

RPN 024

**EFFICACY OF PALM KERNEL CAKE REPLACEMENT FOR CONVENTIONAL
CONCENTRATE SUPPLEMENTATION IN SILAGE
RATIONS OF LACTATING WAD GOAT**

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ABSTRACT

A 112 day study was conducted to evaluate the effect of replacing Conventional Concentrate (CC) with (PKC) supplementation in silage rations of lactating West African Dwarf (WAD) does on dry matter intake, body weight, and weight of the kids. Twenty-five nursing does (WAD) weighing (10-13±1.38 kg) were randomly divided into five groups and assigned to five dietary supplement treatments in a Completely Randomized Design (CRD) layout. Each doe and her suckling kid was fed *Pennisetum purpureum* silage with one of the five supplement diets (CC-PKC mixture: 100/0; 75/25; 50/50; 25/75 and 0/100). There was no significant difference ($P>0.05$) in the total DM intake among the treated groups when silage and supplements were fed. Weekly weight of dams fed in all group decreased throughout the trial ($p>0.05$) but animals that received 0%, 25%, and 50% PKC displayed weight values closer to their initial weight at the end of the experiment. Animals in all groups had reduced weight ($p>0.05$) at the end of trial with. Kids of does fed with experimental supplement gained ($p<0.00$) weight but kids of does from group fed 50/50 (CC/PKC) had highest ($P<0.05$) live-weight (5.90kg). It could be concluded that 50% replacement of CC by PKC enhance optimal performance of lactating WAD doe goats of first parity fed CC and PKC alongside grass silage diet

Keywords: Conventional concentrate, Palm kernel cake, Supplement, WAD Doe, kid

INTRODUCTION

The efficient utilization of local feed resources may reduce cost and enhance the productivity of ruminant animals. However, reduction in feed intake or increased feed intake efficiency without compromising growth rate or carcass quality can have a significant positive impact on production (Snowder and Van Vice, 2003). Palm kernel cake (PKC) noted to contain moderate levels of protein and energy (Rahman *et al.*, 2013; Cavhloet *al.*, 2005) with its readily availability and relatively low price can make it valuable good source of supplement in the ration of goats. According to Rahman (2013), limited research has been conducted PKC as a major component of high concentrate diet on growth performance of goats. This study was conducted to investigate the efficacy of PKC as of CC supplement being used to enhance the performance of lactating WAD does goats fed *Pennisetum purpureum* silage diet.

MATERIALS AND METHODS

Twenty-five does (WAD) goat of weight range between 10 and 13kg were the experimental animals used in this study. Prior to the trial, the lactating does were treated against endo and ectoparasites with Ivermectin injectable solution at dosage of 1ml/50kg body weight, Two weeks prior to expected kidding time, the pregnant does were housed individually in the partitioned pen

in a complete randomized design layout of 5 animals per dietary treatment. The experimental diets were given to the animals in one meal ration per day. Measured quantity of silage that allowed free choice alongside 400g of supplement were supplied at 10 hour of every day of the trial after daily cleaning of the pen in a single ration. Fresh water and mineral salt lick were freely provided. All does used in this study attained end of term and kidded within six days. The weight of the does and kids were taken 1 hour post-partum and weekly afterwards before daily feeding in the morning (10:00 hour) throughout the 16 weeks of the study. Weekly feed intake was computed through the daily record of the intake and refusal each morning. The weight of the does and kids were taken 1 hour after parturition and weekly afterwards before daily feeding. Data obtained were analyzed using analysis of variance and means tested using Duncan's multiple range tests (Duncan, 1955).

RESULTS AND DISCUSSION

Dry matter (DM) silage intake by the animal on 100/0 and 0/100 are significantly different ($P < 0.00$) but supplementary DM intake are comparable ($p > 0.05$) for animals fed 100/0, 75/25 and 50/50 supplements (Table 1), and same similarity also recorded between the animals fed 25/75 and 0/100 ($p > 0.05$). More of the supplements ($P < 0.05$) were consumed by the animals fed 100/0, 75/25 and 50/50 compared to the animals fed supplements with 75 and 100%PKC. The increased DM intake of silage with low supplement intake as the PKC replaced CC could be due to the odour of PKC and feeding behavior of the experimental animals as reported by Morand-Ferhret *et al.* (1991) that goats often have a marked preference for some feeds over others based on their palatability. The total DM intake of silage and concentrate among the treated groups were comparable ($P > 0.05$) however, the increased silage intake and decrease in supplementary diets as the PKC replaced CC could be further attributed to the fact that the feed intake of animals fed with high roughage is controlled by the gut fill limiting and intake of animals fed with high concentrate diets is controlled by the energy demands as reported by Dinius and Baugardt, 1969. Weight of does displayed significant difference ($P < 0.05$) with the highest value from group fed 50/50. This variation may be attributed to the kids that suckled the does and the variations in the nutrient compositions of the supplements occasioned by the PKC inclusion as CC replacer which may have limited the animals from having opportunity for feed preference (Schacht and Melechek, 1992) for better performance. All kids displayed increased weight ($P < 0.05$) at the end of the experiment, however, the weight of the kids from does fed supplements containing 0 and 25%PKC were comparable ($P > 0.05$), likewise kids from groups fed 75 and 100%PKC inclusion. The weight of kids (Table 2) from 50/50 group was significantly different ($P > 0.05$) among the treated groups in all supplemental treatment groups increased as the trial progressed. The variation observed in kids weight may be attributed to the varying proportion of PKC replacing conventional concentrate which may have affected the intake of the nursing does and subsequently the gains by kids. This observation is supported by reports of Mahgoub *et al.* (2003) that diets high in fibres slows down growth, also, Bas and Morand-Fehr (2000) reported that intake of doe can influence the development of the offspring and Valvoet *et al.* (2005) stated that as long as offspring is suckling, its tissue fatty acid composition is largely depending on the doe's diet. However, all kids nursed by the experimental does exhibited weight increase indicating that PKC is a good substitute for CC.

Table 1: Average daily feed intake of lactating WAD goat does fed *Pennisetum purpureum* silage supplemented with palm kernel cake as a replacer of conventional concentrate

DM INTAKE (g/day)	Concentrate / Palm Kernel Cake				0/10	SEM ±
	100/0	75/25	50/50	25/75		
Silage	880.00 ^b	880.00 ^b	880.00 ^b	979.33 ^a	1000.00 ^a	4.594
Supplement	400.00 ^a	400.00 ^a	380.00 ^a	260.00 ^b	261.00 ^b	2.341
Total	1280.00 ^a	1280.00 ^a	1260.00 ^{ab}	1239.00 ^a	1261.00 ^{ab}	2.222

* Means in the same row with common superscripts are not statistical different (p>0.05).

Table 2: Average weight of lactating WAD goat does and kids fed *Pennisetum purpureum* silage supplemented with palm kernel cake as a replacer of formulated concentrate

CC/PKC ratio (%)	Total DM intake (kg)	Ave. wt. of lactating doe (kg)	Ave. wt. of kid (kg)
100/0	1280 ^a	14.20 ^{bc}	3.41 ^b
75/25	1280 ^a	12.20 ^c	3.50 ^b
50/50	1260 ^{ab}	14.70 ^a	3.82 ^{ab}
25/75	1239 ^b	12.8 ^c	3.37 ^{bc}
0/100	1261 ^a	13.27 ^{bc}	3.12 ^c
SEM ±	2.22	0.26	0.080

* Means in the same row with common superscripts are not statistical different (p>0.05).

CC-conventional concentrate, Ave. wt. average weight, DM- Dry matter

CONCLUSION

Does fed with supplements in which palm kernel cake replaced conventional concentrate performed well in terms of dry matter intake, nutrient intake, body weight recovery during lactation and kids showed live weight increment. Hence, PKC could be used as supplementary concentrate to improve weight gain or reduce cost of maintaining the lactating WAD goats of first parity during production and 50/50 replacement of CC/PKC proved best.

REFERENCES

Bas, P. and Morand-Fer P. (2000). Effect of nutritional factors on fatty acid composition of lamb fat deposits. *Livestock Production Science* **64**: 61-79.

Carvalho L.P.F., D.S.P. Melo, C.R.M Pereria, M.A.M. Rodrigues, A.R.J. Carbrita and A.J.M Fonseca. (2005). Chemical composition in vivo digestibility, N degradability, and enzymatic intestinal digestibility of five protein supplements. *Animal Feeds Science & Technology* **119**:171-178.

Dinius, D.A. and Baumgardt, B.R. (1969). Regulation of food intake in ruminants. 6. Influence of caloric density of pelleted rations. *Journal of Dairy Science*, **53**:311-316.

- Duncan, D.B. (1955). Multiple Ranges and Multiple F-Tests. *Biometrical*. 11: 1-42.
- Forbes, J.M., (1995). Voluntary Food Intake and Diet Selection in Farm Animals. CAB International, Wallingford, UK.
- Mahgoub, O. and Lu, C.D, Hameed, M.S., Richie, A., Al-Halhli, A.S. and K Annamalai. (2003). Performance of Omani goats fed diets containing various Metabolizable energydensities. *Small Ruminant Research*37(1):35-42.
- Morand-Fehr, P. (2003). Review: dietary choices of goats at the trough. *Small RuminantResearch*49:231-334.
- Morand-fehr, P., Boutonne, J.P., Devendra, C., Dubeuf, J.P., Haenlein, G.F.W., Hoist, P., Mowlem, I., Capote, J. (2004). Strategy for goat farming in the 21st century. *SmallRuminant Research*. 51, 175-183.
- Morand-fehr, P., Owen, E., Giger-Reverdin, S. (1991). Feeding behavior of goats at the trough. In: Morand-fehr, P. (Ed.), Goat Nutrition Production. Wageningen, pp. 3-12.
- Rahman M.M., R.B. Abdullah, W.E. Wan Kahdijah, T. Nakagawa and R. Akashi (2013). Feed intake, digestibility and growth performance of goats offered Napier Grass supplemented with Molasses protected Palm Kernel Cake and Soya Waste. *Asian Journal of Animal and Veterinary Advances*8:527-534.
- Snowder, G.D., Van Vieck, I.D. (2003). Estimate the genetic parameters and selection strategies to improve the economic efficiency of post weaning growth in lambs. *Journal of AnimalScience*81:2704-2713.
- Valvo M.A., Lanza M., Bella M., Fasone V., Prioloa. (2005). Effect of ewe feeding system (grass v. concentrate) on intramuscular fatty acids of lambs exclusively on maternal milk. *Animal Science*81:431-436.