

Scotland's Rural College

Efficacy of a novel protease produced by fermentation in *Bacillus Licheniformis* on growth performance of broiler chickens fed a wheat-soybean meal-based diet

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Title: Efficacy of a novel microbial serine sfericase endopeptidase expressed in *Bacillus Licheniformis* on growth performance of broiler chickens fed a wheat-soybean meal-based diet.

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Abstract Body:

This study investigated the efficacy of a novel microbial serine sfericase endopeptidase expressed in *Bacillus licheniformis*, in broilers fed wheat and soybean meal-based diets under simulated commercial conditions.

A total of 576, male, day-old Ross 308 broilers were used in this 35-day study in a randomized complete block design. The study contained 2 treatments, each containing 24 replicates. The control cohort was fed a basal diet meeting Ross 308 nutrient requirements. This diet was then supplemented with 30,000 NFP/kg feed protease and represented the second treatment. The experimental diets were fed as crumbs during starter (0-14d) and pellets during grower (14-28d) and finisher (28-35d) phases. Feed and water were supplied *ad libitum*. Average daily feed intakes (ADFI) and average body weights (ABW) were recorded per pen at 0, 14, 28 and 35-d and average daily weight gain (ADWG) and mortality-adjusted feed conversion ratios (FCRc) were calculated. Data were analyzed by one-way ANOVA with blocks using Genstat 19.

The in-feed recovery of protease in starter, grower and finisher feeds were 27,740, 30,460 and 29,520 NFP/kg, respectively. The ABW of birds fed diets supplemented with protease were +17%, +13%, and +11.9% higher ($P<0.05$) during starter, grower, and finisher phases, respectively. The ADFI was also higher ($P<0.05$) during starter (+2.5%), grower (+5.6%), and finisher phase (+7.1%) in birds fed diets containing protease compared with the control. This improvement in ABW and ADFI in protease fed birds was reflected in significantly lower FCR values during starter (-12%) and grower (-5.2%) phase only. Over the entire trial duration (0-35d), birds receiving the diet that was supplemented with protease had +6.3% and +3.3% higher ($P<0.05$) ADWG and ADFI, respectively, and -5.1% lower ($P<0.05$) FCRc values compared to un-supplemented control birds. The overall mortality remained low (3.2%).

It can be concluded that this novel sfericase protease is effective in improving broiler growth performance and can be used in animal production industry to optimize broiler performance.

Key words: Sfericase, Protease, Bacillus licheniformis, feed additive, broilers, growth performance