

## Effect of a probiotic on caecal microbial digestion in the pony

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Three adult male ponies caecally fistulated were fed a maintenance ration of a complete meal (89% dry matter, 16% cellulose, 15% crude protein) distributed at 8 am and 5 pm. The pellets were given alone during 1 month (D1), supplemented with 10 g (or  $10^{10}$  spores) of mature spores of *Bacillus* CIP 5832 (BCIP5832)/day/animal for 5 weeks (D2) and unsupplemented again for 1 month (D3). For each period, 4 samples of caecal content were collected from each animal on 4 different days before distribution of the diet. Total and proteolytic bacteria were counted anaerobically into roll-tubes respectively on complete and specific solid media adapted from those of Leedle and Hespell (1981). The number of cellulolytic bacteria was determined anaerobically on a liquid medium adapted from Halliwell and Bryant's medium (1953) and expressed as the most probable number. Volatile fatty acids, crude protein and  $\text{NNH}_3$  were measured by gas chromatography, Kjeldahl's adapted technique and Conway's technique, respectively. Hay and straw degradabilities were measured using the *in sacco* method.

There were no significant differences for biochemical parameters between the 3 periods. There

was no change in pH ( $7.0 \pm 0.2$ ;  $6.9 \pm 0.1$ ;  $6.7 \pm 0.2$  in D1, D2, D3), VFA level ( $57.1 \pm 13.4$ ;  $43.1 \pm 11.3$ ;  $57.3 \pm 9.3$  mmol/l), total nitrogen level ( $5.0 \pm 0.6$ ;  $4.7 \pm 0.5$ ;  $4.5 \pm 0.7$  g/100 g DM) and  $\text{NNH}_3$  ( $74 \pm 13$ ;  $88 \pm 20$ ;  $83 \pm 13$  mg/l). *In sacco* degradations showed no significant differences. The percentages of disappearance of DM ( $48.9 \pm 6.4$ ;  $43.4 \pm 5.1$ ;  $45.5 \pm 3.6$ ) and cellulose ( $35.9 \pm 10.2$ ;  $26.1 \pm 9.7$ ;  $29.3 \pm 7.4$ ) from hay, DM ( $24.4 \pm 4.9$ ;  $23.4 \pm 4.0$ ;  $23.1 \pm 2.9$ ) and cellulose ( $19.1 \pm 10.3$ ;  $17.7 \pm 8.7$ ;  $18.3 \pm 8.6$ ) from straw were similar. BCIP5832 increased the number of total and proteolytic caecal bacteria in 2 ponies but the means of the 3 animals were not significantly different. The probiotic had no significant effects on the cellulolytic flora of the 3 animals (fig 1).

In conclusion, BCIP5832 had no effects on cellulolytic activity but it could allow the host to increase nitrogenous nutrient availability.

Halliwell G, Bryant MP (1953) *J Gen Microbiol* 32, 441-448

Leedle JAZ, Hespell RB (1981) *Appl Environ Microbiol* 39, 709-719

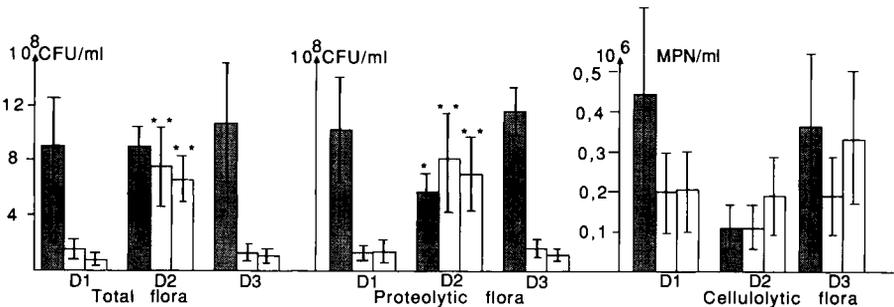


Fig 1. Counts of caecal bacterial populations. ■ Pony 1; ▒ Pony 2; □ Pony 3. \*  $p < 0.01$ ; \*\*  $p < 0.001$ .