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## Effects of Supplemental Enzymes on Metabolisable Energy Values of Wheat Bran and Performance of Broilers

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### Abstract

Inclusion of substantial quantity of cereal by-products, such as wheat bran, in broiler diets could be an imperative technical option for achieving sustainable animal production. However, the utilisation of wheat bran in poultry nutrition has been limited due to its high content of non-starch polysaccharides, low metabolisable energy (ME) and high unavailable phytate phosphorus. Indeed, supplementation of exogenous enzymes have proven as potent tools for considerable use of high-fibre feedstuffs in poultry diets. Different types of enzyme products are available in the global market with varied cost implications and efficacy on animal performance. This study investigated the effect of multi-carbohydrase (Roxazyme G2®), multi-enzyme (Natuzyme®) and single-carbohydrase (Nutraxe Xyla®) on the ME values of wheat bran as well as the performance and nutrient retention of broilers fed wheat bran-based diet. 216 mixed-sex one-day-old broiler chicks were fed either the basal diet or test diet (20% of the basal diet replaced with wheat bran) without or with the commercial enzymes in a 2 × 4 factorial design. Performance data were collected throughout the 42-day trial period and nutrient retention trial was conducted on day 21 of the experiment. The enzymes significantly improved ( $p < 0.001$ ) the ME values of wheat bran but Nutrase Xyla® had the highest increase in apparent ME, nitrogen-corrected apparent ME and true ME of wheat bran. Neither enzyme supplementations of the basal diet nor test diet had significant effect ( $p > 0.05$ ) on the feed intake, weight gain and feed conversion ratio of broilers. Enzyme supplementations of both basal and test diets were economically insignificant ( $p > 0.05$ ) but were rewarding on a numerical basis. Compared to the basal diet, addition of Roxazyme G2® to the test diet had the best economic gain with 27.36% reduction in feed cost per kg live weight of broilers. Enzyme supplementations significantly increase ( $p < 0.001$ ) the fat and phosphorus retention of broilers on both basal and test diets. Broilers fed the test diet supplemented with Roxazyme G2® and Natuzyme® had the highest phosphorus and fat retention, respectively. Overall, addition of enzymes, particularly those containing carbohydrase, to 20% wheat bran-based diet could be a sustainable alternative in broiler nutrition.

**Keywords:** Economic benefit, enzymes, nutrient retention, poultry nutrition, sustainable animal production