. The most important of them are the pelargonium, petunia and violet (ANON 1992e).



## **Open field vegetables**

The total production of open field vegetables in 1991 was about 148 mill. kg and the total cultivation area was 7,600 ha. From that area nearly one third is for commercial production for the processing industry.

From the open field vegetables, carrots and garden peas are cultivated on a larger scale. Other plants cultivated with large areas are onions and cabbages (ANON 1992e).

## **Fruit and berries**

Berries were cultivated commercially in 1991 on an area of about 4,000 ha. The production was, according to statistics, a little over 12 mill. kg, but the statistics do not record all the production, and the crop is in reality about 30% larger. In addition to the commercial cultivation of berries, the kitchen garden cultivation is very common in Finland and it is of great importance to individual households.

The largest part, about two thirds of the area for berry cultivation, is for the strawberry, and this area has been increasing every year. Almost half of the production of black, red and white currants, cultivated in Finland, are used in the processing industry. Other berries cultivated in Finland are the raspberry and the gooseberry, but they are grown less than the strawberry and currants.

In Finland, only cultivation of apples has any commercial significance in fruit production, but in Southern and Southwestern Finland even plums, cherries and pears can be grown with success. In 1991 the total apple crop of professional cultivation was about 2.0 mill. kg and the total cultivation area was about 300 ha (over 7-year old trees) (ANON 1992e).

## **Nursery stock cultivation**

In 1991 the area of nursery stock cultivation was 740 ha (ANON 1992e). From this area about 15-16 million perennial plants per year reach the level where they are ready for sale. These include bushes, trees, perennials, fruit and berryplants (ANON 1993e).

## **1.2. Amenity horticulture**

In Finnish town-plans there is a total of about 2,500 km<sup>2</sup> of greenbelts that demand maintenance. The economical value of the amenity horticulture is approximately FIM 2.5 billion per year. The employment influence of amenity horticulture is, according to calculations, about 14,000 man years, of which the share of all-year-round labour is nearly one third (ANON 1992g).

In this article we have, however, concentrated on estimating the influence of EC-membership on Finland's vegetable, flower, fruit, berry and nursery stock production. Therefore, the amenity horticulture has been omitted all in other calculations.

### 1.3. Natural conditions

The natural conditions of Finland influence significantly the profitability of horticultural production. The short growing season in Finland limits horticultural cultivation on the open field as well as agricultural cultivation in general. The shorter growing season influences the yield levels and the variety assortment. The yield levels are lower and the share of fixed costs per unit produced is high.

Harvest conditions in Finland are more demanding than in many other countries. The harvest season in Finland is relatively short. Therefore, the crop has to be harvested before the ground freezes and the snow falls. The short harvest season also limits the possibilities to use machines that are jointly owned, and it is not possible to stagger the harvests. Early harvest and low temperatures in winter also increase storage costs.

Different amounts of light in Finland influence the greenhouse production. Examining the total amount of sunshine and total radiation there is no significant difference compared to Denmark and the Netherlands, but because of the northern location the distribution of total radiation and sunshine hours is unfavourable.

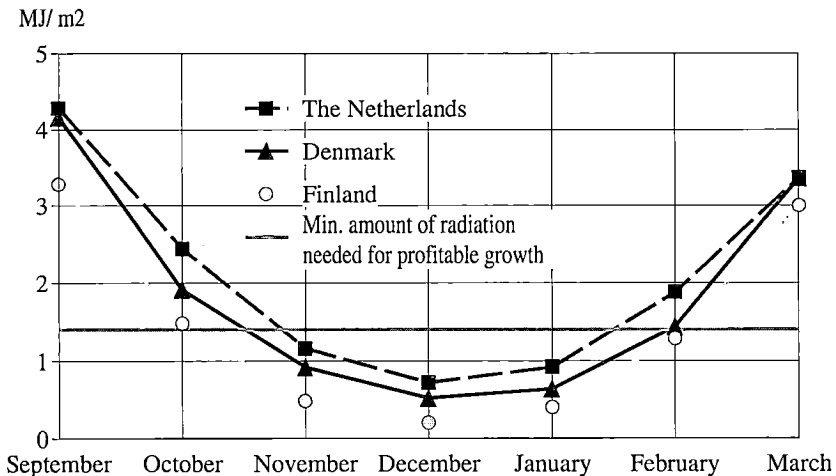


Figure 3. Amounts of visible radiation in greenhouse. Source: PUUSTIÄRVI 1991.

The amount of light in late autumn and early winter is apparently less here than in Denmark and in the Netherlands (Figure 3). Because of the light circumstances, the growing season of greenhouse production begins later and ends earlier in Finland than in Central Europe. Harvest season does not begin in Finland until in that phase of the cycle where the prices of early season crops in Center Europe already have began to fall.

On the other hand, northern climate gives advantages for Finnish production. Summer in Finland is short and light. For this reason the growth is fast, and the respiration losses of plants remain small. Therefore, the plants are aromatic and rich in vitamins. Furthermore, the cold winter prevents pests to spread and use of pesticides in Finland can be reduced to minimum, which is less than in many other countries. In that way, natural conditions offer good basis to Finnish production to develop even safer products and production methods.

Because of the cold climate, special attention is given to winterhardiness of perennials for the open field. When we establish the quality of plants that are suitable for conditions in Finland, winterhardiness has to be one of the quality factors.

#### 1.4. Structure of production

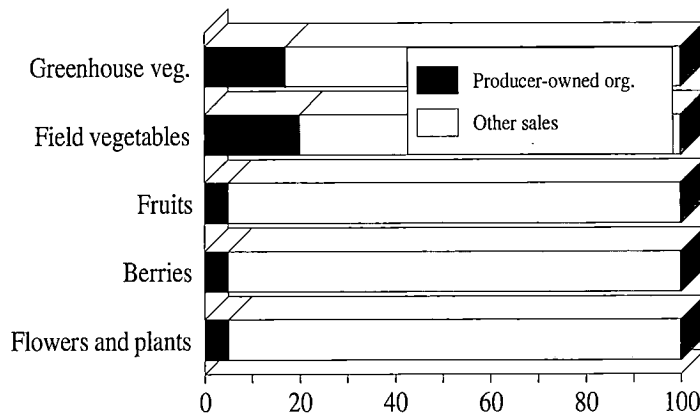
Small enterprise size is typical for Finnish production. The average size of Finnish enterprises is smaller than that of the Netherlands, Denmark and Sweden (Table 2). It is probable that European competition will foster the growth in the size of enterprises in the future.

Another typical feature of Finnish production is that horticultural enterprises are situated all over Finland. This arises naturally because of the long distances in Finland and from the fact that the consumption centers are in various parts of the country.

*Table 2. Average area per enterprise in horticultural production.*

	The Netherlands	Denmark	Sweden	Finland
Greenhouses m <sup>2</sup>	6,656	6,335	2,222	1,442
Field production ha	3.6	3.5	3.6	1.7

Sources: ANON 1991b, ANON 1992b, ANON 1992c, Anon 1992e, JENSEN , A.O. et al. 1992



*Figure 4. Marketed production. Share of producer-owned organizations.*  
*Source: Horticultural Information Centre (Finland)*

The third typical feature for Finnish production is the way products are marketed. In the trading of products, the share of producer organizations is very small (Figure 4). Finnish producers mainly market their products themselves.

### 1.5. Consumption of vegetables

The total consumption of vegetables in Finland has remained constant over the last few decades: however the structure of consumption has shifted from potatoes to fruits and vegetables (ANON 1992d). The very latest statistics indicate, however, a growing consumption of potatoes in households. In 1990 Finnish people consumed about 54 kg of fresh and processed vegetables, 10 kg of berries and 50 kg of fruit per capita (TIKKANEN 1993).

Consumption of vegetables in Finland is about half of that in Central Europe and one third of Southern Europe. Total consumption of vegetables is forecast to grow by 3-5% per year in Finland in the 1990's (ANON 1992d). From the total consumption of berries the share of professionally cultivated berries is about 7 kg per capita, and the consumption of wild berries is estimated to be about 3 kg per capita. Bananas and citrus fruits are the most consumed fruits in Finland (TIKKANEN 1993).

The Finnish grower produces for domestic consumption. Horticultural products are not exported to any great extent. Border measures help to protect domestic production. The self-sufficiency rate of most domestic horticultural products is rather high in Finland (Table 3).

*Table 3. Self-sufficiency rate of horticultural products in Finland.*

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Vegetables in the "open"	80%
Vegetables in greenhouses	75%
Cut flowers	80%
Berries	70%
Apples	10%
Nursery products	60%

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Source: ANON. 1992g.

To consumers there are plenty of horticultural products available, some are imported to Finland all around the year. The market share of imported edible horticultural products is about 60% (ANON 1992d).

## **2. Horticultural policy**

There are many fundamental differences in regulating horticultural production in Finland and in the EC. In the EC most of the horticultural products are covered by the Common Agricultural Policy, CAP.

In Finland no direct price supports have been used for horticultural products, neither has the state limited their production. There has also been no withdrawal action to stabilize the market situation in the times of excess supply responding that of the EC. The state has supported Finnish producers mainly through border measures.

The most important means to regulate the fruit and vegetable markets within the EC are:

1. Quality standards
2. Producer organizations
3. Market withdrawal system
4. Trade policy (border measures, export refund)

The EC quality standards resemble very much those of the UN and the OECD. They are enforced through the whole delivery chain, from production to retail trade. Quality classification and designation of origin are enforced.

The quality of Finnish horticultural products has been regulated by national quality standards. The quality standards are based on those of the UN and the OECD. The significant difference between applying quality standards in Finland and in the EC is the fact that quality classification is not obligatory in Finland. The products in Finland must satisfy minimum requirements, but a quality classification is not presumed. For quality of import products it is possible to adapt the UN and the OECD standards.

Producer organizations have great importance in improving efficiency of the

EC's fruit and vegetable production. Support is granted for founding producer organizations. In Finland, however, the share of producer organizations in marketing enterprises is small (see Figure 4).

In the EC, market prices are supported by a system of compensation for withdrawal of produce from the market. The system is operated by the intervention agencies in member states through registered producer organizations. The support prices are in the form of compensation for withdrawal and are derived from basic and buying-in prices. The compensation which is paid to producers is significantly lower than the price levels prevailing in the market. The price support system for fruit and vegetables is not designed to achieve a guaranteed price over periods of excess and shortage as is the case with some other commodities subject to intervention. The purpose of the system of withdrawal is to act as a safety net for producers at times of oversupply.

The following products are subject to withdrawal:

Apples	Nectarines
Apricots	Oranges
Aubergines	Pears
Cauliflowers	Peaches
Clementines	Satsumas
Lemons	Table grapes
Mandarins (and other hybrids)	Tomatoes

Many products in the system of withdrawal are fruits which are not grown in Finland. For other products the higher price level in Finland than in the EC countries affects the possibilities to withdraw products from the Finnish markets (VESANTO 1993).

Imports to the EC from third countries are subject to customs duties and a reference price. The Common Customs Tariffs may vary from country to country and on a seasonal basis. The reference price system operates during the main marketing period and its application is limited to certain sensitive products. The reference price system determines the minimum prices at which these products may enter the Community without facing additional levies. Deliveries into the Community at prices below those determined by the system are likely to result in the application of a countervailing charge.

As for Finland, the defect of the reference price system is that all the products that are important in Finnish production are not covered by reference price system.

In the present policy of Finland, the border measures have a fundamental impact on the horticultural production. The Finnish border measures consist of quantitative restrictions, import levies and customs duties.

Quantitative restrictions are used in such a way that import licenses are admitted only when domestic production does not cover domestic demand. The imports of nearly all important Finnish horticultural products are licensed.

In the Community, processed products are made competitive by subsidies paid to processors to compensate them for the high raw material costs. Also, controls are applied to some imports, and export refunds may be fixed. These actions are meant to support cultivation of the most important products. However, for example, the products in the range of production support are not produced in Finland. In Finland, in the present organization, imports of most raw materials and some processed products are subject to a system of licensing.

For cut flower production, the important difference between the present organizations of the EC and Finland is also the border measures. In the EC the border measures for cut flowers consist of custom duties. In Finland, in addition to custom duties, there are quantitative import restrictions from March to November.

### **3. Comparison of horticulture in Finland and in the Netherlands**

Finnish horticulture, its structure, yield levels, producer prices and production costs, have been studied and compared with the information from the most important competing countries (LEHTIMÄKI 1993). The most important target of comparison is the Netherlands. Based on this study we can state that the problems of Finnish horticulture are the very same as those of basic agriculture; lower yield levels compared to Finland's competitors and higher producer price levels.

The comparison of the Finnish and the Dutch horticulture is based on the latest information available from 1991. While examining comparisons one must recall that Finnish Mark has devalued after 1991, and comparisons depend on which year the information is from and the rate of exchange applied.

#### **3.1. Yield levels of horticultural products**

Table 4 shows some average yield levels in the Netherlands and in Finland. The levels from the Netherlands are an average of five years data, and for Finland an average of the years 1989 to 1991.

For open field vegetables, the statistical yield levels in Finland are approximately one half of those in the Netherlands. For fruits and berries, the Finnish crop is only one third their output and for the greenhouse vegetables it is two thirds of the average Dutch yield level. In Finland, the statistical yield level is influenced by that fact that the early production of plants and the production of the autumn output is not statistically separated: for this reason, the significantly lower per hectare yields of early production lower the average yield level of the whole production.

*Table 4. Average yield levels of some vegetables, apples and berries in Finland in 1989-91 and in the Netherlands in 1987-91 (the yield qualified for sale).*

	Finland yield in statistics	The Netherlands
Vegetables in the open kg/ha		
Carrot	32,922	75,000
Onion	19,915	37,750 <sup>1)</sup>
Cauliflower	11,739	17,250
White cabbage	32,820	85,000
Fruit and berries kg/ha		
Apple	8,063	23,300
Strawberry	4,169	16,000
Black currant	2,184	6,500
Vegetables in greenhouses kg/m <sup>2</sup>		
Tomato	25.3	37.5
Cucumber	33.4	51.3

<sup>1)</sup> The large difference of yields for onion is influenced by the different quality classification. According to the Finnish quality classification, onions for sale must be at least 40 mm diameter. In the Netherlands, the minimum size of a onion qualified for sale is only 10 mm, so in small size onions add to the total yield per ha qualified for sale.

Sources: ANON. 1992a, ANON. 1992b, ANON. 1992c, ANON. 1992e.

### **3.2. Producer prices and production costs of horticultural products**

Producer prices of horticultural products are significantly higher in Finland than in the Netherlands. Table 5 shows the producer prices as an average of the last three years.

#### **Production costs**

Horticultural enterprises differ significantly from each other in their structure. Partly because of this difference there is neither any information nor enterprise models according to which comparable information for fixed costs of horticultural enterprises could be calculated. Therefore, the comparison has been made between the yearly variable costs of cultivated plants, including cultivation, packing and transportation costs.



*Table 5. Producer prices of horticultural products in Finland and in the Netherlands as an average of the years 1990-1992, FIM/kg.*

	The Netherlands	Finland
Carrot (total) <sup>1)</sup>	1.12	3.67
washed		3.03
unwashed		2.12
Onion <sup>2)</sup>	0.79	3.24
Cauliflower	2.79	5.38
White cabbage	0.84	1.52
Tomato	3.65	9.39
Cucumber	2.97	7.60
Apple	2.86	6.33
Strawberry	10.09	14.40
Black currant, fresh consumption	11.47	6.33

<sup>1)</sup> includes all different packing sizes and also washed and unwashed carrot.

<sup>2)</sup> different quality classifications have also influenced the price.

Used rates of exchange: 1 NLG = 2.1053 FIM in 1990, = 2.1709 FIM in 1991, and = 2.5552 FIM in 1992

Sources: ANON. 1993a, ANON. 1993b, ANON. 1993c

## **Cultivation costs**

In Finland, the yearly cultivation costs of all the plants studied are higher than in the Netherlands. Cultivation costs per hectare for plants are higher in Finland. Furthermore, the higher crop levels of competing countries depress the yearly cultivation costs per kilo even more lower than those in Finland because of economies of scale.

There are great differences in the expense shares between different cultivated plants. For instance, fertilizing costs differ for plants because of the different kinds of fertilizing programs. However, the fertilizing costs per hectare in general are higher in Finland than in the Netherlands.

Pesticide costs are the only expense share that is lower in Finland than in the Netherlands for all the plants. For instance, for carrots and strawberries the pesticide cost is twice as high in the Netherlands compared to that in Finland, for cauliflower the cost is almost four times higher.

## **Transportation costs**

One of the greatest yearly expense shares for horticultural production is the transportation cost. In Finland, the horticultural enterprises are often situated in the rural areas so there are long distances from the grower to, for example, the wholesaler. Long distances cause higher transportation and delivery costs compared with the crowded districts of Central Europe.

High transportation costs in Finland are also caused by small production units and small production quantities. The transportation implements are not as effectively used as in the Netherlands, where producer units and quantities are larger and it is possible to lower the per unit costs. Transportation costs from Finnish vegetable growers to wholesaler are about two or three times higher compared with that of a Dutch grower (LEHTIMÄKI 1993).

A very special feature to the transportation distances and problems in Finland is the archipelago, where the long growing season and early spring give good possibilities for the production of many special vegetables, warmth demanding plants, and early vegetables production. Transportation of horticultural products with ferries and other vessels is a problem in the archipelago. Transportation distances are long and they increase costs. In spite of that, horticulture in the archipelago has an important local and economical meaning, and a large part of archipelago inhabitants are supported by, in one way or another, through horticulture (KOTILA 1992).

## **4. Discussion**

Finland's membership in the EC would considerably change the policy concerning horticultural production. Finnish production has to adjust to competition with the EC-countries and to their products being available in our own markets year round.

The border measures have had an essential impact on the progress of Finnish horticultural production. In the accession of Finland the duration of the transitional period will greatly impact the possibilities of Finnish production to adjust to the new situation. The price level in Finland is still significantly higher than in the EC-countries. Therefore, adjusting rapidly is just not possible.

Adjusting to the new competitive situation necessitates that the Finnish production costs be lowered to the level of EC-countries. Compared with the information from the Netherlands, the costs of seeds, plants and fertilizers per ha in addition to packing and transportation costs are higher in Finland. Only pesticide costs are lower in Finland. One could presume, that as a member of EC, these higher costs will be reduced. Even though the Finnish grower could, for example, buy

seeds, fertilizers and machines at the same price as growers in the EC-countries, there will always be differences in the fixed costs. Greenhouses and storages have to be built in a different way in Finland than in EC-countries with their milder climate. If the production costs per ha were on the same level in Finland and in EC-countries, the lower yields in Finland would make the costs per produced kilo higher than in southern countries. The new varieties of horticultural plants and new cultivation methods may increase yields a little in Finland in the future, but this will not cover all the differences in fixed costs.

Adjustment also means structural changes in production. It is probable that in the future the capability of Finnish production will grow in size if it is to be competitive. But it is evident that the structural adjustment requires some time.

These factors are, however, not enough to get Finnish production to an equally competitive state because the climate conditions in Finland impact even more greatly the competitive ability of production. An important question in horticultural production, as well as in basic agriculture, is how the disadvantages caused by the unfavourable climate are noticed in EC-membership.

There are differences between Finland and the EC agricultural policies for horticultural production. EC-membership would mean the adaption of the common agricultural policy to Finnish horticultural production. Corresponding new administrative arrangements have to be established. The impact of the EC market organization for fruits and vegetables is limited anyway, because the products subject to price support are mostly those which are not produced in Finland.

For Finnish production it would be important in the future to know how the EC common border measures are applied in the trade with third countries. As a member in EC Finland would be one of the EC's border countries.

In the context of EC membership and Finnish horticultural production it is difficult to give any exact figures of what will happen to the Finnish production. The progress is very dependent the duration of the transitional period, structural adjustment and accession arrangements, general trend of prices, and of course, on consumer's preferences.

When surveying this production sector one also has to keep in mind the rural policies. Horticulture is a very important branch of production in some regions in Finland. If the adjustment arrangements led to a decrease in production, it would also influence the economy and the employment of other sectors in the production regions. In some of the regions it is almost impossible to find a alternative economical activity.

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**Finland is seeking  
membership in the EC.  
A majority of the people have  
supported this aim.  
Farmers are, however,  
strongly opposed to joining the EC.  
They are concerned that lower  
EC prices and support would  
force them out of business.  
The articles in this publication  
report what researchers say  
about this matter.**