

## Intake by lactating goats browsing on Mediterranean shrubland

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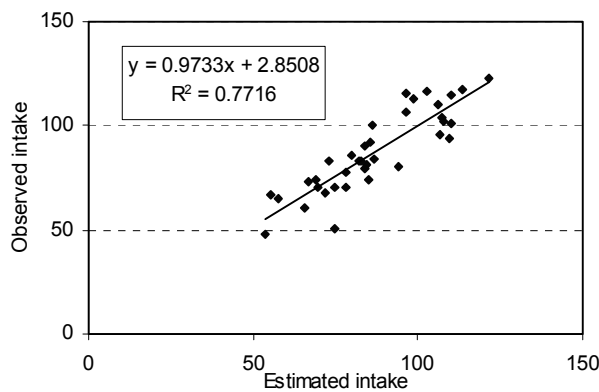
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**Introduction** In Mediterranean regions goat feeding systems are mainly based on shrubland that contain a wide variety of species. There are only a few equations for predicting feed intake of stall-fed goats (Luo *et al.*, 2004). The objective of this study was to develop a model for predicting the intake of lactating goats browsing on Mediterranean shrubland.

**Materials and methods** A database of mean treatment observations (N=44) from goat feeding studies was analysed. The studies were conducted with dairy goats that browsed for 5-7 hrs/day on 5 ha shrubland (Decandia *et al.*, 2000a,b). The goats received 200 g of concentrate and 200 g of ryegrass hay/day. The shrubland contained many tanniferous species and a low proportion of herbaceous species. The variables analysed were: body weight and body condition score (BCS); supplement intake; pasture intake, and botanical composition of the diet (Kababya *et al.*, 1998); chemical composition of the diet (Meuret *et al.*, 1995); botanical composition of pasture (Daget & Poissonet, 1969); fat corrected milk (FCM) and milk urea.

**Results** The variables most strongly related to the intake were FCM, CP and polyphenolic tannin level in the diet. The effect of supplementation was not significant. Two prediction equations for pasture intake were (1)  $DMI = -18.63 + 6.75 CP + 0.02 FCM$ ; N=38;  $R^2=0.77$ ;  $P<0.001$ ; (2)  $DMI = 52.54 + 0.037 FCM - 16.44 PT/CP$ ; N=40;  $R^2=0.59$ ;  $P<0.001$ , where: DMI=DM intake (g/Kg  $BW^{0.75}$ ); FCM=fat (4 %) corrected milk yield (kg);



**Figure 1** Relationship between observed and estimated pasture DM intake (g/kg  $BW^{0.75}$ )

(% DM); PT/CP= ratio between polyphenolic tannins and CP in the diet. Equation 1 has a higher  $R^2$  and is easier to implementation at farm scale than Equation 2. Comparing predicted with observed values, a strong relationship was found ( $R^2=0.77$ ;  $P<0.001$ ; a, b not statistically different from 0 and 1, Figure 1). CP in the diet was related to the percentage of grass (GRAP) in the pasture and milk urea level (mg  $100 ml^{-1}$ ; MU): (3)  $CP = 5.10 + 0.20 GRAP + 0.119 MU$ ; N=31;  $R^2=0.82$ ;  $P<0.001$ . Using this relationship, a two-step prediction model of DM intake of browsing goats is proposed. Step 1: on the basis of GRAP and MU, CP content in the diet can be estimated (Equation 3). Step 2: knowing FCM and dietary CP level, the DMI at pasture can be predicted (Equation 1).

**Conclusions** This model provides a useful tool for estimating the intake of goats browsing Mediterranean shrubland rich in tanniferous species, with a low percentage of herbaceous species.

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### References

- Decandia M., Sitzia M., Cabiddu A., Kababya D., Molle G., (2000a). The use of polyethylene glycol to reduce the anti-nutritional effects of tannins in goats fed woody species. *Small Ruminant Research* 38, 157-164.
- Decandia M., Molle G., Sitzia M., Cabiddu A., Ruiu P.A., Pampiro F., Pintus A., (2000b). Responses to an antitannic supplementation by browsing goats. *Proc of VII<sup>o</sup> International Conference on goats* 15-18 May 2000 Tours, France. pp 71-73.
- Luo J., Goetsch A. L., Nsahlai, I. V., Moore, J. E., Galyean, M. L., Johnson, Z. B., Sahlu, T., Ferrell C. L., Owens F. N. (2004) Voluntary feed intake by lactating, Angora, growing and mature goats. *Small Ruminant Research* 53, 357-378.
- Kababya D., Perevolotsky A., Bruckental I., Landau S., (1998). Selection of diets by dual-purpose mamber goats in Mediterranean woodland. *Journal of Agricultural Science Cambridge* 131, 221-228.
- Meuret M., Bartiaux-Hill N. and Bourbouze A., (1985). Evaluation de la consommation d'un troupeau de chèvres laitières sur parcours forestier: - Méthode d'observation directe des coups de dents, - Méthode du marquer oxyde de chrome. *Annales de Zootechnie*, 34: 159-180.