AMINO ACID DIGESTIBILITIES OF PLANT PROTEIN SUPPLEMENTS FOR BROILERS

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Poultry production throughout the world relies heavily on plant protein supplements to supply the major portion of dietary protein requirements. Next to cereal grains this group of feedstuffs constitutes the largest component of poultry diets. Soyabean meal is the most common plant protein supplement used by the Australian feed industry. Relative to other oilseed meals the protein in soyabean meal is well balanced in terms of essential amino acids for poultry fed diets based on cereal grains. However, the local demand for soyabean meal far outstrips the supply and the trend in the industry is to use a range of locally produced protein sources. In particular, increasing emphasis is being placed on the utilisation of canola meal and lupins. In the present paper, the apparent ileal amino acid digestibility values of soyabean meal, sunflower meal, canola meal, cottonseed meal and lupins (Lupinus angustifolius) for broilers 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. All diets were fortified with minerals and vitamins and contained celite (20 g/kg) as an indigestible marker. Each assy 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 contents from the terminal ileum were collected and processed as described previously (Siriwan et al., 1993). Samples of diets and digesta were analysed for amino acids and acid-insoluble ash, and the apparent ileal amino acid digestibility values were calculated.

The amino acid digestibilities in soyabean meal and sunflower meal were higher than those in other plant protein supplements. The overall mean apparent ileal amino acid digestibility coefficients were: soyabean meal, 0.839; sunflower meal, 0.858; canola meal, 0.711, cottonseed meal, 0.707 and lupins, 0.779. The mean lysine and threonine digestibility coefficients were: soyabean meal, 0.751 and 0.855; sunflower meal, 0.763 and 0.815, canola meal, 0.629 and 0.692; cottonseed meal, 0.609 and 0.510 and lupins, 0.751 and 0.804, respectively. The poor digestibility of lysine in cottonseed meal is in agreement with previous reports (Ravindran and Blair, 1992). Digestibility of threonine was usually the lowest of the essential amino acids in plant protein supplements. The relatively poor digestibilities determined for canola meal were partly due to the low digestibility values observed in one of the three samples assayed. In contrast, variations in amino acid digestibilities observed among the four soyabean meal samples assayed were small, indicating the uniformity of the product.


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