

PRODUCTIVITY CHARACTERISTICS OF SELECTED GROUPS OF TSIGAY SHEEP OF MOLDOVAN TYPE

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Abstract

The article presents the productivity indicators of Moldovan-type of Tsigay sheep, which are oriented towards wool, meat, and milk production, for various age and sex groups. From 2018 to 2022, the evaluation of lambs and ewe lambs at 12-14 months of age, as well as rams and ewes, was conducted based on live weight and wool yields. A comparative assessment of the average productivity of the entire flock was made in comparison with the minimum requirements for selected breeding groups. Throughout all stages, the number of individuals and their individual productive indicators in kilograms and percentage ratios were taken into account.

Keywords: Ram - breeder, raw wool, body weight, lamb, ewe lambs, sheep.

Introduction

In the Republic of Moldova, there are two types of Tsigay sheep breeds - the local wool-milk type, which was imported from Bulgaria, and the Moldovan wool-meat-milk type created by scientists from the Scientific and Practical Institute of Biotechnologies in Zootechny and Veterinary Medicine, in collaboration with zooveterinary specialists and the management of the Agricultural Production Consumer Cooperative "Elita-Alexanderfeld" from Cahul district, for over forty years [1]. The creation of the Moldovan-type Tsigay sheep involved crossbreeding the local Tsigay sheep with rams of the Priazov wool-meat and Crimean wool-meat types, followed by further selection and breeding of desirable sheep "in itself" [2, 4].

The aim of our research was to study the productivity of various age and sex groups over a period of five years, to select highly productive animals for breeding groups, and to compare them with the minimum productivity requirements developed during the creation of the new Tsigay type. Additionally, we compared the selected groups with the average productivity indicators of the entire flock, both in terms of physical weight and percentage ratios.

Materials and Methods

The research was conducted on Moldovan-type Tsigay sheep of wool-meat-milk direction, belonging to various age and sex groups (rams, ewes, and young sheep classified by assessment). The sheep population from Agricultural Production Consumer Cooperative "Elita-Alexanderfeld,"

peasant farm "Rusandu Dumitrii Nikolaevich" in Cahul district, and the Experimental-Technological Station "Maximovka" in Anenii Noi district was analyzed.

The study has been carried out in the project: 20.80009.5107.20 "Management of the genetic potential and productions of breed animals reproduced and exploited in the pedoclimatic conditions of the Republic of Moldova".

Comprehensive assessment (scoring) of the young sheep was carried out at the age of 12-14 months, following the current instruction "Instructions for the scoring of Tsigay sheep with elements of breeding work" [3].

Individual wool yields were evaluated based on the weight of wool fleeces during shearing, while the live weight of the adult flock was measured before the breeding campaign.

The productive indicators of the selected groups, including rams, ewes, reproductive young rams, and ewe lambs, were correlated with the standards of the created Moldavian-type Tsigay sheep, considering the necessary selection intensity for the respective age and sex groups.

The statistical processing of the digital data obtained during the research, along with the determination of the significance difference between the compared groups and the average values of the indicators for the analyzed periods, was carried out following the guidelines for biometric processing [5].

Results and Discussion

Based on the individual results obtained for rams and ewes during the autumn weighing before insemination and shearing for each considered year, a biometric analysis was conducted for the average values across all years.

In comparison to the average values across all years, the live weight of rams in 2021 was higher by 2.48 kg ($P \leq 0.01$) and in 2018 by 1.48 kg ($P \leq 0.05$) (Table 1). As for the ewes, the live weight was higher in 2021 by 1.53 kg ($P \leq 0.001$), in 2020 by 0.68 kg ($P \leq 0.001$), and in 2022 by 1.27 kg ($P \leq 0.05$).

Table 1. Results of the evaluation of adult sheep based on body weight and raw wool production, kg

Year	n	Breeding rams		n	Ewes	
		live weight	Raw wool		live weight	Raw wool
		M±m	M±m		M±m	M±m
2018	68	75.04±0.51*	5.15±0.11	1123	51.25±0.16	3.67±0.02***
2019	65	71.10±0.55	5.63±0.12	959	50.79±0.17	3.35±0.02
2020	65	73.98±0.8	6.13±0.13***	908	53.17±0.19***	3.75±0.02***
2021	63	76.04±0.74**	5.02±0.12	850	54.02±0.19***	3.55±0.02
2022	68	71.71±0.62	5.57±0.10	878	53.76±0.51*	3.45±0.05
Average	329	73.56±0.29	5.50±0.05	4718	52.49±0.11	3.56±0.01

* $P \leq 0,05$, ** $P \leq 0,01$, *** $P \leq 0,001$

In 2020, the wool yield of rams was 6.13 kg, which was higher compared to the average value by 0.63 kg ($P \leq 0.001$). Similarly, for ewes, the wool yield was higher in 2020 by 0.19 kg ($P \leq 0.001$) and in 2018 by 0.11 kg ($P \leq 0.001$) compared to the average.

Based on the above-presented data, Table 2 was compiled, displaying the productivity of animals selected in breeding groups compared to the average productivity of the flock and the minimum requirements for this type of sheep.

Table 2. Productivity of breeding groups of adult sheep in comparison with the average flock performance and minimum requirements

Indicators	Breeding rams			Ewes		
	n	live weight	raw wool	n	live weight	raw wool
Productivity of selected groups	14 3	81.17±0.29* **	6.95±0.09* **	270 2	55.33±0.08* **	4.43±0.01* **
Average productivity across the flock	32 9	73.56±0.29	5.50±0.05	471 8	52.49±0.11	3.56±0.01
+/- compared to the productivity of selected groups	kg	-	- 7.61	-	- 2.84	- 0.87
	%	-	9.4	-	5.1	19.6
Minimum Requirements	-	80.0	6.0	-	50.0	4.0
+/- compared to the productivity of selected groups	kg	-	- 1.17	-	- 5.33	- 0.43
	%	-	1.4	-	9.6	9.7

*** $P \leq 0.001$

During the study period, 143 heads (43.5%) were selected for the breeding groups out of 329 rams, and 2702 heads (57.3%) were selected out of 4718 ewes. The live weight in the breeding groups for rams and ewes was higher compared to the average flock performance by 7.61 kg and 2.84 kg, respectively ($P \leq 0.001$). Similarly, the wool yield for these age-sex groups was also higher. For rams, it was higher by 1.45 kg, and for ewes, it was higher by 0.87 kg ($P \leq 0.001$). Considering that the breeding groups were selected from animals with productivity indicators not lower than the minimum requirements, the live weight for rams was higher by 1.17 kg, and for ewes, it was higher by 9.6 kg. As for wool yield, it was higher by 0.95 kg for rams and 0.43 kg for ewes. According to the evaluation instructions, the young sheep at 12-14 months of age were assessed (Table 3).

All considered criteria for assessment in the breeding groups were based on live weight and wool yield. For the lambs, 183 heads were evaluated, with a live weight of 54.68 kg and a wool yield of 5.45 kg. All lambs were classified as "elite."

As for the ewe lambs, they were classified into three categories: "elite," I, and II. Among the assessed population, 1631 heads (86.6%) were classified as "elite," to I and II respectively 133 heads 7.1% and 120 heads (6.3%) as II. The live weight of "elite" ewe lambs was higher compared to the average flock performance by 1.56 kg ($P \leq 0.001$), and the wool yield was higher by 0.14 kg

($P \leq 0.001$). Table 4 shows the productivity of the selected groups of lambs and ewe lambs at 12-14 months of age compared to the average flock performance and minimum requirements.

Table 3. Results of assessment of young sheep at 12 - 14 months, (M $\pm$ m)

Class	n	%	live weight, kg	raw wool, kg
Lambs				
Elite	183	100	54.68 $\pm$ 0.39	5.45 $\pm$ 0.08
Ewes				
Elite	1631	86.6	45.92 $\pm$ 0.09***	4.83 $\pm$ 0.02***
Class I	133	7.1	36.08 $\pm$ 0.02	3.87 $\pm$ 0.07
Class II	120	6.3	32.35 $\pm$ 0.13	3.68 $\pm$ 0.10
Average	1884	100	44.36$\pm$0.07	4.69$\pm$0.02

*** $P \leq 0.001$

Table 4. Productivity of selected groups of lambs and ewe lambs at 12-14 months of age compared to the average flock performance and minimum requirements

Indicators	Rams			Ewes		
	n	live weight	raw wool	n	live weight	raw wool
Productivity of selected groups	160	56.68 $\pm$ 0.41* **	6.81 $\pm$ 0.15* **	1141	47.64 $\pm$ 0.11* **	5.46 $\pm$ 0.03* **
Average productivity across the flock	1883	54.68 $\pm$ 0.39	5.45 $\pm$ 0.08	1884	44.36 $\pm$ 0.07	4.69 $\pm$ 0.02
+/- compared to the productivity of selected groups	kg	- 2.00	- 1.36	-	- 3.28	0.77
	%	3.5	20.0	-	6.9	14.1
Minimum Requirements	-	45.0	6.0	-	40.0	4.5
+/- compared to the productivity of selected groups	kg	- 11.68	- 0.81	-	- 7.64	- 0.96
	%	20.6	20.0	-	16.0	17.6

*** $P \leq 0.001$

For the lambs, all individuals exceeded the minimum requirements for live weight, but 23 individuals fell below the minimum wool yield. Therefore, 160 heads were selected for the breeding group. The live weight in the breeding group was 56.68 kg, which is higher by 2.0 kg compared to the average flock performance ($P \leq 0.001$) and 11.68 kg higher than the minimum requirements. The wool yield was 6.81 kg, which is 1.36 kg higher than the average flock performance ($P \leq 0.001$) and 0.81 kg higher than the minimum requirements.

Regarding the ewe lambs, the live weight in the breeding group was also higher by 3.28 kg ($P \leq 0.001$) compared to the average flock performance and by 7.64 kg according the minimum requirements at wool yield respectively was 0.77 kg ($P \leq 0.001$) and 0.96 kg .

Conclusions

The results of the conducted research indicate that the live weight in the breeding groups of rams and ewes is higher compared to the average flock performance by 7.61 kg and 2.84 kg, respectively ($P \leq 0.001$). The wool yield in these same age-sex groups is also higher, with rams having 1.45 kg higher wool yield and ewes having 0.87 kg higher wool yield ($P \leq 0.001$).

Regarding the lambs, the live weight in the breeding group is 56.68 kg, which is 2.0 kg higher than the average flock performance ($P \leq 0.001$) and 11.68 kg higher than the minimum requirements. The wool yield is 6.81 kg, which is 1.36 kg higher than the average flock performance ($P \leq 0.001$) and 0.81 kg higher than the minimum requirements.

At ewes, the live weight in the breeding group is also higher by 3.28 kg ($P \leq 0.001$) than the average for the flock and by 7.64 kg according to the minimum requirements, for wool shears, respectively, 0.77 kg ($P \leq 0.001$) and 0.96 kg.

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