

THE EFFECT OF GIVING ADDITIONAL FEEDS ON BALI CATTLE TO PRODUCTIVITY, PERFORMANCE, AND SELLING PRICE OF CALVES IN MARGINAL LAND (CASE STUDY IN BATUMADEG VILLAGE, NUSA PENIDA SUB DISTRICT, KLUNGKUNG REGENCY)

I P A Kertawirawan, N L G Budiari, and I N Adijaya

Assesment Institute of Agriculture Technology (AIAT) Bali
Jln. By Pass Ngurah Rai, Pesanggaran, Denpasar Selatan, Bali

Email : agus_kwirawan@yahoo.co.id

Abstract. Research was conducted in Nusa Penida, Klungkung-Bali from January to December 2018 using 21 Bali cattles. The study was design by randomized block design divided into 3 treatment groups. Control group (P0) : cattle were not given additional feed treatment, while group P1 and P2, the cattle was given 1 kg polard/day, for four months (2 months pre and postpartum). P2 group, the cattles was given biocas probiotics as much as 5 ml/day. Parameters observed were birth weight, weaning weight and postpartum estrus. Data analyzed using variance analysis (ANOVA). The results is, statistically calf birth weight was not significantly as 18.4 kg (P0) and 18.6 kg respectively (P1 and P2). Weaning weights, P2 group showed better performance is 97.7 kg, followed by groups P1 (93.1 kg) and P0 (79.4 kg). that performance make the average calf selling price (P1 and P2) was higher than the control. The highest average was obtained in group P1 which was IDR. 3,941,667, - / calve followed by P2 IDR. 3,716,667, - / calve and P0 IDR. 3,290,000 / calve. The average duration of post partum estrus is shorter on P2 (113.3 days), than P1 (123.7 days) and P0 (138.4 days)

1. Introduction

Bali cattle have many advantages, namely fast breeding, high fertility, adaptability to the environment, can live in critical land, have a good digestibility of feed and a high percentage of carcasses. Although bali cattle can adapt to critical environments, their productivity is not optimal.

Feed is one of the most important factors in a beef cattle business. Providing good nutrition through a good management strategy can increase the productivity of Balinese cattle [1] & [2]. The feed given to beef cattle can be divided into two types, namely forage and concentrate feed [3].

Feed for ruminants depends on the provision of sufficient, high-quality and sustainable forage throughout the year. The low nutritional value and fluctuation in forage production throughout the year is a matter of providing food in Indonesia until now [4]. In the rainy season the availability of forage is very abundant, but in the dry season it is difficult to obtain. On the other hand there is a shift in climate patterns or weather anomalies that affect the life patterns of forage source plants [5].

Good feed management in beef cattle, 60% gives a big influence on productivity. The magnitude of the effect of feed proves that high livestock production cannot be achieved without feeding that meets the quality and quantity requirements [6]. According to Kelly [7] cows need five main nutrients namely energy, protein, minerals, vitamins and water. These nutrients are important for maintaining health and productivity. Feeding needs depend on livestock weights, growth or reproductive phases and growth rates. Feed nutrition is first used for basic living needs and the rest is

used for the synthesis of livestock products such as meat, milk and energy reserves so that feed consumption is a basic factor so that livestock can live and produce [8] & [9].

Nusa Penida is a Bali cattle breeding area in the Province of Bali which is geographically a marginal area (dry land). Availability of feed that is not optimal in the dry season becomes an obstacle in producing good livestock production. In line with Sutrisno [4] which states that the low nutritional value and fluctuation of forage production in Indonesia throughout the year is still a problem where in the rainy season the availability of forages is very abundant, and in the dry season it is difficult to obtain. Animals that have low feed consumption during the pregnancy phase generally have low calf birth weights and poor reproductive performance.

Feed management is an innovation in this study that aims to optimize the productivity and performance of livestock in Nusa Penida. A good birth performance will affect the quality of growth and the sale value of livestock after weaning. The innovation of supplementary feeding to pregnant mothers is indicated to be able to increase livestock productivity.

2. Methodology

The study was conducted in the Batumadeg village, Nusa Penida sub-district, Klungkung-Bali district from January to December 2018 using 21 Bali cattle in pregnant. The study design was a randomized block design (RBD) divided into 3 treatment groups is P0 (control), P1 and P2. Control group (P0): cows were not given additional feed treatment (according to farmers' habits), while groups P1 and P2, cows were given additional feed in the form of polard as much as 1 kg / cow per day, for 120 days (60 days pre partus and 60 days post parturition). In the P2 group, the cattle was also given additional Biocas probiotics as much as 5 ml /cow / day.

2.1. Research variable

The parameters observed were birth weight, weaning weight during estrus post partus and calf selling value

2.2. Data analysis

The data obtained were analyzed using analysis of variance (Anova). If the treatment has a significant effect followed by "Duncan Multiple Range Test" with a level of confidence (significant level) 5% ($P < 0.05\%$).

3. Results And Discussion

Based on the results of the study obtained data where the birth weight, estrus post parturition, calving interval and weaning weight statistically showed results were not significantly different, but there were differences in selling values based on calf body performance between treatments. The complete data is presented in table 1.

Table 1. The main data resulting from this research

Treatment	Average Main Weight (kg)	Birth Weight (kg)	Average age weaned (month)	Mean of Estrus Post Partus (hari)	Calving Interval (days) gestational age 285 days	Calving Interval (month)	Average Weaning Weight (kg)
P0	287.42 ^a	18.4 ^a	7 ^a	138.4 ^a	423.4 ^a	14.1 ^a	779.4 ^a
P1	266.57 ^a	18.6 ^a	7 ^a	123.7 ^a	408.7 ^a	13.6 ^a	93.1 ^a
P2	289.42 ^a	18.6 ^a	7.4 ^a	113.3 ^a	398.3 ^a	13.3 ^a	97.7 ^a

Based on the results of the study, statistically the calf birth weight was not significantly different at 18.4 kg in the control group (P0) and 18.6 kg each in the P1 and P2 groups. Statistically the birth weight obtained is not different, but other impacts of animal feed affect postpartus calf performance and also reproductive health of the parent. The data is in line with the results of Pane [10] study which states that the birth weights of Bali cattle range from 13-18 kg. Calf birth weight is determined by the parent nation, sex of the child, length of cattle pregnancy, age or parity of the cattle, and cattle feed when pregnant. In line with the opinion of Jainudeen, et al., [11] which states that fetal growth and development is influenced by genetic factors (species, nationality, body size, and genotype), environmental factors (parent and placenta) and hormonal factors.

Regarding weaning weight, P2 group showed better performance, namely 97.7 kg, followed by groups P1 (93.1 kg) and P0 (79.4 kg). Based on research by Reynolds [12] in Brangus and Africander x Angus cattle, the effect of nutrition can be seen from the weaning body weights and the level of parent fertility. Birth weight, the real effect on the weaning weight even though the r is not too large. Each kg of body weight increase will increase the total body weight gain of 1.9 kg [13]. Each kg of birth weight will increase the average body weight gain of 0.012 kg. The growth of the weaning body weight was strongly influenced by the production of cow's milk and calf consumption level. Cows who get good rations while breastfeeding have a better level of milk production. According to Bond, et al., [14] so that the provision of high energy to the parent can affect the cow's milk production. The average body weight gain with milk production will decrease with increasing duration of lactation [15].

In line with this performance, the average calf selling value in the treatment group (P1 and P2) was higher than the control group (P0). The highest average calf price was obtained in the P1 group, namely IDR. 3,941,667, - / calf followed by P2 group in the amount of IDR. 3,716,667 / calf and control group of IDR. 3,290,000 / calf. The average price obtained is based on the calculation of the average sales of each treatment group for male and female calves. The selling price is greatly influenced by the calf performance produced. In Nusa Penida, the sale of calves is much dependent on the traditions and only a few are sold directly between farmers, so prices are much influenced by local market prices. Besides price, calf sex also influences, where male calf price can be more expensive between IDR. 1 million to 1.5 million / calf (See table 2).

Table 2. Average price of male and female calf based on body performance

Treatment	Average calf price (Rp, -)		Average calf price (Rp, -)
	Male	Female	
P0	4.050.000,-	2.783.333,-	3.290.000,-
P1	4.800.000,-	3.083.000,-	3.941.667,-
P2	6.350.000,-	3.190.000,-	3.716.667,-

Source: processed primary data

Besides performance and selling price, the provision of additional feed influences the time of post partus estrus. The average duration of post partus estrus in treatment cows was 123.7 days (P1) and 113.3 days for P2 treatment, while for control (P0) the duration of post partus estrus for 138.4 days. Energy (not protein), a large contribution to the interval of parturition and the return of estrus. Parent given high-energy ration for 140 days before parturition, showed estrus which is faster than the parent with low-energy ration [16]. It was also further explained that the provision of better rations to pregnant mothers would increase the conception rate, so that livestock productivity could increase. According to Bearden, et al., [17] lack of nutrition in a long time will cause the ovary to be inactive so that the estrous cycle is irregular and even causes anestrus. The more farmers provide poor quality livestock, the CR value will decrease.

4. Conclusion

Based on the results of the study it can be concluded that the provision of additional feed on pregnant cows can increase productivity, performance and selling value of Bali cattle calf in marginal land in Nusa Penida

5. References

- [1] Heryanto K., Maaruf, S.S., Malalantang., Waani M.R. 2016. *Pengaruh Pemberian Rumput Raja (Pennisetum Purpupoides) dan Tebon Jagung terhadap Performans Sapi Peranakan Ongole (Po) Betina*. Jurnal Zootek Vol. **36** No.1:123-130.
- [2] Imran , Budhi, S.P.S., Ngadiyono, N., Dahlanuddin. 2012. *Pertumbuhan Pedet Sapi Bali Lepas Sapih yang Diberi Rumput Lapang dan Disuplementasi Daun Turi (Sesbania grandiflora)*. Agrinimal J Ilmu Ternak dan Tanaman. Vol **2** No 2:55-60.
- [3] Erlangga, E. 2013. *Meningkatkan Bobot Sapi Potong dengan Pakan Racikan Sendiri*. Pustaka Argo Mandiri.Pamulang
- [4] Sutrisno, C.I. 2009. *Pemanfaatan Sumber daya pakan lokal terbaru*. Seminar Nasional Kebangkitan Peternakan. Program Magister Ilmu Ternak Program Pascasarjana Universitas. Diponegoro, Semarang.
- [5] Ukanwoko, A. I. and N. C. Igwe. 2012. *Proximate Composition of Some Grass and Legume Silages Prepared in A Humid Tropical Environment*. International Research Journal of Agricultural Science and Soil Science **2**: 068.
- [6] Nurwahidah J 1 , A.L. Tolleng2 , M.N.Hidayat. 2016. *Pengaruh Pemberian Pakan Konsentrat Dan Urea Molases Blok (UMB) Terhadap Pertambahan Berat Badan Sapi Potong*. JIIP Volume **2** Nomor 2, Desember 2016, h. 111-121,
- [7] Kelly. 2002. *Nutrition of the dairy cow . The Health of Dairy Cattle*. Blackwell Science, UK
- [8] Kartasdisastra, H. R. 1997. *Penyediaan dan Pengolahan Pakan Ternak Ruminansia Sapi, Kerbau, Domba, dan Kambing*. Kanisius. Yogyakarta.
- [9] Rahman, D. K., 2008. *Pengaruh Penggunaan Hidrolisat Tepung Bulu Ayam dalam Ransum terhadap Kecernaan Bahan Kering dan Bahan Organik serta Konsentrasi Amonia Cairan Rumen Kambing Kacang Jantan*. Skripsi. Program Studi Peternakan Universitas Sebelas Maret.
- [10] Pane I. 1990. *Upaya peningkatan mutu genetik sapi bali di P3. Bali*. Prosiding Seminar Nasional Sapi Bali. Bali: 20-22 September 1990.
- [11] Jainudeen M R, Hafez ESE. 2000. *Gestation, prenatal physiology and parturition*. Di dalam: Hafez ESE, Hafez B, editor. *Reproduction in farm animals*. : Ed ke 7. Lippincott . Williams & Wilkins.
- [12] Reynolds, W. L., T. M. De Rouen and J. W. High. 1963. The age and weight at puberty of Angus, Brahman and Zebu cross heifers. *J. Anim. Sci.* **22**:243.
- [13] Vaccaro, R. dan E.U Dillard. 1966. *J. Anim. Sci.* **25** : 1063
- [14] Bond,J. J.N.Wiltbank, E.J. Warmick, R.P. Lehmann dan T.B Kinney, 1964. *J. Anim. Sci.*, **23** : 901 (Abstract),
- [15] Melton, A. A., J. K. Riggs, L. A. Nelson and T. C. Cartwright. 1967. Milk production, composition and calf gains of Angus, Charolais and Hereford cows. *J. Anim. Sci.* **26**:804.
- [16] Christenson, R.RD.R Zimmerman, D.C Clanton, L.E Jones,R.L Tribble dan R. Sotomayor. 1967. *J. Anim. Sci.* **26**. 652,
- [17] Bearden HJ, Fuquay JW, Willard ST (2004). *Applied Animal Reproduction*, Sixth Edition. Pearson Prentice Hall, Upper Saddle River, New Jersey, NY, U.S.A

Acknowledgments

We thank to the participating farmers and all the team research from BPTP Bali for their kind support.