

Identification of Qualitative Characteristic Bali Polled Cattle

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Abstract

The aim of the research was to identify the qualitative characteristics of Bali polled cattle. Several advantages in polled cattle can reduce the risk of injury that often occurs in herdsmen's caused by horns, can prevent bruising of the carcass and damage to the skin. The development of Bali polled cattle requires further research, this research is related to its qualitative characteristics. The total sample was 100 consisting of 11 Bali polled cattle and 89 Bali horned cattle, consisting of 42 samples from Bone Regency and 47 samples from Barru Regency. Qualitative characteristics that are measured include: coat color, blackline runs along the back, color of socks, color of rump, muzzle color, eyelid color, white hair in the ears, and wattle size. The qualitative characterization of Bali Cattle in this study was based on the Indonesian Institute of Sciences (LIPI)'s guidelines for phenotypic characterization. The distinctive characteristics found in horned Bali cattle are also found in polled cattle. The presence of Bali polled cattle changes the indigenous cattle rearing system in Indonesia.

Keywords : Polled, Bali cattle, qualitative, characterization

INTRODUCTION

Most of the beef production comes from Bali cattle, which are Indonesian local cows. Bali cattle are the result of domestication of wild banteng (Rahayu, 2014; Payne and Hodges, 1997; Martojo, 2003), this opinion is reinforced by the characteristics (phenotype) of Bali cattle which are very similar to banteng. These characteristics include: white color on the rump and the leg (stocking) in males and females, blackline on the back, and a change in hair color in males as adults (aged 12-18 months) which initially reddish-brown to become black (Martojo, 2012).

Bali cattle are developed as beef cattle and are directed at increasing productivity which is supported from the aspect of maintenance management (Baco *et al.*, 2020a). One aspect of management is the ease of maintenance which has an impact on meat production. The development is directed at developing polled cattle. Several advantages in polled cattle, can reduce the risk of injury that often occurs in herdsmen's caused by horns, can prevent bruising of the carcass and damage to the skin (Baco *et al.*, 2020b; Glatzer *et al.*, 2013). Where there are many bruises found on horned cattle, it is caused by competition and contact between livestock that occurs on the transport (cow transporting car).

Indigenous cattle breeds have the advantage of adapting to environmental changes compared to exotic cattle. It is important to note that development of strategies for characterization and conservation of indigenous cattle requires consideration of multiple factors including biology of animals, agroecology of the environment and production system of the animals (Nyamushamba *et al.*, 2017). Bali cattle as local cattle in Indonesia have the advantage of being able to adapt to an inappropriate environment, which is important, because some other breeds of cattle do not have this ability (Baco *et al.*, 2019). Bali cattle can utilize low quality feed (Supriadi *et al.*, 2020), have excellent fertility and conception rates (Hasrin *et al.*, 2020), and have good quality meat with low fat content (Bugiwati, 2007). Some of the characteristics of production and reproduction are important/ economic characteristics that can be used as indicators of selection (Handiwirawan and Subandriyo, 2004).

Selection of polled cattle is very important, especially in modern livestock management (Brockmann *et al.*, 2000). Dehorning in young cattle has been shown to be stressful and reduce growth rates (Mir *et al.*, 2019). So that sometimes there is a selective selection to select polled cows. It takes into account the aspects of livestock welfare without cutting the horns. The development of Bali polled cattle requires further research, this research is related to its phenotypic characteristics. Therefore, research on the characteristics of Bali polled cattle is expected to produce important information which can be used in its future development.

MATERIALS AND METHODS

Time and location

This research was conducted for 10 months, November 2016 - September 2017, which was carried out at the Laboratory of Beef Cattle and Ranch Maiwa Breeding Center, Faculty of Animal Husbandry, Hasanuddin University.

Population and Sample

The population referred to in this study is the population of Bali cattle in Bone and Barru Regencies. The sample of this study were 11 Bali polled cattle consisting of 5 males and 6 females with an age range of 2 - 2.5 years. The total sample was 100 consisting of 11 Bali polled cattle and 89 Bali horned cattle, consisting of 42 samples from Bone Regency and 47 samples from Barru Regency.

Research Methods

Qualitative characteristics that are measured include: coat color, blackline runs along the back, color of socks, color of rump, muzzle color, eyelid color, white hair in the ears, and wattle size. The qualitative characterization of Bali Cattle in this study was based on the Indonesian Institute of Sciences (LIPI)'s guidelines for phenotypic characterization (LIPI, 2015).

RESULTS AND DISCUSSION

Identification of the similarity of phenotypes of Bali polled cattle with horns in this study was carried out on several main characteristics of Bali cattle, such as coat color, backline profile, color of socks, and color of rump (Abdullah *et al.*, 2006; Martojo, 2012; Purwantara *et al.*, 2012). Several qualitative parameters were added to the research analysis, such as muzzle color, eyelid color, hair in the ears and wattle size. The more similarity between the phenotype of polled and horned cattle, the closer the relationship between the two cattle (Table 1).

Table 1. Qualitative characteristics of Bali polled and horned cattle

Phenotypic characteristics	Polled (%)		Horned (%)	
	Males	Females	Males	Females
Coat color				
Reddish-brown	0	14.3	0	0
Light brown	50.0	0	0	0
Yellowish brown	25.0	85.7	85.7	100.0
Dark brown	0	0	9.5	0
Black	25.0	0	4.8	0
Blackline profile				
Thick line	0	0	9.5	4.0
Medium line	50.0	71.4	47.6	33.3
Thin line	50.0	28.6	42.9	62.7
Color of socks				
White, clear boundaries	100.0	100.0	90.5	90.7
White, indefinite boundaries	0	0	9.5	9.3
Color of rump				
White, clear boundaries	100.0	57.1	95.2	85.3
White, indefinite boundaries	0	42.9	4.8	14.7
Muzzle color				
White on the edge	100.0	83.3	96.2	100.0
Other colors	0	16.7	3.8	0
Eyelid color				
Black	100.0	100.0	100.0	100.0
Hair in the ears				
White	80.0	83.3	96.2	100.0
Brown	20.0	16.7	0	0
Black	0	0	3.8	0
Wattle size				
Small	60.0	100.0	76.9	91.9
Moderate	20.0	0	23.1	6.8
Large	20.0	0	0	0

The results showed that the coat color of the polled male cattle was dominant in light brown (50%) and yellowish brown (25%), while the dominant horned cows were yellowish brown, which was 85.7%. In male polled cattle, 25% were found to be black according to Martojo (2012) that the color of male Bali cattle is reddish brown and turns black at the age of 12-18 months and becomes darker when the body is mature. While the color of polled and horned cows' hair is dominant yellowish brown with a value of 85.7% and 100%, respectively. The level of hair color similarity in Bali polled and horned cattle is very high, which indicates a close relationship between the two. Bali cattle are generally reddish brown (Purwantara *et al.*, 2012).

Another phenotypic characteristic is the back band, where the male polled cattle are dominant on the back band with medium and thin lines (50% each), while the dominant horned cattle are in moderate line conditions (47.6%). Whereas for females, the dominant backline of polled cows is moderate (71.4%) and thin-line horned cattle (62.2%). Bali cattle according to Handiwirawan and Subandriyo, (2004), have a straight backline and are inheritance breed of *Bos sondaicus* or *Bos banteng*. Backline is a narrow band of black hair well-defined running along the back from behind the shoulder to the tail (Talib *et al.*, 2003). Backline profiles are categorized into thick, medium and thin lines. A thick line was found in bulls, the band of black hair on the back still being visible even though the body begins to darken at 12–18 months of age and by maturity is almost black. Other qualitative characteristics such as the color of socks and the color of rump between polled and horned cows are both dominant in white and have clear boundaries with other colors. A high similarity was also shown in the color of the dominant muzzle color edge is white, the dominant eyelid color is black, the dominant hair in the ears color is white.

Phenotypic similarities can indicate genetic identity, although there are several limitations, including: identical phenotypes can be caused by different alleles or by genes at different loci. In some cases there may be differences in the power of expression (degree of manifestation in an individual), or by penetration (the frequency with which a trait is expressed relative to a number of known gene carriers in a population) (Abdullah *et al.*, 2007). The phenotypic characteristic which is also the characteristic of Bali cattle and can be used as a comparison is the size of the wattle. Small wattle size is dominant in male Bali polled cattle (60%) and similarly in small-sized 76.9% horned cattle. The same opinion was expressed by Sutarno and Setyawan (2015) that Bali cattle have small wattle. In this research, the wattle profile was categorized into small, medium and large sizes. Large wattle are found in Brahman Cross cattle or in *Bos indicus* cattle.

The characteristic of small wattle is one of the distinctive characteristics of Bali cattle, according to Abdullah *et al.*, (2007). PO cattle have large gumba and are Zebu derivatives, have wide wattle and long hanging prepuce, while Madura and Pesisir cattle have small gumba and prepuce which are short, while Bali cattle have straight backs without gumba, but also have a small wattle. Phenotypic similarity can also be caused by phenocopy, which is the similarity of one phenotype caused by one particular genotype by environmental action on another genotype (Becherucci *et al.*, 2020). However, this marker has a weakness because it is influenced by the environment, shows dominant / recessive inherited traits (Rauw and Gomez Raya, 2015) and many of which can only be observed at certain age levels.

Table 2. Qualitative characteristics profile of Bali polled cattle

Phenotypic characteristics	Bali Cattle	
	Males	Females
Horn	Nothing/ polled	Nothing/ polled
Coat color	Reddish-brown; Yellowishbrown	Yellowish brown
Black band	Medium line	Medium line
Color of socks	White, clear boundaries	White, clear boundaries
Color of rump	White, clear boundaries	White, clear boundaries
Muzzle color	White on the edge	White on the edge
Eyelid color	Black color	Black color
Hair in the ears	White color	White color
Wattle size	Small size	Small size

CONCLUSION

Polled and horned Bali cattle have a high degree of similarity in qualitative characteristics. The distinctive characteristics found in horned Bali cattle are also found in polled cattle. The presence of Bali polled cattle changes the indigenous cattle rearing system in Indonesia. In the future, the development of beef cattle uses the advantages of Bali polled cattle.

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