# Syncra® AVI

## ABSTRACTS

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).

**33 Effects of exogenous enzymes and direct-fed microbials supplementation on first-cycle laying hen performance, energy digestibility, gut integrity and pathogen colonization.** G. R. Murugesan[1], I. V. Wesley[2], J. Remus[3], P. W. Plumstead[3], and M. E. Persia*[1], [1]*Iowa State University, Ames,* [2]*USDA-National Animal Disease Center, Ames, IA,* [3]*DuPont Industrial Biosciences-Danisco Animal Nutrition, Marlborough, United Kingdom.*

Corn-soybean meal (SBM)-dried distillers grains with solubles (DDGS) based diets were used to generate experimental diets including an industry type control (CON), the same diet with reduced energy (RE), RE + exogenous xylanase, amylase, and protease enzymes (XAP), and RE + XAP + a combination of spores from 3 *Bacillus* spp. direct-fed microbial strains (XAP+DFM) that were fed to Hy-Line W36 laying hens from 25 to 40 wk of age. The RE diet was formulated to contain a 100 kcal/kg reduction in ME compared with the CON diet. Each diet was fed to 8 replicate groups of 9 hens in a completely randomized design. Supplementation of XAP+DFM increased AMEn compared with RE at wk 36 ($P$ = 0.09), wk 38 ($P \leq 0.01$) and wk 40 ($P$ = 0.03) by an average of 116 kcal/kg. At the end of the experimental period, ileal morphology, nutrient flux and mucin (MUC2) mRNA expression were determined from one randomly selected hen per replicate group. Colon trans-epithelial electrical resistance (TER) and endotoxin permeability co-efficient (*P*app) were measured using one randomly selected hen per replicate group for the XAP and XAP+DFM groups. No significant differences were found in ileal morphology, but XAP increased the active transport of d-glucose and l-lysine ($P \leq 0.01$). The *Bacillus* spp. direct-Poult. Sci. 92(E-Suppl. 1) fed microbials increased ileal MUC2 mRNAexpression and colon TER, while decreasing *P*app ($P \leq 0.01$). Colonization of *Campylobacter* spp. in the colon was reduced with the addition of the *Bacillus* spp. directfed microbials ($P \leq 0.05$). These results indicate that, energy utilization was increased with exogenous XAP and XAP+DFM, while the *Bacillus* spp. direct-fed microbials increased gut barrier function and lowered pathogen colonization. Addition of these additives to corn-SBM-DDGSbased diets may improve gut health and energy utilization of laying hens.

**Key Words:** nutrient transport, trans-epithelial electrical resistance, MUC2, LPS, campylobacter



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