

## **PRODUCTION AND COMPOSITION OF MILK FROM TSIGAI SHEEP BREED IN VOJVODINA**

**KÖNYVES T., VUKOSAV M., IVANC A., BOŠKOVIĆ J., MIŠĆEVIĆ B.**

Megatrend University Belgrade  
Faculty of Biofarming  
24300 Backa Topola, Marsala Tita 39. Serbia  
wiwat36@hotmail.com

### **ABSTRACT - Milk quality of Tsigai sheep breed in Vojvodina**

In this study the milk quality of Tsigai, like a most popular local sheep breed in northern part of Serbia are presented. The purpose of this paper is to review the several differences in physical-chemical quality aspects of sheep milk.. The average milk quantity are between 0,46 and 0,88 kg, and in 6 month milking period are up to 150 l. The milk is mostly processed into cheese and yoghurt. Compared results with other Tsigai breeds in Middle-East Europe area indicate that milk yield and composition are approximately the same, depending on pasture quality, keeping system and feeding.

**Keywords:** sheep, ewes milk, Tsigai breed, milk quality

### **INTRODUCTION**

The investigation on the sheep milk quality over the recent years has been focused on the ingredients of milk, (JANDAL, 1997), (ABOU-DAWOOD ET AL., 1980), (KANDARAKIS AND ANIFANTAKIS, 1986). Various sheep breeds have different milk quality. The composition and milk processing characteristics of the milk produced from different sheep breed reared in various regions have been subject of continuous researches, (RAICHEV ET AL. 1987), (SLAVOV ET AL. 1990), (GERCHEV, 1998), (PETROVA ET AL. 1998), (ODJAKOVA ET AL. 1992), (GENKOVSKI, 2002). GERCHEV ET AL. (2005), examined the amino acid composition in mixed sheep milk samples obtained from thoroughbred Tsigai and Karakachanska ewes reared in the Central Balkan Mountain region. CARIC (1973), reported on changes in the composition of cysteine in the milk casein of Tsigai breed over lactation period. On the other hand GERCHEV (2004), investigated the amino acid composition of sheep milk from the Tsigai breed. The origin, situation and future of Tsigai breed in central – south European region are described by KUKOVICS AND JÁVOR (2002). They also reported on milk production of Tsigai ewes and their types in different countries. CSANÁDI ET AL. (2006), described the Hungarian Tsigai milk production. Many different dairy sheep breeds are recognized, mainly in the Mediterranean and Middle-east Europe area, with different genetic milk yield merits, but all distinguished by higher milk fat and protein levels than in goat and cow milk. Some sheep milk protein polymorphisms and their relationships to different cheese making parameters have been identified. Sheep milk composition can also be influenced by different feeds, grazing systems and by subclinical mastitis conditions. The fatty acid composition in sheep milk is easily altered by different feed supplements. Average composition of milk from sheep, goats, cows and humans is comprehensively documented and compared relatively to the nutrient supply from human milk and to the

recommended human daily dietary allowances. The unique richness in short chain and medium chain fatty acids in sheep milk, sheep cheeses, sheep butter (so far very neglected commercially), and their special values in human health and as treatment for many disease conditions is discussed extensively, (HEINLEIN, 2002).

The purpose of this paper is to review the production and composition of milk from Tsigai sheep breed, like a most reared milky ewes in Vojvodina, and compare with other Tsigai breeds in Middle-East Europe.

## DISCUSSION

According to the sheep milk production in Vojvodina the most popular breed is Tsigai. They are also valuable for milk and meat production. The sheep milk production and processing are concentrating in east part (Banat) and in north-west part of Vojvodina near city Sombor. The semi-extensive system is widely use. Until March the animal were kept indoors, feeding with concentrate, forage and hay, from April they were grazed but milking ewes received some concentrate, (STATISTIČNI GODIŠNJAK, 2008). The length of the suckling period is cca. 50-55 days. After this the ewes are housed in large groups, and milked twice daily. Ewes are milked mostly by hand. The machine milking is used only for big flocks due to practical and economically reasons.

Sheep milk production in Vojvodina is usually seasonal, with average length of lactation of 60 days. Milk production per lactation period also varied. MITIĆ (1984), recorded production of 110 – 120 litre. In the other investigation the amount of milk in 6 month lactation period is between 50 – 150 liter, (KRAJNOVIĆ AND SAVIĆ, 1992). Most of sheep milk is made into cheese, and into products such like as a yoghurt and cream. From Tsigai sheep milk near city Sombor the famous Sombor cheese are produced. In Banat the Kashkaval cheese is widely made from sheep milk.

VULIĆ ET AL. (2000) examined the physical and chemical quality of ewe's milk (*table 1.*).

**Table 1. Quality of examined Tsigai sheep milk**

<b>Milk ingredients</b>	<b>Mean</b>	<b>Standard deviation</b>	<b>Min – max.</b>
Daily quantity of milk (g)	681,67	90,01	460 – 880
Total Solids (%)	17,86	1,74	13,15 – 20,7
Milk fat (%)	7,42	1,58	2,20 – 10
Non fat total solids (%)	10,44	1,69	5,54 – 17,71
Protein (%)	5,51	0,22	5,22 – 5,82

MASLOVARIĆ (1987) reported results of two year examination on Tsigai sheep milk in Vojvodina. According to this the value of total solids was: 17,73 %, milk fat 7%, total solids non fat 10,73%, milk protein 5,86% lactose 3,96% and ash 0,97%.

In spite of the fact that milk production of Tsigai ewes fall behind from the other milky sheep breeds, the milk level and composition even at the extensive system is still acceptable. CSANÁDI (2005) explain in Hungarian Tsigai population the average daily milk quantity of 0,78 l, and total milk in lactation of 102 litres. However the length of

the suckling period is differ, in Vojvodina are between 50-55 days, while in Hungary, in the examined stock it was 30 day. In the same time the composition of milk is nearly correspond in mentioned two Tsigai type, namely in Hungary was: total solids 18,16%, fat 6,97%, non fat total solids 11,19% and protein 5,44%. Taking into account the aviability on Tsigai milk components in some recorded flocks in Slovakia, ORAVCOVÁ ET AL. (2007), the values of milk fat and protein were 7,77 % and 5,94 % which are very common to sheep milk content in Vojvodina. In Bulgaria, as PETKOV AND NAKEV (1970) described, the local Tsigai ewes have a milk production between 76.8 and 81.4 litres, that is very similar to ewes milk production in Northern part of Serbia. The research, which has been done on individual milk samples, received from 8 sheep, crosses of Tsigai ewes and Black-head Pleven rams, MIHAYLOVA ET AL. (2005), showed different values of milk yield and composition. In three month experimental period (May, June, and July) on pasture, the average daily milk yield decreased as follows 1012,5 ml, 962,5 ml and 617,8 ml, but it was higher than in Tsigai milk in Vojvodina. The daily secretion of milk fat increased 7,09 %, 7,28 % and 8,01 % but the content of protein in the milk was almost equal throughout the pasture period 6,32 %, 6,38 % and 6,33 %. These results indicate that crossing with Black-head Pleven rams and factors such as a relief and climate with natural vegetation have positive effect on milk yield and composition. Concerning the average daily quantity of milk (g) 681,67 of Tsigai ewes in Vojvodina, ORAVCOVÁ ET AL. (2006), found in Slovakia 0,604 kg, which represent a lower milk yield, but in the same time the Improved Valachian breed had lower milk production, 0,595 kg. In the time of the same experiment Lacaune breed was included in the analyses, and showed higher milk yield 1,053 kg than Tsigai. In other experiment by OCHODNICKY (2000), two milk sheep breeds, which are mostly reared in Slovakia: Tsigai and Improved Valachian breed ewes, were tested for milk performance. Milk production varies considerably between the herds as well as between individuals. The average milk production was in the best Improved Valachian herd 139.19 L/ewe and in the best Tsigai herd 159.93 L/ewe. The top Tsigai ewe milked 291.22 L. These results indicate to genetic potential of Tsigai breed milk production in different intensive systems, as it was mentioned in case of Vojvodina Tsigai ewes.

## CONCLUSION

The observed Tsigai milk in Vojvodina according to physical and chemical properties are in the range of standard sheep milk quality. The average milk quantity are between 0,46 and 0,88 kg/day, and in 6 mounth milking period are up to 150 l. The sheep milk in Vojvodina mostly processed into cheese and yoghurt. Compared results with other Tsigai breeds in Midle-East Europe area indicate that milk yield and composition are approximately the same, depending on pasture quality, keeping system and feeding. At the same time the average milk production in top herds suggests that there are animals in the populations which give a guarantee for considerable growth of the milk production within the whole population by their genetic potential. Our opinion is based on suggests in literature namely the breeding and milking of Tsigai ewes may contribute to the development of the economical sheep breeding in Middle-East Europe regions.

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