

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 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 ± 0.2 ; 6.9 ± 0.1 ; 6.7 ± 0.2 in D1, D2, D3), VFA level (57.1 ± 13.4 ; 43.1 ± 11.3 ; 57.3 ± 9.3 mmol/l), total nitrogen level (5.0 ± 0.6 ; 4.7 ± 0.5 ; 4.5 ± 0.7 g/100 g DM) and NNH_3 (74 ± 13 ; 88 ± 20 ; 83 ± 13 mg/l). *In sacco* degradations showed no significant differences. The percentages of disappearance of DM (48.9 ± 6.4 ; 43.4 ± 5.1 ; 45.5 ± 3.6) and cellulose (35.9 ± 10.2 ; 26.1 ± 9.7 ; 29.3 ± 7.4) from hay, DM (24.4 ± 4.9 ; 23.4 ± 4.0 ; 23.1 ± 2.9) and cellulose (19.1 ± 10.3 ; 17.7 ± 8.7 ; 18.3 ± 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

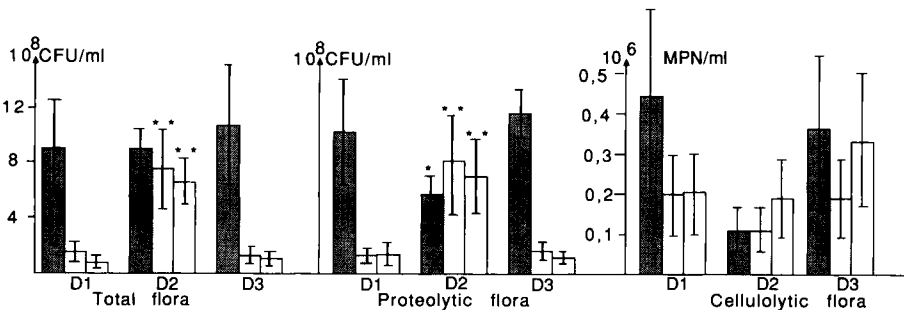


Fig 1. Counts of caecal bacterial populations. ■ Pony 1; ▨ Pony 2; □ Pony 3. * $p < 0.01$; ** $p < 0.001$.