Ann Zootech (1993) 42, 183

Preliminary study of the cecal bacterial flora in the pony: quantification and diet effect

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The objectives were to enumerate the cecal proteolytic and cellulolytic bacteria in the pony and assess the effect of different diets.

Five cecally fistulated ponies were used. Three animals were fed the 4 following diets: 77% wheat-straw + 15% maize + 8% soybean meal (D1); 78% wheat-straw + 22% maize (D2); 78% wheat-straw + 22% maize + 14 g urea per kg straw (D3); 100% wheat-straw (D4). The 5 ponies were fed 72% wheat-straw with molasses at 10% + 18% maize + 10% soybean meal (D5); then 100% hay (D6). The diets were offered *ad libitum* at 8 am and 4 pm. The ponies were adapted to each ration for a 2 wk period prior to cecal fluid collections.

Cecal fluid samples were collected immediately before the first meal in sterile CO_2 saturated flasks. Flasks were maintained at 4°C and immediately transported to the laboratory. Half a ml of appropriate decimal dilutions were inoculated anaerobically into 5 roll tubes (Hungate, 1950) containing cellulotytic or proteolytic media (for 11: 5 g cellulose MN 300 and 10 g casein respectively). Inoculated tubes were incubated for 7 d at 39°C and every colony was counted from roll-tubes containing between 20–200 colonies.

Cellulolytic bacteria formed a higher proportion of the cecal microflora than proteolytic bacteria (except for D1). Mean counts of proteolytic bacteria were from 0.3 to 1.0 x 10^6 CFU/ml (except for D1), in agreement with the results of Reitnour and Mitchell (1979). In ration D1, soybean meal might have stimulated proteolytic bacteria, although it did not in ration D5. Mean counts of cellulolytic bacteria were from 4.6 to 9.4 x 10^6 CFU/ml, increasing but not significantly with the fiber proportion of the diet and with molasses. These results seem low for a herbivore cecum. Incomplete mastery of the anaerobic technique or of the substrates might be concerned.

Hungate RE (1950) *Bacteriol Rev*, 14, 1-63

Reitnour CM, Mitchell GE (1979) *J Agric Sci (Camb)* 92, 507-509

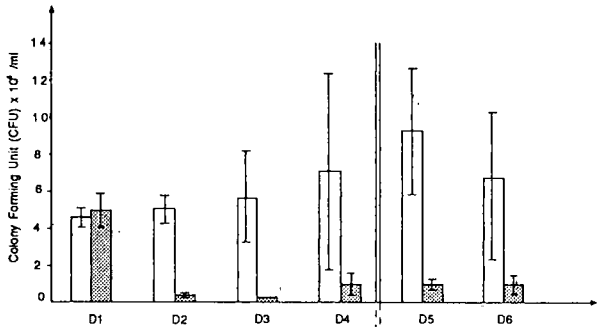

Fig 1. Diet effect on mean counts of cellulolytic (□) and proteolytic (▩) bacteria.