

RETENTION OF ILEAL-DIGESTIBLE THREONINE BY GROWING PIGS

S.A. BEECH*, R.ELLIOTT** and E.S. BATTERHAM*

Slope-ratio assays have shown that ileal digestible (ID) lysine in some protein meals is not efficiently retained by growing pigs (Batterham et al. 1984). This indicates that the availability of lysine in these proteins is less than predicted by ileal digestibility values. However, the relationship between the ileal digestibility and retention of other amino acids has not been determined. The aim of this experiment was to determine the efficiency with which ileal digestible threonine, in different protein sources is retained by the pig.

Three sugar-based diets were formulated which contained either soya-bean meal (SBM), meat and bone meal (MBM) or cottonseed meal (CSM) as the only source of dietary protein. Each diet contained 0.22 g ID threonine/MJ DE and other amino acids were present in excess of the levels required to utilize this amount of threonine. Each diet was fed restrictively (3 x maintenance) to 10 growing pigs (20-50 kg live weight). Also, to establish that threonine was limiting protein deposition in these diets, each diet was fed with additional free threonine (to make 0.28 g ID threonine/MJ DE) to a second group of 10 growing pigs. Samples of carcass and viscera were collected from each pig at slaughter (50 kg live weight) and these were analyzed for protein, gross energy and amino acids. Retention of ID threonine was calculated by comparing the amino acid content of pigs at 50 kg live weight with a control group of 10 pigs slaughtered at 20 kg live weight.

For all diets, supplementary threonine increased protein deposition. This indicated that threonine content was limiting protein deposition in diets containing 0.22 g ID threonine/MJ DE. Pigs fed CSM retained less ID threonine than pigs fed either SBM or MBM (Table 1).

Table 1 Effect of soya-bean meal (SBM), meat and bone meal (MBM) and cottonseed meal (CSM) on retention of ileal digestible (ID) threonine by growing pigs

Protein source	SBM	MBM	CSM	s.e.m.
Gain (g/d)	524 ^a	452 ^b	417 ^c	12.0
Protein deposition (g/d)	75 ^a	62 ^b	47 ^c	3.1
ID threonine retained (g/g intake)	0.643 ^a	0.588 ^a	0.447 ^b	0.0227

Superscripts within rows indicate means which are significantly different $P < 0.05$.

It appears that the ID threonine in CSM is not completely available for protein deposition since it was retained less efficiently than the ID threonine in either SBM or MBM. This confirms the results of experiments with lysine and methionine and suggests that ID values cannot be used to predict the availability of amino acids in all protein meals.

BATTERHAM, E.S., MURISON, R.D. and ANDERSEN, L.M. (1984). Br. J. Nutr. 51: 85.

* North Coast Agricultural Institute, Wollongbar, N.S.W. 2480.

** Agriculture Department, University of Queensland, St Lucia Qld. 4067.