

Morphometric Characteristics of the Taro White Cattle in Bali

¹Luh Gde Sri Surya Heryani, ¹I. Nengah Wandia, ²I. Wayan Suarna and ³I. Ketut Puja

¹Laboratory of Veterinary Anatomy, Faculty of Veterinary Medicine,
Udayana University, Bali, Indonesia

²Tropical Forage Research and Development Center, Udayana University, Bali Indonesia

³Veterinary Genetics and Reproduction Technology Laboratory,
Faculty of Veterinary Medicine, Udayana University, Bali Indonesia

Abstract: The present investigation was undertaken to study morphometric characteristics in Taro White Cattle. The morphological measurements pertain to 24 indigenous cattle including different sex. The body length, body height, chest depth, chest width, chest circumference, hip length and width, head width and length were taken up for morphometric characterization. Morphometric characteristics data obtained were classified according to sex of the animal. In a total of 24 morphometric study, the means for body length, body height, chest depth, chest width, chest circumference, hip length and width, head width and length were 96.58 ± 7.40 ; 111.96 ± 8.04 ; 27.38 ± 3.13 ; 46.04 ± 5.45 ; 121.17 ± 15.13 ; 108.33 ± 8.67 ; 34.17 ± 4.47 ; 37.54 ± 4.64 ; 17.54 ± 3.46 , respectively. Sex had significant effect on body length, body weight, chest width, chest diameter, hip height, head length and head width however, chest length and hip width effect was non-significant. In conclusion, the morphometric data obtained in this study might be useful tool in strategies for conservation.

Key words: Cattle • Morphological Traits • Characterization • Bali

INTRODUCTION

Cattle is the one of animal that can be found in almost all of countries in the world, including Indonesia with high species diversity. Taro White cattle is one of indigenous cattle in Bali (Fig.1). They are tropically well adapted and concentrated only in limited area of Taro Village, district of Tegalalang, Gianyar Regency, Bali Province. Taro White cattle has distinct phenotypic characteristic from the other indigenous cattle in Bali. The Taro white cattle has white coat color and managed under extensive conditions in small area. The origin of this cattle is unknown, but the people of Taro believed that they brought originally from India by the great Rishi Markandeya.

Recently, there are 33 Taro White cattle breeds in this village. Based on the number of population and the following classification is used by FAO [1] Taro white cattle was considered a critical breeds. Loss of typical breeds, therefore, means a loss of cultural identity for the communities concerned and the loss of part of the heritage of humanity. To ensure that unique genetic resources are available in the future and consequently,



Fig. 1: Taro White cattle calf

conservation can be considered as part of an overall strategy to use Taro White cattle in a sustainable manner. However such programs for the conservation of Taro white cattle lack of scientific information on morphological traits.

Characterization of livestock breeds is the first approach to a sustainable use of its animal genetic resources [2]. The phenotypic information will be the basis for the establishment of further characterization,

conservation and selection strategies [3]. Morphological measurements have been traditionally used for characterization of native cattle breeds by many researchers [4-6]. The morphometric data useful tool in future strategies for cattle breeding [5]. Morphometric traits measurements can be an essential tool for the program selection and breed improvement [7]. Thus, the techniques for the analysis of the morphometric are an essential ingredient for the programs of conservation and improvement. Since none of the morphological data for Taro White cattle has previously been studied, in the present work we analysed nine body linear measurements to characterize this breed. Although, the population of Taro white cattle in the village very small, it offers tremendous potential for exploitation as social culture roles for the the people. The objective of this study was to provide information about morphometric characteristic of the Taro white cattle in Bali as part of strategy for breed conservation programme. Data presented here are the first report on the morphology of this breed.

MATERIAL AND METHODS

The present investigation was carried out in the Taro village, district of Tegallalang, Bali. Investigation pertaining to morphometric characteristics under field conditions were recorded by observation. The studied animals are comprised of 16 female and 8 male that were traditionally managed. Morphological traits were recorded in centimeter with the help of measuring tap. The body measurements taken on each animal were: body length, body height, chest depth, chest width, chest circumference, hip length and width, head width and length. All measurements were taken with the animals standing on a flat surface. Mean (X), maximum and minimum values, standard deviation (SD), were computed for each body linear measurement. The data obtained for morphometric characteristics were classified according to sex of the animal. The t-test was done to examine whether there are significant differences in the morphometric characters between the sex of animal [8].

RESULTS AND DISCUSSION

In a total of 24 morphometric study, the means for body length, body height, chest depth, chest width, chest circumference, hip length and width, head width and length were 96.58 ± 7.40; 111.96±8.04; 27.38±3.13;

Table 1: Means, standard deviation and range of body measurement of Taro White cattle

Traits	n	Means	SD	Range
Body Length (cm)	24	96.58	7.401	83-121
Body Height (cm)	24	111.96	8.405	99-134
Chest width (cm)	24	27.38	3.132	23-39
Chest Length (cm)	24	46.04	5.457	38-59
Chest diameter (cm)	24	121.17	15.139	102-160
Hip Height (cm)	24	108.33	8.671	95-131
Hp width (cm)	24	34.17	4.479	25-47
Head Length (cm)	24	37.54	4.644	32-47
Head width (cm)	24	17.54	3.464	13-23

46.04±5.45; 121.17±15.13; 108.33±8.67; 34.17±4.47; 37.54±4.64; 17.54±3.46, respectively as seen in Table 1 and Table 2.

In the present study, body traits were significantly greater in some morphometric variables for male bulls (Table 3). The body length, body weight, chest width, chest circumference, hip height, head length and head width were found to differ significantly between different sex of the animals (p<0.05). There were no significance of difference (p <0.05) between male and females in hip length and head length.

Taro, is one of the ancient village in Bali where by you can find sacred white cows sanctuary that are rare to the island. The Taro people called them Taro White cattle. The people respect to the white cattle as sacred animal. The people defend that genetic resources mainly used for ritual occasion [9].

Various morphometric measurements play key role in identification between and within various cattle breeds [3]. The morphometric measurement is conducted for characterize breeds of animals. These type morphometric measurements in Taro White cattle are important to establish a basis of identification of this breed. The morphometric characters recorded in the present study revealed that the Taro white cattle are comparatively rather small in size than of the recognized breeds of cattle in Bali. The results of our study were found to be lower than the results of other studies for Bali cattle who reported that the average for body length and body height. In Bali cattle, the minimum and maximum measurements in adults for body length and body height were reported to be 111cm-145cm and 116 cm-160 cm respectively [10]. Some morphometric characteristic recorded for adult Taro white cattle was alike to Bali cattle but, variations exist which might be due to difference in breed. The result of body length found in the present study was lower than the result for Achai cattle from Pakistan [6] and for Red Chitagong cattle in Bangladesh [11].

Table 2: Body measurement of Taro White cattle

Traits	Category	Number	Minimum	Maximum	Mean	Standar Deviation
Body length	Female	16	83	97	93.25	4.509
	Male	8	96	121	103.25	7.760
Body height	Female	16	99	114	108.00	5.404
	Male	8	110	134	119.88	7.882
Chest depth	Female	16	38	49	44.88	2.630
	Male	8	38	59	48.38	8.585
Chest width	Female	16	23	29	25.94	1.526
	Male	8	28	39	30.25	3.615
Chest circumference	Female	16	102	130	112.00	6.733
	Male	8	130	160	139.50	8.928
Hip length	Female	16	95	111	104.38	5.608
	Male	8	105	131	116.25	8.498
Hip width	Female	16	25	37	33.12	4.113
	Male	8	32	47	36.25	4.713
Head length	Female	16	32	40	35.06	2.144
	Male	8	35	47	42.50	4.342
Head width	Female	16	13	20	15.38	1.708
	Male	8	20	23	21.87	.991

Table 3: Comparison characteristics of Taro White cow male and female

	Sex	N	Mean ±SD	P
Body Length	Male	8	103.25±7.760	0.001
	Female	16	93.25±4.509	
Body Height	Male	8	119.88±7.882	0.001
	Female	16	108.00±5.404	
Chest width	Male	8	30.25±3.615	0.001
	Female	16	25.94±1.526	
Chest Length	Male	8	48.38±8.585	0.142
	Female	16	44.88±2.630	
Chest diameter	Male	8	139.50±8.928	0.001
	Female	16	112.00±6.733	
Hip Height	Male	8	116.25±8.498	0.001
	Female	16	104.38±5.608	
Hip Width	Male	8	36.25±4.713	0.108
	Female	16	33.12±4.113	
Head Length	Male	8	42.50±4.342	0.001
	Female	16	35.06±2.144	
Head width	Male	8	21.88±0.991	0.001
	Female	16	15.38±1.708	

The body length, body weight, chest width, chest circumference, hip height, head length and head width were higher in male sex. This result showed that the different morphometric traits of Taro white cattle were significant with sex. Which was similar to those obtained in Dhofari cattle [7] and in Kenana cattle [12].

In conclusion, the morphometric data obtained in this study is vital and valuable in management and useful tool in future strategies and should be well utilized to improve the performance of Taro white cattle.

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