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COMPETITIVENESS OF MILK PROCESSING INDUSTRY IN SERBIA

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Abstract

In paper was examined competitiveness of bigger and middle sized dairies. It is concluded that dairies in Serbia had improved competitiveness over last five years. Export value, as well as value of net trade of dairy products increased over period. Dairy plant's labour productivity in Serbia is lower than average labour productivity of dairies in EU. The biggest dairy plants perform higher levels of productivity than middle sized dairy plants. Efficiency of labour cost is on average higher in case of middle sized dairies, because of significantly lower average labour cost per employee.
Key words: *competitiveness, productivity, costs, dairy plants, Serbia*

Introduction

Milk supply chain is consisted from several segments: input industry, dairy farms, milk processing industry, wholesale, retail chains and food service. Competitiveness of each segment is equally important for competitiveness of all dairy supply chain. In focus of this paper is competitiveness of dairy plants.

Milk processing in Serbia exists on two parallel market segments. Formal milk market includes milk processed in dairy companies, while non formal market includes milk processed and sold by farmers. Formal milk market has been continually developing and in 2009 reached share of 65% of the total produced raw milk intended for human consumption (Popovic, Knezevic, 2010). Rest of 35% produced milk is used partly for farm family needs and bigger share is processing and distributing to consumers. Milk processing is done by 186 dairy companies which structure could be roughly divided in 3 groups. The first group are big dairy companies (5) that process over 28 million litres of milk per year, the second group consist medium sized dairy companies (73) that process from 1 to 28 million litres per year and the last group are

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micro dairy companies (108) with an annual processing of milk less than 1 million litres. Their shares in the total amount of milk processing are respectively: 60, 34 and 6%. Dairy industry employs 9% of the total employees in the food industry, and contributed with share of 6.4% in creation positive trade balance of agriculture and food industry in 2009.

Fundamentals of measuring competitiveness, based on absolute differences in costs of production between different countries, originated by Adam Smith's theory of trade from 18th century. From that time new trade theories incorporated different aspects in analysis of competitiveness, such as differentiation, innovation or economies of scale (Wijnands et al. 2007).

As Zawalinska (2005) stated, citing many authors, there is at list five dimensions of competitiveness. They are: wide range of possible applications (from farm to state level), potential (ex-ante) or revealed (ex-post), originated from diverse theories, temporal approach (short-run, long-run) and relative term of application (internal and external competitiveness).

In earlier studies, because of lack of single measure of competitiveness, the most used indicators as determinants of competitiveness until now were: cost of production, profitability, efficiency, factor productivity and market share. Citing other authors Jeffrey and Grant (2001) conclude that producer efficiency and its relationship with production costs is a more appropriate measure of competitiveness than simply comparing average total costs of production. Because of multidimensional approach, there is no single theory of competitiveness. In practice researchers usually combine few indicators to assess competitiveness.

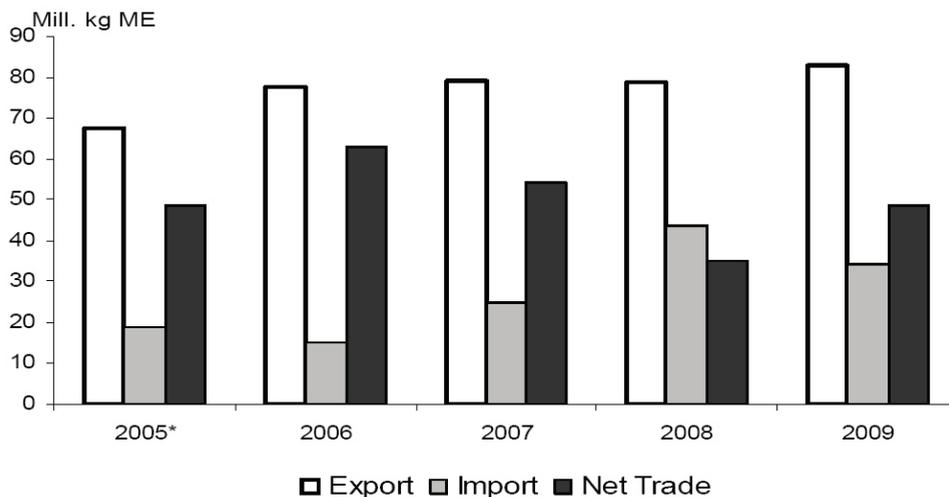
Material and methods

The financial data of elements of the competitiveness of dairy plants in Serbia used in the research have been taken from the financial statements of companies published in data base of Serbian Business Registers Agency. Data on dairy processing capacities have been taken from the Ministry of Agriculture, Forestry and Water Management, conducted semi-structured questionnaires and interviews with employees in the management of sampled dairy plants. The sample was consisted of five large dairy plants and nine medium sized dairy plants. There were also used data from the Statistical Office of the Republic of Serbia and data from Eurostat. Competitiveness was measured with three indicators for the period 2005–2009, depending of data availability. It was examined the growth of external net trade of dairy products Republic of Serbia, partial technical and economic efficiency in bigger and middle sized dairy plants.

Results

Serbia had positive external net trade with dairy products measured in milk equivalents² (ME) and in terms of value over last five years (Figure 1 and 2). Data in following figure shows that export of dairy products measured in ME had positive trend. But, at same time amount of imported dairy products increased faster, what resulted in decrease of net trade by the rate of -5.7%.

Figure 1. Serbia external trade in dairy products, in period 2005 to 2009

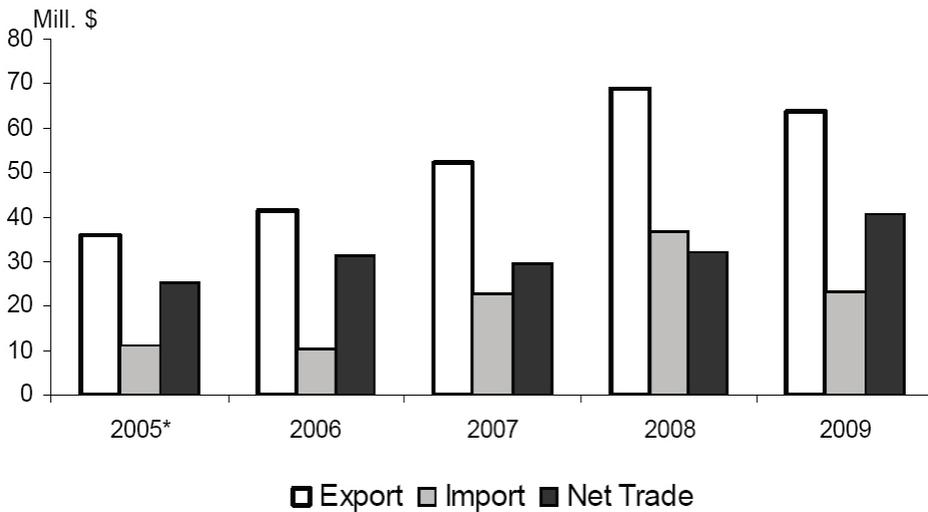


* Estimate was made for export and import with Republic Montenegro in 2005

Value of dairy products net trade is increasing over period by the rate of 10.5%. The highest value of net trade, 40.7 million \$ was reached in 2009. This achievement wasn't result of export increase as much as of import decrease. As consequence of economic crisis consumers oriented more on cheaper imported dairy products.

2 Method solids fat and protein only, was used to calculate dairy products in external trade on common unit – milk equivalent.

Figure 2. Value of external trade in dairy products, in period 2005-2009



* Estimate was made for external trade with Republic Montenegro in 2005.

Serbia exports dairy products mainly to a few countries in the region. The majority of milk products, counted in value, are exported to Montenegro, with a share of 61% in 2009. The value of exported dairy products in Bosnia and Herzegovina in the same year had a share of 24% and in Macedonia 11%. The most important export products by value are: UHT milk, cheese, ice cream and yogurts, with a total share of over 90%.

On the import side, about 70% of the value of all imported dairy products comes from EU countries (Germany, Czech Republic, Republic of Slovakia, Poland, and France). Dairy products are also imported from countries in the region, Bosnia and Herzegovina and Croatia. In terms of value, the most important imported products are: SMP, WMP, whey powder, hard cheese, fermented milk products and UHT milk. These products account for 81% of the value of total dairy imports.

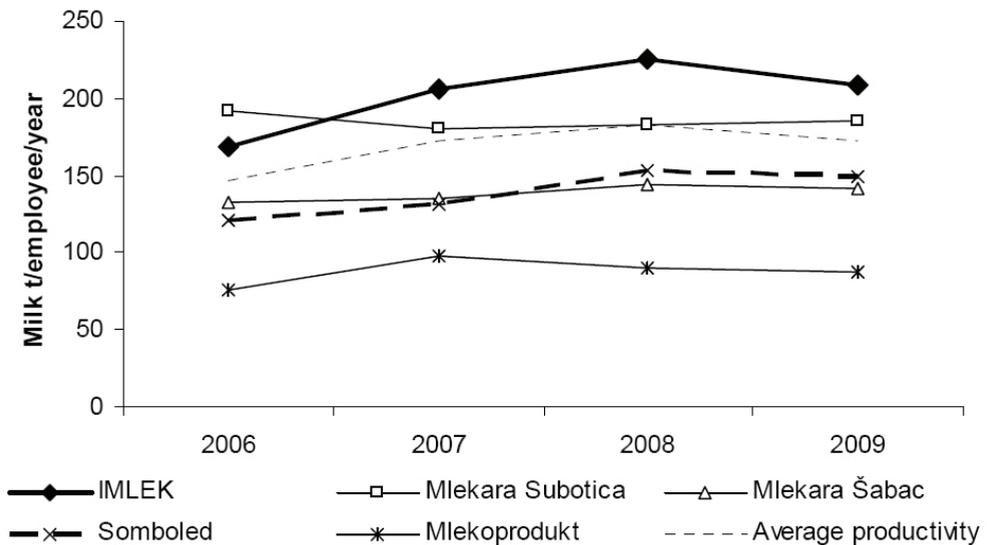
In Table 1, data are presented for unit values of dairy products in export and import in US \$. Unit value is a term used as an indicator of price and quality aspects of products in external trade. Calculated unit values reveal that Serbia exports cheaper dairy products with lower value added. On the other side, dairy products with higher quality and value added were imported. Some examples are hard and blue-veined cheeses, which are not produced on the domestic market. Excluding data for 2007 and 2009, when prices of dairy products on the world market reached a very high level, it is possible to infer that price ratios of dairy products in export and import were closer to value 1 in 2009 than in previous years. In other words, the dairy industry in Serbia exported dairy products with higher added value in 2009 than in previous years.

Table 1. Unit value of dairy products in export and import in period 2005 to 2009

Year	Unit value (USD/litre ME)		Price ratio	Net trade (in ME) share in Total production
	Export	Import		
2005	0,89	1,45	0,62	3,04%
2006	0,99	1,57	0,63	3,96%
2007	1,14	2,20	0,52	3,50%
2008	1,56	2,77	0,56	2,28%
2009	1,25	1,44	0,87	3,28%

During the period 2006-2009 there was a general trend of labour productivity growth of the largest dairy plants in Serbia (Figure 3).

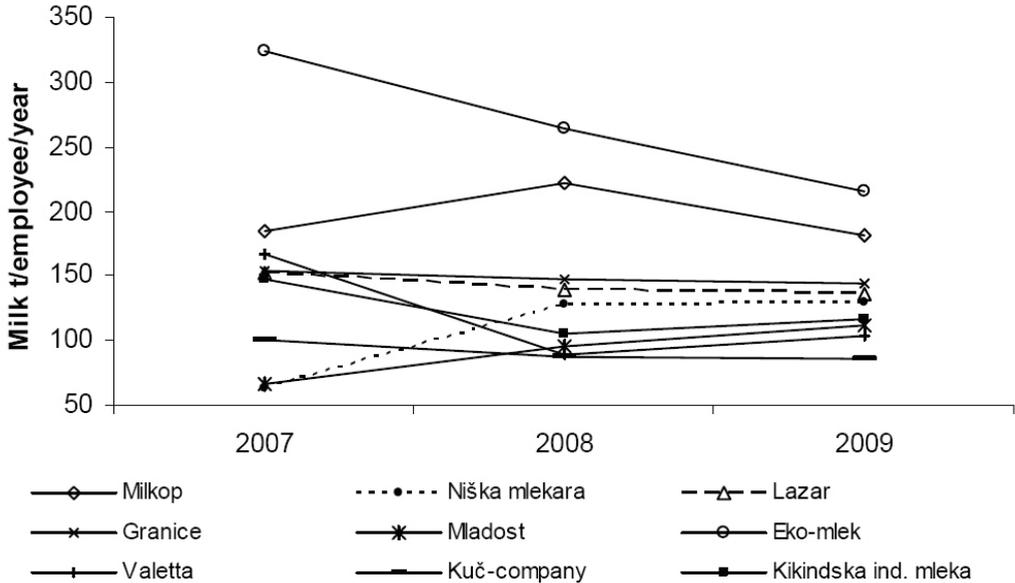
Figure 3. Labour productivity of biggest dairies in period 2006-2009



The highest level of productivity among biggest dairies was reached by Imlek. In the period 2006-2009 only Mlekara Subotica didn't show the growth of labour productivity, but it has held stable above average level of productivity. Dairy plant Mlekoprodukt with its production structure, which is focused on cheese production, is significantly different from 4 others large dairy plants, and with lower technology level, performed lower level of productivity. Weighted average productivity level of five dairy plants was 172.5 tons per worker in 2009. That is slightly lower level than those achieved in the previous year 183.7 tons per worker. At the same time the average productivity of dairy plants in the EU countries was 337.5 tons per worker (Eurostat, 2009).

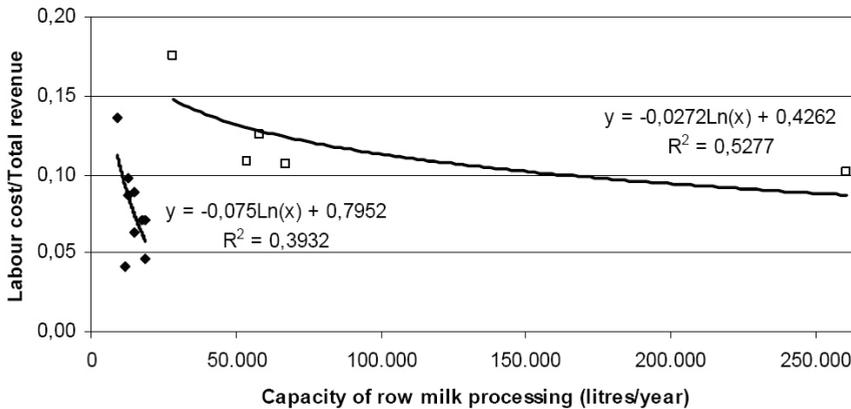
Although labour productivity of middle sized dairies is in average at a lower level, comparing with big dairy plants, it had positive trend over time and reached 129.5 tones of processed milk per worker in 2009 (Figure 4).

Figure 4. Labour productivity of middle sized dairies, in period 2007-2009



Economic efficiency of milk processing can be measured with cost efficiency which represents the share of the costs of certain inputs, or total costs in revenue. Assessing the cost (economic) efficiency, the rule applied is, the lower coefficient of costs share the greater is economic efficiency of analyzed economic entity. When analyzing the economic efficiency of dairy plants, as a measure of efficiency it has been considered the share of labor costs in total revenue. The results shown in Figure 5 indicate that the cost efficiency of observed dairy plants had ranged from 0.04 to 0.18 in 2009. The medium sized dairy plants reached lower coefficient of cost efficiency that is higher level of economic efficiency. The reason why this group of dairy plants have higher economic efficiency and at the same time lower level of productivity should be looked in the levels of average labor costs. Weighted average cost of medium-sized dairy plants was 61% lower than the same category for large dairy plants. It contributes the location of medium sized dairies, which operate mostly in rural areas. In the both groups of dairy plants, with the growth of processing capacity the coefficients of cost efficiency tend to decrease.

Figure 5. Labour cost control ratios for 5 the biggest and 9 middle sized dairies in 2009



Conclusions

Indicators of competitiveness were examined in case of five the biggest and 9 middle sized dairies. Its total share on formal milk market was 73.5%. Dairy industry in Serbia increased export by the value and by quantity in period 2005-2009. Also, it is identified trend of growing export of dairy products with higher value added. Labour productivity of dairy plants generally has improved during 2006-2009, but it is still lower than in EU. Bigger dairies performed higher average productivity comparing with middle sized dairies. But, two middle sized dairies also achieved higher productivity. Thanks to significantly lower average labour cost per employee middle sized dairies achieved in average higher economic efficiency, measured with labour cost efficiency. It can be concluded that Serbian dairy plants improved competitiveness over last five years. They increased export of diversified milk products with higher added value, as well as increased labour productivity. In both groups of dairies it was identified trend of improvement labour cost efficiency by increase of capacities.

Acknowledgement

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Literature

1. EUROSTAT, (2009), European Business: Facts and figures 2009 - Chapter 3: Food, beverages and tobacco, page 88.
2. Jeffrey S., Grant H. (2001), An economic analysis of productive efficiency in

- Alberta dairy production, Project report, Department of rural economy, University of Alberta, Edmonton, Canada, page 53.
3. Popović R., Knežević M., 2010, Dinamika troškova prerade mleka u Srbiji, Prehrambena industrija – Mleko i mlečni proizvodi, Vol. 21, broj 1-2, Savez hemičara i tehnologa, Beograd, page 9-15.
 4. Smith A. (1776), Istraživanje prirode i uzroka bogatstva naroda, Global book, 1998, Novi Sad, page 378.
 5. Wijnands J., Meulen B., Poppe K., (2007), Competitiveness of European food industry – An economic and legal assessment, EC, LEI, The Hague, page 283.
 6. Zawalinska K. (2005), Changes in competitiveness of farm sector in candidate countries prior to the EU accession: the case of Poland, 11th Congress of EAAE, Denmark, page 2.