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1 Introduction to the dairy sector

Production of fresh milk has an important role in the Serbian economy, accounting for nearly 1% of the GDP. The share of milk in Serbia's total agricultural output ranged between 3.5% and 6.6% in period 2000 to 2005.

Cows' milk is some 99% of total milk production throughout the period, the other 1% being sheep milk as goat milk production has not been recorded statistically hitherto.

Beef, veal and cow milk production together represent about 12% of Serbia's total agricultural output, holding third place after cereals and pigmeat.

In the years 2000 to 2005, there was a gently rising trend in total milk production (by 1.9%), with an increase of 2.2% in cow milk production but a fall of a quarter in sheep milk production.

The main characteristics of changes between 2000 and 2005 are as follows:

- The long term declining¹ trend in Serbia's total cattle population continued, falling by 13.4% from 1.246 million in 2000 to 1.079 million in 2005; with dairy cow numbers down from 759000 to 672000 (11.5%) and heifers-in-calf from 58000 to 48000 (-16.4%). Over the same period, the number of cows used as working (draft) animals fell by two-thirds. (Table 1 in Annex).
- Similarly the national sheep flock declined² 2.2% from 1.611 to 1.576 million; with breeding ewe numbers (i.e. potentially milking animals) down from 1.233 to 1.169 million (5.2% fall). (Table 2 in Annex).
- Total goat numbers also continued their declining trend³, falling from 183000 in 2000 to 152000 (16.8% fewer) in 2005 which has reduced the volume of the goat milk production (Table 3 in Annex.)
- there has been a slight increase in milk production, up from 1586 million to 1616 million litres, i.e. by 30 million litres (1.9%),⁴ the increase being wholly due to more cows' milk (up from 1567 million to 1602 million litres), with sheep milk production falling from 19 million to 14 million litres. (Table 4 in Annex.)

At the moment there are 35 industrial dairy companies in Serbia and more than 200 small dairy units (including dairy facilities of craftsmen type, small and medium industrial dairy plants). In

¹ With small year to year fluctuations there was a long-term declining trend from 1991 to 2005 in total cattle numbers from 1,482,727 to 1,079,020 (-27.2%); with dairy cow numbers down 20.7% from 847,276 to 672,313 and heifers-in-calf from 59,113 to 48,246 (-18.4%). The number of cows used as working (draft) animals fell from 128,094 to 22,628 (-82.3%), and their proportion of the total dairy herd fell from 14.1% to 3.1%.

² With small year to year fluctuations there was a long-term declining trend from 1991 to 2005 in the total sheep flock from 2,137,477 to 1,575,907, a fall of 26.3%. Breeding ewe numbers were down by 26.4% from 1,588,357 to 1,169,204

³ Again with small year to year fluctuations, total goat numbers fell from 164,307 in 1993 to 152,428 in 2005.

⁴ Over the period 1991 to 2005 total milk production rose from 1397 to 1616 million litres (+15.7%), with cow milk production up 17% from 1369 to 1602 million litres sheep milk production halving from 28 to 14 million litres,

addition, majority of family farms own cows and a few of them own sheep and/or goats as milking animals. Family farms make cheese and cream for their own consumption and they sell the remaining milk at the local green markets.

The dairy industry is the first Serbian food processing industry that has completed the privatisation process. The greatest share of industrial dairy plants in Serbia has been taken over by the English Investment fund SALFORD (now: DANUBE FOODS GROUP - DFG) which owns the three largest dairy plants (IMLEK, NOVOSADSKA and SUBOTICKA) and two medium dairy plants (ZEMUN and ZAJECAR dairy plants). Beside DFG, the French BONGREN has taken over MLEKOPRODUKT – Zrenjanin, while SOMBOLED – Sombor has been bought by Croatian LURA. Other smaller industrial dairy plants have been bought by domestic firms.

According to data published by the Serbian Business Livestock Association (Dairy Department), the biggest 25 industrial dairy plants annually purchase and process around 600 million litres of milk or some 36.6% of totally 1.6 billion litres of cow milk.

Five dairy plants within DFG system process annually 373 million litres of milk or 63.8% out of the milk quantity purchased by 25 dairy plants within DFG association i.e. only 23.3% of totally produced cow milk quantity in Serbia.

However, the second "pillar" of Serbian dairy industry – *Association of Private Dairy Producers* (including 200 small and medium dairy plants) does not publish data on their production and sales of dairy products. According to data on installed capacities, these small and medium dairy plants could process between 3,000 and 30,000 litres of milk per day. If we assume that their average daily processing is around 5,000 litres of milk (economically profitable minimum). It can be concluded that these 200 dairy plants could daily process around 1 million litres of milk (i.e. 365 million litres of milk annually). That would mean that the 200 small and medium dairy plants annually process almost the same amount of milk as DFG.

2 A dual sector?

Milk is produced on commercial farms, private and state owned, as well as on small family farms. The commercial farms usually have a greater number of animals; they also possess mechanised feeding and milking systems that achieve higher milk quality.

In the case of big state farms (e.g. 10000 milking cows in PKB - Agricultural Kombinat Belgrade and 5000 milking cows in PIK Becej), the installed capacities are not fully utilised. Due to the bad financial situation of these farms the quality of nutrition varies excessively resulting in fluctuations in both the quantity and quality of milk produced.

Family farms are usually small with generally only one or two cows, often with poor facilities, and mostly manual milking. Such farmers are often poorly educated and practice low standards of animal health resulting in low levels of quality and quantity in milk production. Moreover, the large industrial dairy plants set standards and minimum quantities that small farmers cannot achieve. In future, fewer and fewer small farmers are expected to be able to meet rising quality standards for liquid milk sales, hence will use their surplus production for livestock feed particularly pigs. Many small farmers are expected to leave the industry due to high production costs.

Some small producers will probably try to increase their herd size and to modernise their milking machines and equipment for storage of raw milk, in order to fulfil the quality standards and become specialised milk producers.

3 Prospects for dairy product consumption

According to FAO, milk consumption in Serbia (excluding butter) is around 165 litres per head. Small farms have a significant share of daily consumption; as well as processing milk for their own needs they have a large share of the green market for cheese and cream. A few family farms that can fulfil quality standards as well as produce acceptable quantities sell milk to dairy plants.

Despite recognising the importance of the dairy sector for national economy, robust official statistics on milk and dairy products do not exist. However, the main trends in milk and dairy product consumption are as follows:

- An increase in the variety of milk and dairy products available in the country;
- Entrance of foreign producers into the Serbian market
- High consumption in family farms
- High sales of cheese and cream (in some regions even milk) in local green markets

The following main factors that will influence future consumption:

- An increase in supply and expanding variety of dairy products
- Increased consumers' income
- Stricter conditions for purchase of milk from smaller family farms
- Preference for consumption of traditional Serbian speciality cheeses and cream
- Development of the baking industry, particularly an increase of the baking products made with cheese
- Development of the catering industry, particularly pizza restaurants
- Developments of the overall food trade and entry of foreign food companies
- Modernisation of equipment for all phases of milk and dairy produce sales

Decline in major catering outlets such as the army, students' hostels works canteens, social nutrition restaurants and school kitchens

The short term and long term prospects are the following:

- An increase in consumption and growth of demand for highly processed products, with less milk fat, as well as with fruit and cereals ingredients
- Increased share of dairy products' consumption in total consumption of animal products
- Change in frequency of milk and dairy products' purchase, from daily local purchases to less frequent but larger purchases from supermarkets
- An increase in hypermarkets' and supermarkets' share of milk and dairy product sales
- Greater utilisation of vehicles and cars for purchasing
- An increase of marketing activities, particularly promotional activities of producers in the hypermarkets as well as other retail shops
- An increase of the consumption volume within the HOREKS (Hotels, Restaurants and Pubs) segment
- Recognition of brands

4 Expert views on the challenges at the level of the milk production

In the recent years milk producers have had some successes but they faced several problems that still continue. These problems are as follows:

- Marking of cattle and monitoring of number, movements, health situation and production
- How to increase the quality of milk produced
- Higher revenues per animal head
- Improved system of milking and storage of fresh milk
- Stimulating conditions for an increased milk quality defined by dairy plants
- Low education level of milk producers
- High trade discounts for dairy plants required by retail trade (up to 5% for pasteurized milk and up to 12% for solid cheese)
- Very high margins included in the retail-sale price (up to 15% for pasteurised milk and up to 30% for solid cheese)
- Due to great differences in discounts and retail-sale margins, retail-sale prices significantly differs from shop to shop (15.8% for pasteurized milk and 26.1% for solid cheese) (26.1%)
- Basic problem in purchase is control of the milk quality parameters by processors, i.e. an absence of control done by independent institutions
- Absence of milking cows' concentration onto the less number of farms that will obtain better conditions for automated feeding, milking as well as hygiene of animals and facilities, which cause a relatively high collection costs.
- Delay in paying of milk premiums to the producers for purchased milk quantities
- Some dairy plants do not purchase milk from private producers during weekend days, so private milk producers have to process the milk themselves (it is particularly problem for those having production over 50 litres per day)
- A great number of small farmers are milking cows manually. Also they have no cooling system and store milks in plastic or similar cans.
- Disparities in prices of concentrates, veterinarian services and energy compared to the purchasing milk price
- Many milk collection posts, collectors and some small dairy plants do not fulfil required quality conditions and standards which resulted in decreased economic benefit for small farmers.

There are some activities done to address the problems/challenges:

- In 1996 it was put into force The Antimonopoly Law, but it has not been ever implemented. In 2005 it was put into force a new Law on competition, while the Parliament of Serbia has appointed in 2006 five members as the Council of the Commission for Protection of Competition. At the moment farmers are not able to join together to process the milk and supply local consumers.

The short and long term prospects could be the following:

- Change in the breeding structure of the national cattle herd aiming at dual purpose breeds that supply both good milk yields and steers that fatten well, rather than concentrating on dairy breeds.
- Reduction in the number of dairy farmers from existing 170000 to, say, half that number.

- Increased organic milk production.
- Increased number of animals per farm and increased milk yield per cow.
- Improvement in milk quality
- Modernisation of technology
- Change in parameters and quality evaluation standards for calculation of purchasing milk price
- Development of sheep and goat milk production in underdeveloped rural areas

5 Expert views on the challenges at the stage of milk collection from farms

In the recent years there have been some changes in milk collection procedure.

- Collection is only once a day and on small farms the milk is kept overnight in cans without refrigeration which reduces milk quality
- There are very many small farms producing small quantities of milk for the market. This has been due to unemployed rural workers buying one or more cows and starting milk production, though this was more way of surviving than aiming to be a milk producer.
- High costs of milk collection (because of great collecting territory, bad local roads, great number of collection posts, and long distances and time for the milk transport)
- Great difference in facilities for transportation and cooling of milk
- Decrease in number of dairy plants dealing with dairy products' production and their conversion into the collecting facilities for proper collection and transportation of milk to the industrial dairy plants
- Change in the existing calculation of purchasing milk price that is done on the basis of the fat and protein contents as well as CFU & SCC parameters.
- Provision and installation of milking equipment from dairy to the relatively larger farms
- Provision of refrigerators for milk, freezers and lacto-freezers for cooling of milk
- Provision of appropriate facilities for collection and transport of milk
- In following two years DFG will decrease number of farms for milk purchasing (from present 19000 onto approximately 10000) but at the same time with an increase in number of milking animals per farm i.e. to provide same or bigger quantity of milk from smaller number of farms.
- An increase in minimal purchasing quantity of milk per farm and equipping with these farms by the milking parlors as well as lacto-freezes of bigger capacities. The dairy companies prefer to collect milk from larger farms because of lower collection cost.

6 Expert views on the challenges at the milk processing stage

- Introduction of the HACCP in all industrial dairy plants. At the moment only one dairy plant in Subotica has introduced a recognised HACCP programme, though HACCP is in the process of implementation in several other industrial plants.
- Provision of computerised systems for determination of purchased milk quality parameters.
- Improvement in the quality and variety of dairy products, as well as in marketing.
- One-sided break of Agreement on free trade by Bosnia and Herzegovina that introduced again custom duties for milk and dairy products from Serbia.

- Problems due to stoppage of processing in three dairy plants (in Nis, Kragujevac, Pancevo) due to the cancellation of the privatisation legislation, resulting in some 30 million litres of milk annually being sent to other dairy plants
- Harmonisation of Serbian and EU legislation.

7 Conclusion

Key challenges for the entire dairy food chain could be summarised as follows:

- Improvement of the animal breeding structure so as to raise milk output back to the levels of the late 1990s, thereby assuring Serbia of a higher national quota for milk after EU Accession.
- An increase in milk yields through selective breeding, education of producers, higher quality feedstuffs and improved animal housing through reconstruction of existing facilities as well as construction of the new ones
- Specialisation of the farmers for milk production
- Recording of the animals and establishment of an information system for monitoring and evaluation of milk production, processing and sales
- Harmonising the system for monitoring milk purchased by dairies with the EU standards
- Internal regionalisation of the breeding structure (e.g. Vojvodina for the milk, Southern Serbia for cattle fattening). This regional specialisation would be possible because in the north of the country, the corn basket of Serbia, there is possible to produce fodder at a lower cost than in the south. Southern Serbia is mostly hilly region appropriate for a more extensive production, because there are relatively high share of meadow and pastures in the total agricultural area.
- An increase in competitiveness in production, processing and sales of milk and dairy products at domestic, regional and international market in the context of global trends aiming at food market liberalisation.⁵
- Harmonization of domestic legislative with EU directives
- Improvement of agricultural extension services as well as the veterinarian services
- Regionalisation of sheep and goat milk production in the uplands and mountain areas
- An increase of organic milk production (banning the use of animal feed containing GMO) and better utilisation of significant but unused land resources for livestock grazing
- Regionalisation of the milking cows' breeding structure (aiming at Holsteins on the plains and Simmental cattle in the hill and upland regions of Central Serbia)
- Designing of adequate agrarian policy measures compatible with CAP as well as with reform of agrarian measures in WTO
- Establishment of the system of national laboratories for milk and dairy products' quality control for health and safety of consumers.

⁵ Necessity of competitiveness increase in the Serbian dairy sector is coming from the Decision of Serbian Government to accept requirement to decrease particular import duties for some agricultural products from EU, among which there are also the following products: powder milk (from 70 dinars/kg onto 56 dinars/kg), butter (from 70 dinars/kg onto 35 dinars/kg), milk creams (from 50 dinars/kg onto 25 dinars/kg), cheeses (without *kackavalj*) (from 80 dinars/kg onto 40 dinars/kg). By this additional decrease of import protection, domestic dairy industry has been exposed to sharper competition from EU. As a result it could be expected a growth in dairy products' import, as domestic supporting level for milk production is significantly lower compared to the one given to the producers in EU.

Annex 1: Information on primary production

ANNEX with Tables

*Table 1- Number of cows and heifers-in-calf in Serbia in 2000–2005
(without data for Autonomous Province Kosovo and Metohia)*

Year	Number of cattle				Of which: cows used as working animals	% of cows and heifers- in-calf (? cattle=100)	% of cows used as working animals (?cows and heifers-in- calf =100)
	Cows	Heifers- in-calf	Cows and heifers- in-calf	Total			
2000	759484	57874	817358	1246226	69423	65.6	8.5
2001	733447	53676	787123	1162035	64805	63.2	7.9
2002	699415	52985	752400	1128245	63054	60.4	7.7
2003	677559	62672	740231	1112164	52545	59.4	6.4
2004	680692	61321	742013	1101951	25955	59.5	3.2
2005	672313	48246	720559	1079020	22628	57.8	2.8
D=2005-00	- 87171	- 9628	- 96799	- 167206	- 46795		
I=2005/00	88.5	83.4	88.2	86.6	32.6		

Calculated by Prof. Dr. Miladin M. Sevarlic – on the basis of data taken from documentation of Agricultural Statistics for cited years, The Serbia Republic Bureau of Statistics (SRBS), Belgrade.

*Table 2 - Number of sheep in Serbia in 2000-2005
(without data for Autonomous Province Kosovo and Metohia)*

Year	Number of sheep		% of breeding ewes (Total=100)
	Breeding ewes	Total	
2000	1233180	1611159	76.5
2001	1185778	1489473	79.6
2002	1130347	1447675	78.1
2003	1132513	1515561	74.7
2004	1156681	1585645	72.9
2005	1169204	1575907	74.2
D=2005-2000	- 63976	- 35252	
I=2005/2000	94.8	97.8	

Calculated by Prof. Dr. Miladin M. Sevarlic – on the basis of data taken from documentation of Agricultural Statistics for cited years, The Serbia Republic Bureau of Statistics (SRBS), Belgrade.

*Table 3 – Number of goats in Serbia in 2000–2005
(without data for Autonomous Province Kosovo and Metohia)*

Year	Number of goats
2000	183305
2001	179558
2002	163964
2003	169241
2004	155359
2005	152428
D=2005-2000	30877
I=2005/2000	83.2

Calculated by Prof. Dr. Miladin M. Sevarlic – on the basis of data taken from documentation of Agricultural Statistics for cited years, The Serbia Republic Bureau of Statistics (SRBS), Belgrade.

*Table 4 – Milk production in Serbia in 2000–2005
(without data for Autonomous Province Kosovo and Metohia)*

Year	Total milk production (000.000 lit)			% of cow milk	Milk production (lit per head)	
	Total	Cow	Sheep		Cow	Sheep
2000	1586	1567	19	98.8	2063	15.4
2001	1594	1576	19	98.9	2149	16.0
2002	1596	1580	16	99	2259	14.2
2003	1590	1577	13	99.2	2327	11.5
2004	1593	1579	14	99.1	2350	12.1
2005	1616	1602	14	99.1	2383	12.0
D = 2005-00	30	35	-5		320	-3.4
I=2005/00	101.9	102.2	73.7		115.5	77.9

Note: Agricultural Statistics of Serbia does not collect data on goat milk production.

Calculated by Prof. Dr. Miladin M. Sevarlic – on the basis of data taken from documentation of Agricultural Statistics for cited years, The Serbia Republic Bureau of Statistics (SRBS), Belgrade.

Annex 2: Information on the processing and manufacturing sector