

The following Syncra® AVI related abstracts were presented at The Poultry Science Association 102nd annual meeting, held in San Diego, California, 22-25th July 2013. Abstracts have been published in Poultry Science Vol. 92 (E-suppl. 1) 2013 Poultry Science Association Annual Meeting Abstracts (<http://www.poultryscience.org/psa13/abstracts/toc.htm>).

246 Influence of combinations of a direct-fed microbial and exogenous enzymes on nutrient digestibility in broilers at 11 and 21 days of age. L. F. Romero^{*1}, S. E. Indrakumar¹, and V. Ravindran², ¹Danisco Animal Nutrition–DuPont Industrial Biosciences, Marlborough, United Kingdom, ²Massey University, Palmerston North, New Zealand.

Two studies with 11-d-old and 21-d-old Ross-308 male broilers evaluated the digestibility of nutrients in response to dietary combinations of xylanase, amylase, protease and a *B. subtilis* direct-fed microbial (DFM). Day old chicks were administered a live coccidiosis vaccine and assigned to 1 of 6 dietary treatments with 8 replicate cages and 8 birds per cage. Four chickens per cage were randomly selected at 11 d and 21 d for collection of ileal digesta samples. A 3 × 2 factorial arrangement was used. Three enzyme levels were: 1) no enzyme, 2) xylanase from *T. reesei* and amylase from *B. licheniformis* (XA), or 3) XA plus protease from *B. subtilis* (XAP). Two levels of DFM were: 1) no DFM, or 2) a combination of spores from 3 defined strains of *B. subtilis* (DFM). Diets contained corn, soybean meal, corn DDGS, and wheat middlings. Apparent ileal digestibility of energy and protein were measured at both 11 and 21 d using TiO₂ (0.3%) as marker. Ileal digestibility of fat and starch, and AMEn (total collection) were evaluated only at 21 d. Data were analyzed with ANOVA. At 11 d, a main effect of enzyme was present for ileal digestible energy (IDE), where XA and XAP increased IDE by 118 and 128 kcal/kg DM compared with treatments without enzymes. No effects on protein digestibility and no interactions were detected at 11 d. At 21 d, main effects of enzymes and DFM were detected on IDE and AMEn with increments on digestibility for both enzymes and DFM versus unsupplemented diets, with no interactions present. Ileal protein and fat digestibility was affected only by enzymes at 21 d ($P < 0.05$), whereas starch digestibility was affected by DFMs, enzymes, and exhibited an interaction ($P < 0.05$). Interestingly, the DFM + XAP treatment increased IDE by 152 kcal/kg DM, but only 110 kcal/kg DM were explained by increments in the digestibility of starch, fat and protein, suggesting an effect on fiber disappearance, which was subsequently confirmed by evaluation of NSP digestibility. These enzymes and DFM may have complementary effects on nutrient digestibility in broilers.

Key Words: *Bacillus*, broiler, digestibility, direct-fed microbial, enzyme

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