

## THE EFFECT OF EXERCISE ON DIGESTIVE FUNCTION IN HORSES

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Enforced exercise has been shown to increase the voluntary feed intake of rats (Oscail et al. 1973) and rate of liveweight gain of pigs (Murray et al. 1974). In horses, as well as other herbivores, as the level of feed intake increases the rate of passage of digesta has been shown to increase (Hintz and Loy 1966), which often leads to a decrease in apparent digestibility (Haenlein et al. 1966). In contrast to this Olsson and Ruudvere (1955) earlier reported that light exercise enhances the digestibility of the diet in the horse, whereas more strenuous exercise depresses it.

The movement of the liquid and particulate phases of digesta has not been reported in horses, although there is considerable literature regarding various other species (Faichney 1975 and Warner 1981). This paper reports the effect of exercise on the digestibility of the whole diet, and the movement of liquid and solid markers through the gastro-intestinal tract of sedentary and exercising horses.

Eight yearling horses were fed a diet formulated according to the NRC (1978) recommendations at approximately ad libitum feed intake level, with or without exercise (four horses per group). Exercised horses were required to trot 12 km per hour each day for one hour on a horse walker; unexercised horses remained in their stalls. Known amounts of unlabelled ruthenium-phenanthroline complex (MacRae and Evans 1974; Orton et al. 1983) and  $^{51}\text{Cr}$ -EDTA were given by stomach tube, and faeces were then collected as they appeared over the next 7 days.

Compared with non-exercised horses, exercised horses had a shorter mean retention time (MRT) for the particulate digesta marker ( $P < 0.05$ ) (MRT for exercising horses = 23 h, MRT for non-exercising horses = 27 h) but a longer MRT for the liquid digesta marker ( $P < 0.05$ ) (MRT for exercising horses = 22 h, MRT for non-exercising horses = 24 h). Exercise increased the apparent dry matter digestibility of the ration (as estimated by 2N-HCl insoluble ash and total faecal collection) ( $P < 0.05$ ) despite the faster passage rate of the particulate digesta marker.

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