Phenotypic Characteristics Of Doro Ncanga Swamp Buffalo Reared Extensively on the Native Savannah of Tambora Dompu Regency

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ABSTRACT

Phenotypic characteristics are important in breed identification and classification. This study was undertaken to characterized phenotypically Doro Ncanga swamp buffalo on the native savannah of Mt. Tambora. A total of 3 measurements, i.e. body length (BL), height at withers (HW) and heart girth (HG) were collected on 693 female and 279 male buffaloes kept extensively in Manggelewa, Kempo and Dompu District, Dompu Regency. The data were classified on the basis of age group and sex. The morphometric characteristics observed in the present study suggested that for female buffaloes: no significant different ($p>0.05$) of BL, HW and HG of calves in the three districts was observed. The BL of heifers in Dompu was longer ($p>0.05$) than that in Kempo. Similarly for cows, BL recorded in Manggelewa was longer ($p>0.05$) than that in Dompu. However, the differences in HW for cows reared in all districts were not significant ($p>0.05$). Except for HG, cows in Manggelewa were greater than that of Kempo and Dompu ($p<0.05$). Measurements of BL, HW, HG in both old and aged cows did not indicate any significant differences ($p>0.05$) among the three locations. For male buffaloes, the study recorded that BL and HW in calves were found to be non significant ($p>0.05$). Conversely, HG of calves in Dompu was greater ($p<0.05$) than that in Kempo and Manggelewa; the differences in HG in the two latter districts were also significant ($p<0.05$). In the case of young bulls, BL noted in Manggelewa was significantly ($p<0.05$) longer than in Dompu. The study also found higher ($p<0.05$) HW of young bulls in Kempo and Manggelewa than that in Dompu. In conclusion, the parameters examided varied both across the age groups and locations. It seems that the more age of the animals the greater their body size.

Keywords: Swamp buffalo, Characterization, Morphometric Measurements

INTRODUCTION

Doro Ncanga swamp buffalo plays an important role in the agricultural economy of Dompu Regency. This domestic buffalo raised by farmers in primarily for meat, while milk being of secondary importance. This breed is native and well adapted on the native savanna of mountainous Tambora in Sumbawa island, West Nusa Tenggara Province. Increasing meat production from Doro Ncanga swamp buffalo might be achieved by producing calves and increasing their growth performance. The first objective can be obtained by increasing dam productivity through regular calving rate, whereas the second one requires enhancement of the growth potential and survival of calves.

Potential growth performance of animals can be predicted through knowledge on phenotypic or morphometric characteristics of the body which is important in breed

identification and classification. In addition, body measurements have been used to evaluate breed performance and characterize various types of ruminants (Tariq *et al*., 2013). Morphometric measurements are simple and easy to conduct, and allow estimating the animal's BW with reasonable accuracy (Sowande and Sobola, 2008). Although the technique is simple to perform, it is subjective and requires expertis; moreover, it is influenced by feeding regime and parity (Roche *et al*., 2009). Tariq *et al*. (2013) reported that body weight (BW) of Nili-Ravi buffaloes can be predicted by reliable method using body measurements. While according to Franco *et al*. (2017), the main body measurements used to predict the weight of dairy cattle among others are heart girth, wither height, and body length.

There is no published data on the morphometric characteristics including body length (BL), height at withers (HW) and heart girth (HG) in Doro Ncanga swamp buffalo. Therefore, the objective of the present investigation was to obtain these linear body measurements in this breed.

MATERIALS AND METHODS

Data on Doro Ncanga swamp buffalo collected at three different district, namely Manggelewa, Kempo and Dompu District, Dompu Regency from from 16 July 2015 to 16 March 12016. This study was conducted using experimental and survey methods.This data included morphometric characteristics (BL, HW, and HG). Data which were available for analysis included 693 female and 279 male buffaloes. For females, data were divided into five age groups (0-6 months = G1; 7-12 months = G2; 13-24 months = G3; 25-36 months = G4; >36 months = G5). For males, data were divided into two age groups (0-6 months = G1; 7-12 months = G2).

A cloth tape measure was used for heart girth (HG) measurement. Body length (BL) and height at withers (HW) measurements were obtained with a metric measuring stick. The measurements were carried out on the animals in a 'forced station', with anterior and posterior members perpendicular on a flat floor, forming a rectangular parallelogram support base. Recorded data were subjected to simple arithmetic means analysis using the Statistical Package for Social Sciences version 17.0 (SPSS Inc. 2007).

RESULTS AND DISCUSSION

The means and standard deviations for BL, HW and HG of Doro Ncanga female buffaloes with different age groups are presented in Table 1. The morphometric characteristics observed in the present study suggested that no significant different ($p>0.05$) of BL, HW and HG in G1in the three districts was observed. The BL of G2 in Dompu was longer ($p>0.05$; 130,25 ± 2,63 cm) than that in Kempo (117,00 ± 2,43 cm). Similarly for G3, BL recorded in Manggelewa was longer ($p>0.05$; 130,73 ± 1,04 cm) than that in Dompu (122,55 ± 2,97 cm).

However, the differences in HW for G3 reared in all districts were not significant ($p>0.05$). Except for HG, G3 in Manggelewa (173,33 ± 2,54 cm) were greater than that of Kempo (158,10 ± 5,09 cm) and Dompu (122,55 ± 2,97 cm) ($p<0.05$). Measurements of BL, HW, HG in both G4 and G5 did not indicate any significant differences ($p>0.05$) among the three locations.

Table 1. Means with standard deviations (x±SD) of different traits in Doro Ncanga female buffaloes with different age groups (N=693).

Age Group (month)	Traits (cm)	District			Regency
		Manggelewa	Kempo	Dompu	Dompu
0-6 / G1	BL	76,52 ±10,58	86,05 ±6,63	76,17 ±11,40	80,25 ±5,37
n=165	HW	98,05 ±10,79	88,05 ±6,90	86,42 ±14,82	91,51 ±5,84
	HG	91,38 ±10,07	112,50 ±8,87	113,92 ±10,99	104,75 ±5,83
7-12 / G2	BL	123,84 ± 1,78	117,00 ± 2,43	130,25 ± 2,63	122,09 ± 1,45
n=132	HW	125,44 ± 4,97	108,87 ± 3,66	107,50 ± 6,75	118,16 ± 3,35
	HG	151,12 ± 6,01	150,80 ± 7,81	171,00 ± 5,77	152,82 ± 4,38
13-24 / G3	BL	130,73 ± 1,04	126,10 ± 1,97	122,55 ± 2,97	127,51 ± 1,08
n=243	HW	118,58 ± 1,03	113,86 ± 1,49	119,75 ± 5,05	117,64 ± 1,40
	HG	173,33 ± 2,54	158,10 ± 5,09	150,65 ± 5,05	163,78 ± 2,44
25-36 / G4	BL	132,14 ± 3,23	130,40 ± 2,52	121,50 ± 3,13	125,69 ± 2,08
n=117	HW	114,86 ± 1,70	124,70 ± 5,84	128,45 12,27	125,05 ± 7,05
	HG	170,86 ± 3,80	175,60 ± 3,39	155,45 ± 16,53	163,38 ± 9,41
>36 / G5	BL	133,67 ± 4,30	137,00 ± 5,13	131,00 ± 9,45	133,83 ± 3,14
n=36	HW	117,50 ± 2,05	121,67 ± 2,40	126,33 ± 44,51	120,75 ± 9,62
	HG	170,00 ± 12,43	158,00 ± 29,55	126,33 ± 44,51	156,08 ± 13,92

Abbreviations:
BL=body length
HW=height at withers
HG=heart girth

The mean values of BL (125,69±2,08 cm), HW (125,05±7,05 cm) and HG (163,38±9,41) in Doro Ncanga female buffaloes aged 25-36 months noted in Dompu Regency are higher than mean values of 109,8±12,2, 110,6±10,1 cm and 139,1±17,2 cm reported for Nilli-Ravi buffaloes dairy aged 12-36 months, respectively (Tariq *et al*., 2013). These differences in body measurements might have been due to differences in management, nutritional, animal numbers as well as in breed of the animals.

The means and standard deviations for BL, HW and HG of Doro Ncanga male buffaloes with different age groups are presented in Table 2. The study recorded that BL and HW in G1were found to be non significant ($p>0.05$). Conversely, HG of G1in Dompu (130,64 ± 5,56 cm) was greater ($p<0.05$) than that in Kempo (98,79 ± 3,22 cm) and Manggelewa (81,67 ± 2,43 cm); the differences in HG in the two latter districts were also significant ($p<0.05$). In the case of G2, BL noted in Manggelewa (115,13 ± 2,82 cm) was significantly ($p<0.05$) longer than in Dompu (99,00 ± 2,95 cm). The study also found higher ($p<0.05$) HW of G2 in Kempo (128,38 ± 7,32 cm) and Manggelewa (125,67 ± 4,86 cm) than that in Dompu (101,69 ± 2,90 cm).

In the present study live body measurements of BL, HW and HG for female calves (G1) tended to increase with ages until the cow reached >36 months (G5). Similar tendency was also revealed in male calves (G1) to young calves (G2). This reflected the increase in body muscles, size and skeleton of the animals during growth and development processes. In the current study, no Doro Ncanga male buffaloes was obtained beyond 12 months of age. This is likely that mature bulls were very rare, if not unavailable in the field to be used for natural mating to breeding females.

Table 2. Means with standard deviations (x±SD) of different traits in Doro Ncanga male buffaloes with different age groups (N=279).

Age Group (month)	Traits (cm)	District			Regency
		Manggelewa	Kempo	Dompu	Dompu
0-6 / G1 n=144	BL	84,50 ± 3,94	88,00 ± 7,12	80,45 ± 2,11	84,96 ± 3,19
	HW	91,72 ± 5,30	86,84 ± 6,88	89,27 ± 4,01	89,23 ± 3,44
	HG	81,67 ± 2,43	98,79 ± 3,22	130,64 ± 5,56	99,67 ± 3,34
7-12 / G2 n=135	BL	115,13 ± 2,82	105,63 ± 3,91	99,00 ± 2,95	108,78 ± 2,12
	HW	125,67 ± 4,86	128,38 ± 7,32	101,69 ± 2,90	119,22 ± 3,41
	HG	150,67 ± 34,03	113,75 ± 7,67	118,92 ± 8,46	134,93 ± 18,35

CONCLUSIONS

In conclusion, the parameters (traits) examided in Doro Ncanga female and female swamp buffaloes varied both across the age groups and locations. It seems that the more age of the animals the greater their body size. Body measurements especially heart girth can be used to predict live body weight of female and male buffaloes.

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