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THE PRICE IMPACT OF ADOPTING THE COMMON AGRICULTURAL POLICY IN ESTONIA: ESTIMATED VERSUS ACTUAL EFFECTS

Kristina Toming¹

Abstract

With accession to the EU, Estonia gave up its liberal trade and agricultural policies and adopted the much more protectionist regime of the EU. Prior to accession, many studies predicted that this would lead to price increases for agricultural products and processed food. This article discusses the results from the studies conducted and compares them with actual price changes that have occurred. The article concludes that prices have actually increased much less than predicted, with only a few exceptions like sugar. The reason lies in the uncertainties associated with policy modelling as well as the gradual price convergence already in motion before accession.

Keywords: EU accession, trade policy, food prices

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1. INTRODUCTION

Since re-gaining its independence in the early 1990s, Estonia has stood out as a small entrepreneurial country with almost unprecedented liberal agricultural and trade policies, with no tariffs on agricultural products. Only in 1998, were direct payments to producers of some agricultural products implemented, and in 2000, low tariffs on agricultural and food imports were introduced. These tariffs, however, only applied to a small share of Estonian trade partners. The absence of significant import tariffs meant that the prices of foodstuffs and agricultural products in Estonia were equal to low and distorted world market prices.

However, the situation was expected to change significantly with Estonia's accession to the European Union (EU) on 1st May 2004, as this highly liberal foreign trade policy as well as agricultural policy had to be abandoned. Instead, Estonia was required to adopt the significantly more protectionist Common Commercial Policy (CCP) applied to external trade and the highly regulated Common Agricultural Policy (CAP) of the EU. Within the general context of a positive attitude towards EU integration that prevailed in Estonia, this raised the question of whether joining the EU would lead to a significant increase in the price of foodstuffs and gave rise to doubts about the positive outcome of the accession among the public and researchers as well as at the political level.

Consequently, prior to accession, quite a lot of studies have attempted to anticipate the possible effects of the accession to the EU and the adoption of the CAP on the agricultural sector in Estonia. Contrary to what has been found in the case of other Central and Eastern European countries (CEECs), the common conclusion from these studies has been that accession would lead to significant increases in the prices of agricultural products and foodstuffs in Estonia. This was considered to be beneficial for farmers in Estonia, however, consumers were expected

to lose out and overall welfare to fall as a result of the expected price increases. Nevertheless, Estonia's accession to the EU in 2004 now allows us to draw some conclusions about the actual price effects of EU membership, and these diverge significantly in many cases from the expected results.

The aim of this study is to discuss how well the studies conducted before accession, estimated accession-related changes in food prices in Estonia. Therefore, the paper mainly focuses on trade aspects of the CAP. This is done by taking into account that the first actual short-term changes in agricultural trade and prices have occurred already, although many of the effects will only occur in long term. The paper is the first attempt to compile the results of different ex-ante models focusing on Estonia's integration with the EU, and to compare their results with the actual accession effects.

The rest of the paper is structured as follows. The next chapter provides an overview of the changes to the trade regime applied to agricultural products and foodstuffs due to Estonia's accession to the EU. The third chapter summarises and discusses the results of quantitative studies dealing with accession-related changes in food prices in Estonia. The fourth chapter reports the actual price effects for agricultural products and foodstuffs that occurred with Estonia's accession to the EU, and compares them with the results of earlier studies. The fifth chapter discusses the deviations between estimates and actual changes. The sixth chapter concludes.

2. POLICY CHANGES IN ESTONIA DUE TO ACCESSION TO THE EUROPEAN UNION

Accession to the EU led to the following changes in Estonia's trade regime in processed food and agricultural products:

- elimination of tariffs and levies on imports of any products between Estonia and the EU;
- elimination of EU subsidies on agricultural exports to Estonia;
- adoption of EU common external tariffs (CET) on imports from third countries.

On 1st January 1995, Estonia and the EU concluded the Europe Agreement, which also embodied a free trade agreement. However, agricultural products were left out of the free trade agreement, although other goods of Estonian origin were granted tariff-free entry to the EU market. Yet, as a result of that agreement, the EU provided some gradual concessions for Estonian agricultural exports, gradually lowering and abolishing tariffs and increasing the amounts of Estonian agricultural products and foodstuffs allowed to enter the EU (i.e. quotas). Estonia, at the same time, did not apply tariffs or other trade barriers against imports from EU countries already before full membership. However, with Estonia's accession to the EU on 1st May 2004, the last remaining formal barriers on Estonia's exports to EU countries were abolished.

As a consequence of its very expensive agricultural policy, the prices of agricultural products in the EU internal market in most cases exceed world market prices. In other cases, direct income payments to producers are made. Where these products were exported to Estonia, any differences between the EU internal market prices and the world market prices were covered via export subsidies (i.e. paid as export refunds). This made the prices of products from the EU artificially lower than the internal market prices. Table 1 provides the rates of export subsidies granted by the EU on exports of agricultural products and processed food to Estonia in 2001. This was the range of

the artificial advantage in prices of imports from the EU, which Estonian producers had to compete with. Table 1 also shows the minimum and maximum producer prices in the old member states of the EU in 2001, and the average producer prices in Estonia (due to data availability, the producer prices for Estonia are presented from 2000). It can be seen, that the export subsidies were especially relevant for butter and sugar, where the subsidy was close to the actual producer prices. At the same time, according to its accession agreement with the WTO, Estonia has not been allowed to use any export subsidies.

Table 1. EU export subsidies and producer prices in the EU and Estonia

	EU export subsidy, Jan-Feb 2001 (EUR/t) ^a	EU-15 producer price, 2001 (EUR/t)		Estonian producer price, 2000 (EUR/t)
		Min	Max	
Beef	161	1588 ^b	3233 ^b	1141
Pork	0	1427 ^b	1687 ^b	1486
Poultry	0	1234	1942	...
Skimmed milk powder	150	505 ^c	977 ^c	177 ^c
Butter	1680	2999	4849	177 ^c
Wheat (common)	13	105	161	103
Rye	46	93	131	85
Rice	226	...	...	...
Sugar	428	429 ^d	552 ^d	...

Sources: Commission Regulations (EC) No 66/2001, No 152/2001, No 355/2001, No 386/2001, No 403/2001, No 463/2001 and No 478/2001; Eurostat; Statistical Office of Estonia.

Notes: ^a Granted EU agricultural and food exports to Estonia

^b Carcass weight for calves/pigs

^c Producer price of whole drinking milk

^d Producer price of sugar beet

In accordance with the principles of the common market, export subsidies had to be abolished by the time of Estonia's accession

to the EU. In 2002, the EU removed export subsidies for unprocessed agricultural products (except for rice and sugar) exported to Estonia. However, export subsidies for processed food remained in effect until 1st May 2004. This implied that imports of processed food from the EU were expected to become more expensive after accession. On the other hand, as accession to the EU also implied the adoption of the CAP in Estonia, the prices of domestically produced goods were expected to converge to the level of EU administrative prices set by the CAP. In most cases, these were higher than the prevailing producer prices in Estonia. The fact that with accession, the EU export subsidies would also apply to Estonian producers was nevertheless seen as a positive development.

However, serious changes were also anticipated due to the implementation of the full range of EU common external tariffs, as this involved a significant increase in tariffs on imports from third countries. Table 2 shows the structure of tariffs applied in the EU and in Estonia before accession. For Estonia, the year 2003 is chosen to show the data on tariffs before accession to the EU; and for the EU, the year 2004 is chosen because with accession, Estonia had to adopt the EU tariffs from 2004 onwards. For comparison, tariff data from 2002 is also shown to highlight the fact that the EU has reduced its tariffs slightly during 2002–2004. The tariffs in Estonia at the same time remained unchanged. It can be seen from the table that the simple average tariff rate applied in the EU in 2004 was twice as high as the MFN² tariff rate applied in Estonia in 2003, whereas Estonia applied no tariffs to non-agricultural imports.

² The most-favored-nation (MFN) principle refers to the rules of non-discrimination in the WTO. MFN means that every time a country lowers a trade barrier or opens up a market, it has to do so for the same goods or services from all its trading partners. However, some exceptions are allowed. For example, countries can set up a free trade agreement that applies only to goods traded within the group, discriminating against goods from outside. Or they can give developing countries special access to their markets.

The table also reveals that the bound tariff rate for agricultural products in Estonia was higher than that in the EU (21.9 per cent and 16.7 per cent, respectively).³ Nevertheless, the tariffs actually applied in Estonia were somewhat lower, although the differences were not remarkable.

Table 2. Structure of customs tariffs in the EU and Estonia

	EU			Estonia		
	2002 applied rate	2004 applied rate	2004 bound rate	MFN 2002	MFN 2003	2003 bound rate
Simple average tariff rate	6.6	6.5	6.5	3.3	3.3	10.2
Agricultural products (HS01–24)	16.7	16.6	16.7	14.4	14.4	21.9
Non-agricultural products (HS25–97)	3.9	3.7	3.7	0.0	0.0	6.8
Duty-free tariff lines (% of all tariff lines)	20.8	26.9	26.8	88.0	88.0	16.0

Source: WTO, 2004.

However, one has to keep in mind that this is only a simple average, not weighted with import volumes, and can hence be misleading. The last row in table 2 provides some insight into that matter: 88 per cent of all tariff lines applied in Estonia were actually duty-free, whereas the same indicator for the EU was only 26.9 per cent in 2004. Furthermore, the percentage of duty-free lines applied by the EU to agricultural products was even lower, 18.8 per cent (WTO 2004, pp. 42, 163). According to the calculations by the Estonian Ministry of Agriculture, the trade-weighted average tariff level applied by Estonia was only 0.57 per cent in 2000.

³ The bound rate refers to the maximum tariff rate allowed by the WTO.

Furthermore, whilst the average tariff on all agricultural products and processed food in the EU exceeded the average tariff applied in Estonia by only about two percentage points, the range of tariffs applied by the EU was much larger. The maximum import tariff applied by the EU was 209.9 per cent (dairy products), while the highest tariff imposed by Estonia was “only” 59 per cent (meat and cereals) (see table A.1. in appendix 1 for tariffs for different product groups in the EU in 2004 and in Estonia in 2002). Yet, for some product categories, the average tariffs applied by Estonia were actually higher than in the EU (e.g., meat (code 02), edible vegetables (code 07), products of the milling industry (code 11), preparations of meat and fish (code 16)). However, the low weighted average tariff in Estonia reveals that most imports came from the EU and from countries that had free trade agreements with Estonia.

Thus there were, in principle, three kinds of factors that could lead to food price increases in Estonia after accession to the EU. First of all, imports from third countries were expected to become more expensive due to the adoption of EU tariffs, leading to shifts in demand for imports from the EU (i.e., trade diversion). Secondly, imports from the EU were predicted to become more costly after export subsidies were removed. Thirdly, the adoption of EU administrative prices in the Estonian agricultural sector was also anticipated to cause increases in the price level of domestically produced goods.

3. THE RESULTS OF PREVIOUS STUDIES

There are many studies that have evaluated the effects of EU membership for CEECs as a whole or for particular countries. Still, there have not been many comprehensive analyses conducted concerning the impact of EU accession on the agricultural sector in Estonia. Although a few studies have dealt with that issue (e.g., Fock 2000, Riik et al. 2002, Roth 2001, Selliov 2002,

Tamm 2002, Toming 2002, Varblane et al. 2001, Varblane et al. 2002, Varblane et al. 2003),⁴ some of them were only descriptive, not providing a deeper insight into the expected changes, or they have occupied themselves with issues not directly of interest in the context of the present paper (e.g., the adoption of direct payments to farmers). Therefore only a few of them will be considered here.

Part of the studies dealt with the effects of EU integration on import prices only, not applying any economic models to the problem set (e.g., Varblane et al. 2001 and Varblane et al. 2002). Varblane et al. (2001) considered the removal of EU export subsidies, calculating the changes in import prices from the EU simply by adding the subsidy rate to the price. The authors found that the elimination of export subsidies would result in quite considerable import price increases in some sectors, the highest of which would be in the case of sugar (136 per cent compared with prior to the policy change). Also, import prices of some milk products and cereals were expected to rise significantly — for example, imported butter was to become 83 per cent and acidified milk 47 per cent more expensive; the price of rye and maize was anticipated to rise by 34 per cent and 21 per cent, respectively. The changes in import prices of other products were estimated to be more modest (e.g. canned meat 12 per cent, condensed milk 11 per cent, beef 2.5 per cent, meat sub-products 6 per cent, rice 11 per cent, wheat 7 per cent) (Varblane et al. 2001, pp. 38–39). However, as the authors emphasised, these estimated changes in import prices were expected to occur only if the structure and quantity of imports remained unchanged compared to the base year, 2000. Furthermore, the study did not analyse the impact of adopting EU import tariffs.

Another study by Varblane et al. (2002) considered, in addition, the introduction of EU import tariffs on agricultural products and

⁴ However, there are no studies that analyse the effects of EU integration explicitly on Estonian exports of agricultural products and processed food.

processed food in Estonia. The impact of eliminating EU export subsidies was also recalculated. The authors used 2001 import data and calculated new expected import prices assuming that the import structures remained as they were in 2001. They added the EU export subsidy rates to the import prices from the EU, and the EU tariff rates to import prices from countries towards which the EU applied tariffs. Based on these, they found new weighted average import prices. Compared to Varblane et al. (2001), some variations existed in the predicted price changes. In most cases, the estimates for price increases due to policy changes had increased (e.g., the import price for sugar was expected to increase by 132–146 per cent and for meat sub-products, by 58 per cent). This was a reasonable result, as the latter study also included the effects of adopting EU import tariffs. Only in the case of butter, was the estimated price increase in the 2002 study markedly lower than in the 2001 study (35.5–46.9 per cent and 83.4 per cent, respectively) (Varblane et al. 2002, pp. 81–85). This can be explained by the change in the structure of imports in 2001 compared to 2000, because within one year, the share of the EU in Estonian butter imports decreased by more than 2.5 times (imports from the EU were replaced by imports from CEECs). Secondly, during that year, the EU subsidy rate on exported butter decreased slightly.

However, a few studies have applied economic models to quantify not merely the accession-led changes in import prices, but also the changes in consumer and producer prices as well as the impact on economic welfare. Selliov (2002) used a simple static partial equilibrium model, incorporating the adoption of EU import tariffs and abolition of export subsidies towards Estonia. Different scenarios were set up differing in terms of the assumed size of the export subsidies, the possible trade diversion as well as whether the EU intervention system also applied in Estonia or not. The models were of single commodity character, and different assumptions of demand elasticities (different values for elasticities as well as different functional forms of the demand) were used. Domestic production was assumed to be inelastic in the short run. Selliov (2002) analysed 4 different commodity

groups, in which either the consumption consisted of imports only (sugar), or the imports were (mostly) reaching the final consumption only after re-processing by domestic food producers (beef, poultry and butter), hence, decreasing the need to count for consumer preferences. The calculations were based on 2001 price and quantity data. The results of the study differed according to the scenarios used; however, the largest changes in the import and consumer prices were foreseen in the case of butter (price increases in the range of 0–146 per cent) and the smallest in the case of poultry (–1 to +8 per cent). The consumer prices for beef and sugar were expected to change in the range of 0–95 per cent, and 130–132 per cent, respectively. The resulting losses in welfare were quite modest, accounting for 0–0.34 per cent of GDP for beef, 0–0.2 per cent of GDP for butter and 0–0.31 per cent for sugar. The welfare loss in the case of poultry was negligible. However, Selliov (2002) also calculated the welfare losses with respect to the product market—that is, the total domestic consumption of a product, and the welfare losses in that case were remarkably higher. For example, the welfare loss in the case of butter accounted for 1–1519 per cent of the total butter consumption in Estonia (the respective figures for beef, poultry and sugar were 0–84, 0–74 and 0–107 per cent, respectively).

Tamm (2002) applied a partial equilibrium model to estimate the changes in consumer prices for agricultural products and the accompanying effects on economic welfare in Estonia, as a result of imposing EU import tariffs and abolishing EU export subsidies on the markets of some primary agricultural products (meat, cereals and sugar). As a basis, import data for 1998–2001 was used. Whilst applying different (constant) demand elasticities, the author assumed that domestic supply was inelastic in the short-run. Unfortunately, the author did not calculate the average change in consumer prices (the weighted average of domestic producer and import prices) in percentage terms or report the base prices. Therefore, the results of that study cannot be easily compared with other studies. Nevertheless, the main findings were similar to other studies, suggesting that the greatest

welfare loss would occur in the sugar sector.⁵ This can be explained by the fact that sugar is not produced in Estonia and its demand is relatively inelastic. This implies that price increases do not lead to significant falls in consumption. Other sectors characterised by deadweight losses where maize and poultry; somewhat smaller were welfare losses in pork and rye (Tamm 2002, pp. 44–47).

However, the above-mentioned study assumed homogeneous goods, hence only modelling inter-industry trade and ignoring an important phenomenon of the real world, that most trade is intra-industry (a country can be an exporter and an importer of a certain good at the same time). There are two studies that take into account product differentiation (i.e. substitutability between domestic and imported sources of supply) in modelling the adoption of an EU trade regime in Estonia (Fock (2000) and Toming (2002)).

Fock (2000) studied the effects of integrating the Estonian agricultural sector into the EU (assuming accession in 2003); however, leaving out the distinction between the effects of adopting EU trade instruments and other factors of integration. He built a demand system based on the behavioural assumption that consumers maximize their utility given prices and a budget constraint. Fock (2000) found that, under various scenarios that were constructed, the retail prices of agricultural products and food were in most cases expected to increase. The model showed that the prices of cereals and poultry would only rise modestly; however, in cases where the producer prices were determined by EU administrative prices, the prices were predicted to increase considerably. The calculations showed that the retail prices of milk and beef would rise by the range of 5–41 per cent and 7–76 per cent, respectively. The lowest margin referred to the total liberalization of EU agricultural policy (including the WTO negotiations), the highest showed the result of adopting the status quo CAP as it stood in 1999. By now, it is known that the latter

⁵ The magnitude of deadweight loss varied with chosen demand elasticities.

scenario did not apply to Estonia, and therefore, will be neglected in what follows. The closest scenario to the real situation, the Agenda 2000, however, predicted price increases by 28 and 38 per cent, respectively. Another example of a considerable price increase was sugar; there, the retail price was estimated to rise by 21–42 per cent (total liberalisation and Agenda 2000 scenarios, respectively) (Fock 2000, p. 286).

However, these numbers only referred to the changes in retail prices; the increases in producer prices were even more pronounced, ranging to 10–59 per cent for milk, 14–72 per cent for beef, and 52–103 per cent for sugar (Fock 2000, p. 199). This indicates that retail prices could not rise as much as producer prices because of the limited purchasing power of consumers, and that the price margins (the share of the wholesale and retail sector in consumer prices) would fall. The only product predicted to result in a price reduction with Estonia's accession to the EU was pork, as its producer price in Estonia exceeded that in the EU.⁶

Another study, undertaken by Toming (2002), used a one-country partial equilibrium model and applied the so-called Armington assumption. The study dealt with the changes in the import regime for processed food and agricultural products, and the resulting implications on economic welfare in Estonia. There were eight commodity groups analysed: beef, pork, poultry, milk products, wheat, rye, rice and sugar. However, the model from its nature was only a single-product model, neglecting any demand and supply interrelationships among agricultural products. Also, any changes in income were ignored, and the domestic supply was assumed to be inelastic in the short-run.⁷ A dataset from the original data was constructed, consisting of the quantities and prices of imports subdivided into sectors corresponding to the classification of consumption and domestic production. This, however, led to a very high aggregation level and left out the

⁶ The retail price of pork was expected to fall by 16–17 per cent.

⁷ As in Tamm (2002).

possibility to model forward and backward linkages within food supply chains. As the base year, 2000 was chosen, assuming for simplicity that economic relations would change only due to the implementation of EU trade policy and the CAP.

The results of the study were quite significant. As a result of EU accession, the import prices of most commodities were predicted to rise by a range of 30 per cent (for poultry) to 140 per cent (for sugar) (Toming 2002, p. 32). The price increases were due to the fact that EU subsidies for exports to Estonia were no longer granted, and the adoption of the common external tariff led to higher prices of imports from third countries. Also, the import prices of commodities from other new member countries in the EU (i.e. CEECs) were estimated to increase significantly. This was due to the adoption of EU administrative prices (applied to some agricultural products) by these countries. For example, the import price of beef from CEECs was estimated to increase by 68–77 per cent (Toming 2002, p. 29). However, this shows that product quality differences between the EU-15 and CEECs were neglected.

In addition, the producer prices in Estonia were also expected to rise to the level of EU administrative prices, further and even to a greater extent contributing to overall price increases.⁸ For example, the producer price of beef was estimated to increase 2.25 times, and the producer prices of poultry, rye and wheat by 42, 31 and 9 per cent, respectively. As a result, the consumer price of beef was expected to rise by two times, the prices of poultry, rye and wheat by 35–38 per cent, 31 per cent and 10 per cent, respectively. The predicted increase in the average consumer price of milk products was even more pronounced — about 3 times, mainly due to the adoption of EU administrative prices (Toming 2002, p. 32).⁹ Hence, according to that study,

⁸ This refers again to the fact that quality differences between Estonian products and EU products, to which the administrative prices apply, were neglected.

⁹ In Toming (2002), the studied milk products also included butter and other dairy products in addition to fresh milk.

domestic production was not able to mitigate the increases in the cost of imported foodstuffs even in cases where it was available. In cases where no domestic production existed — for example, rice and sugar — the increases in import prices were expected to pass fully into consumer prices (the consumer prices for rice and sugar were expected to increase respectively by two and 2.4 times compared to the price level in 2000).

Table 3 summarises the studies discussed with respect to the methods, model specifications and problem sets used.

Table 4 reports the estimates of changes in import and consumer prices associated with Estonia's accession to the EU and the accompanying adoption of the CAP. As can be seen, the results of different studies vary considerably. However, as the studies have relied on different assumptions about policy changes as well as model specifications, and in addition vary in their chosen product categories (the level of disaggregation), the results of the different studies cannot be compared directly. Yet, one can conclude that the magnitude of the expected price changes has increased with time. The price effects predicted by Fock (2000) are the smallest compared to the later studies, and the largest price changes have been estimated by Toming (2002).

To conclude, all these studies predicted that accession to the EU would bring considerable import and consumer price increases, and therefore, reduce economic welfare in Estonia. However, the magnitude of price changes varied to a large extent, reflecting the different initial conditions, assumptions and approaches chosen in the studies.

Table 3. Overview of the models dealing with the agricultural price effects of EU accession in Estonia

Model	Fock (2000)	Selliöv (2002)	Tamm (2002)	Toming (2002)
Method	PEM * (Comparative-static model for Estonia's agricultural and food sector — EFASIM, based on CEASIM developed by IAMO)	PEM *	PEM *	PEM *
Base year	1997	2001	1998–2001	2000
Data sources	Statistical Office of Estonia; European Commission; Estonian Ministry of Agriculture, FAO	Statistical Office of Estonia; European Commission; Estonian Ministry of Agriculture, Estonian Institute of Economic Research	Statistical Office of Estonia; European Commission; Estonian Ministry of Agriculture, Estonian Institute of Economic Research	Statistical Office of Estonia; European Commission; Estonian Ministry of Agriculture
Demand functions	Demand system based on expenditure minimisation	Derived from initial consumption quantities and prices and price elasticities of demand	Derived from initial consumption quantities and prices and price elasticities of demand	Derived from initial consumption quantities and prices and price elasticities of demand (based on Rousland and Suomela (1993))
Demand-side disaggregation	1 consumer income group	1 consumer income group	1 consumer income group	1 consumer income group
Production functions	Supply functions derived from profit maximisation; perfect markets for basic agricultural producers; Cournot oligopoly in food processing industry	Production-side explicitly not modelled (production is assumed to be inelastic in short run)	Production-side explicitly not modelled (production is assumed to be inelastic in short run)	Production-side explicitly not modelled (production is assumed to be inelastic in short run)

Model	Fock (2000)	Selliov (2002)	Tamm (2002)	Toming (2002)
Production-side disaggregation	9 agricultural production sectors, 10 consumer commodity groups; 5 production inputs	4 agricultural commodity groups	10 basic agricultural commodities	8 agricultural commodity groups
Extraneous use of elasticities	Own and cross price elasticities of demand; income elasticities of demand; price elasticities of supply; elasticities of substitution in production; elasticities of substitution between domestic and imported commodities	(Own) price elasticities of demand (constant and linear); infinite import supply elasticity	(Own) price elasticities of demand; infinite import supply elasticity	(Own) price elasticities of demand; elasticities of substitution between domestic and imported commodities; infinite import supply elasticity
Policy changes incorporated	Base scenario (no accession) compared to 3 EU accession scenarios (include increases in growth rates): 1. Current CAP — implementation of CAP 1997 2. Agenda 2000 — adoption of reformed CAP following the proposals of the EU Commission of March 1998 (reduced administrative prices, direct payments fully applied/not applied) 3. Liberalisation — drastic liberalisation of CAP (reduction in tariffs by half, intervention prices banned, decoupled direct payments)	Removal of EU export subsidies, adoption of CET and EU administrative prices (different scenarios)	Removal of EU export subsidies and the adoption of CET	Removal of EU export subsidies, adoption of CET and EU administrative prices

Model	Fock (2000)	Selliou (2002)	Tamm (2002)	Toming (2002)
Policy conclusions	Adoption of CAP (compared to no-accession scenario) leads in general to increases in consumer and producer prices, whereas the magnitude of changes varies with the scenarios. The welfare effects are positive for producers and negative for consumers, the total welfare effect is, however, positive (except in Agenda 2000 scenario without any direct payments).	Net welfare decreases as a result of price increases	Net welfare decreases as a result of price increases	Consumer welfare decreases as a result of price increases concurrent with the policy changes; net welfare falls (deadweight loss)

Source: author's table.

Remarks: * Partial equilibrium model.

Table 4. The predicted price changes due to Estonia's accession to the EU: the results of selected studies

	Studies dealing with import prices only			Partial equilibrium models					
	Varblane et al. (2001)	Varblane et al. (2002)	Fock (2000)	Selliov (2002)		Toming (2002)			
	Δ import price (%)	Δ import price (%)	Δ consumer price (%)	Δ import price (%)	Δ consumer price (%)	Δ import price (%)	Δ consumer price (%)		
Beef	3	0-1	7-38	2-16	0-95	64	112-113		
Pork	...	5	-16	...	...	-0.3	0
Poultry	...	...	7-14	-1-13	-1-8	30	35-38
Milk	47	3-43	5-28	...	...	72	209-217
Butter	83	36-47	...	2-56	0-146	...	...
Maize	21	88	...	...	...	...	...
Wheat	7	16	4	...	...	7	9-10
Rye	34	49	...	...	...	34	31
Rice	11	...	...	...	...	102	102
Sugar	136	132-146	21-42	130-132	130-132	139	139		

Sources: Fock (2000), Selliov (2002), Toming (2002), Varblane et al (2001), Varblane et al (2002) (author's table)

4. THE ACTUAL PRICE CHANGES AFTER ACCESSION

The import price effects due to Estonia's accession to the EU were expected to be the following:

- increases in import prices from the EU-15 as a result of the abolition of export subsidies;
- increases in the import prices from regions outside the EU towards whom the EU applies import tariffs (e.g. the United States, Canada, Ukraine).

Concurrently to these price changes, import volumes from the EU-15 and countries, which had no free trade agreements with the EU, were expected to fall. On the other hand, import volumes from CEEC countries (EU members from May 2004) and non-EU countries, that could export their foodstuffs to the EU free of trade barriers, were anticipated to rise.

In most cases, however, the accession-accompanying changes to the trade regime did not have a significant impact on import prices (figures showing developments in import prices and volumes of other selected commodities during the period from January 2003 to September 2004 can be found in appendixes 2–4 (figures A.1.-A.31)).¹⁰ The prices followed rather ordinary fluctuations or the effect on import prices was only temporary and the prices quickly returned to their initial levels.¹¹ However, there is a serious problem related with the comparability of the data. Before May 2004, the import data was collected on the basis of source countries. With accession to the EU, the system of data collection changed to become based on destination country, as a result of which, it is not possible to track the real

¹⁰ EEK 1 = EUR 1/15.6466.

¹¹ The abrupt price changes can also refer to changes in the quality composition of product categories. The prices equal to zero indicate the absence of imports from a certain country group at a certain time.

sources of imports when the goods are not entering Estonia directly from the source country, but through another member state of the EU. Therefore, the conclusions hereafter need to be considered with caution.

Only in the case of buttermilk and yoghurt, did the trade volumes follow the expected patterns, although the prices of imports from the EU did not rise. After accession, the volumes of imports from the EU-15 fell somewhat, and the volumes of imports from CEECs rose considerably. However, import volumes of frozen beef showed reverse patterns — before accession, basically no imports came from the EU, but from May 2004, EU imports became significant (with a lower average import price compared to CEECs). In some cases, the trade volumes showed a steady increase before accession (e.g. condensed and uncondensed milk from CEECs, maize from Ukraine, poultry sub-products from countries that have no free trade agreement with the EU¹²), reflecting the expectations of importers about possible price increases after accession. After accession, import volumes of these products decreased. Imports of maize from Ukraine decreased to insignificant levels, and imports of poultry sub-products from the United States ceased completely.

Import prices of butter (HS code 0405), however, increased slightly in May 2004 compared to one month earlier (the average import price of butter was 25 EEK/kg in April 2004 and 31 EEK/kg in May 2004), and stabilised at an even higher level afterwards.¹³ The pre-accession average import price of butter (calculated for the period January 2003–April 2004) was 23 EEK/kg, whereas the post-accession price (for the period May 2004–September 2004) was 36 EEK/kg. These price increases can be mainly associated with the price developments of imports from the EU after the removal of export subsidies on

¹² Imports of poultry sub-products from the United States increased mostly.

¹³ The average import price of butter was 38 EEK/kg in September 2004.

butter in May 2004. In April 2004, the average import price of butter from the EU was 47 EEK/kg; however, by May 2004, it had increased to as high as 70 EEK/kg (see Figure 1). After the steep initial price increase, the import price of butter from the EU fell to a somewhat lower level, however, still exceeding the pre-accession level (the average post-accession price of butter imports from the EU was 57 EEK/kg compared to the average pre-accession level of 33 EEK/kg). In addition, butter imports from CEECs became more expensive (the post-accession price of butter imports from CEECs was 34 EEK/kg compared to pre-accession level of 23 EEK/kg).

The volume of butter imports increased before accession (especially from CEECs), indicating the intention of importers to gain from price differences before and after accession. However, as a result of the increase in import prices after accession as well as sufficient stocks being obtained before accession, the volume of butter imports decreased markedly from all sources after Estonia joined the EU (see Figure 2).

The most significant case was, however, sugar imports, the price of which rocketed as Estonia acceded to the EU on 1st May 2004. The weighted average import price of sugar in April 2004 formed 118 per cent of the price level at the beginning of the year (see Figure 3). However, by May 2004, the price of imports had jumped to the level of 325 per cent compared to that in January 2004 (hence, from April to May, the price increased nearly 2.8 times). This was an expected result of the removal of EU export subsidies (42.4 EUR/100 kg) at the accession date, although its range seems to exceed the estimates.

As most imported sugar originated from the EU because of its favourable price (as a result of EU export subsidies), the average import price followed the behaviour of the import price in the EU. This price increase was, nevertheless, not ultimate, and by September 2004, the price of imported sugar had risen by 470 per cent compared to the beginning of the year. How-

ever, after a considerable increase in quantities of (cheap) sugar imports just before the accession date (in April, imports grew by nearly 4 times compared to March 2004, whereas next to traditional sugar imports from the EU, sugar was also imported from CEECs, Ukraine and other non-EU countries), the drastic increase in import prices after accession led to an extreme fall in imported quantities (see Figure 4).¹⁴ The average import price of sugar after accession to the EU was around 12 EEK/kg (during the period May – September 2004), which was three times higher than the average pre-accession price (the import price of sugar was less than 4 EEK/kg during the period 2000 – April 2004).

¹⁴ According to calculations by the European Commission, the excess sugar stocks acquired in Estonia before accession amounted to 91 000 tons, for which the Estonian government has to pay a so-called sugar fine which has been estimated to be up to 715 million Estonian kroons (Riikoja, 2005).

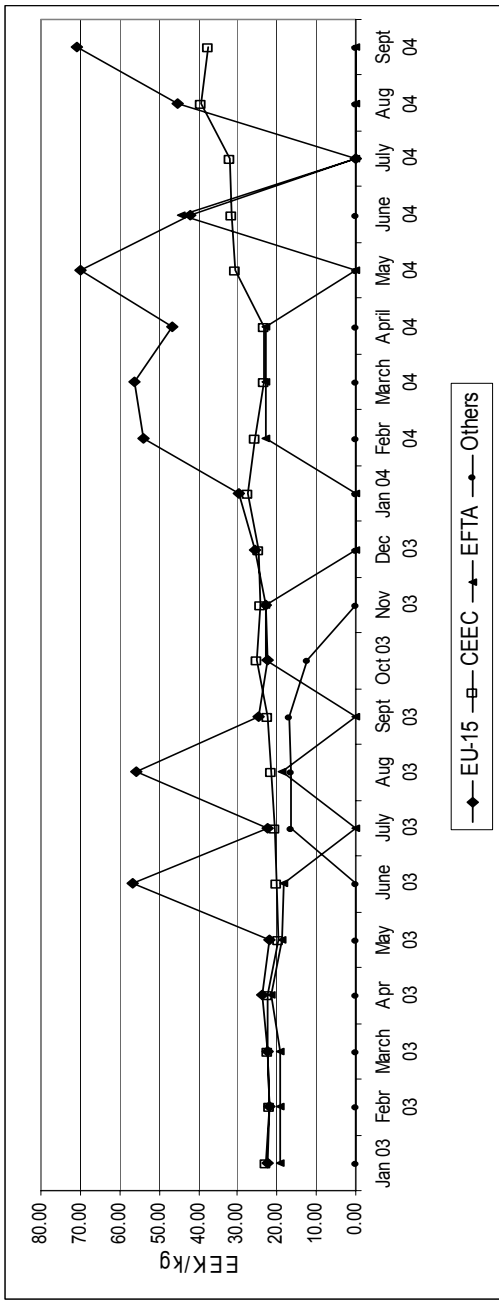


Figure 1. Import prices of butter in Estonia, January 2003 – September 2004 (Source: Statistical Office of Estonia; own calculations)

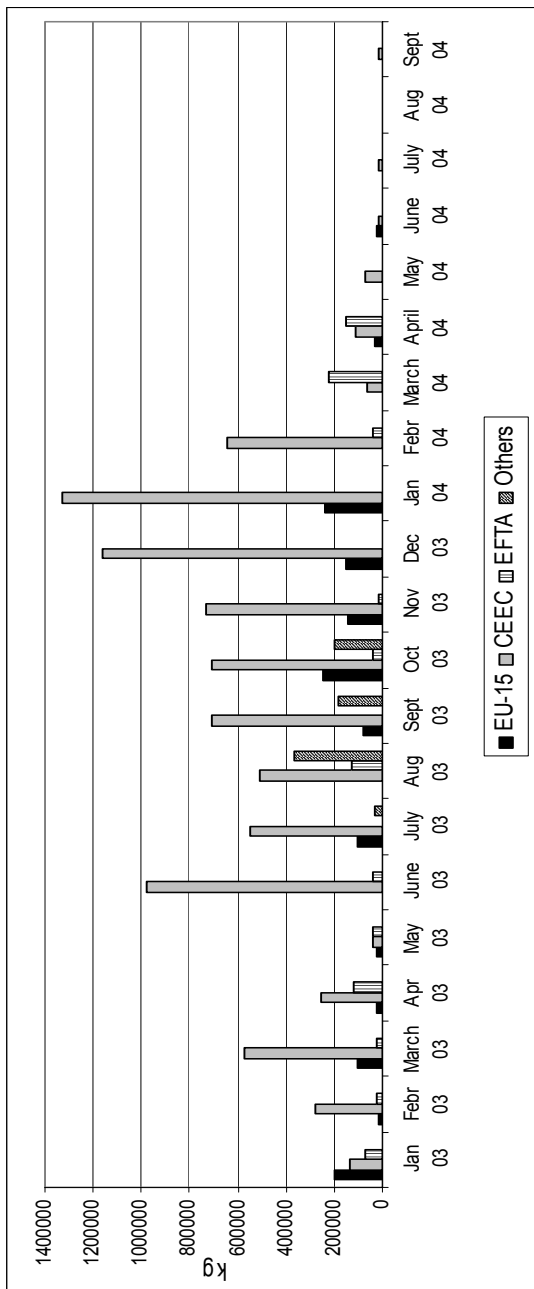


Figure 2. The quantity of butter imports, January 2003 – September 2004 (Source: Statistical Office of Estonia; own calculations)

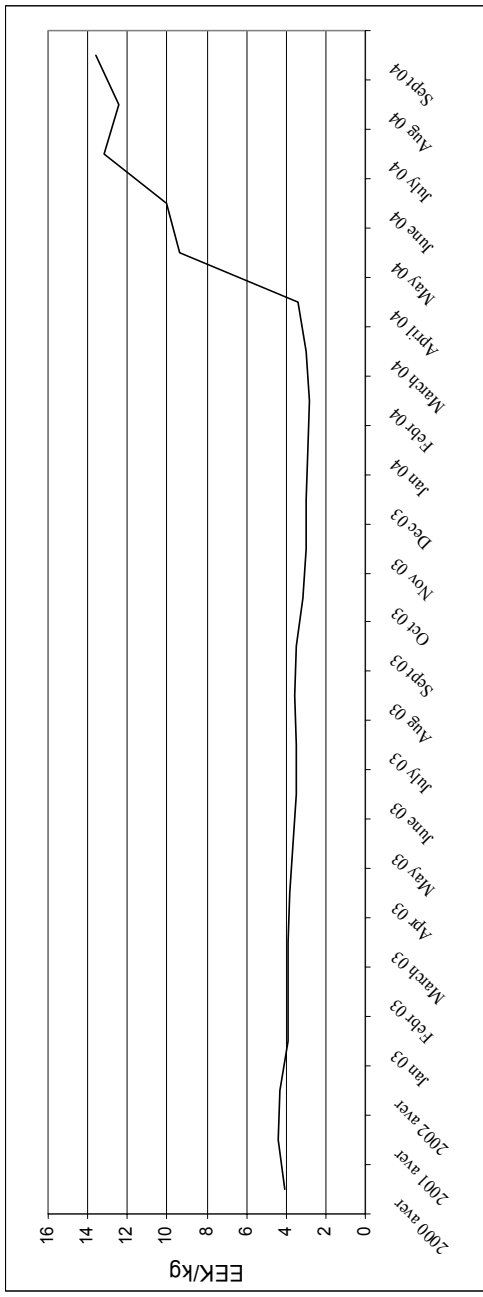


Figure 3. Average import price of sugar in Estonia (all sources), 2000 average – September 2004 (Source: Statistical Office of Estonia; own calculations)

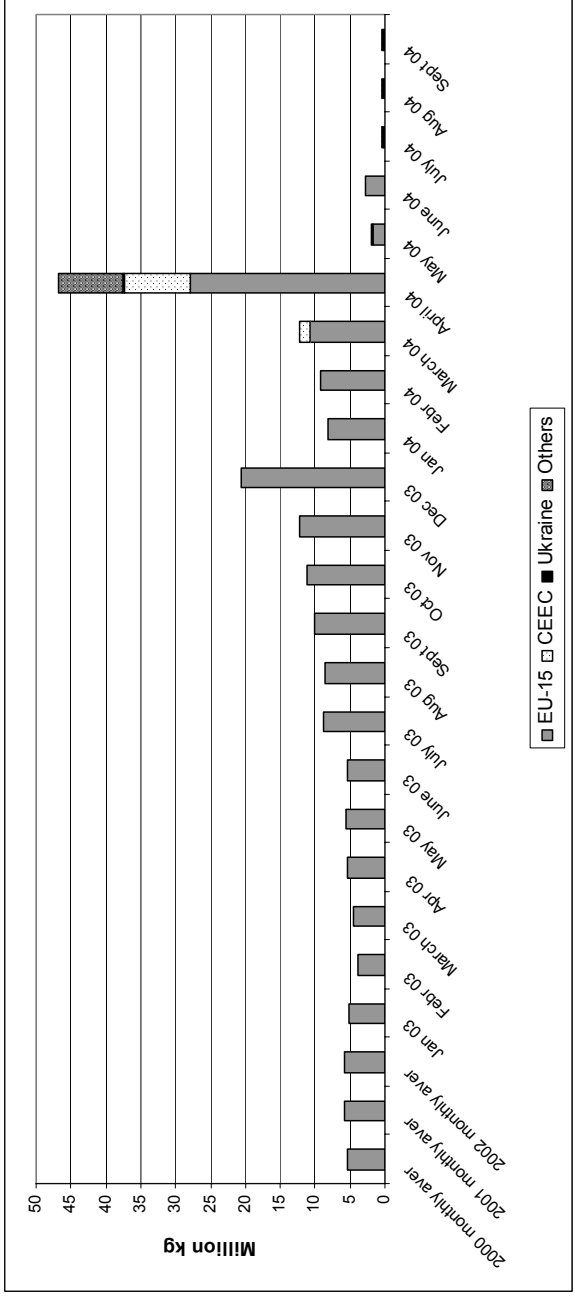


Figure 4. The quantity of sugar imports, 2000 monthly average – September 2004 (for 2000–2002, the figures show total imports from all sources) (Source: Statistical Office of Estonia; own calculations)

Table 5 presents foodstuff prices in Estonian supermarkets before and after accession to the EU. It can be seen that from April to May 2004, the prices of foodstuffs followed rather normal fluctuations with the only notable exception being sugar. In many cases, the retail prices even decreased compared to the previous month (e.g., milk, cheese, poultry, wheat).

However, as table 5 also indicates, many of the price increases occurred already in the pre-accession period. In the case of milk products, the prices increased already before 2004, partly reflecting higher raw milk prices paid to farmers in Estonia as a result of improved export opportunities (Estonian Institute ... No 150, 2004, p. 48). The procurement price of milk in April 2004 was 61 per cent higher compared to its level in June 2000 (see table 6 for procurement and producer prices). As a result, the average retail price of milk increased by 22 per cent during the period June 2000–April 2004. Retail prices of butter and cheese increased during September 2003 to April 2004 by 20 and 7 per cent, respectively.

Nevertheless, the modest immediate price effect of EU accession was followed by more significant price effects in the longer term. By May 2005, the retail prices of butter and cheese had increased by 22 and 7 per cent respectively compared to April 2004 (table 5). The increase in retail prices was a result of the introduction of the EU intervention system in Estonia. For example, the producer prices for butter and skimmed milk powder, which are in markets that are highly regulated by intervention purchases, started to rise after accession, and by May 2005 reached the levels 18 and 6 per cent respectively, higher than in April 2004 (table 6).¹⁵ However, the post-accession increases in retail prices were only partly related directly to the accession, as the milk prices increased due to higher raw milk prices (increase by 4 per cent during April

¹⁵ The intervention prices for skimmed milk powder and butter during the period 1 July 2004 – 30 June 2005 were 30.55 EEK/kg and 47.76 EEK/kg, respectively.

2004 to May 2005) and the pricing policy of milk-processing companies. Yet, part of the price increases reflected the fact that after accession, subsidised imports from the old EU countries were cut off, and by May 2005, the stocks of cheap imports in the stores had run out.

Also, the prices of animal products increased gradually during the period considered, rather than showing any dramatic price developments after accession to the EU. Compared to June 2000, the retail price of beef in April 2004 had increased by 23 per cent and the retail prices of pork and poultry rose by 9 per cent each. Right after the accession, in May 2004, the average retail price of pork increased by 4.5 per cent (compared to April 2004), whereas the prices of beef and poultry decreased slightly (by 0.4 and 1.4 per cent, respectively) (table 5). The effect of EU accession on producer prices of meat was even negative — the procurement prices of beef and poultry fell respectively by 13 and 32 per cent in May 2004 compared to April 2004 (table 6). Only the procurement price of pork increased slightly (by 3 per cent). However, the procurement price of beef started to increase again in May 2005 becoming nearly 31 per cent higher than in April 2004.

Bananas are also an interesting case. Accession to the EU did not have any significant immediate effect on retail prices of bananas as the price of bananas in May 2004 was only 6.5 per cent higher than in April 2004 (table 5). However, by May 2005, the retail price of bananas had increased by 49 per cent compared to April 2004. This abrupt rise in the price of bananas can be explained if we look at the EU banana market regulations. Estonian companies are allowed to import a proportion of bananas within a preferential quota, which covers only about 20 per cent of domestic consumption. The remaining 80 per cent are imported at much higher prices.¹⁶ The quotas are negotiated

¹⁶ In 2004-2005, the EU import duty rate for bananas within quota was EUR 75 per ton, whereas the MFN duty rate (i.e. the import levy payable for quantities outside the quota) was EUR 680 per ton (European Commission 2005).

every quarter, and presumably by May, the bananas within the preferential quota were sold out, which resulted in the much higher subsequent retail price for bananas.

However, there was a direct effect from accession on sugar prices. The retail price of sugar increased by nearly 84 per cent in May 2004 compared to just one month earlier. Moreover, when we compare the retail price of sugar in September 2004 to the price in April 2004, the increase was much more pronounced (2.7 times). By May 2005, however, the retail price of sugar had decreased somewhat to a level of 116 per cent higher than the price in April 2004.

The extent to which the changes in import prices pass into consumer prices depends largely on the share of imports in domestic consumption (see table A.2. in Appendix 5 for balance sheets of selected foodstuffs in Estonia in 2004). The drastic rise in sugar prices is a good example of a product that is not produced in the home country. Estonia imported sugar almost entirely from the EU, since its prices were artificially kept low with the help of export subsidies. After accession, the EU had to remove the subsidies when exporting to Estonia, and the prices of sugar from the EU rose drastically. The expensive imports from the EU, on the other hand, could not be replaced with cheaper imports from other (non-EU) countries as Estonia had to adopt high EU tariffs on sugar imports from third countries.¹⁷ Neither could the imports be substituted with domestic production as Estonia does not produce sugar itself. As a result, the increase in import prices passed totally into an increase in consumer prices. However, the increase in the consumer price was partly suppressed by the existence of stocks procured just before the accession date. Furthermore, the low purchasing power of consumers set a limit to the price increases and rather lowered the price margins absorbed by the wholesale and retail sectors.

¹⁷ The third country tariff applied by the EU on imports of white cane sugar was 41.9 EUR/100 kg in 2004.

Table 5. Foodstuff prices in Estonian supermarkets before and after joining the EU

	Price (EEK/kg) ^a						Change (%)					
	June 2000	Sept 2003	Apr 2004	May 2004	Sept 2004	May 2005	Apr 2004/ June 2000	May 2004/ June 2000	May 2005/ June 2000	May 2004/ April 2004	May 2005/ April 2004	May 2005/ April 2004
Milk 2.5% (l)	6.50	6.44	7.90	7.78	7.94	7.45	21.5	19.7	14.6	-1.5	-5.7	
Butter	...	44.64	53.69	54.28	59.72	65.52	20.3 ^b	21.6 ^b	46.8 ^b	1.1	22.0	
Cheese	...	71.97	76.70	76.16	78.51	81.89	6.6 ^b	5.8 ^b	13.8 ^b	-0.7	6.8	
Pork	66.34	71.53	72.09	75.33	74.14	74.09	8.7	13.6	11.7	4.5	2.8	
Beef	61.53	71.90	75.52	75.22	77.59	78.99	22.7	22.2	28.4	-0.4	4.6	
Poultry	35.72	38.47	38.85	38.31	38.95	37.76	8.8	7.3	5.7	-1.4	-2.8	
Wheat	...	6.90	7.21	7.11	7.37	6.98	4.5 ^b	3.0 ^b	1.2 ^b	-1.4	-3.2	
Bananas	...	10.88	13.62	14.50	12.53	20.32	25.1 ^b	33.3 ^b	86.8 ^b	6.5	49.2	
Sugar	7.40	6.59	6.29	11.56	16.82	13.56	-15.0	56.2	83.2	83.8	115.6	

Sources: Estonian Institute of Economic Research, 2005; Hinnainfo No 5(106), 2004; Quarterly Review of Estonian Economy No 150, 2004.

Notes:

^a EEK 1 = EUR 1/15.6466

^b Price change compared to September 2003.

Table 6. Procurement and producer prices for agricultural products and foodstuffs in Estonia before and after joining the EU

	Price ^a						Change (%)				
	June 2000	Sept 2003	Apr 2004	May 2004	Sept 2004	May 2005	Apr 2004/ June 2000	May 2004/ June 2000	May 2005/ June 2000	May 2004/ Apr 2004	May 2005/ Apr 2004
Average procurement price ^b for milk (EEK/kg)	2.37	2.72	3.82	3.85	3.81	3.96	61.2	62.4	67.1	0.8	3.7
Producer price (EEK/kg)											
unskimmed milk											
powder	26.64	31.33	34.17	33.38	37.63	35.43	28.3	25.3	33.0	-2.3	3.7
skimmed milk powder	23.85	26.88	27.50	27.45	29.56	29.24	15.3	15.1	22.6	-0.2	6.3
milk 2.5% (average)	...	4.38	5.25	5.27	5.39	5.56	19.9 ^c	20.3 ^c	26.9 ^c	0.4	5.9
cheese	38.15	41.24	43.94	43.66	43.53	45.80	15.2	14.4	20.1	-0.6	4.2
butter	25.37	29.94	35.58	36.42	38.66	42.06	40.2	43.6	65.8	2.4	18.2
Procurement price ^a for cereals (EEK/t)											
wheat	1894	1867	2234	2342	1790	1691	18.0	23.7	-10.7	4.8	-24.3
rye	1396	1557	1978	1954	1545	1692	41.7	40.0	21.2	-1.2	-14.5
Average procurement price ^b for pork (EEK/kg)	22.78	18.20	20.61	21.23	23.44	20.96	-9.5	-6.8	-8.0	3.0	1.7
Average procurement price ^b for beef (EEK/kg)	17.19	18.66	18.03	15.70	21.71	23.53	4.9	-8.7	36.9	-12.9	30.5
Average producer price for poultry (EEK/kg)	23.58	27.80	27.80	18.80	19.10	18.62	17.9	-20.3	-21.0	-32.4	-33.0

Sources: Estonian Institute of Economic Research 2004, 2005.

Notes:

^a EEK 1 = EUR 1/15.6466

^b Procurement prices refer to the prices received by farmers.

^c Price change compared to September 2003.

5. DISCUSSION

As showed above, the actual price effects following Estonia's accession to the EU were in most cases substantially lower than predicted by previous studies. There can be many reasons why these studies overestimated the effect of accession — for instance, the assumptions made in the studies and the base data and product aggregation levels used in the analyses — thus also making the results of the different studies undertaken difficult to compare. For example, differences in the proportions of different partners in total imports and the structure of the product groups analysed vary between years, and can alter the results many times.

It is somewhat easier to predict the effects of accession on import prices from certain countries, as the only crucial elements in the analysis are the selection of the base year, the sufficient level of product aggregation and the policy parameters. However, as a result of policy change, the proportion of different import partners within a certain product group most probably also change, and it is a much harder task to estimate changes in the average import prices. This can at least partly explain why the predicted price changes were often overestimated compared to the actual effects.

However, the analysis gets much more complicated when the accession-led effects are studied for consumer and producer prices. This requires the use of more complicated economic models, which rely on economic theory and take into account much more factors and parameters than just a direct policy change. This can also be seen in the deviations of the results of the model from actual price effects after Estonia's accession to the EU, which in many cases exceeded the import price deviations (especially in the case of Toming 2002, where the changes in domestic producer prices for some products were heavily overestimated). The importance of consistency in the

use of the theory and the data as well as the explicit modelling of demand and supply systems can be seen from the fact that the estimations by Fock (2000) were the closest to the actual price effects of EU accession. Based on optimization assumptions, he explicitly derived demand and production functions, as well as assuming imperfect competition in the food processing industry. The other studies (for example, Seliiov (2002), Tamm (2002) and Toming (2002)), on the other hand, assumed perfectly inelastic domestic supply in their models, thereby neglecting any possible changes in domestic production.

As noted by van Tongeren *et al* (2001), the parameters used in behavioural equations in a model determine the response to policy changes, and are hence one of the most crucial elements in policy analysis. The key parameters of a model are price and income elasticities. In addition, McDaniel and Balistreri (2002) emphasize the role of the substitution (so-called Armington) elasticities in driving the model results. However, there has been only one attempt to estimate demand elasticities for Estonia econometrically, because the relevant time period for measuring the behaviour of economic agents under market conditions has been too short and probably not free from structural breaks (as is common to transition economies). Seliiov and Vörk (2002) used an AIDS (Almost Ideal Demand System) method, and calculated different price and income elasticities for uncompensated demand in five different income groups in Estonia. However, the estimated elasticities in most cases gave a positive sign, which is characteristic of so-called Giffen goods. Yet, taking into account that most food products are considered as necessities, their findings were likely to suffer from poor quality of data, or the model had misspecification errors.

In another study, Fock (2000) calibrated demand elasticities for Estonia. His findings can be considered somewhat more reliable as all calibrated price elasticities of demand had a negative sign and all income elasticities of demand a positive sign. Most of the analyses conducted about Estonia's accession to the EU have utilised the findings of these two studies, or used elasti-

cities calculated for other countries. However, the results of the analyses are only as reliable as the underlying data and parameters.

In addition, Nielsen (1999) underlines the importance of the way the agricultural policy instruments are modelled to determine the outcomes of policy analysis models both in terms of the magnitude of production and trade responses as well as the size and composition of economic welfare changes. However, in the models on Estonia's accession to the EU, the policy changes are all inserted as ad valorem or fixed price wedges.

All the models used for assessing Estonia's accession to the EU have neglected the links between the agricultural sector and other economic sectors — that is, the models were partial, not general equilibrium models (GEM). Although there are limitations and disadvantages of using partial equilibrium models, this cannot be the main reason for the poor performance of the models. In principle, the partial models are able to give a more precise and detailed picture of policy effects than GEMs. This is true especially in an environment where the agricultural sector represents only a small share of GDP and hence, the linkages with other sectors are not very strong (the share of agriculture in GDP in Estonia was only 2.6 per cent in 2003).¹⁸

However, the comparison of real accession-related price changes with the expected price effects is not without problems. For example, the actual consumer prices shown above originate from the database of the Estonian Institute of Economic Research, however, its product groups are not identical to the product groups listed in the official external trade statistics. Yet, the estimates of the studies have been mostly based on the latter ones. In addition, the considered retail prices also include value-added tax, which is not taken into account in the studies. Furthermore, the comparison of actual and predicted price

¹⁸ For a discussion of the use of partial or general equilibrium models, see e.g., O'Toole and Matthews (2002), van Tongeren et al. (2001).

effects is complicated by the change in the collection of import data referred to in Chapter 4.

Nevertheless, one of the crucial reasons that the studies failed to predict the price effects is that many changes in import prices, associated with many factors, had already occurred prior to actual accession to the EU, and hence, the comparison of price changes immediately before and after the accession date does not show the whole magnitude of real price changes. For example, in January 2000, Estonia introduced import tariffs on agricultural products and processed food.¹⁹ This had a noticeable effect on the trade structure. In 1999, 59 per cent of agricultural imports into Estonia originated from the 15 EU member countries, and 18 per cent from the CEECs that joined the EU in 2004 (see table 7). Estonia had free trade agreements with these countries; hence, no tariffs were applied towards imports from these countries (in addition to some other countries, e.g. Ukraine and EFTA members). With the introduction of tariffs in 2000 on imports from countries that did not have free trade agreements with Estonia, the imports from the EU-15 and the CEECs increased to 61 and 19 per cent, respectively. On the other hand, the share of other trade partners in Estonian imports of agricultural products and foodstuffs decreased by three percentage points from 23 per cent in 1999 to only 20 per cent in 2000 (see table 7). This phenomenon of change in trade structures because of a policy change (introduction of tariffs) is commonly known as trade diversion.

The trade diversion in the case of cereals was especially significant, where the import shares of the countries affected by the tariffs declined almost to zero in 2000, compared to the previous year's 17 per cent, while the share of the EU increased considerably (from 65 per cent to 87 per cent) (see Figure 5 for selected cereals).

¹⁹ These tariffs, however, only applied to a minor share of trade partners as Estonia mostly traded with countries it had concluded free trade agreements with.

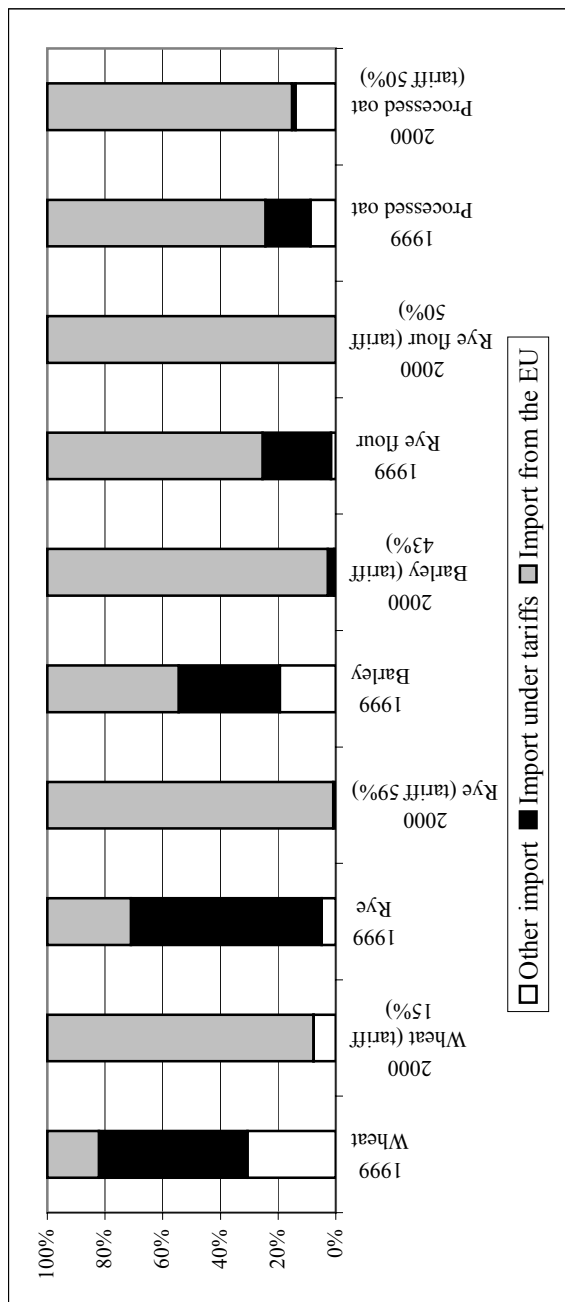


Figure 5. Changes in the import shares of different country groups for cereals into Estonia after the introduction of tariffs on 1st January 2000 (Source: Varblane, Toming and Selliov, 2002)

Table 7. The value shares of country groups in Estonian imports of agricultural products and processed food (HS 1–24) during the period 1995 – April 2005 (per cent)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2004 Jan-Apr	2004 May-Dec	2005 Jan-Apr
CEEC-10 ^a	10	12	11	15	18	19	21	23	27	31	29	32	30
EU-15	66	59	62	60	59	61	60	57	51	56	54	57	59
EU-25 ^b	76	72	73	75	77	80	81	80	78	87	83	88	89
Others	24	28	27	25	23	20	19	20	22	13	17	12	11
Total	100	100	100	100	100	100	100	100	100	100	100	100	100

Source: Statistical Office of Estonia; own calculations.

Notes: ^a Cyprus, Czech Republic, Hungary, Latvia, Lithuania, Malta, Poland, Slovak Republic, Slovenia.

^b EU-25 includes EU member states as of May 1st, 2004 (i.e. EU-15 plus CEEC-10).

The same patterns also occurred in the case of dairy and meat imports. In the case of the former, the import share of countries to which the tariffs were applied fell to 13 per cent in 2000, compared to the previous year's 22 per cent (a drop by 25 per cent). The value of imports from the EU and the other countries that Estonia had free trade agreements with rose by 13 per cent and 100 per cent, respectively. Trade diversion was most clearly discernible in the case of butter and condensed milk (see Figure 6).

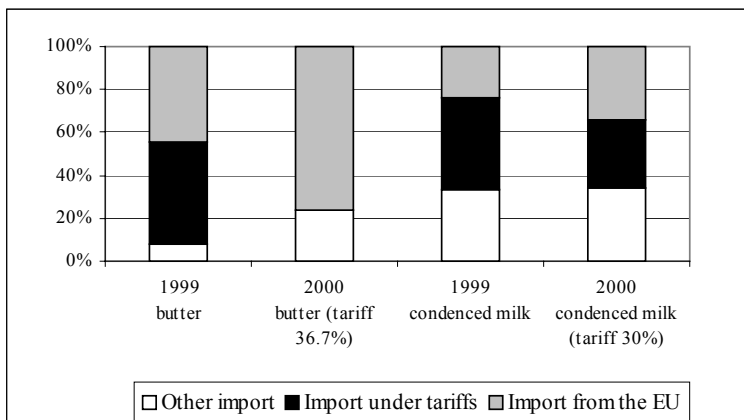


Figure 6. Changes in the import shares of different country groups for selected milk products into Estonia after the introduction of tariffs on 1st January 2000 (Source: Varblane, Toming and Sellio, 2002)

In the case of meat products, imports from the countries affected by tariffs fell by 46 per cent, while imports from the EU and other free trade countries rose by 44 per cent and 33 per cent, respectively. Trade diversion effects were most significant in the case of poultry and meat preparations (see Figure 7).

Hence, the actual price effects after Estonia's accession to the EU in May 2004 were smaller because of the trade diversion in 2000 — that is, as a result of the introduction of tariffs, imports have shifted from more expensive partners to less expensive

partners.²⁰ By 2004, most of Estonia’s agricultural trade took place with the EU-15 and CEECs (in 2003, the EU members states and candidate countries together accounted for 78 per cent of Estonian agricultural imports), reducing the actual impact of raising the import tariffs to the EU level. The study by Fock (2000) was based on 1997 data, and hence, could not take into account that factor.

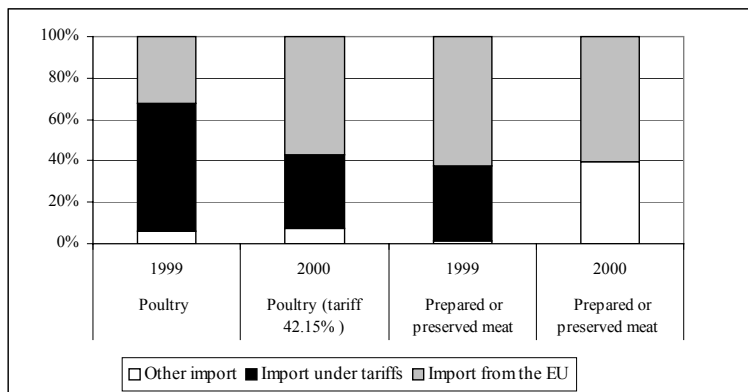


Figure 7. Changes in the import shares of different country groups for selected meat products into Estonia after the introduction of tariffs on 1st January 2000 (Source: Varblane, Toming and Selliov, 2002)

On the other hand, the gradual removal of EU export subsidies on some products already before the actual membership mitigated the rise in import prices from the EU at the accession date. However, as mentioned above, in the cases where EU export subsidies were removed only after the actual accession date (e.g., butter and sugar), the price increases were considerable. As a result, the share of “old” EU members increased from 54 per cent during January-April 2004 to 57 per cent during May-December 2004, and reached even higher 59 per cent during January-April 2005. Also, the proportion of the “new”

²⁰ The issue of trade diversion after introducing import tariffs in Estonia in 2000 is further discussed in Varblane et al. (2001).

EU members increased with accession, from 29 per cent during January-April 2004 to 32 per cent during May-December 2004. These increases were accompanied by a dramatic fall in the share of imports from other trade partners not belonging to the EU. During January-April 2004, the third countries accounted for 17 per cent of Estonian agricultural imports, however, the same figure for the period May-December 2004 was much lower, only 12 per cent (see table 7). Hence, the accession to the EU had to a certain extent a trade divertive effect in Estonia.²¹ For example, the import shares of Russia, Ukraine and the United States — the three main trading partners in Estonian imports of agricultural products that do not have free trade agreements in agriculture with the EU — dropped considerably. In 2003, 3.8, 2.9 and 3 per cent of Estonian imports of agricultural products and foodstuffs originated from Russia, Ukraine and the United States, respectively. Shortly before accession, the Ukraine's share rose to 3.9, signalling the anticipation of possible price increases after accession.²² However, the accession led to a sharp fall in imports from these countries, as a result of which, the share of imports from the Ukraine and the United States for the total year of 2004 amounted to only 2.2 and 1 per cent, respectively. The fall in Russia's share in agricultural imports to Estonia was somewhat less pronounced – to 3.2 per cent for 2004 (see table A.3. in Appendix 6).

Finally, the actual price effects remained smaller also due to the liberalisation of EU agricultural and trade policies within the framework of the World Trade Organisation (WTO) negotiations. The studies conducted prior to actual accession to the EU often took into account export subsidy rates and import duty rates higher than those actually applied in 2004. For example,

²¹ The shares of selected countries in Estonian imports of agricultural products and processed food during the period 1995 – April 2005 are given in table A.3. in Appendix 6.

²² The import share of the United States remained at the 3 per cent level, however, Russia's share fell slightly to 3.5 per cent for the period January-April 2004 (see Appendix 6).

the export refund for butter was 1680 EUR/t in 2001, but only 1320–1390 EUR/t in 2004 (Commission Regulation (EC) No 1871/2004).²³ The EU tariffs applied to imports from third countries have dropped considerably — the simple average tariff applied on imports of agricultural products and processed food was 20.8 per cent in 1997, 17.3 per cent in 2000 and “only” 16.6 per cent in 2004 (WTO 1997, 2000, 2004). This was accompanied by a fall in the maximum applied tariff on agriculture from 236.4 per cent in 1999 to 209.9 per cent in 2004 (WTO 2000, 2004). Furthermore, in 2003, as a result of pressure from EU trade partners within the WTO as well as due to budgetary problems related to EU eastern enlargement, a new reform of the CAP was launched that altered the principles of direct payments to farmers and lowered the administrative prices of some agricultural products. Hence, the trade regime that Estonia had to adopt in May 2004 differed from the one considered in the studies, and the “moving target” nature of the EU integration process made the validity of the ex ante analyses more complicated.

²³ The export subsidy rate for white sugar remained, however, relatively stable during 2001-2004.

6. CONCLUSIONS

With accession to the EU on 1st May 2004, Estonia gave up its liberal agricultural and trade policies and adopted the much more protectionist agricultural policy of the EU. This included the introduction of EU import tariffs, which were significantly higher than tariffs applied in Estonia. Furthermore, the EU had to abolish export subsidies on agricultural products and processed food to Estonia, losing the artificially created price advantage. The adoption of the EU's Common Agricultural Policy implied the introduction of EU administrative prices on Estonian agricultural producers, whereas these prices mostly exceeded the respective producer prices prevailing in Estonia. As a result, the prices of imported as well as domestically produced foodstuffs were expected to increase. Prior to accession, many studies predicted that accession to the EU would lead to significant price increases for agricultural products and processed food in Estonia. Especially considerable price increases were foreseen in the case of sugar, milk products, butter and beef, reaching 100–200 per cent. However, the comparison with actual data shows that the prices have increased much less than predicted, with sugar being one of the few exceptions.

These deviations from the actual results are related mainly to three broad categories of arguments. First, the forecasts for price changes tend to diverge from the real effects because of the number of uncertainties associated with policy modelling — for example, the selection of assumptions, model specifications and parameters. The transitional nature of the economy as well as insufficient time series makes it difficult to predict any changes in economic terms. For example, the crucial parameters of price and income elasticities differ across studies, and attempts to calculate demand elasticities for Estonia have been very limited. Hence, the results of the studies can only be as reliable as the underlying data and parameters.

Second, the statistics underlying the analyses can cause divergences. The results of the comparison of the real accession-related price changes with the expected price effects need to be taken with caution, as the data used is not always comparable. For example, the actual consumer (retail) prices shown in this paper are taken from the database of the Estonian Institute of Economic Research, where product groups are not identical to the product groups presented in the official external trade statistics. Yet, the estimates of the studies have mostly been based on the latter. In addition, the retail prices considered also include value-added tax, which is not taken into account in the studies. Furthermore, accession to the EU changed the way import data is collected from a source country basis to a destination country basis, as a result of which, it is not always clear where the imports originate. Additionally, the studies themselves differ in the product groups analysed and their aggregation level, which makes their comparison not always straightforward.

Third, the immediate price effects calculated in the earlier studies do not give a precise picture of the price impact of EU accession because of the “moving target” effect — that is, many changes in import prices (and hence in consumer prices) already occurred prior to actual accession. As a result, the studies tend to overestimate the price effects. For example, the EU removed its export subsidies on some agricultural products already before Estonia became a member, which mitigated the rise in import prices at the accession date. EU trade and agricultural policies have been also somewhat liberalised, hence showing the actual results smaller than the estimates. Finally, increases in retail prices were limited by the purchasing power of Estonian consumers.

The third group of reasons for why the estimates diverged from the actual price changes cannot be eliminated; however, improvements need to be undertaken in the methods and data used for policy analyses. So far, all the studies on Estonia’s accession

to the EU have rested on the partial equilibrium approach; nevertheless, in order to get more reliable results, a larger variety of analysis methods could be used. Furthermore, a critical assessment of analytical models is necessary to improve their performance in policy analyses. Even more important is the proper selection of key parameters used in the analysis, which reflect the actual economic situation in a country or industry. Furthermore, the data used in the studies should be sufficiently detailed, in order to give reasonable results. Yet, in many respects, the statistics available in Estonia suffer from a non-comparability problem and do not provide a sufficient basis for economy-wide analyses. Nevertheless, the validity of policy analyses can only be improved by using high-quality data and appropriate analysis methods.

The fact that Estonia has already become a member of the EU does not however, lessen the need to analyse the effects of EU membership. The future research agenda is very broad, and only a few of them will be mentioned here. The studies referred to in this paper only dealt with the immediate (short-run) price effects of EU accession; however, a further price convergence can occur in the long-term, as the period as a member of the EU has still been quite short. Furthermore, new policy changes due to CAP reform and WTO trade negotiations also imply changes in the Estonian agricultural and food-processing sector. Also, the expected introduction of the Euro in 2007 (or later) in Estonia can affect the prices of foodstuffs. In addition, so far, an important element of the accession-related policy changes for a small open economy has been completely neglected, that is the issue of Estonian food exports. However, the statistics show considerable export creation and diversion effects due to integration into the EU. To conclude, besides the prices of agricultural products and foodstuffs, accession-related price effects in other economic sectors are also worth studying.

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KOKKUVÕTE

Euroopa Liidu Ühise Põllumajanduspoliitika rakendamine Eestis: liitumiseelsete hinnamõjuprognoside ja tegelike hinnamuutuste võrdlus

Alates taasiseseisvumisest 1991. aastal on Eestit iseloomustatud kui üliliberaalse põllumajandus- ja väliskaubanduspoliitikaga riiki. Kuni 2000. aastani ei rakendanud Eesti põllumajandussaaduste impordile tollimakse. See tähendas, et põllumajandussaaduste ja toidukaupade hinnad Eestis järgisid maailmaturu hindu, mis olid tänu riikide majanduspoliitikatele moonutatult madalad.

Euroopa Liiduga ühinemisel 1. mail 2004. aastal see olukord muutus. Eesti loobus oma senisest üliliberaalsest poliitikast ja võttis üle Euroopa Liidu oluliselt proteksionistlikuma põllumajandus- ja kaubanduspoliitika põhimõtted. See hõlmas endas Euroopa Liidu tollimaksude ülevõtmist ja senistest liikmesriikidest Eestisse sissetoodavate toidukaupade subsideerimise lõpetamist. Enne Eesti liitumist Euroopa Liiduga leidsid mitmed autorid, et ühinemine toob endaga kaasa ulatuslikud põllumajandussaaduste ja toidukaupade hinnatõusud. Hinnatõusu mõju hinnati positiivseks Eesti põllumajandussektori tootjatele, kuid negatiivseks tarbijatele.

Käesoleva toimetise eesmärgiks oli võrrelda liitumiseelsete uuringute tulemusi tegelike hinnamuutustega, mis kaasnesid Euroopa Liitu astumisega, ning analüüsida, kuivõrd täpselt eelnevalt teostatud uuringud suutsid ennustada tegelikke hinnafekte. Seejuures on arvesse võetud, et esialgsed, lühiajalised muutused põllumajanduskaubanduses ja hindades on juba toimunud, kuid mitmed liitumisega kaasnevad mõjud võivad ilmuda alles pikaajaliselt.

Analüüs näitas, et liitumiseelsed ennustused hinnatõusude kohta olid võrreldes tegelike hinnamuutustega liitumise hetkel ülehinnatud. Ainsaks erandiks, kus hinnatõus toimus mais 2004. aastal võrreldes sama aasta aprilliga järsult ja suures ulatuses, oli suhkur. Teiseks huvitavaks kaubagrupiks oli banaanid, kus märkimisväärne hinnatõus toimus alles kuid pärast Euroopa Liiduga ühinemist (tulenevalt Euroopa Liidu banaanirežiimi iseärasustest). Hinnangute erinevine tegelikest hinnaefektidest on seotud mitmete teguritega, nagu poliitika muutuse mõju selgitamiseks rakendatud mudelites tehtud eeldused ja mudelite parameetrid, uuritavad kaubagrupid ja nende agregeerituse tase, analüüsi aluseks oleva baasaasta valik, eeldused poliitika muutuse ulatuse kohta jne.

Samas näitab statistika, et mitmed põllumajandussaaduste ja toidukaupade hinnad tõusid järk-järgult juba liitumise eelselt, kuna Euroopa Liit kaotas ekspordisubsiidiumid Eestisse sisseveetavatelt kaupadelt osaliselt juba enne 2004. aasta maikuud. Samuti on aja jooksul muutunud Euroopa Liidu põllumajandus- ja väliskaubanduspoliitika veidi liberaalsemaks võrreldes ajaga, millal liitumiseelsed analüüsid tehti. Selle tulemusena on ka tegelikud liitumishetkel toimunud hinnamuutused väiksemad kui ennustatud. Lisaks sellele oli toidukaupade hinnatõus teatud määral piiratud ka tarbijate madala ostujõuga.

Appendix 1

Table A.1. The average applied MFN tariffs in the EU and Estonia

Code	Description	EU 2004			Estonia 2002		
		No. of lines used ^a	Average tariff (%)	Range (%) ^b	No. of lines used ^a	Average tariff (%)	Range (%) ^b
	Total/Average ^c	10,045	6.5	0-209.9	10,559	3.3	0-59
01	Live animals	52	20.6	0-107.8	56	15.8	0-39
02	Meat and edible meat offal	205	28.9	0-192.2	236	31.8	0-59
03	Fish and crustaceans, molluscs and other aquatic invertebrates	322	12.2	0-23	327	0	0
04	Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included	123	38.4	0-209.9	179	33.8	0-49
05	Products of animal origin, not elsewhere specified or included	21	0.2	0-5.1	21	1	0-20
06	Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage	42	6	0-10.9	42	0	0
07	Edible vegetables and certain roots and tubers	107	13.2	0-150.1	108	22.8	0-40

Code	Description	EU 2004			Estonia 2002		
		No. of lines used ^a	Average tariff (%)	Range (%) ^b	No. of lines used ^a	Average tariff (%)	Range (%) ^b
		08	Edible fruit and nuts; peel of citrus fruit or melons	128	10.4	0-118.1	128	8.6	0-30
09	Coffee, tea, maté and spices	42	3.1	0-12.5	42	0	0
10	Cereals	55	39.6	0-101.1	61	6.6	0-59
11	Products of the milling industry; malt; starches; insulin; wheat gluten	72	22.2	1.2-84.5	82	45.9	20-50
12	Oil seeds and oleaginous fruits; misc grains, seeds and fruit; industrial or medicinal plants; straw and fodder	76	2	0-52.3	80	0	0
13	Lac; gums, resins and other vegetable saps and extracts	18	2.2	0-19.2	18	11.7	0-15
14	Vegetable plaiting materials; vegetable products not elsewhere specified or included	8	0	0-0	8	0	0
15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes	122	8.9	0-75.8	128	2.7	0-48
16	Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates	90	18.5	0-97.2	92	28.4	0-39
17	Sugars and sugar confectionery	36	23.6	2.1-114.4	47	0	0

Code	Description	EU 2004			Estonia 2002		
		No. of lines used ^a	Average tariff (%)	Range (%) ^b	No. of lines used ^a	Average tariff (%)	Range (%) ^b
18	Cocoa and cocoa preparations	27	17.9	0-68.9	27	0	0
19	Preparations of cereals, flour, starch or milk; pastry cooks' products	51	20.3	7.6-49.6	51	19.3	0-30
20	Preparations of vegetables, fruit, nuts or other parts of plants	311	20.9	0-146.9	322	20	5-30
21	Miscellaneous edible preparations	40	9.6	0-21.1	42	13.9	0-30
22	Beverages, spirits and vinegar	167	5.7	0-58.6	218	1.3	0-30
23	Residues and waste from the food industries; prepared animal fodder	59	7	0-76	66	14.7	0-35
24	Tobacco and manufactured tobacco substitutes	30	18.3	2.2-74.9	31	0	0

Source: WTO 2004, pp. 151, 164.

Notes: ^a The number of tariffs used in a product group.

^b The minimum and maximum tariffs applied.

^c Total/average tariffs over all products, both agricultural and non-agricultural products.

Appendix 2. The developments in the import prices and volumes of milk products

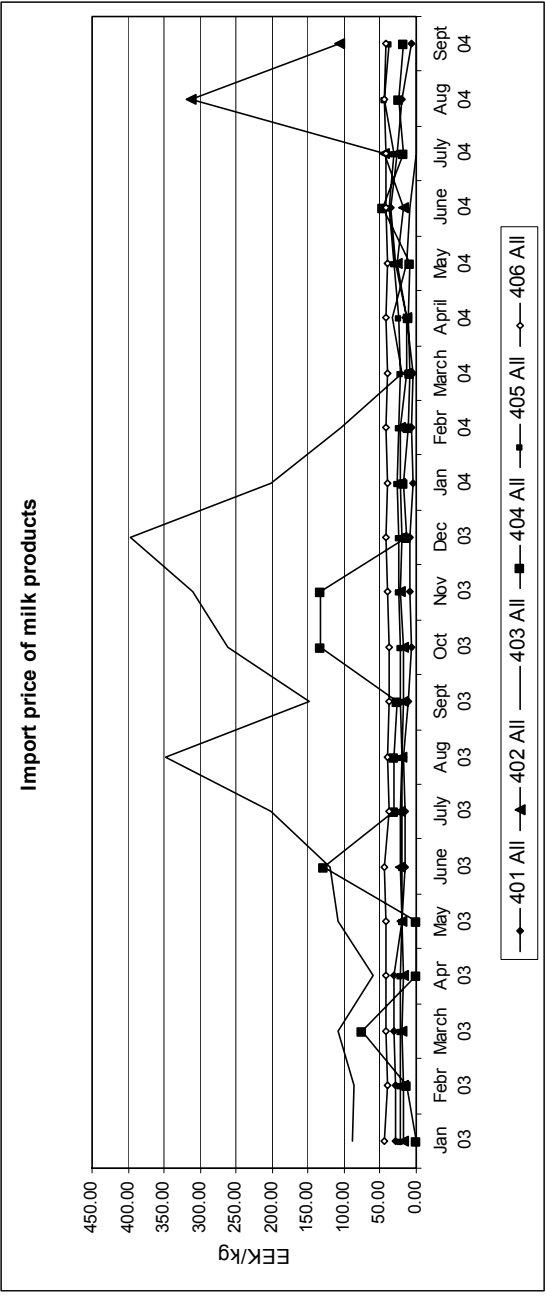


Figure A.1. The changes in the import prices of selected milk products (Source: Statistical Office of Estonia; own calculations)

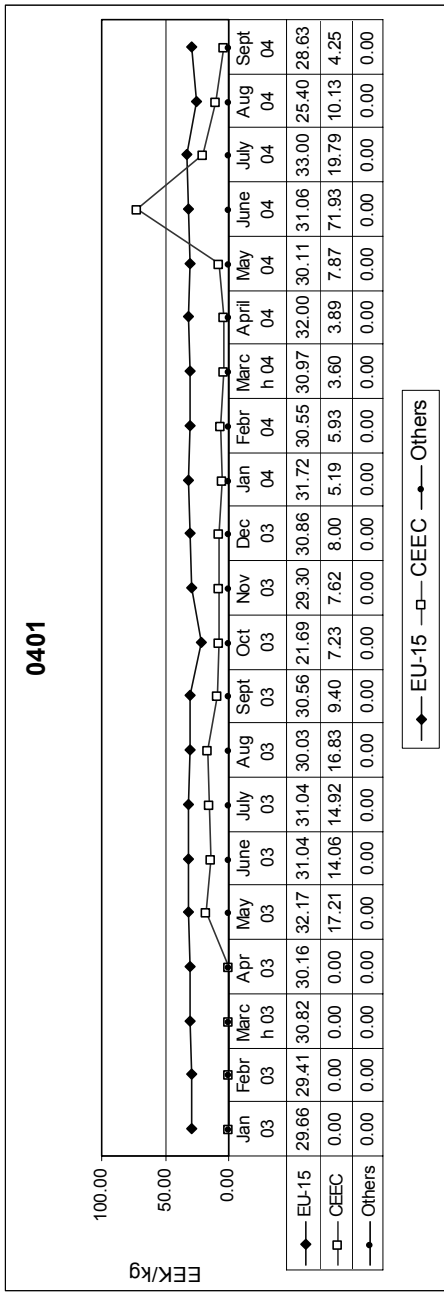


Figure A.2. The changes in the import price of uncondensed milk from different country groups (HS code 0401) (Source: Statistical Office of Estonia; own calculations)

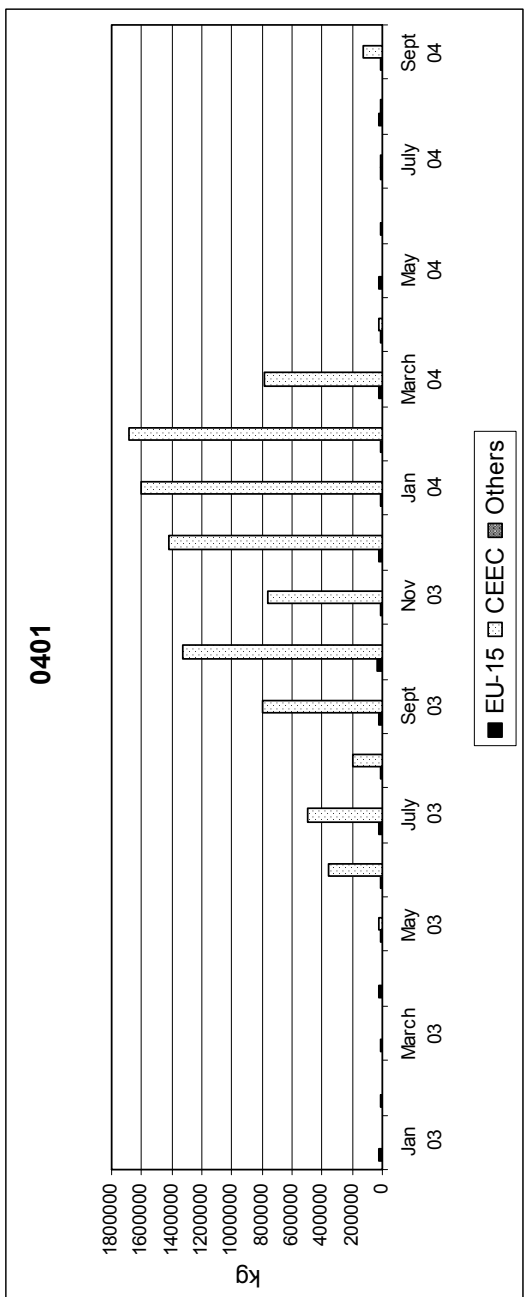


Figure A.3. The changes in the import volumes of uncondensed milk from different country groups (HS code 0401) (Source: Statistical Office of Estonia; own calculations)

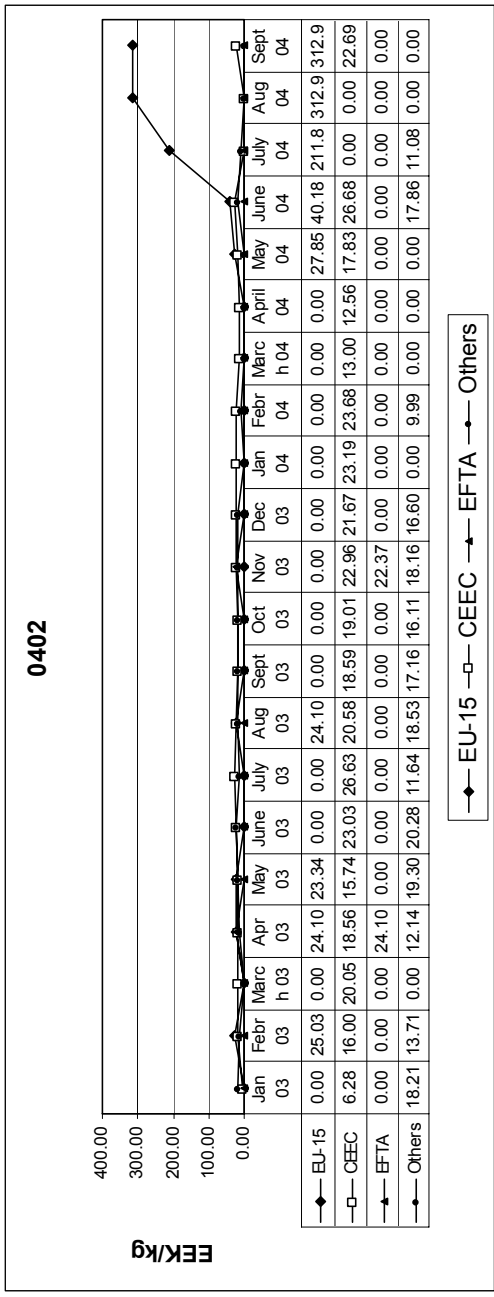


Figure A.4. The changes in the import price of condensed milk from different country groups (HS code 0402) (Source: Statistical Office of Estonia; own calculations)

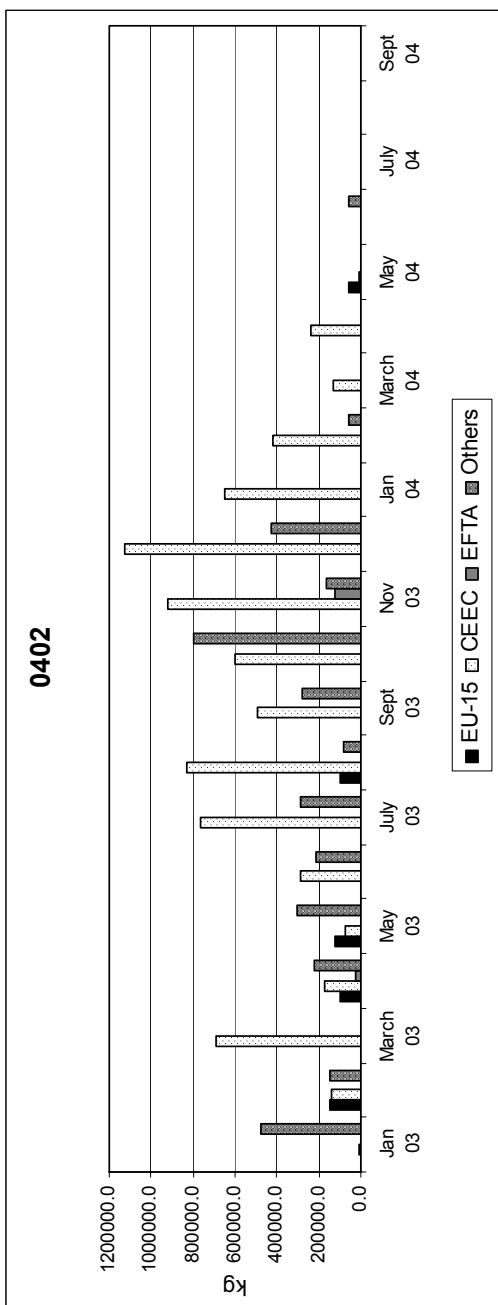


Figure A.5. The changes in the import volumes of condensed milk from different country groups (HS code 0401) (Source: Statistical Office of Estonia; own calculations)

0403

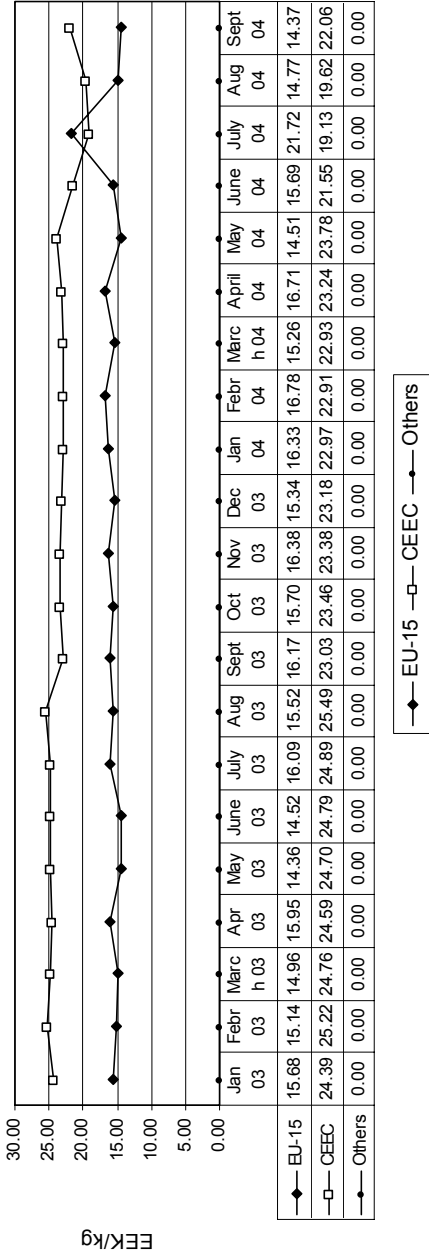


Figure A.6. The changes in the import price of buttermilk and yoghurt from different country groups (HS code 0403) (Source: Statistical Office of Estonia; own calculations)

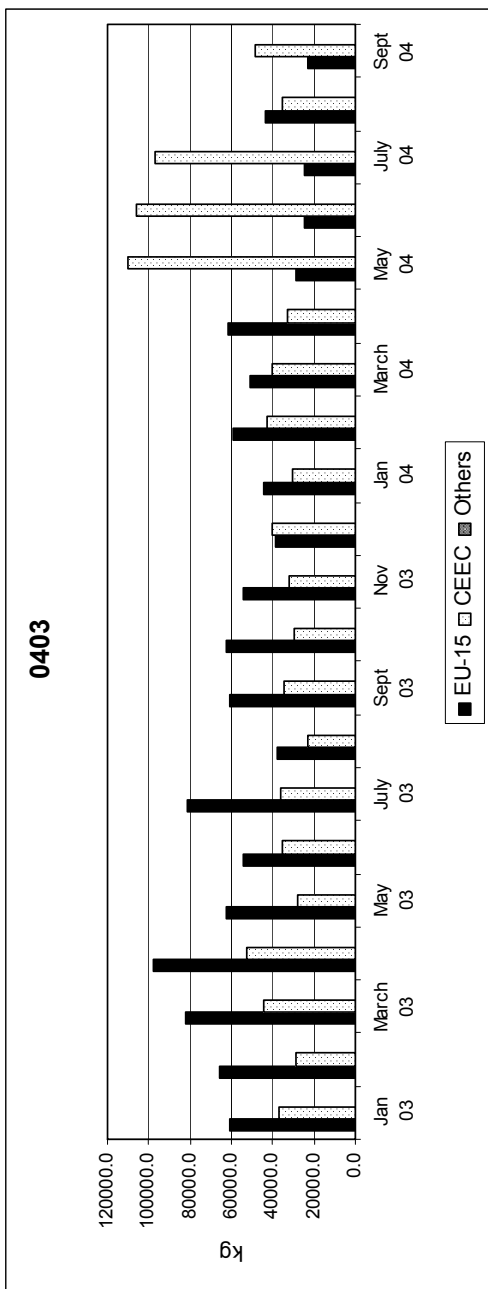


Figure A.7. The changes in the import volume of buttermilk and yoghurt from different country groups (HS code 0403) (Source: Statistical Office of Estonia; own calculations)

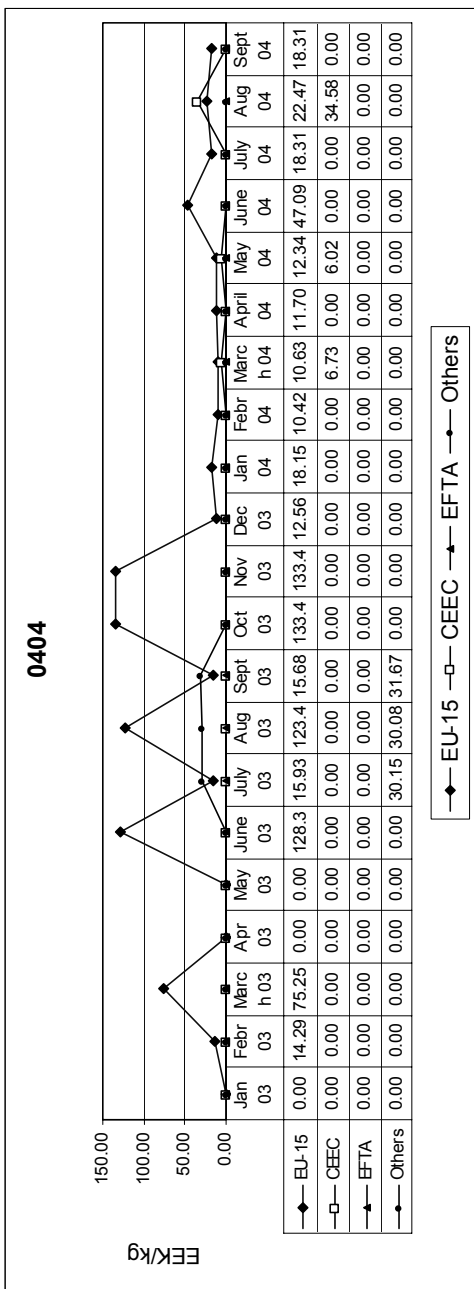


Figure A.8. The changes in the import price of whey from different country groups (HS code 0404) (Source: Statistical Office of Estonia; own calculations)

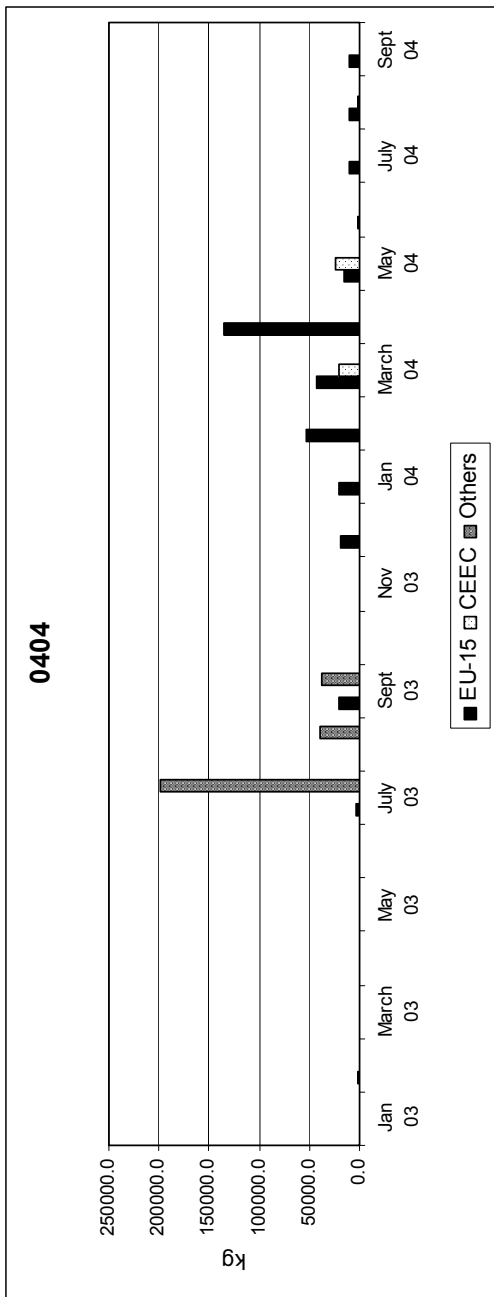


Figure A.9. The changes in the import volume of whey from different country groups (HS code 0404) (Source: Statistical Office of Estonia; own calculations)

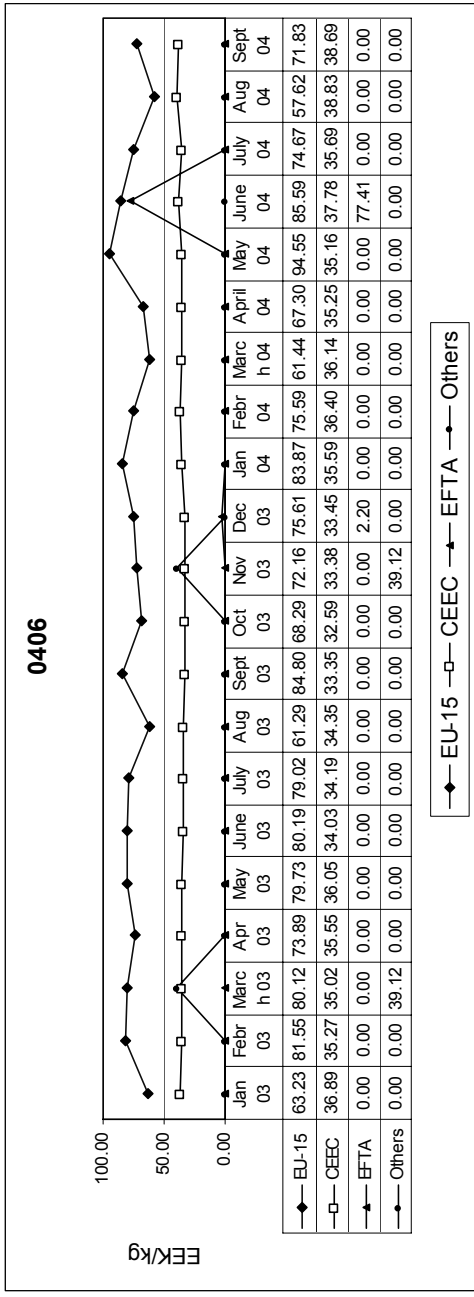


Figure A.10. The changes in the import price of cheese and curd from different country groups (HS code 0406) (Source: Statistical Office of Estonia; own calculations)

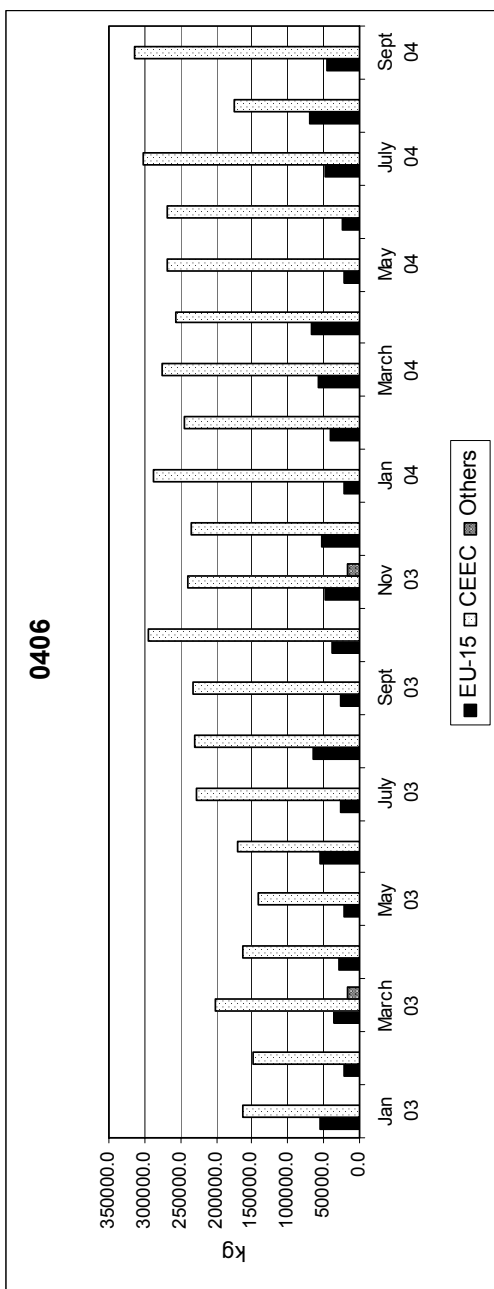


Figure A.11. The changes in the import volume of cheese and curd from different country groups (HS code 0406) (Source: Statistical Office of Estonia; own calculations)

Appendix 3. The developments in the import prices and volumes of cereals

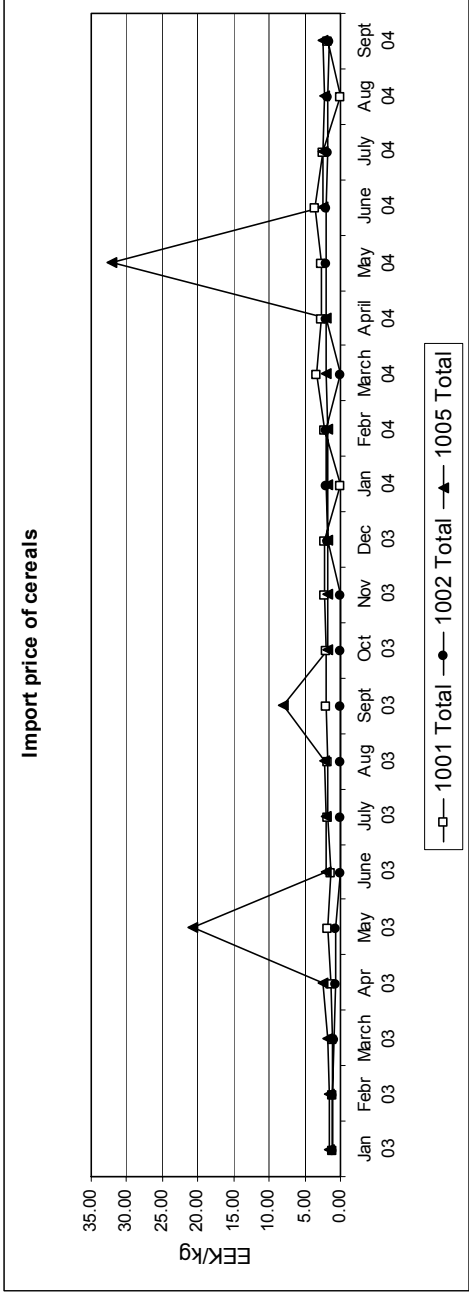


Figure A.12. The changes in the import prices of selected cereals (Source: Statistical Office of Estonia; own calculations)

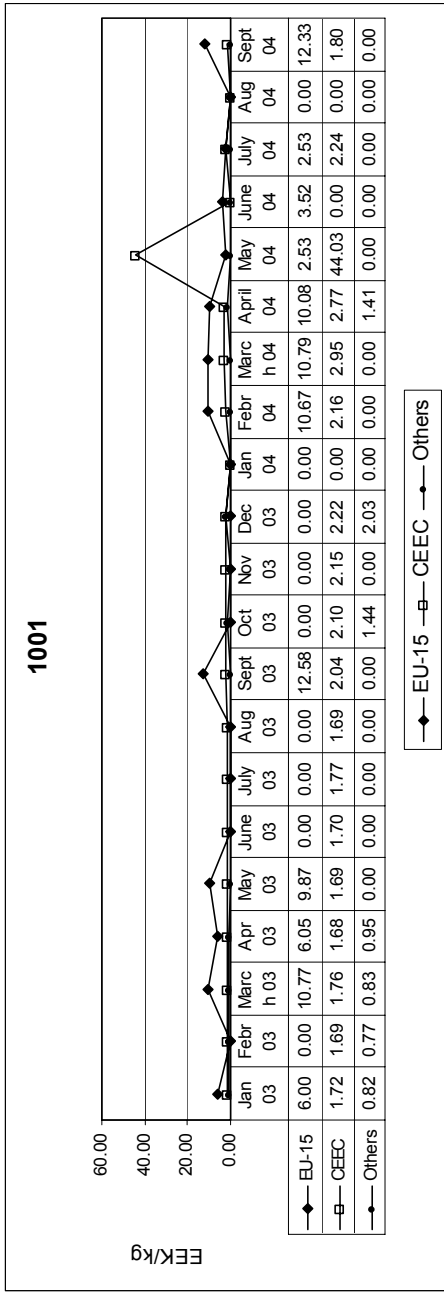


Figure A.13. The changes in the import price of wheat from different country groups (HS code 1001) (Source: Statistical Office of Estonia; own calculations)

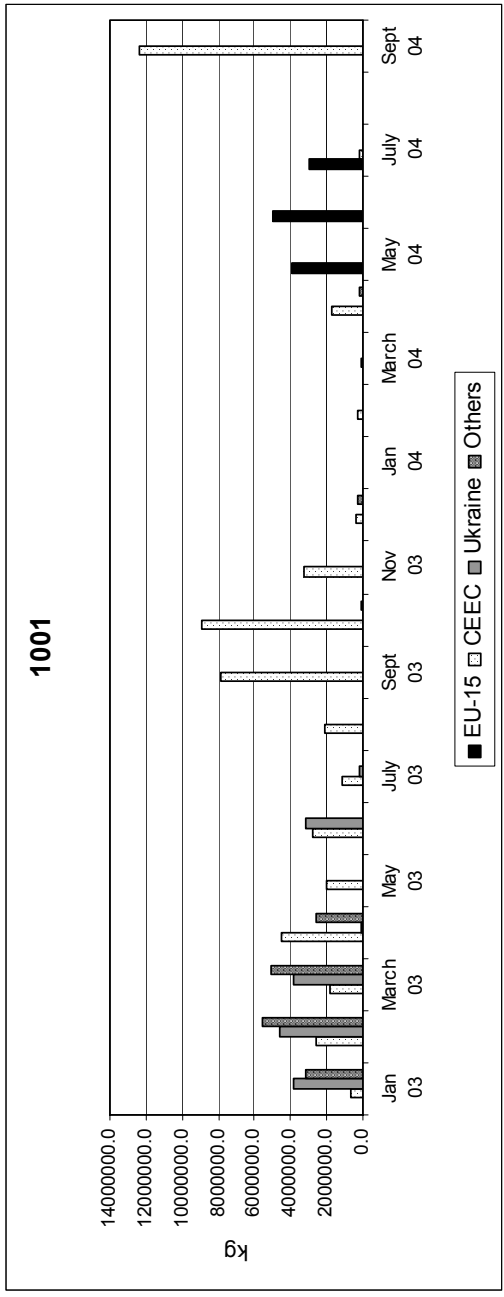


Figure A.14. The changes in the import volume of wheat from different country groups (HS code 1001) (Source: Statistical Office of Estonia; own calculations)

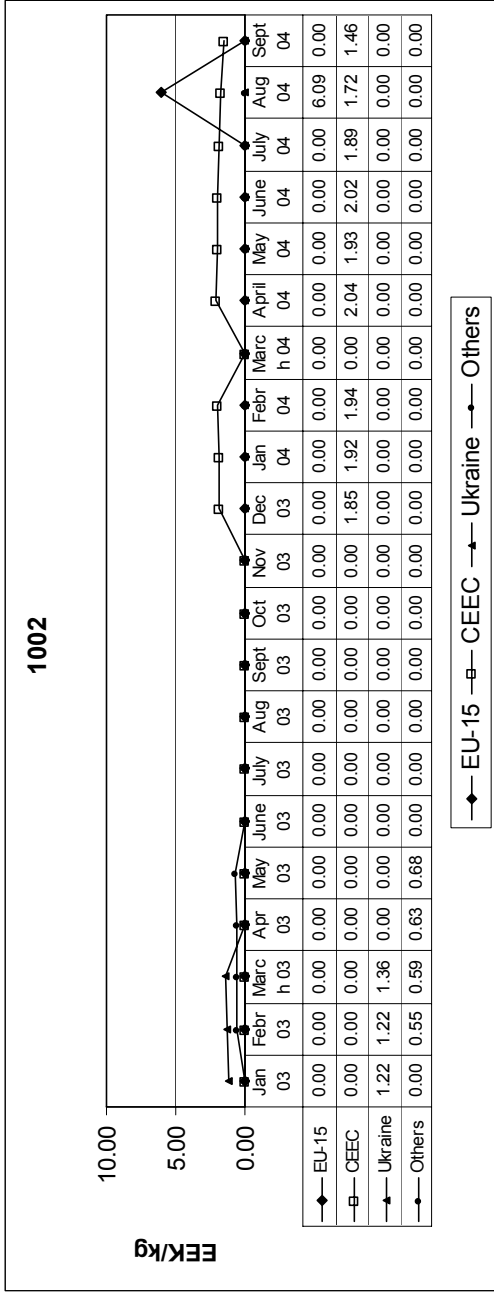


Figure A.15. The changes in the import price of rye from different country groups (HS code 1002) (Source: Statistical Office of Estonia; own calculations)

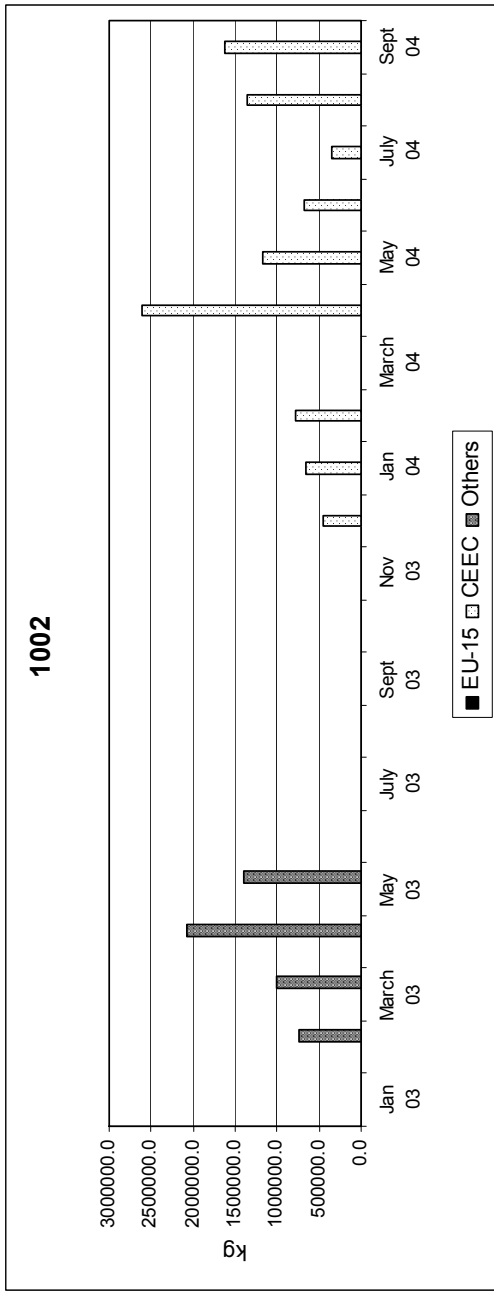


Figure A.16. The changes in the import volume of rye from different country groups (HS code 1002) (Source: Statistical Office of Estonia; own calculations)

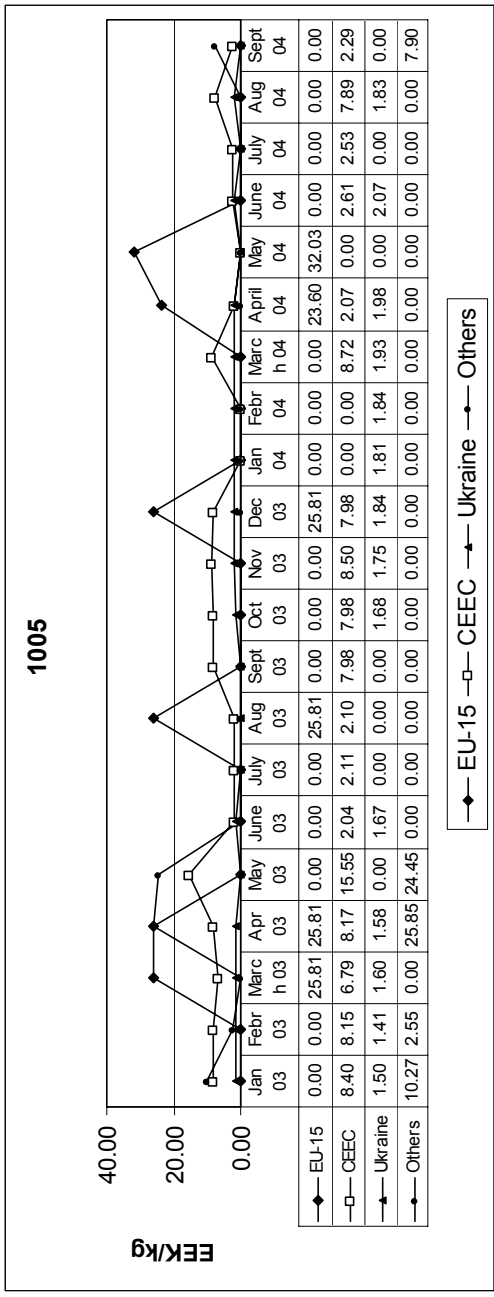


Figure A.17. The changes in the import price of maize from different country groups (HS code 1005) (Source: Statistical Office of Estonia; own calculations)

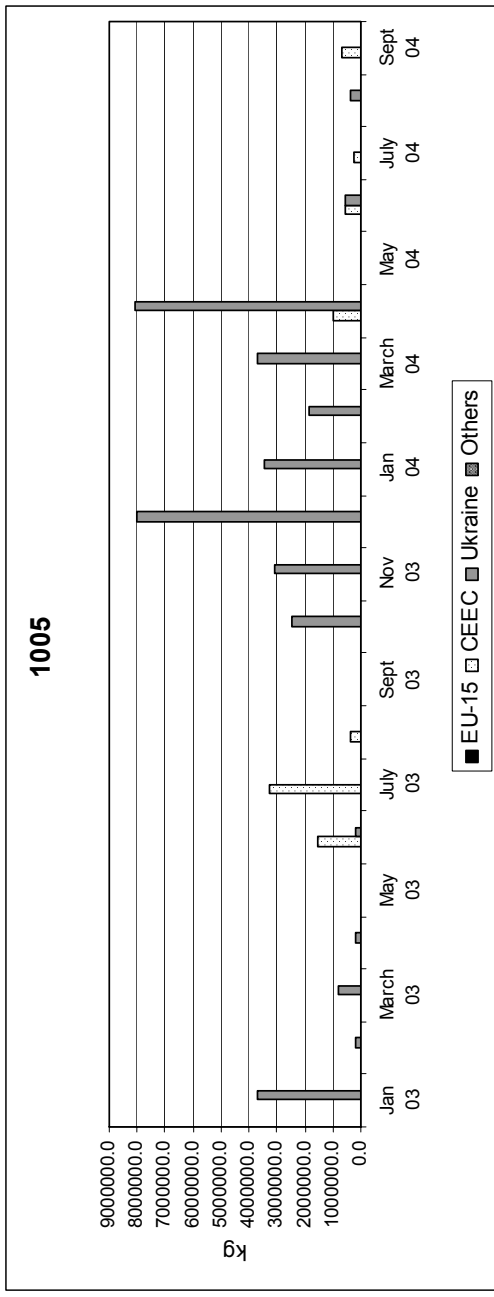


Figure A.18. The changes in the import volume of maize from different country groups (HS code 1005) (Source: Statistical Office of Estonia; own calculations)

Appendix 4. The developments in the import prices and volumes of meat products

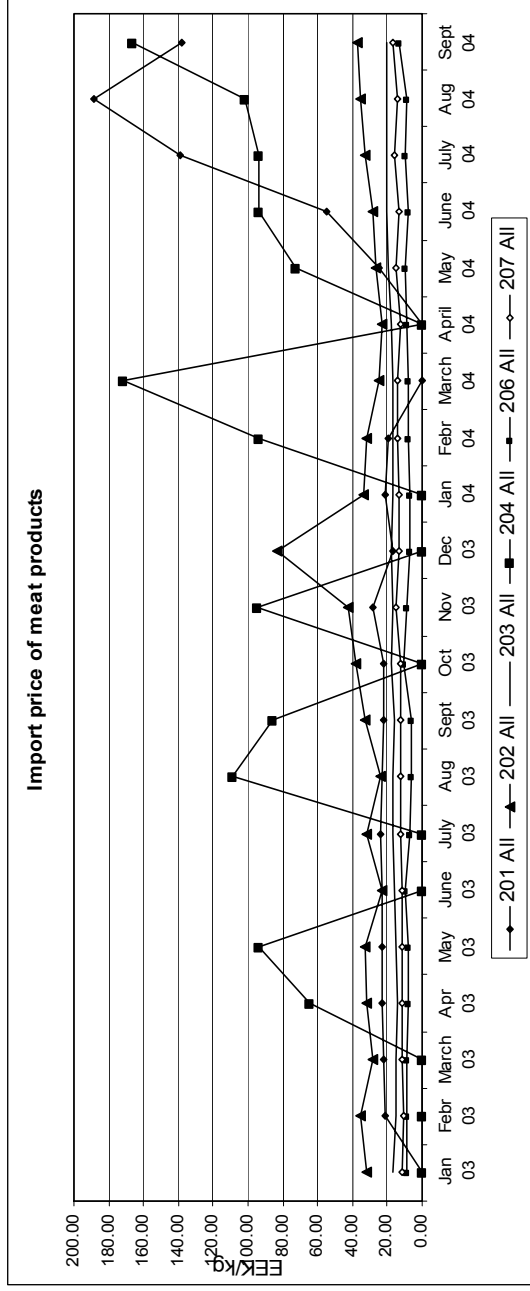


Figure A.19. The changes in the import prices of selected meat products (Source: Statistical Office of Estonia; own calculations)

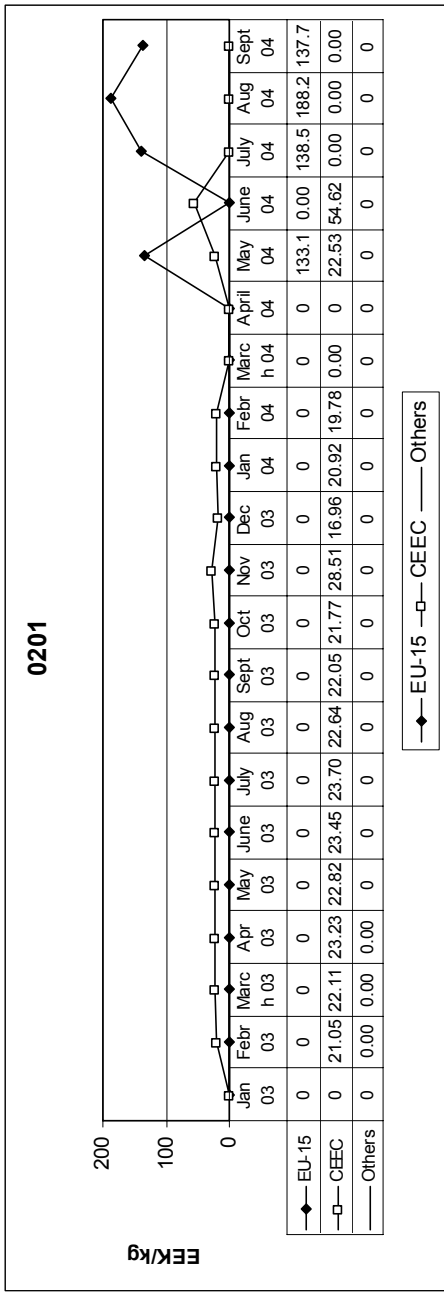


Figure A.20. The changes in the import price of fresh beef from different country groups (HS code 0201) (Source: Statistical Office of Estonia; own calculations)

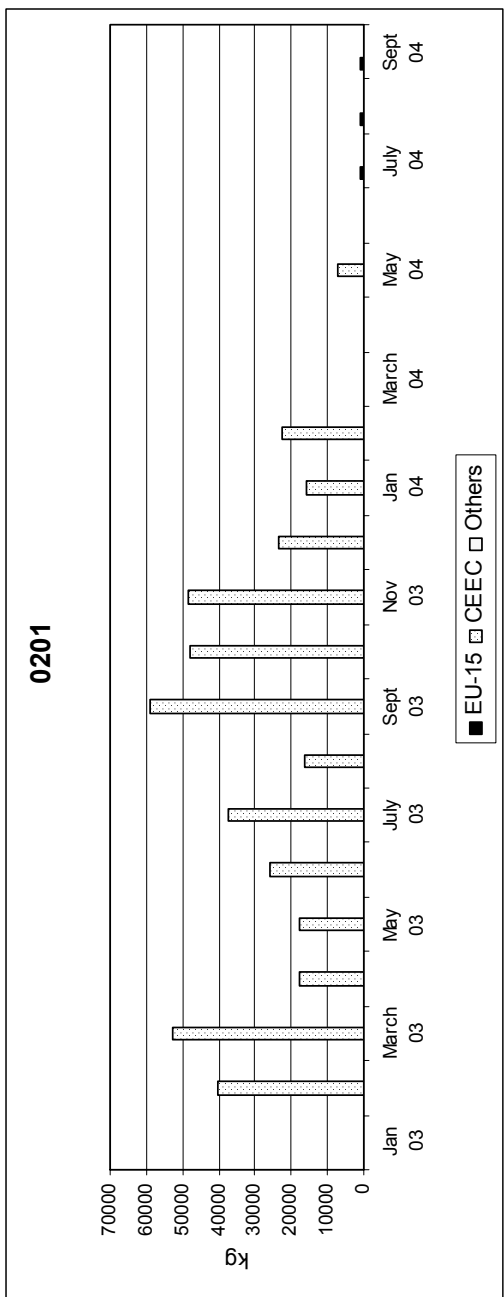


Figure A.21. The changes in the import volume of fresh beef from different country groups (HS code 0201) (Source: Statistical Office of Estonia; own calculations)

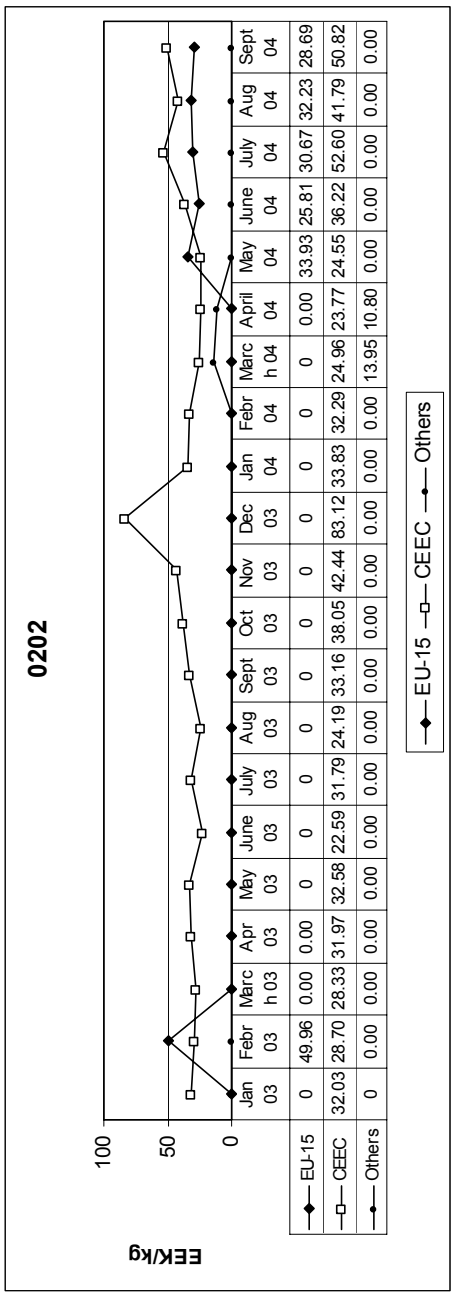


Figure A.22. The changes in the import price of frozen beef from different country groups (HS code 0202) (Source: Statistical Office of Estonia; own calculations)

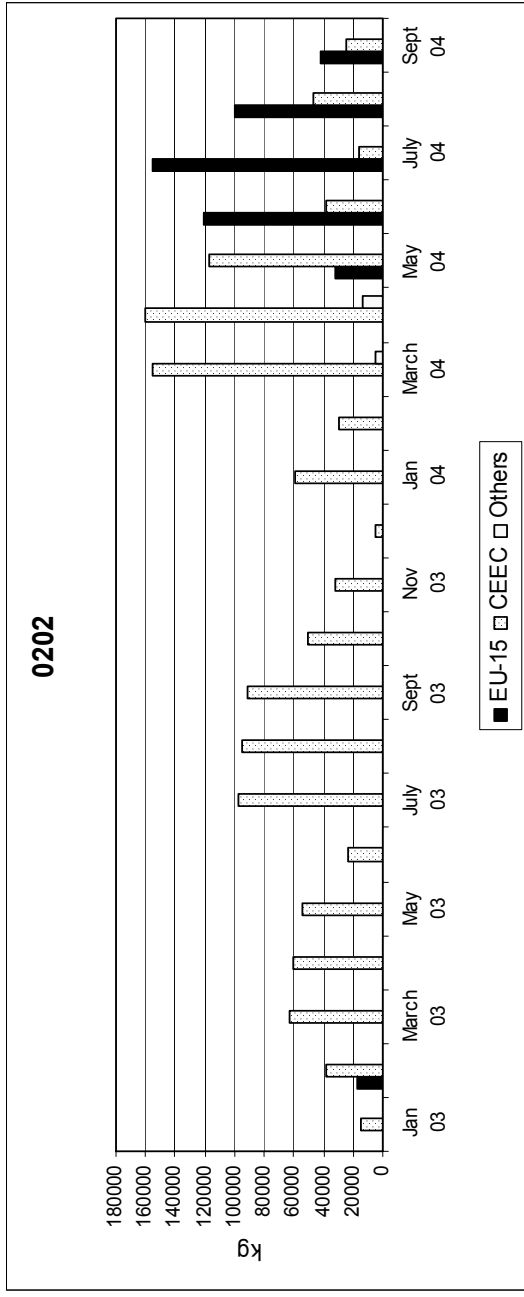
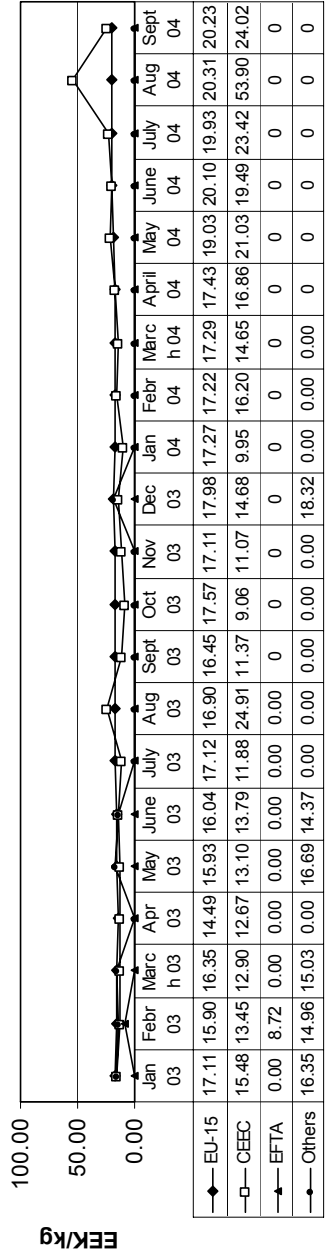


Figure A.23. The changes in the import volume of frozen beef from different country groups (HS code 0202) (Source: Statistical Office of Estonia; own calculations)

0203



EU-15 CEEC EFTA Others

Figure A.24. The changes in the import price of pork from different country groups (HS code 0203) (Source: Statistical Office of Estonia; own calculations)

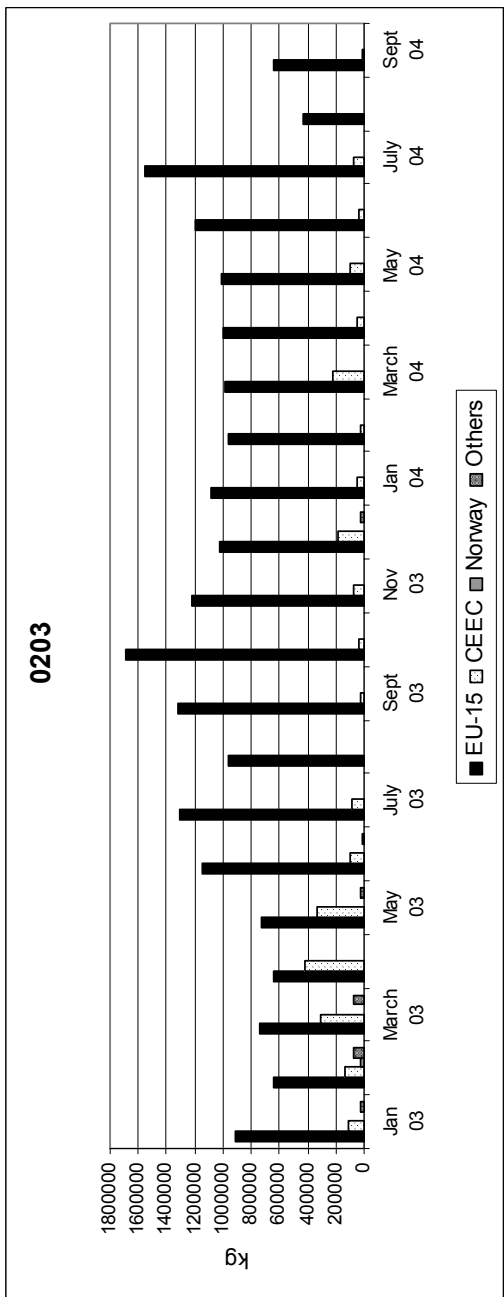


Figure A.25. The changes in the import volume of pork from different country groups (HS code 0203) (Source: Statistical Office of Estonia; own calculations)

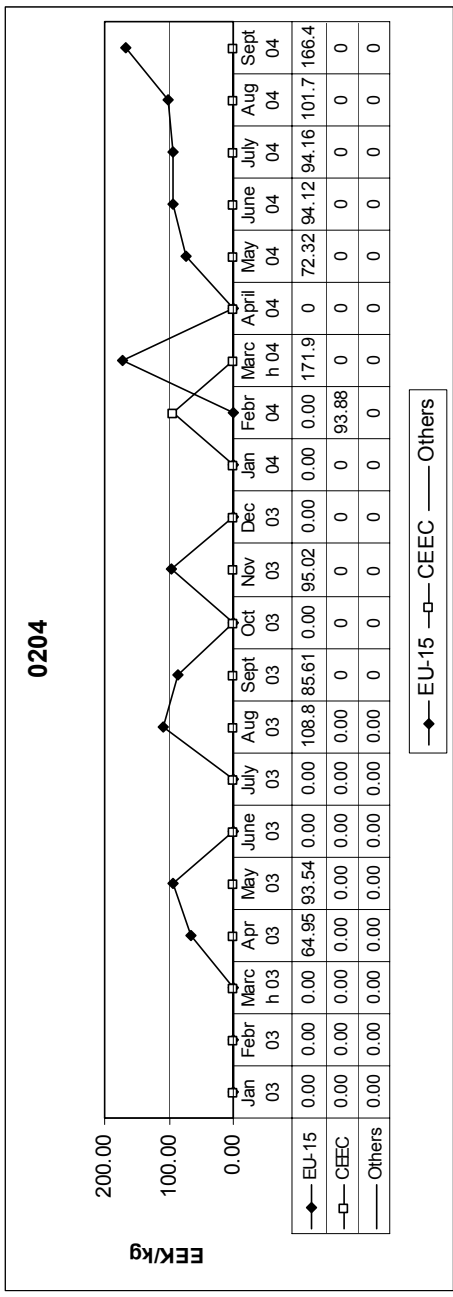


Figure A.26. The changes in the import price of lamb and goat meat from different country groups (HS code 0204) (Source: Statistical Office of Estonia; own calculations)

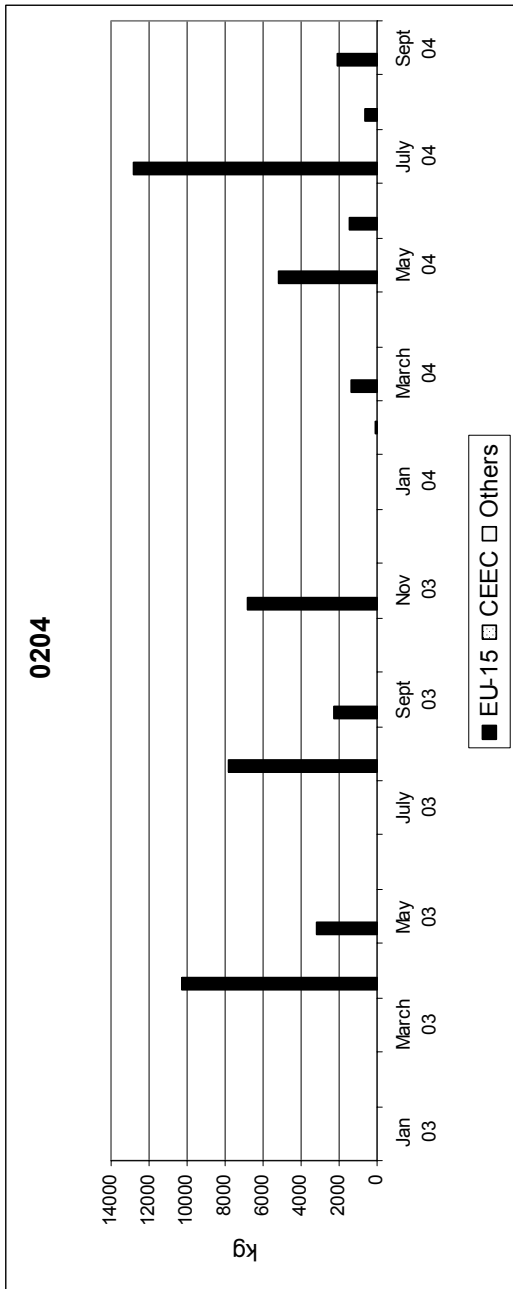


Figure A.27. The changes in the import volume of lamb and goat meat from different country groups (HS code 0204) (Source: Statistical Office of Estonia; own calculations)

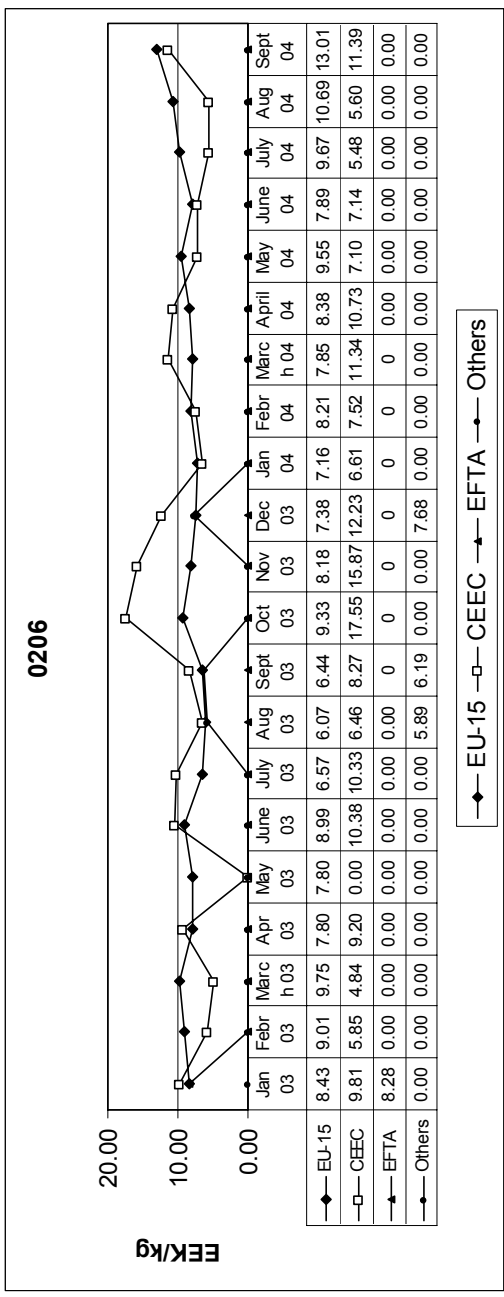


Figure A.28. The changes in the import price of meat sub-products from different country groups (HS code 0206) (Source: Statistical Office of Estonia; own calculations)

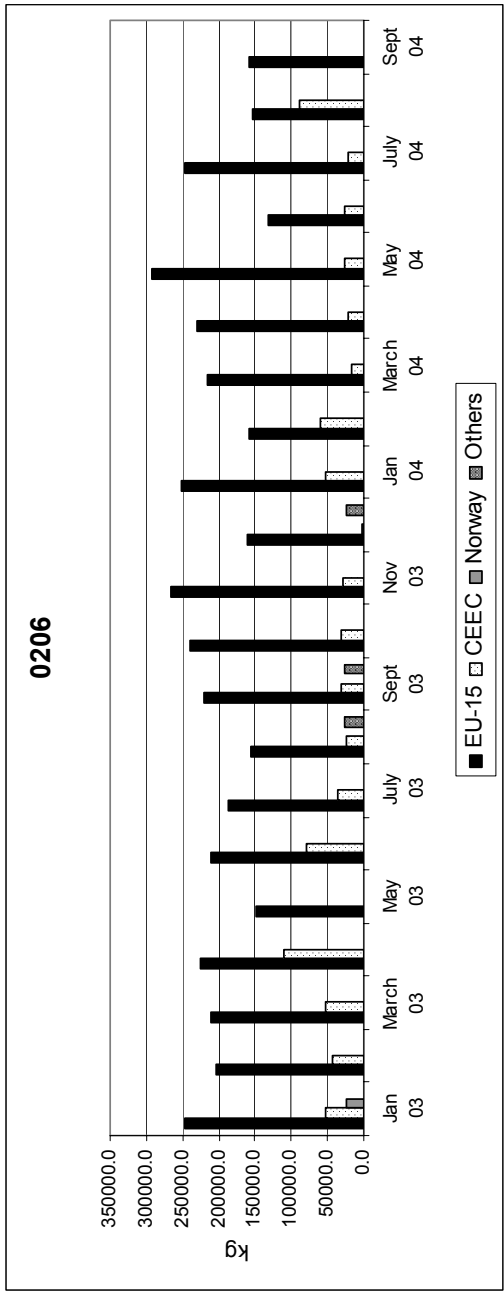


Figure A.29. The changes in the import volume of meat sub-products from different country groups (HS code 0206)
 (Source: Statistical Office of Estonia; own calculations)

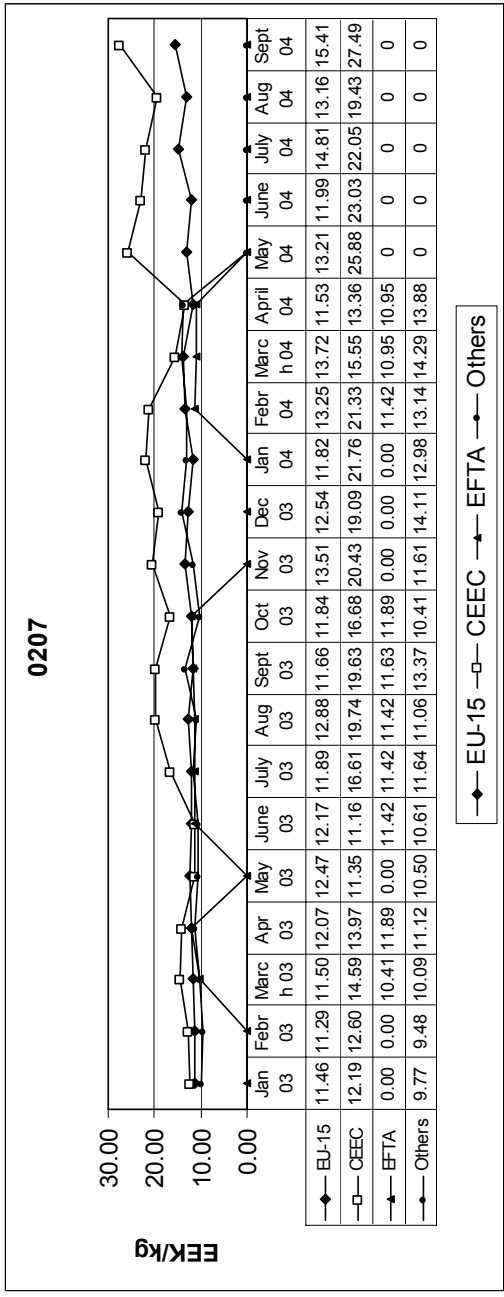


Figure A.30. The changes in the import price of poultry sub-products from different country groups (HS code 0207) (Source: Statistical Office of Estonia; own calculations)

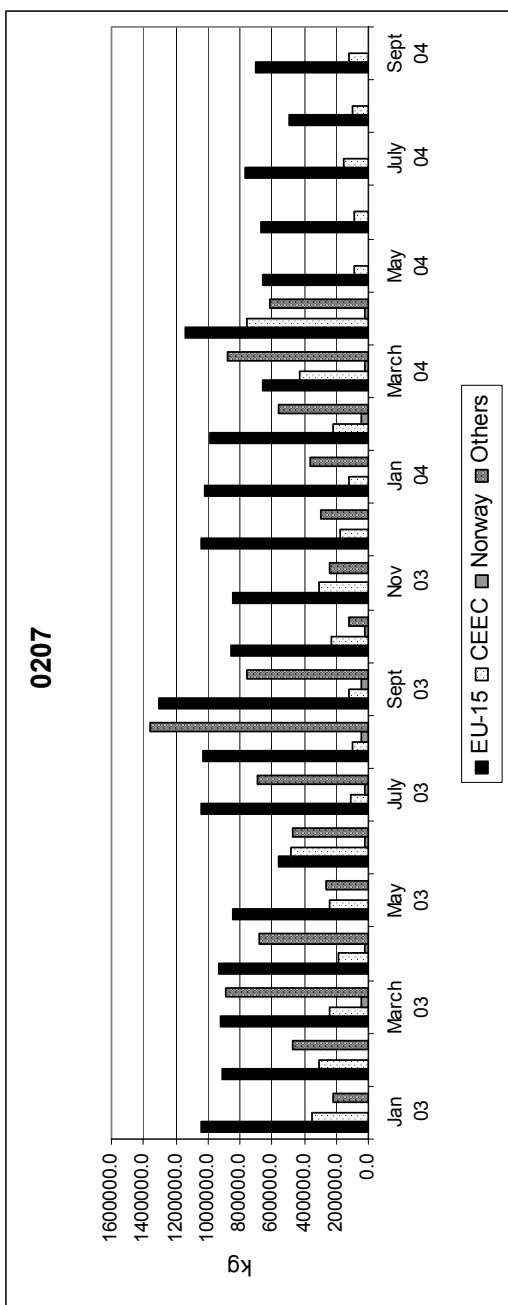


Figure A.31. The changes in the import volume of poultry sub-products from different country groups (HS code 0207) (Source: Statistical Office of Estonia; own calculations)

Appendix 5. The balance sheet for selected foodstuffs in 2004

Table A.2. The resources and utilization of selected foodstuffs in Estonia in 2004 (thousand tons)

	Production	Imports	Exports	Domestic consumption	Human consumption	Self-sufficiency (%)
Fresh milk products	170.6	1.5	6.5	165.7	165.7	103
Fresh cream	7.6	0.2	0	7.9	7.9	96
Concentrated milk	0	0.3	0	0.3	0.3	0
Whole milk powder	8.2	0.4	6.3	1.8	1.8	456
Skim and butter milk powder	11.9	1.8	11	3.5	3.5	340
Butter	6.4	0.2	1.4	6.2	6.2	103
Cheese	22.6	3.3	5.7	19.5	19.1	116
Meat, total	71.3	41.9	20.5	93.9	93.8	76
Beef	14.5	2.5	0.8	16.3	16.3	89
Pork	39	19.6	14.6	44.3	44.2	88
Lamb and goat meat	0.3	0	0	0.3	0.3	100
Poultry	15	14.6	4.6	25.9	25.9	58
Other meat	0	0.2	0	0.2	0.2	0
Sugar ^a	0	170 192	25 185	139 043	138 361	0
Cereals, total ^a	505 726	177 326	16 803	662 120	120 908	76
Wheat	144 885	66 773	11 681	196 496	67 532	74
Rye	23 316	7 903	1 017	50 291	39 713	46
Barley	253 607	49 542	1 374	283 604	2 541	89
Oats	63 351	3 076	2 099	63 740	2 637	99
Other cereals	20 567	50 032	632	67 989	8 485	30

Source: Statistical Office of Estonia; own calculations.

Notes: ^a Data for sugar and cereals: 1. July 2003 – 30. June 2004

Appendix 6. The main sources of Estonian agricultural and foodstuff imports

Table A.3. The shares of selected partner countries in Estonian imports of agricultural products and processed food (HS 1–24), 1995 – April 2005 (per cent)

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2004 Jan- April	2005 Jan- April
Finland	19.4	16.9	13.8	13.0	12.7	9.2	12.9	12.4	12.2	14.4	10.8	16.5
Lithuania	2.5	3.0	2.3	4.3	4.6	5.2	5.7	7.6	9.1	12.1	8.1	12.0
Germany	9.2	9.1	8.8	9.2	8.3	10.0	13.5	12.3	9.2	10.0	8.9	10.1
The Netherlands	10.2	8.7	7.5	7.9	6.7	4.3	6.6	6.4	6.2	8.9	9.0	9.0
Poland	1.6	2.7	2.6	4.2	6.0	5.8	5.8	5.6	5.9	6.3	5.7	7.8
Latvia	3.9	3.6	3.8	3.9	3.9	4.1	4.4	4.3	4.3	7.8	4.6	7.6
Denmark	4.5	3.6	5.4	5.6	5.8	6.7	7.1	5.6	4.3	5.1	3.5	6.7
Sweden	5.5	4.3	6.7	5.5	5.0	4.8	5.1	5.2	3.8	4.2	3.6	5.3
Russia	5.1	3.7	2.6	3.9	3.9	4.1	4.2	3.2	3.8	3.2	3.5	3.2
France	2.2	2.6	3.2	3.6	3.2	3.0	3.2	3.9	4.5	3.6	3.4	2.3
Belgium	3.6	3.0	2.9	2.6	2.6	1.9	3.3	2.7	2.3	2.6	2.5	2.3
Ukraine	2.7	5.4	1.2	1.1	1.1	1.3	2.5	4.1	2.9	2.2	3.9	1.2
United Kingdom	2.7	3.0	2.9	3.4	1.7	1.2	1.2	1.1	1.2	2.2	1.8	1.1
USA	3.9	4.2	5.1	3.6	3.2	2.4	2.4	1.9	3.0	1.0	3.0	0.6
Switzerland	1.6	3.6	4.9	2.0	1.7	1.4	0.7	0.3	0.6	0.2	0.3	0.1
New Zealand	0.0	0.6	1.1	1.8	0.3	0.0	0.1	0.6	1.0	0.0	0.1	0.0
Australia	0.0	0.0	0.3	1.7	0.6	0.1	0.2	0.1	0.1	0.0	0.1	0.0

Sources: Estonian Ministry of Agriculture (2005), Statistical Office of Estonia; own calculations.