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EFFECT OF FEED SUPPLEMENTATION ON THE PERFORMANCE OF EARLY-WEANED BALI CALVES

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ABSTRACT

Late-weaned practice is common in Indonesia and this contributes for longer calving interval. Lack of milk is the main reason why farmers let their calves with the cows for longertime. Twenty seven 28 days old Bali calves were divided into 2 groups of 13 (Group A) and 14 (Group B). Animals in Group A were offered with 12 % live weight (LW) chopped Elephant grass and 6% LW mix legume leaves (*Gliricidia : Leucanena : Calliandra* at a ratio of 60 : 30 : 10) (Diet A). While animals in Group B (Diet B) were offered 0.2 kg/hd/day molasses and cassava 0.3 kg/hd/day) on top of Diet A. Water was available at all time and the trial was terminated when calves reached 168 days old. Supplementation of molasses and ground cassava significantly improve body condition score (5.8 vs 5.2) and market price (Rp 244.000,- vs Rp 205.000,- ($P<.05$). While mortality rate was significantly lower (43 % vs 52%). Animals in the supplemented Group (B) Had higher live weight (39 kg vs 31 kg) and higher average daily live weight gain (142 vs 116 g/day), however they were not significant ($P>.05$). This may be due the limited number of calves used in this study. It is suggested that complete supplementation should be given to calves in order to support early weaning practice for calves.

Key words: Bali calves, Supplementation, Early-weaning technique

INTRODUCTION

Late-weaned practice is common in Indonesia and this contributes for longer calving interval. Lack of milk is the main reason why farmers let their calves with the cows for longer time. Generally management and strategies for young calf by farmer in the village is not practiced, because the farmers, especially in East Java have sold their calf before weaning and also the farmers have weaned their calf from two up to six months of age (Affandhy *et al.*, 1995). This may be due survival and growth rates of beef calves are still lower than predicate potential calves. This is due largely to mark seasonal fluctuations in feed supply. Affandhy *et al.* (1997) reported that pre-weaned PO calves of up to 84 days of age fed a legumes-based diet would not benefit further from a dietary supplement of fermentable carbohydrate such as molasses and cassava.

This study was undertaken to examine the value of shrub legumes in the feeding of Bali calves for growth. As basal diet used another grass, because the legumes more fermentable than grass (Lowry and Kenedy, 1996). The supplementary feeding for early weaned calves using a mix of molasses and cassava is important, In reality research has indicated that 1.3 kg molasses is equivalent to 1.0 kg of grain for milk production (Cowan and Davison, 1980 cited by Walker *et al.*, 1996). Therefore, the absence of appropriate feeding and management strategies for the young calf.

It is possible under the resource settings of the Indonesian smallholder farmers, to successfully incorporate the early weaning of calves in an overall management strategy for efficient beef production. The objective of this study was determined to develop an efficient feeding and management strategy for early-weaned calves using locally

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available feed resources.

MATERIAL AND METHODS

Animals Treatment

Twenty seven Bali calves were divided into two group. Thirteen heads were fed a basal diet of fresh Elephant grass at approximately 12% of live weight plus fresh legume leaves (*Gliricidia : Leucanena : Calliandra* at a ratio of 60:30:10) at 6% of live weight (diet A).Fourteen heads (diet B) received diet A supplemented molasses (at 0.2 kg/hd/day and cassava (at 0.3 kg/hd/day) and had free access to mineral blocks.

Procedure

The study commenced when the calves were 28 days old and terminated when the animal reached 168 days old. Calves had access to their dams continuously during the seven days *post-partum*. Thereafter, they were separated from their dams and allowed to suckle twice a day until at 28 days of age and ones a day until weaned at 84 days of age.

Recordings/Measurements and analysis

Data collected included live weight, body condition (BC) score (Nicholson and Butterworth, 1986), mortality, price estimated and feed intake which was measured five consecutive days at four weeks weekly intervals. The data collected are presented in analysis of variance and used to detect the significant of differences between Diets by t-test (Lund, 1983).

RESULTS AND DISCUSSION

Results

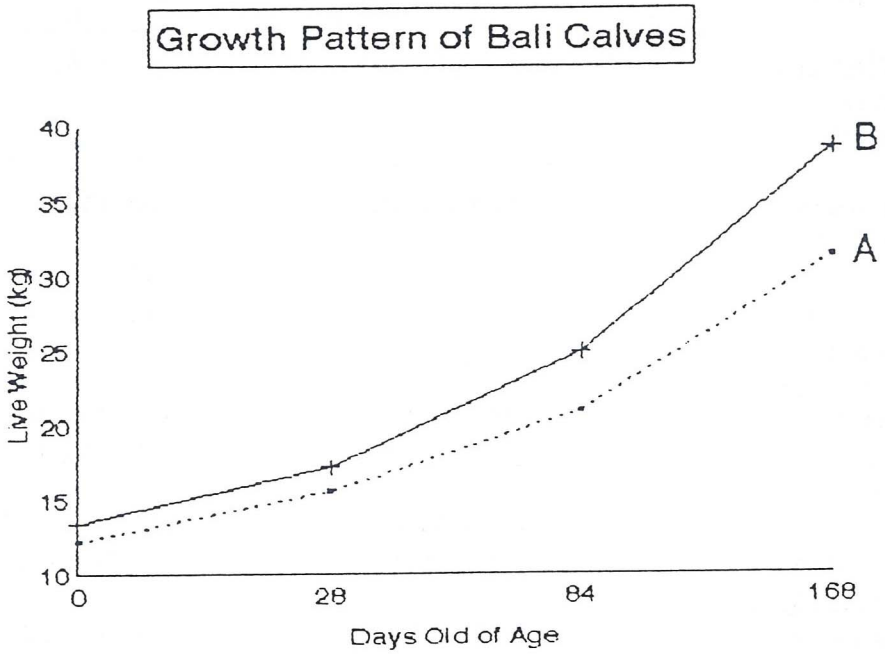
Performances of Bali calf

The live weight of Bali calves at 84 days or 168 days (before and after weaning) was not different between diets (P>.05), but BC score and price estimated of the calves on live weight were not different between diets, however the mortality of the calves on the Bali calves on Diet B was lower (42.85%) than those Diet A (53.85%) and also the pattern of the Bali calves on Diet B appeared higher than those Diet A (Figure 1).

Table 1. Live weight, BC score, price estimated and mortality of Bali calves

Parameters	Diets	
	A	B
Number	13	14
Birth weight (kg)	12.20 ± 1.53	13.39 ± 1.75
Live weight (kg):		
- 84 days of age	20.96 ± 2.26	24.93 ± 4.05
- 168 days of age	31.27 ± 7.34	38.56 ± 5.96
Body condition score:		
- 84 days of age	05.08 ± 0.20[a]	05.58 ± 0.49[b]
- 168 days of age	5.17 ± 0.41[a]	05.83 ± 0.60[b]
Price estimated (Rp)x1000		
- 84 days of age	172.50 ± 8.22[a]	194.17 ± 19.85[b]
- 168 days of age	205.83 ± 32.31[a]	244.17 ± 49.84[b]
Mortality (%)	53.85	42.85

[a,b] Different superscript in the same row showed a significant differences (P<.05)
A = Calves were fed Elephant grass + Legumes
B = Calves were fed Elephant grass + legumes + Molasses + Cassava



A= Diet 1
B= Diet 2
Figure 1. The Growth pattern of Bali calves feeding

Table 2. Feed intake of DM, OM, CP, fresh milk from cows and live weight gain of Bali calves before weaning

Item	Diets	
	A	B
DM intake (g/day):		
- 28-35 days of age	150.17 ± 90.38	227.88 ± 219.06
- 49-56 days of age	222.67 ± 123.52[a]	475.38 ± 167.77[b]
- 77-84 days of age	445.67 ± 144.79[a]	756.43 ± 73.03[b]
CP intake (g/day):		
- 28-35 days of age	29.50 ± 18.15	33.00 ± 12.57
- 49-56 days of age	37.83 ± 18.10	64.00 ± 27.33
- 77-84 days of age	84.00 ± 23.01	115.00 ± 12.82
Fresh milk consumption (g/day):		
- 84 days of age	598.33 ± 84.43	648.87 ± 185.18
Live weight gain (g/day):		
- 84 days of age	101.67 ± 41.67	121.25 ± 57.43

[a,b] Different superscript in the same row showed a significant differences (P<.05)
A = Calves were fed Elephant grass + Legumes
B = Calves were fed Elephant grass + legumes + Molasses + Cassava

Table 3. Feed intake, digestibility and live weight gain in Bali calves after weaning

Item	Diets	
	A	B
Number of Bali calves	6	8
120 days of age:		
Feed intake (g/day)		
- Dry matter	823.67 ± 86.53[a]	1127.00 ± 270.31[b]
- Crude protein	140.67 ± 31.47	190.15 ± 71.13
Digestibility (%)		
- Dry matter	72.00 ± 04.98	77.75 ± 08.91
- Crude protein	70.00 ± 08.99	72.50 ± 09.87
160 days of age:		
Feed intake (g/day)		
- Dry matter	976.60 ± 117.17[a]	1345.75 ± 435.55[b]
- Crude protein	142.04 ± 29.45	152.00 ± 33.59
Digestibility (%)		
- Dry matter	69.00 ± 09.35[a]	79.12 ± 04.52[b]
- Crude protein	70.60 ± 09.71	68.75 ± 13.52
Live weight gain (g/d)		
- 168 days of age	116.67 ± 40.82	141.67 ± 30.71

[a,b] Different superscript in the same row showed a significant differences (P<.05)
A = Calves were fed Elephant grass + Legumes
B = Calves were fed Elephant grass + legumes + Molasses + Cassava

Feeding

DM and CP Intakes of the calves at 28-35 days of age and fresh milk consumption and live weight gain were not different between diets (P>.05). However DM intake of the calves at 49-84 days on Diet B was higher than Diet A, Whereas CP intake on the calves at 49-84 days of age between diets were not different.

DM intake of the calves on the Bali calves at 120 and 160 days of age between diets were significantly different (P<.05), but CP intake and live weight gain were not significantly different (P>.05); Whereas DM digestibility on the calves at 160 days of age was significantly different (P<.05), however at 120 days of age, the DM digestibility was not different (Table 3).

Discussion

Performances of Bali Calf

The live weight of Bali calves was not different between diets (P>.05), but BC scores and price estimated of the calves on Diet B were significantly higher (P<.05) than those Diet A (Table 1). The growth pattern of the Bali calves on Diet B appear higher than those Diet A (Figure 1), therefore, supplementation of molasses and ground cassava significantly improve body condition score (5.8 vs 5.2) and market price (Rp 244.000,- vs Rp 205.000,- (P<.05). While mortality rate was significantly lower (43% vs 52%); The mortality of calves was become before weaning with milk production of cows was very little, too (0.1 up to 0.2 kg per day).

The live weight (31-39 kg) and live weight gain (205-244 g/day) of Bali calves were still low, because birth weight of the calves is small (12-13 kg). The normal birth weight of Bali calves from some studies were 16 kg (Pastika and Dardja, 1976), 16-17 kg (Winugroho *et al.*, 1994) and 15 kg (Thalib and Siregar, 1984) and then live weight of cows are very small (215-224 kg) and also fresh milk consumption of calves from Bali cows is low (see Table 2).

Feeding

DM and CP intakes of the calves at 28-35 days old and fresh milk consumption and live weight gain were not different between diets (P>.05), However DM intake of the calves at 49-84 days old on diet B was higher than diet A, whereas CP intake on the calves at 49-84 between diets were not different. Although their DM intake was higher, the calves at 84 days old (before weaning) on diet B did not have a higher live weight gain. This is due to the Bali calves up to 84 days of age fed a legumes-based diet would not benefit further from a dietary supplement of fermentable carbohydrate such as molasses and cassava.

DM intake of the calves at 120 up to 160 days old and DM digestibility of the calves at 160 days old between diets was significantly different (P<.05), but CP intake, live weight gain and CP digestibility and DM digestibility (at 120 days of age) of the calves were not significantly (P>.05). Although their DM intake and DM digestibility (at 160 days of age) were higher, especially the calves at 168 days old on diet B did not have a higher live weight gain, because feed requirement of CP intake still low and then milk production of the cows were very little (±0.6 kg/head/day). In fact supplementary feeding of molasses has responded positively to growing cattle (Stateler, 1995), but Bali calves more sensitive to nutritional stress. Wijono *et al.* (1992) reported that Bali cattle appear to be more sensitive nutritional stress than PO and Madura cattle.

CONCLUSION

It would appear from results of this research that pre-weaned Bali calves of up to 84 days of age fed a legumes-based diet would not benefit further from dietary supplement of carbohydrate such as molasses and cassava, but the Bali calves of 84 up to 168 days of age fed a legumes-based diet would give benefit further from feed supplement such as molasses and cassava.

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