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Morphometric characteristics of local cattle breed "Busha e Dukagjinit" managed in Kosovo

PËLLUMB ZALLA[1*]; ENKELEDA OZUNI[1], VASILIKA DINI[1], EGON ANDONI[1], KUSHTRIM MUÇAJ[2]

[1]Faculty of Veterinary Medicine, Agricultural University of Tirana, Albania

[2]Private practical veterinarian

*Corresponding author; E-mail: pellumbzalla@gmail.com

Abstract

This study was carried out in Busha cattle managed in western part (Prizren region) of Kosovo. A total of 60 Busha cattle aged between 6 months to 6 years old, randomly selected from herds in study area. The body measurements selected parameters were: wither height; rump height; rump width; body length; fore leg length; face length; neck length; neck circumference; chest circumference. The linear measurements (cm) were taken using a tailor's measuring tape and excel ANOVA single factor was used to analyze the data. There is an obviously positive tendency regarding to all morph metric traits values and age (wither height 80.40±2.85 – 117±4.56; body length 90.21±4.88 – 122.83±2.48; neck length 24.83±2.94 – 44.16±1.16; neck circumference 57.00±2.52 – 85.83; chest circumference 103.60±1.94 – 141.53±2.34; rump width 23.00±1.41 – 34.83±1.16; face length 28.00±0.70 – 43.50±2.16; fore leg length 34.61±1.81 – 53.16±2.63; rump height 88.00±3.24 – 121.00±4.16). Statistical analyses indicate that there are significant differences ($\alpha \leq 0.05$) in morphological study parameters between age groups. There is a positive correlation (r 0.23 – 0.99) between certain age groups and all study parameters.

Keywords: Busha cattle, age, body measurement, statistical analyses.

1. Introduction

Busha cattle (*Bos brachecerus europeaus*) is a local breed managed in western part of Kosovo and northern part of Albania. The total population of Busha cattle has been estimated as 13300 individes [2]. Busha cattle is a risked breed with small body and it is adapted to extensive menagement condition and up to highest altidude. It si very resistant to several major disease, including internal and external parasites. Morphological parameters are used to characterize different breed and estimate their exteriority. Body wheight is important trait in the cattle farms, but it is not very practical. Therefore, the evaluation of body weight was estimate indirectly by using morphological data [12]. In order to evalute both quantitaty and qualitaty of body size are used linear body measurements [8, 9]. Quantity measures dimenssion and body conformation are important to estimate genetic parameters in the breeding programs of cattle [5]. Alderson, 1999 developed a linear system of body measurements, which provide a useful tool to evaluate body configuration and life body weight. This is important, particularly for replacement animals and improving genetic parameters. Differences in body size is one of most parameters used for breed classification [6]. There is association between linear meassurements and yeild production, general performance and carcase characteristics of farm production animals. Morphological and morphometric studies of body region do not reflect only contribution of genetic and environmental components to individual development and describe genetic and ecophenotipic variation, but also are foundation of clinical and surgical practices [10; 15]. The aim of study was evaulation of morphometric parameters according to age in Busha cattle.

2. Material and Methods

This study was carried out in western part (Prizren region) of Kosovo. A total of 60 Busha cattle aged between < 1 and + 5 years (0 – 6 month: 6 – 12 m: 12 – 24 m; 24 – 36 m; 36 – 60 m; + 60 m) were randomly selected from flock in study area.Cattle are managed in the extensive system. We collected data for each animal, according to a

properly designed template document: climacteric zone, type of management, sex, age, morph metric parameters and physiological status. The linear body measurements taken were: wither height (WH); rump height (RH); rump width (RW); body length (BL); fore leg length (FLL); face length (FL) neck length (NL); neck circumference (NC); chest circumference (CHC). The linear body measurements (cm) were taken using a tailor's measuring tape. Data collected were evaluated by using Anova method.

3. Results and Discussion

Species phenotypic feature are genetic characteristic expression are affected by environment conditions. Both genetic and environments condition may impact in phenotypic changes. The results of this study are summarized in the Table 1. The date shows that there is an increasing of numeric value of morphological parameters by age increase. Wither height is 80.40±2.85-117.17±4.56; BL is 90.21±4.88 - 122.83±2.48; NL is 24.83±2.94-44.16±1.16; NC is 57.00±2.52 - 85.83±2.63; CHC is 103.60±1.94 - 141.53±2.34; RW is 23.00±1.41- 34.83±1.16; FL 28.00±0.70 - 43.50±2.16; FLL is 34.61±1.81-53.16±2.63; RH is 88.00±3.24 -121.00±4.16. The highest rate increase of values for all study parameters were recorded in animals ages 0 - 12 month. However, there were less than results reported for Red Chittagong cattle [4,7], Indian Deoni cattle [13], Bangladeshi cattle [11]. Bhuiyan, 2007 reported higher value for body length of Pabna cows (164.39±2.36 cm) than ours, while Singh, 2016 in a study for Sahiwal cattle reported higher values for body length (139.13±1.26), wither height (125.13±1.34) and similar data for face length (43.21±1.21). Our results indicate an increasing tendency of wither height and body length according to age. Similarly results are reported for Red Chittagong cattle [4] and Sahiwal cattle [13]. Statistical analyses indicate that there are significant differences ($\alpha \leq 0.05$) in morphological trait between age group. (Table 2). There are a positive correlation between certain age groups and all study parameters (r 0.23 - 0.99) (Table. 3). The strongest correlation were observed for body length (r 0.54 – 0.99) and rump height (0.57 – 0.83) (Table 3). Linear body measurements can be used as useful method to assessment phenotypic and genotypic characteristics of Busha cattle breed. There was a large variation in the body measurements which could be important for genetic improvement of these traits especially body weight as this is an economically important trait. However, as this is phenotypic variation, this variability may not be translated directly into genetic variation as this could be due to environmental factors.

Table 1. Morph metric measurements of Busha cattle for different age classes.

Age (month)		WH	BL	NL	NC	CHC	RW	FL	FLL	RH
O - 6	MEAN	80.40	90.21	24.83	57.00	103.60	23.00	28.00	34.61	88.00
	SD	2.85	4.88	2.94	2.52	1.94	1.41	0.70	1.81	3.24
6 - 12	MEAN	97.66	104.16	33.16	63.66	113.16	28.83	35.00	41.33	109.66
	SD	3.17	2.94	2.71	3.88	1.72	2.13	1.78	1.75	2.71
12 - 24	MEAN	108.66	116.41	40.50	69.00	117.50	32.51	40.83	48.83	113.33
	SD	2.65	1.33	1.04	2.36	1.87	1.64	1.47	1.47	2.58
24 - 36	MEAN	111.66	120.83	43.53	76.66	127.33	33.16	42.66	51.16	115.5
	SD	2.58	1.83	2.34	1.75	3.26	0.98	0.81	1.94	1.87
36 - 60	MEAN	115.17	122.33	44.00	83.16	132.50	34.53	43.00	52.52	118.03
	SD	1.72	2.55	1.40	1.32	2.66	1.51	1.26	2.25	3.28
+ 60	MEAN	117.00	122.83	44.16	85.83	141.53	34.83	43.50	53.16	121.00
	SD	4.56	2.48	1.16	2.63	2.34	1.16	2.16	2.63	4.16

Table 2. Analyses of variation (ANOVA) for different parameters.

Stat.	WH	BL	NL	NC	CHC	RW	FL	FLL	RH
$\alpha \leq$	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
F crit	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63	2.63
F fact	34.49	12.78	41.40	63.22	48.92	31.44	71.63	70.19	25.74

Table 3 Relationship between morphological traits and age.

Correl.	WH	BL	NL	NC	CHC	RW	FL	FLL	RH
Min	0.30	0.54	0.49	0.23	0.34	0.30	0.34	0.48	0.57
Max	0.88	0.99	0.85	0.83	0.81	0.83	0.81	0.87	0.83

4. Conclusions

Based our study results, there is positive correlation between age and morphological measurements of Busha cattle. There is an obviously significant increase rate for study parameters in young animals, particularly at 0 - 12 month age old. In addition, linear body measurements can be used as useful method to assessment phenotypic and genotypic characteristics of Busha cattle breed.

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