INFLUENCE OF ENZYME SUPPLEMENTATION ON APPARENT METABolisABLE ENERGY AND AMINO ACID DIGESTIBILITY OF WHEAT, MILLRUN AND TRITICALE FOR BROILERS

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The addition of xylanase enzymes to poultry diets based on wheat is becoming a routine practice in Australia. While the exact mechanism(s) of action of supplemental xylanases remains unclear degradation of non-starch polysaccharides in the cell wall of the grain is thought to be the major outcome. The beneficial effects of xylanases in overcoming the anti-nutritive influence of these viscous polysaccharides on the performance and utilisation of energy and amino acids in broilers fed on wheat-based diets have been previously reported (Hew et al., 1996). The efficacy of xylanase supplementation, however, may be influenced by the age of the wheat included in the diet. The present study was conducted to examine the influence of a commercial xylanase (Avizyme®, Finfeeds International Ltd, U.K.) on the apparent metabolisable energy (AME) and apparent ileal amino acid digestibility (AAAD) of old season and new season wheats, millrun (a mixture of wheat pollard and bran) and triticale for broilers.

The AME values of the test feedstuffs were determined, with or without the enzyme, using the classical total collection method as described by Mollah et al. (1983). For the AAAD assays, the basal diet contained the test feedstuff as the only source of protein and was used with or without the enzyme. Celite, a source of acid-insoluble ash, was added at 20 g/kg to all diets as an indigestible marker. Each assay diet was fed to three pens (4 birds/pen) of male broilers from 35 to 42 days of age. On day 42, digesta contents from the terminal ileum were collected and processed (Siriwan et al., 1993). Samples of diets and digesta were analysed for acid-insoluble ash and amino acids, and the AAAD values were calculated.

Enzyme addition improved (P < 0.05) the AME of old season and new season wheats by 7.0 and 5.1%, respectively, but had no effect on the AME values of millrun and triticale. The AME contents (MJ/kg) of the basal and enzyme supplemented diets were as follows: old season wheat, 14.3 and 15.3; new season wheat, 13.7 and 14.4; millrun, 11.3 and 11.5, and triticale, 13.2 and 13.2. The AAAD in both wheat types was improved (P < 0.05) by supplemental enzyme with improvements in the digestibility of individual amino acids ranging from 2 to 8 percentage units. Although numerical increases in the AAAD of millrun and triticale were seen with enzyme addition, the differences were not significant (P > 0.05). The overall mean AAAD coefficients of feedstuffs with or without enzymes were as follows: old season wheat, 0.902 and 0.855; new season wheat, 0.903 and 0.845; millrun, 0.745 and 0.732, and triticale, 0.812 and 0.792.


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