

LEUCAENA LEUCOCEPHALA AS A SUPPLEMENT FOR GOATS ON TROPICAL PASTURES

T. Clavero¹ and R. Razz¹

¹ Department of Animal Science, Universidad del Zulia, Venezuela.

ABSTRACT

A field experiment was conducted in the dryland farming area of Northwest Venezuela in order to evaluate three diets in grazing goats (pasture only; grazing pasture + 0.3 kg of commercial concentrate/animal/d; grazing pasture + restricted grazing for 2 hours daily in *Leucaena leucocephala*) on milk production (mp) and milk composition (fat -f- and mineral concentration -mc-). The experiment was laid out as randomized block design. The data showed significant difference ($P < 0.05$) between treatments. Milk production increased in 50 and 70% when goats had access to commercial concentrate or *Leucaena* grazing as well as grass pasture compared with the control treatment. Milk production in goats with access to *Leucaena* was insignificantly different than goats on concentrate. Treatments did not affect milk composition. The results suggest that *Leucaena leucocephala* can supply an adequate amount of nutrient with similar value to commercial concentrate for milk production in grazing goats.

KEYWORDS

Leucaena leucocephala, goats, milk production, grazing

INTRODUCTION

Traditional goat production systems in tropical regions are characterized by extensive use of introduced or native pastures, utilized by direct grazing. Rate of productivity in these systems is relatively low per animal and per unit area. One of the major factors limiting increased meat and milk production from these animals is the deficiency of good quality feed. Most of the grassland are deficient in protein and do not meet maintenance and production requirements for small ruminants (Mtenga and Shoo, 1990). The use of concentrates which provide protein and energy is expensive and not easily available where the majority goats are kept. *Leucaena leucocephala* has been shown as an important and cheap source of high quality feed for small ruminants (Adejumo and Ademosun, 1991). The objective of this study was to determine the response of grazing goats fed low quality grass (*Cynodon nlemfuensis*) and supplemented with commercial concentrate and *Leucaena leucocephala* in a restricted grazing scheme.

MATERIALS AND METHODS

Location: The experiment was located in the dryland farming area of Northwest Venezuela (10×45' N; 75×31' E), at 10 m elevation. A 120 days feeding trial was designed to investigate the effect of legume supplementation on milk yield and composition on goats.

Pastures: The pastures were almost pure stands of star grass (*Cynodon nlemfuensis*) fertilized with 150 Kg N/Ha as urea distributed in four applications during the year. A number of pastures were available to permit a rotational grazing scheme with rest periods of three weeks. The *Leucaena* had been established 18 months previously in continuous rows with 2 m spacing between rows.

Animals: Twenty-four crossbred goats (French Alpine and Nubian) were divided into three homogeneous groups of eight animals each regarding weight, age, milk production.

Treatments: The treatments were: (a) the control treatment grazing only on grass pasture; (b) the same grass pasture grazing, but an additional period of 2 hr/d grazing *Leucaena*; (c) the same grass pasture grazing with individual supplementation with concentrate (300 g/animal/d) feed (20% crude protein). All animals had free access to mineral salt and water.

Measurements: Milk production of the animals were recorded daily. Samples of milk were analysed for fat and mineral content by the method of Gerber (Covenin, 1982).

Statistical analysis: Milk production and composition data were analyzed as randomized block design (Steel and Torrie, 1980).

RESULTS AND DISCUSSION

The chemical composition of the commercial concentrate, *Leucaena* foliage and pasture offered to the animals is presented in Table 1. The composition of *Leucaena* foliage was similar to that reported by Girdhar *et al.*, 1991. Pasture was of low nutritive value as shown by the low crude protein and high crude fibre content.

At the end of the common lactation period significant differences ($P < 0.05$) were found in milk production. A 50% increase in milk yield was noted when goats had access to pasture and received concentrate (0.74 Kg of milk/d) compared to those animals which had access to pasture without supplementation (0.5 Kg of milk/d). Animals with access to the *Leucaena leucocephala* protein bank produced on average 0.85 Kg of milk/d, a production 70% higher than that obtained with animals grazed on pastures only but not different from the animals which received concentrate and pasture (Table 2). Treatments did not affect milk composition.

Based on conventional measures of quality such as crude protein, the quality of the diet improved by the addition of *Leucaena*. Because of the high crude protein content in the treatments with commercial supplementation and the *Leucaena leucocephala* protein bank, the N intake of goats given these treatments was more than double that of the control goats. According to Mtenga and Shoo (1990) *Leucaena leucocephala* supplementation increase protein intake and dry matter digestibility. This improved nutrient status should have allowed for enhanced milk production. This experiment indicated there were no adverse effects on goats due to the ingestion of *Leucaena*.

The possible role of *Leucaena* in a rotational browsing-grazing system for goats in tropical areas is suggested from the foregoing results. Forage from *Leucaena* has high nutritional quality and when managed as a browse supplement in grazing goats may lead to improvements in milk production especially during periods when pasture quality is reduced.

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Table 2

Milk production and composition from crossbred goats on tropical pasture supplemented with *Leucaena* forage.

	Pasture	Pasture + Leucaena	Pasture + Concentrate
Milk yield (kg.d)	0.5 ^a	0.85 ^b	0.74 ^b
Fat(%)	3.4 ^a	3.3 ^a	3.2 ^a
Minerales (%)	0.78 ^a	0.81 ^a	0.80 ^a

a,b values on the same line with different superscripts are different, LSD P <0.05.

Table 1

Chemical composition (%DM) of commercial concentrate, *Leucaena* foliage and pasture fed to goats.

Contituens	Commercial	<i>L. leucocephala</i>	Pasture
Organic matter	93.1	92.4	92.2
Crude Protein	20.0	23.5	9.5
Crude Fibre	8.0	16.1	24.8
Nitrogen-free extractives	67.8	43.8	49.7