

ground via hammermill, riffle divided, and analyzed for mycotoxin concentration using multiclass liquid chromatography tandem mass spectrometry. Data were analyzed using the GLIMMIX procedure of SAS, as a completely randomized design with run as the experimental unit. Within run, cleaned corn contained lower aflatoxin and fumonisin quantity than unclean corn despite the variability in quantity across run number. Cleaning generated approximately 6% screenings, and reduced ($P < 0.05$) aflatoxin concentration by an average of 26% (1,074 vs. 789 ppb aflatoxin for unclean vs. cleaned corn, respectively). Cleaning also reduced ($P < 0.05$) fumonisin concentration by 45% (8.3 vs. 4.5 ppm fumonisin for unclean vs. cleaned corn, respectively), but did not impact ochratoxin A. Screenings had nearly 4 times the aflatoxin (4,224 ppb) and 7.5 times the fumonisin concentration (60.4 ppm) as uncleaned corn. These data suggest that cleaning is an effective method to legally reduce aflatoxin and fumonisin concentration, but the resultant screenings should be used cautiously when feeding to animals.

Key Words: Corn, Mycotoxin, Screenings

231 Effect of Feeding a Blend of Naturally-Contaminated Corn on Nutrient Digestibility and Feed Preference in Weanling Pigs. Y. D. Jang*, C. S. Escobar, M. D. Lindemann, *University of Kentucky, Lexington, KY*

Two experiments were conducted to determine the effect of feeding diets with 2009 and 2010 naturally-contaminated corn containing deoxynivalenol (DON), zearalenone, and fumonisin B₁ to pigs on apparent nutrient digestibility and feed preference. The 2009 corn contained higher concentrations of mycotoxins than the 2010 corn (5.6 vs. 0.5 ppm DON, 5.5 vs. 2.0 ppm fumonisin B₁, and 2.45 ppm vs. nondetected zearalenone, respectively). For both experiments, 3 diets that contained 57.1% corn were mixed. Diets contained 100% 2010 corn (Control), 50-50% blend of 2009 and 2010 corn (Diet 2), and 100% 2009 corn (Diet 3). In Exp. 1, 24 pigs with BW of 7.64 ± 0.70 kg were allotted to 4 replicates of 3 treatments with 2 pigs per pen on the basis of gender and BW. Fecal samples were collected and apparent DM, energy, and nitrogen digestibility were determined for 5 consecutive 4-d periods with 2 feeding methods (*ad libitum* in Periods 1-3; scale feeding to BW in Period 4-5). Linear reductions in ADFI were observed with more contaminated corn (Periods 1-3: average 1,091, 964, and 787 g for Diet 1, 2, and 3, respectively, $P < 0.04$) with associated reductions in ADG; however, DM, energy, and nitrogen

digestibility were not affected ($P > 0.12$) by either Diet 3 or Diet 2 compared to the Control throughout all periods. In Exp. 2, 30 pigs with BW of 7.98 ± 1.15 kg were allotted to 3 replicates of 2 comparisons with 5 pigs per pen for 3 experimental periods of 1 week each. Comparisons were: 1) Control vs. Diet 3, and 2) Control vs. Diet 2. A preference for the diet containing 2010 corn was observed in both comparisons. Pigs discriminated against mycotoxin-contaminated diets (95.34 vs. 4.66% for Diet 1 and 3, respectively, $P < 0.01$; 91.29 vs. 8.71% for Diet 1 and 2, respectively, $P < 0.01$) over the 3 week period. The discriminations were evident in each weekly period for both comparisons. These results demonstrated that nutrient digestibility was not affected by naturally-contaminated corn, but a clear decrease in feed preference was observed in the pigs consuming highly contaminated corn. With this combination of mycotoxins, the observed decreases in performance with the contaminated corn are more a function of the effect of the contamination on feed intake than on the utilization of the feed.

Key Words: weanling pigs, nutrient digestibility, Naturally-contaminated corn

232 Effects of added Defusion or Feed Aid on finishing pig growth performance from 20 to 110 kg. D. J. Shawk*, S. S. Dritz, M. D. Tokach, J. C. Woodworth, B. D. Goodband, J. M. DeRouchey, *Kansas State University, Manhattan, KS*

A total of 1,188 pigs (PIC 359 \times 1050; initial BW 20.5 kg) were used in a 112-d growth trial to determine the effects of Defusion (Provimi, Brooksville, OH) or Feed Aid (NutriQuest, Mason City, IA) on finishing pig performance from 20 to 110 kg in a commercial setting. Defusion and Feed Aid are commercially available products containing sodium metabisulfite. Pens of pigs were blocked by BW and then randomly assigned to 1 of 4 dietary treatments with 27 pigs/pen and 11 pens/treatment. The four treatment diets included a corn-soybean meal-based diet, a corn-soybean meal-based diet containing 40% distillers dried grains with solubles (DDGS), or the DDGS diet with either 0.25% Defusion or 0.25% Feed Aid. Thiamine was included at 0.01 g/kg at the expense of corn when Defusion or Feed Aid was added to the DDGS diet. Mycotoxin analysis indicated the deoxynivalenol (DON) concentrations varied by treatment and phase, but all concentrations were less than 1 ppm. Data were analyzed as a randomized complete block design using PROC GLIMMIX (SAS Inst. Inc., Cary, NC) with pen as the experimental unit. From d 0 to 56, pigs, fed the corn-soy

Item	Corn-Soy	40% DDGS	Defusion	Feed Aid	SEM
d 0 to 112					
ADG, kg	0.82 ^a	0.78 ^b	0.79 ^b	0.79 ^b	0.006
ADFI, kg	2.11	2.07	2.08	2.04	0.027
G:F	0.387	0.379	0.381	0.388	0.004

^{ab}Means within a row with different superscripts differ $P < 0.05$.

diet had greater (0.78 kg; $P < 0.05$) ADG compared to pigs fed the DDGS (0.71 kg), Defusion (0.74 kg), or Feed Aid (0.72 kg), with no evidence for difference among pigs fed the diets with DDGS. Pigs fed the corn-soy diet had greater (1.60 kg; $P < 0.05$) ADFI compared to pigs fed Feed Aid (1.49 kg), with pigs fed Defusion (1.54 kg) and DDGS (1.54 kg) intermediate. Pigs fed the corn-soy diet had better (0.488; $P < 0.05$) G:F than pigs fed the DDGS diet (0.460), with pigs fed Feed Aid (0.482) and Defusion (0.478) intermediate. Overall, pigs fed the corn-soy diet had greater ($P < 0.05$) ADG when compared to the other dietary treatments with no evidence of differences in ADFI or G:F. There was no evidence that Defusion or Feed Aid influenced overall performance. In conclusion, feeding 40% DDGS reduced ADG. Overall there was no evidence Feed Aid or Defusion improved growth performance of finishing pigs when the dietary DON concentration was less than 1 ppm.

Key Words: finishing pig, sodium metabisulfite, deoxynivalenol

- 233 The Impact of a Sulfur-Containing Preservative Blend on Growth Performance of Growing Pigs (30-100 kg) Fed Diets Containing Deoxynivalenol (DON).** S. M. Ebarb¹, C. M. Fowler¹, P. Xue^{*1}, S. B. Williams¹, J. C. Peters¹, D. W. Giesting²,
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Deoxynivalenol (DON) negatively impacts intestinal health, reduces nutrient transport, and suppresses the immune response. Collectively these deleterious responses can significantly reduce growth performance and profitability of swine production. Defusion® (Provimi, Brookville, OH) is a complex product, formulated to support animal health and growth. The components of Defusion include a blend of sulfur-containing preservative, antioxidants, and other components to support gut integrity. This study evaluated the impact of Defusion on ADG, ADFI, and G:F of growing pigs fed diets containing DON. A total of 1,080 pigs (initial BW = 29.5 ± 2.9 kg) were used in a 10 wk study with 9 pens/treatment, and 24 pigs/pen. Pigs were blocked by initial BW and randomly allotted

to one of 5 treatments within block. The treatments were: 1) Low DON corn and soybean meal (CON), 2) Corn and DDGS containing DON (quality challenged, QC) + 0% Defusion, 3) QC + 0.25% Defusion, 4) QC + 0.375% Defusion, and 5) QC + 0.5% Defusion. The average DON level of the CON and QC diets were 1.3 and 4.0 ppm, respectively. Pen weights and feed intake were collected weekly throughout the trial and data were summarized by feeding phase. Return over feed cost (ROFC) for each treatment was calculated by assuming the return at \$2.20 per kg of gain. Orthogonal contrasts were constructed and data were analyzed using PROC GLIMMIX in SAS 9.3 (SAS Inst. Inc., Cary, NC). The overall ADG of treatment 1 to 5 were 0.91, 0.78, 0.86, 0.85, and 0.84 kg/d, respectively. The ROFC for the 5 treatments were \$108.69, \$94.10, \$104.41, \$102.32, and \$100.10, respectively. The QC diet with 0% Defusion decreased final BW, ADG, ADFI, and ROFC compared with CON ($P < 0.01$). Supplementation of Defusion in QC diets (treatments 2-5) linearly and quadratically increased final BW, ADG, and ROFC ($P < 0.05$). The G:F of treatments 1 to 5 were 0.402, 0.404, 0.417, 0.416, and 0.411, respectively. Feed efficiency was quadratically improved ($P < 0.01$) as Defusion increased in QC diets (treatment 2-5). In conclusion, the addition of Defusion at 0.25 to 0.50% of complete diet can alleviate some of the negative performance impact displayed by growing pigs fed diets containing DON.

Key Words: deoxynivalenol, growth, growing pig

- 234 Effects of Sulfur-Containing Preservative Blends or Sodium Metabisulfite with or without a Yeast Derivative on Nursery Pig Performance When Challenged with Diets Containing Elevated Level of Deoxynivalenol.** S. M. Ebarb¹, C. M. Fowler^{*1}, S. B. Williams¹, D. W. Giesting²,
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Deoxynivalenol (DON) contamination of swine diets can reduce growth performance. This study evaluated the effects of sulfur-containing preservative blends (Defusion® and Defusion® Prime; Provimi, Brookville, OH) or sodium metabisulfite with or without a yeast derivative on growth performance of nursery pigs fed diets containing corn and corn distillers dried grains with solubles (DDGS) which contained elevated levels of DON. The study utilized 1,822 pigs (40-42 d of age; 12.5 ± 0.4 kg), 12 pens/treatment, and 23 pigs/pen. Two barns were blocked separately by starting BW and randomly allocated to treatments. Treatments were