The Effects of Concentrate Based Local Feed Supplementation and Anthelmintic Injection on Bali Cattle Calves and Cows Performances

Y U L Sobang¹, M R Pellokila², S Fattah¹, M Yunus¹, G Maranatha¹

¹Faculty of Animal Husbandry, University of Nusa Cendana, Indonesia
²Faculty of Agriculture, University of Nusa Cendana, Indonesia

E-mail: yulsobang@staf.undana.ac.id

Abstract. A study was conducted to determine the effect of local feeds supplementation and anthelmintic injection on calf birth weight, daily weight gain of Bali cattle calves and cows, and fecal egg count. The study was followed a Completely Randomized Design with 3 treatments and 5 replications. The experimental diets were T₀; control diet (legumes without local feed concentrates), T₁; T₀ + local feed concentrates, T₂; T₁ + anthelmintic. The results of this study indicate that both averages birth weight and body weight gain were increased (P<0.05) by local feed concentrates and anthelmintic (T₂) were 14.1±0.822kg, 16.82±0.602kg, respectively. In addition, the average fecal eggs count was lower in T₂ (25±2.236 egg/g) followed by T₁ (64.2±2.490 egg/g) but higher in T₀ (68.4±2.702 egg/g). Therefore, it can be concluded that supplementation of local feed concentrates and anthelmintic increased birth weight and body weight gain and at the same time reduced worm egg of Bali cattle calves and cows.

Keywords: supplementation, anthelmintic, cow, calf, local feeds.

1. Introduction
The pregnant Bali cow is a physiological condition that requires adequate nutrition to support the growth needs of the foetus and also the basic life and maintenance of the cow. The availability of adequate nutrition during pregnancy period of Bali cow is expected to obtain normal birth weight, high calf survival, increase milk production, and the ability to recover from postpartum body condition, therefore results in subsequent normalreproductive cycle. During 80-90 days of pregnancy prior to delivery is a critical period for the animal as it has to meet some factors including nutrient requirements for the growth and foetal development since the increase of body weight is threefold as well as maintaining the normal body condition to remain strong for birth which results in a healthy calf [1].

Beef cattle production system in Kupang Regency is still dependent both on the forages that are naturally available in the pastures and on the forage of tree legumes which are cultivated on agricultural land [2]. Furthermore [3] stated that nutritional intake during pregnancy is correlated with milk production and calf birth weight, and if the intake deficiency
continuously occurs for three months before parturition it can lead to death of calf both while in the womb and after birth. The *Gliricidia sepium* and cassava plants that abundantly available in Kupang Regency can be used as a source of protein in concentrate. Feed repair also needs to be followed by health maintenance, especially in eliminating internal parasitic infestations, so that animal feed use is more efficient.

2. Methodology

Fifteen 7 months pregnant Bali cows owned by farmers were used in this study. The animals were randomly assigned to one of the three treatments were: T0 = legumes as control; T1 = T0 + feed concentrate 2 kg/h/d; T2 = T1 + anthelmintic. The experimental was subjected to a completely randomized design with 3 treatments and 5 replications. The cows were fed a basal diet consist of grass and legumes. The concentrates offered were locally available feeds with compositions of 50% rice bran, 25% corn meal, 15% *Glyricidia* leaf meal, 5% cassava leaf meal, 2% urea, 2.5% salt, 0.5% starbio (Table 1). The amount of 5 ml anthelmintic (Ivermectin) was injected intramuscularly to each of the animal at the beginning of the. While B-Complex vitamin was also applied to the animals.

| Table 1. Nutrient content of diet in research (%) |
|-----------------------------------------------|
| Variable          | DM (%) | OM (%) | CP (%) | Fat (%) | CF (%) | BETN (%) | Energy |
| Basal Feed (T0)   | 28.68  | 81.24  | 19.12  | 3.72    | 18.18  | 40.36    | 16.32  |
| Concentrate Feed  | 83.34  | 72.46  | 18.92  | 4.29    | 16.44  | 52.02    | 18.54  |

Note: Nutrition and Animal Feed Laboratory of Faculty of Animal Husbandry

Variables Measurement

1) Calf birth weight was obtained by weighing the animal within the first 24 after parturition. The weighing process was carried out by an officer carrying the calf and weighing on the scale, where birth weight is the difference between the weight of an officers and the weight calf(kg).
2) The calf and cow weight was determined using the formula: W2-W1/t, where W1 = Initial body weight (Kg); W2 = Final body weight (Kg); and t = time fattening (days)
3) The number of worm eggs was determined by collecting feces sample from the rectum. The formalin was added to the feces sample before placed in a tube that subsequently allocated in an ice flask. The number of worm eggs in feces was examined by an electron microscope by using the EggPer Gram (EPG) method. Briefly, the amount of 2 g feces was weigh and then a salt solution of 38 mL was added and stirred evenly in the mortal. The sample was filtered using a tea filter and the filtrate was store in the mortal. The filtrate was then taken using a micro-pipette of 1000 µL and put into the count chamber of Mc. Master Slide until all the compartment rooms were fully filled and leftsitted for 4-5 minutes. The final step was counting the number of eggs and observing the shape and size by using a microscope with a magnification of 10x according to the comparative image contained in the guidebook of Helminths, Arthropods and Protozoa of Domesticated Animals [4]. The worm eggs examination by using the Egg Per Gram (EPG) method followed the formula of [4], as follows:

\[
EPG = \frac{N \times V_t}{V_k \times B_t}
\]

Where:

- The sample number was 58ml NaCl + 2g feces = 60ml
- Bt = 2g feces
Data analysis
The data obtained were analyzed using analysis of variance, and LSD was undertaken for the differences between treatments [5]. The model used was: $Y_{ij} = \mu + \alpha_i + \varepsilon_{ij}$
Where $Y_{ij} = \text{Observation on the treatment level-i and replication level-j; } \mu = \text{General average}$
$\alpha_i = \text{Effect of treatment level I; } \varepsilon_{ij} = \text{Effect of error from treatment level-i and replication level-j}$

3. Result and Discussion
Calf birth weight
Supplementing the cows with legumes, concentrate and anthelmintic during pregnancy period had a significant effect (P < 0.05) on calf birth weight. The average calves birth weight found in the present study were 13.57 kg in the group of cows treated with legumes, concentrate and anthelmintic (T2) followed by animals fed legumes and concentrate (T1) but not significant in control group. This may indicate that addition of local feed-based supplementation and anthelmintic in 7-month pregnant cows was able to provide adequate nutrient intake that needed for the fetus growth, and thus resulting in higher calf birth weight compared withcows without feedsupplementation. The results of the present study is in agreement with the statement of [15] that with "flushing" through feeding of concentrates on 8-month-old pregnant cows to calves of aged 2-3 months can increase calf birth weight.

The results of this study was slightly lower than the result of cit [6] who reported calves birth weight were between 15-17kg. Similar results was reported by [7] that Bali cattle of aged 0 week and supplemented with rice bran and anthelmintic had birth weight ranged from 11.80 to 15.10 kg. Study by [8] also recorded similar birth weight of Bali cattle in Sumbawa ranging from 13.8-15.2kg. In addition, birth weight of male and female Bali cattle raised in highlands were found to be 15.2 kg and 12.8kg respectively, while in the lowlands were 13.8 kg and 11.8kg, respectively [9]. In addition results of [14] found that an increase in energy levels from 2000 kcalME/ kg to 2300kcalME/kg on crude protein 10% increased birth weight of calves from 17.83kg to 18kg and daily gain of Bali cows from 0.535kg/h/d to 0.515kg/h/d. The differences between the results of previous studies may be due to variability of feed, age and weight of the cow and the time the study was conducting.

Table 1. Average calf birth weight, calf daily weight gain of 2 months age, daily weight gain after 2 months of bali cow, and number of worm eggs.

| Variables                              | Treatment |          |          | Average | P-value |
|----------------------------------------|-----------|----------|----------|---------|---------|
| Calves birth weight (kg)               | T0        | T1       | T2       |         |         |
|                                        | 12.3±0.570a | 14.1±0.652b | 14.3±0.570b | 13.57   | 0.003   |
| Daily gain of calf (kg/e/h)            | 0.17±0.021a | 0.23±0.026b | 0.24±0.015b | 0.20    | 0.001   |
| Daily gain of bali cow 2 month postpartum (kg/e/h) | 0.18±0.016a | 0.27±0.019b | 0.28±0.018b | 0.24    | 0.014   |
| Decrease in the number of worm eggs (EPG) | 45.00±5.39a | 50.80±4.87a | 55.80±10.06a | 50.53   | 0.097   |

a-b,values within a row with different letters differ (P <0.05)

Daily weight gain
Providing pregnant Bali cows with legumes, concentrate and anthelmintic increased (P <0.05) calf birth weight. There were no significant difference between cows received legumes, concentrate and anthelmintic (T2) and animals fed legumes and concentrate (T1) compared with control group. The difference between supplementation treated groups compared with control group may indicate that adequate nutrition derived from local feedbased supplementation and anthelmintic for 7-month pregnant cows was able to increase daily weight gain of the calves. This finding is in line with the
opinion of [20] that cattle performance not only affected by breed, but also by the management of feeding.

Daily weight gain of Bali calves in the present study was ranged from 0.17-0.24kg/h/d (average of 0.20kg/h/d) and the highest was in the group of cows treated with legumes, concentrate and anthelmintic (T2). The results of this study were not much different from some previous studies. Study by [12], had documented the average daily weight gain of Bali cattle calves both male and females were 0.256kg/d and 0.245kg/d, respectively. Similar results were reported by [16] that daily weight gain of one year Bali cows was 0.21 ± 0.04kg (male) and 0.15 ± 0.03kg (female) and [17] of 0.22 ± 0.02kg/h/d for calves fed legumes. However, the results of the present study was lower than that reported by [7] that 0.53 kg/h/d was the weight gain of 2 months calf. Study by [18] also reported the daily weight gain of Bali cattle was 0.65 kg/h/d. The results of this study however, were slightly higher than the results reported by [19] that Bali cattle maintained on natural grass in South Sulawesi had 0.10kg/h/d of daily weight gain. The difference between the studies may be caused by differences in birth weight of calf, feed, milk production of the dam, and time of conducting research. This study was carried out during the dry season.

Cow weight gain 2 months postpartum
Cows treated with legumes, concentrate and anthelmintic (T2) and legumes and concentrate (T1) had significantly higher (P<0.05) in weight gain 2 months postpartum than the control group. This indeed indicates that providing the dams with concentrates and anthelmintic was properly support the animals during pregnancy through nutrients contained in the feed. Therefore results in meeting the needs of the dams during lactation as well as for recovery of body weight compared to the cows without concentrated treatment. However, there were no differences between cows administrated with anthelmintic and in no anthelmintic group.

Daily weight gain of cows in this study was ranged from 0.18-0.24kg/h/d with an average of 0.24kg/h/d. The results of this study were lower than those reported by [21] that Bali cattle maintained with a feedlot system with complete ration resulted in body weight gain of 0.60 kg. Similar results reported by [22] and [23] where the daily weight gain were 0.53kg and 0.97kg, respectively. The differences between the results may be influenced by some factors including sex, feed quality, age of the animal, and season when the study was conducted.

Number of Worm Eggs
There were no differences between treatments (P>0.05) on the decrease in the number of worm eggs. Maintaining pregnant Bali cows with concentrate and anthelmintic did not reduced the number of worm eggs in the feces. This may be due to worm infestation in cows that was relatively low and thus the cows were still in a good condition that was not disturbed by worm infections. Previous study [24] argued that high infestations of worm caused negative impact to the host animal as a result of some of the nutrients used by parasite to survive. Furthermore [4] states that nutrition plays an important role in shaping the immune system of the animal.

4. Conclusion
Therefore, it can be concluded that the feeding concentrate and anthelmintic to cows during 7 months pregnancy results in an increase calf birth weight, daily weight gain both the cow and the calf, but had no effect in reducing the number of worm eggs.

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