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## SOURCES OF PROBLEMS IN MILK SUPPLY CHAIN IN SERBIA AND ITS CONCEQUENCES

*Slobodan Aćimović<sup>1</sup>, Jovan Zubović<sup>2</sup>, Ivana Domazet<sup>3</sup>*

### Abstract

*This paper is the result of research efforts aimed to identify key problems in the milk supply chain in Serbia. Authors intend to indicate major issues in the Serbian milk market during last three months of summer 2010. In the introductory part of the research authors briefly define supply chain – a network of upstream-downstream links and the values in each chain. That is followed by the structure of the "milk flow" in Serbia, with basic performances of the market and analysis of most important participants in the market. After that we have analyzed causes of problems in the milk supply chain in Serbia, with detailed analysis of key issues related to supply chain structure (participants). Finally, we summarize with the consequences of structural problems in Serbia and provide solutions for them.*

**Key words:** Milk Market, Distribution chain, Serbia

### Introduction

Supply chain is a network of organizations which includes both upstream and downstream links, involved in various processes and activities that produce added value for products and services distributed to end users or consumers (Rogers, D. and Tibben-Lembke, R., 2005 pp. 11). Supply chains have traditionally been viewed as weakly linked association of companies in certain business sector. The concept of network, being the first pillar of the above definition, indicates the need to introduce coordination of processes and relations among all horizontal and vertical supply chain participants of a certain product.

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1 Phd. Slobodan Aćimović, Associate professor, Faculty of Economics, Belgrade, Kamenička 6, tel: +381652235821, e-mail: asloba@ekof.bg.ac.rs

2 Phd. Jovan Zubović, Research fellow, Institute of Economic Sciences, Belgrade, Zmaj Jovina 12, tel. +38166357000, e-mail: jovan.zubovic@ien.bg.ac.rs

3 Phd. Ivana Domazet, Research associate, Institute of Economic Sciences, Belgrade, Zmaj Jovina 12, tel. +38163334366, e-mail: ivana.domazet@ien.bg.ac.rs

Furthermore it is important to identify upstream and downstream connections for every supply chain. Upstream connection is those „against the current“ and refers to the relationship between company and its suppliers as well as suppliers of our suppliers. On the other hand, downstream link or connection "along the current" is relationship between company and its consumers. It is also possible to have combined upstream-downstream connection, for example in companies that sell products with return containers, pallets or products of internal trade. Very important determinant of each supply chain is the value created throughout the process. Porter defines value as "the amount that consumers are willing to pay" (Porter, M., 1985, p. 3.). If the supply chain is an unobstructed flow of goods from raw materials to final consumers, smooth as a production line, then the goal of such a supply system would be creation of greater value to final consumers at reasonable costs (Aćimović 2006 , p. 82).

Specifically, the goal of every supply chain is to maximize its total worth by creating greater value in a single system (assembly line) than it would be created if each participant operated as independent entities (adapted on Chorpa, S. and P. Meindl (2004), p. 6). The value in supply chain can be defined as the difference between the value of the final product to the end consumers and the value of all activities throughout the supply chain, created with a goal of meeting consumer demands.

In that way we can define as a key objective of this paper to analyze milk supply chain in Serbia, identify its supply network including upstream-downstream links, and to determine if it creates added value for all participants in the market. Such an analysis begins with brief overview of "Serbian dairy market.

### **Structure of “milk flow” in Serbia**

Dairy sector in Serbia had a significant decline in production volume in recent years. The fall of activities resulted in significant reduction of milk cows. Current production is around 1478 million liters of milk per year, which is 327 million liters less than in 1990 and 98 million less than in 2001 (Table 1). There are approximately 200 dairies in Serbia which annually purchase and process over 800 million liters of milk. Out of 1.5 billion liters of milk a year nearly 50 percent is used in subsistence spending. At a time when the number of milk cattle in Serbia declined at a rate of 1.5 to 2 percent, milk production is stabilized to the level of minimum household consumption, which amounts to 107 liters per capita per year (Popović, 2009).

Currently in Serbia there are about one million cattle, out of which 585.000 are milk cows and heifers in calf, which is equal to the number of cattle in 1910. At the same time, with a decreasing number of livestock, the number of mini-dairies is increasing, particularly during intensive privatization in this sector of economy. Such irregularities in Serbian milk supply chain created during last 20 years resulted in reduced availability of resources in primary production, while processing capacity was constantly increasing.

*Table 1 – Indicators of milk market in Serbia*

<b>Indicator</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
Milk cows and heifers in calf (000)	787	752	740	742	721	692	648	624	585
Cow milk production (mil l.)	1576	1580	1576	1579	1602	1587	1549	1534	1478
Liters per milk cow	2203	2348	2345	2427	2568	2645	2663	2731	2877
Milk acquired by dairies (mil. l.)	601	700	710	761	750	740	814	825	n/a
Raw milk price (dinars)	10.95	10.61	10.85	12.72	14.21	15.18	18.44	23.7	28.5
Sales of fresh milk (mil. dinars)	n/a	n/a	4,700	5,682	8,675	10,730	12,260	17,605	n/a

*Source: Ministry of agriculture of Serbia, Statistical office of Serbia: statistical yearbook 2003-2009, communication P012, databases*

Decline of primary production was caused by low milk purchase prices that were significantly lower compared to average of EU countries. As a measure to help manufacturers, government paid premiums for milk sold, which in 2005 amounted to four dinars per liter, but it was been reduced to only 1.5 dinar per liter in 2010. Decision to reduce the premium government argued by the fact that privatized dairies operated profitably, so the share of profit could have been directed towards primary producers (farmers).

This decision had very negative consequences for farmers, especially those who were not registered, because the state allowed premiums only to registered farms. At this point of time in Serbia there are around 180,000 eligible, while the other 600,000 are not eligible for getting state support (not registered farmers). These are mostly small commodity producers with one or two cows per farm. Their milk production is expensive and unprofitable. The latest agreement the Ministry of Agriculture and participants in the milk supply chain in August 2010 regulated that the premium will be paid to all farmers, regardless of whether they are registered or not. This will significantly alleviate previous model which dominantly delivered premiums to milk processors - dairies, and not to primary producers.

Dairies as the participants in the market are gaining substantial advantage from premiums paid to producers (farmers) through them. The state paid annually significant amounts for premiums, but there was no positive financial impact because the money was directed to processors (dairies) instead to producers, which at the end dairies used to simply reduce the purchasing price of milk by the amount of premiums (Rajic, 2007).

Table 2 – Yearly volume of milk delivered to dairies in Serbia (2006-2008)

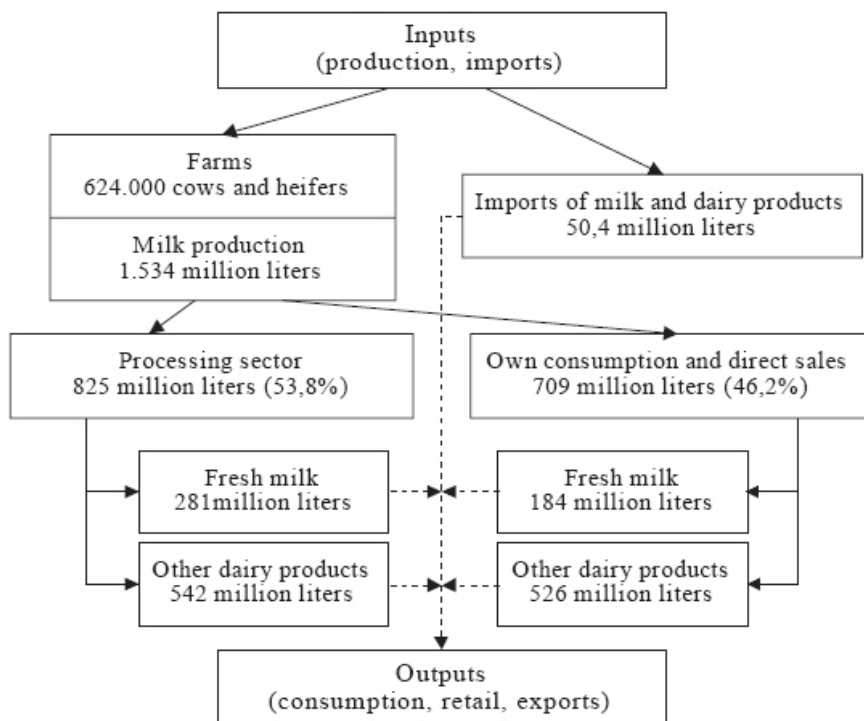
Dairy – Company	2006	2007	2008
Danube foods group	350.374.975	361.959.880	354.904.468
Mlekara Šabac	43.187.653	56.945.950	67.627.936
Somboled	40.256.713	43.665.250	52.212.275
Mlekoprodukt	28.977.976	28.720.080	27.646.386
Middle dairies*	126.563.765	158.097.080	171.970.915
Small dairies**	150.584.654	165.139.540	150.736.043

\* Middle size dairies have the capacity of 5-20 million liters per year  
 \*\* Mini sized dairies have the capacity of up to 5 million liters per year

Source: Adapted on Popović (2009)

In Serbian market there are a few large milk processors including: Danube food groups (Imlek, Impaz, dairy Zemun, Novi Sad Dairy, Subotica Dairy), Dukat (Somboled), Unimilk (Senta, Pancevo, Kragujevac, Nis and Pirot - in summer 2010 overtaken by Danone), Bongrain (Mlekoprodukt) Farmakom MB (Šabac) and 200 others (small and middle sized) private dairies (Table 2).

Graph 2 – Chain of “Milk flow” in Serbia in 2008



Source: Statistical office of Serbia (2009), Popović (2009)

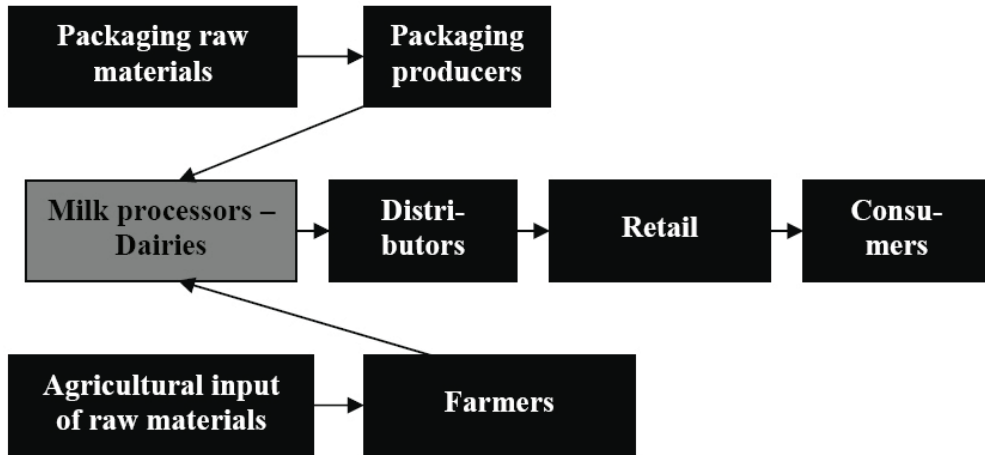
Majority of privatized dairies had operated profitably before change of ownership. For that reason they were attractive for sale. Good examples of privatization apart from Salford (Danube food groups - 5 dairies) are Somboled from Sombor bought by Dukat (Lura) and French company Bongrain has overtaken Mlekoпродукт dairy from Zrenjanin for seven million euros. Bongrain and Dukat are viewed as better opportunity for Serbian market since they are originally manufacturing companies, to Salford which is an investment fund. Unimilk which was in 2010 acquired by Danone of France is another example of important foreign investments in this sector in Serbia (Gulan, 2006). Despite findings in other papers (Zubović, Domazet, Kovačević, 2009 and Zubović, Subić, Jeločnik, 2009) of significance of foreign investments in Serbia, in milk market, privatization by foreign capital has brought some negative results.

### **Sources of problems in milk distribution chain in Serbia**

«Milk crisis» in Serbia culminated in summer 2010. The average consumer was left without enough milk on store shelves. At the same time customers were exposed to media "arguments" from all participants in the market trying to offer solution for the problem of milk supply chain, with different answers to why the agro-food production, especially milk production segment, which should be Serbian comparative advantage faced problems on the market.

From a brief review of the milk market in previous section one can see that there are many factors that may cause problems in milk supply in Serbia. Continuous neglecting of primary producers is reflected on reduction of number of cows, state disincentives per liter of milk (reduced premiums). Shift to incentives per cow (instead per liter sold) may have been the initial source of the problem in the supply chain. Although we will not deal with this agricultural and economic problems in this paper, our assessment is that due to frequent changes in agricultural policies of milk production and processing in the last 10 years culminated in 2010 with problems on the market.

How to simply explain why there was not enough milk in major shopping chains in Serbia on September 2010? Does it look like the shortages are at sight again after more than ten years? Based on preliminary results another study (Aćimović 2010) dealing with structural problems in the supply chains in Serbia on the one hand, and knowing the market and the structure of participants in the "milk flow" in Serbia on the other hand, it is easy to identify the key issues in Serbian milk supply chain - structural unequal power relations between participants in the supply chain. In the graph 3 we show milk supply chain in Serbia with highlighted major source of the problem.

*Graph 3 – Key source of problems in milk supply chain in Serbia*

Why have we identified dairies as a key generator of current problems in the supply of milk? Are all dairies problem generators in the same way or are there some manufacturing groups whose negative behavior is particularly “felt” on the milk market?

It is obvious that dairies as producers of the final products are very satisfied with the system of state subsidies. Most of the subsidies are going directly to them, thus allowing them to become a key “player” in the dairy industry (through the system “where the money is there the power is”). In that way dairies have obtained dominant position in the milk supply chain in Serbia. Now we come to define differences between participants in the industry. They imply that not all dairies are willing and able to abuse their dominant position in the supply chain. The abuse of dominant position is primarily immanent to largest manufacturing groups, which have been created, during privatization process of dairy industry in the past few years.

What allows large manufacturing groups to have power on the milk market and disrupt normal supplying network, by breaking primarily upstream links in the supply chain, and to a certain level downstream as well? The answer is known to all those who are aware of the strength of large buyers - purchasing power. What is purchasing (buyer) power? There are many different definitions of purchasing power. Simply put, the power of certain participants in the supply chain is usually reflected on its purchasing capabilities or a privileged position (the state agricultural policy), which in turn derives from a particular strategic advantage (large manufacturing groups). In other words, if a customer is able to obtain more commercial and financial concessions from their suppliers than competitors, then it gains significant strength. Furthermore, the strong “player” with its continuous activities can affect the whole cost side of the market, and even push some of the competitors out of the market.

## **Concluding remarks – consequences of the “milk crisis” and how to prevent them?**

The most important aspect of any supply chain is its ability to create added value for all participants in the chain. Is there value creation in the milk supply chain in Serbia? Obviously there is, but only for those who predominantly affect the market. All other players in the supply chain have a problem:

- primary producers - for diverting premiums to dairies, but most of all because of low prices of raw milk, which does not cover the cost of production;
- the state – it risks shortages (with the negative political connotations), but with possible long-term significant reduction or even extinction of domestic primary production of milk
- packaging producers (and their suppliers), agricultural inputs manufacturers, distributors, retailers – since they lose sales and profits from milk and dairy products
- final consumers - who are by shortages deprived from one of the basic products in consumption.

It is natural that participants of certain product supply chain have different goals and strengths. The problem arises when in the supply chain a particular participant grows too big. It uses purchasing and selling power on the market (especially in small, relatively unorganized markets such as Serbian is) to disturb all normal relations between the partners. The reason for such behavior is desire for greater profit. Example of this is a Serbian milk market during past years, which culminated in summer 2010. One major group, or its owner - a foreign investment fund, probably unsatisfied with returns on investments, wanted to improve its, already excellent market position. The group, on the one hand tightened its payments to primary producers of milk, and on the other hand has problems with the state, because it is getting obvious that they abuse dominant position on the market. Hence such egocentric behavior of a manufacturing group, as a leader in the milk supply chain in Serbia (with 43% of raw milk supply and about 60% of processing facilities located in 5 major dairies) created a problem in the milk market. Problem of one strong participant in the supply chain is later transferred to other dairies, and their relationship to the supply side and sales.

Manufacturing group, whose owner is not a typical foreign milk producer, but it rather is the investment fund, views no long-term social interest in Serbian agricultural production. We believe that for them there makes no difference if raw milk is purchased in Serbia or from abroad, only what is important is the level of profit. Serbian Government has recognized such behavior at time and it is taking difficult, but proper care to fight for domestic milk production, and the rights of domestic consumers for regular supply of milk.



## Literature

1. Aćimović, S. (2010), *Structural aspects of Serbian supply chain: Analysis of Vendor-trader relation*, working paper, Ekonomski fakultet Beograd.
2. Aćimović, S. (2006), «Razumevanje lanca snabdevanja», *Ekonomski anali*, br. 170, Ekonomski fakultet Beograd.
3. Chopra, S. i Meindl P. (2004) *Supply Chain Management*, Pearson Prentice Hall.
4. Porter, M., (1985), *Competitive advantage*, Free Press, New York,
5. Rogers, D. and Tibben-Lembke, R., (2005), *Going Backwards: Reverse Logistics Trends and Practices*, Reverse Logistics Executive Council, Pittsburgh, USA.
6. Gulan B (2006) „Privatizacija industrije mleka u Srbiji - domašaji i promašaji“ preuzeto sa: <http://www.agropross.org.rs/tekstovi/10723.html>.
7. Petković V (2008) „Uticaj tržišne strukture na ekonomsku efikasnost – empirijska analiza tržišta mleka u Srbiji“, Srpski ekonomski Forum, Beograd.
8. Popović R (2008) „Dairy chain analysis – The case of Serbian Market“, *Strategijski menadžment*, vol 13, No. 1, page 1-7.
9. Popović R (2009) „Strukturne promene na tržištu mlečnih proizvoda u Srbiji“ *Mleko i mlečni proizvodi* Vol 20. br. 1-2, str. 7-12.
10. Rajić Z et all (2007) „Kapaciteti i proizvodnja mleka u Srbiji“ *Savremena poljoprivreda*, posebno izdanje, str. 1-11.
11. Statistical office of Serbia (2009) *Statistical yearbook*, Belgrade
12. Zubović J, Domazet I, Kovačević M (2009) *Foreign direct investments in Serbia: what has been done so far and what can we expect*, *Business Opportunities in Serbia: the case of Italian business sector and the role of management education*, Institute of Economic Sciences, pp. 219-225,
13. Zubović J, Jeločnik M, Subić J (2009) *Foreign direct investments in transition economies – the case of Serbian financial industry*, *Petroleum-Gas University of Ploiesti Bulletin – Economic*, vol. 61, br. 4, Petroleum-Gas University of Ploiesti, Bukurešt, Rumunija