

## 229 Effect of Dietary Chromium Propionate and *Yucca schidigera* on Finishing Pig Growth Performance.

J. T. Gebhardt<sup>\*1</sup>, J. C. Woodworth<sup>1</sup>, M. D. Tokach<sup>1</sup>, S. S. Dritz<sup>1</sup>, J. M. DeRouche<sup>1</sup>, J. A. Loughmiller<sup>2</sup>, A. L. P. De Souza<sup>2</sup>, M. J. Rincker<sup>3</sup>, R. D. Goodband<sup>1</sup>,  
<sup>1</sup>Kansas State University, Manhattan, KS, <sup>2</sup>Kemin Industries, Des Moines, IA, <sup>3</sup>DPI GLOBAL, Porterville, CA

A total of 2,430 pigs [PIC (Hendersonville, TN) 359 × 1050; initial BW=29.3 kg] were used to evaluate the effects of dietary chromium propionate (Cr; Kemin Industries, Des Moines, IA) and a *yucca schidigera*-based extract (DPI Global, Porterville, CA) on growth performance of finishing pigs housed in commercial conditions. Pigs were placed in balanced, mixed-gender pens (27 pigs/pen), blocked by average pen BW, and randomly assigned to treatment. Diets were corn-soybean meal-based and were formulated in 5 dietary phases to meet or exceed NRC (2012) requirement estimates. Dietary treatments were fed for the full duration of the study and were arranged in a 2 × 3 factorial with 14 pens per treatment. Main effects included added chromium (0 or 200 µg/kg from chromium propionate) and *yucca schidigera* feed grade concentrate (0, 62.5, or 125 mg/kg). For the overall study, a marginally significant (linear;  $P \leq 0.072$ ) Cr × *yucca schidigera* interaction was observed for ADG and ADFI. Pigs fed *yucca schidigera* without added Cr had similar ADG and ADFI; however, pigs fed added Cr had increased ADG and ADFI as *yucca schidigera* increased from 62.5 to 125 mg/kg. There was insufficient evidence that added Cr had an effect on G:F ( $P > 0.05$ ). Increasing *yucca schidigera* resulted in a marginally significant reduction (quadratic;  $P = 0.053$ ) in G:F. The main effect of added *yucca schidigera* on final BW and HCW (quadratic;  $P = 0.012$ ) resulted in pens of pigs fed 62.5 mg/kg having the lowest final BW and HCW. Sufficient

Interactive effects of Cr and *yucca schidigera* supplementation on finishing pig growth and carcass performance, 29 to 124 kg BW

Added Cr, µg/kg	0	0	0	200	200	200	
<i>Yucca schidigera</i> , mg/kg	0	62.5	125	0	62.5	125	SEM
ADG, kg <sup>1</sup>	0.89	0.88	0.88	0.89	0.88	0.90	0.013
ADFI, kg <sup>2</sup>	2.46	2.44	2.45	2.43	2.45	2.48	0.019
G:F <sup>3</sup>	0.36	0.36	0.36	0.37	0.36	0.36	0.006

<sup>1</sup> Cr × *yucca schidigera*; linear,  $P = 0.072$ .

<sup>2</sup> Cr × *yucca schidigera*; linear,  $P = 0.071$ .

<sup>3</sup> *Yucca schidigera*; quadratic,  $P = 0.053$ .

evidence was lacking ( $P \geq 0.278$ ) to conclude added Cr influenced carcass characteristics including HCW, loin depth, backfat, percentage lean, and percentage yield. Added *yucca schidigera* did not demonstrate sufficient evidence of an influence on loin depth, backfat, percentage lean, or percentage yield ( $P \geq 0.152$ ). In summary, adding Cr propionate along with *yucca schidigera* led to modest changes in performance, with the greatest benefit observed with 200 µg/kg Cr and 125 mg/kg *yucca schidigera*.

**Key Words:** chromium propionate, finishing pigs, *yucca schidigera*

## POSTER SESSION IV: NONRUMINANT NUTRITION V: FEED ADDITIVES III: MYCOTOXINS

### 230 Effect of Cleaning Corn on Mycotoxin

**Concentration.** A. D. Yoder<sup>\*</sup>, C. R. Stark, J. M. DeRouche<sup>y</sup>, M. D. Tokach, C. K. Jones, Kansas State University, Manhattan, KS

Mycotoxins are fungal secondary metabolites from molds grown on cereal grains and other commodities. These molds may produce aflatoxin B<sub>1</sub>, which is carcinogenic to humans and animals. Mycotoxins are often concentrated in cracked or broken kernels because there is exposed substrate for mold growth. Removal of this material has been demonstrated to reduce the concentration of mycotoxin, but the reduction is highly variable. Most literature has used artificial mycotoxin contaminated grain to limit variability. Therefore, the objective of this experiment was to quantify the magnitude of natural mycotoxin concentration that may be reduced by cleaning corn in a traditional grain handling facility setting. 10 mT of corn naturally contaminated with aflatoxin (1,074 ppb), fumonisin (8.3 ppm), and ochratoxin A (206 ppb) was procured from central Oklahoma to evaluate the role of cleaning to reduce mycotoxin concentration in corn. After receiving regulatory approval to transport it, the corn was cleaned at the biosafety level-2 feed mill at Kansas State University. 3,000 kg of corn were divided into twenty 150 kg runs, which were then cleaned using a commercial corn cleaner (Gentle Roll, EBM Manufacturing, Norfolk, NE) to remove overs (material > 12.7-mm) and thrus (material < 4.76-mm) to establish 3 treatments: 1) unclean corn; 2) cleaned corn; and 3) screenings (overs + thrus). The corn cleaner was sanitized between each of the 20 runs. Three 5-kg samples of corn were collected by probing from each treatment of each run,

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 B<sub>1</sub> 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 B<sub>1</sub>, 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  $7.64 \pm 0.70$  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  $7.98 \pm 1.15$  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. Hawk\*, 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