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DEVELOPMENT OF AN IN VITRO TECHNIQUE FOR THE EVALUATION OF FEEDS FOR HORSES

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The information available on feeds used by the horse industry in Australia lags behind other animal industries. mainly because of the cost and time involved in running conventional in vivo methods of feed evaluation. We examined the feasibility of developing an in vitro technique for estimation of digestibility of horse feeds, based on in vitro techniques used for ruminant feeds. This paper reports the results obtained using this in vitro technique with two roughage feeds. in comparison with results obtained for the same roughage feeds in vivo.

The in vitro fermentation technique used in this study was an adaptation of the Tilley and Terry (1963) method described for ruminants, with the difference that caecal fluid obtained from horses was used as the fermentation medium in place of rumen fluid. Five hundred milligrams of ground feed material was incubated with 10 ml of horse caecal fluid obtained from an abattoir, and 40 ml of McDougall's artificial saliva as a buffer, in polypropylene centrifuge tubes fitted with Bunsen valves in a shaking water bath at 38.5°C for 48 hrs. The residue was filtered through sintered glass crucibles and dried to estimate dry matter (DM) disappearance as a measure of in vitro digestibility.

Eight thoroughbred geldings, average live weight 550kg, were used in the digestibility trial and the procedures used were as described by Sriskandarajah et al. (1988). One group of four horses was fed lucerne chaff and the other oaten chaff, at the rate of 18 g/kg liveweight. At the end of three weeks, the groups were reversed. The moisture, nitrogen and neutral detergent fibre (NDF) content of the two roughages were (g/kg feed) 92, 24 and 391 for lucerne and 67, 9 and 479 for oaten chaff respectively. The mean apparent digestibility of DM, Organic Matter (OM) and NDF for the two roughages and their estimated digestible energy (DE) content are shown below.

		Lucerne	Oaten	SED
Feed intake kg DM/d		9.0	9.0	
% Digestibility	in vitro DM	61.4	57.8	0.84
	in vivo DM	61.7	53.4	1.02
	OM	63.1	56.5	0.84
	NDF	32.5	23.6	2.34
DE MJ/kg DM		11.5	10.3	0.16

At the same levels of intake. digestibilities of the two roughages were significantly different ($P<0.01$), the differences in nutritional quality between the roughages being retlected in their digestibilities and in their DE values. Similar differences seen in the in vitro digestibility, validate the use of the fermentation technique. In order for the technique to be useful with the typical mixed rations fed to horses, further work is required in its development to simulate gastric and intestinal digestion to precede caecal fermentation in vitro.

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