

## Adaptation of the free bag technique to evaluate the use of the nitrogenous component of feeds in the large intestine of the pony

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In order to adapt to the horse the free bag technique already perfected on ruminants (cows and sheep; Vérité *et al*, 1987), we used 4 male adult ponies, weighing approximately 180 kg, with a permanent cecum cannula, fed in individual stalls twice a day (8:00 am and 5:00 pm) 4.5 kg of first cutting cocksfoot alfalfa hay. Water and a mineral block were available *ad libitum*. The feed was enclosed in a free bag made of a nylon fiber material (46  $\mu$ m) and was introduced through the cecum cannula either directly or after pepsin predigestion (6 h in a pepsin solution: 2 g/l of 0.1 N HCl). It was recovered in the feces. The quantity of nitrogen found in the bag enabled us to evaluate the quantity of alimentary nitrogen really degraded in the large intestine (de Boer *et al*, 1987).

First we compared 3 sizes of bags filled with alfalfa hay. They measured 2.5 x 3 cm with 0.35 g of substratum, 2.5 x 6 cm with 0.8 g of substratum and 3 x 11 cm

with 1.7 g of substratum, respectively. The 32 measures of DM disappearance gave the following mean results: small bags:  $30.0 \pm 3.3$ ; middle-sized bags:  $31.4 \pm 5.4$ ; large bags:  $38.1 \pm 2.7$ . We consequently chose to introduce the large bags at 5:00 pm to evaluate nitrogen digestion in the large intestine, either by introducing the bag containing the feed directly or after pepsin digestion. We studied 4 feeds: alfalfa hay, soya cake, meat flour and fish flour. Our first observations show a close relationship between disappearance in the large intestine after pepsin digestion and digestibility measured *in vivo* (table I).

de Boer G, Murphy JJ, Kennely JJ (1987)  
*J Dairy Sci* 70, 977-982  
Vérité R, Michalet-Doreau B, Chapoutot P, Peyraud JL, Poncet C (1987) *Bull Tech CRZV Theix INRA* 70, 19-34  
Voigt J, Piatkowki B, Engelmann H, Rudolph E (1985) *Arch Tierernachr* 35, 555-562

Table I. *In sacco* nitrogen degradability (Snd) in the cecum directly or after pepsin digestion (pd).

Feed	TN % DM	Snd	Snd + pd	pd
Alfalfa hay	12.9	$44.5 \pm 3.2$	$71.6 \pm 3.2$	23.5
Soya cake	50.7	$86.0 \pm 2.0$	$88.6 \pm 2.0$	56.7
Meat flour	61.9	$66.9 \pm 3.3$	$80.8 \pm 2.7$	29.2
Fish flour	69.3	$58.3 \pm 5.4$	$82.3 \pm 3.2$	50.4