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Comparison of microbial activity in the cecum of ponies and donkeys

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In this study, the ability of donkeys to utilize low quality diets with or without energy and nitrogen supplemention was compared to that in ponies.

Three ponies (mean live weight: 203 kg) and 3 donkeys (228 kg) adult and cecal-fistulated were fed successively during 4 periods (2 wk adaptation and 1 wk of measurements), 4 diets based on wheat straw (WS, crude protein 3.4% DM). The diets were offered *ad libitum* and were composed of (g/kg): 770 WS + 150 maize and 80 soybean meal (diet I); 785 WS + 215 maize (diet II); diet II + 11 g urea (diet III, isonitrogenous to diet I) and 1 000 WS (diet IV). The cecum juice was sampled before and 4, 6 and 8 h after the morning meal.

Wheat straw degradation measured *in sacco* for 24 h was not significantly different between donkeys and ponies; however, with low nitrogen diets (II and IV), it tended to be higher in donkeys. The higher concentration of volatile fatty acids (VFA) in the cecum juice of donkeys, due to more intensive microbial activity, was related to their straw intake (43.0, 41.0, 41.9 and 48.2 g/kg $W^{0.75}$, *ie* 172%, 175%, 157% and 140% the intake of the ponies for diets I – IV respectively). Consequently, the pH was lower in donkeys. The higher straw intake had no effect on digestibility but tended to decrease transit times in the digestive tract (Suhartanto *et al*, 1992). The supplementation of diets with energy and nitrogen increased the VFA concentration. The proportion of butyric acid was higher in donkeys than in ponies, while the proportion of acetic was lower. The cecum content, measured with polyethylene glycol 4000, tended to be higher in donkeys than in ponies (114, 107 and 104% for diets II, III and IV).

In conclusion, higher feed intake and persistency of microbial activity allows the donkey to utilize low quality forage better than the pony.

Suhartanto B, Julliand V, Faurie F, Tisserand JL (1992) *18e Journée Rech Chevaline.* CEREOPA, Paris

Table I. Degradation of wheat straw (dWS) *in sacco*, pH and concentration of volatile fatty acids (VFA; acetic, propionic and butyric acid) in the cecum of ponies (P) and donkeys (D): means of 4 samples ± SE.

Parameters	*Diet I*		*Diet II*		*Diet III*		*Diet IV*	
	P	*D*	*P*	*D*	*P*	*D*	*P*	*D*
dWS *in sacco* (%)	21.6 ± 0.9	21.4 ± 2.8	17.5 ± 0.4	19.0 ± 0.3	21.4 ± 3.2	19.7 ± 2.6	17.4 ± 1.6	17.7 ± 1.0
pH	7.1 ± 0.1	6.8 ± 0.0	7.1 ± .0.0	6.8 ± 0.1	7.0 ± 0.0	6.7 ± 0.1	7.1 ± 0.0	6.9 ± 0.0
VFA (mmol/l)	40.1 ± 5.1	63.7 ± 6.0	39.4 ± 1.1	59.6 ±0.0	43.6 ± 1.5	59.5 ± 7.0	30.9 ± 0.3	45.6 ± 1.9
Acetic acid (mol%)	65.3 ± 0.5	61.9 ± 1.6	67.8 ± 2.9	63.2 ± 1.0	67.8 ± 2.9	62.5 ± 0.5	69.8 ± 2.1	65.8 ± 2.2
Propionic acid (mol%)	28.1 ± 0.4	26.0 ± 1.9	25.9 ± 2.7	23.2 ± 0.2	25.2 ± 2.5	24.2 ± 0.8	23.4 ± 1.6	24.4 ± 1.9
Butyric acid (mol%)	4.9 ± 0.2	9.4 ± 0.4	5.2 ± 0.2	11.6 ± 0.7	6.3 ± 0.0	11.8 ± 0.9	5.8 ± 0.5	7.7 ± 1.2