

Summary

A feeding trial was conducted in 1998 at the CORPOICA Research Center "La Libertad", located in the eastern piedmont region of Colombia. The trial aimed to (1) evaluate the effect of increasing levels of rumen ammonia nitrogen ($\text{RNH}_3\text{-N}$) on voluntary intake of *Cynodon nlemfuensis* (star grass) hay and on the in situ degradation of *Arachis pintoii* and *C. nlemfuensis*; and (2) establish relationships between dietary crude protein (CP) content, $\text{RNH}_3\text{-N}$, blood urea nitrogen (BUN), and blood ammonia nitrogen ($\text{BNH}_3\text{-N}$) levels. Four rumen-fistulated zebu steers were assigned to four levels of urea supplementation (0%, 1%, 2%, and 3% of forage dry matter), using a 4 x 4 Latin square design. Blood samples were taken on days 5 and 10 of each 10-day experimental period (at 8 a.m. before feeding). Rumen liquid was sampled on days 7 and 9, at 4 a.m., 8 a.m., 12 m., 4 p.m., 8 p.m., and 12 p.m.

As expected, rumen ammonia nitrogen concentration was highly affected by the level of urea supplementation ($P < 0.0001$), and mean $\text{RNH}_3\text{-N}$ increased from 59.3 mg/l without urea, to 256.9 mg/l, with 3% urea in the diet. However, no effect of $\text{RNH}_3\text{-N}$ level on voluntary intake and rumen degradation was observed ($P > 0.05$). Mean voluntary dry matter intake of *C. nlemfuensis* was 1.49 kg/100 kg body weight, and rate of rumen degradation was 3.45%/hour. Effective dry matter degradability of *C. nlemfuensis* at a rate of passage of 4%/hour, was 33.4%. The rate of rumen degradation of *A. pintoii* was 6.02%/hour, and effective dry matter degradability was 54.24%. A linear relationship was found between $\text{RNH}_3\text{-N}$ and CP in the diet ($P < 0.0001$, $r^2 = 0.77$), and between BUN and $\text{RNH}_3\text{-N}$ ($P < 0.0001$, $r^2 = 0.88$). $\text{BNH}_3\text{-N}$ was not affected by CP concentration in the diet or by $\text{RNH}_3\text{-N}$ level ($P > 0.05$), and averaged 0.20 mg/100 ml.

This study confirms that BUN may be a useful tool for monitoring rumen ammonia nitrogen level and protein intake of cattle consuming tropical forages. Voluntary dry matter intake and effective rumen degradability of *C. nlemfuensis* and *A. pintoii* were not improved by increasing rumen ammonia nitrogen concentration from 59 to 257 mg/l, indicating that 60 mg/l of $\text{RNH}_3\text{-N}$ is sufficient to maximize not only voluntary intake and rumen degradability of *C. nlemfuensis* but also degradability of *A. pintoii*.