
PSVIII-1 Evaluating the Efficacy of Acidifiers Used in Nursery Diets in Reducing Bacterial Loads in Both Non-Inoculated and Inoculated Complete Feed.

Olivia Harrison¹, Payton L. Dahmer¹, Jason C. Woodworth¹, Chad B. Paulk¹, Jordan T. Gebhardt¹, Valentina Trinetta¹, Cassandra K. Jones¹, ¹*Kansas State University*

Abstract: Acidifiers are used in nursery pig diets to reduce the incidence of diarrhea, improve growth performance, and act as a feed preservative. The objective was to evaluate whether acidifiers were able to reduce bacteria presence in non-inoculated feed and reduce bacteria growth in feed inoculated with *Escherichia coli* and *Enterococcus faecium*. Each culture media was arranged in a 2×5 factorial with 2 phases and 5 diets. The diets were 1) control – no antibiotics, 2) ZnO (Phase 1: 3,000 ppm Zn and Phase 2: 2,000 ppm Zn), 3) formic acid at 0.7% of the diet (Amasil-NA; BASF Corp. Florham, NJ), 4) glycerol monolaurate – GML at 0.18% of the diet (Natural Biologics, Newfield, NY), and 5) FORMI-3G at 1.0% of the diet (Addcon GmbH, Bitterfeld-Wolfen, Germany). Non-inoculated feed was plated onto Aerobic Count, *E. coli*/Coliform, and *Enterobacteriaceae* petrifilm (3M, St. Paul, MN). Inoculated feed was initially contaminated with *E. coli* or *E. faecium* and allowed to incubate prior to plating on MacConkey. There was no difference ($P > 0.05$) in quantity of bacteria for the diets inoculated with *E. coli*. There was no difference ($P > 0.05$) between the diets inoculated with *E. faecium* for phase 1; however, the formic acid diet had reduced ($P < 0.05$) quantities of bacteria compared with control, ZnO, and GML diets. The control and ZnO phase 1 non-inoculated diets had reduced ($P < 0.05$) quantities of aerobic bacteria, coliforms, and *Enterobacteriaceae* compared with GML. In phase 2 only the control had reduced ($P < 0.05$) quantities of *Enterobacteriaceae* compared with the ZnO and formic acid diets. Formic acid was able to reduce *E. faecium* quantities in phase 2, while the control and ZnO had decreased overall bacterial loads in phase 1.

Keywords: acidifiers, bacteria, swine

PSVIII-3 Evaluation of the Metal Corrosiveness and Pelleting Stability of Formic Acid-Based Organic Acid Blend and the Effects of the Blend on Post-Weaning Growth Performance.

Ying Chen¹, Ana Sevarolli¹, ¹*Eastman Chemical Company*

Abstract: Studies were conducted to evaluate the metal corrosiveness and pelleting stability of a formic acid-based organic acid blend, which is a free-flowing powder with silica as inert carrier. Under experimental conditions, results suggested the blend has minimal metal corrosiveness and is stable during the pelleting process (conditioning temperature = 195° F). An animal trial was conducted to evaluate the effects of the blend on post-weaning growth performance. A total of 1,320 post-weaning piglets (~21 d of age, 6.9 kg BW) were assigned to 5 dietary treatments (22 pigs/pen, n = 12) and fed for 42 d in 4 dietary phases (12, 10, 13 and 7 d, respectively). Treatments were 1) NC, basal diet without antibiotics or acidifier; 2) PC, basal diet with antibiotics but without an acidifier; 3) PC+A, product A is a blend of organic and inorganic acids; 4) PC+B, product B is a blend of organic acids and derivatives; 5) PC+C, product C is the formic acid-based organic acid blend. For treatments 3, 4, and 5, products A, B and C were added to the PC diet respectively at 0.3% in Phase 1, 0.15% in Phase 2 and 0% in Phase 3 and 4. Data were analyzed with ANOVA and differences considered significant at $P < 0.05$. During Phase 1, 2 and 3, PC+C treatment showed the greatest BW, ADG and ADFI, which were greater compared with NC ($P < 0.05$) and numerically greater comparing with PC, PC+A and PC+B treatments. In Phase 1, PC+C treatment showed less FCR than the other groups. There were no significant differences for ADG, ADFI and FCR among all treatments during Phase 4. Overall, PC+C treatment showed greater final BW, ADG and ADFI, which were significantly greater than NC ($P < 0.05$) and numerically higher than PC, PC+A and PC+B groups.

Keywords: formic acid; growth performance; post-weaning pigs