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EFFECT OF CONCENTRATE LEVEL AND THE LENGTH OF FATTENING ON THE GROWTH, FEED INTAKE AND FEED CONVERSION EFFICIENCY OF *PESISIR* COWS

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ABSTRACT

A study was done to examine the effects of concentrate level and the length of fattening on the daily weight gain (DWG), feed intake and feed conversion efficiency of Pesisir Cows. Twelve cows between 2 and 2.5 years old with live weights of 126 to 170 kg were used. The study used a randomized block design in factorial arrangement with two factors. The first factor was concentrate level (CL) with either 50 % concentrate and 50 % of ammoniated rice straw or 75 % concentrate and 25 % ammoniated rice straw (defined as A1 and A2, respectively). The second factor was the duration of fattening, either 3 or 4 months (B1 and B2, respectively). There were significant effects of CL on DWG ($P<0.05$), no significant ($P>0.05$) effect of LF on DWG and no CL x LF interaction on DWG. There were no significant ($P>0.05$) effects of CL on DMI but LF significantly affected ($P<0.05$) on DMI. There were no interaction effects of CL and LF on DMI. CL significantly ($P<0.05$) decreased FCR while LF did not significantly affect FCR. There were no significant effects of interaction between CL and LF on FCR

Keywords: Pesisir Cow, Concentrate, Length Of Feeding, Daily Weight Gain, Consumption, Feed Conversion

INTRODUCTION

Pesisir cows (PC) are a typical breed of cow from district of Pesisir Selatan, West Sumatra (Saladin, 1984). BPS (2001) reported that the total population to be 96,443 cows in 2001. The cows are small in stature and as this breed is only native to that area, special care must be taken with its development so as to preserve its genetic potential.

Feeding level together with growth rate is known to affect the lifetime performance of cows. One possibility to improve productivity of Pesisir cows is fattening using feedlot management systems. Clarke (1991) reported that in such systems cows are fed high levels of concentrate (e.g., 70 to 100 % in ration) over a short period of time. This tends to increase daily gain and improve feed conversion efficiency. The availability of quality local feed is the main constraint with respect to develop PC in this area. However there is a great deal of agricultural and industrial co-products such as rice bran, coconut waste, maize, sago and rice straws.

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Table 1. The composition of diets offered

Chemical composition	Treatment (g kg^{-1})	
	A1	A2
Dry Matter	633.7	717.5
Crude Protein	100.6	113.6
Crude fibre	256.3	184.7
Ether extract	38.6	49.0
Ash	134.3	97.5
BETN	458.9	540.0
TDN	607.4	681.2

Dinas Pertanian Tanaman Pangan dan Perkebunan (2002) reported that there were about 426,325 ha of paddy fields in West Sumatra, with an estimated annual rice straw production of 2,984,275 ton.

However information is required on the use of locally produced feeds with respect to utilisation by and development of Pesisir cows under such feeding (short-term fattening systems). The aim of the study reported here was therefore to examine the effect of concentrate level and period that this diet was offered on the growth of the cow, feed intake and feed conversion efficiency.

MATERIAL AND METHODS

The study used a randomized block design in factorial arrangement with two factors examined, either concentrate level (CL) or length of fattening (LF). Concentrate was offered at either 50 or 75 % of the diet (A1 and A2, respectively) with remainder ammoniated rice straw. These diets were offered as a mixed feed for either 3 or 4 months (B1 and B2, respectively).

Twelve Pesisir cows, 2 to 2.5 years old and weighing between 126-170 kg, were used. The cows were blocked by weight then allocated randomly to treatment. The within-block cow live weights range was 126-140 kg, 141-155 kg and 156-170 kg for block I, II and III respectively. Each cow was kept in an individual pen and adapted to the experimental ration for 30 days prior to data collection.

The concentrate consisted of rice bran, ground maize, coconut waste, sago meal and mixed minerals at inclusion rates of 40, 18, 30, 10 and 2 % respectively. The composition of experimental ration can be seen in Table 1.

The cattle were weighed at the beginning data collection and at the end data collection and the change in weight over time used to estimated daily weight gain (DWG). Feed was allocated daily on an *ad libitum* basis with refusals collected daily to determine dry mater intake (DMI). All values presented in Table 2 are mean values obtained over the entire feeding period, with the feed conversion ratio (FCR) estimated as dry matter feed intake / weight gain.

RESULTS AND DISCUSSIONS

Whether the cows were fed for 3 or 4 months in both cases those offered the higher concentrate diet (A2) consumed more, had higher daily gains and showed an improvement in feed conversion efficiency (Table 1). That these differences were not significant is most likely due to the small number of animals used in each treatment group (3).

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Table 2 : Influence of concentrate level and duration on live weight gain (DWG), feed intake (DMI) and feed conversion efficiency (FCR)

Concentrate level	Fattening period						Overall mean		
	B1			B2					
	DWG[1]	DMI[2]	FCR[3]	DWG	DMI	FCR	DWG	DMI	FCR
A1	0.58	4.87	8.38	0.58	5.18	8.88	0.58[a]	5.03	8.63[a]
A2	0.80	5.02	6.25	0.77	5.41	7.06	0.78[b]	5.22	6.70[b]
Mean	0.69	4.95[x]	7.36	0.68	5.30[y]	7.97	0.68	5.12	7.67

[1] DWG kg d^{-1} [2] DMI kg d^{-1} [3] FCR: DMI / DWG
[a,b] means in columns with different superscripts are significantly different (P<0.05)
[x,y] means followed by different superscripts, in row are significantly different (P<0.05)

However overall (data for the two feeding periods combined) there were significant (P<0.05) effects of CL on live weight gain and FCR.

Daily gain cows offered the A1 ration was higher due to both greater intakes and the composition of the ration offered. For instance B1 cows offered A2 will have consumed 460 g more total digestible nutrients daily (including 80 g protein, 58 g lipid) than the A1 cows.

This is in agreement with Soeparno (1992) who mentioned that high consumption of energy and protein would increase DWG. Equally as Nitis and Lana (1984) stated concentration supplementation will affect digestibility of nutrients offered and therefore animal production.

There were no significant (P>0.05) effects of CL on DMI, suggesting that the cows were near to maximum intake. LF significantly affected (P<0.05) DMI with intake increasing with feeding period. This effect is most probably due to the animals being heavier. (Table 1). Anggorodi (1979) reported that the higher the body weight the higher feed consumption.

CL significantly (P<0.05) decreased FCR while LF did not significantly affect FCR. There were no significant effects of interaction between CL and LF on FCR (Table 1 and Figure 3). The range of FCR values for the various treatments (6.25 to 8.88) was lower (i.e. better) than a study done by Ngadiono (1995). He found that the FCR of Sumba Onggole, Brahman Cross and Australian Commercial Cross were 10.6, 10.9 and 10.9 respectively. The low FCR in this study might be due to cows having been raised traditionally before treatment and exhibiting compensatory growth. Previously cows were usually fed with native grasses without concentrate. The FCRs obtained showed that cows efficiently utilized the rations to develop body weight. However an analysis of feed cost versus rate of gain is required to confirm whether the higher level of concentrate feeding is economically sustainable.

CONCLUSION

The higher level of concentrate inclusion increased feed intake and daily live weight gain and improved the feed conversion ratio. No significant interaction between feeding period and intake or gain were identified indicating no significant decrease in this effect.

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