

## The reproductive performance of South African indigenous goats grazing *Leucaena leucocephala* pasture and natural veld during gestation.

A. A. Akingbade<sup>1</sup>, I. V. Nsahlai<sup>1</sup>, C. D. Morris<sup>2</sup> and M. L. K. Bonsi<sup>1</sup>

<sup>1</sup> Animal and Poultry Science, School of Agricultural Sciences and Agribusiness, University of Natal, P Bag X 01, Scottsville, 3209, South Africa; <sup>2</sup>Range and Forage Institute, ARC, University of Natal, P Bag X01, Scottsville, 3209, South Africa

### Introduction

The widely distributed South African indigenous goat (SAIG) is reared under extensive systems (Duvel & Afful, 1994) characterised by low production rates resulting from nutritional constraints. *Leucaena* species grow well in the absence of nitrogenous fertilizer and are rich in protein (14-30% CP) and minerals (Nsahlai *et al.*, 1994). Incorporation of *Leucaena* cultivation into these farming systems will not only improve soil fertility but alleviate nutritional constraints for ruminants. Substantial benefits were reported on intake, digestibility and growth of ruminants fed *Leucaena* (Morris & du Toit, 1998) but there were no reports on the forage carry-over effects.

### Materials and Methods

Twenty DHP-inoculated SAIG that had previously grazed on *Leucaena leucocephala*/grass pasture or natural veld during gestation were used for the study. During the study, they were fed on concentrates containing 0 or 10% molasses during lactation. Doe and kid weight were recorded weekly for 10 weeks. Return to oestrus was determined using vasectomised bucks. Milk yields were determined weekly using the weigh-suckle-weigh and hand milking methods. The proximate composition of the diet and milk protein content was analysed according to AOAC (1984) methods. The experimental design was 2(gestation diets) x 2(lactation diets) factorial. Doe and kid weights and milk efficiency (weight gain/milk consumed) were analysed using SAS (1987), while return to oestrus and milk protein data were analysed using Minitab (1994).

### Results and Discussion

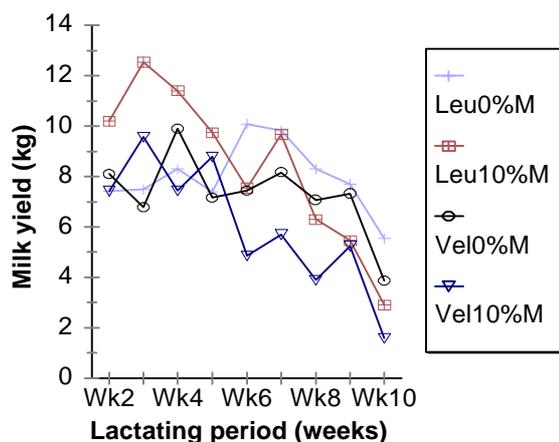
The average daily gains of the pregnant goats grazing *Leucaena*-grass pasture were significantly ( $P < 0.05$ ) higher than their counterparts grazing veld. Kids from does grazing *Leucaena*-grass pasture tended to be heavier ( $P > 0.05$ ) at birth than their counterparts on veld grazing. Does that previously grazed *Leucaena*-grass pasture returned earlier to oestrus than their counterparts on veld grazing, but the differences were not significant (Table 1). Kid live weight gain and milk efficiency were not significantly influenced by the lactation diets (Table 1). Weights at weaning of does from the *Leucaena* group fed 10% molasses concentrate and does from the veld group fed 0% molasses concentrate differed ( $P < 0.05$ ; Table 1). Although milk yield from the *Leucaena* group was not significantly different from the veld group, peak lactation occurred earlier with 10% molasses than with 0% molasses (Figure 1). Milk protein contents and milk efficiency were independent of diet and stage of lactation.

**Table 1** Return to oestrus, milk efficiency, live weight gains of kids and weaning weights of dams

	Leucaena-grass pasture		Natural veld		sed
	0% Molasses	10% Molasses	0% Molasses	10% Molasses	
Return to oestrus(days)	27 <sup>a</sup>	23 <sup>a</sup>	35 <sup>a</sup>	52 <sup>a</sup>	16.14
Milk efficiency (g/kg)	141.36 <sup>a</sup>	109.32 <sup>a</sup>	134.41 <sup>a</sup>	124.08 <sup>a</sup>	27.73
Kids Live weight gain (g/d)	143.18 <sup>a</sup>	140.7 <sup>a</sup>	142.55 <sup>a</sup>	126.84 <sup>a</sup>	20.21
Dams weaning wt (kg)	35.56 <sup>ab</sup>	34.31 <sup>a</sup>	38.99 <sup>b</sup>	36.63 <sup>ab</sup>	1.48

<sup>a,b,c</sup> Row means with the same superscripts are not significantly different ( $P > 0.05$ )

Short paper and poster abstracts: 38<sup>th</sup> Congress of the South African Society of Animal Science



**Figure 1** Milk production of lactating South African indigenous goats

Return to oestrus was not influenced by diets fed during and post gestation in agreement with the reports of Hamilton *et al.* (1971) that return to oestrus was unaffected by feeding *Leucaena* during gestation and of Mitchell *et al.* (1998) that return to oestrus was independent of lactation diets. Return to oestrus was also independent of weight at kidding, which contrasts with previous studies (Wright *et al.*, 1987). The significantly ( $P < 0.05$ ) higher average daily gains of pregnant goats on *Leucaena*-grass pasture showed that the pasture was nutritionally superior to natural veld. Milk production increased with litter size (Raats *et al.*, 1983) and dam weight at kidding. However, there was a reduction in milk efficiency and kids live weight gains with increased litter size (Ehoche & Buvernendran, 1983) which perhaps suggests that additional milk resulting from multiple litters was not enough to support maximum growth of the kids. Milk protein content in this study accords with values (4.46%) of Banda *et al.* (1990) from non-dairy goats in Malawi. Milk protein contents were independent of diets and stage of lactation (Ehoche & Buvernendran, 1983).

## Conclusion

Lactating does previously grazed on *Leucaena*-grass pasture returned to oestrus slightly earlier than their counterparts that grazed veld. The pre-weaning live weight gains of kids from the *Leucaena* group were marginally better than their counterparts in the veld group. Milk yields were higher in the *Leucaena* group than the veld group. Though these carry-over benefits were not statistically significant ( $P > 0.05$ ), marginal benefits seemed to be derived from feeding *Leucaena leucocephala*-grass pasture during gestation.

## References.

- AOAC, 1984. Official methods of Analysis. 15th Ed, Washington, DC, pp, 69-88.
- Banda, J. W. et al., 1990. Proc. 1<sup>st</sup> Conf. African Small Ruminant Res. Network, ILRAD. pp 461-483.
- Duvel, G. H. & Afful, D. B. 1994., Res. Rep. S. A. Inst. Agric. Ext., Univ. Pretoria.
- Ehoche, O. W. & Buvernendran, V., 1983. Wld. Rev. Anim. Prod. 19:19.
- Hamilton, R. I. et al., 1971. Aust. J. Agric. Res., 22:681.
- Hassan, A. et al., 1981. Wld. Anim. Rev., 28:65.
- Nsahlai, I. V. et al., 1994. J. Sci. Food Agric., 69:235.
- Mbayahaga, J. et al., 1998. Anim. Reprod. Sci., 51: 289.
- Mitchell, L. M. et al., 1998. Anim. Sci., 67: 65.
- Morris, C. D. & du Toit, L. P., 1998. Trop. Grassl., 32:188
- Mukasa-Mugerwa, E. et al., 1991. Anim. Reprod. Sci. 24: 73.
- Raats, J. G.. et al., 1983. S. A. J. Anim. Sci, 13:240.
- Wright, I. A. et al., 1987. Anim. Prod., 45: 395.