

COMPARATIVE EXTERIOR MEASURES OF PRAMENKA SHEEP RAISED IN THREE LOCALITIES IN BOSNIA AND HERZEGOVINA

ORIGINAL SCIENTIFIC PAPER

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ABSTRACT:

The aim of the research was to measure the basic external characteristics of Pramenka sheep (ridge height, from the ground to the highest ridge point, lower back height, from the ground to the highest lower back point, hull length, chest width, chest depth, chest circumference, hull circumference, shin circumference, body weight) with the aim of comparing the measured values in order to assess the impact of breeding areas on them. Domestic kind Pramenka (Kupres strain, Vlašić strain) were used in this research. There were 36 sheep in the experimental group, and the same number in the control group. Experiments were performed on long-term purebred herds of Pramenka on three private farms in the Una-Sana Canton, 2 municipalities of Cazin, 1 municipality of Bihać, as well as on one private farm in Central Bosnia (area of the municipality of Travnik), and one in the municipality of Kupres (Livno Canton). Based on the presented average values of the external properties of Pramenka sheep and their variations for all examined localities, we can conclude the following: that the sheep are longer in relation to their height and that the Pramenka is of medium physical development, that the differences in body measures in the examined areas are greatly influenced by the origin of certain breeds of Pramenka sheep (Kupres strain, Vlašić strain), as well as the quality of pastures and unequal access to food. By comparing our results with the results of other authors who examined the exterior of other strains of Pramenka (from region in Croatia: Rab, Lika, Pag, Istria) in our wider environment concluded that Vlašić Pramenka is the largest strain of Pramenka in this area.

KEYWORDS: sheep, exterior, measures

INTRODUCTION

Sheep farming in Bosnia and Herzegovina, along with cattle breeding, is one of the main branches of livestock production. In 1990 in Bosnia and Herzegovina, the number of sheep was about 1.3 million, and in 1960 it was even larger and amounted to about 2.2 million. This indicates the fact of a significant decline in 30 years, even by 41%. In the last period the number of sheep suffered even bigger fall, and since the list has not been made for a long time, it is not possible to say with certainty how many sheep there are today in BiH.

The characteristics of sheep breeding in developed countries is that with intensification of agriculture, the number decreases, but therefore increases production. Although the number of sheep in BiH has decreased, however, there was no significant increase in production.

From the earliest times natural meadows have been most successfully exploited with sheep. They

are together the greatest absolute sources of food for sheep, in relation to other species of domestic animals. That is why hill and mountain areas, economically speaking, can be most successfully used by sheep breeding. The existing population of sheep in BiH in a high percentage is Pramenka with a large number of strains (around 80%), and in smaller number are represented by various types of crossbreeds (around 20%). Production capabilities of domestic Pramenka are low, which implies a small body weight of adults, low production of meat and milk, and low yield of unwashed coarse wool. Some strains make even the tiniest sheep in the world, such as let's say, Pramenka from the area of Stolac in Herzegovina.

Exterior presents external appearance, that is, development and connection of individual parts of the body, then the size of the whole body and its overgrowth and the color of the wool in sheep, as well as everything else that can be seen on them and can be measured and evaluated (horns, hooves, etc.). Exterior

assessment is of particular point when it comes to breeding choice [1]. Nikolić et al. [2] a good assessment of the exterior is considered to be a powerful means which a reliable picture of their breeding value can be created. The exterior of domestic animals can be assessed in three ways, and those are: by measuring the development of individual parts of the body and determining the body measurements of the animal with the help of special accessories for this purpose, by assessing the appearance of the said parts by photographing the animals. The animals should stand on a flat and firm surface during the measurement. Body dimensions are taken in the following order: height, length, depth, width and volume. The measurement is performed on the left side of the animal. The measurement of domestic animals is of special importance because only by measuring can reliable and accurate data on the development and relations of individual parts of the body and the animal as a whole be established. The data obtained by measurements are entered in the appropriate registers. Based on the data obtained by measuring animals, it is possible to monitor their growth from birth to full physical development.

A large number of authors have investigated the exterior characteristic of some strains of Pramenka and crossbreed. The works of following authors stand out in particular: [3], [4], [5]. Pramenka as a breed makes up about 80% of the sheep stock in BiH. It is grown in hilly mountain areas, where food is not available in winter. In many areas it finds itself in search of food as a nomadic animal. It is characterized by high resistance to disease. It is suitable for long distance and good use of lawns. It belongs to the group of long-tailed Balkan Pramenka. There are large number of strain that differ from each other in age and production characteristics, which is the result of action of existing environmental factors. The division into strains was performed according to the area of cultivation and variability at external and production characteristics. The most famous strains are: from Vlašić region (Dupska, Travnik), Kupres strain, Privor strain, Duvanjski strain, Glamoč strain, Gatac strain, Ključ strain, Stolac strain, Podveležki strain and others [3]. The hull is rectangular in shape, with length of the hull being greater in relation to the height of ridge. The height of the ridge in sheep ranges on average from 63.5-66.9, and length of the hull from 67.7-69.8 cm. The depth of the chest is 28.4-36.5 cm, the width of the chest is 18.8-23.5 cm, while the circumference of the chest is 67.0-94.5 cm. The body weight of sheep ranges from 20.0-50.0 kg, and rams up to 70.0 kg, noting that the upper limits of variability may be higher [6], [7], [8], [9], [10], [11], [12], [13].

MATERIALS AND METHODS

The paper presents the results of measurements and analysis of exterior properties. Domestic strains of Pramenka (Kupres, Travnik) were used for research. There were 36 sheep in the group of experimental animals. The experiments were performed on long-term purebred herds of Pramenka on three private farms in Una-Sana Canton, two in the municipality of Cazin (Mutnik I i Mutnik II), one in the municipality of Bihać (Gata), as well as one on private farm in Central Bosnia (Travnik municipality) and one in Kupres municipality (Livno Canton). The results of measurements and analysis of external properties of sheep of the examined breed using standard methods and methods of measurements are presented. Ecological factors together with the hereditary characteristics of the animal shape the types or breeds suitable for the existing environmental conditions. Therefore, judging the exterior is the oldest way to assess breeding value. Every trait we want to select must be measurable.

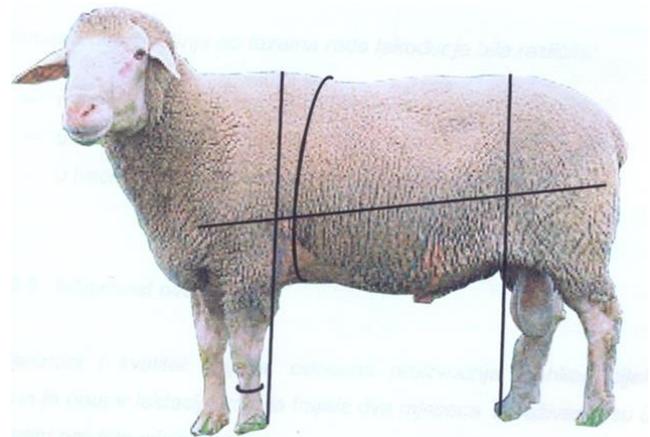


Figure 1. Marked places where body measurements are taken in sheep

For the development of the breeding program it is especially important to know the phenotypic and genotypic parameters of each trait, and especially those traits that are inherited. We try to use them as heterosis effect- since the body structure represents a certain form of its biological mass, so there is a certain connection between it and production characteristics. To assess the body of an animal, each part of the body is assessed. In this paper, measurements of individual body parts were performed to assess the exterior using a Lydthin rod and tape. A total of 180 heads were measured at the mentioned 5 locations. The following measurements were made:

- Height of the ridge, from the ground to the highest point.

- Trunk length, oblique distance from another edge of the shoulder-scapular joint to the posterior point of the static bone.
- Chest width, measured just behind the shoulder blade.
- Chest depth, vertical distance from the top of the ridge to the lower edge of the sternum.
- The circumference of the breasts, the circumference of the carcass behind the shoulder blades (tape), the circumference of the shin, measured at the thinnest point of the shin (tape).
- Body weight, weighing the body of the animal with a livestock scale.

RESULTS AND DISCUSSION

Table 1. Values of exterior measures of examined sheep from 5 localities.

Locality	Body weight (kg)	Shin circumference (cm)	Chest width (cm)	Chest circumference (cm)	Chest depth (cm)	Chest length (cm)	Cross height (cm)	Reef height (cm)
Gata	65,27	8,47	22,73	90,60	36,88	71,63	67,86	67,89
Mutnik I	65,44	9,16	24,77	93,20	39,67	74,98	70,26	70,63
Mutnik II	66,25	9,99	26,88	95,19	43,26	78,91	73,21	73,74
Vlašić	69,52	10,40	29,55	98,49	44,53	80,99	75,31	75,72
Kupres	57,95	8,27	21,62	86,43	33,74	69,39	69,39	64,56

Locality Based on the presented average values and their conclusion that the sheep are longer in relation to their height. We also conclude that Pramenka is of medium physical development, but it is more developed than most Mediterranean sheep breeds, but also physically inferior in relation to meat and meat - wool sheep breeds. If we compare these results with the results of about 30 years ago [6], we can see a larger body frame of today's breeds Pramenka expressed through all established body measures (height, length, depth, circumference and body weight). This can be attributed to the genetic influence of larger genotypes and better nutritional conditions in the examined areas.

Based on the presented results in the mentioned areas of research, we can conclude that the differences in body measures in the examined areas are greatly influenced by the origin of certain breeds - strains of sheep breed Pramenka (Kupres strain, Vlašić strain) as well as the quality of pastures and unequal access to food.

In particular, we can notice the difference between the examined areas of Kupres and Vlašić where it is observed that sheep from the area of Kupres are lower than other sheep from other areas of research, as well as that they are shorter and less body weight. Pavić et al. [14] state similarly. However, if we compare the obtained results of the examined sheep with sheep of Croatian sheep breeds, we conclude that ours are much more developed with an emphasis on differences in

breast width (about 30%) and body weight (about 20%), and this is especially reflected in the works [15], [16], [9], [17], [12], [18], [19], [13]. However, based on the obtained results, our pramenka from Kupres has a significantly smaller body frame than the Croatian Istrian sheep [20], [21]. Similar results to our research are given by Omanović [8] and Ivanković et al. [22] when it comes to the exterior of the Kupres pramenka.

When it comes to sheep of the Vlašić strain pramenka, the results of our research in comparison with the research of other authors [23] show small deviations in the following body measures: ridge height (76, 92 cm [23]; 76.42 cm [13]), body length (84.69 cm: 81.65 cm), shin circumference (10.34 cm: 10.44 cm) and body weight (74.89 kg: 70.01 kg). By comparing the results of Pavić et al. [14] with our results of research of the exterior of Travnik pramenka we come to the conclusion that our results differ significantly, which is confirmed by the following values of body measures: sheep body weight 70.74 kg, ridge height 66.76 cm, body length 73.86 cm, shin circumference 8.68 cm.

By comparing our results with the results of other authors who examined the exterior of other strains of pramenka (from region in Croatia: Rab, Lika, Pag, Istria) in our wider environment, we conclude that Vlašić pramenka is the largest strain of pramenka in this area.

Table 2. Values of exterior measures of examined rams from 5 localities.

Locality	Body weight (kg)	Shin circumference (cm)	Chest width (cm)	Chest circumference (cm)	Chest depth (cm)	Chest length (cm)	Cross height (cm)	Reef height (cm)
Gata	74,30	10,32	33,11	101,32	47,41	84,16	78,76	79,14
Mutnik I	73,82	10,42	32,96	101,21	47,36	84,09	78,56	79,00
Mutnik II	79,84	11,16	35,80	105,08	50,96	87,04	81,54	81,90
Vlašić	78,35	10,68	33,62	102,72	48,36	86,42	79,16	79,58
Kupres	79,86	9,54	27,04	96,14	41,96	78,18	72,66	73,12

Based on the presented average values and their variations for all localities, we can conclude that the rams are longer in relation to their height. We also conclude that rams of the Pramenka breed are, as a rule, larger in body frame and have a stronger constitution than sheep, which was confirmed by this research.

Comparing the body measurements between sheep and rams of the Pramenka breed by research sites, we can conclude the following: at the Gata site in the municipality of Bihać, rams are 13% taller than sheep, 13.5% longer, 27.6% wider and 12% taller. %; at the locality Mutnik I in the municipality of Cazin rams are higher by 10%, longer by 10.5%, wider by 23% and higher body weight by 10.3%; at the locality Vlašić rams are higher by 4%, longer by 3.5%, wider by 10.8% and higher body weight by 10.6%; at the locality Kupres rams are higher by 11.5%, longer by 11%, wider by 10.4% and significantly higher body weight by 20% and at the locality Mutnik II in the municipality of Cazin rams are higher by 9.7%, longer by 9.1 %, wider by 24% and higher body weight by 16.8%. Similar results are stated by Ivanković et al. , [22], where the rams of Kupres pramenka were 8.5% taller than the sheep, 10% longer, 14.8% wider and 36% taller.

The rams of our domestic pramenka, which were measured, compared to others of the same or different breeds have a significantly larger body frame, are longer and have higher body weights, such as Indian Marwari rams [24], Tibetan rams [25], rams of Lika pramenka [18], rams of Dubrovnik ore [15], Krk sheep [16], Pag sheep [9], Cres sheep [17], Rab sheep [12] and Dalmatian pramenka [19]. However, we can conclude that the rams of Kupres pramenka are significantly less developed than the rams of Travnik pramenka, which is confirmed by the results of other authors [14], [23]. Also, the rams of the Kupres pramenka are less developed than the rams of the Istrian sheep [20] and the rams of the cigaja [21].

In the examinations, Omanović [8], states similar results for the Kupres pramenka, but significantly

different results for the exterior of the Merinolandschaf (Württemberg) rams. The rams of the Wirtmeberg sheep are significantly more developed than the rams of our domestic pramenka, as follows: the height of the crest averages 83.00 cm, the height of the cross 83.25 cm, body length 85.75 cm, chest depth 35.94 cm, chest circumference 113.25 cm, chest width 27.37 cm, shin circumference 10.96 cm and body weight 116.56 kg.

CONCLUSION

1. Based on the presented average values of external properties of Pramenka sheep and their variations for all examined localities, we can conclude the following:

- That sheep are longer in relation to their height and that Pramenka is of medium physical development.
- That the differences in body measures in the examined areas are greatly influenced by the origin of certain breeds - sheep strains of the Pramenka breed (Kupres strain, Vlašić strain), as well as the quality of pasture areas and unequal access to nutrition.
- By comparing our results with the results of other authors who examined the exterior of other strains of pramenka (from region in Croatia: Rab, Lika, Pag, Istria) in our wider environment, we conclude that Vlašić pramenka is the largest strain of pramenka in this area.

2. Based on the presented average values and their variations for all localities, we can conclude that rams are longer in relation to their height, and also, we conclude that rams of the Pramenka breed are generally larger in body frame and stronger constitution than sheep, which was confirmed by this study.

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