

INCORPORATION OF TOTAL NITROGEN AND SOME AMINO ACIDS ABSORBED IN THE SMALL INTESTINES INTO THE EMPTY BODY GAIN OF THE EARLY-WEANED PIG

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The weight gains of pigs may be limited by the dietary amounts of individual amino acids and their availability to the animal. The availability will alter with both the source of protein and the absorption of the individual amino acids.

Between 7 and 28 days of age, 18 pigs were fed pelleted diets containing either milk, isolated soy protein (ISP) or soybean meal (SBM) as the protein source, unsupplemented, or supplemented with methionine (milk diet) or methionine and lysine (ISP and SBM diets). At 28 days of age the pigs were slaughtered for intestinal content sampling (Wilson and Leibholz 1977) and the empty bodies analysed for total nitrogen (N) and amino acids. The efficiency of N and amino acid utilization into the empty body gain was calculated from the amounts of N and amino acids apparently absorbed in the small intestines and the gain in the empty body N and amino acids. Two pigs were slaughtered at 7 days of age to provide the initial carcass N and amino acid values.

TABLE 1. Ratio of gain in nitrogen and amino acids in the empty body of pigs to their apparent absorption in the small intestines

Protein source	Amino acid supplement	Ratio					
		N	Lysine	Methionine	Cystine	Threonine	Arginine
Milk	-	0.812	0.595	0.609	0.814	0.690	1.648
	+	0.854	0.605	0.349	0.729	0.710	1.660
ISP	-	0.618	0.465	0.754	0.646	0.665	0.475
	+	0.892	0.420	0.239	0.571	0.646	0.428
SBM	-	0.986	0.585	0.929	0.430	0.926	0.692
	+	0.927	0.594	0.226	0.653	1.100	0.709
SEM		0.104	0.092	0.126	0.072	0.115	0.141

The above ratios show that methionine and threonine were probably the first two limiting amino acids for pigs fed soybean proteins. The addition of methionine reduced the efficiency with which the apparent absorbed methionine was incorporated into the empty body by 43-76%. Lysine supplementation did not alter the efficiency of lysine utilization. At least 65% of the gain in arginine in the body was from endogenous sources in pigs fed the milk diet.

It may be concluded that the incorporation of nitrogen and individual amino acids absorbed in the small intestines into the empty body gain of pigs depends on their dietary source and the amounts ingested. In addition, it appears that young pigs are more efficient in the utilization of dietary amino acids than older pigs (Buttery and Annison 1976).

BUTTERY, P.J., and ANNISON, E.F. (1976). "Reviews in Rural Science No. II", p 111. (U.N.E. Publishing Unit: Armidale, Aust.).
 WILSON, R.H., and LEIBHOLZ, JANE (1977). Proc. Nutr. Soc. Aust. 2: 77.

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