

EFFECT OF NUTRITION ON SENSITIVITY OF FEMALE GOATS TO THE MALE EFFECT

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Female Australian goats are anovulatory from September to May but are responsive to the male in autumn (Restall 1992). The breeding season in the male can be advanced by high nutrition (Walkden-Brown *et al.* 1993) and the aim of this work was to determine if the female responsive phase could be altered with nutrition.

During October (non responsive anovulatory period) groups of 9 does were fed either Pangola grass hay (P, 500 g/hd.day), or Pangola grass (100 g/hd.day) plus either crushed lupin seed (L 500 g/hd.day) or a mixture of crushed soybean and sorghum (M, 556 g/hd.day), for 18 days, and exposed to males 7 days after treatment began. Blood samples were collected every 20 minutes for 8 hours before and after exposure to males to determine endocrine and metabolic parameters. Ovarian examinations were conducted 5 and 10 days after exposure to the males.

Results are given in Table 1. Average liveweights declined slightly on all diets and gross energy intakes (GEI, MJ/kg^{0.75}.day) were higher in the groups fed lupins or mixed diet ($P < 0.01$). There was a significant correlation ($r = 0.85, P < 0.01$) between GEI and glucose entry rate (GER, irreversible loss rate g/kg^{0.75}.day). Luteinising hormone (LH) pulse frequency and amplitude were significantly higher in animals fed the L and M diets prior to exposure to males ($P < 0.01$). The proportion of does ovulating was also higher in the L and M treatments but the differences were not significant.

Table 1. Metabolic (gross energy intake GEI, glucose entry rate GER), endocrine (luteinising hormone LH, pulse frequency PF, amplitude Amp) and physiological parameters in female goats fed 3 diets before exposure to males in October (SE in parentheses)

Diet	n	LWT (kg)	GEI (MJ/kg ^{0.75} . day)	GER g/kg ^{0.75} . day)	LH (Pf/hour)	LH Amp (ng/mL)	% Ovulating
Pangola hay	9	26.8 (0.94)	0.56 (0.02)	2.47 (0.18)	0.21 (0.06)	4.32 (1.07)	22.2
Lupin grain	8	26.6 (0.72)	0.74 (0.03)	5.97 (0.23)	0.35 (0.05)	12.24 (1.87)	37.5
Mixed grain	9	25.9 (1.23)	0.92 (0.03)	7.59 (1.09)	0.38 (0.04)	9.73 (2.26)	44.4

We conclude that nutritional manipulation alters female reproductive hormone parameters and may affect sensitivity to the presence of the male. Confirmation of these results could lead to new methods to advance the breeding season in Australian female goats.

RESTALL, B.J. (1992). *Anim. Reprod. Sci.* 27: 305-18.

WALKDEN-BROWN, S.W., RESTALL, B.J. and HENNIAWATI (1993). *Anim. Reprod. Sci.* 32: 69-84.