

MILK PRODUCTION OF MOLDAVIAN TSIGAI SHEEP OF NEW TYPE

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The cheese and albumin curds made from sheep's milk are in great demand among the population of the Republic of Moldova. These foods have long been a traditional Moldavian food staple, especially among the population living in the South of the country.

Tsigai sheep breeding originated in the late XVIII century and spread rapidly in the early XIX century, when a lot of Bulgarians resettled in Bessarabia during the Russian-Turkish wars (1806-1812). The Bulgarian Tsigai breed sheep at that time were raised for wool and milk, and was characterized by low levels of productivity. The average live weight of rams was 65-70 kg, of the ewes 40-42 kg, the weight of the wool clip was 3.9–4.2 kg and 2.2–2.3 kg, respectively, with fibres 7.5 cm in length. The productivity of the young ewes 12-14 months of age was also relatively low – their average weight was 30 kg, the weight of the wool clip was 3.7 kg, with fibres 8.4 cm in length (F. V. Iliev, 1966).

According to **Guzun V. A.** (1966), the milk production of Tsigai ewes during 140 days of lactation was 77.08 kg, with fluctuations within 55.2 and 91.5 kg. During two months of milking period, 8.6 kg of commercial part on average per sheep were obtained (**Dovbush F. M.**, 1968).

To improve the Tsigai sheep breed, a breeding program was developed and implemented, which aimed to increase the productive qualities of sheep using the method of pure breeding, by pairing Tsigai ewes of local breeding of Bulgarian type with meat-and-wool and wool-and-meat breeding rams imported from Ukraine (**Dovbush F. M., Bogdanovici N. I.**, 1972).

The main goal of the breeders was to create, on the basis of the available ewes and breeding rams, inbred types of Tsigai, a livestock which would combine in the conditions of the republic the highest possible body weight, a high wool and milk production, a high adaptability to the dry summer specific to the south of the country, while preserving the valuable qualities of wool and the constitutional strength of this breed.

As a result of the implementation of phased breeding programs, a new Moldovan wool-meat-milk breed of Tsigai sheep have been created and accepted.

MATERIAL AND METHODS

As material for the trial sheep of Tsigai breed of Moldavian type were chosen, which were reared at the basic farm of the Institute of the Agricultural Production Cooperative «Elita-Aleksanderfeld.»

Four hundred and thirty-eight ewes were used to study the ewe's milk production in the first 20 days after lambing, and then in the suckling and milking period, that is during the whole lactation period.

The investigations were carried out using two groups of mature ewes formed according to the number of lambs produced – ewes that had produced one and two lambs.

The study of milk production and the chemical composition of milk was carried out according to the methodical guidelines on the technique of analysis of milk and milk products (1996), and to methodical indications (**Guzun V. A.**, 1996).

The statistical analysis of the trial results was carried out according to (**Merkureva E. K.**, 1964; **Plohinsky N. A.**, 1978, 1980).

RESULTS AND DISCUSSION

During lambing of the ewes the lambs were evaluated in live weight taking into account their origin and date of birth. When the lambs were born, and when they reached 20 days of age their live weight was studied and the weight gain was calculated, which were multiplied by the coefficient 5.35 (the amount of milk needed to produce 1 kg of weight gain from birth to 20 days of age). According to the data obtained, 348 ewes that had had one offspring, in the first 20 days of lactation produced 23.66 ± 0.52 kg of milk, and 90 ewes with twins produced 39.52 ± 1.25 kg of milk. The ewes in both groups produced on average 26.92 kg of milk during the first 20 days of lactation (Table 1).

Later on, the milk production in the suckling and milking periods was studied using the method of control yield of milk. In the suckling period during 109 days the ewes with twin lambs produced $142,68 \pm 5,52$ kg of milk, which was

Table 1. Milk production of the ewes according to periods

	During 20 days	Suckling period	Milking period	During lactation
One lamb	23.66 ± 0.52	87.76 ± 1.83	19.22 ± 0.72	106.63 ± 2.22
Twins	39.52 ± 1.25	142.68 ± 5.52	24.98 ± 1.60	167.67 ± 6.40
On the average	26.92	99.04	20.40	119.17

Table 2. The average daily milk production of ewes by lactation periods (grams)

Offspring	During 20 days	Suckling period	Milking period	During the whole lactation period
One lamb	1183.01±38.99	834.90±17.41	237.28±9.01	572.05±11.93
Twins	1975.70±46.84	1314.47±52.90	306.22±19.84	882.47±34.29
On the average	1345.89±32.41	933.44±47.13	251.45±14.56	635.83±21.34

Table 3. Structure of the ewe livestock by the capacity of milk production per lactation

Milk production capacity per lactation, kg	One lamb		Twins		Total	
	head	%	head	%	head	%
50 75	32	9.3			32	7.3
75 100	130	37.1			130	29.7
100 125	111	31.8	16	17.6	127	29.0
125 150	48	13.9	18	19.6	66	15.1
150 175	27	7.9	26	29.4	53	12.1
175 200			7	7.8	7	1.6
200 250			18	19.6	18	4.1
250 275			5	5.8	5	1.1
On the average	348	100	90	100	438	100

by 54.92 kg ($P \leq 0.001$), or by 62.6% more compared with the ewes that had had one offspring during a period of 106 days.

During the lactation which lasted 81 days (from 1 June to 20 August), on the average each sheep in both groups produced 20.4 kg of commercial milk. It should be taken into account the specificity of the climatic conditions of Bugeac wilderness, in which the sheep of Tsigai breed are bred and raised, and especially the very dry year in which the study was conducted. Analyzing the milk production of the ewes in each group separately, it was found out, that under such conditions the ewes with twins produced more milk than the ewes with one lamb – by 5.76 kg (30.0%), with a total of 24.98 ± 1.60 kilograms produced. During the entire lactation period (187 days for the ewes with one lamb, and 190 days for the ewes with twins) 106.63 ± 2.22 kg and 167.67 ± 6.40 kg, respectively, of milk were obtained.

The analysis of the results in reference to the average daily milk production of the ewes by periods of lactation showed that, the daily milk production of the ewes with twin lambs was higher than that of the ewes that had produced one

lamb (Table 2). During the whole lactation period the average daily milk production of the whole livestock was 635.83 ± 21.34 g. The ewes with twin lambs produced 882.47 ± 34.29 g, which was by 310.42 g ($P \leq 0.001$) more compared with the average daily milk production of the ewes with one lamb, and by 246.64 g ($P \leq 0.001$) on average with regard to entire studied livestock.

When studying the milk production capacity per lactation in regard to the ewes with one and two lambs, it was found out that the of the ewes with one lamb it was from 50 to 175 kg, and for those with twins it was much higher – from 100 to 275 kg of milk (Table 3).

The milk production of 68.9% of ewes with one offspring was within 75-125 kg, the milk production capacity of 21.8% of ewes was 125-175 kg, and only 9.3% of ewes had a milk production capacity of 50-75 kg. The milk production of the ewes with twins was as follows: 66.6% of ewes produced from 100 kg to 175 kg of milk, and 33.4% of ewes – between 175 and 275 kg of milk per lactation. From a total of 438 head of tested ewes, over half of them, namely 56.2%, produced from 100 kg to 175 kg of milk per lactation.

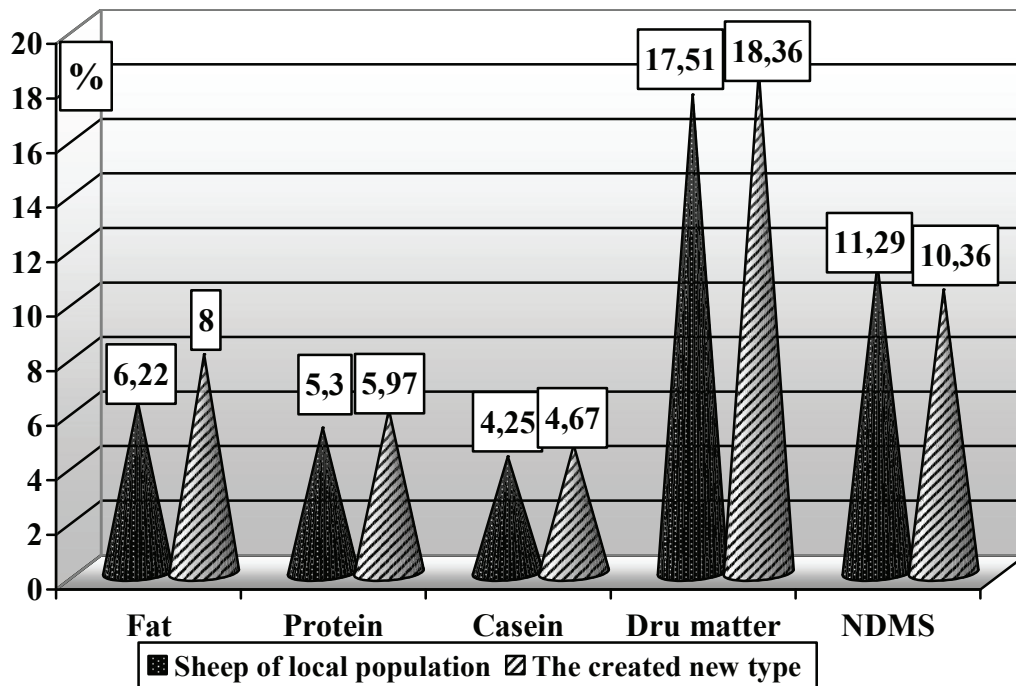


Figure 1. The chemical composition of the milk of the local Tsigai sheep and of the milk of the created new type

The results of the studies show, that during the whole lactation period the ewes with twin lambs have produced on the average by 61.04 kg, or 57.2% more milk than the ewes with one lamb. This once again confirms that this criterion and the positive association of the fertility and milk production of Tsigai ewes should be taken into consideration in the breeding activities with this breed of sheep, particularly in the selection and targeted rearing of breeding rams.

Figure 1 shows indices for the chemical composition of milk obtained from the Moldavian Tsigai sheep of the new type and from the Tsigai ewes of local breeding of Bulgarian type.

The percentage of fat, protein and dry matter in the created new Moldavian type of sheep was higher than in the ewes of local population. The results were obtained from the analysis of milk in the middle of the lactation period. The established differences were most pronounced in respect to the content of fat, protein and dry matter in the sheep milk, in favor of the Tsigai ewes of the new type, which is valued by the local population, because it influences the quality of the different varieties of cheese they produce. With regard to fat content, the difference was highly reliable at a $P < 0.001$, and with regard to protein, casein and dry matter at a $P < 0.5$. The milk of the sheep of the local wool and milk breed was superior only in regard to the dry nonfat milk solids, but the difference was not significant.

CONCLUSIONS

The milk production of the Moldavian Tsigai ewes of new type which had produced two lambs, during the first

twenty days, the suckling and milking periods, and during the whole lactation was significantly higher in relation to the ewes with one offspring.

During the 187-190 days of lactation, the milk production on the average for the tested sheep livestock was of 119.17 kg of milk per ewe. The ewes with twins produced 167.67 kg of milk, and the ewes with one lamb – 106.63 kg of milk.

In regard to the chemical composition of the milk of the new created type of Moldavian sheep in comparison with the milk of the sheep of local population: the fat content was higher, and the difference was highly reliable ($P < 0.001$); with respect to the content of protein, casein and dry matter, the accuracy of the difference was characterized by the error threshold at $P < 0.5$.

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SUMMARY

In the Republic of Moldova have long been bred Tsigai sheep of Bulgarian type wool-milk productivity with relatively not high productive indicators. As a result many years of work, was created a new type of Moldavian Tsigai sheep wool-meat-dairy productivity with good adaptation to local conditions of breeding and dairy.

On 438 head of livestock was studied milk production of ewes with single and double offspring.

Milk yield of 275 ewes with single lamb in general for the 187 days of lactation was 106.98 kg of milk, including the suckling period 87.76 kg and 19.22 kg of milch period. From 163 heads of ewes with twins lambs milk production was respectively: 167.67 kg 142.68 and 24.98 kg of milk in 190 days of lactation. On average, the herd during lactation obtained from one sheep 129.57 kg of milk.

Key words : *Sheep, lambs, milk, lactation, suckling period, milking period.*

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