

THE EFFECT OF EXERCISE ON GROWTH IN HORSES

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The amino acid requirements of young horses at pasture have not been studied to any extent. Under confinement conditions, increases in liveweight gain in horses in response to increasing dietary crude protein level have been reported (e.g. Pulse et al. 1973; Craxton et al. 1979).

Exercise has been shown to have significant effects on the optimal protein to energy ratio in the diet of rats and pigs (Oscai et al. 1973; Andaya et al. (1972). Non-ruminant animals attempt to adjust their feed intake according to energy demands (Murray et al. 1974), and therefore if the protein content of the diet is not altered in relation to the work intensity, protein could well be oversupplied in the exercising horse. Enforced exercise has been shown to increase the rate of liveweight gain in some growing animals (e.g. in rats by Oscai et al. 1973, and in pigs by Andaya et al. 1972). The relationship between exercise and energy and amino acid requirements is of major interest, since it may be possible to modify the proportion of nutrients in the diet, potentially reducing the generally more expensive ingredients (for example, protein).

Two experiments with growing horses were conducted (9 and 24-months old). The horses were fed either a low (8 or 6%) or high (14 or 12%) crude protein diet, with exercise (trotting at 12 km/h on a horse walker for one hour each day) or without exercise (confined to stalls).

In the non-exercised horses fed intakes and growth rates were greater ( $P<0.05$ ) on the high than on the low protein diets (dry matter intakes 4.3 and 7.2 kg/d v. 3.8 and 6.6 kg/d, growth rates 0.53 and 1.1 kg/d v. 0.35 and 0.6 kg/d for the high and low protein diets respectively). The differences disappeared when the horses were exercised; that is, the rate of liveweight gain was similar in both age groups of exercised horses whether they were fed the high or low protein diet. The apparent dry matter digestibility of the diet (estimated by the 2N-HCl insoluble ash method) was greater ( $P<0.05$ ) in the exercised than the non-exercised groups (81% v. 68% and 84% v. 69% in the two experiments).

The results suggest that exercise has a beneficial effect on liveweight gain and that current estimates of the dietary protein level required by growing horses may be too high.

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