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354 **Effect of protease on growth performance, intestinal morphology, and inflammatory response of nursery pigs fed corn-soybean meal based diets.**

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A keratinase-based additive, Versazyme (VZ, BioResource International, Inc. Durham, NC), was used as an exogenous source of protease. The experiment was to evaluate the effect of VZ on growth performance, intestinal morphology, and inflammatory response of nursery pigs fed diets with a higher inclusion of SBM. One hundred and twenty pigs (7.3 ± 0.1 kg) weaned on d 21 were allotted to 4 experimental treatments based on a 2 × 2 factorial arrangement with 2 levels of TID Lys (1.22% and 1.01%) and with or without VZ (0.00 and 0.05%). Diets with 2 levels of TID Lys were achieved by altering the amount of SBM included (24 vs. 30%) during a 2-wk study. Body weight and feed intake were measured weekly. Six pigs from each treatment were selected for blood and tissue sample collection. Ileal digesta were collected to measure viscosity. Dietary 1.22% TID Lys increased ( $P < 0.05$ ) ADG (267 vs. 215 g/d) and G:F (0.68 vs. 0.58) during the entire 2-wk period compared with pigs fed 1.01% TID Lys. There were interactions ( $P < 0.05$ ) of TID Lys and VZ for ADFI and ADG during entire 2 wk period indicating that VZ improved ADFI (411 vs. 375 g/d) and ADG (282 vs. 252 g/d) of pigs fed 1.22% TID Lys (30% SBM) diet whereas not for pigs fed 1.01% TID Lys (24% SBM) diet. Viscosity of ileal digesta was not different among treatments. Tumor necrosis factor  $\alpha$  (TNF- $\alpha$ ) concentration of duodenum and jejunum were not different among treatments. However, VZ tended to decrease ( $P = 0.055$ ) TNF- $\alpha$  concentration in serum. In addition, an interaction ( $P < 0.05$ ) between VZ and TID Lys in serum malondialdehyde (MDA) indicated that supplementation of VZ reduced serum MDA concentration at 1.22% TID Lys. Microscopic examination of both duodenum and jejunum also showed an interaction ( $P < 0.05$ ) between 2 treatment factors, reflecting that supplementation of VZ increased villus height:crypt depth ratio at 1.22% TID Lys. Results suggested that VZ had positive effects on growth performance, systemic lipid peroxidation, inflammatory responses and intestinal development of nursery pigs when dietary TID Lys level was 1.22% (30% SBM).

**Key Words:** keratinase, nursery pigs, soybean meal, TID Lys

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355 **Effects of fine grinding corn or dried distillers grains with solubles (DDGS) and diet form on growth performance and caloric efficiency of eleven 22-kg nursery pigs.** J. A. De Jong\*, J. M. DeRouche, M. D. Tokach, R. D. Goodband, S. S. Dritz, *Kansas State University, Manhattan*.

Little is known about the effects of fine-grinding other ingredients in combination with grinding the corn or the effect that

form (meal vs. pellet) of these diets may have on nursery pig performance. Thus, a total of 687 pigs (PIC 1050 barrows; initially 11.6 kg BW and 37 d of age) were used in a 21-d study to determine the effects of fine grinding corn and/or DDGS and diet form (meal vs. pellet) on growth performance and caloric efficiency of nursery pigs. Pigs were allotted to 1 of 10 dietary treatments (14 pens/treatment and 5 pigs/pen) using 2 groups of nursery pigs. The 10 diets included 4 corn-soybean meal-based diets consisting of: (1) corn ground to ~638  $\mu$  in meal form; (2) treatment 1 in pellet form; (3) corn ground to ~325  $\mu$ , in meal form, and (4) treatment 3 in pellet form. The remaining 6 diets contained 30% DDGS. Diets 5 through 10 consisted of: (5) corn and DDGS ground to ~638 and 580  $\mu$ , in meal form; (6) diet 5 in pellet form; (7) corn and DDGS ground to ~638 and 391  $\mu$ , in meal form; (8) diet 7 in pellet form; (9) corn and DDGS ground to ~325 and 391  $\mu$ , in meal form, and (10) diet 9 in pellet form. Diets were formulated to 1.28% SID Lys and were not adjusted for energy as DDGS was added. Overall, a corn particle size × diet form interaction was observed ( $P < 0.01$ ) as a result of increased ADFI when corn was finely ground and fed in pellet form but decreased intake when corn was finely ground and fed in meal form. Pelleting diets decreased ( $P < 0.001$ ) ADG (594 vs. 560 g), ADFI (872 vs. 864 g), and final BW (23.8 vs. 23.2 kg) but improved ( $P < 0.001$ ) G:F (0.63 vs. 0.65) and caloric efficiency on both an ME and NE basis. Fine-grinding corn decreased ( $P < 0.04$ ) ADG (588 vs. 572 g) as a result of numerically decreased ADFI ( $P > 0.16$ ). Feeding 30% DDGS also decreased ( $P < 0.01$ ) ADG (591 vs. 568 g), ADFI (897 vs. 898 g), and NE caloric efficiency and tended to decrease ( $P < 0.07$ ) final BW (23.7 vs. 23.3 kg). In conclusion, pelleting nursery diets and fine-grinding ingredients reduced ADG as a result of decreased ADFI, which resulted in improved feed efficiency.

**Key Words:** DDGS, nursery pig, feed processing, pelleting

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356 **Effects of feeding increasing levels of a proprietary yeast blend on growth performance of commercial nursery pigs.** R. Song\*, K. W. Purser, R. E. Musser, C. D. Hagen, *NUTRIQUEST, Mason City, IA*.

Two experiments were conducted to evaluate feeding increasing levels of Evosure™ (NUTRIQUEST, Mason City, IA), a yeast additive for swine, on growth performance of commercial nursery pigs. In both experiments, weanling pigs were housed in pens and fed a common starter diet for 7 d. On d 7, pens within block were assigned randomly to experimental diets in a randomized complete block design. Data were analyzed using the MIXED procedure of SAS. In Exp 1, nursery pigs ( $n = 1188$ ; BW = 5.49 ± 0.31 kg) were allotted to one of 4 dietary treatments containing 0 (CON), 0.22 (EVO1), 0.44 (EVO2) or 0.66 (EVO3) g/kg Evosure™ with 11 replicates per treatment. This experiment was conducted over a 14-d period. Ending BW, ADG and G:F increased linearly ( $P < 0.05$ ) with