Proc. Nutr. Soc. Aust. (1978) 3:70

THE EFFECT OF GUT CONTENTS ON THE ESTIMATES OF LYSINE AVAILABILITY USING THE SLOPE-RATIO ASSAY WITH RATS

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Estimates of amino acid availability using the slope-ratio assay are usually based on calculations involving % lysine in diet with either live-weight gain or FCE (live-weight gain/food eaten). The latter normally gives slightly higher estimates but is preferred as it is thought less susceptible to appetite effects (Carpenter 1973). The use of live-weight gain in these calculations leaves the estimate subject to variation in gut fill; this could occur due to the replacement in the diet of the highly digestible energy source with less digestible protein concentrates. We investigated the effect that removal of the gastrointestinal tract has on the estimates of lysine availability in two sunflower meals for rats. The relationship of the rat results with the Silcock chemical available lysine test (Roach *et al.* 1967) was also examined.

The basal diet consisted of wheat, wheat gluten, maize oil, minerals and vitamins, DL-methionine and wheat starch. Three levels of standard lysine were used to determine the response to lysine. The sunflower meals were incorporated into the diets to supply the same three levels of total lysine at the expense of wheat starch. Additional maize oil was used to maintain the estimated digestible energy content of the diets. The assays were conducted according to Batterham *et al.* (1978). Available lysine estimates were calculated with either live-weight gain or empty-weight gain ((final live weight - heart, lungs and gastrointestinal tract) - initial weight) in the equations.

TABLE 1. Availability of lysine (%) in two sunflower meals.

	Rat slope-ratio assay				Silcock assay
	Live-weight gain		Empty-weight gain		
	Gain	FCE	Gain	FCE	
Sunflower meal (1)	39 (12)†	61 (11)	35 (13)	47 (13)	87
Sunflower meal (2)	50 (9)	59 (7)	42 (8)	48 (7)	94

† Standard deviation

The results indicate that the estimates based on empty-weight gain were lower than those based on live weight. We consider the use of live-weight gain overestimates availability due to variation in gut fill. The results also indicate low lysine availability in the meals which was not detected by the Silcock assay. This supports earlier findings of Batterham *et al.* (1978).

BATTERHAM, E.S., MURISON, R.D. & LEWIS, C.E. (1978). *Br. J. Nutr.* 40:23.
CARPENTER, K.J. (1973). *Nutr. Abst. Rev.* 43:423.
ROACH, A.G., SANDERSON, P. & WILLIAMS, D.R. (1967). *J. Sci. Fd Agric.* 18:274.

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