

ASSESSING OF COST PRICE OF MILK AT SLOVAK MILK PROCESSORS

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Abstract

The dairy sector represents one of the most important branches of agriculture and food industry in the Slovak Republic. The period of year 2015-2016 is referred to as the period of the middle milk crisis. The ban on imports of agricultural products from the European Union into the Russian Federation and the abolition of milk quota regime in the European Union in 2015 caused the enormous surpluses of milk at the European market. The high surpluses of milk led to the decrease in the purchase prices of milk. The article's task is to assess and present the development of purchase prices of cow's milk at processors in the Slovak Republic in the observed period 2015-2017. The essential information sources are presented by monthly reports on purchase of milk and cream and production of milk products acquired from the Ministry of Agriculture and Rural Development of the Slovak Republic. In 2017 the development of average purchase prices of raw cow's milk was auspicious in comparison with the development of these prices in years 2015-2016. The average purchase price of raw cow's milk with the whole year 2017 continuously rose.

Keywords: cow's milk, milk crisis, price, processor, purchase

JEL classification: Q10, Q11, Q13

1 Introduction

According to Lajdová, Kapusta and Bielik (2017) the dairy sector represents one of the most important branches of agriculture and food industry in the Slovak Republic. However, the sector is losing its scope continuously, also production is

diminishing and moreover it faces several problems affecting the sector (EU milk quota regime has come to an end in 2015, a drop in prices paid to producers and the increase in the cost of animal feeding, etc.). The milk production is important for the society as a whole, both in terms of economy of state and the employment of rural population. It is a traditional economic sector that due to its very favourable conditions promises a very viable future (Gurčík, Dobošová, Richter, Kubicová & Dobák, 2016). For the past 17 years, consumption of milk, except cheese, cottage cheese, sour milk products and butter, decreased. Expressed by linear regression model in recent years (since 1995) in Slovakia occurred overall reduction in the consumption of milk and dairy products by an average of 0.988 kg per capita per year. This development was mainly conditioned by the annual descent of demand for milk, as its consumption with little variation in average decreased annually by up to 1,88 kg per capita. This development is largely due to the increase of milk prices and especially the increasing supply of a wide range of quality and flavoured sour milk and cheese products (Kubicová & Habánová, 2012).

The production of milk is organizationally, materially, economically and in focus of manpower deployment the most demanding livestock sector. Reasons of the cost items fluctuation are mainly different natural, productive, organizational and other conditions. Other reasons are different individual cost items registrations; variability in determination of biological indicators and in some cases the inaccuracy or inability of their exact findings (Bouška et al., 2006). The relationship between the producers, wholesale and retail prices provides insights into the marketing channel efficiency and the degree of market competition. The milk pricing system in Slovakia has stimulated a public debate on the milk price formation and on the price transmission along the milk marketing channel (Weldesentbet, 2013). The retailers face the surplus of food products as the farmers are not able to export their products production and at the same time they face the offer of cheaper products by foreign producers which results in an extensive import (Kita, Máziková, Grossmanová & Kita, 2012). The milk prices in dairy industry within the food vertical from in the territory of Slovakia is developed also by Kadlečíková, Kapsdorferová, Filo and Malejčíková (2012), Brodová (2013), Matošková and Gálik (2014), Božik, Uhrinčatová, Chrastinová and Krížová (2016).

2 Data and Methods

The article's task is to assess and present the development of purchase prices of cow's milk at processors in the Slovak Republic in the observed period based on the selected literature sources. The essential information sources for the processing

of before mentioned issue are presented by monthly reports on purchase of milk and cream and production of milk products acquired from the Ministry of Agriculture and Rural Development of the Slovak Republic (hereinafter referred to as "MARD SR"). The purchase prices and the number of purchased milk from producers are represented for the assessed period of year 2017. The average purchase price of raw cow's milk in the Slovak Republic is treated in the years 2015-2017. The assessment of purchase price of milk can contribute to the identification of price transfers and margins and their influence in the change of prices of milk food what is simultaneously presented in expenses for food. The basic methodical approach of processing in a theoretical as well as in a practical level is presented by standard methods of scientific work such as selection, analysis, comparison, deduction and synthesis.

3 Results and Discussion

Table 1 Purchase prices and amount of purchased milk from producer in the 1st half of the year 2017 (prices are stated in EUR/100 kg without VAT)

Product	Amount/price	January	February	March	April	May	June
Raw cow's milk, Q. class	Amount (t)	52 878	48 538	52 997	48 190	47 556	43 889
	Min. price	24,27	24,26	24,27	24,26	24,82	24,90
	Max. price	34,00	35,23	34,66	35,90	36,46	37,75
	Avg. price	29,33	29,62	29,69	30,06	30,09	30,30
Raw cow's milk, 1 st class	Amount (t)	14 937	15 063	19 014	22 562	25 868	26 168
	Min. price	22,16	27,33	26,83	22,73	25,95	25,78
	Max. price	30,93	33,66	32,62	33,59	31,59	32,28
	Avg. price	28,70	29,37	29,29	29,34	29,58	29,72
Raw cow's milk, non-standard	Amount (t)	556	543	1 174	880	907	1 189
	Min. price	11,30	13,35	11,28	11,28	11,29	11,43
	Max. price	28,32	29,12	29,61	42,55	29,50	29,50
	Avg. price	24,51	24,16	24,78	27,21	25,28	24,92
Raw cow's milk total	Amount (t)	68 371	64 144	73 185	71 632	74 331	71 246
	Fat cont. %	3,96	3,87	3,74	3,73	3,70	3,65
	Protein cont. %	3,44	3,39	3,32	3,33	3,31	3,27
	Min. price	24,27	24,26	24,27	23,13	27,07	26,96
	Max. price	34,00	34,44	33,98	33,98	34,46	35,93
	Avg. price	29,15	29,52	29,51	29,79	29,86	29,99

Source: Monthly reports on purchase of milk and cream and production of milk products (MARD SR).

In January 2017 more raw cow's milk was purchased in comparison with December 2016 while the average purchase price was stable at the level of 29,15 EUR/100 kg. In January the processors purchased altogether 68 371 tonne of raw cow's milk what presented the increase by 3,2 % between months. Thereof the majority (77,3 %) of Q. class milk was purchased, the 1st class milk presented 21,8 % of January purchase and non-standard milk participated only by 0,8 %. In January the average purchase price of milk increase by 3,1 % to the level of 29,15 EUR/100 kg in comparison with December 2016. Mostly the price of non-standard milk increased, almost by 19,4 %. In comparison with January 2016 the average purchase price of raw cow's milk was higher by 6,1 %.

The increase in milk purchase price continued as well as in February and the price was confirmed at the level 29,52 EUR/100 kg. The processors purchased 64 144 tonne of raw cow's milk, presenting the decrease by 6,2 % in comparison with the prior month. Year on year the processors purchased less by 6,8 % than in February 2016. As regards the year on year development of prices the average purchase price increase by 1,2 % while mostly the purchase price of the 1st class milk increased and the price of non-standard milk decreased. In comparison with February 2016 the average purchase price of raw cow's milk was higher by 9,9 %. Year on year the purchase prices of individual quality classes of milk increased from 9,5 % till 13,3 %.

In March more raw cow's milk was purchased in comparison with February but the price was slightly weakened at the level of 29,51 EUR/100 kg. The processors purchased 73 185 tonne of milk what presented the increase by 14,1 % in comparison with February. The amount of purchased non-standard milk increased by 116,2 %. Year on year the processors purchased less of raw cow's milk the decrease by 1,6 %. In March the average purchase price of milk stayed at the level of 29,51 EUR/100 kg. Comparing the prior's year March the average purchase price was higher by 14 %. Year on year the increase from 13,9 % till 22,1 % was disclosed for all individual quality classes.

In April the amount of purchased milk was lower in comparison with March while the purchase price slightly increased. In April the processors purchased 71 632 tonne of milk from producers what presented the decrease by 2,1 % in comparison with March. As well as in the annual comparison the decrease of purchased amount of milk was presented altogether by 1,9 %, while the highest decrease was reported by the amount of non-standard milk (58,5 %). In April the average purchase price of milk slightly increased by 1 % at the level of 29,79 EUR/100 kg in comparison with the prior month. Year on year the average purchase price of raw cow's milk increased almost by 20,5 %. In comparison with

April 2016 the purchase prices of individual quality classes of milk increased from 19,0 % till 31,2 %.

In May the purchase of raw cow's milk was higher than in April and its purchase price slightly increased. The processors purchased 74 331 tonne of raw cow's milk presenting the increase by 3,8 % in comparison with April. In the annual comparison the purchase of milk was higher only by 0,4 % than in May 2016. The average purchase price of milk slightly increased at the level of 29,86 EUR/100 kg what presented the increase only by 0,2 % in comparison with April. When comparing the purchase prices of milk with May 2016 the average purchase price of raw cow's milk was higher by 26,1 %. The purchase prices of individual quality classes of milk increased from 26,2 % till 34,1 %.

In June the decreased in the amount of purchased milk was reported in comparison with May nevertheless the purchase price of milk slightly increased. In June the processors purchased 71 246 tonne what presented the decrease by 4,2 % than in May. Annually the processors purchased altogether more than 3,3 % of raw cow's milk. The purchase of Q. class milk annually decreased by 12,4 % but the purchase of 1st class milk was higher by 43,7 % than in June 2016. In June the average purchase price of raw cow's milk increased only slightly by 0,5 % at the level of 29,99 EUR/100 kg. In comparison with June 2016 the average purchase price of raw cow's milk was higher by 29,5 %. The purchase price of individual quality classes annually increased from 29,8 % till 34,6 %.

Table 2 Purchase prices and amount of purchased milk from producer in the 2nd half of the year 2017 (prices are stated in EUR/100 kg without VAT)

Product	Amount/ Price	July	August	Sep- tember	Octo- ber	Novem- ber	Decem- ber
Raw cow's milk, Q. class	Amount (t)	41 695	35 265	35 093	39 573	42 103	47 640
	Min. price	28,34	25,67	26,77	26,58	28,25	26,20
	Max. price	36,45	36,82	37,04	37,84	38,68	39,21
	Avg. price	30,80	31,26	32,14	33,34	33,90	34,11
Raw cow's milk, 1st class	Amount (t)	28 310	31 511	28 782	25 418	20 633	19 281
	Min. price	21,35	21,37	21,35	21,36	21,35	29,13
	Max. price	32,12	34,59	34,33	35,10	35,16	39,90
	Avg. price	30,28	30,73	31,89	32,80	33,20	33,79
Raw cow's milk, non- standard	Amount (t)	1 899	1 643	1 886	932	757	744
	Min. price	9,72	9,70	11,96	11,34	11,43	11,28
	Max. price	30,00	30,50	43,03	32,04	34,02	33,02
	Avg. price	26,87	27,01	30,00	28,51	28,75	29,90

Product	Amount/ Price	July	August	Sep- tember	Octo- ber	Novem- ber	Decem- ber
Raw cow's milk total	Amount (t)						
	Fat cont.	71 904	68 419	65 761	65 923	63 492	67 485
	%	3,63	3,61	3,70	3,84	3,90	3,93
	Protein	3,25	3,27	3,37	3,44	3,48	3,48
	cont. %	21,35	21,37	21,35	21,36	21,35	26,20
	Min. price	35,93	36,20	36,59	37,84	38,68	39,22
	Max. price	30,49	30,91	31,97	33,06	33,61	33,97
Avg. price							

Source: Monthly reports on purchase of milk and cream and production of milk products (MARD SR).

In July the purchase price of milk still increased at the same way as the amount of purchase raw cow's milk in comparison with June. The 71 904 tonne of raw cow's milk was purchased presenting the increase by 0,9 % in comparison with June. In the annual comparison the processors purchased more than 3,4 %. In July the average purchase price of milk slightly increased by 1,7 % at the level 30,49 EUR/100 kg. In comparison with July 2016 the average purchase price of raw cow's milk was higher by 31,9 %. In comparison with July 2016 the purchase price of individual quality classes of milk annually increased from 31,7 % till 43,6 %.

The increase of purchase price of milk continued as well as in August and the price increased at the level of 30,91 EUR/100 kg. The processors purchased 68 419 tonne of raw cow's milk disclosing the decrease by 4,9 % than in the prior month. In the annual comparison the processor purchased more than 1,2 % more of raw cow's milk than in August 2016. As regards the development of prices between months the average purchase price increased by 1,4 %. In comparison with August 2016 the average purchase price of raw cow's milk was higher by 32,2 %. The purchase prices of individual quality classes of milk annually increased from 31,9 % till 46,8 %.

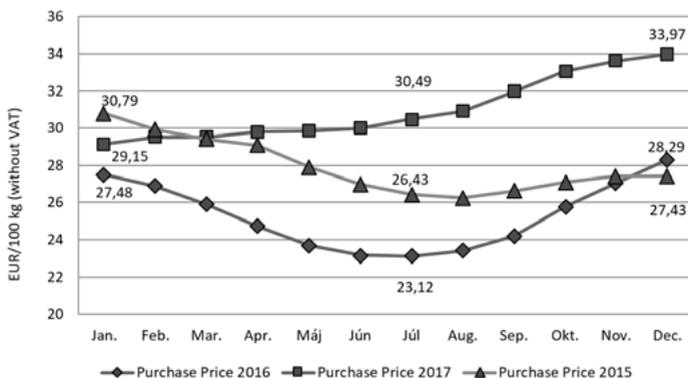
In September the amount of purchased raw cow's milk was lower than in August but the purchase price of milk increased again. The processors purchased 65 761 tonne of milk what presented the decrease by 3,9 % than in August. Annually the processors purchased altogether more than 4,8 % of raw cow's milk. In September the average purchase price of milk increased almost by 3,4 % and reached the level of 31,97 EUR/100 kg. In comparison with September of prior year the average purchase price of raw cow's milk was higher by 32,1 %. As regards individual quality classes of milk the increase of purchase prices was reported from 30,5 % till 54,3 %.

In October the amount of purchased milk was higher while the purchase price further increased. In October the processors purchased 65 923 tonne from producers what presented the increase by 0,3 % than in September. In the year on year comparison the increase in the amount of purchased milk was by 13,4 %. In October the average purchase price of milk increased from 3,4 % at the level of 33,06 EUR/100 kg in comparison with the prior month. Annually the average purchase price of raw cow's milk increased by 28,2 %. In comparison with October 2016 the purchase prices of individual classes of milk increased from 28,3 % till 48,0 %.

In November the amount of purchased raw cow's milk was lower than in October and its purchase price increased. The processors purchased 63 492 tonne of raw cow's milk what was less by 3,7 % in comparison with October. In the year on year comparison the amount of purchased milk was altogether higher by 2,2 % than in November 2016. In November the average purchase price of milk increased at the level of 33,61 EUR/100 kg, what presented the increase by 1,7 % in comparison with October. When comparing the purchase prices of milk with November 2016 the average purchase price of raw cow's milk was higher by 24,3 %. The purchase price of individual quality classes of milk annually increased from 24,5 % till 33,2 %.

In December the increase in the amount of purchased milk was reported in comparison with November as well as the purchase price of milk increased. In December the processors purchased 67 45 tonne of raw cow's milk what was higher by 6,3 % than in November. Year on year the processors purchased altogether more of raw cow's milk, the increase by 1,9 %. Nevertheless the purchase of Q. class milk annually decreased by 10,9 % but the amount of purchased 1st class milk increased almost by 52,0 % than in December 2016. The average purchase price of raw cow's milk increased by 1,1 % at the level of 33,79 EUR/100 kg in December. In comparison with December 2016 the average purchase price of raw cow's milk was higher by 20,1 %. The purchase prices of individual quality classes of milk annually increased from 19,8 % till 45,7 %.

Chart 1 Average purchase price of raw milk in the years 2015 - 2017 in the Slovak Republic



Source: Own processing pursuant to the Monthly reports on purchase of milk and cream and production of milk products (MARD SR).

In 2017 the development of average purchase prices of raw cow's milk was auspicious in comparison with the development of these prices in prior years 2015-2016 (Chart 1). In January 2017 the average purchase price of raw cow's milk was at the level of 30,79 EUR/100 kg and with the whole year 2017 continuously rose. The only decrease in price was recorded in March, it presented the slight decrease by 0,01 EUR/100 kg in comparison with the prior month February. From March the auspicious development between months continued and in December 2017 the average purchase price of raw cow's milk reached the level of 33,97 EUR/100 kg.

Chart 1 presents the inauspicious development of average purchase prices of raw cow's milk in the prior years 2015 and 2016. In January 2015 the average purchase price of milk was at the level of 30,79 EUR/100 kg, however in the following years the significant decrease of milk price was disclosed and continued in the year 2016. In the observed period the lowest average purchase price of raw cow's milk was in July 2016, exactly at the level of 23,12 EUR/100 kg. Since July 2016 the price of milk began gradually increase and after the year in July 2017 it overreached the level of 30 EUR/100 kg, concretely the level of 30,49 EUR/100 kg.

4 Conclusion

The period of year 2015-2016 is also referred to as the period of the middle milk crisis. The negative impact on the development of purchase prices of milk was presented by the abolition of milk quota regime in the European Union, terminated as at 1 April 2015. In addition, the ban on imports of agricultural products from the European Union into the Russian Federation, which was introduced on 7 August 2014, continued. The continuing Russian embargo and the abolition of milk quota caused the enormous surpluses of milk at the European market as the Russian federation was the second largest export market for the European agricultural products by then. In addition the weakened interest of the Chinese market in dried cow's milk was added. The high surpluses of milk at the European market led to the decrease in the purchase prices of milk.

In Slovakia the average purchase price of raw cow's milk fell below the threshold of 30 EUR cents per one kilogram of milk. The primary producers disclosed losses as pursuant to the Slovak Agriculture and Food Chamber the productions expenses are at the level of 40 EUR cents per one kilogram. The sum of means paid through direct payments, project subsidies and state subsidies reached approximately 9 EUR cents per one kilogram of milk according to the average efficiency. These subsidies significantly contributed to the mitigation of milk crisis consequences. We assume that within the year 2018 the prices of milk will decrease from the current level of 30 - 34 EUR/100 kg, while except for the trends on the world market the decrease will be supported as well as by seasonal continuous decline in the content of supplied components in milk. At the level of approximately 28 EUR/100 kg the price of commodity could be stabilized by the continuous demand for milk, especially for milk fats ("Milk in the year 2018", 2018).

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