

Estimation of the contribution of the pony's colon in fiber digestion : a methodological approach

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It is generally accepted that caecum is the principal site of fiber digestion in equine. A preliminary study, held in our laboratory, showed that the colon takes a significant part in this fiber digestion as well as the caecum (Drogoul *et al*, 1994, Ann Zootech, 43, Suppl 1, 17). We tried to perfect a method to estimate the contribution of the colon in the forage's fiber digestion.

We tested the feasibility of a method based on the exchange of Nylon bags between the two compartments in order to simulate the "physiological" incubations, that is an average of 24 h in the caecum (C) followed by 24 h in the colon (N).

Four ponies fitted with a caecum and a colon cannula where fed a maintenance diet in two meals/day (Lucerne/ Orchard grass hay - 0.58 UFC et 76 MADC/kg DM). The Nylon bags (Blutex T120) measured 3.5 x 11 cm with pores of 46 µm and contained 0.8 g of forage (wheat straw (S) or the hay used in the diet (H)). Three identical bags were placed in each compartment. After 24 h of incubation, 2 bags were taken out of each compartment (C 24 h and N 24 h). One of them was immediately reintroduced in the other compartment for an

other 24 h incubation. 24 h later all bags were taken out (CN 48 h, NC 48 h (exchanged bags), C 48 h and N 48h).

We measured the dry matter (DM) and the fiber degradation (NDF, ADF Van Soest -the analysis were carried out on the residual dry matter of 8 bags for each pony).

The contribution of the colon for the second 24 h incubation, after a 24 h incubation in the caecum was calculated by the difference between the CN 48 h bags and the C 24 h bags. In order to make a comparison, the same calculation was done with the caecum (C 48 h - C 24 h).

The analysis of variance showed no significant difference between the ponies. For both forages, and for an equal time of incubation, the disappearance of DM, NDF and ADF did not depend on the kind of compartment in which the bags did stay (C, N, CN or NC).

The cellulolytic activity in the colon and in the caecum is roughly equal. A further experimentation, based on our exchanged bags method and connected with a kinetic, is under way in order to elucidate what 's going on in both compartments during the first 24 h of incubation.

Time and compartment of incubation		% DM disappearance		% NDF disappearance		% ADF disappearance	
		H	S	H	S	H	S
C 24 h	mean	61.0	37.4	44.6	25.2	43.1	25.2
	standard error	0.9	1.1	1.3	1.3	1.4	1.3
N 24 h	mean	60.1	36.7	44.5	24.7	42.9	23.8
	standard error	1.1	1.3	1.5	1.6	1.6	1.6
C 48 h	mean	64.2	41.4	51.0	33.5	50.5	33.7
	standard error	0.5	1.3	0.7	0.9	0.7	0.9
N 48 h	mean	63.2	40.5	49.9	32.8	47.3	29.7
	standard error	0.4	0.9	0.6	1.0	0.6	1.1
CN 48 h	mean	63.5	41.7	49.7	33.0	47.9	33.2
	standard error	0.6	1.0	0.8	1.2	0.8	0.9
NC 48 h	mean	63.7	42.1	50.3	32.6	49.3	32.1
	standard error	0.6	0.8	0.9	0.9	0.9	0.9
CN 48 h - C 24 h	mean	2.6	5.1	5.2	8.8	4.9	9.1
	standard error	0.9	0.7	1.4	0.9	1.5	1.1
C 48 h - C 24 h	mean	2.7	5.2	5.7	9.9	6.6	10.0
	standard error	0.8	0.7	1.2	0.9	1.2	1.0