

Ileal and excreta digestibilities of amino acids of some protein supplements for broilers

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The majority of published values on amino acid digestibility of feedstuffs for poultry are derived from measurements based on excreta (1). Amino acid digestibility assays based on excreta have the decided advantage of simplicity over those based on ileal digesta and the assay can be carried out on a large number of birds without sacrificing the birds. Although the available evidence remains inconclusive (2), excreta digestibility is often considered to be an inferior estimate of amino acid availability than ileal digestibility because of the unknown and variable influence of hindgut microflora. A comparison of these two methods of amino acid digestibility determination was made in the present study using a total of 13 samples of feedstuffs.

The feedstuffs tested included seven samples of plant protein supplements [soyabean meal (n=3), canola meal (n = 2), cottonseed meal (n = 1) and sunflower meal (n = 1)] and six samples of animal protein supplements [meat meal (n = 3), feather meal (n = 1), blood meal (n = 1) and fish meal (n = 1)]. 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/kg crude protein. Celite (20 g/kg) was added to all diets as an indigestible marker. Each assay diet was fed ad libitum to three pens (4 birds/pen) of male broilers from 35 to 42 days of age. Total collection of excreta was carried out during the last three days of the trial. At the end of the trial, ileal contents were collected and processed. Samples of diets, excreta and ileal digesta were analysed for amino acids and acid-insoluble ash, and the apparent amino acid digestibility values were calculated.

The effect of method of determination varied among protein supplements and, within protein supplements, among different samples. Apparent digestibilities of amino acids measured at the terminal ileum were similar to those measured at the excreta for samples of soyabean meal. Excreta digestibility estimates were numerically different from ileal digestibility estimates for most other protein supplements, but the differences were significant ($P < 0.05$) only for two samples of meat meal and a sample of feather meal. Aspartic acid, threonine, serine and lysine were the amino acids that were most influenced by the method of determination and this effect was consistent across all feed samples. Overall, the results of the present study favour the use of ileal rather than excreta analysis for the determination of amino acid digestibility for poultry.

1. McNab JM. Amino acid digestibility and availability studies with poultry. In: JPF D'Mello, ed. Amino acids in farm animal nutrition. Wallingford, UK: CAB International, 1994:185-203.
2. Papadopoulos MC. Estimation of amino acid digestibility and availability in feedstuffs for poultry. *World's Poult Sci J* 1985;41:64-71.