DISCUSSION PAPER

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MILK AND MILK PROCESSING INDUSTRY IN LITHUANIA: AN ANALYSIS OF HORIZONZAL AND VERTICAL INTEGRATION

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ABSTRACT

Despite significant progress in recent years, horizontal and vertical integration of the Lithuanian milk sector is not very much advanced. The primary sector is characterised by small-scale farming, the fragmentation of farmland and a low number of livestock per farms. These features cause severe problems regarding the restructuring and modernisation of agricultural production since only a few farmers possess the capital resources to conduct necessary investments. However, despite the unfavourable conditions Lithuanian milk producers have made significant improvements concerning milk quality. In the last decade, the processing sector was due to drastic concentration processes. These were induced by the strong competition processes on the milk market and fostered by foreign direct investors. Today, the market is dominated by three companies. About ten enterprises supply almost the entire market of dairy products.

The main mode of governance in the market for raw milk is contractual arrangements. The spot market of strong vertical control are unimportant. The basic rules of the contracts like duration or payment scheme are set by the Ministry of Agriculture, others, especially prices, are negotiated individually between farmer and processor. Because of advantages in terms of transport and transaction costs processors provide better conditions to large agricultural producers. Often the processors try to strengthen their relationships with large-scale producers by providing credits for farm modernisation and/or foodstuff. Most small producers do not deliver directly to processors but to milk collection centres. In general, these are owned by processors. So far, only a few farmers co-operatives have been established in order to take this function.

Contractual arrangements also dominate in the distribution channel. Small processors supply mainly to wholesalers who supply the retail market. Large processors often circumvent the wholesale stage and supply the retail stage directly. The basic means which allow this forward integration are intensive marketing activities which are intended to improve the consumer perception of their products. However, this type of exchange is mainly observed in urban areas where well established large retail chains exist.

The Lithuanian milk sector is highly internationally competitive. The expansion to international markets is in the responsibility of the individual firms. However, the Lithuanian government and the food processors have established a joint marketing agency that provides infrastructure and joint marketing for international trade.

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Keywords: Horizontal and vertical integration, Lithuanian milk sector, foreign trade, consumption.

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LIST OF ABBREVIATIONS

CIS	Confederation Of Independent States
CEC countries	Central European Candidate Countries
CEFTA	Central Europe Free Trade Association
EU	European Union
GDP	Gross Domestic Product
JSC	Joint Stock Company
LAFPMRA	Lithuanian Agricultural And Food Products Market Regulation Agency
RTA	Relative Trade Advantage
SAPARD	Special Pre-Accession Programme for Agriculture and Rural Development
SC	Stock Company
WTO	World Trade Organization

1 INTRODUCTION

In Lithuania's recent 'Strategy for Agricultural and Rural Development', the dairy sector has been acknowledged as the priority branch of agriculture. A few figures underline its importance: In 2000, milk production made up 17.7% of the total value of agricultural production. The dairy sector accounted for almost one-third of total sales of the food and beverage industry. Its share on total exports of agricultural and food products was more than 30%.

Even after more than ten years of transition Lithuania is still facing the challenge of adapting its dairy chain to the requirements of the new legal and economic environment. This includes improvements of product quality and chain management as well as the increase of productivity in milk production and processing. In this paper we will summarise the Lithuanian experiences in this process of restructuring and re-orientation. We will not pay very much attention to the development of production and consumption patterns[1]. Our main objective is to explain and assess the developments that occurred in chain and quality management within recent years. The stronger tendency towards vertical and horizontal integration in dairy processing is of special interest in this context. In particular, we will analyse the state and direction of these integration processes.

The paper starts with a short overview on the development of milk supply and demand since the beginning of transition (Chapter 2). The representation covers both, the development of the domestic market as well as changes in import and export. Chapters 3 and 4 are dealing with horizontal and vertical integration processes, respectively. Chapter 5 summarises the results obtained in this paper[2].

2 DEVELOPMENTS IN THE LITHUANIAN DAIRY CHAIN

2.1 Dairy production

The production structure of the Lithuanian dairy industry and its development during the 1990s is presented in Table 1. In 2000, the sales of the dairy industry were about 1.26b Litas (Lt) or 350m €.[3] In quantities, fresh not-skimmed milk products accounted for 77% of the domestic dairy production. The rest consisted of fat cheese (8%), butter (6%), skimmed milk powder (6%) and condensed milk (3%) a. o.[4]

The major trend since 1990 is the drastic reduction of output in almost all categories. The production of butter decreased by 3.8 times, canned dairy products by 10.2 times and fresh milk products by 2.9 times from 1990 to 2000. Contrary to the majority of products the output of fat cheese increased rapidly by 57% in comparison to 1990. This expansion is mainly due to the major fat cheese

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1 On these issues see GIRGZDIENE et al. (1998) and (1999) and KIELYTE (2001).

2 Various statistical publications were used in the paper. They were issued by the Lithuanian Department of Statistics, the Lithuanian Ministry of Agriculture, the Lithuanian Agrarian Economy Institute, and by *Pieno Centras*, the Lithuanian Milk Producers Association. Some information were taken from domestic media. The authors of the paper are especially thankful to Ruta Vasiliauskaite from the Lithuanian Agrarian Economy Institute, Remigijus Samuilevicius from the LAFMRA and Irma Pilipiene from *Pieno centras* for helpful consultations, as well to Vygantas Katkevicius, Sarunas Janavicius and Danguole Kulveckiene from the Ministry of Agriculture for consultations regarding foreign trade co-ordination and EU accession.

3 An exchange rate of 3.45 Lt/€ is assumed.

4 This figures are biased since only the amount of production is considered. Comparisons on basis of milk equivalents would have provided a more accurate information. However, these data were not available.

producer *Rokiškio Suris* which modernised its equipment, conducted an active marketing and developed new export markets, etc.

Table 1: Production of dairy products in Lithuania in 1990 and in 1995-2000, in thousand tons

	1990	1995	1996	1997	1998	1999	2000
Butter	73.9	31.1	34.8	34.6	36.8	26.3	20.9
Fat cheese	26.3	18.8	20.9	29.4	36.4	35.4	40.7
Not-skimmed fresh milk products*	831.0	283.0	297.8	301.3	324.0	294.1	288.4
Including: - liquid milk	169.1	82.5	85.2	80.1	80.9	72.6	73.7
- sour milk, yoghurt	61.2	29.9	30.7	29.7	32.5	34.4	30.9
- sour cream	39.3	15.1	17.4	18.7	19.8	17.5	17.8
- milk cream	6.7	0.6	0.9	0.8	1.7	1.0	1.0
- curds	25.8	9.5	9.4	11.8	12.6	11.5	11.1
- Cottage cheese	15.8	4.1	3.9	5.9	6.0	4.8	5.1
Condensed milk	35.7	12.8	11.4	15.2	12.5	9.4	3.5
Ice-cream	20.1	8.3	9.0	11.0	12.8	12.5	12.0
Not-skimmed milk powder		1.9	2.4	5.3	4.2	5.0	2.0
Skimmed milk and whey powder	28.5	19.5	26.3	29.0	30.0	21.6	16.1
Other	3.8	7.5	9.2	6.7	7.8	3.5	6.7

Note: * in milk equivalent.
Source: *Pieno centras* (2001).

The reasons for the changes in sales of dairy products are manifold. They include high transaction costs associated with transition, modernisation and privatisation of processing facilities and chain management as well as changes of consumer preferences (demand for some traditional milk products decreased, whilst consumption of new hitherto unusual products like yoghurt increased). Other influences are developments on the world market for dairy products and the decrease of domestic raw milk production. The various reasons will be analysed in some more detail in the next subchapters.

2.2 Domestic milk production

Primary milk production has changed significantly during transition. Between 1990 and 2000, the number of cows decreased steadily from 848 to 494 thousand (Table 2). At the beginning of the transition process productivity, measured as milk production per cow, decreased as well. The fact that both, the number of cows and productivity, was declining is an indication that the restructuring and selection process was due to a systemic component and concerned all enterprises similarly. Since 1993 there are signs of recovery. Although the number of cows was still declining , the milk production per cow started to increase. Until 2000 it reached more than 90% of the level of 1990. This trend indicates that either marginal enterprises have increasingly abandoned milk production and/or that competitive farms were able to strengthen their position and to increase the efficiency of milk production. However, the increase of milk production per cow did not compensate the rapid reduction of the number of cows. Thus, total milk production was still declining at the end of the 1990s.

Before transition started, farmers delivered about 90% of their milk production to dairy companies. This share dropped significantly to about 70% in 1993. On average this figure remained at that level, however, annual fluctuations were relatively large. They ranged from 63% (1994) to 76% (1998). Compared to other CEEC countries with an average about 57% in 1999 this share is relatively high. However, in Western European countries more than 95% of milk production is transferred to the processors.

Table 2: Indicators of milk production, 1990-2000

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Number of cows (in 1000 head)[1]	848	842	832	738	678	615	586	590	583	541	494
milk production per cow (in kg)	3734	3481	3080	2910	2925	3010	3093	3205	3384	3400	3440
total production (in tons)	3157	2916	2421	2067	1896	1819	1832	1950	1930	1714	1560
of this: purchased	2885	2557	1731	1588	1199	1216	1332	1426	1477	1207	1100

Note: * at January 1st.
Sources: DSRL (various issues, a), ZMP (2001).

Another characteristic feature of Lithuanian milk production is the high seasonal fluctuation. In February 2000 milk purchases were 2.4 times lower than in August 2000. In EU countries, by contrast, seasonal fluctuation is about 1.3, in Denmark and Germany even less than 1.2. The main reason for this high variability is the severe problem of farms to provide foodstuff in sufficient quality and quantity in winter.

Table 3: Distribution of the number of cows in the farms of the different sizes in Lithuania, as of 1st of November 2001

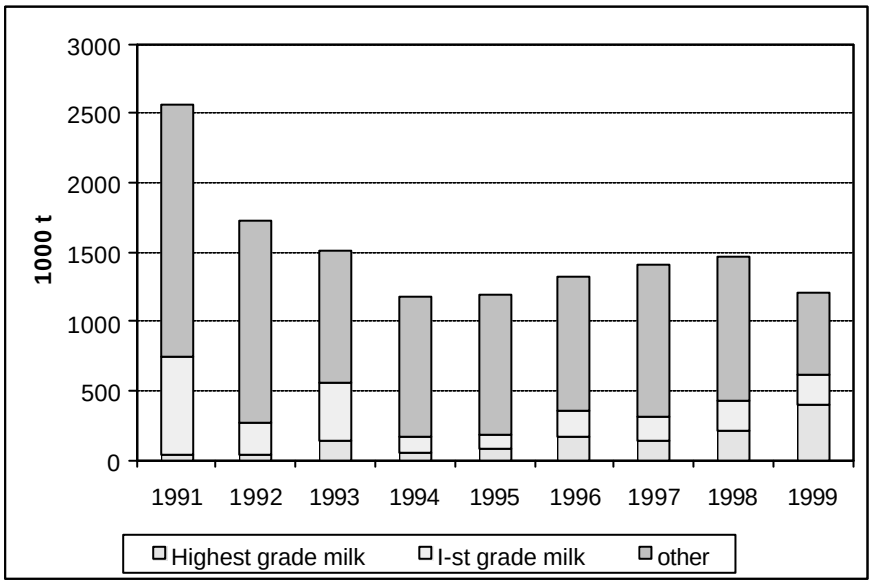
Herd size (# of cows)	Farms		cows	
	Number	%	head	%
1	115569	51.6%	115569	24.8%
2	64293	28.7%	128586	27.6%
3	24167	10.8%	72501	15.6%
4	10135	4.5%	40540	8.7%
5	4564	2.0%	22820	4.9%
6-10	4095	1.8%	28529	6.1%
11-20	567	0.25%	7603	1.63%
21-30	104	0.05%	2576	0.55%
31-50	73	0.03%	2829	0.61%
>50	251	0.17%	43644	9.38%
Total	223818		465197	

Sources: Pieno centras (2002).

Milk production in Lithuania is highly fragmented (Table 3). In November 2001, subsistence oriented farmers and small scale farmers with less than 4 cows kept about two third of the total number of cows. Commercial farms with 11 and more cows account for just 0,5% of the milk producers, but were keeping 12% of the cows. Mixed farming and crop production prevail among the large commercial farms, only some are specialised in milk production. As a result, milk production per cow and year is on average not higher than in small farms. Large enterprises with more than 50 cows hold about 10% of the animals, however, their share on total milk production is also about 10%. Today, there are only a very few large scale dairy farms operating on the same technical and management level as the enterprises in Western countries.

Despite the shortcomings in specialisation and farm size considerable improvements of raw milk quality could be observed in recent years (Figure 1). Deliveries of raw milk with at least grade I quality increased in relative as well as in absolute terms and accounted in 2000 for about 50% of the milk purchases of the dairy companies. The production of high quality milk was promoted and supported by the government and also by the processing industry. This included the following measures: implementation and ongoing enforcement of a quality-dependent payment scheme, subsidies for improving the breeding stocks, supporting the establishment and development of commercial dairy farms, providing credits for their modernisation, etc.

Figure 1: Structure of purchased milk by quality, 1991-2000, in 1000 tons



Source: Pieno centras (2001).

Technological progress and structural changes in the milk processing industry since 1998 had positive spillovers on raw milk producers. These adjustments in dairy processing were induced by the second round of privatisation, which was accompanied by a high influx of foreign direct investment (FDI) and modernisation of the equipment. The modern dairy production lines require high quality raw material to produce high quality final products. The technologically updated large dairy companies were able to push high quality requirements through. This was, inter alia, a basic requirement of the EU for a firm's certification regarding exporting dairy products into the EU.

However, after these progresses still about 50% of the purchased milk is of low quality. In order to improve this situation and to overcome the structural shortcomings in agriculture and food processing

the *Strategy of Lithuanian Agricultural Development* was drawn up at the Lithuanian Agrarian Economy Institute in 2001 and was approved by the Ministry of Agriculture. The integral part is constituted by the Lithuanian SAPARD program which is expected to become one of the major funding sources promoting rural and farm development in Lithuania. In the strategy additional programs have been added in order to allow a more comprehensive support for agricultural restructuring.

Table 4: Lithuanian milk sector development program, 2002-2003

	Measures	Financing for 2002 – 2003, in 1000 Lt			
		means needed	Source		
			National budget	EU funds	other
1	**Restructuring and modernisation of the dairy farms**	486319	138629	115560	232130
1.1	Compensate 45-50% of the investments for the modernisation of the dairy farms (SAPARD)	327830	38520	115560	173750
1.2	Compensate 40-50% of the means for various other type of investment of dairy farms (special rural development program)	70000	33350		36650
1.3	Subsidising 30-40% of the no-compensated SAPARD investments for dairy farms modernisation (special rural development program)	36000	16920		19080
1.4	Compensate 45-50% of the investments for establishing milk purchasing co-operatives	5000	2350		2650
1.5	Temporary direct payments for dairy producers	47489	47489		
2	**Market development and quality measures**	52000	5850	17550	28600
2.1	Compensate 45% of the investment for milk processing companies (SAPARD)	52000	5850	17550	28600
3	**Research and Extension Services**	2100	2100		
3.1	Financing of special courses, seminars, etc. for dairy producers; publishing of books and other materials and their circulation	900	900		
3.2	Support of demonstration farms	600	600		
3.3	Financing scientific research	600	600		
		540419	146579	133110	260730

Source: VASILIAUSKAITE and KRISCIUKAITIENE (2001).

Funds for the domestic milk producers will be available from 2002 to 2006. In 2002 and 2003 540m Lt (150m €) of resources are needed to meet the requirements of the development of the domestic milk sector as set up in the program (Table 4). From this, about 90% of the resources are expected to be spend on farm modernisation. After having successfully implemented strategy, it will contribute to the strengthening of the domestic milk-chain. It is forecasted that, as the result of the measures, in 2006 about two third of the cows will be kept in commercial dairy farms with more than 6 cows (VASILIAUSKAITE and KRISCIUKAITIENE 2001).[5]

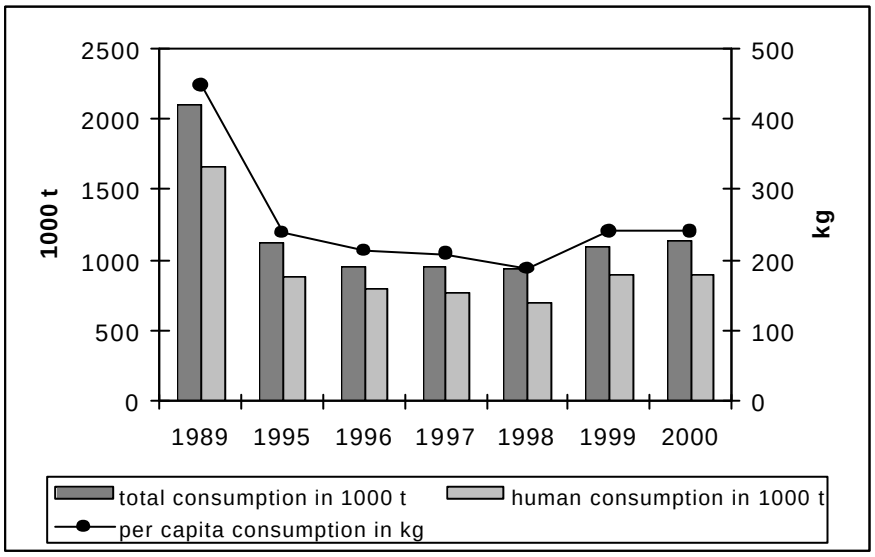
[5] According to statistic projections, 450 thousands cows will be kept in 2006. 113 thousand will be on farms keeping 6-9 cows, 200 thousand in farms keeping 10 and more cows. Only 138 thousand will be kept on farms with 1-5 cows.

2.3 Domestic consumption of dairy products

Per capita consumption of dairy products in Lithuania decreased by 50% between 1989 and 2000 (Figure 2). The reasons for this trend are the decrease of per capita income, the increase of dairy products prices and changes of nourishment habits.

The various dairy products were affected differently. The consumption of butter dropped by 2.7 times in 2000 compared to 1990. Among others, this trend was influenced by a change of nourishment traditions. Many customers substitute vegetable products for animal products. Besides, margarine is 1.6 times cheaper than butter. The consumption of pasteurised milk has recently dropped to a minimum. According to the Department of Statistics, per capita consumption of bottled milk was 19.8 kg in 2000. This is more than 2.5 times less than in 1990 (45.2 kg). In addition to the reasons mentioned above, this development can be partly explained by the growth of direct sales of milk and dairy products to customers. In this market segment milk prices are up to 50% lower than in retail shops. However, the volume of direct sales can be only roughly estimated. An indicator of the importance of this market segment is provided by Table 2. It was mentioned that on average only 70% of total milk production is sold to dairy companies.[6]

Figure 2: Consumption of milk and milk products in Lithuania, 1989-2000



Source: Pieno centras (2002).

In contrast to butter the consumption of fat cheeses increased in recent years. In 2000 per capita consumption amounted to 3.6 kg which was 15% higher than in 1999. Despite this growth, this figure has not yet overcome the 1990 cheese consumption record which amounted to 3.8 kg per capita.

[6] According to the balance of milk and milk products completed by the Lithuanian Department of Statistics in 2000, the total supply for human consumption was 904 thousand tons of milk and milk products in milk equivalent. About 419 thousand tons (46%) were consumed by avoiding the retail system. This amount comprises consumption of milk at the farms, sales to the urban population in producer markets, direct deliveries to the houses, etc.

2.4 Foreign trade

Import and export are other sources of total supply and demand, respectively. Traditionally, the Lithuanian national milk sector is export-orientated. In 1989-1991, Lithuania exported over 1m tons of dairy products (in terms of milk equivalents), mainly to other parts of the Soviet Union. Even the transition process caused changes in trade volumes and directions, in 2000 more than 40% of the total production was sold in the foreign market. Calculations show that milk production in Lithuania is highly competitive. The index of relative trade advantage (RTA)[7] of the Lithuanian dairy sector in 1999 was 7.94. It was the highest among the CEC countries. The second highest RTA index belonged to Latvia and was 2,77 (HARTMANN 2001). Accordingly, the milk product's balance is strongly positive. This applies for every country as well as every product except yoghurt (Table 5 and 6). However, it is worth looking in detail at changes of export and import structures. Reliable information on international trade of dairy products is available since 1995. Thus, only recent developments could be presented.

Table 5: Export of dairy products in milk equivalents, 1995-2000, in tons

	1995	1996	1997	1998	1999	2000
	by kind					
Milk	3339	5922	10876	13313	1119	8267
Condensed milk	9884	7918	15724	6437	9702	1892
Skimmed milk powder	24499	34605	46911	29318	22752	9801
Yoghurt and sour milk products	1259	2991	5522	6228	453	380
Whey	53	783	1532	2643	2931	6887
Butter	15199	27494	23041	29196	15017	11061
Cheese	11355	14101	19595	29923	22846	32350
	by country					
EU	21414	23115	36999	25413	15129	13633
CIS	30749	48929	58465	59237	24680	16200
CEFTA	6276	1352	1505	2274	2321	5050
Baltic countries	5441	9522	10884	10646	3804	7643
USA	1268	1368	1535	8999	19837	16808
Other countries	440	9493	14013	10470	9046	11303

Sources: DSRL (various issues, b).

Export of dairy products reached their maximum in 1997-98 with 110-120 thousand tons. In these years the quantities were about 1.5 times higher than in 1995 and 2000 (Table 5). The main products were skimmed milk powder and cheese. Together, they accounted for more than 50% of the exports. The increase in exports until 1997-98 was mainly stimulated by the recovery of the export of skimmed milk powder to the CIS, especially Russia, where about 50% of the exports were sold. The government supported this trend by export subsidies. After the Russian crisis in August 1998

[7] The RTA is an index that is constructed from relative trade flows and allows statements about the competitive position of a country for a product or a group of products. For construction and interpretation of the index see FROHBERG and HARTMANN (1997).

and the devaluation of the Rouble this market broke down. Only about 20% of the exports were directed towards CIS since then.

Until today, there was only little success regarding a stronger presence in Western countries as a compensation for the loss of markets in Eastern Europe. One of the main reasons are quality requirements, entry methods, etc., which are different from Eastern markets. First of all, only companies having EU quality certificates can export their products to the EU market. CEFTA and Baltic countries have also different standards regarding quality even if they apply to most of the EU standards as candidates.

In 2000, the USA became the main export market of Lithuanian dairy products. The EU and other countries attracted almost the same amount of exports as the USA and the CIS. The major export market in CEFTA countries is Poland. The neighbouring Baltic countries are also very important for Lithuania. There are close historical links, similarities in national traditions as well as similar problems and achievements in joining the EU. Especially exports to Latvia are increasing from year to year.[8]

It is interesting to observe that despite the crisis, CIS countries still attract more dairy export than the EU. A good image of the Lithuanian products in Eastern markets, old and tight business contacts and some similarities in mentality due to 50 years of common history are Lithuania's main advantages in this market segment. Furthermore, the quality requirements in CIS are more comparable to those in Lithuania, so that there are no additional production costs for compliance with foreign quality standards. Whether the Eastern markets are going to have the same importance in future depends on the economic recovery in these countries. Today, we observe increasing exports to the EU. If this trend is continuing, the EU could already overtake the CIS in 2002 or 2003.

[8] Dairy product exports to USA, to CEFTA, the Baltic, CIS countries, and to other countries group (Latin America, Asia, Japan, Australia, etc.) are unlimited. Exports to the EU are limited by export quotas. Since July 1st, 2001 till June 30th, 2002 export quotas were 5500 t of milk powder, 300 t of condensed milk, 1925 t of butter, 6600 t of cheese. The quotas are defined by the European Commission for each EU economical year.

Table 6: Imports of dairy products in milk equivalents, 1995-2000, in tons

	1995	1996	1997	1998	1999	2000
	by kind					
Milk	8	128	223	133	129	418
Condensed milk	88	143	500	518	656	1246
Skimmed milk powder	516	7377	14165	624	727	207
Yoghurt and sour milk products	759	1408	3698	4358	2886	3238
Whey	20	55	569	361	99	48
Butter	66	24	509	178	68	94
Cheese	148	146	253	437	492	341
	by country					
EU	958	2275	8941	4200	3184	3012
CIS	568	6622	959	11	22	140
CEFTA	22	45	150	374	241	405
Baltic countries	2	126	787	1260	1537	2022
USA	53	75	0	0	0	0
Other countries	3	43	443	661	74	0,3

Sources: DSRP (various issues, b).

The import of dairy products to Lithuania is administered by the Ministry of Agriculture. Quotas limit the amount of dairy product import from the EU. They are applied to milk powder, condensed milk, sour milk products and cheese. Import licences to importing companies are spread on a competitive basis (auctioning). Dairy product import from other countries are not affected by quotas. However, automatic licensing is used, i.e. imports are approved as soon as the compliance with quality standards is ensured.

In recent years yoghurt was the major import product. It accounted for more than half of all imports in 2000. The import of skimmed milk powder mainly from Estonia and Latvia also increased (Table 6). Lithuania imports also some cheese, mainly from Latvia, Poland, Germany and France. Regarding the import structure by countries, two leaders can be identified: the EU and the Baltic countries. Almost all yoghurt is imported from Germany.

3 HORIZONTAL INTEGRATION IN THE LITHUANIAN DAIRY INDUSTRY

3.1 Horizontal integration in the domestic milk processing industry

The milk processing industry in Lithuania was already well developed in the mid-wars period (1918-1940). Lithuanian dairy products, especially butter, were well known in the European market as products of good quality. During Soviet times, the milk processing industry experienced a period of very slow modernisation of equipment, limited assortment, low quality of product, etc. However, dairy processing was one of the largest sectors of the food industry. It comprised four smaller sectors producing whole milk products, cheese, butter and canned dairy products. Before 1990 all milk processing enterprises were state-owned. At that time there were 45 dairy plants in Lithuania, each

was part of one of the nine major dairy complexes. The individual plants had well defined areas of milk purchases and sales of dairy products.

After Lithuania re-established its independence in 1990 the milk processing industry experienced a few rounds of privatisation. In the first, the big complexes were abandoned and the dairy plants started to operate independently. According to the *Law on Initial Privatisation of State Property,* passed in February 1991, ownership rights could be acquired by milk suppliers (farmers, agricultural enterprises), private companies (banks, industry, services), employees and the state. Furthermore the Lithuanian population could obtain ownership rights by acquiring vouchers. The privatisation of dairy plants started in 1992.

The majority of the state property was sold through public subscription of shares; only 30% of the first round privatisation capital were sold for cash (OECD 2000). From the 33 milk processing companies on the privatisation list only three firms (*Biržu pienas*, *Rokiškio suris* and *Jonavos pienine*) were sold in the first round. That round led only to a partial privatisation of the sector. Solely 30% of the assets belonged to private capital. According to the law of privatisation, milk suppliers could obtain up to 50% of the assets of the dairy plants. However, because of the lack of capital and the rather complex privatisation process primary producers were very reluctant to take part. Foreigners could not participate in this initial phase. Thus, the result of this stage was an only partly privatised sector that was dominated by domestic capital.

In the second round which started in 1995 modified rules were applied to ease the access and distribution of the enterprises' assets. Furthermore, foreign investors were allowed to participate. The ownership structure at the end of this stage is documented by GIRGZDIENE and KUODYS (1998). According to their survey of 17 dairy companies in 1997, milk suppliers held about 38% of the firms' assets, 28% belonged to the employees and 9% to foreign investors. The government still owned 10% of the capital. The sector has attracted only some strategic investment by foreign dairy companies. The majority of the foreign resources were provided by financial investors (EBRD, Namura, Bankers Trust Company).

Another result of the primary privatisation round was the rapid increase of the number of milk processing entities. In 1995 about 60 dairy processing enterprises were operating in the industry. The lack of management capabilities, technical inefficiencies associated with high production costs and more severe competition from abroad pushed the industry into financial difficulties. The high number of participants in a saturated market inevitably lead to the elimination of weak enterprises. Concentration processes in domestic dairy industry started at the beginning of privatisation, however, after 1997, with the start of the second round of privatisation, the process accelerated significantly. In 1998, only 48 enterprises with milk processing facilities were left in the sector.

Table 7: Concentration ratios in the Lithuanian dairy industry (based on the processed raw milk) and foreign direct investment in dairy processing, 1994-2000

Concentration ratio	1994	1995	1996	1997	1998	1999	2000
CR3	24.5	27.3	29.3	38.4	45.2	52.5	72.0
CR4	29.7	34.4	35.5	46.5	56.4	59.6	78.6
CR10	55.7	61.4	61.1	75.3	83.5	86.6	94.9
FDI (m Lt)			50	53	54	156	98

Source: 1) for 1994-1998 – JANSIK (2001).
2) for 1999-2000 – own calculations, based on the data from *Pieno centras.*

Table 7 shows changes of concentration ratios in the Lithuanian dairy industry between 1994 and 2000. All concentration indicators were fairy stable until 1996, but went up in the subsequent years. In 2000 the CR3 reached 70%, the CR10 covered already almost the entire industry, leaving just some 5% of the raw milk processing to small dairy companies.

The figures also show that foreign investors were able to increase considerably their ownership on the industries' assets. As JANSIK (2001) pointed out, the share of capital controlled by foreign investors increased from 10% (1997) to 15% (1998) to about 30% (1999). Thus, there is a positive correlation between the ratio of concentration in the domestic dairy industry and the industrial FDI stock.[9] The empirical evidence suggests that the FDI has accelerates an ongoing process of concentration.

Concentration and firm growth in the domestic dairy sector was supported by the companies *Žemaitijos pienas*, *Rokiškio suris*, *Biržu pienas* and *Mažeikiu pienine*. Horizontal integration has evolved along three lines:

1. Large companies have acquired medium or small sized firms (*Rokiškio suris* and *Žemaitijos pienas*). *Rokiškio suris* is the largest fat cheese producer in the Baltic countries. The company has attracted significant FDI and is controlled mainly by foreign capital. *Žemaitijos pienas* is the largest milk producer in Western part of Lithuania. The company is mainly controlled by domestic capital, the share of foreign capital is unimportant so far.
2. Mergers between domestically owned companies. An example is *Pieno žvaigždes*. This company was founded in 1999 in response to the competition induced by *Rokiškio suris*.
3. Greenfield investment (ice-cream producer *Ingman-Vega*).

Pieno žvaigždes and *Rokškio suris* managed to get among the top ten Lithuanian companies (Table 8). The data reveal also that four out of the eight largest dairy processors made losses in 1999 and 2000. There is also evidence that restructuring and concentration processes will continue in the next years. In 1999, *Biržu akcine pieno bendrove* was the third largest dairy processor. In the following years it lost about two third of its sales. In 2001, it went bankrupt. A contrary development can be observed for *Utenos pienas* which has almost doubled its sales within one year.

[9] JANSIK (2001) calculated correlation coefficients between concentration and FDI for Baltic countries food processing industries with a 1998 data set. For Lithuanian food industry, which comprised 12 subsectors, it was equal to 0.8817.

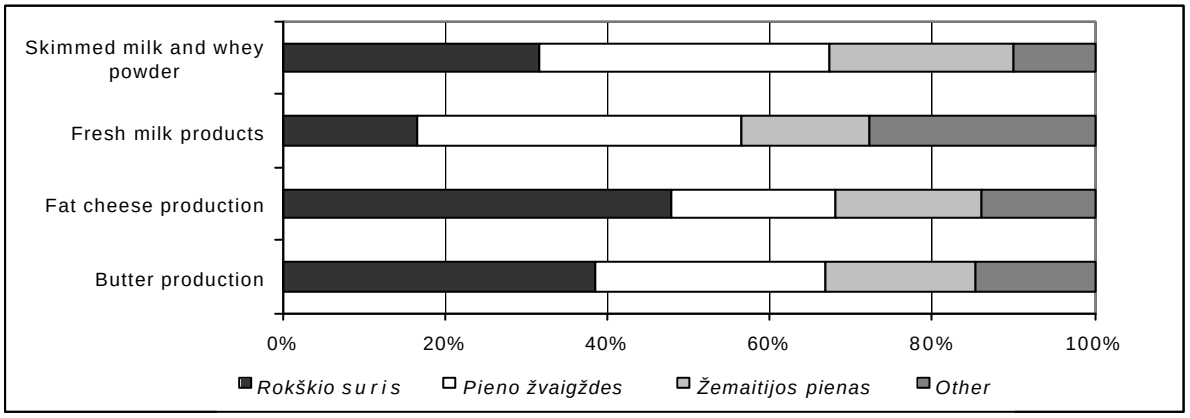
Table 8: Milk producing companies on the list "TOP-100 Lithuanian companies 2000"

Rank		Company	Sales, m Lt		change, %	Net profits, m. Lt		change, %
2000	1999		2000	1999		2000	1999	
9	17	*Pieno žvaigždes*	261.2	147.1	77.8	12.2	5.1	139.7
10	12	*Rokiškio suris*	255.4	191.5	33.4	13.4	27.1	-50.3
14	19	*Žemaitijos pienas*	181.3	138.7	30.7	5.2	3.2	60.6
30	64	*Utenos pienas*	101.8	57.5	76.9	-6.9	-3.0	–
45	51	*Panevežio pienas*	71.9	72.1	-0.2	-4.9	-1.1	–
65	65	*Klaipedos pienas*	52.1	57.0	-8.5	0.1	1.6	-94.3
68	18	*Biržu akcine pieno bendrove*	50.2	145.8	-65.6	-34.7	-8.2	–
83	38	*Marijampoles pieno konservai*	37.7	81.3	-53.7	-21.2	-21.8	–

Source: BALNIS (2001).

The high degree of concentration on the aggregate level finds its counterpart in the concentration ratios of individual products (Figure 3). Fat cheese production is the most concentrated one. In 2000 *Rokiškio suris* provided almost one half of the total domestic fat cheese production. The company performed well in butter production too, where its share amounted to about 40%. Fresh milk products are the main production lines of *Pieno žvaigždes*, the main competitor of *Rokiškio suris*. These products are almost being entirely consumed in the domestic market. In this group, smaller domestic dairy companies are also relatively strong.

Figure 3: Concentration of production of the major dairy products or product groups in Lithuania in 2000, in %



Source: *Pieno centras* (2001).

Horizontal integration often leads to a situation, in which one company could take over the market and, thus, gets into a monopoly position. Because monopolisation is recognised as a negative phenomenon, many countries are applying various restrictions on the exploitation of market power. Lithuania introduced an Antitrust Law a few years ago. According to this regulation, market power is considered to be a severe problem when one company takes control over 40% of the market sales. Domestic milk producers are still below this limit regarding the total sales. In individual production lines, *Rokiškio suris* is well beyond that limit. However, the government didn't see any need for interventing so far.

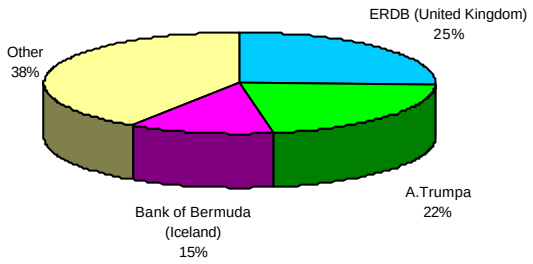
3.2 Case Studies

3.2.1 *Rokiškio Suris*

The company is located in the north of Lithuania. It was established in 1966 and became the largest specialised fat cheese producer in the Baltic countries. It went through the first round of privatisation in 1991 and was run as a joint stock company since then. Later, the company got through the second round of privatisation and foreign investors started to own a significant part of the shares. Figure 4 shows the main investors and shareholders in July 2001.

The shares of *Rokiškio Suris* are registered and listed on the National Stock Exchange. The value is relatively stable. At the end of 2001 it was equal to about 47m Lt (about 13m €). Because of the daily turnover, the structure of shareholders is slightly fluctuating. Furthermore, the company experienced a few emissions of shares, which changed the ownership structure as well.

Figure 4: Shareholder structure of *Rokiškio Suris*



Source: National Stock Exchange (2001).

Since 1994 the company has been expanding. Some smaller companies were acquired, from others the majority of shares was obtained. In the last years, the company attracted a large amount of investments from its owners. Additionally, a large part of profits were reinvested. In 1999, the company got 40m Lt investments from the European Bank of Reconstruction and Development and from the Bank of Bermuda. These investments were directed towards improvement of the milk procurement, modernisation of production equipment on farms, technical reconstruction of processing facilities, development of new production lines, improvement of the distribution system, and towards environmental projects. Today it is a very modern company with qualified human resources.

Rokiškio suris produces 27% of the domestic dairy production. The company's turnover, domestic and foreign, were about 255m Lt in 2000, net profits about 13m Lt. The enterprise accounted for 22% of total industry sales (Securities Commission of the Republic of Lithuania 2002). It provides a broad assortment, which includes fat cheeses, milk, sour cream, butter, and desert milk products.

The company has a strong tradition in cheese production. It is the main producer of fat cheese in Lithuania. 70% of the production is being exported – this is the biggest export share among all Lithuania's milk processing companies. In recent years 80% of the exports went to Western countries (USA, Holland, Denmark, Italy, Cyprus, Poland) and about 20% to Eastern markets. In the beginning of 1998, the company, together with other Lithuanian milk producers, got the certificate

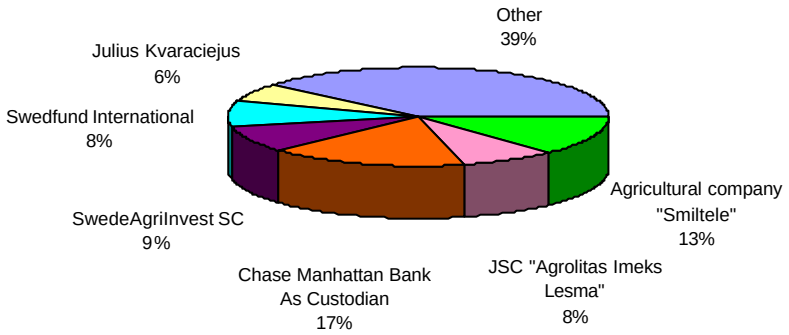
from the European Commission on the quality of its products. This opened the EU export markets for *Rokiškio Suris*.

The number of employees at *Rokiškio suris* was about 1800 at the end of 2000. This figure includes 16 top-managers, 161 specialists and 1624 workers. The average monthly salary of the top-managers in 2000 was 4085 Lt, specialists received 1467 Lt and farmer 1232 Lt (Securities Commission of the Republic of Lithuania 2002).

3.2.2 Pieno Žvaigždes

Pieno žvaigždes, another large domestic dairy company, is also located in the north of Lithuania. Contrary to *Rokiskio suris*, it has no deep historical roots, because it was established as a new enterprise on the basis of the dairy company *Mažeikiu pienine*. After independence, *Mažeikiu pienine* operated very successfully in the Lithuanian market and was one of the largest milk producers in Lithuania. On January 1st 1999 it merged with *Pasvalio suris* and the new company *Pieno žvaigždes* was established. The broad assortment of the company includes various kinds of milk, butter, skimmed milk powder, fat and cottage cheese, sour cream, curds and desert milk products.

Figure 5: Shareholder structure of *Pieno Žvaigždes*



Source: National Stock Exchange (2001).

Recently, this company acquired control over *Panevežio pienas*, another large operator in the domestic milk processing industry. So, step by step, *Pieno žvaigždes* became the second largest producer of dairy products in Lithuania. In 2000, total sales amounted to 261m Lt and made up around 25% of total industry sales. Thus, regarding turnover, *Panevežio pienas* managed to beat its major competitor, however, its net profit (12m Lt) is still lower than those of *Rokiškio Suris* (13m Lt). The key factors for the company's success are an intensive marketing and product promotion in the domestic market and a good chain management.

Contrary to *Rokiškio Suris*, *Pieno Žvaigždes* is mainly owned by domestic capital. In 2000, the value of shares was about 42m Lt (about 11m €). The shareholder's structure is fragmented, the largest shareholder owns just 17% of the shares and there are at least 5 shareholders which have to make alliances in order to manage the company (Figure 5). Another difference between the two firms is that *Pieno Žvaigždes* mainly operates at the domestic market. 70% of its production is sold in Lithuania. Only 30% are exported to Asian and Western European markets and to CIS.

4 VERTICAL RELATIONSHIPS IN DOMESTIC MILK PROCESSING INDUSTRY

4.1 Vertical integration: Some basic principles

The milk industry is characterised by considerable interdependence among farmers, dairy processors, wholesalers, retailers and consumers. This system is surrounded and influenced by input suppliers and by regulatory institutions. The efficient co-ordination of such a complex and evolutionary structure is a demanding task. The actors in the chain can choose among various co-ordination mechanisms ranging from a spot market to vertical integration.[10] The choice between these forms is influenced by several determinants. These include the exploitation of economies of scale, technological interdependencies and uncertainty, life-cycle considerations and preventing double marginalisation. However, as it was pointed out in recent years, the possibilities of transaction cost reduction are the main reason for vertically integrated structures (Tirole 1988).[11]

The term transaction cost refers to all costs associated with the preparation, implementation, control and enforcement of transactions. These costs occur ex ante, such as information or negotiation costs and ex post such as expenditures on performance, on control or on monitoring. There are two main reasons that cause these costs: bounded rationality and opportunism. Bounded rationality refers to the limited capabilities of human beings to contemplate and to collect information for every contingency. Thus, exchange takes place under asymmetric information. In addition, given opportunistic behaviour, each partner will try to extract as much benefits from the transaction as possible, even if this includes cheating or breaking agreements (RICHTER and FURUBOTN 1999).

Because of this, partners look for governance structures that provide as much control as necessary over the transaction in order to hedge their factor input. However, at the same time, complete control is often not optimal because of the monitoring costs. In literature, three dimensions of transactions are discussed that determine the optimal governance structure: frequency, uncertainty, and asset specificity. A high degree of uncertainty favours transacting in a highly integrated environment in which monitoring and control mechanisms could be implemented through contracts or through ownership. The other two dimensions affect governance structures as shown in Table 9.

In general, the higher the degree of asset specificity, the higher is the tendency towards full vertical integration or ownership. However, this tendency is modified by the frequency of the transaction. In principle, the more frequent a transaction and the higher the number of competitors in the upstream stage, the less are the possibilities for opportunistic behaviour and the more likely is a settlement of the transaction via markets. However, if a firm can only deal with one input supplier, opportunistic behaviour becomes very likely. In such situations, ownership or vertical integration are the governance structures with the lowest transaction costs (WILLIAMSON 1985).

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[10] In our view, vertical integration is when one company takes control of subsequent stages in the vertical channel by applying common ownership principles. Other authors have a broader view. They subsume under this term all activities to co-ordinate the stages of a chain. We prefer to distinguish between co-ordination and integration, where the latter refers to the broader view of vertical integration.

[11] Because of technological and economic reasons optimal co-ordination mechanisms are varying, depending on time and country. The choice is strongly related to the level of development and the availability of institutional arrangements that support the different mechanisms.

Table 9: Relationship between the degree of asset specificity and frequency of the transaction

		Degree of Asset Specificity		
		Low	Intermediate	high
Frequency	Rare	spot-markets (standardised commodities)	Contracts (customised equipment)	Vertical integration or contracts (construction of a factory)
	Frequent		Long-term bilateral contracts, strategic alliances (customised inputs)	Full vertical integration (site-specific transfer of intermediate products)

Source: adjusted from WILLIAMSON (1985).

Asset specificity cannot be measured directly. However, an indicator is the degree to which the asset can be applied to other operations. Thus, the concept is closely related to opportunity costs. Generally, asset specificity refers to the characteristics of human and physical capital. However, as far as agriculture is concerned, there is at least one further dimension of asset specificity, because many agricultural products are perishable. This raises a timing problem, as many products, especially those from animal production, must be sold within a relative short time. From this point of view, the producer has an incentive to integrate forward into processing activities. The main reason is that primary processing contributes to relaxing the timing constraints and, thus, reduces the possibilities of opportunistic behaviour for the sellers (ALLEN and LUECK 1998).

However, perishable goods pose not only problems for agriculture, but also for the processors. Generally, food processors have established factories where the quality of the specialised products depends on the quality of the raw materials. From this point of view, there is an incentive for processors to integrate into the agricultural production, as well.

Applying the theoretical consideration to milk production and processing gives the following results. Processors have a propensity to integrate into agriculture. Manufacturing of highly specialised dairy products (cheese, yoghurt) requires, first of all, high investments in specific processing facilities, and secondly, an adequate quality of the raw materials. The spot market is not very well positioned to provide an environment that prevents opportunistic behaviour. Because quality control is pivotal in such production lines, it is of essential interest of the processor to perform this task within the factory. In addition, if the payment scheme depends on the quality of the raw product, there is an incentive for the farmers to act according to the price differentials.

However, integrating further into agriculture, insofar as the specialised processors acquire ownership in agricultural holdings, will often not be optimal. First of all, there is a difference in optimal scale of agricultural production and dairy processing. A dairy plant would need to take control over a whole set of farms to process in optimal scale. First of all, this would increase administrative requirements. Because of seasonal and other temporal influences, agricultural production can not be controlled in the same way as industrial production. Since the possibilities to control agricultural workers is restrained, it is very likely that opportunistic behaviour would lead to exploding transaction costs. This suggests that the optimal governance structure in such a situation is one of long-term contracts between farmers and dairy producers. Furthermore, one can expect that producers use mechanisms, like providing credits, that tighten the links between the dairy plants and the milk producers.

So far, we have discussed the case of backward integration. Especially in Western countries, we observe a long history of forward integration. Farmers may organise milk collection so that they are better positioned to negotiate milk prices. However, this is only the first stage of co-operation. Beyond that, farmers may establish processing co-operatives. However, one can expect that the production structure differs considerably from those of the specialised dairy plants. The reason for integration was not to protect the specific investment in the processing facilities, but to protect investment in milk production and quality. Because of this, co-operatives will prefer production facilities, which are more flexible, and which could be easily adapted to different sorts of dairy products.[12]

A majority of the companies, acting in today's market have implemented marketing strategies to foster sales volumes and profits. Since the choice of a marketing strategy is affected by the level of production specification, the theory of transaction costs is also relevant for marketing activities. In general, dairy companies apply mostly differentiated strategies of market entry and maintenance. This means, they are not producing uniform, standardised products for the whole market (undifferentiated strategy case), but products, having some degree of intermediate specification. Usually, companies have one or more major brand of milk products, aimed at a wide range of consumers and secondary brands, geared toward specific segments, for example, dairy products for children or especially health products with special biological additives. A company, applying such strategy, will try to connect upstream and downstream partners using contractual agreements. Companies, specialising in dairy production with a high degree of specification, for example, ecological products, etc., will use a concentrated marketing strategy. This means that all their market efforts will be addressed to one segment, for example, to well-educated consumers of different sex and age, respecting their health and having average and above-average income. As was already discussed, such firms will seek vertical integration by common ownership, like co-operatives, or by well fixed contracts.

Moreover, it can be expected that these enterprises prefer to negotiate directly with retailers in order to appropriate the returns of the marketing investment. However, in order to save negotiation costs, this strategy can only be applied when the retail system is not too fragmented or the processors are able to negotiate with large retail systems. In other cases omitting the wholesale stage will not be rational for the processors. In the following section we will analyse whether these principles for managing exchange can be found in the Lithuanian dairy chain.

4.2 Transactions between farmers and dairy processors

At first stage we consider the exchange of raw milk between milk producers and dairy processors. The theoretical considerations suggest that the modes of exchange depend on the special characteristics of the enterprises involved in the stages. In order to evaluate this hypothesis, we have to describe the co-ordination principles in Lithuania and their functioning. Today, the major forms of vertical relationships in the "milk producer-milk processor" stage are (1) contracts with dairy companies, (2) forward integration through shareholding and (3) establishing milk collecting co-operatives.

By far most of the milk deliveries are governed by contracts. They are set up either between each milk producer and the processor directly or between farmers and local milk collection entities which in turn belong to the dairy companies. The contract fixes the quantities and the prices of exchange.

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[12] One justification of this arguments is the observed pattern of production structure in Germany. Co-operatives play an important role in milk processing. In 1990s they collected and processed about 60% of the raw milk. They concentrate on the production of standardised dairy products, which have a high share of raw materials. Typical examples are pasteurised milk or butter.

The terms of payment for the supplied milk, are set up by the government (Ministry of Agriculture), but are also subject of the contracts. Usually, the processor has 30 days after the end of the purchasing period (usually a month) to make the payment.[13] The average term of the contracts is one year. On individual basis the contracts can be signed for a longer period. Farmers are not forced to supply milk just to one company. They may contract with collection entities belonging to different milk processing companies.

Farms producing a significant amount of milk are able to negotiate 20-30% higher prices for raw milk than small farms. Furthermore, they are able to put through other individual terms of delivery that go far beyond the minimum requirements set up by the Ministry of Agriculture. Small milk suppliers have to accept the price, which is suggested by the dairy company.

Milk processing companies usually have an interest to attract large milk suppliers, because of the quality and amount of the milk supplied. It is a common practice of the dairy companies to provide credits for their major suppliers for farm modernisation like new equipment or improvement of the breeding stock. Dairy companies provide the money as payment in advance for future milk deliveries over the next 10-20 years. Each dairy company has different criteria for the selection of potential borrowers. These criteria are not based on officially announced competition; often the individual initiative of the farmers', talks at the companies, farmers' performance and business plans play the decisive role in the selection of the prospective credit-owner. The terms, sum and conditions under which the credit is provided differ from company to company. *Pieno žvaigždes* grants the means without charging any interest, *Rokiškio suris* charges an interest of 2-4% per year, but in the first year usually no interests are paid. The provided sums differ as well. *Rokiškio suris* gives credits up to 1m Lt. Because of the half-official character of these arrangements, there are no detailed information on the importance and the number of these credits. Moreover, when credits amounts to 50% of the property, farmers will not get any funds from SAPARD. This gives reason to disclose the information. However, since there are only a very view large dairy farms, experts conclude that there are only a few arrangements yet.

Besides contractual arrangements there is also forward integration of farmers. One consists of keeping shares of milk processing companies. In the privatisation process farmers received ownership in almost all milk processing companies. However, they own just a small percentage of shares and only in a few cases primary agricultural producers can influence managerial decisions significantly. At the moment, it is more a symbolic participation, because primary producers do not have sufficient financial means to obtain more powerful percentage of the shares.[14] However, even such participation is positive, since it connects milk producers with milk processors and tightens the relationships between them. Farmers that get information of the companies' management, have the possibility to observe and react to the specific problems of milk processors, etc. Depending on the profitability of the dairy plant, farmers receive annual interest for their shares. Thus, providing the processor with sufficient milk, which meets high quality requirements, could c. p. increase profits of the enterprise and thus would be of genuine interest of farmers.

A second form of forward integration is the foundation of processing and/or collecting co-operatives by farmers. Today, co-operatives are not a widespread phenomenon in the country. However, re-

[13] There is the evidence that some payments were delayed for some months or even a year. However, after Ministry's intervention the delay period shortened.

[14] For example, *Rokiškio suris* (2000) points out that in 2000 only 2,6% of the shares is owned by the raw milk producers.

cent discussions and the history of co-operatives in Lithuania give reason to discuss them in more detail.

4.3 Agricultural co-operatives in Lithuania: state and perspectives

The basic prerequisite for horizontal co-operation is the possibility of mutual gains. Incentives for co-operation arise when this either produce additional benefits for consumers (production differentiation) or reduces marketing costs. Agricultural co-operatives have deep historical roots in the country, they were well developed in mid-war time (1918-1940). The restart of this movement began after the liberalisation of milk purchasing prices in 2000. Co-operatives are aiming at reducing milk collection prices and putting farmers in a stronger negotiation regarding milk prices. They could also provide a limited assortment of various sorts of milk, curds, cottage cheese, and butter. These products could be sold in the local market, as they would be fresher, cheaper and would satisfy the tastes of local consumers.

According to expert recommendations (*IPP Consultant* from France), there is a need to establish at least 10 small regional milk collection and processing co-operatives in Lithuania. The foundation of one company with a production capacity of 2 thousand tons/per hour would cost about 1m Lt (0,29m €). Long-term loans with a repayment period of 20 years from the World Bank could be used to establish them. The participating farmers would be milk producers, suppliers, processors and managers. Because of cost advantages in milk collecting and no disadvantage regarding market power, such local co-operatives could pay 10% higher prices for the raw milk than the large dairy processing companies.

An example of corresponding activities is given by farmers from the Žemaitija region. They are already working on a co-operative project and going to apply to SAPARD funds. Co-operatives can not only be established by farmers. Agricultural enterprises can join the co-operative as well. Recently, agricultural enterprises established *Lithuanian milk*. This organisation does not process milk, but collects it from the members of co-operative and sells it to a processing company. However, at the moment, there are only a few milk collection-processing co-operatives in Lithuania. Experts estimate that they process less than 5% of the purchased milk.

The main reasons interfering the restart of the co-operatives are lack of finances, doubts about finding the market, lack of trust, insufficient promotion of the idea and the benefits of co-operations. Furthermore, 50 years of the Soviet collective experience hinder an unprejudiced start of co-operatives.

Other reasons for a low rate of foundation may result from the decision principles in co-operatives. Each member has only one vote, irrespective of the amount of financial means he/she has donated in the establishment phase. This statement, which actually is the symbol and slogan of co-operations, could cause some problems while achieving effective management. The lack of concentration of decision competence cause high cost on finding consensus because compromises have to be found that meet the desires of the majority of the partners. Furthermore, because the principle of decision making is fixed, potential member would hesitate in providing more than the required contribution. This increases the probability that, especially in the establishing phase, a lack of capital is hindering a successful foundation of a co-operative. Moreover, it is very unlikely that banks are willing to provide the missing means, because, in general, co-operative do not possess sufficient property that can be used as a collateral for a loan. These arguments suggest that founding a co-operative requires financial support by the local or the national government. Furthermore, it is likely that deviations from the

principle "one person – one vote" have to be accepted. This could be established by linking the number of votes to the amount of milk supply. In addition, a maximum number of votes per member could be fixed. However, in this case, the term co-operative may not be correct anymore since it would look like a joint stock company.

This discussion shows that the Lithuanian government, agricultural institutions, media, sociologists, etc. will have to put in enough efforts in order to make co-operatives a competitive organisation in the countryside. The idea of collecting and processing co-operatives has also been supported by the recently approved measures for development of the domestic milk sector over the years 2002-2003.[15] However, the economic costs and benefits of such a program still need to be analysed in detail.

4.4 Transactions between processors and retailers

In order to understand the modes of exchange, the retail system in Lithuania has to be described in more details. The main food-retailing systems are (1) integrated retail chain stores running as the joint stock companies, (2) independent private groceries run by individual private capital, and (3) small size stores run as consumer co-operatives.

Integrated chain stores are already well developed and are spread over the entire country. However, they are located mainly in big cities and regional centres. According to a census survey on retailing enterprises, performed by *JSC Profindex* in 1998-1999, in major cities the integrated chain stores accounted for up to 50% of all food retailing stores, in Vilnius – even 60%. They have their own distribution centres, well-equipped warehouses and retail stores. They are using electronic and laser equipment for code scanning, data transmission to retail monitoring companies' etc. The technological standards in these chains are almost the same as in Western countries. At the moment, two international retail chain groups operate in the domestic market under their own management: *IKI* (Belgium/France) and *SPAR* (Germany). At the beginning of 2002 the *IKI* retail chain group managed 82 stores in the country. There are also two large domestic retail chain groups in the market: *Ekovalda* and *Vilniaus Prekyba*. Both are owned by domestic capital and by foreign investors. *Ekovalda* belongs to *ICA-Ahold*, one of the top-retailers in Northern Europe. In 2000, the chain managed around 40 retail stores. *Vilniaus prekyba* retail chain group, which comprises a few smaller retail chain systems, such as *VP Market* and others, expanded to Latvia and Estonia. At the beginning of 2002 *VP Market* managed 155 retail stores, including 17 in Latvia and 1 in Estonia. There are no exact data on the turnover of the retail chain groups. It is estimated that the returns of *VP Market* was equal to 2.264b Lt in 2001 and 1.685b. Lt in 2000 (SLUŠYTE 2001).

Contrary to the urban areas, small private groceries owned by domestic capital and stores run as co-operatives prevail in the countryside. Around 55% of all food retail stores functioning in smaller cities and in rural areas belong to private capital and 20% to consumer co-operatives. Because the purchasing power in the countryside is low and consumption of industrially processed milk products is limited by home production, special marketing activities in this market segment are almost not observable. The small assortment is a sign of the poor consideration of this market segment by the milk processors – only the most important dairy products are available.

In recent years, horizontal integration took place in food retailing. However, detailed data on the level of concentration is not available. One year ago, the Lithuanian Board of Competition performed

[15] 2.35m Lt. of the National budget are going to be directed towards this purpose.

a special research on the level of concentration in domestic food retailing. The results provide that the turnover of the three largest retail chains was equal to about 40-50% of total returns.[16] About 50% of the annual turnover in domestic food retailing were made by private stores.

A large part of milk products are perishable without a long shelf life. Their distribution is organised on the basis of contracts between milk processors and retail chain stores.[17] Usually, the processing companies are responsible for transportation. Most of them possess already modern means of transportation and can deliver the products safely and quickly over the radius of about 200-300 km. Furthermore, in accordance with the theory, large and medium sized milk producers have marketing departments that perform market and consumer research, they are investing into advertising and product promotion. If they lack capabilities to perform more complicated marketing function by themselves, they can charge the well developed domestic consulting, research and advertising industry, which is able to complete the given tasks on the appropriate level. The top dairy producers *Rokiškio Suris* and *Pieno Žvaigždes* are doing advertising of their products in domestic media, they are clients of leading consulting and advertising agencies. By pursuing such concepts, companies are investing into new technological lines, new assortment of production, consumer research and are working on the methods of promotion, improving their distribution system, etc.

Since the purchasing power of a large part of domestic consumers is limited, price competition is important. This may be the reason why sales volume and turnovers were growing at the same rates from 2000 to 2001: 11.7% for fresh milk products 29.4% for cheese, and 26% for ice cream. Often small and medium sized dairy processors are selling their products at cost coverage. Sometimes, they sell at a price that is 25% lower than the one of the large dairy producers (DEKSNYS 2002). However, the top dairy producers are able to sell their products at higher prices, because of superior product quality and broader assortments. As competition is severe on the market for dairy products, some large domestic processors tried to push products of smaller dairy plants away from the distribution channel. Because of a broader assortment in sufficient quality and quantity, the large processors are able to influence distributors to remove the products of small competitors from the shelves. Although this trend can be observed very intensely in the supermarkets and has been described in the national media, it is not officially recognised.

4.5 Co-ordination of dairy products exports

Altogether, about 50% of manufactured milk products are exported.[18] For large dairy producers, such as *Rokiškio suris* and *Pieno žvaigždes* the export market is equally important as the domestic, since a large part of profits is earned abroad: *Rokiškio suris* is selling 70%, *Pieno Žvaigždes* 30% of their production in foreign markets. Domestic dairy producers are worried about falling dairy product prices in the foreign markets. Such tendency was observed at the beginning of 2002 and could cause a reduction of milk purchasing prices of 10-15% in 2002 in the domestic market. The recent slowdown in world market prices for dairy products is already the third since 1990. If this tendency will hold on, domestic producers will face the next wave of bankruptcy (DEKSNYS 2002). This trend rises the question how shares on the world market can be stabilised and/or increased.

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[16] *Vilniaus prekyba* group covers around 20% of the domestic food retail market; *Iki* and *Ekovalda* cover each 10%.

[17] The relationships at this stage have at least two dimensions: international and domestic. Each shows special characteristics regarding vertical co-ordination. The international dimension will be discussed in chapter 4.5.

[18] The average dairy products export ratio for EU countries is 10% of the total production.

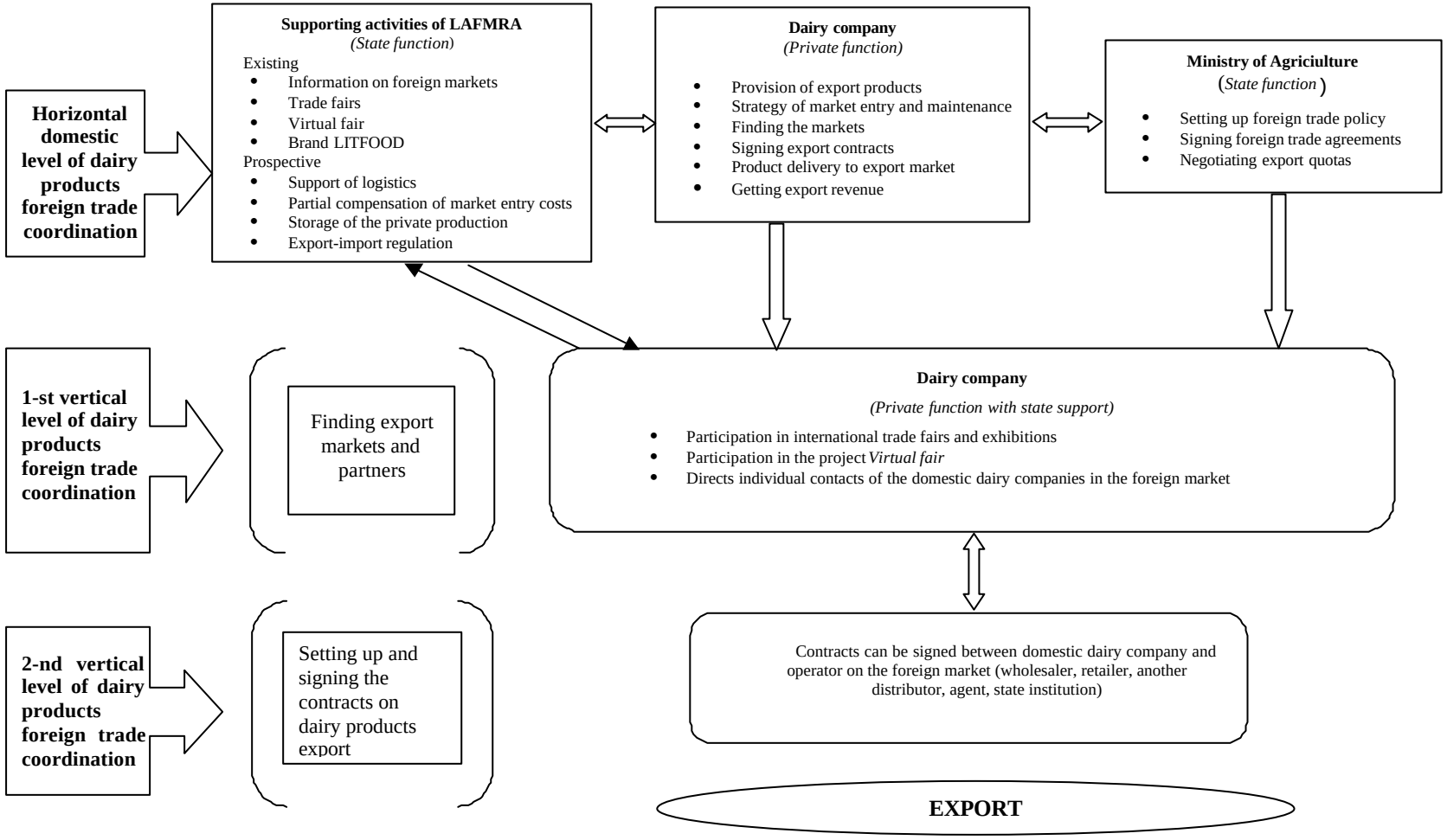
Basically the milk processing companies have to do the marketing of their products on international markets by their own. However, since export of milk products is promoted by the state, the processors receive some governmental assistance for export activities (Figure 6). In 1996 the International Agriculture Trade Agency was established. Its function was to support the domestic food and agricultural product exporters. The Agency was reorganised in 2001. Today it is running under the responsibility of the Lithuanian Agricultural and Food Market Regulation Agency (LAFMRA). In autumn 2001, LAFMRA completed a new program of agricultural and food products export promotion which is under the discussion in the Parliament (Seimas) of the Republic of Lithuania.

The program is especially directed towards the reduction of transactions costs (information, search, monitoring). Information cost shall be diminished by the creation of a Market Information System (MIS). Since 1998, LAFMRA collects and reports price and quantity information on domestic and international markets. In 2000, LAFMRA has strengthened these activities by establishing the MIS. All dairy product exporters-importers can get access to MIS databases.

LAFMRA has an Export Development Department. One of its main tasks is to organise the participation of the Lithuanian food processors in international exhibitions, trade fairs and trade missions in order to present Lithuania's food-processing industry and agriculture. Such events offer excellent opportunities for companies to present themselves at the export market and to provide foreign partners with information about food products manufactured in Lithuania. LAFMRA installs Lithuanian stands at the international agri-food fairs. It also publishes marketing material and introduces Lithuanian companies. In addition to monitoring forthcoming international agri-food events, LAFMRA keeps a database of inquires and interested potential partners. Seminars are organised on a regular basis for Lithuanian company specialists in order to advice them on various aspects of preparation for and participation in international trade fairs.[19]

[19] In 2001, the LAFMRA Export Development Department helped local food companies to attend the international trade fairs POLAGDA FOOD 2001 in Poland and WORLD FOOD MOSCOW 2001 in Russia. Since Russia and Poland are among Lithuania's largest foreign markets for foodstuffs, the Lithuanian Business Development Council (Ministry of Economics) sponsored the participation of the country's food producers in these international key agri-food events. The international trade fairs to be attended in 2002 are: PRODEXPO in Moscow, FOODEX JAPAN 2002 in Tokyo, AGROBALT 2002 in Vilnius, POLAGRA FOOD 2002 in Poznan, INTERMOPRO 2002, INTERMEAT 2002, INTERCOOL 2002 in Düsseldorf, WORLD FOOD MOSCOW 2002 in Moscow, WORLD FOOD ST. PETERSBURG 2002 in St. Petersburg.

Figure 6: Horizontal and vertical co-ordination of dairy product export



Source: own design.

Measures, aimed at building a positive image of Lithuanian products are an integral part of the country's export promotion campaigns. The introduction of the LITFOOD quality mark was a landmark step in shaping the positive image of the Lithuanian food products on both the domestic and foreign market.[20] The LITFOOD quality mark is used to emphasise the Lithuanian origin of products and their excellent quality. The label has produced a three-fold effect, boosting sales, providing support to small and medium business and increasing consumer culture and confidence. The owner of the trademark will have an opportunity to check the products' quality based on established selection criteria.[21] No one will have the right to use the same or similar label of the registered trademark LITFOOD without the consent and authorisation of the LAFMRA. A certificate, issued on May 7th, 2001 by the State Patent Office establishes the exclusive rights of the LAFRIMA to the LITFOOD trademark. The trademark is registered according to the general Regulations of the Madrid Agreement and Protocol. Lithuanian Embassies, trade agencies, fairs, press, radio, television, and product presentations promote the trademark. As a consequence, the introduction of LITFOOD decreases monitoring costs regarding product quality significantly.

Search and information costs are furthermore reduced by a virtual fair (www.food-fair.com) which was developed with financial means of PHARE and the Lithuanian Ministry of Agriculture. It is successfully operating already for more than year.[22] At the moment, the internet catalogue of the virtual fair lists more than 130 enterprises, however, the number of companies, participating in the project is about 500, including all dairy product exporters. The system enables companies to exchange import and export inquires.

Companies find export partners and organise the exchange in the foreign market in different ways: (1) by participating in various trade fairs and exhibitions, as it was discussed already, (2) by participating in the virtual fair, and (3) by contacting foreign markets directly through agents or various middlemen such as the Lithuanian Embassies, personal foreign business relationships etc. Vertical coordination occurs exclusively by contracting where the terms depend on the legal framework of the respective foreign country.

5 CONCLUSIONS

Milk production in Lithuania is characterised by a low level of horizontal integration. Small milk producers, keeping less than two cows dominate. Commercial dairy farms are still poorly developed. However, development prospects are promising. It is expected that the number of specialised milk farms able to produce high quality milk will increase significantly until 2006. This shall be achieved by using financial means from SAPARD funds, domestic Rural Support Fund, special educational programs, training, etc. If the implementation of all measures will be successful and the financing sufficient, half of the cows will be kept in commercial dairy farms with 6 and more cows, in 2006.

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[20] Similar labelling systems are used by many Western European countries as well as by Estonia and Latvia.

[21] The labelled products not only have to be of excellent quality, but also of the Lithuanian origin. Unprocessed products will have to be 100% of Lithuanian origin, whereas, processed products will be required to be made of Lithuanian-grown main raw materials. The main criteria for obtaining the quality mark will be voluntary participation, quality consistency and limited product usage periods.

[22] The Virtual Fair is based on the most up-to-date internet technologies following the "Business to business" (B2B) concept. Its intention is to facilitate the search of business contacts and help to find international business partners both in Lithuania and world-wide.

The demand at the domestic market is still suffering from the consequences of the transition process. The consumption of dairy products per capita decreased by 50% over the last decade. In the last years consumption stagnated at about 200 kg per capita. This negative tendency was mainly caused by budget constraints of domestic consumers.

The milk processing industry is the most developed segment of the national dairy sector. It is a modern industry, employing the newest processing and packaging technologies, and thus, is able to produce good quality dairy products. The Lithuanian milk processing industry is highly horizontally integrated. In 2000, over 70% of purchased milk was processed by three major dairy producers: *Rokiškio Suris, Pieno Žvaigždes* and *Žemaitijos Pienas*. One of the main reasons for this high degree of concentration is the influx of foreign investment, which started in 1995 with the second stage of privatisation. The industry is totally privatised, and shareholders' concentration is high. In most companies only 2-3 major shareholders have the majority shares.

Transactions with upstream and downstream industries are primarily governed by contracts. The spot market or vertically integrated ownership structures are relatively unimportant. In the first stage of privatisation farmers had the possibility to become owners of the processing companies by buying shares for a preferential rate. However, because of a lack of financial resources only a few farmers took this option. Thus, today only a small percentage of the shares is owned by farmers. They can hardly influence the companies' decisions significantly.

The most developed and consistent relationships can be observed between raw milk producers and processors. The basic rules of the contracts like duration or payment scheme are set by the Ministry of Agriculture, others, especially prices, are negotiated individually between farmer and processor. Because of advantages in terms of transport and transaction costs processors provide better conditions to large agricultural producers. Often the processors try to strengthen their relationships with large-scale producers by providing credits for farm modernisation and/or foodstuff. Most small producers do not deliver directly to processors but to milk collection centres. In general, these are owned by processors. So far, only a few farmers co-operatives have been established in order to take this function. Processing co-operatives are also poorly developed. At the moment, just up to 5% of supplied milk is processed in such entities.

Regarding further vertical co-ordination at the stage "processor-distributor" there is a more diversification in the modes of governance. Transactions at this stage have at least two dimensions: international and domestic. In each, different principles of vertical co-ordination are dominant. The distribution in the domestic market is mainly governed by long-term contracts. Especially large dairy processors organise their distribution by circumventing wholesalers. They negotiate directly with retailers. Lithuania has three major food-retailing systems: integrated chain stores, independent private groceries, and small size stores, which are run as consumers' co-operatives. The major part of milk products is distributed through integrated retail chain stores in big cities.

On the international level, companies mainly themselves take care of the expansion to the international market. The government is supporting the producers through LAFMRA, an institution which is run under the responsibility of the Ministry of Agriculture. Analysing Lithuanian foreign trade of milk and milk products, the following conclusions can be set up. Domestic dairy industry is export-orientated, up to 50% of produced dairy products are sold on the world market. Regarding both products and countries, export balances are positive. The comparative advantage of the Lithuanian dairy sector, calculated by the relative trade advantage index was the highest among CEC countries. Lithuanian milk producers export successfully to Eastern and to Western markets. In 2000, Lithuania

exported almost the same amount to four country groups: EU, CIS, USA and other countries (Japan, South-East Asia). The largest part of imports comes from the EU, the main imported product is yoghurt from Germany.

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