

Blood Biochemical Profile of Bali Cattle with Repeated Breeding Condition

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ABSTRACT

The current research aims to identify the blood biochemical profile of the Bali cattle with repeated breeding condition. This research conducted in *Sege Village, Karangasem*, Bali Island to collect the blood sample then the analysis was conducted in the integrated research and testing laboratories or *Laboratorium Penelitian dan Pengujian Terpadu (LPPT)* Universitas Gadjah Mada, Yogyakarta. This research used 10 Bali cattle which consisted of 5 cattle having repeated breeding and 5 others are in the fertile condition. The data collected include the blood glucose level, total cholesterol and total albumin. The results showed that the glucose level of the blood serum in repeated breeding cattle category (44 ± 6.95) was lower than the fertile cattle (44.26 ± 5.44). The cholesterol level of the Bali cattle with repeated breeding was lower (111.72 ± 28.81) compare to Bali cattle with fertil condition (119.92 ± 36.38). This Result was also in line with the albumin level in Bali cattle having repeated breeding, which is lower about (4.31 ± 0.36) compared to the fertile cattle (4.45 ± 0.69). Moreover, the blood biochemical profile of the Bali cattle with repeated breeding was lower than the fertile cattle.

Keywords: Repeat Breeding, Bali Cattle, Glucose, Cholesterol, Albumin.

INTRODUCTION

The successful of the stockbreeding business can be seen from the improvement of the livestock population raised. The improvement effort must be supported by the good management. The poor management affects the low efficiency of the cattle reproduction. Providing the good quality feed and the good environment can support the reproduction performance of the beef cattle so that it can fulfill the nutrient requirement for the physiological process and the reproduction of the cattle.

Bali Cattle is a native Indonesian cow descended from a bull (*Bos sondaicus*) that has been domesticated. The calves are light brown. The bulls' hair turns black in adulthood, while the cows remains light brown. There is a white striped butt. Both bulls and cows have very thin black fur lines along their backs. The adult weighs 800 lbs (363 kg) while the cows is about 600 lbs (272 kg) (Rianto and Purbowati, 2009). Bali cattle are scattered in almost all provinces in Indonesia and are growing quite rapidly in some areas. Bali cattle have the advantage of having a good adaptability to a bad environment, such as areas with high temperatures and have low or poor feed quality. In addition, Bali Cattle has a high fertility rate compared to other cows, which can reach 83% (Ngadiyono, 2012).

One of the reproduction problems is the repeated breeding of the cattle. The repeated breeding shows that the cattle having failure in the reproduction performance. The repeated breeding is a cow cattle condition which fails to pregnant after being breeding three times or more with the fertile male without the abnormality occurrence (returning estrus, with the normal interval) and without the pathology in the reproduction tract.

Some causes of repeated breeding are; (1) the fertility failure and (2) the effect of the early embryotic death (Amiridis et al., 2009). The fertility failure can be caused by the anatomic abnormalities of the reproduction tract, the abnormalities of ovum and spermatozoa, and the ovulation and the cysts ovarium failure. The other causes are the early embryotic death caused by the infection of the reproduction tract, the existence of certain disease and the presence of hormonal disorder. Generally, the cattle having repeated breeding marked by the length of the calving interval (18-24 months), the low number of conception (< 40%), and the heights of the *service per conception* (>3) (Rustamadji et al., 2007). The heights repeated breeding will affect the low production and productivity of the cattle per year. The low nutrient feed can indicate the cattle to have a repeated breeding. Therefore, in the efforts to improve the reproduction performance, the cattle feed nutrient status must be considered because it will influence the blood biochemical nutrient of the cattle, such as the glucose, cholesterol, and the albumin.

One of the ways to know the reproduction status of the Bali cattle is by observing the level of glucose, cholesterol, and albumin. The low level of the glucose can influence the energy produced by the cattle which affecting the fertility failure. Same as the heights cholesterol and albumin, it can influence the equality of the energy which affecting the fertility degradation and extends the anesthetic period. Besides the genetic and the environmental factors, the nutrient factor also indeed influences in improving the reproduction performance so that it really need to be considered and needing the good management.

MATERIALS AND METHODS

This research conducted in Bali Island then analyzed in the integrated research and testing laboratories or *Laboratorium Penelitian dan Pengujian Terpadu (LPPT)* Gadjah Mada University, Yogyakarta. The cattle used is Bali cattle which the amount to each is 10 cattle from the farm of the people. The characteristics are; the age around 3-5 years, ever breeding once, normal reproduction, and the healthy body condition. The cattle are divided into two groups; group 1 consists of 5 fertile cattle and the 5 others are the cattle that had been in the insemination or ever breeding naturally more than three times but there are no birth signs.

The sample was collected from jugular vena about 5 ml using holder and Venoject. Then, it was placed into the blood tube and saved in the iced thermos (Prihatno et al., 2013). The next was conducting the centrifugal to get the blood serum. It was continued by the blood analysis in the integrated research and testing laboratories or *Laboratorium Penelitian dan Pengujian Terpadu (LPPT)*, Gadjah Mada University. The total content of the cholesterol, albumin, and glucose in the blood were measured using Spectrophotometer Micro lab.

RESULTS AND DISCUSSION

The testing result of the glucose level, cholesterol, and blood serum albumin of the fertile and the repeated breeding of the Bali Cattle can be seen in table 1:

Table 1. The testing result of the blood biochemical of the normal and repeated breeding of the Bali Cattle.

| Blood Biochemical | Normal (n = 5) | Repeated breeding (n = 5) |
|---------------------|----------------|---------------------------|
| Glucose (mg/dl) | 44.26 ± 5.44 | 44 ± 6.95 |
| Cholesterol (mg/dl) | 119.92 ± 36.38 | 111.72 ± 28.81 |
| Albumin (g/dl) | 4.44 ± 0.69 | 4.31 ± 0.36 |

This research is in line with the opinion of Prihatno et al. (2013) that glucose in ruminants with repeated breeding is lower than that of normal cattle. Glucose is the most important metabolic substrate necessary for functions in the process of cow reproduction, so if low glucose content can affect the performance of cow reproduction such as repeated breeding events. Low levels of glucose in cow blood serum, in addition to inhibiting the synthesis or release of gonadotropin releasing hormone (GnRH) also inhibit the release of follicle stimulating hormone (FSH) and luteinizing hormone (LH), this results in inhibition of follicular, ovum, estrogen, and progesterone developments. In this case if the glucose content in the body is very excessive then the glucose will experience enzymatic catabolism reaction to produce energy, but if the glucose content is below the minimum, then the pyruvic acid produced from the process of catabolism will undergo the process of gluconeogenesis to synthesize glucose and meet the levels normal blood glucose (Murray et al., 2003).

Low cholesterol levels are found in cattle that are repeatedly breeding. According to Apriansyah, (2010) if the consumption of cholesterol from the excess feed, it can increase cholesterol levels in the blood and if the lack of cholesterol in the diet can suppress the desire and ovulation or reduce the number of ovulated eggs. Murray et al. (2003) cholesterol is an important element in the plasma membrane as well as the parent compounds for other steroid components synthesized in the body such as adrenal cortex hormones, sex hormones, vitamin D, and bile acids.

The results showed that the serum albumin levels of Bali Cattle that experienced repeated breeding was lower than that of normal cattle. This difference indicates that low albumin levels can cause repeated breeding. According to Bearden et al. 2004 lack of albumin causes the onset of weak lust, quiet calm, anestrus, repeat breeding, early embryonic death, absorption of embryos that die by the uterine wall. Another function of albumin is to play a role in the process of transporting food substances, albumin transporting small molecules through plasma and cell fluid. This function is closely related to the metabolism of free fatty acids and bilirubin and various drugs that are less soluble in water but must be transported through blood from one organ to other organs in order to be metabolized or excreted. The lower the albumin content, the nutrients from the feed do not benefit properly (Roche et al., 2008).

Table 2. The result of calculation of dry matter and organic matter feed intake in Bali Cattle normal and repeated breeding

| Nutrient intake | Normal (n = 5) | Repeated Breeding (n = 5) |
|-----------------|------------------|---------------------------|
| Dry matter | 4975,49 ± 160,83 | 4671,99 ± 340,40 |
| Organic matter | 4476.72 ± 155,01 | 4226.51 ± 308.89 |

Bali cattle in this study were given the same type of feed in a number that is not much different. So that, glucose, cholesterol and albumin levels are not much different from each group of livestock. Another things, Bali cattle raising activities in this research is far from home breeders with environmental conditions and difficult road access, thus affecting the activities of feeding that is only done once a day that is in the morning.

The result of blood biochemical test was related to dry matter and organic matter of Bali Cattle (Table 2), normal cow consumed dry matter and organic matter higher than repeated breeding. So that the dry ingredients and organic ingredients consumed are not much different.

CONCLUSIONS

The blood biochemical profile of Bali Cattle with repeated breeding is lower than of normal cattle.

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