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Development of an *in vitro* technique to measure the cellulolytic activity of donkey caecal contents

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We modified Tisserand and Zelter's ruminant technique (1965, Ann Biol Anim Bioch Biophys, 5 (1), 101-111) to measure cellulolytic activity in the caecum of donkey.

Three caecally-fistulated donkeys were fed a maintenance diet (30 % concentrate (16 % CP) + 70 % lucerne-cocksfoot-hay (15 % CP)) twice a day. Caecal samples were collected before the first meal from each donkey, mixed together and given 4 different treatments (T) : filtered through 6 layers of muslin (M) as indicated in the Tisserand and Zelter's technique in T1 and T2, or through a nylon (N) (blutex T120 - pores of 48 µm) in T3 and T4 in attempt to pick up more micro-organisms. In T2 and T4 fibres were collected in 200 ml of the Tisserand and Zelter's buffer and mixed in a stomacher for 10 min in to detach the fixed micro-organisms. The fibres + buffer were then filtered through muslin (T2) or nylon (T4).

20 ml of the first filtrate were inoculated in testtubes and complemented with 20 ml of buffer in T1 and T3 or 20 ml of the second filtrate in T2 and T4. Each test-tube contained 0.5 g of filter-paper (FP) cut into narrow stripsand was placed under continuous CO_2 current. After 24 h and 48 h of incubation at 39 °C for the 4 treatments, 6 tubes were removed. The pH was measured and the FP was collected and dried at 80°C for 48 h. The disappearance of dry matter (dDM) was calculated.

The addition of micro-organisms detached from fibers by the stomacher decreased (P<0.05) the pH at 24 h (T2/T1 and T4/T3) and 48 h (T2/T1). The global effect of the stomacher was highly significant at 24 h (P<0.01) and significant at 48 h (P<0.05). The treatment with the stomacher homogenized the inoculates which resulted in a decrease in the coefficient of variation of dDM which was significant in T2 at 24 h (P<0.01).

The nylon was more permeable to free or detached micro-organisms than the muslin and allowed a significant greater degradation of FP after 24 (P<0.01) and 48 h (P<0.05) of incubation. The filtration material had no significant effect on pH.

There was no interaction between the 2 effects (filtration material/mixing machine) on pH nor on dDM at 24 h and 48 h.

In conclusion, the modification of the following parameters allowed to measure and increase the *in vitro* cellulolytic activity of caecal contents of donkey : filtration through a nylon, treatment with stomacher. More experiments have to be done to confirm these adjustments.

		pH			dDM (%)	
Time		0 h	24 h	48 h	24 h	48 h
T1 : M	Mean CV (%)	6.65 2.26	7.14 7.42	6.63 7.09	0.0	26.5 93.6
T2 : M + STO	Mean	6.65	6.47	5.92	24.7	54.4
	CV (%)	2.26	1.54	1.69	23.5	13.6
T3 : N	Mean	6.80	6.63	6.10	22.0	56.7
	CV (%)	1.47	2.11	6.56	59.5	33.3
T4 : N + STO	Mean	6.80	6.39	5.89	36.7	62.0
	CV (%)	1.47	1.88	2.21	18.8	8.7