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Research Article

CHARACTERISTICS OF MALE BALI CATTLE IN TOILI DISTRICT

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Abstract: Bali cattle family is one of four native Indonesian cattle breeds that play an important role as a domestic source of meat. Bali cattle have a major problem in their development such as low quality breeds due to inbreeding (internal crossbreeding) or maintenance management. One of the efforts to improve genetic quality and increase cattle productivity sustainably is through Performance testing. The aim of this research was to determine the phenotypic performance of male Bali cattle on community farms in Banggai Regency. The research used 100 male Bali cattle aged 2-3 years. This research used a field experimental method through observing and measuring livestock. The data was analyzed descriptively, describing the facts at the research location. The result show that body hair color of male Bali cattle consisted of brown, dark brown, blackish brown and black. The boundaries of the body color pattern on the legs and buttocks mirror were clearly visible, without any changes or deviations. Body weight of Bali cattle was 204.56 ± 14.32 kg. Body weight was strongly correlated with chest circumference, body length and height.

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INTRODUCTION

Indonesia has a potential of national beef cattle genetic resources, which have been utilized as a source of meat food, labor, energy and fertilizer (Riady, 2004; Romjali, 2018). Maintaining local livestock resources is important to achieve sustainable food security for millions of people. The Bali cattle family is one of four native Indonesian cattle breeds (Aceh, Pesisir, Madura and Bali). Sumba-Ongole and Java-Ongole (PO) cattle are also considered as local Indonesian cattle breeds. Bali cattle play an important role as a domestic source of meat. The high demand for Bali cattle has not been balanced by breeding efforts or matters related to improving the genetic quality of livestock. The impact of livestock exploitation will result in a decline in genetic quality.

The cattle population in Toili District is 9,145 or 10.8% of the total number in Banggai Regency (BPS Banggai Regency, 2018). The available cattle potential is expected to support cattle development in Banggai Regency. The Bali cattle maintenance system in Banggai Regency, especially in Toili District, is still a sideline, where male Bali cattle are kept in pens for a short period of time. This is different from female Bali cattle, where the maintenance system of most farmers and breeders maintains female cattle by letting their cattle forage on open land, which affects their growth. In addition, the decline in genetic quality is also due to negative selection (Hartati et al., 2007). Bali cattle have a major problem in their development efforts, i.e. the low quality breeds which are suspected to be due to inbreeding (internal crossbreeding) or maintenance management. Intra-crossbreeding in beef cattle results in a weight loss of around 2.5-5.0 kg for every 10% increase in inter-crossbreeding. For this reason, real efforts are needed to improve genetic quality. One of the efforts to improve genetic quality and increase cattle productivity sustainably is through Performance testing.

Performance testing is one of the test methods on livestock to determine the level of performance or appearance of cattle to obtain the best performance which is then passed on to their offspring during further testing (Progeny testing). The good appearance of a bull can be measured by measuring its body dimensions in the form of body weight, shoulder height, body length and chest circumference. The increasing age of the livestock also increases the body size and body weight of the livestock (Ismirandy, 2018). For this reason, it is necessary to conduct research on the body sizes of Bali cattle in an effort to develop Bali cattle in the future. This study aims to identify data on the body sizes of Bali cattle in Toili District, Banggai Regency.

MATERIAL AND METHOD

This research has been conducted for 2 months from January to February 2023 in Toili District, Banggai Regency, Central Sulawesi Province. The tools and materials used in the study were 100 male cattle, measuring sticks, measuring tapes, writing instruments, observation throws and cellphone cameras. The design of this study was direct sampling of 100 male Bali cattle aged 2-3 years in villages where there are Bali cattle in Toili District, for observation of qualitative and quantitative characteristics, the data obtained were analyzed descriptively, describing the facts at the research location, using the formula Maximum value and Minimum value average/mean (x) Standard side, coefficient of variation. The procedure for this study was to conduct direct sampling by examining the quantitative and qualitative characteristics of male Bali cattle. The body parts observed from the quantitative characteristics of female Bali cattle were measuring the body dimensions of the livestock.

Data Analysis

Qualitative and quantitative data obtained from observation results, documentation and analyzed descriptively on each qualitative and quantitative characteristic following the formula

Maximum value and Minimum value; Average/Mean (χ); Standard deviation; Coefficient of variation as follows:

1. Maximum Value and Minimum Value of Average/Mean (χ)

$$\bar{x} = \frac{x_1 + x_2 + \ldots + x_n}{n} \text{ atau } \bar{x} = \sum_{i=1}^{n} \frac{x_i}{n}$$

Description:

(X)= Arithmetic mean

χ_i = Value of the i-th sample

n = Number of samples

2. Standard Deviation

$$S = \sqrt{\frac{\sum_{i=1}^{n} (X_i - \bar{X})^2}{n-1}}$$

Description:

S = Standard deviation (Standard deviation)

χ_i = Value of x-i

(X)= average

n = Sample size

3. Coefficient of Variation

$$KV = \frac{s}{\bar{X}} x100\%$$

Description:
CV = Coefficient of variation
S = Standard Deviation
(X) = Average

RESULT AND DISCUSSIONS

Overview of the Research Location

Toili is a sub-district in Banggai Regency, Central Sulawesi, Indonesia. This sub-district is approximately 95 km west of Luwuk City, the capital of Banggai Regency. The center of government is in Cendanapura Village. The population is mostly transmigrants from Java and Bali. Toili Sub-district has an area of 762.63 km², has 25 villages/sub-districts including Cendana Village, Cendana Pura, Sentral Sari, Tohiti Sari, Tirta Kencana, Singkoyo, Tolisu, Piondo, Tirta Sari, Rusa Kencana, Bukit Jaya, Samalore, Ue Mea, Benteng, Mansahang, Sindang Baru, Tanah Abang, Jaya Kencana, Mekar Kencana, Marga Kencana, Sari Buana, Sentral Timur, Mulya Sari, Tirta Jaya, and Sidomukti.

Characteristics of Male Bali Cattle in Toili District

In general, livestock productivity is influenced by genetic and environmental factors. Superior seeds that have undergone crossbreeding and gradual and strict selection will not

provide maximum productivity if not supported by a comfortable livestock environment (comfort zone). Likewise, a comfortable livestock environment will not help much if the livestock being raised has low genetic quality. The main abiotic environmental components that have a real influence on livestock are temperature, humidity, wind and solar radiation (Chantalakhana and Skunmun, 2002).

Qualitative Traits

Qualitative traits are traits that are generally described in words or pictures, for example fur or skin color, color patterns, horned or hornless traits. The appearance of the livestock's body that is visible from the outside is a phenotype characteristic that is directly observed such as body color and color pattern, horn development, and so on (Laya et al, 2020); (Naufal et al, 2016). In this study using a sample of 100 male Bali cattle aged 1.6-3 years, qualitative trait data of male Bali cattle in Toili District with observed parameters including: Body color, eel line, sock color, muzzle color, rump mirror color, horn shape, nail color, nail shape, ear shape and tail color.

Table 3. Qualitative traits of male Bali cattle in Atinggola District, North Gorontalo Regency

No	Qualitative traits	Phenotype frequency
	Body Color	N=100
1	Brown	16.0
2	Dark brown	30.0
3	Blackish brown	19.0
4	Black	35.0
	Sock Color	
1	Firm	29.0
2	Not firm	71.0
	Horn Shape	
1	upright sideways up	11.0
2	upright curved up	53.0
3	upright curved backward	36.0
	Ear Shape	
1	Upright	100.00
2	Not upright	0.00
	Nail Shape	
1	Split	100.0
	Eel line/Back line	
1	Thick	6.0
2	Medium	35.0
3	Thin	59.0
	Nail Color	
1	Black	100.00
2	White	0.00
	Tail Hair Color	
1	Black	100.00
2	White	0.00
	Snout Color	
1	Black	100.00
2	White	0.00
3	Mixed	0.00
	Dewlap	
1	Dewlap	100.00
2	No	0.00

Source : Personal data (2022)

The color of the fur of male Bali cattle in the study from the age of 1.6-3 years from the percentage (100%) are: brown (16%), dark brown (30%), blackish brown (19%), and black (35%).

So the more dominant body fur color is black (35%), in contrast to previous research from (Domili, 2021), in Atinggola District, North Gorontalo Regency, the dominant body fur color is blackish brown (49%). Socks on Bali cattle have two colors, some are white with borders and white without borders. The older the cow, the clearer the color of the socks. Based on the data obtained, the color of the socks of male Bali cattle in Toili District is white with borders (29%) and white without borders (71%). in contrast to previous research from (Domili, 2021), in Atinggola District, North Gorontalo Regency, the dominant color of socks is white with borders (71%).

Based on the data obtained, the horns of male Bali cattle have various shapes, namely: upright to the side (11%), upright curved upwards (53%), upright curved backwards (36%). Bali cattle in Toili District (100%) have horns although the shapes of the horns vary. Like previous research from (Domili, 2021), in Atinggola District, North Gorontalo Regency, the dominant horn shape is curved upwards (76%). Based on data obtained in Toili District, the dorsal line of Male Bali Cattle from the percentage (100%) is: Thick (6%), medium (35%), and thin (59%). So the more dominant is the thick dorsal line with a percentage (59%). different from previous research from (Domili, 2021), in Atinggola District, North Gorontalo Regency, the dominant eel line is a thick eel line of (83%). The results of the study of the muzzle color of male Bali cattle in Toili District are (100%) black. As in previous research from (Domili, 2021), in Atinggola sub-district, North Gorontalo Regency, namely (100%) the muzzle color of male Bali cattle is black.

Quantitative Traits

Quantitative traits are measurable traits that are influenced by many pairs of genes and the environment (Kurnianto, 2010). According to Sarbaini, 2004, body size and shape are comprehensive predictors of body shape and typical descriptions of various body images. Fourie et al., (2002) stated that the shape and size of a cow's body can be determined by measuring directly or visually. Body size is often used to evaluate growth. Size is an important indicator of growth, but cannot be used to indicate the body composition of livestock. Quantitative trait data taken at the location are such as: Pk (head length), lk (head width), lp (hip width), lt (ear width), pb (body length), tb (body height), tp (hip height), ld (chest circumference), pg (wattle length), lg (wattle width), ld (chest width), dd (chest depth), pe (tail length), and pt (ear length).

Table 4. Mean value, STDVe and body size diversity of male Bali cattle in Toili District, Banggai Regency

No	Body size	Average	STDVe	Cov
1	Body length	103.19	7.39	7.16
2	Chest circumference	145.04	13.11	9.04
3	Body Height	107.93	4.18	3.87
4	Hip Height	106.93	4.19	3.92
5	Body weight	204.56	48.95	23.931

Source :Personal data (2022)

Based on data obtained in Toili sub-district, Banggai Regency, the body length of male Bali cattle has an average value of (103.19), cov value (7.16). Compared to research (Domili, 2021) in Atinggola sub-district, the body length of male Bali cattle has an average value of (101.62 ± 6.04), cov value (5.94), (Saputra et al., 2019) in Sumbawa district has an average value of (100.41 ± 10.36), and (Zafitri et al., 2020) in Bangko sub-district, Merangin district has an average value of (113.18 ± 3.31). The chest circumference of Bali cattle in Toili sub-district, Banggai Regency has an average value of (145.04), cov value (9.04). In contrast to research (Domili, 2021), in Atinggola sub-district, the chest circumference of Bali cattle had an average value of (138.70±5.33), cov value (3.84), (Saputra, et al 2019) in Sumbawa Regency had an average value of (129.82±16.42).

almost the same as research (Andoyo et al., 2014) in Inam and Jandurau Villages, Kebar District, Tambrauw Regency, West Papua Province had an average value of (143.33±33.3).

Height is measured from the highest point of the back through the back of the scapula perpendicular to the ground, using a measuring stick in cm units. Based on data obtained from Toili District, Banggai Regency, the height of male Bali cattle has an average value of (107.93), cov value (3.87). In contrast to research (Domili, 2021), in Atinggola District, the height of male Bali cattle has an average value of (112.02 ± 6.10), cov value (5.45). Hip height is measured from the highest point of the hip to the ground using a measuring stick in cm units. Based on data obtained from Toili District, Banggai Regency, the hip height of male Bali cattle has an average value of (106.93), cov value (3.92). In contrast to research (Domili, 2021), in Atinggola District, the hip height of male Bali cattle has an average value of (110.66 ± 4.95), cov value (4.47). Based on data obtained in Toili sub-district, Banggai Regency, the body weight of male Bali cattle has an average value (204.56) with a cov value (23.931). Compared to research (Domili, 2021), in Atinggola sub-district, the body weight of male Bali cattle has an average value (177.38±20.21) with a cov value (11.39).

CONCLUSION

Characteristics of male Bali cattle in Toili District varied. The color of the body hair of male Bali cattle is brown, dark brown, blackish brown. The color of the socks of male Bali cattle that is more dominant is white without borders. The shape of the horns is more dominant upright. The eel line or back line is more dominant thin. The body weight of male Bali cattle in Toili District, Banggai Regency has an average value of 204.56

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