

ASSESSMENT OF REPRODUCTIVE AND MORPHOLOGICAL PARAMETERS ON LOCAL POPULATIONS OF GOATS IN NORTH-EAST OF ROMANIA

N. Zaharia, C. Pascal, Roxana Zaharia, C.A. Sava, T. Atanasiu

*University of Agricultural Sciences and Veterinary Medicine Iasi,
Faculty of Animal Sciences, Iasi, Romania
e-mail: nicu_z2007@yahoo.co.uk*

Abstract

The purpose of this paper is to present a summary with reference to the reproductive and morfological parameters specific to local populations of goats raised in north-east of Romania. The research was conducted on a number of 955 individuals, divided into six populations. Working methods used are specific to this type of research and refers to the macro and microscopic measurements, free assessments and statistical analysis. As a result of body measurements, it appears that goat populations studied have a mid-body development, with height of 72.5 cm for males and 64 cm in females. Regarding the exterior features, uniform white color has been shown to over 32% of individuals, horn at 50.44% and beard to over 90% of goats studied. Regardless of color or body region where it was harvested, the hair has an average length of 12 cm, is devoid of undulations and is characterized by an average of over 104 μ thick. In terms of reproductive parameters, goat populations in north-eastern Romania is characterized by a 97.4% fertility and prolificacy of 129.6%. Evaluating these parameters, it is clear that local populations of goats raised in the north-east of Romania are relatively homogeneous if we consider the degree of physical development, or the presence of beard, but highly heterogeneous in terms of coat color.

Key words: goats, morphology, reproduction.

INTRODUCTION

Need for research is justified by the fact that Romania has a large number of goats (approximately 1 million), mainly of Carpatina breed, and the literature does not include relevant data that can be used to characterize and then to improve them. Also, in Romania, there is an increasing trend in the number of goats, being higher in the last 5 years [3]. This paper makes a comprehensive analysis on some characters specific to goats raised in Romania, particularly those in the north-east. First part refers to appearance of animals, studying the degree of bodily development in adult animals, colors, and how their distribution within populations, data on the quality of hair, and other aspects of their external peculiarities. Another part of the study was conducted on reproductive function, especially in the main indices breeding, specific to populations of this region. An

important aspect is that, because of the seasonality of reproduction in goats (in temperate zones), the breeding cycle occurs naturally in late summer, when daylight decreases [1; 2]. Finally, based on evaluations, presents some conclusions on which we can make some recommendations, particularly those dealing with growth and exploitation of goats.

MATERIAL AND METHODS

The biological material studied was represented by a number of 955 adult goats, males and females, belonging to local populations, and being operated in six private farms in north-eastern Romania. Assess the degree of bodily development was using biometrics, which was based on direct measurement of the live animal and endorse the various regions, mainly in mass measurements. Measurements were made in

good conditions, the animals were brought on a level ground, and placed in the relaxed position. The instruments used for making these determinations were: compass Wilkens, zoometer, ribbon metric and electronic scales. For the evaluation of color and exterior features, was used free assessing, in natural light conditions. In order to determine the qualitative features of the hair samples were taken from the shoulder, rump and abdomen. Fiber fineness was determined objectively, using microscopes Motic Images Plus 2.0 ML Hair length was determined by direct measurement using the electronic calliper Suki-Strabel D-54526 Landscheid licensed by Black & Decker Corporation. Estimation of the reproduction function was performed properly by calculating breeding

indices. Data were processed with MSExcel spreadsheet application.

RESULTS AND DISCUSSION

1. Morphological traits. Following the measurements can be appreciated that body shape is pear-shaped body, the upper line has an upward traectorie from the front to the rear, size is medium (64.03 cm to 72.52 cm for females and males respectively), the rear most developed (rump height of 65.70 cm to 75.09 cm for females and males respectively) than the previous one, and the body weight of 41.8 ± 0.53 kg in females and 45.4 ± 0.32 kg for males (Table 1). Size values are similar to those reported by other researchers from studies done on other goat, which belong to local populations in the the Carpathians area [4; 5; 7].

Table 1. Main dimensions and weight specific for adult goats (cm)

Specification	Males			Females		
	$\bar{X} \pm s \bar{x}$	V%	% from withers height	$\bar{X} \pm s \bar{x}$	V%	% from withers height
Withers height	72.52 ± 0.44	3.45	100.0	64.03 ± 0.69	6.22	100.0
Rump height	75.10 ± 0.28	2.14	103.6	65.70 ± 0.47	4.09	102.6
Body lenght	74.95 ± 0.37	2.91	103.3	65.79 ± 0.37	3.26	102.7
Chest depth	36.05 ± 0.33	5.30	49.7	30.67 ± 0.61	11.49	47.9
Chest width	22.57 ± 0.33	8.47	31.1	17.82 ± 0.36	11.44	27.8
Rump width	20.98 ± 0.31	8.54	28.9	17.06 ± 0.20	6.86	26.6
Chest perimeter	86.33 ± 0.38	2.55	119.0	81.24 ± 0.75	5.28	126.9
Metacarp perimeter	9.81 ± 0.12	6.93	13.5	8.15 ± 0.11	8.05	12.7
Body weight (kg)	45.4 ± 0.32	6.73	-	41.8 ± 0.53	10.27	-

Because the values determined for chest depth are higher than those assessed for chest width and body width to the rump, we can appreciate that, in the case of goats raised in the north-east part of the country, the body format is pear-shaped and laterally flattened. Also, after statistical analysis of data on the main body size, can be observed variability between individuals of the populations analyzed, which can be explained by the fact

that the body development in adult goats is a intense heritable character. Analysis of color in local goats has a scientific importance, knowing that the color is a breed character. Fiber color evaluation of the six goats populations studied, show that white individuals are found mainly, but they do not represent the majority, as shown in Table 2.

Table 2. Colors and color features specific for goat populations in NE Romania

No. crt.	Color	Peculiarity	Unit	
			Heads	(%)
1.	White	uniformly	296	32.45
		+ black	105	11.51
		+ red	66	7.24
		+ gray	31	3.40
		+ brown	8	0.88
		+ gray + black	4	0.44
	<i>Total white</i>	-	510	55.92
2.	Black	uniformly	105	11.51
3.	Red	uniformly	51	5.59
5.	Ash gray	uniformly	16	1.75
		uniformly	113	12.39
4.	Gray	+ white	27	2.96
		+ red	4	0.44
		+ black	12	1.31
		+brown	12	1.31
	<i>Total gray</i>	-	168	18.42
5.	Brown	uniformly	23	2.52
		+ black	27	2.96
		+ white	12	1.31
	<i>Total brown</i>	-	62	6.80
6.	Total population	-	912	100.00

Data presented in Table 2 show that the most common color in populations of goats raised in northeast Rumania is white-uniform color and white with different spots, over 55% of individuals, followed by individuals who have different shades of gray color and gray with different spots (18.42%) and those with black color representing 11.51% of the total herd in the study. Also, in populations studied, could see other colors such as brown color (6.8%), red (5.59%) and gray (1.75%). After analyzing the color of hair fibers, between the six populations showed no major differences in the proportions in which they occur. Depending on the different aspects, the characteristics of the goat hair fibers are highly variable. Normally, races and local

populations characterized by high tardiness, pilose production is lower and lower quality compared with breeds specialized for this type of production. In Romania, and implicitly in the north-east, the main production for this species is exploited is the production of milk, pilose production is rather a by-product, making it less economically interesting. However, if a farmer has a large number of goats, this production may present some interest. Typically, due to environmental conditions in our country, this production is harvested in late winter before shedding goats. The fluff and hair, due to the properties and characteristic traits (Table 3) may be used for the manufacture of household articles.

Table 3. Fiber quality specific for goat populations in North-Eastern Romania

Specification	Category	No. samples	$\bar{X} \pm s_{\bar{x}}$	V%	Min	Max
Lenght (cm)	Fluff	83	3.265 ± 0.122	17.89	1.9	4.4
	Hair	240	11.950 ± 0.273	27.03	4.6	20.1
Finesse (μ)	Fluff	54	18.807 ± 0.242	9.44	15.9	23.1
	Hair	253	104.985 ± 1.149	17.42	72.7	156.3
	Medullary layer	142	56.651 ± 2.540	53.43	8.4	107.1

After analyzing the data presented in Table 3, it can be said that both hair and fluff collected from those populations do not have special qualities to be exploited. Regardless of color or body region where it was harvested, the hair has an average of about 12 cm long, is free of undulations and has an average thickness of over 104 μ. Also, throughout its length (3.27 cm), fluff collected from goats studied have not undulations, having a fineness of 18.81 μ. Regarding the medullary layer, where present, has a highly variable thickness (V%

= 53.43), occupying 50.89% of the average thickness of fibers analyzed.

Besides the above (conformation, constitution, physical development, colors, etc.) in the same races or populations meet and differences between individuals on the shape and size of the horns, ears, shape and degree of udder development, and other issues that relate to the presence of horns, ears, tassels or beard. The evaluation of the six populations studied, it was observed that over 50% of them had fully developed horns and ears, as illustrated in Table 4.

Table 4. External features characterizing local goats in northeastern Romania

No. crt.	Pecularity	Unit	
		No. of heads	% of the herd
1.	Goats with horns	460	50.44
2.	Goats with beard	826	90.57
3.	Goats with tassels	308	33.77
4.	Goats perk up	160	17.18
5.	Tufted goats	214	23.46
6.	Total heads	912	100.00

The data in Table 4 shows that, in populations studied there are differences between individuals in respect of certain external features. Thus, the total herd in the study 90.57% of individuals had beards, earrings were 33.77% and approximately 17% of them are without ears.

As regards the horns, differences were observed both in shape and size. Thus, the horns have a position rearward and upward, but more or less directed to the side,

depending on the individual. The shape is slightly flattened, sword-shaped, curved or slightly twisted to the side or/and up. Length of horns varies from one individual to another, with an average of about 35 cm. The ears have specific shapes, average length of 17 cm, being held in lateral position. Goats belonging to the local populations have a characteristic mammary gland, with different sizes, depending on their productivity at more than 75% of individuals having an

udder shape. The most common defects in mammary gland refers to the udder with teats thick (15.37% of individuals) and cone-shaped bag (9.63% of the herd), the form caused by the large difference in volume between the two nipples (compartment was barren). It should also be noted that the goat population studied, the mammary gland was not observed the presence of additional nipples.

2. Reproductive parameters. Regarding breeding technologies applied in the farms studied, they were not very advanced. Thus, apart from Popăuți Research Station, Botosani, where several actions have been implemented to coordinate reproduction by

applying a directed matings, in the other farms has been random mating. Before the mating season, in any of the farms surveyed, no one ever made in terms of preparedness to supplement feed rations, which could stimulate the development of multiple follicles and hence poly-ovulation. In terms of technical and economic, breeding efficiency is assessed by calculating breeding indices. They represent an absolute or relative value, which measures how reproduction takes place in a livestock farm. Based on data obtained from breeding records of the populations studied were able to calculate the main indices of breeding (Table 5).

Table 5. Breeding indices specific for local goats in North Eastern Romania

Specification	Unit	Geographical area						Total
		Bacău	Botoșani	Iași	Neamț	Suceava	Vaslui	
Adult goats		70	236	320	89	103	120	938
Goats mounted		69	233	314	89	103	120	928
Goats aborted		4	8	12	5	2	6	37
Goats kidded	Heads	64	223	295	74	99	112	867
Kids kidded		87	304	377	93	120	143	1124
Kids live kidded		85	304	370	93	120	143	1115
Non-viable Kids		0	0	5	0	0	0	5
Dead Kids		2	0	2	0	0	0	4
Abortion		6	11	15	5	2	8	47
Fecundity		98.6	99.1	97.8	88.8	98.1	98.3	97.4
Prolificacy	%	132.8	136.3	127.8	125	121.2	127.7	129.6
Fertility		126.1	130.5	120.1	104.5	116.5	119.2	121.1
Birth rate		92.8	95.7	94.0	83.1	96.1	93.3	93.4

Analysis of the data presented in Table 5 shows that the fecundity index recorded in populations under study has an average of 129.6%, with limits ranging from 121.2% (at the farm in Suceava) and 132.8% (at the farm of Iasi), a value relatively lower than that presented in the literature [6]. Lower value of this index can be attributed to poor maintenance and operating conditions, and the fact that these populations have not been the subject of selection and breeding stock.

Since the inclusion of normal fertility index is when, at the end of the plan, exceeds the proportion of 85 - 90% of the total herd, it can be said that the populations studied, the average value of this index is very good (97.4%), slightly higher than that reported by other researchers in studies made on the same race [6; 8].

The data presented above can be concluded that goat populations in north-eastern Romania is characterized by high fertility and birth rate, but at the same time,

by the low fecundity and fertility for this species, which recommends immediate application of measures of selection and breeding. These measures can be easily applied by reforming goats that do not correspond in terms of productive and reproductive, but also by purchasing some goats of high genetic value and applying a directed matings.

CONCLUSIONS

Evaluation of six populations of goats, in terms of morphology and reproduction, can be found through the following statements:

Local populations of goats in north-eastern Romania has a body formed dolicomorf with medium size, with a predominantly white color, and horns and ears of different shapes and sizes.

Also, in terms of reproductive, goat populations studied have a high fecundity, but with a much lower prolificacy index compared with specialized breeds.

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