

Percentage of Bali Cattle Potential as Breeders in West Lombok Regency, West Nusa Tenggara Province, Indonesia

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Abstract— Bali cattle as native Indonesian cattle have been well known throughout Indonesia and have been input by smallholder breeders generally small scale business. This cow is easy to adapt well to various environments that exist with displaying a fairly varied production performance and performing high performances. The purpose of this study was to maintain the performance and quality of Bali cattle. Evaluation results for livestock selection and standardization of livestock that meet the Indonesian National Standard (INS) for Balinese cattle breeds. The research was conducted at the location of people's farms in West Lombok Regency, West Nusa Tenggara in July-August 2020. The material used in this study were 50 adult females aged 3-8 years. Parameters measured include height, body length, and chest circumference. The criteria for Balinese cattle breeds refer to INS 2020. Based on the results of the study, the average height was 113 ± 2.95 cm, body length was 112 ± 2.45 cm, and chest circumference was 151 ± 2.22 cm. Based on INS 2020 (height 111 cm, length 110 cm, chest circumference 151 cm), cows that meet body size standards according to class 1 are 40% tall, 24% body length, and 12% chest circumference. The percentage of body size of Balinese cattle such as shoulder height, body length, and chest circumference for Class 1 (76%), class 2 (92%), and class 3 (100%). In conclusion, as a future development area for Bali cattle and to maintain its performance in West Lombok Regency, there is a need for breeding stock. They assess that currently, only 76% of the available Bali cows meet the criteria for breeding by smallholder breeders.

Keywords— Bali cattle breeding stock, West Lombok Regency, West Nusa Tenggara Indonesia.

I. INTRODUCTION

Bali cattle are the descendants of wild cattle called Banteng (*Bos sondaicus*) which have been domestication processes for centuries (Sugeng, 1992). According to Abidin (2002) the advantage of Balinese cattle is that they are easy to adapt to new environments, so they are often called pioneer cattle. Payne and Hodges (1997) stated that Bali cattle have the genetic potential of local livestock plasma which has comparative advantages compared to imported livestock, among others, advantages in utilizing high fiber forages, adaptability to tropical climates and high fertility (83%) and the percentage of the carcass (56 %) and good carcass quality.

The physical characteristics of Bali cows are medium size, deep chest with good legs. Feather color brick red and dark brown. On the back, there is a black line along the back which

is called the "eel line" (Williamson and Payne, 1997). Bali cattle have a characteristic that is not humped, generally all four legs and a white rump (Abidin, 2002). The body's calf is brick red (Susilorini *et al.*, 2008).

Growth is a change in size which includes changes in live weight, shape, dimensions, and body composition including changes in body and organ components and chemical components (Soeparno, 2005). Ensminger (1969) stated that the growth of livestock can be seen from the increase in body size.

Growth is the increase in body weight or body size according to age, whereas development is related to changes in the size and function of various parts of the body from the embryo to adulthood (Sugeng, 1992). According to Soenarjo (1998), the process of animal growth is weight gain to adulthood (growth) and the development of the body shape and its performance process (development). Tillman *et al.* (1998) states that growth usually starts slowly then progresses more rapidly, then gradually declines or slows down and stops after reaching body maturity.

The purpose of this study was to maintain the performance and quality of Bali cattle, by assessing the exterior characteristics and body size of the cattle to see the growth or development of cattle. Evaluation results are used for livestock selection, standardization of livestock, and other essential production aspects.

II. MATERIAL AND METHOD

A. Time and Place of Research

The research was carried out at the location of people's farms in West Lombok Regency, West Nusa Tenggara in July-August 2020.

B. Material

The Bali cattle used are 50 adult female Bali cows (3-8 years old) which are kept intensively in the community livestock groups of West Lombok Regency.

C. Method

To find out the farmer profile and maintenance system, interviews were conducted with breeders. The criteria for

breeders who were used as respondents were to have adult Bali cows and have had calves.

D. Retrieval of Exterior Characteristics

See body color, but color, leg color, tail tip color, and line color of eel on back.

E. Retrieval of Body Size Data

Variables measured according to Indonesian National Standard (SNI 7651-4:2017) include:

1. Shoulder height, measured from the highest point between the shoulders (withers) to the ground using a measuring stick in cm;
2. Chest circumference, measured in a circle around the chest cavity through the back of the hump and behind the shoulder joint (*os scapula*) using a measuring tape in cm;
3. Body length, measured from the hump of the shoulder (*scapula*) to the tip of the pelvis (*process spinous*), expressed in cm.

F. Data Analysis

Exterior characteristic data were processed descriptively quantitatively and qualitatively. Body size was analyzed descriptively quantitatively to obtain the mean value and standard deviation. Then compared with the size of the gumba height, body length, and chest circumference according to the SNI. The percentage of body sizes that exceed the standard in the three standard body sizes according to INS is calculated.

III. RESULTS AND DISCUSSION

A. West Lombok Regency

West Lombok Regency is one of the regencies in the West Nusa Tenggara (NTB) Province which has economic conditions or activities in the agricultural economy and most importantly in the tourism economy.

West Lombok Regency has a strategic position, namely as the gateway to the Province of West Nusa Tenggara (NTB) with the Province of Bali with the Sheet Harbor, and is a crossing area for Lombok International Airport (BIL) in Central Lombok Regency with the center of the NTB Province government located in Mataram City. Also, Lombok Island, which has been designated as a new tourist destination by the Ministry of Tourism and Creative Economy after Bali Island, presents a great opportunity to develop the tourism sector. West Lombok Regency is also designated as the best tourist destination (tourist destination) after the island of Bali so that the number of tourist visits from year to year continues to increase. As an area directly adjacent to the administrative center of NTB Province, West Lombok Regency has developed rapidly housing and residential areas.

The community farming system in West Lombok Regency is largely still

is intensive because grazing land has decreased due to expanding development. The pattern of cattle farming that uses group drums makes it easy for farmers/breeders to look after and care for their livestock to fatten them.

B. Exterior Characteristics

Exterior characteristics include body-color, lower legs, rump, dorsal line, and the tail tip of adult female Bali cattle. Table I.

TABLE I. Exterior characteristics of adult Bali female cows

Variable	Bali cattle
Body color%	
Redness	100
Lower leg color%	
white sock shape	92
Butt color%	
White mirror shape	90
Backline color%	
Black	100
Tail tip color%	
Black	100

C. Body-color

At the age of less than one year, male and female Bali cows are yellowish and brick red. At the age of 13-18 months, most of the female Bali cows are brick red, there is also a small part of it with yellowish color, and red brick with white spots, while the male Bali cows are partly brick red, yellowish and some are brick red, yellowish mixed with black.

The color characteristic of Bali cows is consistent with the findings from Payne and Rollinson (1973), who reported that when calves are still calves, their body hair is brown to reddish, after maturing male Bali cows are darker than female Bali cattle. Bahary (2017) also reported that Bali cattle have light brown, yellowish-brown, dark brown to brick red colors. The color of male Bali cows gradually turns black at the age of 13-18 months and with age the black color gets darker (Purwantara *et al.*, 2012). Color changes that occur in Bali cattle according to age and sex are categorized as dimorphism-sex animals (Guntoro, 2002). White spot color in Bali cattle is one of the irregularities in hair color that decreases recessively (Olson, 1999).

D. Lower Leg Color

Female Bali cows at birth have the same color as the body color of the lower legs with slightly irregular white patches. At the age of less than one year, most of the lower legs are white but not in the form of socks, while a small portion of white is in the form of socks and at the age of 13-18 months, the color of the lower legs is mostly white in the form of socks.

E. Butt Color

The exterior of female Bali cows at birth and less than one year old mostly has a white rump but not a mirror shape. At the age of 13-18 months, most of the male and female Bali cows have a mirror-shaped white rump and a small part is white without a mirror shape. According to Hartatik *et al.* (2010) white spots in cattle can occur due to mutant genes, mutant gene dilution, and a combination of several mutants, generally, the genes that express white spots in *Bos taurus* cattle such as Hereford, Simmental, Bradford, Jersey, and others are known. however, no information has been found for Bali cattle.

F. Backline Color

The backline of female Bali cattle at birth is mostly thick black, while a small portion of it is medium black. At the age of less than one year and 13-18 months, male and female Bali cattle mostly have a thick black backline. The backline is also found in cows from the crossbreeding of Balinese and other bulls, such as Aceh and Madura cattle. Mohammad *et al.* (2009) reported that Madurese cows (sonok) have a black dorsal stripe. In Madura cattle, 56% banteng mtDNA was found (Dorminanto *et al.*, 2016).

G. Tail Tip Color

The tip of the female Bali cattle at birth, less than one-year-old, and 13-18 months are black, however, there are a small number of female Bali cows that have a black tail tip. The black color at the end of the tail in this Balinese cow is derived from the two elders who also have black tail hair, but black. Rauf *et al.* (2015) reported that the offspring of the crossbreeds of Bali cattle with Simmental, Limousin, Ongole, and Brahman have a dominant black tail hair color, but there are several colors of tail hair that are a mixture of elder colors including brown-red, and white.

H. Body Size

Body measurements include body length, shoulder height, and breast circumference of adult female Bali cows. Table II.

TABLE II. Body sizes of adult Bali female cows

Variable	Lombok	INS 2020		
		I	II	III
Shoulder height (cm)	113±2,95	111	109	106
Body length (cm)	112±2,45	110	107	104
Chest circumferences (cm)	151±2,22	151	145	139

Production of body weight and body size, adult female Bali cows are influenced by a good maintenance system, where maintenance is carried out intensively by providing feed, feed is also provided in the pen. This is in line with the opinion (Mount, 1979) which states that livestock productivity is greatly influenced by feed and environmental temperature conditions. Wijono *et al.* (2001) and Latulumamina (2013) suggested that the growth rate of livestock will decrease as a result of hot environmental conditions. Also, when there is a lack of feed it will cause weight loss, especially due to fat loss, so it is necessary to improve feed to influence the development or improvement of the body condition come back sooner.

TABLE III. Percentage of Bali cattle body measurement more than Indonesia national Standard for Breeding Stock in Lombok Barat Regency

Variable	% 1st Class	% 2nd Class	% 3rd Class
Shoulder Height	40 %	48 %	52 %
Body length	24 %	28 %	32 %
Chest circumferences	12 %	16 %	16 %

IV. CONCLUSION

Based on the results of the study, it can be concluded that Bali cattle in West Lombok Regency have skin color, backline, the tip of tail (100%), leg color (92%), and buttocks

(90%), this shows that the characteristics, body size, and percentage Bali cows by Indonesian national standards and can be used as a development area. To maintain its phenotypic appearance, it is necessary to maintain the quality of the feed given to young and old parents.

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