

THE AVAILABILITY TO PIGS OF LYSINE AND THREONINE IN WHEAT

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Wheat is a basic ingredient in most pig diets in Australia and usually contributes at least one-third of all dietary amino acids. Little is known of the availability of amino acids in wheat or factors affecting availability.

In a study using three pigs (50 to 90 kg liveweight, W), each prepared with a re-entrant cannula at the terminal ileum, true digestibility (TD) of total N, lysine and threonine in five wheats was determined by total collection of digesta from the ileum for a 12 h period. Normally three collections were made on each pig for each diet, but for one wheat, with the lowest N content, only five collections in total were made and these data are not included in the statistical analysis but are appended to Table 1. The average (\pm SE) levels of endogenous N, lysine and threonine measured on a N-free diet were 5.4 ± 0.4 , 0.7 ± 0.1 and 1.7 ± 0.1 mg/kg $W^{0.75}$ /100 g dry matter intake, respectively. These values were used to obtain the TD values shown in Table 1.

TABLE 1: True digestibilities at the ileum of N, lysine and threonine.

	Wheat N content % dry matter	Ileal true digestibility %		
		N	lysine	threonine
Wheat No. 1	2.59	86.6 ^{a+}	79.8 ^{ab}	84.3 ^a
2	2.56	87.9 ^a	85.2 ^a	84.6 ^a
3	2.22	87.6 ^a	81.3 ^{ab}	85.4 ^a
4	1.93	81.4 ^b	74.3 ^b	76.1 ^b
\pm SE	-	1.09	2.32	1.61
Wheat No. 5	1.88	79.8	68.4	67.5

+ Within columns, means with different superscripts are significantly different ($P < 0.05$).

The lower protein wheats (4 and 5) tended to give lower TD of N, lysine and threonine. Variations in amino acid digestibility paralleled those of N digestibility but lysine (mean TD 80.2%) was less digestible ($P < 0.05$) than threonine (mean TD 82.6%) and both amino acids less digestible ($P < 0.05$) than total N (mean TD 85.9%). There are no other ileal TD values for wheats but other estimates of amino acid availability have been made by faecal analysis (Eggum 1973). These estimates are generally higher and less accurate because of the disappearance of amino acids in the hind gut. The apparent relationship between TD of nitrogen and nitrogen content in our wheats is similar to that reported for barley by Eggum and Christensen (1975).

Feed compounds generally apply a single factor to wheat to correct for amino acid availability. Our results show that availability not only varies between amino acids, but also varies considerably between wheats, dependent partly on nitrogen content.

EGGUM, B.O. (1973). Beretn. 406. Forsøgslab. Copenhagen, Denmark.
EGGUM, B.O. and CHRISTENSEN, K.D. (1975). "Breeding for Seed Protein Improvement Using Nuclear Techniques". International Atomic Energy Agency, Vienna.

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