

## Rumen digestibility of Mulato II hybrid and rice straw for cattle feeding in Cambodia

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In Cambodia, seasonal flooding of land each year by the Mekong river limits the availability of feed for cattle. To alleviate this feed shortage, the concept of forage banks was developed by CIAT (2003-05) and feed banks are being exploited in our current ACIAR project (AH/2003/008). *Brachiaria* mulato II hybrid (CIAT 36087) is a promising grass for these fodder banks but its nutritive value for cattle when used as a supplement with rice straw has not been widely investigated. The aim of this study was to provide basic information on the *in situ* rumen digestibility of mulato II hybrid relative to rice straw and to determine the effect of the animal's diet on rumen degradability estimated by the *in situ* method.

*In situ* evaluations of dried samples of rice straw and sun-dried, first-cut mulato were made using 3 fistulated steers (c. 2.5 years, 248 ± 38kg). In Expt 1, bags were placed in steers ingesting 30% fresh-cut mulato II and 70% rice straw and, in Expt 2, the steers ingested only freshly cut mulato *ad libitum*. In Expt 1, feed bins were emptied each morning and then filled with rice straw followed by half of the daily ration of fresh mulato; the second half was given in the evening. Both feeds were cut to 2 mm, placed in nylon bags (pore size 40 µm) and incubated (in triplicate) for 3, 12, 24, 36, 48, 72 and 96 h in all three steers. All bags were removed together and washed with 9 additional bags, similarly prepared but never placed in the rumen (to give washing loss). Results for loss of OM (Y) during the incubation period (t) were fitted to a curve,  $Y=A+B(1-e^{-ct})$  where A, B, c and lag time are as described by Dhanoa *et al.* (1996). Rumen NH<sub>3</sub> was also determined (Beecher and Whitten 1970).

Effective degradability of both feeds was higher (P<0.05) when steers were ingesting 100% mulato, and lag time (the period before there was net loss of OM) was shorter by 3-4 h (P<0.05), indicating that rumen digestion was markedly inferior when the diet was 70% rice straw and only 30% mulato (Table 1). Effective degradability of OM, washing loss and rate of degradation of B were higher (P<0.05) and lag time was shorter (P<0.05) for mulato than for rice straw. The degradable OM percentage, excluding washing loss (WL) was similar for mulato and rice straw but with WL included, total potential degradability was higher (P<0.05) for mulato. Thus, the main reason that mulato hybrid exhibited a higher nutritive value than rice straw was its higher washing loss (higher level of soluble components) and its apparently more rapid colonisation by rumen microorganisms.

**Table 1. *In situ* coefficients (%), OM degradability estimates and rumen NH<sub>3</sub> concentrations (mg N/L) for mulato II and rice straw in bags in the rumen of cattle ingesting 70% rice straw, 30% mulato II (Expt 1) or 100% mulato *ad libitum* (Expt 2). (Means ± SE; split-plot AOV with 'expt' as the main plot).**

Rumen NH <sub>3</sub> -N**	Expt 1 24.3		Expt 2 51.1	
	Mulato II	Rice straw	Mulato II	Rice straw
Pot deg. †	80.5 (3.02)	73.5 (3.26)	80.0 (2.88)	72.4 (2.59)
Rate c (/h)	0.030 (0.0032)	0.020 (0.0017)	0.034 (0.0073)	0.027 (0.0034)
Eff. Deg.*(%)	37.2 (0.61)	23.8 (0.41)	41.9 (1.43)	32.7 (0.74)
Undegradable (%) †	19.5 (3.02)	26.5 (3.26)	20.3 (2.88)	27.6 (2.59)

†Pot. Deg. = potential degradability, i.e. (A+B). Undegradable (%) = (100-A-B).

\*Effective degradability, calculated for a rumen outflow rate of 4%/h. \*\* Beecher and Whitten (1970).

Mulato II hybrid is typical of tropical C<sub>4</sub> forages which, in general, have lower digestibility than temperate C<sub>3</sub> species. Nevertheless, as a C<sub>4</sub> grass, mulato hybrid has an appreciably higher feeding value than rice straw, probably mainly because of its higher content of soluble protein and other components. *In situ* OM degradability of both feeds was higher in Expt 2 when bags were placed in steers ingesting 100% mulato, probably at least in part because their rumen NH<sub>3</sub> concentrations were higher (51 mg N/L, P<0.001) than in Expt 1 (24 mg N/L).

Beecher GR, Whitten BK (1970) *Anal. Biochem.* **36**, 243.

Dhanoa MS, France J, Dijkstra J, Lopez S (1996) *Br. J. Nutr.* **75**, 142

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