

## Ileal amino acid digestibilities of some grain legumes for broiler chickens

*LI Hew, V Ravindran, WL Bryden*

Department of Animal Science, The University of Sydney, Camden, NSW, 2570

Grain legumes have an excellent potential as sources of protein for poultry. In recent years, increasing emphasis has been placed on the utilisation of grain legumes, particularly of lupins, in poultry diets. There is a wealth of published data concerning the nutritional composition of grain legumes, but information on amino acid digestibility is limited. In the present paper, the apparent ileal amino acid digestibility values of soyabean meal, narrow leaf lupin (*Lupinus angustifolius*), white lupin (*L. albus*), field peas (*Pisum sativum*), fababeans (*Vicia faba*) and chickpeas (*Cicer arietinum*) for broiler chickens are reported.

Assay diets were based on dextrose and contained the test feedstuff as the only source of protein. The proportions of dextrose and the test feedstuff were varied in each diet to obtain 200 g crude protein/kg. Celite (20 g/kg) was added to all diets as an indigestible marker. Legume seeds, with hulls, were crushed in a hammer mill prior to inclusion into diets. Each assay diet was fed ad libitum to three pens (4 birds/pen) of male broilers from 35 to 42 days of age. At the end of the trial, digesta was collected from the terminal ileum, pooled from birds within a pen and lyophilised. Samples of diets and ileal digesta were analysed for amino acids and acid-insoluble ash, and the apparent amino acid digestibility values were calculated. The apparent ileal protein and amino acid digestibility coefficients of grain legumes and a soyabean meal sample are summarised in the Table.

Amino acid	Soyabean meal	Narrow leaf lupin	White lupin	Field peas	Fababeans	Chickpeas
Protein	0.82	0.80	0.79	0.73	0.66	0.72
Threonine	0.77	0.77	0.75	0.68	0.64	0.66
Valine	0.82	0.78	0.76	0.69	0.65	0.70
Methionine	0.90	0.81	0.83	0.71	0.67	0.76
Isoleucine	0.83	0.79	0.77	0.70	0.65	0.68
Leucine	0.84	0.81	0.79	0.70	0.66	0.69
Phenylalanine	0.85	0.79	0.78	0.71	0.65	0.69
Histidine	0.83	0.83	0.81	0.74	0.70	0.76
Lysine	0.86	0.81	0.83	0.71	0.67	0.76
Arginine	0.88	0.88	0.88	0.84	0.78	0.84

Ileal digestibilities of protein and amino acids of lupins were slightly lower than those of soyabean meal. Interestingly, the digestibility estimates for the two lupin species were remarkably similar. The protein and amino acid digestibilities of field peas, fababeans and chickpeas were considerably lower than those of lupins, and these lower digestibilities may be attributed to the condensed tannins that occur in the hulls of seeds of these grain legumes (1). Trypsin inhibitors and haemagglutinins are some other factors which may have contributed to the low protein digestion.

1 Carre B. The qualities of grain legumes for poultry. Proc Aust Poult Sci Symp 1997; 9: 46-53,