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## ***In sacco* measurements of filter-paper degradation : rumen vs caecum**

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Fiber digestion is less efficient in monogastric than in polygastric herbivores (Dulphy *et al.*, 1994, Ann Zootech, 43, 11-32). To compare the cellulolytic activity in the rumen and the equine caecum we measured the *in sacco* degradation of filter-paper (FP). The Nylon bag technique has never been used previously with FP.

### (1) Preliminary study :

We first tested the feasibility of the method in 3 ponies and 3 donkeys (caecally-fistulated) and in 3 dry cows fitted with a rumen cannula which were fed a maintenance diet (30 % concentrate (16 % CP)-70 % lucerne-cocksfoot-hay (15 % CP)) in 2 meals/day. After 2 weeks adaptation, 3 bags were placed into the caecum or rumen for 48 h. The bags were made out of Blutex T120 measured 3.5 x 11 cm with pores of 48 µm. Each contained 0.5 g FP cut into narrow strips. After 48 h incubation the bags were washed in a washing machine in water at 10°C then dried at 80°C for 48 h. The residual dry matter (rDM) was calculated.

The degradation of FP was higher in cows than in ponies or donkeys after 48 h. Ponies and donkeys had the same ability to degrade FP.

### (2) Kinetic study :

We measured the kinetics of FP degradation using the same protocol described above in 4 ponies, 3 donkeys and 4 cows but withdrawing the bags after 4, 8, 16, 24, 36 or 48 h from the caecum or rumen.

The analysis of variance (repeated measures) showed an interaction between time and species ( $P < 0.01$ ). The degradation of FP in the rumen of cows was more effective than in the caecum of the equids after 36 h and 48 h of incubation.

The kinetics of the rDM demonstrated that donkeys degraded cellulose quicker and to a greater extent than ponies or cows during the first 24 h. Linear regressions confirmed that the degradation rate of FP was higher in donkeys in the first 24 h (2.76 %/h) than in cows (2.23) or ponies (2.19).

These results confirmed that the cellulose degradation in polygastric animals is more efficient than in monogastric herbivores when the retention time is longer than 24 h and that donkeys are particularly effective in degrading large amounts of cellulose in a short time.

		residual Dry Matter (%)					
Preliminary study		Kinetic study					
Time	48 h	4 h	8 h	16 h	24 h	36 h	48 h
Ponies	14.1 <sup>a</sup>	88.1 <sup>a</sup>	85.6 <sup>a</sup>	66.5 <sup>a</sup>	46.0 <sup>a</sup>	27.0 <sup>a</sup>	13.5 <sup>a</sup>
Donkeys	13.4 <sup>a</sup>	88.2 <sup>a</sup>	81.2 <sup>a</sup>	52.9 <sup>b</sup>	34.8 <sup>b</sup>	21.4 <sup>a</sup>	9.5 <sup>ab</sup>
Cows	2.6 <sup>b</sup>	90.0 <sup>a</sup>	86.6 <sup>a</sup>	64.1 <sup>a</sup>	45.2 <sup>a</sup>	8.1 <sup>b</sup>	5.6 <sup>b</sup>

Within the same column a differs statistically from b with  $P < 0.05$