

THE EFFECT OF DIETARY PROTEIN CONCENTRATION ON NUTRIENT DIGESTIBILITY AND GROWTH IN YOUNG HORSES.

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The crude protein requirements of young horses for achievement of maximum growth rates under Australian conditions have not been extensively researched. In this experiment, the effect of dietary crude protein (CP) concentration on growth and nutrient digestibility in young horses was examined.

Twelve geldings and four fillies were allocated to four treatment groups. The average age of the horses was 15 months and their average weight was 256 kg. Horses were group fed 5 kg dry matter (DM)/head/d for five weeks. During weeks two to five, one horse per group was individually stabled for measurement of feed intake and estimate of digestibility (McCarthy et al. 1974). The diets contained oaten chaff, lucerne chaff, maize, molasses and a vitamin-mineral mix. The CP contents of Diets 1 to 4 were 131, 110, 92 and 77 g/kg DM, achieved by altering the proportions of oaten and lucerne chaff. The digestible energy intake was in the range 222 to 235 kJ/kg liveweight (LW)/d; NRC (1978) recommended an intake of 218 kJ/kg LW/d for yearling horses with an expected mature weight of 400 kg and a daily liveweight gain of 0.4 kg. The lysine content of the diets was calculated to be similar to that suggested by Ott et al. (1981) viz. 41g/kg CP intake. Jugular blood was collected at the end of the experiment.

TABLE 1. Results

	DIET			
	1	2	3	4
CP intake, g/kg LW/d	2.61 ^a	2.10 ^{ab}	1.81 ^{bc}	1.47 ^c
CP digestibility, %	84.3 ^a	83.4 ^a	66.4 ^b	64.6 ^b
Digestible CP intake, g/kg LW/d	2.19 ^a	1.75 ^a	1.19 ^b	0.95 ^b
Dry matter digestibility, %	83.6 ^a	77.5 ^a	65.5 ^b	64.9 ^b
Plasma urea N, mg/dl	13.4	13.7	10.8	11.7
Total plasma protein, mg/ml	63.0 ^{ab}	66.3 ^a	58.5 ^b	59.1 ^b
Liveweight gain, kg/d	0.54	0.51	0.50	0.36

Values on the same line followed by different superscripts are significantly different, P at least 0.05.

While not significant, the liveweight gains indicate that diet 4 did not sustain the same growth rate as the other diets. It can be suggested then that the minimum digestible CP intake required to support the maximum rate of growth in 15 month-old horses is 1.19 g/kg LW/d (diet 3). Extrapolation of the NRC (1978) data gives their requirement for similar animals as 1.13 g of digestible CP/kg LW/d. However, the digestibility and total plasma protein values above suggest that the CP content of the diet should be at least 110 g/kg DM (Diet 2). Below this level, body protein reserves may be reduced as indicated by the lower plasma protein of horses on diets 3 and 4 (Fonnesbeck and Symons 1969).

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