



Body Condition Score (BCS) And Parity Of Bali Cows Experiencing Reproductive Disorders Kept Under Smallholder Farms In Bulukumba District, South Sulawesi, Indonesia

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Abstract

The aim of this study was to provide an overview of body condition score (BCS) and the parity of Bali cows experiencing reproductive disorders in Bulukumba District. A total of 54 Bali cows kept under smallholder farms were used in the present study. The cows were identified using a survey method to the cows owned by the farmers, and data collection was carried out was only in Bali cows at the study location. Clinical examinations were carried out to all the cows such as general reproductive health, pregnancy examination, examination of reproductive disorders, and measurement of body condition scores (body condition score = BCS; scale 1–9). All data were analyzed using regression analysis and correlation tests with the help of SPSS 24 program. The results of this study showed that out of the 54 Bali cows examined, 42 (76.4%) had normal status and 12 (23.6%) had reproductive disorders. Parity 1 was the highest proportion in Bali cows experiencing reproductive disorders (41.7%), followed by Parity 4 (25.0%), and 16.7% in Parity 2 and 3, respectively. The highest BCS values in Bali cows experiencing reproductive disorders were BCS ≤ 3 (50.0%), BCS 4–6 (33.3%), and BCS 7–9 (16.7%). The correlation test conducted between parity and BCS stated that it was correlated ($P < 0.01$) with the degree of perfect compression (0.87). It can be concluded that the lower BCS value resulted more potential to be experiencing for reproductive disorders. The parity value obtained cannot be used as a standard for determining reproductive performance but can be used to assess reproductive efficiency.

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Keyword: Bali cows, reproductive disorders, BCS, parity

1. Introduction

Bali cattle are native Indonesian cattle that are often kept in smallholdings [1]. Bali cows have the potential to be developed due to their high carcass presentation and low-fat content. In addition, Bali cows also have the advantages of being able to adapt to dry environments and having the ability to digest greenery with low nutrient content when entering the monsoon season [2]. Based on these advantages, the potential of Bali cattle as local cattle for meeting the needs of beef in Indonesia is perfectly appropriate.

However, some studies indicate that the reproductive potential of Bali cattle is still low due to several factors, including the environment, the management of breeding, and the conditions of the cattle. Efforts to increase cattle populations in the region can be made through the improvement of reproductive performance. One of them is through calving management, in which the ideal calving rate is once a year for each cow. As for how many times the cow experience parturition, the calculated period is marked by Parity 1, and so on. The maximum production level typically reached parity with four in the age range of 5.5–7 years [2]. It takes effort amidst the limiting factors faced to achieve ideal numbers, such as the availability of bulls in the field or inseminator skills [3].

Apart from parity, another factor that affects reproductive performance in Bali cattle is body condition score (BCS). BCS is assessment of cow's body condition with visual observation and helps the farmer get a description of the level of reserve muscle tone and fat in the body. Excessive fat content tends to cover up the reproductive organs, which has an impact on the occurrence of disorders in reproductive organ function. On the other hand, cattle with low BCS reduce the body's ability to synthesize hormones, reproduce, and have ovulation disorders. Therefore, the aim of this study was to provide a comprehensive overview of the parity values and body condition scores (BCS) of Bali cows experiencing reproductive disorders.

2. Materials and Methods

The materials used in the present study were 54 Bali cows, that older than two years old and they were kept in traditional smallholdings in Bulukumba District, South Sulawesi, Indonesia.

The observation method was conducted directly to the Bali cows. The determination of the sample was based on a purposive sampling technique (based on considerations) of the cows greater than two years old and having given birth at least once. To find out and identify the body condition and reproductive physiological status of the cows, individual cow and the internal condition of the reproductive organs was examined clinically either by vaginostomy, rectal palpation or using ultrasonography (USG).

Measurement of body condition; an examination of the body condition of Bali cows was carried out on each animal individually [4]

Vaginostomy examination; firstly, the condition of individual cow was checked and the presence of fresh mucus on the vulva or tail and then followed by a vaginostomy examination. The vulva was washed using water, then wiped using a clean tissue, then sprayed with 2% PVP-iodine and wiped again using 70% alcohol and cotton. A vaginostomy examination was carried out using a speculum glass and a light source (flashlight) to visualize the internal condition of the reproductive organs until reached the outside of the cervix [5,6]. If there mucus (discharge) occurred or liquid, then it was collected using a plastic pipette and placed in a petri dish for assessment. Mucus was considered to be normal if it looks clear or slightly cloudy without any pus or odor. On the other hand, it was considered as an uterine infection (metritis/endometritis) [7].

Palpation per rectum and ultrasonography (USG); Transrectal palpation and ultrasound of the reproductive organs were performed to understand the condition of the uterus and ovarian structure. Cows were considered to have reproductive ovarian cyst disorders if there were structures such as follicles >25mm with or without a corpus luteum (CL). An ovary without structures or follicles <10 mm in diameter, or CL, would be referred to as an inactive ovary. All reproductive abnormalities found were recorded during this examination [1,8].

Data Analyses

Data were tabulated in Microsoft Excel and presented in a form chart in a descriptive way. In order to know the percentage of parities and the the BCS values of Bali cows, the data was processed using the SPSS program to meet the correlation between the BCS value and parity.

3. Results and Discussion

Farm Conditions

In this study, generally Bali cattle were kept under smallholder farms. The farmers raising their cattle under extensively; without any housing or just kept around the farmers house [1]. Consequently, due to low management of Bali cows in the farmers level, resulting in low productivity [9]. Under these conditions, most of Bali cows experience poor nutrition, very poor production and reproductive performance, and are susceptible to disease [10]. The method of raising cattle carried out by the farmers in small farms in this study such as shown in Figure 1.



Figure 1. Bali cattle kept under smallholder farms

Reproductive Status of Bali Cows

The study was using 54 Bali cows that were kept at a small farms in Bulukumba Regency, South Sulawesi. The results of the examination using rectal palpation for the reproductive status of the Bali cattle is presented in Figure 2.

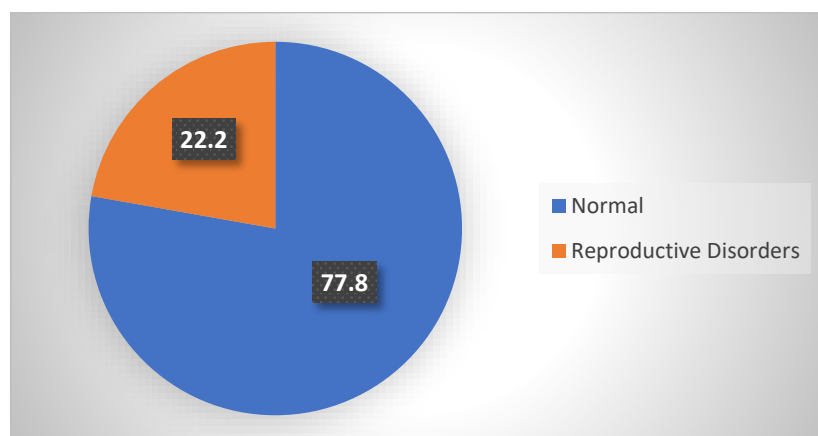


Figure 2. Reproductive Status of Bali Cows under smallholder farms

Figure 2 shows that of the 54 Bali cows examined by rectal palpation, 77.8% had a normal status and 22.2% suffered from reproductive disorders. The reproductive disorders found on small farms in Bulukumba Regency are still lower than those reported for Bali cattle raised using the Integrated Cattle-Oil Palm System (SISKA) of 57.9% [11]. Click or tap here to enter text.. The similar incidence of reproductive disorder was occurred to Bali cattle in Kotabaru Regency, South Kalimantan, with an incidence rate of 77.9% [12]

Body Condition Score (BCS) of Bali Cows

Body Condition Score (BCS) is a reflection of the level of health, sufficiency nutrition, and reserve energy in Bali cows [13]. These energy reserves support physiological processes when metabolic needs increase [6]. The BCS of Bali cows that experienced reproductive disorders in this study are shown in Figure 3.

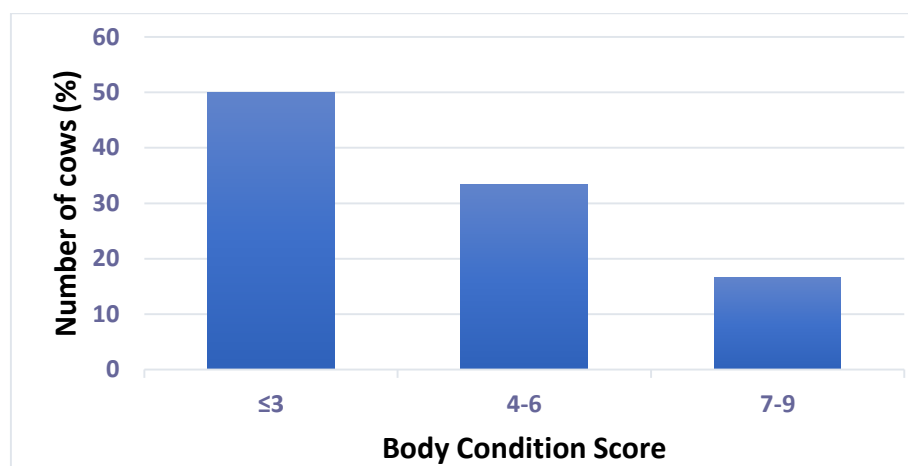


Figure 3. Body Condition Score (BCS) of Bali cows experiencing reproductive disorders

The highest BCS values in Bali cows experiencing reproductive disorders were BCS ≤ 3 (50,0%), BCS 4-6 (33.3%), and BCS 7-9 (16.7%). This value shows that the lower the BCS value of cattle, the greater the percentage of reproductive disorders. Likewise, in cattle with high BCS values, the percentage of reproductive disorders was lower. This happens because BCS is the main parameter that influences reproductive efficiency, which applies to all breeds of cattle [14]. BCS is also a very important factor in determining the performance of reproduction in cattle [1,15]. For example, a cow giving birth in good health will experience estrus faster and have more chances of giving birth. Cows in pregnant with better BCS in mating season was greater compared to the cows in a condition of thin body. Furthermore, cows with a thinner body will extend the anestrus period postpartum [16] and so on, extending the interval from calving until conception as well as the calving interval.

Parity of Bali Cows

The highest proportion of parity in Bali cows experiencing reproductive disorders occurred in parity 1 (41.7%), followed by parity 4 (25.0%) and parities 2 and 3 (16.7%) (Figure 4). The differences in parity values are influenced by the condition of the reproductive organs of Bali cattle. The number of livestock proportions for each parity is different, presumably because the level of difficulty for pregnant animals varies, so efforts are needed to maximize and increase the reproductive potential of Bali cattle [1]. Parity 1 in Bali cattle that experience reproductive distress is very high compared to other parities. This is because calves who are giving birth for the first time have a higher level of stress than older cows and this has an impact on their reproductive organs [17].

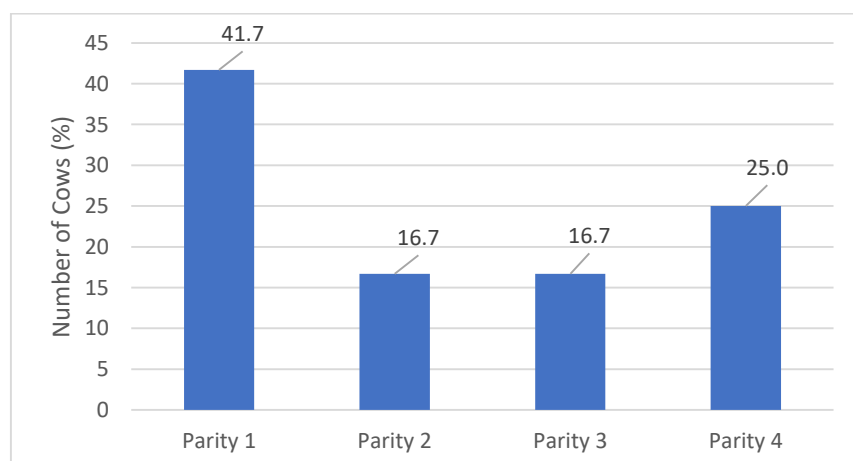


Figure 4. Parity in Bali cows experiencing reproductive disorders

BCS and Parity Correlation Test

The correlation test was carried out between parity and BCS in Bali cows experiencing reproductive disorders. The results confirmed that there was a high level of correlation ($P < 0.01$) between BCS and parity with the degree of perfect compression was 0.87. However, parity cannot be used as a reference in determining the reproductive performance of Bali cows, even though numerically there are high and low parity values. However, the parity value can be used as a description of the actual physical maturity of cows [18]. Several previous studies stated that there was no effect of the parity value on the S/C, CR, CvR, CI, and DO values, which in this case were used as reproductive performance parameters [19,20].

Increase parity value of the cows is directly relative to the increase of age. This suggests that higher parity value of the cows, might be affect reproduction performance. This due to that physiologically, the body condition of old cows will experience a decrease in muscle, bone and tissue capacity as well as cell damage [21]

4. Conclusion

The conclusion of this study is that the lower the BCS value, the greater the potential for reproductive disorders. The parity value obtained cannot be used as a standard in determining reproductive performance, nonetheless can be used to assess reproductive efficiency.

Conflict of Interest

The authors declared that there is no conflict of interest.

Novelty Statement

This is the first to report of the Body Condition Score (BCS) and parity of Bali cows experiencing reproductive disorders in Bulukumba District, South Sulawesi, Indonesia.

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