The Dairy Sector in the Central European Candidate (CEC) Countries

– The Status of Restructuring and Future Challenges –

MONIKA HARTMANN

Abstract

The dairy sector in the CEC countries had to cope with tremendous adjustment pressures in the 90ies. Privatization and liberalization contributed to intense competition on the CEC countries' dairy market. Major problems that impede the competitiveness of this sector are a considerable fragmentation of the dairy processing industry, pronounced excess capacities, high seasonality of milk production and low investment activities. The latter delays the modernization of processing technologies and thus hinders quality improvements and the adjustments of hygienic conditions as well as product and process standards to EU norms. These problems are common to all CEC countries, though to different degrees. In addition, especially in Bulgaria and Romania, but also in Poland, Lithuania and Latvia the dairy industry is burdened by the low quality of the raw material and high milk collecting costs. Improving technical as well as economic efficiency in the primary and processing sector and seeking strategic alliances are necessary to secure the competitiveness of the CEC countries` dairy industry in EU and world markets.

Key words: Central European candidate countries; dairy industry; restructuring process; competitiveness

Die Milchindustrie in den Mitteleuropäischen Beitrittsländern – Stand der Restrukturierung und zukünftige Herausforderungen –

Die Milchindustrie in den Mitteleuropäischen Beitrittsländern (MEL) war in den 90er Jahren erheblichen Anpassungszwängen ausgesetzt. Die Privatisierung und Liberalisierung führte zu einem intensiven Wettbewerb auf den Milchmärkten dieser Länder. Wesentliche Probleme, die die Wettbewerbsfähigkeit des Sektors derzeit behindern sind die starke Zersplitterung der Industrie, die erheblichen Überkapazitäten, die bedeutende Saisonalität der Milchproduktion sowie die geringen Investitionsaktivitäten. Letzteres schränkt die Modernisierung der Verarbeitungsanlagen ein und hemmt somit Verbesserungen in der Produktqualität, eine Ausweitung des Produktsortiments und die Anpassung der Hygienevorschriften sowie der Prozess– und Produktstandards an EU-Normen. Diese Probleme sind für alle MEL von Relevanz, wenn auch in unterschiedlichem Maße. Zusätzlich wird die Milchindustrie insbesondere in Bulgarien und Rumänien, aber auch in Lettland, Litauen und Polen durch die geringe Milchqualität und die hohen Aufkaufkosten beeinträchtigt. Die Verbesserung der technischen und ökonomischen Effizienz im Primär– und Verarbeitungssektor und die Suche nach strategischen Allianzen ist notwendig, um die Wettbewerbsfähigkeit der Milchindustrie der MEL auf den EU und den internationalen Märkten sicherzustellen.

Schlüsselwörter: Mitteleuropäische Beitrittsländer; Milchindustrie; Restrukturierung; Wettbewerbsfähigkeit

1 Introduction

With the breakdown of the socialist system in the Central European Candidate (CEC) countries[1]) in 1989 considerable changes have occurred in production and consumption of dairy products. Elimination of producer and consumer price subsidies, decline in real purchasing power of the population, privatization and restructuring in the primary, processing and distribution sector as well as the liberalization of trade led to very difficult times for the dairy industry far into the second half of the 90ies. Only during recent years some stability began to show up for this industry. However, at present the sector seems to be confronted with even greater challenges, since the aspired membership in the EU requires the implementation and enforcement of the acquis communautaire. In addition, the dairy sectors in the CEC countries have to be able to compete with producers in the present member countries.

Given this state of transition of the dairy sector the aim of the paper is threefold. Firstly, for the CEC countries a brief overview with respect to the restructuring process and its main driving forces in the dairy industry will be provided. This includes a discussion of the forms and procedures used in privatizing this sector as well as an analysis of agricultural policy reforms and changes taking place in input and consumer markets. Secondly, based on the present state of restructuring competition within and competitiveness of the dairy sector will be analysed using the economic theory of industrial organization. This will cover issues such as ownership and market structure, vertical integration as well as quantitative and qualitative performance indicators including productivity and profit measures, the level of capacity utilization and market shares. A discussion of the importance of foreign direct investment (FDI) for the industry's development is going to complement this part of the analysis. Thirdly, based on the results obtained, the study identifies those economic conditions that impede competitiveness and discusses adjustments in the private and policy arena necessary to reach global competitiveness.

For the analysis, the dairy sector has been selected because it plays a decisive role in the CEC countries in food industry output and employment[2]). In addition, the restructuring process has been especially pronounced in this sector. Finally, it is probably the area in the agriculture and food arena that faces in most of the CEC countries the greatest pressure towards adjustments prior to accession.

2 Importance of the dairy sector and its development

The dairy industry plays an important role in most of the candidate countries. Gross output of this sector amounted in the CEC countries in 1999 to 5.5 billion € which accounts for 14.9 % of food industry output[3]). As expected Poland

1) Estonia, Latvia, Lithuania, Poland, the Slovak Republic, the Czech Republic, Hungary, Slovenia, Romania, and Bulgaria.

2) The term „food industry" is used in this paper to comprize all branches of food processing. It refers to the NACE classification 15.

3) The analysis refers in general to sector 15.5 of the NACE classification. In table 1 gross output and gross value added is converted for each country into Euro to enable comparisons of the absolute size of this food

has by far the largest dairy sector accounting for about 40 % of total gross output of this branch in the 10 CEC countries (cf. table 1). The country with the second largest gross output in dairying is the Czech Republic (1.0 billion €) followed by Hungary (0.8 billion €). Much smaller in absolute size are the dairy sectors in the remaining countries.

Table 1: **Importance of the dairy sector in the 10 CEC countries in 1999 and changes over the period 1995 to 1999**

Country	Gross Output				Employees				Gross Value Added	
	1999	change 1995/1999	share in food industry 1999	share in food industry change 1995/1999	1999	change 1995/1999	share in food industry 1999	share in food industry change 1995/1999	1999	share in food industry
	Mio. €	%	%	%	1000	%	%	%	Mio. €	%
Estonia	138	9.9	24.9	–2.4	3.6	–12.1	16.8	9.1	29.1	24.9
Latvia[a]	142	12.5	17.8	–1.1	5.6	–7.7	17.0	–1.4	n.a.	n.a.
Lithuania	388	61.5	31.0	3.3	11.9	–23.2[b]	26.9	4.7[b]	n.a.	n.a.
Poland[c]	2202	35.7	15.8	–3.7	52.8	–6.2	15.6	–9.6	n.a.	n.a.
Czech Rep.	1003	21.4	15.0	1.0	14.4	–8.8	9.6	–4.6	108.3	8.8
Slovak Rep.	278	10.1	16.4	–1.8	4.8	–11.1	9.6	–9.3	31.5[d]	8.9[d]
Hungary[e]	839	23.7	13.1	16.7	10.8	–28.0	8.5	–22.0	57.5	6.1
Slovenia[e,f]	304	17.8	17.9	–24.8	1.8	–6.3	9.3	–29.0	29.1	7.6
Romania[b]	146	–24.1	4.9	1.1	18.3	18.9	8.2	–4.2	38.9	5.8
Bulgaria[d]	104	n.a.	8.1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

n.a.: not available. – a) Data refer to 1998; % change refers to 1996 to 1998. – b) % change between the years 1997 and 1999. – c) For gross output sales are taken as a proxy; Refers to enterprises with more than 50 employees. – d) Includes only companies with 20 and more employees. – e) For gross output sales are taken as a proxy. – f) For gross value added data was available only for 1998.

Sources: Information on the references used are available by the author on request.

Data on the shares of the dairy sector in food industry output are also depicted in table 1. The picture which emerges from those numbers, is quite different. It is not surprising that the dairy sector reaches the highest shares in output of the food industry in the Baltic countries and Slovenia; ranging from 31 % to 18 %. In those countries permanent grassland takes up a high proportion of total agricultural land. The Baltic countries were net exporters of dairy products already before as well as after World War II. During socialist times large quantities of milk and dairy products had been exported to the other Soviet Republics. On the lower end of the scale are Romania and Bulgaria with 5 % and 8 %, respectively. Because milk processing requires an intensive use of raw material and offers little possibility for value adding, the dairy sectors' share in food industry value added tends to be smaller than these figures (cf. table 1).

Besides absolute levels and shares of the output value in 1999 it also is of interest to look at changes in those indicators over time[4]). For all countries but Romania[5]) the data show a positive development with regard to output of the dairy industry, expressed in Euro over the period 1995 to 1999[6]). Growth rates were especially pronounced in Lithuania (62 %), Poland (36 %), Hungary (24 %) and the Czech Republic (21 %).

The share of the dairy sector in food industry output changed only slightly in most of the countries considered, with Hungary and Slovenia being an exception. While in Hungary dairy output grew much faster than food industry output leading to an increase in its relative importance the opposite holds for Slovenia. This development partly reflects the loss of (gain in) competitiveness of the Slovenian (Hungarian) dairy sector relative to the food industry.

Table 1 also provides information on the employment level in the dairy sector. With more than 50000 persons engaged in its dairy sector in 1999 Poland has the largest work force of this sector among all CEC countries. This is about three times the work force employed by Romania's dairy industry, the next largest in this respect. Taking the employment share of the dairy sector within the food industry as an indicator of importance milk processing offers employment to relatively many persons in the Baltic countries, reaching as much as 27 % in Lithuania. The number of employees declined in the period 1995 to 1999 in all CEC countries but Romania. This reduction was especially considerable in Hungary (–28 %) and Lithuania (–23 %). In general it was to a large extent due to rationalization in the sector. The implied growth in average labour productivity (cf. section 5.1) is a necessary prerequisite for restructuring the food industry including the dairy sector and making both more competitive in the future.

3 Main driving forces behind the restructuring processes in the dairy sector

In order to understand the economic pressures on individual firms in the dairy industry of the CEC countries that are forcing them to adjust, the forms and procedures of privatization, developments in agricultural policies, as well as changes in demand and input supply need to be considered. This chapter will provide a brief overview with respect to these factors.

3.1 Privatization

Both speed and form of privatization are crucial for a successful economic transition towards a market economy. The privatization process determines initially the horizontal and

branch in each country. Nevertheless, cross-national comparisons are always difficult because e.g. different price levels for dairy products result in different output values even if the volume, composition and quality of output would be equal. In addition, the use of different definitions in published statistics can be a problem. Also the minimum employment or turnover size to be included in the national statistics may vary from country to country. Finally, for comparisons with the food industry a definition of industry is sometimes used which also includes tobacco. Whenever information was available on these issues it was provided. In general, it can be assumed that the data refer to all enterprises and that for the food industry a narrower definition covering only food and beverages is used.

4) Nominal output values will be affected by inflation and may show a nominal increase even when the volume of output is contracting. Examination of output trends in Euro rather than in national currencies provides an approach to reducing the impact of differences in inflation rates on these figures; the assumption here is that inflation rates are reflected in changes in the value of a country's currency against the Euro. However, it should be noted that several CEC countries have pegged their nominal exchange rate to a Western currency.

5) This is due to the marked depreciation of the LEI against the Euro over the period considered. In national currency output of dairy products showed a strong increase of 64% over the period 1997 to 1999 in Romania.

6) Due to a lack of data the development for Latvia could be considered only for the period 1996 to 1998, and for Romania for the period 1997 to 1999. For Bulgaria no information was available to calculate a development over time.

vertical structures of the industry in a transition economy. Moreover, by restoring property rights, privatization provides appropriate economic incentives for entrepreneurs to increase efficiency: of individual enterprises, and thus branches, and the economy as a whole.

Though the methods used in privatization differed substantially between the candidate countries, some common features can nevertheless be identified. In general, small enterprises were privatized by being sold directly or at auctions to the highest bidder[7]) Large enterprises were mostly turned into joint stock companies, with a subsequent transfer of shares to various owners. In the Czech Republic and Hungary some of the large state enterprises were split up into smaller entities before converting them into a joint stock company. In the Czech and Slovak Republics, as well as in Slovenia, privatization of the newly created stock companies took place through a voucher scheme. Vouchers had been handed out to the population of the countries which could use them to purchase shares. In most CEC countries, especially in the Baltics, Poland and Romania but also in Slovenia and Hungary, preference was given to agricultural producers and/or to enterprise employees and managers. The aim of granting preferential treatment to agricultural producers is, on the one hand, to dilute monopsonistic power in the downstream sectors and, on the other hand, to guarantee processors the supply of milk (cf. e.g. GIRGZDIENE et al., 1998; JASJKO et al., 1998; SEPP et al., 1999; European Commission, 1998; EITELJÖRGE et al., 1999).

In Poland the situation of the dairy sector was different. Already prior to transition it mainly consisted of co-operatives. However, farmers' equity share in those enterprises did not exceed 1 %, hence the dairy plants were state enterprises rather than co-operatives. With the economic reforms introduced at the end of 1989 privatization schemes were developed for the dairy sector and farmers became real owners of the co-operatives. In addition, many new private enterprises were established. Despite this development, co-operatives still dominate the dairy sector in Poland until today (PRZEPIORA et al., 1999, p. 49; LUBA, 1999, pp. 4–5).

In all CEC countries considerable progress has been made in divesting state-owned enterprises in the dairy sector. In most of them this process is now completed. Only in Lithuania and Romania about 7 % and 20 % of the capital, respectively, is still owned by the state.

3.2 Agricultural policy adjustments

During socialist time, production and consumption of dairy products were strongly supported by policies in most of the CEC countries. This support was, in general, drastically reduced or eliminated altogether at the end of the 80ies, beginning of the 90ies. At the same time trade with dairy products was liberalized. This led to a considerable decline in real producer prices and a sharp increase in consumer prices (e.g. Agra Europe, 1997, p. 1; PIENIADZ, 1997, p. 33).

As a result consumption of milk products decreased strongly in most of the 10 CEC countries, this decline was even more pronounced than the reduction in production leading to surpluses which could no longer be disposed of in their internal markets. To ease the burden for producers and processors, protective measures increased again or were reintroduced in most countries over the 90ies. Thus, at the beginning of 2000, the dairy markets in these countries are again affected to a considerable extent by state interference. Intervention measures and/or minimum price arrangements are applied in Lithuania, Poland, Hungary, the Czech and the Slovak Republics as well as in Slovenia. In addition, direct payments per ton of milk produced and/or per cow are granted in Estonia, Lithuania, the Czech Republic, the Slovak Republic, Hungary and Romania. In the meantime, a quota system has also been introduced in the Czech and the Slovak Republics as well as in Hungary, however, it is in general not binding yet[8]). Imports of dairy products are usually protected by ad valorem import tariffs ranging between 30 % to 35 % in Estonia up to more than 100 % in Poland. In most CEC countries tariffs are especially high for butter and skimmed milk powder, and thus "standard" dairy products for which the processing capacities in this region are at present least utilized (cf. section 5.2). Finally, to dispose of surpluses on the international market, export subsidies for dairy products are granted in Lithuania[9]), the Czech Republic, the Slovak Republic and Hungary (e.g. Agra Europe, 2000; Agra Europe, AgraFood East Europe No. 03/1999 p. 23, 04/2001 p. 22, 05/1999 p. 26, 01/2001 pp. 16–20, 09/1999 p. 15; Osteuropa Agrarmärkte – aktuell, No. 05/2000 p. IX, No. 01/2001 p. 5; HETZNER et al., 1998 p. 19; Deutsche Milchwirtschaft 7/2001 – 52. Jg.).

The discussion so far has revealed that support to the dairy sector is again of importance in most of the CEC countries. For 1999 the Producer Support Estimate (PSE) is estimated to amount to 53 % in Slovenia[10]), 50 % in Hungary, 45 % in Romania, 39 % in Slovakia and 36 % in the Czech Republic. In Poland and Estonia the level of support for milk production is, with a PSE of 9 %, much lower. Latvia and Lithuania even discriminate in 1999 against their dairy sector (PSE –5 % and –9 %, respectively). For comparison, the relative support in the EU amounts in 1999 to a PSE of 58 % (OECD, 2000a, 2000b, 2000c and 2000d).

3.3 Developments of input supply in the dairy sector

In the 10 CEC countries, 38.9 million tons of cow milk were produced in 1989. Over the last decade production sharply declined by 10.6 million tons or 27 % to 28.3 million tons. This development was primarily the result of the removal of price support which had been granted to milk producers prior to 1989 as well as of rising input costs for farmers (cf. section 3.2). The strongest decline occurred over the period 1990 to 1993. Since then production has more or less stabilized at the lower level, but with few signs of recovery[11]).

7) In the Czech Republic family businesses were restituted to their former owners.

8) For the year 2001 the introduction of a milk quota is envisaged in Poland, too (Osteuropa Agrarmärkte – aktuell, p. 8).

9) Lithuania has committed itself to eliminate export subsidies in its WTO negotiation. Thus, in the future these measures have to be abolished. Government plans to replace them with indirect aids to support dairy farmers (Agra Europe, AgraFood East Europe No. 09/1999, p. 15).

10) For Slovenia the number for the PSE refers to 1997.

11) The expositions are based on the following sources: European

Producers' deliveries to dairies declined even steeper than milk production in the CEC countries. In 1999 an average of just 57 % of milk production was delivered to dairies. This is a rather low percentage as compared with 95 % in both Germany and the EU-15. The share of all milk delivered to dairies fell in 1999 to as low as 22 % in Romania, 49 % in Latvia, 55 % in Poland and 56 % in Bulgaria[12]). The highest processing shares are calculated for the Czech Republic (87 %), the Slovak Republic (87 %) and Hungary (76 %). The variation in the delivery quotas, to dairies across these countries resembles to a large extent their divergent structures in dairy farms. While in Estonia, the Czech Republic, the Slovak Republic and Hungary milk is produced on farms with relatively large average herd sizes[13]) the dairy farm structure in Latvia, Lithuania, Poland, Slovenia, Romania and Bulgaria is characterized by a large share of smallholdings with only a few cows each[14]). Small dairy farmers find it difficult to comply with stricter regulations on milk quality and hygienic standards introduced in most countries over the last years. This has forced an increase in sales of milk through less formal channels (e.g. Agra Europe, AgraFood East Europe No. 12/1999, p. 12).

Developments in the agricultural sector significantly affected the food processing sector. This also holds for milk processing. The decline in milk production has considerably reduced raw material availability for dairy plants and has thus been a major reason for the low capacity utilization in this sector (cf. section 5.2). This situation was aggravated by the decline in the delivery quota. In addition the low quality of the raw milk (cf. section 5.4) is a big problem for the processing sector since the quality of the final dairy commodity is crucially dependent on the former. Other severe shortcomings are the high seasonality[15]) of production in the whole region as well as the small average herd sizes found in Latvia, Lithuania, Poland, Slovenia, Romania and Bulgaria. This leads to high expenses for collecting the milk from agricultural producers, a considerable cost factor[16]) for dairies in these countries (e.g. Wissenschaftlicher Beirat beim BML, 2000, pp. 66–67).

For the future it can be expected that the availability of milk to dairies will improve due to an increase in production and due to rising shares of deliveries to dairies in total production. The effects on the raw material supply for the dairy sector in the CEC countries will, in addition, crucially depend on the conditions of EU accession. Of utmost importance in this respect is whether the delivery quota will be applied in the new member states and if so, at which level (e.g. HETZNER et al., 1998, p. 20; Agra Europe, AgraFood East Europe No. 11/1999 pp. 1–3 and 02/2000, p. 2; Agra Europe, 2000).

3.4 Changes in consumer demand

Removal of generous state subsidies led to a sharp rise in dairy product prices. This, together with a decline in purchasing power of consumers, induced a fall in per capita consumption of milk and dairy products in the region by 19 % over the period 1989 to 1999. Especially the consumption of fluid milk and butter dropped sharply in the CEC countries[17]).

The excess supply on the domestic market was aggravated by several factors. Firstly, traditional export markets in the East collapsed. Secondly, from 1991 onwards, Western imports of high quality milk products increased considerably. The latter was encouraged by a liberal import regime in the beginning of the 90ies and an often inadequate quality, low variety and unattractive packaging of dairy products from domestic dairies (cf. section 3.2; Osteuropa Agrarmärkte – aktuell, No. 14/1999, p. III; HETZNER et al., 1998, p. 18).

Over the next years there is considerable potential for increased consumption of milk and dairy products in the CEC countries. At present, consumption per capita is generally significantly lower in these countries than in the EU-15. While in 1999 per capita consumption of milk and dairy products amounts to 247 kg in milk equivalent in the EU-15 it only reaches 184 kg on average in the CEC region. Especially in Lithuania, Slovakia, Hungary and Bulgaria the consumption of milk and milk products lies with 114 kg, 129 kg, 170 kg and 172 kg, respectively, far below the corresponding values in the EU. Only in Slovenia the level of milk production is with 223 kg per capita and year close to the EU number (FAO 2001). Consumption in the CEC countries is especially low for cheese and fresh dairy products. These pronounced differences can be seen as an indication for future increases. This is supported by the expectation of an increase in real purchasing power of the population in the countries considered and a convergence in preferences between those countries and the EU.

4 Structural developments in the dairy industry

4.1 Ownership and legal structure

One outcome of the privatization process has been that agricultural producers and/or employees and managers of the firm have become the most important owners of the dairy industry in some of the CEC countries. This holds for the Baltic countries, Poland, Slovenia and Romania. Such an ownership structure may cause problems with regard to corporate governance. It seems doubtful that groups of producers, who generally have great difficulties surviving as primary producers and financing their own development, could take on the task of successfully developing and running a processing enterprise. Also, where employees own a significant share of the enterprises as is especially the case in Romania, restructuring could be hampered because priority might be given to maximizing employee benefits, thus

Commission, 1998; ZMP, 2000 and previous years; ZMP, 2001 forthcoming; Agra Europe, AgraFood East Europe No. 12/1999, p. 12.

12) Other sources indicate for Bulgaria that even more than 80 % of all milk produced are used on-farm for direct consumption and processing. This would imply that the delivery quota is below 20 % (Agra Europe, AgraFood East Europe No. 03/2000, p. 33).

13) Cf. e.g. Agra Europe, AgraFood East Europe No. 02/1999, p.11, No. 11/1999, p.3; TOTH, 1999, p. 65.

14) Cf. JASJKO et al., 1998, p. 21; Osteuropa Agrarmärkte – aktuell, No. 16/2000, p. VII, No. 7/1999, p.II, 16/1999, p. 18 and No. 20/2000, p. III; PANAYOTOVA et al., 1999, p. 17; ZMP, 2001 forthcoming, p. 50.

15) Cf. e.g. PRZEPIÓRA et al., 2000, p. 443; GIRGZDIENE et al., 1999; p. 22; JASJKO et al., 1999, p. 24; BAAS et al., 1998, pp.38–39.

16) This situation is aggravated by the in general relatively low milk yields in the CEC countries. In 1999 milk yields in the region amounted to 3882 kg per year and cow. In the EU the respective number is 5700 kg.

17) Cf. LUBA 1999, pp. 8–10; ZMP, 2000 and previous years; FAO 2001. For Slovenia data was only available from 1992 onward.

awarding wages and salaries that are not related to productivity. In addition, job security may be a preferred goal. Finally, this form of privatization leads to the danger of leaving management and decision-making structures unchanged (e.g. HARTMANN et al., 2001).

Severe problems, both in farmer-owned and employee-owned enterprises, can be expected with regard to investment. These groups of owners lack funds, making the financing of much-needed investments quite difficult. Furthermore, especially in the first years of transition, these ownership structures crowded out outside investors, including foreign interests that could have injected much of the required investment capital, management and marketing expertise. Money lendes face an agency problem. As long as they have no real possibility to control the efficient use of their loans, lenders will be reluctant to finance long-term restructuring measures (e.g. HARTMANN et al., 2001). Thus, it is not surprising that, e.g. in the Baltic, Slovenia and Romania, foreign capital hardly entered the dairy sector during the privatization process and the first phase of restructuring.

Finally, the conflict of interests regarding the pricing of raw materials might not be solved when farmers are the major owners of a dairy plant. For many of them a high procurement price for milk deliveries is considered more important than receiving dividends from the processing companies as a result of operating profitably (e.g. WEINDLMAIER, 2000, p. 42). This induces two problems. First, farmers will not necessarily deliver their produce to a processing enterprise in which they have ownership interests if someone else offers more favourable marketing conditions; experience in some western countries indicates such behaviour (LAURINKARI, 1990, p. 581)[18]). Second, the attitude of farmers create obstacles for investments and the overall development of the food processing enterprise.

Especially in Latvia, Poland and Slovenia a further result of the privatization method applied was the dominance of co-operatives in the dairy sector (e.g. Osteuropa Agrarmärkte – aktuell 14/2000, p. 17). Companies that have this legal status are additionally hampered in their successful operation (e.g. cf. WEINDLMAIER, 2000, p. 42; Wissenschaftlicher Beirat beim BML, 2000, pp. 50–51). This is mainly due to the specific organizational structure of co-operatives, which gives each member one vote irrespective of his/her amount of shares. As a result, the interests of large shareholders are hurt which has negative consequences on an effective corporate governance in these enterprises (SHLEIFER et al., 1997, p. 754). These problems as well as the easier access to credits have motivated some co-operative dairies in CEC countries to change their legal status into joint-stock companies, a development which can also be observed in some Western countries such as Germany (JASJKO, 1999, p. 13; WEINDLMAIER, 1998, pp. 54–56).

4.2 Size distribution and horizontal concentration

The size structure of enterprises in the dairy industry and its changes have important implications for the competitiveness of this food branch. However, with respect to the CEC countries it is important to avoid prior beliefs about the direction of these effects. For example, larger firm size may be important in enabling dairy plants to reap the benefits of economies of scale in processing, lower transaction costs and pecuniary economies of scale in procurement and sale, advantages in the areas of acquiring and processing information as well as of research and development (WEINDLMAIER, 1998, p. 55; KALLFASS, 1993, p. 233)[19]). On the other hand, downsizing of firms may reflect the necessary continuation of structural reform in the food industry in the wake of the horizontal and vertical integration policies pursued in the central planning era. Nonetheless, knowledge of the status and the development of dairy industry structure is the first step to interpreting its consequences for competitiveness.

Following the decentralization and privatization of the dairy sector, the number of enterprises increased considerably in the beginning of the 90ies in all CEC countries. However, since the middle of the 90ies countries fall into two groups with regard to the development in the total number of food firms. Latvia, Lithuania, the Slovak Republic and Hungary experienced a decline in the total number of dairy firms since 1995 (cf. table 2). The second group of countries includes Estonia, Poland, the Czech Republic, Slovenia and Romania, where the number of food firms remained stable or even increased. However, this trend reversed in some countries such as the Czech Republic in 2000 when only 68 enterprises existed on the Czech market (Deutsche Milchwirtschaft 7/2001, Jg. 52). Also in Poland recent mergers and bankruptcies have led to a reduction in the number of enterprises to 420 (Agra Europe, AgraFood East Europe No. 03/2001, p. 75). Despite the increase in the number of firms revealed for five countries in table 2 over the period 1995 to 1999 only in Slovenia and Romania gross output per enterprise (measured in €) declined.

In terms of the trends in concentration measured by the Concentration Ratios, CR3 and CR10[20]), the results in table 2 clearly hint at an increasing concentration in recent years, a development which also can be observed in Western countries (e.g. GLOY, 1995, pp.10–13; BAAS et al., 1998, pp. 12–13). The interpretation of this index with respect to industry competitiveness may be ambiguous. It might be seen as a reasonable entrepreneurial measure to adjust to market conditions. If economies of scale are realized through merger or acquisitions dairy products can be produced at lower costs and thus the price competitiveness of the dairy sectors in the CEC countries might be strengthened. Also in cases where an enterprise sells shares to another enterprise new funds can be raised for investments. If a more efficient entrepreneur acquires shares from a less efficient one, the competitiveness of the latter might be increased. Any of these activities indicates that the selection function of competition is working in the dairy sectors of the countries considered. The concentration process in the dairy sector very likely will also generate more foreign investments since large entities are more attractive to investors.

18) This, however, does not hold for all Western countries. In The Netherlands for example, dairy farmers have the obligation to deliver their raw material to the dairy co-operative if they are a member of this co-operative. At the same time the processing firm has the duty to accept that milk. So the obligation goes both directions.

19) Certainly large enterprises might also suffer from some disadvantages. Potential disadvantages of large enterprises are higher costs of co-ordination and control as well as lower flexibility and lower orientation towards customers requests (WEINDLMAIER, 1998, p. 55).

20) The CR 3/10 is defined as the sales of the 3/10 largest enterprises in the sector relative to the total sales of the sector.

Table 2: **Concentration in the dairy sector of the CEC countries and selected Western countries in 1999[a]**

Country	Number of Enterprises		Gross Output per Enterprise		CR 3		CR 10	
	1999	1995/ 1999 %	1999	1995/ 1999 %	1995 %	1999 %	1995 %	1999 %
Estonia	43	10.2	3.2	–0.3	38	41	79	79
Latvia	53[b]	–27.4[c]	2.7	75.7[c]	41[d]	n.a.	68	n.a.
Lithuania	40	–32.2[e]	9.7	24.3[f]	29	42	66	83
Poland	340	6.9	6.5	26.9	n.a.	n.a.	n.a.	n.a.
Czech Republic	83	7.8[f]	12.1	3.3[f]	n.a.	n.a.	n.a.	n.a.
Slovak Republic	47	–17.5	5.9	33.2	21	27	54	62
Hungary	104	–12.6	8.1	42.0	34	51	68	84
Slovenia	22	22.2	13.8	–3.6	78[g]	n.a.	n.a.	n.a.
Romania	973	24.9[f]	0.2	–39.2[f]	n.a.	36[h]	n.a.	n.a.
Germany	135	–28.9[f]	142.4	72.8[f]	17[i]	29	39[i]	50
Austria	n.a.	n.a.	n.a.	n.a.	n.a.	54	n.a.	86
Netherlands	15	n.a.	728.4	n.a.	n.a.	76	n.a.	92[j]
Switzerland	n.a.	n.a.	n.a.	n.a.	n.a.	77	n.a.	99

n. a.: not available. – a) No data was available for Bulgaria. – b) Refers to 1998. – c) Change over the period 1996 to 1998. – d) Refers to CR4. – e) Change over the period 1996 to 1999. – f) Change over the period 1997 to 1999. – g) Refers to CR4 and 1996. – h) Refers to CR5. – i) Refers to 1997. – j) Refers to CR8.

Sources: Information on the references used are available by the author on request.

However, horizontal concentration processes always imply the risk of restricting competition. At this stage of the restructuring process it is difficult to arrive at any conclusion, whether the horizontal integration processes observed are endangering competition. The number of enterprises in these mostly relatively small countries can still be considered as high. Compared to their Western competitors, especially average output per enterprise is extremely low. Thus, to be able to compete in the EU market and reap the benefits of larger enterprise sizes as discussed above, a further concentration process can be expected in the future. This development is also foreseen by experts in the respective countries[21]).

This trend is very likely to be accelerated by three developments: Firstly and foremost, to withstand competition in the European context high investments are a precondition for the dairy industry in the CEC countries. However small enterprises lack the financial means to realize such investments (Osteuropa Agrarmärkte – aktuell, 16/1999, p. 18). Secondly, capital rich foreign investors increasingly enter the dairy market in the CEC countries and as the experience for instance in Hungary shows will foster the concentration processes (cf. section 5.5). Thirdly, merging of firms in the retail and wholesale sector which can be observed in most of the CEC countries will force larger units also in dairy processing (cf. WEINDLMAIER, 1998, p. 57 and 2000, p. 10; SZABO, 2001).

4.3 Vertical Integration

With the introduction of economic reforms vertical co-ordination in the dairy chain, until then mainly organized by state planners, collapsed. This led to high levels of instability and insecurity for farmers, as well as for dairy processing enterprises. To hedge against these risk factors, some dairies have started to reinitiate vertical integration by offering farmers guarantees for forward contracts and future prices (e.g. TOTH, 1999 p. 65; JASJKO et al., 1998 and 1999; GIRGZDIENE et al., 1998 and 1999).

In addition, many dairies have started to provide agricultural producers with various support measures in order to guarantee themselves throughout the year with better quality raw milk and smooth milk supply. A further intention especially in countries such as Poland is to foster concentration processes in the primary sector. To achieve these objectives milk processing enterprises provide technical support, give economic advice, grant financial means, e.g. for the improvement of the genetic material of the cow herds, and deliver special inputs such as milking and cooling equipment and feed concentrate. The advantages for the dairy are that the collection costs decline and the improved quality allows the manufacturing of high quality dairy products by at the same time reducing energy costs for the thermic treatment of the raw material (e.g. PIENIADZ, 1997, p. 34; Osteuropa Agrarmärkte – aktuell, No. 1/1999, p. 18; HARTMANN et al., 2001; LUBA, 1999, p. 46).

Whereas these forms of vertical integration are the result of a rational decision made by the individual economic agent who takes into consideration the specific economic factors and conditions valid in the individual cases, vertically integrated structures have also appeared as a result of political decision. Privatization granted agricultural producers preference in the acquisition of shares in dairy enterprises in the Baltic, Hungary and Slovenia, regardless of whether this was economically justified (cf. section 3.1)[22]). As discussed in section 4.1, these decisions are likely to have hampered and delayed the restructuring in the dairy industry.

5 Performance

In order to assess the success of the transition process in the CEC countries' dairy industries, performance has to be analysed. It would have been desirable to compare e.g. profit indicators, total efficiencies and total factor productivities of the dairy sectors among CEC countries and relative to selected EU countries. However, due to lack of data this was not possible. Instead, only partial factor productivities, e. g. that of labour could be compared between all of the CEC countries and Germany (cf. section 5.1). In addition, factors that are likely to affect the industry's financial performance such as average capacity utilization (cf. section 5.2), the price and quality of milk (cf. sections 5.3 and 5.4) as well as the level of foreign direct investment in the dairy sector (cf. section 5.5) will be discussed. As far as information about the financial performance of the dairy industry could be obtained this will be summarized in section 5.6. Finally, in section 5.7 the performance of the dairy sector will be measured based on trade indicators.

5.1 Labour productivity

As mentioned above among the various factor productivities only that of labour[23]) could be calculated due to a lack of

21) The Polish Institute of Agriculture and Food, for example, expects for the medium future a reduction to about one fourth of the presently existing enterprises (Osteuropa Agrarmärkte – aktuell, 16/1999, p. 18).

22) COASE and WILLIAMSON's transaction cost theory, which is mainly used to explain vertical integration processes, shows that conditions for specific forms of vertical integration differ from case to case; they depend not only on the economic environment, but also on product specifications.

23) Labour productivity is measured as gross output per employee. Net

data. The results are summarized in table 3. Average labour productivity in the dairy industry equals the one in the food industry in 1999 in Latvia, Lithuania and Poland. In Romania the value for the dairy branch is far below that for the whole food sector. In the remaining of the acceding countries and in Germany the relation is opposite. There, labour productivity in the dairy sector is much higher which might be an indication that this branch of the food industry has a competitive advantage[24]).

Table 3: **Labour productivity in the dairy sector and in the entire food industry in the CEC countries and Germany for 1999 and its development over the period 1995 to 1999[a]**

Country	Dairy Industry		Food Industry	
	1999 (1000 €)	% change 1995 to 1999	1999 (1000 €)	% change 1995 to 1999
Estonia	38.3	25.03	25.9	39.76
Latvia[b]	25.4	21.89	24.2	21.52
Lithuania	32.6	110.29	28.3	113.14
Poland[c]	41.7	44.67	41.2	35.81
Czech Rep.	69.7	33.11	44.6	25.73
Slovak Rep.	57.9	23.85	33.9	14.39
Hungary[d]	77.7	71.81	50.4	14.83
Slovenia[e]	168.9	25.72	87.7	18.70
Romania[f]	8.0	–36.16	13.4	–39.51
Germany	507.9	16.15	414.0	–1.66

a) Measured in general as gross output per employee; no information was available for Bulgaria. – b) Data refer to 1998, % change refers to 1996 to 1998. – c) Sales are taken as a proxy for gross output, referring to enterprises with more than 50 employees. – d) Sales are taken as a proxy for gross output. – e) For gross output sales are taken as a proxy, gross value added being available for 1998, only. – f) % Change for 1999 against 1997.

Sources: Information on the references used are available by the author on request.

Over the period 1995 to 1999 labour productivity in the dairy sector increased in all countries but Romania. This rise was especially pronounced in Lithuania and Hungary, those countries that despite a noticeable production growth were able to reduce their workforce in the dairy sector to a considerable extent (cf. table 1). Compared to the food industry the increase in labour productivity was steeper in all countries except the Baltic, pointing towards the fact that the dairy branch gained relative to total food processing in the former countries[25]).

The results in table 3 also reveal that labour productivity in the dairy industry as well as in the food industry considerably deviates among the CEC countries. In 1999 (1995) it ranged in the dairy sector between 8000 (12 500) € in Romania to 169 000 (134 000) € in Slovenia with a weighted average of 45 000 (32 000) € in the whole region[26]). Relative to Germany labour productivity in the candidate countries' dairy sectors reached 7 % in 1995 rising to 9 % in 1999.

The much lower labour productivity in the CEC countries should not be assessed as insufficient performance of the dairy sector and food sector in those countries when compared with Germany. Labour productivity should be different if the structure of factor prices and/or the input/output price relations differ. This certainly holds for the countries considered. While e.g. in Hungary the milk price at the farm level reached 84 % of that in Germany in 1999 (cf. also section 5.3), wages in the Hungarian food industry were about 12 % of the corresponding German value (Hungarian Central Statistical Office, 2000, p. 176; BMELF 2000, p. 567)[27]). However, labour productivity differences between the CEC countries and an EU country such as Germany is indicative of the adjustment necessary once the countries are members of the EU. It can be expected that following an EU-membership and thus extending the Common Agricultural Policy to the CEC countries agricultural producer prices will harmonize. In addition, although to a lesser degree, the wage differentials between CEC countries and the EU will shrink. This necessitates restructuring the whole economy including food processing to cope with the new economic conditions.

5.2 Capacity utilization

One factor likely to affect the industry's performance to a considerable extent is the level of capacity utilization. Due to the much reduced milk delivery there has been a noticeable decline in the utilization of processing capacities. The situation is especially severe in Bulgaria and Romania, where in 2000 it reached only 20 % and 33 %, respectively. In Poland, processing capacities are used in the range of 30 % to 60 %, depending on the kind of the dairy product manufactured and the season. The utilization rate is considerably better for high value products such as yoghurts and cheeses compared to butter as well as during summer time relative to winter months. The same observation can be made for most of the remaining CEC countries. A medium level of capacity utilization of between 50 % and 70 % is achieved in the Baltic, the Slovak Republic, the Czech Republic and Hungary. Overcapacities to the extent mentioned above lead to high fixed costs per output unit and thus hamper the competitiveness of the dairies in the CEC countries on domestic and international markets (e.g. Osteuropa Agrarmärkte – aktuell No. 20/2000, p. III; PRZEPIÓRA et al., 2000, p. 443; Agra Europe, AgraFood East Europe No. 01/2001, p. 19; JASJKO et al., 1998, p. 39 and 1999, p. 24; GIRGZDIENE et al., 1998, p. 43 and 1999, p. 22; LUBA, 1999, pp. 15–17)[28]).

value added per employee would have been preferable but was not available across countries.

24) However, one needs to be careful with this conclusion. The high raw material intensity of dairy processing compared to total food processing leads to relative higher production costs which are also reflected in the value of gross output. Thus, gross output per employee might be inflated because of this and might therefore not hint at a true competitive advantage.

25) Especially Hungary reveals a much higher change in the labour productivity of dairy processing compared to the food industry. Thus, while in 1995 labour productivity in these two areas were about equal, in 1999 there was a considerable divergence in these two values. This partly reflects the much higher reduction in labour force in the dairy sector compared to food industry (cf. table 1 in section 2).

26) Not including Bulgaria.

27) It is interesting to note that the relation in labour productivity of Hungary´s food industry to that of Germany matches almost exactly their wage differential.

28) It should be noted that definitional problems may complicate the interpretation and comparison of these figures, in that some countries may report obsolete capacity that in other countries has been removed through bankruptcy and closure.

5.3 Milk prices

Expenses on raw material are by far the most important cost component in the production of dairy products[29]). Thus, the level of milk prices to be paid by the dairies is an important competitive factor for the performance of this industry. A comparison of producer prices in the CEC countries with those in the EU-15 reveals that in 1999 the former were still much lower. Milk prices ranged between 48 % in Latvia and 94 % in Slovenia of the EU level[30]). Even after considering the 15 % decline in EU intervention prices for milk products due to the Agenda 2000 and assuming that it would lead to an equal reduction in market prices for the raw product, a substantially price gap would still remain for all CEC countries but Slovenia and Hungary. At present, low raw material prices are favourable for the dairy industry in these countries compared to their competitors in the EU. However, with accession to the EU these price differentials will level off [31]), leading to a considerable cost increase for dairy plants in the CEC countries.

5.4 Quality of Milk Production

Besides the price also the quality of the products determines the ability of a sector or branch to compete on domestic and international markets. The quality of dairy products crucially depends on the quality of the milk. Low raw material quality raises the costs for thermic treatment in the processing process, leads to an increase in the input/output ratio and thus to higher input costs and reduces the options with respect to the kind of dairy products that can be produced. In most of the CEC countries large shares of the milk reaching the dairy plant do not fulfil EU standards. The situation is especially problematic in Bulgaria and Romania where quality of the raw material is low and varies considerably leading to severe problems in processing. In Bulgaria it is estimated that the bacteria content of the milk is about 3 to 4 times higher than what is allowed in the EU. The majority of the milk is collected from farmers without adequate cooling equipment. The situation is similar in Romania. This may be explained by the fact that farmers do not get paid for better quality, partly because the milk collectors have no laboratories to check quality. Thus, there is little incentive for farmers to invest in appropriate milking and cooling equipment. However, quality and hygienic deficiencies in Romania and Bulgaria are not limited to the raw product but continue to exist in the dairy enterprises. According to the National Veterinary Bureau of Bulgaria about 90 % of the processing enterprises do not meet the EU hygienic requirements. The poor hygienic conditions have been the motivation for the EU in summer 1997 to ban all dairy products originating from Bulgaria. In the meantime four dairies obtained a licence to export to the EU (Osteuropa Agrarmärkte – aktuell No. 04/2001, p. VI, No. 20/2000, p. III, No. 05/1999, No. 25–26/1999; PANAYOTOVA et al., 1999).

Besides these two Balkan countries also Poland, Latvia and Lithuania still have a long way to make their milk meet EU standards. In Poland at present only about 40 % of the delivered milk fulfil the highest quality standard and thus conform to EU norms. The Polish government has assessed the cost of upgrading this country's dairy sector to EU norms at about 4 billion €; for dairy processing alone an amount of about 625 million € is said to be necessary. It is estimated that only about 40 % of the presently existing enterprises will be able to satisfy EU standards in the future and probably only half of those will survive competition from the EU. Also Poland was hit by an export ban on dairy products in 1997 on grounds of quality and hygienic deficiencies. At the end of 1999, exports to the EU were authorized again granting 5 dairy plants this license. In the meantime 20 additional plants have been approved for exports. In Latvia 9 got the licence and in Lithuania 18 (e.g. Osteuropa Agrarmärkte – aktuell, 01/2001, p. 8; Agra Europe, AgraFood East Europe No. 03/2001, p. 15).

Estonia, the Czech and the Slovak Republics, Hungary as well as Slovenia lead the way in meeting EU hygienic standards with 82 %, 95 %, 84 %, 84 % and 85 % of milk production corresponding to EU norms. Seven dairies and thus 16 % of all enterprises of Estonia possess a licence to export to the EU. Their share in total production of the sector amounts to more than 50 % (e.g. Osteuropa Agrarmärkte – aktuell No. 20/2000, p. 1, No. 01/2001, p. 5 and p. 19; Agra Europe, AgraFood East Europe No. 12/1999, p. 26, 06/2001, p. 10).

However, also in these countries considerable investments are still necessary in the dairy industry to adapt to EU quality and hygiene legislation. Even in relatively advanced countries such as Hungary improvements in factory hygiene is urgently necessary. Deficiencies exist in many dairy plants with respect to cooling effectiveness, hygiene of raw milk procurement as well as sewage treatment, waste disposal and utilization of whey. Until the present most Hungarian dairy plants are producing cheese by using outdated equipment from the 70ies which does not allow for close-circuit production like in the EU although domestic regulations set a lower limit for microbiology contamination than in the EU. Thus, it is not surprising that around 70 % of Hungarian cheeses available in shops fail to meet national quality standards (e.g. Agra Europe, AgraFood East Europe No. 01/2001; SZABO, 2001).

This indicates that still considerable investments will be necessary to upgrade dairy plants in all CEC countries. The SAPARD programme of the EU could play a decisive role in this respect. However, so far the CEC countries have hardly made use of these funds.

5.5 Foreign direct investment

One of the main impediments to economic growth in the candidate countries' dairy sectors is the outdated and inefficient capital stock that needs to be replaced. At the same time there is lack of capital from domestic sources to pursue

29) In Germany the share of the raw material costs in total costs amounts to about 50 % for milk and curd cheese, to 58 % for cream, to 64 % for Gouda, to 73 % for butter. Only for the production of yoghurt these costs are with 18 % much lower (Wissenschaftlicher Beirat beim BML, 2000, pp. 62). In Poland the raw material and energy costs together amount to about 75 % of total costs in the processing of dairy products (Glowny Urzad Statystyczny, 1998).

30) 52 % in Estonia, 54 % in Lithuania, 50 % in Poland, 67 % in the Czech Republic, 62 % in the Slovak Republic, 84 % in Hungary, 94 % in Slovenia and 54 % in Bulgaria. The data for Estonia and Bulgaria refer to 1998 (ZMP 2000).

31) This only holds if the milk quality in the CEC countries is comparable to the one in the EU.

the necessary investments. Due to less developed financial and banking sectors in transition economies, most dairy enterprises suffer from both insufficient liquidity and inadequate access to credit at reasonable conditions. Therefore, foreign direct investment (FDI) inflows are regarded as essential for the success of the economic transformation of the dairy sector and the whole economy in the CEC countries. Additional arguments in favour of FDI are the stimulation of competition in the local market thereby increasing the efficiency of the whole industry. This in turn leads to opening of export opportunities and the inflow of specific, often intangible assets acquired by foreign investors. Thus, the level of foreign investments seems to determine to a considerable extent the performance and the future prospect of a sector (e.g. EITELJÖRGE et al., 1999, p. 202).

Data on FDI for specific branches of the food industry is not easily available for most of the CEC countries. In general, only qualitative information is accessible. From the material obtained the following conclusions can be derived. For foreign interest groups dairy processing in the CEC countries has been an ambiguous endeavour. On the one hand, it has been a very attractive investment target, mainly because of the excellent prospects for the development of consumer demand for dairy products in these countries (cf. section 3.4). In addition, especially the Baltic countries but also Poland and Bulgaria can be regarded as an exceptional platform to enter markets to the East which also are likely to show a strong increase in demand for dairy products in the future. Other factors that have encouraged FDI in this sector include low raw material prices (cf. section 5.3) as well as cheap and skilled labour. However, at the same time there have been several factors impeding foreign interest to invest in the dairy sector of the CEC countries. These include the fragmented ownership of share capital as a result of the method of privatization (cf. sections 3.1 and 4.1), the fragmented dairy farm structure (cf. section 3.3) and the low quality of the raw material (cf. sections 3.3 and 5.4)[32]).

In most CEC countries the negative factors have so far been of a somewhat higher relevance than the positive ones. Thus, although most of the large European dairy enterprises such as Bongrain, Danone and Parmalat have established firms in the CEC countries, the level of FDI inflows in the dairy sector has in general been rather moderate. Especially Slovenia, the Slovak Republic, Romania and Bulgaria were not very successful in attracting foreign capital for the restructuring of their dairy sectors. This is different for the Baltic countries, especially Estonia and Lithuania, and the Czech Republic where FDIs reached a noticeable share of total investment. Also in Poland several foreign firms invested into dairy plants. However, their share in total equity of the sector amounts to only about 10 %. The Hungarian dairy industry has been the most attractive FDI target. The dominant share of total investment was done by foreign companies in recent years. In 2000, they owned about 70 % of the equity of this food branch. Nevertheless, even in this country, the FDI attracted by the dairy sector from 1995 through 1998 has been only about 7 % of total food industry FDI while its share in the food industry's gross output is with 13 % much higher. However, with increasing concentration and rising milk quality foreign investors seem to be ready to increase their activities in the region (PRZEPIÓRA, 2000, p. 443; Agra Food East Europe No. 06/2000, p. 40, No. 06/2001, p. 9).

5.6 Financial performance

The most commonly used quantitative indicators for measuring and comparing financial performance of enterprises or sectors in one country or between countries are either net or gross profit as a percentage of sales, called net income ratio and gross income ratio, respectively. However, it should be noted that these indicators have shortcomings if employed to make comparisons between enterprises of different legal status and/or between countries. The former is due to the fact that e.g. for some enterprises such as co-operatives paying high milk prices to producers is more important than making profits. The latter shortcoming is due to the fact that countries have different tax rules which influence the level of this indicator to a considerable extent. This should be kept in mind when interpreting the results (e.g. WELLERT, 1994, p. 106; GLOY, 1995, p. 124) [33]).

Table 4 **Gross income ratio (GIR) and net income ratio (NIR) as a percentage of sales in selected CEC countries[1]**

	Poland[2]				Slovak Republic[3]			Hungary				
	Dairy		Food		Dairy		Food	Dairy			Food	
	GIR	NIR	GIR	NIR	total GIR	big 10 GIR	GIR	total GIR	total NIR	big 6 NIR	GIR	NIR
1995	0.38	–0.29	3.12	1.12	n.a.	–0.48	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1996	0.68	–0.21	3.80	1.90	n.a.	0.46	n.a.	0.34	–1.08	n.a.	1.55	n.a.
1997	1.02	0.90	2.82	1.28	–0.85	0.53	–0.68	1.80	0.77	0.98	2.85	1.82
1998	0.41	–0.47	1.85	0.59	0.42	0.58	–1.96	–0.35	n.a.	–0.81	2.72	1.94
1999	1.21	0.26	0.95	–0.39	n.a.	n.a.	n.a.	–0.53	n.a.	n.a.	2.56	n.a.
2000	2.41	1.15	1.86	0.75	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.

n.a.: not available. – 1) GIR (NIR) is equal to gross (net) profit as a percentage of sales. – 2) Refers to enterprises with 50 and more employees. – 3) 1997 includes all companies; 1998 includes only companies with 20 and more employees.

Sources: Information on the references used are available by the author on request.

Information on gross and/or net income ratios were available only for Poland, the Slovak Republic and Hungary. These figures indicate that profitability of dairy production increased in Poland and in the Slovak Republic over the period for which data were available (table 4). However, the levels of the gross and net income ratio were much lower in the latter country. In both countries profitability in the dairy industry exceeded that in the food industry in recent years. In Hungary the opposite situation and development can be observed. The dairy sector reveals a much lower profitability than the food industry and even had to cope with losses during more recent years. This also holds for the aggregate of the 6 largest dairy plants that had a combined market share of 68 % in 1999[34]).

32) Other factors of great importance for the decision of foreigners to invest are the progress made in the transformation process, the level of bureaucratic barriers, as well as the predictability of the legal framework, particularly of taxation.

33) While in Poland co-operatives are the dominant legal form – 270 of the 340 enterprises have the status of a co-operative – this is of much lesser and declining relevance in the Slovak Republic and especially in Hungary.

34) All but one of these enterprises are being owned by foreign inves-

All three countries have in common that return on sales between enterprises varies considerably. In Poland net income ratios among the 55 best co-operatives differs between 0.01 and 4.1, leading to a coefficient of variation (CV) of 107 % with respect to this indicator. In the Slovak Republic one third of all dairy plants had to bear losses in 1998 though the sector as a whole had a positive gross income ratio indicating the considerable variance in the profitability also in this country (Ministry of Agriculture of the Slovak Republic, 1999, p. 76). In 1998 (1997) the gross income ratio in the 10 largest dairy plants[35]) ranged between 0.02 and 2.43 (–2.34 and 4.13) leading to a CV of 114 % (210 %) with respect to this indicator. The differences among dairy plants seem even more pronounced in Hungary. The CV of the net income ratio for the 6 largest enterprises in 1998 (1997) amounts to 896 % (295 %). Especially "Danone kft" which produces a relatively narrow product mix and concentrates on high value products such as fruit yoghurts and desserts has been able to realize relatively high and stable profits in the past. In addition, this company is exceptional in Hungary with respect to both the technology used and the hygienic standards applied (SZABO, 2001, p. 44).

Those dairy plants that face losses over several years will have to leave the market inducing further consolidation (cf. section 4.2). This will very likely lead to higher profitability of the sector. The latter assumption is also supported by analysing the investment ratios[36]) which were available for Poland and Hungary. For the Hungarian dairy industry this figure increased over the period 1996 to 1998 from 1.4 to 2.1 but in 1999 showed a lower value (1.7) again. Nevertheless, the value is far above 1 indicating that there has been sufficient room for net investments. This also holds with respect to the Polish dairy industry. However, in this country the investment ratio has been especially high in 1996 and 1998 with 2.0 and 1.9, respectively, while it was somewhat lower in 1997 (1.7) and 1999 (1.4).

Table 5: **Competitiveness of the dairy sector in 10 CEC countries, Germany and the EU-15 – value of the RTA in 1999 and over the period 1995 – 1999**[1]

Country	Dairy sector total		Milk, whole, fresh unprocessed[2]		Milk, 1st processing stage[3]		Milk, 2nd processing stage[4]		Milk 3rd processing stage[5]	
	1999	1995/1999	1999	1995/1999	1999	1995/1999	1999	1995/1999	1999	1995/1999
Estonia	2.54+	4.09+	0.86±	0.27+	–0.11±	–0.45±	5.31+	8.56+	0.62+	0.50+
Latvia	2.77+	3.29+	–1.43–	2.02+	–0.28±	1.29+	5.66+	5.08+	1.05+	1.88+
Lithuania	7.94+	9.58+	0.20±	1.42+	–0.15±	0.77±	9.98+	14.57+	7.88+	6.21+
Poland	1.03+	1.69+	0.02±	0.05±	–0.20±	–0.00±	–2.04+	2.82+	0.41+	0.96+
Czech. Rep.	1.70+	1.02+	0.11±	0.04±	–0.53±	0.15–	1.97+	2.48+	–0.24±	–0.22±
Slovakia	0.32±	0.34±	0.84±	0.46±	0.13±–	–0.03±	0.56±	0.43±	0.02+	0.25+
Hungary	0.44±	0.44±	0.73±	0.86+	–0.01±	–0.94–	0.24±	0.11±	0.60±	0.84+
Slovenia	0.27±	0.36±	3.02+	5.89±	0.68±	0.88+	0.19±	0.18±	–0.14±	–0.33±
Romania	–0.33±	–0.36±	–0.09±	–0.12±	–0.25±	–0.27±	–0.45±	–0.34±	–0.27±	–0.43±
Bulgaria	0.49±	0.45±	–0.05±	–0.09+	–0.20±	–0.15±	–0.75±	–0.55±	1.77+	1.58+
Germany	0.37+	0.33+	5.08+	5.36+	0.72+	1.76+	0.58+	0.57+	–0.50–	–0.79–
EU–15	1.82+	1.97+	3.29+	4.10+	–2.05–	2.00+	1.27+	1.38+	2.40+	2.75+

1) Competition is assumed to exist if the RTA is greater than zero and the RXA is greater than 1. This is indicated with (+) behind the value of the RTA. A lack competitiveness can be detected if the RTA is smaller than zero and the RMP is greater than 1. This is marked with (–). In all other cases no clear statement can be derived, as is indicated with (±). For the definition of the RTA, RXA and RMP see formulas 1, 2 and 3 as well as the expositions in footnote 37. – 2) Includes cow and sheep milk. – 3) Includes cream, fresh, skim milk and whey fresh. – 4) Includes whey, condensed; whole milk, condensed or evaporated; yoghurt; butter from cow milk; ghee (from cow milk); skim milk, evaporated or condensed; dry whole or dry skim cow milk; dry buttermilk; dry whey; products of natural milk constitutes. – 5) Includes yoghurt, concentrated or not; cheese of whole or skim cow milk; whey cheese; processed cheese; ice cream and edible ice; cheese of sheep milk or goat milk.

Source: Own calculations based on data from FAO 2001.

5.7 Trade indicators

Market indicators are an alternative way to gain insights into the performance of a sector. The following analysis is based on the Relative Export Advantage Index (RXA), the Relative Import Penetration Index (RMP) and the Relative Trade Advantage Index (RTA) (cf. e.g. VOLLRATH, 1991).[37] These indicators have been calculated for all ten CEC countries, Germany and the EU-15 for the years 1995 to 1999 for the whole dairy chain differentiated with respect to four levels of processing (table 5). In these calculations merchandise trade excluding the respective product has been used as reference, and the world excluding the respective country as reference country group.

For the whole dairy sector a clear competitive advantage is revealed for all three Baltic countries, Poland and the Czech Republic as well as for Germany and the EU-15. Especially the Baltic countries and the EU exhibit high positive RTA values, however with a downward trend. For the Baltic countries this is due to the Russian financial crisis in 1998 which severely disrupted export flows of these countries to the East and thus to their traditional export markets. The loss of the Eastern market can not be fully compensated by reorienting trade towards the West since firstly, the EU being the most important western market exhibits a high border protection for dairy products and secondly, due to quality and hygienic problems only a limited number of Baltic dairy processing enterprises have a licence to export to the EU (cf. section 5.4)[38]).

tors. The only leading Hungarian owned dairy company, MiZo-Baranyatej is at present under liquidation. It is one of those companies that have accumulated considerable losses over the last years (SZABO, 2001, p. 44).

35) In 1998 the share of the 10 largest dairy plants in the total sector was 54 % with respect to turnover and 43 % with respect to employment (ŠALAK 2000, p. 43).

36) Investments as percentage of depreciation.

37) (1) $RXA_{ij} = (X_{ij} / \sum_{l,l\neq j} X_{il}) / (\sum_{k,k\neq i} X_{kj} / \sum_{k,k\neq i} \sum_{l,l\neq j} X_{kl})$

(2) $RMP_{ij} = (M_{ij} / \sum_{l,l\neq j} M_{il}) / (\sum_{k,k\neq i} M_{kj} / \sum_{k,k\neq i} \sum_{l,l\neq j} M_{kl})$

(3) $RTA_{ij} = RXA_{ij} - RMP_{ij}$

X (M) refers to exports (imports), with the subscripts i and k (j and l) denoting the product (country) categories. Values for RXA (RMP) which are above 1 suggest that the country has a comparative advantage in exports (a high level of import penetration). Similarly, RXA (RMP) values below 1 indicate a low level of export competitiveness (import penetration) of the considered products. Values for the RTA below (above) 0 point at a competitive trade disadvantage (advantage).

38) Thus the Baltic countries cannot even fully utilize the preferential access granted by the EU in the association agreements and the further liberalization decided on in 2000.

In the Baltic and Poland the whole dairy sector is competitive because dairy products belonging to the 2nd processing stage and to a lesser extent those belonging to the 3rd processing stage exhibit high competitiveness. For the Czech Republic the positive RTA values for the dairy sector can be traced back to the existence of competitiveness for products of the 2nd processing stage, while for Germany it is due to fresh milk and the 1st and 2nd processing stages. The EU-15 reveals a competitive advantage at all levels of the dairy chain except for the 1st stage of processing. For Slovakia, Hungary, Slovenia, Romania and Bulgaria no clear indication can be found with respect to the existence or lack of competitiveness. However, especially for Romania the results hint at a competitive disadvantage for all stages of the dairy chain with no signs of improvement. In Bulgaria the situation is somewhat similar. This country lacks competitive advantage for all dairy products but sheep cheese for which the RTA indicator amounts to 122 (95) in 1999 (over the period 1995 to 1999). Since this product accounts for 93 % of all dairy exports in 1999 it influences the results of the analysis for Bulgaria's dairy sector as a whole.

In interpreting these indicators, two aspects need to be considered. Firstly, market share indicators measure competitiveness only on the basis of observed and possibly distorted market data. As discussed in section 3.2, protection is especially pronounced in the EU countries but also far from negligible in the Czech Republic, the Slovak Republic, Hungary, Slovenia and Romania. Thus, the level of competitiveness revealed for those countries should not be mixed up with true comparative advantages in the production of dairy products (e.g. FROHBERG et al., 1997). Secondly, competitiveness is a relative measure as are the indicators used in the present analysis. Thus, absolute advantages in the production of dairy products in a country might not necessarily be reflected in the results of these indicators, if such advantages are more pronounced in the production of other products.

6 Conclusions

The dairy sectors in the CEC countries had to cope with tremendous adjustment pressures in the 90ies. As a result of privatization and liberalization in most CEC countries deliveries to dairies sharply declined, imports increased and a de-monopolization of the dairy industry took place. This contributed to rather intense competition on the CEC countries' dairy markets. In general, the de-monopolization process resulted in a fragmented structure which now constitutes a major problem for the dairy processing industry, since the firms have difficulties to take advantage of economies of scale. In fact, a tendency towards higher concentration can now be observed. As financial means are increasingly needed for investments to meet the EU requirements on product quality and standardization as well as sanitary regulations the number of mergers and/or liquidations of dairy processing enterprises can be expected to keep on rising.

The performance of the dairy sector in the CEC countries shows a very diverse picture. On the one hand, the dairy processing industry in these countries benefits from low milk prices and low wages as well as from qualified labour. Further advantages for the sector will be the considerable rise in consumption of dairy products expected for these countries to take place in the future.

On the other hand, all these countries suffer from overcapacities leading to high fixed costs per unit of output and thus hampering competition on domestic and on international markets. In addition, deficiencies exist in most of the dairy enterprises in meeting EU requirements for hygiene, food safety, quality and environmental standards. Thus, as a result of harmonizing national law with the acquis communautaire considerable investments will be necessary in these countries to upgrade processing plants to EU standards. The SAPARD programme of the EU plays a decisive role in this respect.

The analysis indicates that especially the dairy industry in the Balkan countries lacks competitiveness. Processing enterprises in these countries have to cope with pronounced overcapacities leading to high fixed costs, an expensive milk collecting system due to small average herd sizes, low milk quality and high seasonality of supplies. The dairy processing sector itself is characterized by a strongly fragmented structure with considerable deficiencies in the technology used and hygienic conditions. So far, little foreign investment has been attracted to upgrade this industry. The analysis of competitiveness based on trade shares supports these findings.

In the remaining countries the situation of the dairy sector is more ambiguous. In Estonia, Latvia and to a somewhat lesser extent in the Slovak Republic and Poland the size of processing plants is a severe limitation to exploit economies of scale. In Latvia, Lithuania, Poland and Slovenia the fragmented structure of dairy farms induces high collection costs for the dairies. In addition, the low quality of the raw material in Latvia, Lithuania and Poland impedes competitiveness of the dairy plants. Thus, to overcome these problems processing enterprises will be increasingly forced to require larger deliveries of high quality milk from farmers. This will induce further adjustment processes in the primary sector and force smaller farms to either co-operate in producer groups or stop milk production.

The analysis of the financial performance carried out indicates that especially Poland has been able to realize positive and rising net as well as gross income ratios, while for Hungary these values were even negative in recent years. Considerable variance in the financial performance of enterprises in the sector is found in all three of these countries. Many of those enterprises that faced losses in recent years will have to leave the market. Thus, in the near future further consolidation leading to a rise in sectoral profitability can be expected for the respective countries. The analysis based on trade indicators supports the finding about Poland's competitiveness in dairy products while the results for Hungary and the Slovak Republic are ambiguous with respect to the existence or lack of competitiveness. Besides Poland, especially the Baltic countries but also the Czech Republic reveal clearly competitive advantages based on these indicators.

Joining the EU may have important implications for the dairy industries in the CEC countries as it will enormously expand market opportunities for their enterprises when all trade barriers disappear. On the other hand, by entering the EU market they will also meet fierce competition from the

dairy industry of the EU. That largely comes from big West-European companies, which are able to spend considerable amount of money on sophisticated marketing strategies and product innovation. These investments are necessary for a market with consumers particularly demanding high quality, healthy and convenience food. Further, opening up their markets will expose the milk processing companies in the CEC countries to increasing competition on their home markets. Given its present state, it will be a difficult task for the milk processing industry in the candidate countries to succeed in such competition. Both improving technical and economic efficiency at firm level as well as seeking for strategic alliances are necessary to master the challenges the milk processing industry is going to face.

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Author: Prof. Dr. MONIKA HARTMANN, Institut für Agrarentwicklung in Mittel- und Osteuropa (IAMO), Theodor-Lieser-Straße 2, D-06120 Halle (Saale), Telefon: (0345-) 2928 200, Telefax: 2928 299 (E-Mail: hartmann @iamo.uni-halle.de

39) In addition, the paper is based on published and unpublished statistical material of the CEC countries.