THE USE OF PALM KERNEL CAKE AS FEED SUPPLEMENT FOR GROWING GOATS

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ABSTRACT

Palm kernel cake was evaluated as supplement to basal diets of napier grass for goats. Twenty male goats with an average initial body weight of 14.34 ± 2.19 kg, were randomly allocated to four treatment groups. A 10 -week feeding and a 7- day digestion trial were carried out. All animals received chopped Napier grass *ad libitum*. Four levels of palm kernel cake supplementation were offered to each goat: 0 (R1), 1% (R2) and 2% (R3) of body weight and *ad libitum* (R4). The results showed that the palm kernel cake and Napier grass contained 22.5% crude protein, 4250 and 4049 cal/g energy, respectively. The supplementation of palm kernel cake increased (P<.05) the intakes and digestibilities of dry matter, crude protein and energy; but there was no different (P>.05) between treatment R2 and R3. The average daily gain was significantly (P<.05) affected by treatments. The highest average daily gain was 49 g/d (R4).

Key words : Goat, Palm kernel cake, Intake, Body weight

INTRODUCTION

In Indonesia most of the farmers feed grasses as main forages for their small ruminants. Grasses frequently contain a low nutritive value or provide an unbalanced amount of nutrients. Therefore, to stimulate higher growth rates, supplementation to these grasses with high protein feed stuffs is necessary. Agro industrial by product such as palm kernel cake which contain 19% crude protein, is considered to be a potentially important as a source of protein for animal feed.

The aim of this research was to find out the nutritive value of palm kernel cake and its effect on the intake, digestibility and performance of goats consuming Napier grass as a basal diet.

MATERIAL AND METHODS

Twenty male *kacang* goats with an initial mean body weight of 14.34 ± 2.19 kg were randomly allocated to four treatment groups. Each goat was placed in an individual pen and received chopped Napier grass *ad libitum* as a basal diet. Palm kernel cake (PKC) was added with different level to the basal diet. The diets used were:

R1 = chopped Napier grass *ad libitum*
R2 = R1 + 1% of palm kernel cake (PKC) of body weight (BW)
R3 = R1 + 2% PKC of body weight
R4 = R1 + PKC *ad libitum*

Each animal had free access to water and salt. An adjustment period of about 2 weeks proceeded to 10 week feeding trial. All animals were weighted weekly before he morning feeding.

Individual feed intakes and refusals were weighed daily. At the end of the feeding trial, a 7- day digestion trial was carried out. During the digestion trial daily samples were taken from feeds, refusals and faeces. Faecal samples were composited by treatment. Samples were analyzed by AOAC (1970) and Goering and van Soest (1970). Analysis of variance, least significant differences and regression analysis of digestion and daily live-weight gain of the goats as described by Still and Torrie (1980).

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RESULT AND DISCUSSION

Palm kernel cake contained higher protein, energy and low NDF than that of Napier grass, indicating that palm kernel cake can be considered as a good protein source (22.5%) and as a high-energy (4250 cal/g) supplement.

Napier grass contained crude protein 11.4%, NDF 17.2 and energy 4049 cal/g. The goats consumed 380 g/d of Napier grass, but when the diet was supplemented with palm kernel cake the intake of napier grass declined to 308 (R2) 330 (R3) and 300 g/d (R4) while the intake of total dry matter was significantly increased. It ranged from 380 to 518 g/d or from 54 to 64 g/kg W.75, as shown in Table 1. The improvement in intake can partially be explained by the provision of more palatable supplement and the preference of goats for the palm kernel cake than Napier grass. This experiment provides opportunity for goats to increased intake of palm kernel cake at the expanse of Napier grass intake. Therefore, dry matter intake of Napier grass decrease with increasing palm kernel cake on the diet.

Supplementation of palm kernel cake about 1% (R2) and 2% (R3), or about 150 and 300 g/d respectively; fortunately the goats only consumed about 120 and 170 g/d or about 80 and 1.06% of body weight. By giving palm kernel cake *ad libitum* the goats consumed about 218 g/d or about 1.5% of body weight. This finding was similar to that resulted by Sitorus (1993) who reported that the addition of the same amount of palm kernel cake to Napier grass sheep diet, were only consumed about 0.75; 1 and 1.5% of body weight. However, the rubber seed cake supplementation to the diet with the same amount, the sheep can consumed all of them. This maybe due to the higher crude protein content in rubber seed cake (40%), and subsequently its palatability, than that in palm kernel cake. It is probably that stimulants such as molasses can maximize intake of palm kernel cake. The intake of energy followed the pattern of total DM intake. It was from 210 (R1) to 250 (R2), 257 (R3) and 263 cal/kg W.75. The intake of crude protein increased ($P<.05$) by 4.1 g/kg W.75, it was from 5.8 (R1) to 8.92 g/kg W.75 (R4). But there was no significantly ($P>.05$) different between treatments in the intake of NDF.

The digestibilities of the nutrients are shown in Table 2. The digestibilities of DM, increased by addition of supplement palm kernel cake on the diet. The dry matter digestibility increased were about 4 ; 8 and 11% unit (R1 vs. R2, R3 vs. R4). The digestibility of crude protein was different ($P<.05$) between treatments. The digestibility increased about 11; 19 and 24% unit for R2, R3 and R4. The highest coefficient digestibility was found in the group receiving palm kernel cake *ad libitum*. The level of palm kernel cake was significantly ($P<.05$) affecting the performance of goats as shown

Table 1. Mean intake of nutrients by goats fed Napier grass with various levels of palm kernel cake

Item	R1	R2	R3	R4
Intake (g/d)				
Napier grass	380	358	330	300
Palm kernel cake	0	120	170	218
Total	380[a]	478[b]	500[b]	518[b]
Intake (g/kg W.75)				
DMI	54[a]	61[b]	63[b]	64[b]
CP	5.8[a]	7.2[b]	8.4[b]	8.9b[c]
NDF	11.8	11.9	12.0	12.2
Energy (cal)	210[a]	250[b]	257[b]	263[b]

[a,b,c] Means in the same row with different superscript are significantly different ($P<.05$)

Table 2. Apparent digestibilities of nutrients and average daily gain (ADG) of goats fed Napier grass supplemented with palm kernel cake

Item	R1	R2	R3	R4
Digestibility (%)				
DM	54[a]	58[ab]	62[bc]	68[c]
CP	58[a]	69[b]	77[c]	82[d]
NDF	53[a]	60[b]	62[bc]	67[c]
Energy	4[a]	20[b]	32[c]	42[d]
ADG (g)				

[a,b,c] Mean in the same row with different superscript are significantly different (P<.05)

at the bottom of Table 2.

In this study goats fed Napier grass alone met only their maintenance requirements. The results were similar to previous experiments that found that the highest level of soy-sauce waste, rubber seed cake on palm kernel cake gave the fastest growth rate. The addition of palm kernel cake to the diet increased the nitrogen and the energy contents and hence improved the growth of the animals. This was due to the total dry matter intake, about 42% from palm kernel cake, with high total protein and low fibre to increase the total dry matter intake. The high level of supplement gave a significantly heavier (P<.05) live weight gain than the other treatments 47 g/d, that similar to the reported by Sitorus (1993) who found that goats fed palm kernel cake about 150 g/d gave a live weight gain 44 g/d. However, these values were still fewer than that reported by Sitorus (1978) who used rubber seed cake as supplement and gave the daily gain about 67 g/d.

CONCLUSION

Palm kernel cake can be considered as a good protein source and high energy supplement. The addition of palm kernel cake to the diet increased the live weight gain of goats. The highest palm kernel cake on the diet gave the highest growth rate of goats.

REFERENCES

A.O.A.C., (1970). *Official Methods of Analysis* 4th Ed. Association of Official Analytical Chemist, Washington D.C, USA

Goering. H.K., and J.P. van Soest (1970). *Forrage Fibre Analysis*, U.S.D.A. Handbook No. 379

Sitorus, S.S. 1987. Rubber Seed Cake by Product Supplementation to Napier Grass Based Diets for Growing Sheep. *Proceeding The 4th Animal Science Conference*. New Zealand, p 508.

Sitorus, S.S. 1993. Penggunaan inti kelapa sawit dalam ransum domba. *Ilmu dan Peternakan*, Vol. 7 No. 1, September 1993. BPT Puslitbangnak, Badan Litbang Pertanian, Jakarta.

Steel, R.G.D. and Torrie. 1980. *Principles and Procedures of Statistics*. Mc. Graw Hill Book Co. N.