
291 Effects of a multistrain *Bacillus* spp. direct-fed microbial and protease combination at different doses on apparent ileal and total tract digestibility of nutrients in growing pigs fed corn–soybean meal–based diets – A combined analysis of two studies. M. C. Walsh^{1,*}, L. Payling¹, I. H. Kim², H. H. Stein³, ¹*Danisco Animal Nutrition, DuPont Industrial Biosciences, Marlborough, UK*, ²*Department of Animal Resource, and Science, Dankook University, Cheonan, The Republic of Korea*, ³*University of Illinois at Urbana-Champaign, Urbana.*

The addition of direct-fed microbials (DFM) or protease individually to grower–finisher pig diets has not consistently led to nutrient digestibility improvements; however, new research suggests that there may be greater and more consistent effects of feeding protease and DFM in combination. The objective of these studies was to investigate the effects on nutrient digestibility of feeding a protease and multistrain *Bacillus* spp. DFM combination (PRO+DFM) at different doses to growing pigs. A combined analysis of 2 trials involving 64 ileal cannulated barrows (25 ± 2 kg BW) was conducted. Treatments included 1) corn–soybean meal–based (control) diet with 20% coproducts; 2) Dose A, control plus PRO+DFM (2,500 units/kg protease, 7.5 × 10⁴ cfu/g DFM); 3) Dose B, control plus PRO+DFM (5,000 units/kg protease, 1.5 × 10⁵ cfu/g DFM); and 4) Dose C, control plus PRO+DFM (7,500 units/kg protease, 2.25 × 10⁵ cfu/g DFM). Pigs were randomly assigned to treatments, surgically equipped with a T-cannula at the distal ileum, and individually housed with 8 replicates/treatment in a randomized complete block design. Diets were fed for 14 d at 3 × maintenance energy requirement with 10 d of adaptation followed by 2 d of both fecal and ileal digesta collection. Duplicate samples were analyzed for chromic oxide and nutrients for the calculation of apparent ileal digestibility (AID) and apparent total tract digestibility (ATTD). Data from the 2 trials were pooled and analyzed using the Fit Model platform of JMP11. Means separation was determined using Tukey’s honest significant difference test. A regression

analysis was performed to determine the correlation between the indigestible AA fraction and the uplift in AA digestibility for each combination dose. All PRO+DFM treatments (Dose A, B, and C) increased ATTD of N compared with the control (86.8, 86.8, and 86.6 vs. 84.5%, respectively; *P* = 0.01). Dose A also increased AID of starch (90.6 vs. 87.9%; *P* = 0.02), arginine (85.5 vs. 82.9%; *P* = 0.01), valine (77.4 vs. 73.8%; *P* = 0.02), isoleucine (80.8 vs. 77.1%; *P* = 0.01), and tryptophan (73.6 vs. 65.4%; *P* < 0.02) compared with the control. Dose B and C increased the AID of tryptophan compared with the control (*P* = 0.001). The regressions demonstrated that Dose A and B resulted in an average uplift in AID of AA of 33 and 9%, respectively, compared with the control and that the uplift was positively correlated with the indigestible fraction (*P* < 0.001). No AA uplift was found with Dose C. In conclusion, the dietary supplementation of a PRO+DFM combination to growing pigs resulted in improvements in ATTD of N and AID starch and key AA in a dose-dependent manner compared with the control.

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