

## MILK RESPONSE TO LEVEL OF PROTEIN IN CONCENTRATES

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Nitrogen fertilizer will increase yield and quality of tropical grasses and dairy production can be increased by supplementing cows with energy rich concentrates. Adding protein to these concentrates increases feed costs.

In a feeding system based on rain grown Rhodes grass, irrigated annual ryegrass and concentrates, twenty Holstein-Friesian cows and 10 heifers half calved in spring 1989 and half calved in Autumn 1990, received 6.0 kg concentrate/cow/day throughout lactation. Cottonseed meal (CSM) was substituted for grain to provide iso-energetic supplements containing c. 10, 12, 14, 16 or 20% crude protein. Cows grazed tropical grass throughout the year and irrigated, nitrogen fertilized ryegrass during the day from June to November.

TABLE 1 Milk production and rumen ammonia of cows fed grain and Cottonseed Meal

	Concentrate Protein Level				
	10	12	14	16	20
<b>Tropical Grass (Oct-June)</b>					
Milk Yield (L/day)	15.2	14.8	14.6	16.7	17.1
BF%	3.4	3.9	3.7	3.5	4.0
Protein %	3.1	3.3	3.4	3.3	3.4
<b>Rumen Ammonia (mg NH<sub>3</sub> - N/100 ml) - December 1989</b>					
Pre Feeding	7.7	8.5	8.5	8.8	11.7
Post Feeding +5 Hrs	6.7	7.8	10.4	9.2	14.7
<b>Irrigated Ryegrass (June-Nov)</b>					
Milk Yield (L/day)	18.9	19.1	17.8	16.3	18.6
BF%	3.5	3.6	3.2	3.3	3.6
Protein %	3.2	3.2	3.1	3.1	3.2
<b>Rumen Ammonia (mg NH<sub>3</sub> - N/100 ml) - July 1990</b>					
Pre Feeding	4.5	8.9	8.7	10.2	8.4
Post Feeding	25.3	24.4	29.9	30.4	24.4

Rhodes grass pastures provided over 3 tonnes DM/ha on offer throughout summer, with an average of 10% CP in pasture and 12% CP in the green leaf fraction. Oesophageally fistulated cows selected a diet containing 60% green leaf and 13% CP from these pastures in February-March. The irrigated ryegrass provided over 1.8 tonnes DM/ha on offer at each grazing with a crude protein content of 25-30%. Milk yield of cows grazing Rhodes grass was higher for cows fed 16 or 20% CP (Table 1) with the greatest response in early lactation. Rumen ammonia levels in December were low for animals offered grain only and may have been below optimum for microbial activity (Satter and Slyter 1974). Protein content of ryegrass was always high and rumen ammonia levels after grazing ryegrass were high.

Preliminary results indicate that additional dietary protein can increase milk yields in cows grazing tropical grass pastures with a high energy concentrate. When **forage quality** is high added protein is not required.

Satter, L.D., and Slyter, L.L. (1974). Brit. J. Nutr. 32: 199-208.

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