Morphological and mating behavioral characteristics polled Bali cattle

Zulkharnaim, S Baco, M Yusuf and L Rahim
Department of Animal Production, Animal Husbandry Faculty, Universitas Hasanuddin, Jl. Perintis Kemerdekaan KM 10 Makassar 90245, Indonesia.
E-mail: zulmaupa@gmail.com

Abstract. This research aimed to identify morphological characteristics Bali polled cattle and to know the mating behavioral characteristics of Bali polled male. Morphological characteristics research used 100 head samples, including 11 head of polled cattle and 89 head of horned cattle. Identification of morphological characteristics using t-test independent sample using analysis Completely Randomized Design. Mating behavioral characteristics research used 5 head samples, including 3 head of polled cattle and 2 head of horned cattle. Mating behavioral characteristics were analyzed by several parameters: the first time teasing a teaser (second), when flehmen arise (second) and frequency or number of flehmen (times). The results showed that the morphological characteristics Bali polled cattle were not significantly different with Bali horned. The mating behavioral characteristics of Bali polled cattle were not significantly different with Bali horned.

1. Introduction
Bali cattle were the directed domestication of Banteng the opinion was reinforced by the characteristic (phenotype) Bali cattle are very similar to banteng [1–3]. Bali cattle are said to be polled because their horns do not grow naturally. The horn has a function as a means of protecting cows from predators and in competition for finding territory, especially in wildlife. But now, the existence of horns is no longer important with the change in the maintenance system to become intensive. In addition, the presence of horns also affects the temperament of cattle that gone wild.

The phenomenon polled trait in cattle Bali should have a scientific basis to explain the validity of the type of breed. The results of the early assessment shows that the Bali polled cattle are still the same with Bali cattle in general. So that an assessment of the phenotypic of Bali cattle polled is needed.

Bulls have a strategic role in efforts to improve the genetic quality of beef cattle. Improvement of genetic quality bulls are considered capable of providing a broader change in the livestock population. Therefore, genetic improvement and reproduction of bulls is still a logical choice to improve the superiority of beef cattle populations. The introduction of Bali polled cattle as local cattle with high production performance is expected to improve the quality of production and reproduction of existing local cattle.

Good quality bulls in terms of reproduction are only produced from superior breeds. One of the conditions that must be possessed by superior bulls is the reproductive requirements which include. 1) high libido; 2) Serving ability; 3) Serving capability, and 4) The color of sperm is milky-white [4]. Libido or the desire to mate is shown in the form of sexual behavior, which occurs in response to bulls.
due to sexual stimulation. Sexual behavior appear and may be observed during the pre-copulation, copulation and post-copulation. Copulation patterns in cattle include arousal sex, courtship (sexual display) or flirtation, erection, mounting that takes place during pre-copulation and ejaculation during copulation [5]. For this reason, studies regarding the reproductive potential of Bali polled cattle are focused on identifying the reproductive behavior of bulls.

2. Materials and methods

2.1. Animals

The total numbers of Bali cattle used in identify morphological characteristics study were 100 samples, including polled (n = 11) and horned (n = 89). The polled cattle in this study are small herd in South Sulawesi. Samples were taken from Livestock Laboratory, Faculty of Animal Science, Hasanuddin University (n = 11), Bone district (n = 42), Barru district (n = 47). Mating behavioral characteristics used 5 bulls including 3 head of polled cattle and 3 head of horned cattle.

2.2. Methods and data analysis

Measurements recorded on the Maiwa Breeding Center farm included Shoulder height (cm), Hip height (cm), Body length (cm), Chest size (cm) and Body weight (kg). The mating behavioral characteristics measure several parameters: the first time teasing a teaser (second), when flehmen arise (second) and frequency or number of flehmen (times) [5]. Sexual behavior was observed during ten days at the time from 07.00 to 11.00 West Indonesian Time. Identification of morphological characteristics using t-test independent sample and mating behavioral characteristics using analysis Completely Randomized Design.

3. Results and discussion

The results of body dimensions measurements of Bali polled cattle and horned cattle have in common with the results of measurements of several other studies. The height of the shoulder of bulls polled cattle in this study had an average of 108.80 ± 3.70 cm, while [6] reported the results of shoulder height measurements in Bali cattle of 106.97 ± 4.93 cm, and [7] reported a lower size of 104.4 ± 2.1 cm for cattle born to local bulls with local cows and 103.2 ± 1.9 cm for cattle born from superior buls (the result of selection) with local cows. Whereas the body length and chest circumference of polled cows are lower when compared to the results of Bali cattle body measurements from [6] and [7] (table 1).

Table 1. Body size characteristics of Bali Polled cattle aged 2–2.5 years.

| Phenotypic       | Bali Polled Cattle |
|------------------|--------------------|
|                  | Bulls              | Cows               |
| Shoulder height, cm | 108.80 ± 3.70     | 107.67 ± 4.68     |
| Hip height, cm    | 108.40 ± 3.44      | 108.00 ± 3.23     |
| Body length, cm   | 105.80 ± 4.15      | 107.50 ± 9.99     |
| Chest size, cm    | 136.40 ± 10.99     | 136.67 ± 8.85     |
| Body weight, kg   | 158.80 ± 14.75     | 155.33 ± 34.68    |

Based on the results of the measurement of quantitative traits in Bali polled cattle, the body dimension characteristics are obtained as shown in the table 1. Bali cattle have a relatively smaller size compared to Bos taurus and Bos indicus, which is due to genetically Bali cattle having characteristics as small cattle. Incorrect selection also contributes to the small body size. In the 1980s there was a massive negative selection of large Balinese cattle, where large Bali cattle were then sold.
(distributed) to the Kalimantan region and beyond. The presence of Bali polled cattle is expected to contribute to the development of Bali cattle (local) has a potential larger body size.

The results of mating behavior measurements on polled Bali cattle are presented in Table 2.

| Variabes                                | Bulls   |
|-----------------------------------------|---------|
| The first time teasing a teaser         | A       |
| (second)                                |         |
|                                         | B       |
|                                         | C       |
|                                         | D       |
|                                         | E       |
|                                          |         |
| When flehmen arise                      |         |
| (second)                                |         |
| Frequency or number of flehmen          |         |
| (times)                                 |         |
|                                          |         |

Table 2. The average value of the measurement results of bulls mating behaviour.

The results of the analysis of variance on the first time teasing teaser variable showed significant differences in the male (P <0.05) between male A and male B. A bull takes relatively longer than the bulls B, C, D and E. Bulls B, C, D and E have a good libido compared to bulls A, this is evidenced by the response to the teaser approach and start making an effort to make out in a relatively short time. The results of the analysis of variance in the time variable arising from flehmen showed that differences in bulls had a significant effect (P <0.05) between the five bulls. bulls B, C, D and E require a relatively shorter time compared to cattle A. Results of analysis of variance to variable frequency or number flehmen shows that bulls are significant differences (P <0.05), where A, C and D do flehmen more than two bulls B and C. bulls A, B and C which are polled bulls show normal behavior when approached with a teaser. Of the three parameters tested, it was indicated that the behavior of polled bulls had a normal reproductive response or libido similar to that of horned Bali bulls.

4. Conclusion

Bali polled cattle have similar morphological characteristics with cattle horns Bali. Polled occurrences in Bali cattle do not affect male mating behavior, seen in flirting behavior and frequency of flehmen.

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