

Scotland's Rural College

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**P<sup>079</sup>** **The effect of a by-product of solid state fermentation on the performance of broilers fed wheat based diets**

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**Abstract**

The current experiment was set up to evaluate effect of a by-product of solid state fermentation on performance of broilers fed a reformulated wheat based diet. The raw material used was a by-product of wheat solid state fermentation by *Aspergillus niger* that contains residual enzyme activity. The trial was carried out in a facility where 8 pens (4 containing males and 4 females) were used per treatment in a randomised block design. Ross 308 chicks were stocked to achieve 33 kg/m<sup>2</sup> at 40 days of age. The rations were commercial wheat/soya based formulation, fed in 4 phases: starter (0-10 d), grower (11-25d), finisher (25-35 d) and withdrawal (no coccidiostat) (35-40 d). The control diet contained a phytase and NSP enzyme and had metabolisable energy values of 12.75 (3060), 13.10 (3144) and 13.45 (3228) MJ/kg (kcal/kg), respectively. The treatment diets contained no enzymes and the raw material being tested was added at 200g/t. Both diets were reformulated using the same values, compared to a basal ration (no enzymes) energy was reduced by 0.2MJ/kg (50kcal/kg), calcium by 0.1% and digestible phosphorus by 0.083%. The starter was a crumble and all other diets were pelleted. Performance parameters, litter quality, foot pad and hock lesions were recorded. Data was analysed by ANOVA. Birds fed the raw material had statistically the same feed intake, weight gain and body weight at 40 days, as control. However, both weight and FCR (0.016) were numerically improved over the whole period. There was no statistical effect of treatment on mortality, foot pad lesions, hock burns or litter quality. It was concluded that the raw material tested maintained the performance of broilers fed a re-formulated wheat/soya ration.

**Key words:** Broiler; solid state fermentation; energy; performance; wheat

**Introduction**

Synergen<sup>TM</sup> (Alltech Inc.) is a by-product of solid state fermentation of wheat by *Aspergillus niger* that contains residual enzyme activity. The product allows for a more flexible approach to feed formulation through the inclusion of by-products or by reducing nutrient constraints in the diet. The use of this novel feed material in different feed formulations for a varied of animal species is currently being investigated. The objective of this study was to assess the effect of Synergen in wheat diets on broiler performance.

**Materials and methods**

364 male and female Ross 308 broilers from one breeder flock were used in a 40 day study. The birds were housed from day old in 24 separate sex pens measuring 3.72 m<sup>2</sup>; to give eight pens per treatment (four pens of males and four pens of females). The stocking density of each pen was 33 kg/m<sup>2</sup>, which were deep littered with clean wood shavings. The two treatments were allocated to the pens in a randomised block design: Control group (containing a phytase and xylanase) and treatment group (no enzymes) containing Synergen<sup>TM</sup> (Alltech Inc.) at 200 mg /kg. Both diets were reformulated using the same values, compared to recommendations for the breed, energy was reduced by 0.2MJ/kg (50kcal/kg), calcium by 0.1% and digestible phosphorus by 0.083%.

The raw materials used in both diets were identical, formulated to UK commercial standards to meet current standards for the breed. The starter feeds (0-12d) were produced as crumbs, whilst grower (grower (13-24d), finisher (25-35d) and withdrawal feeds (35-40d) were pellets (3mm). Commercial coccidiostats at current recommended dose rates were used in all feeds, apart from the withdrawal diets, with MaxiBan used in starter diets and Elancoban in grower and finisher diets. The basal feeds were formulated to contribute: 12.75 MJ/kg (3060kcal/kg) metabolisable energy (ME); 23.3% crude protein (CP) and 1.325% digestible lysine (DL) in