performance. A 41-d experiment was conducted in a commercial wean-to-finish barn; 1,300 piglets weaned at 21-d of age (weaned 2 or 4 days prior to experiment; 6.14 ± 0.18 kg BW, PIC 1050 sows and multiple sire lines) were blocked by sire, sex, and wean date, and assigned to 8 treatments: 4 dietary treatments each evaluated across 2 group sizes. The four diet treatments were: negative control (NC), positive control (PC; NC + in-feed antibiotics (chlortetracycline-HCl in phases 1 and 3 and tiamulin hydrogen fumarate in phase 2), zinc oxide with a dietary acid blend (ZA; NC + ZnO + acid), and a *bacillus*-based direct-fed-microbial combined with resistant potato starch (DR; NC+DFM+RS). The two group sizes were 31 (large pens) or 11(small pens) pigs per pen; floor was modified so area/pig was not different ($0.42 m^2$/pig). There were 7 pens/diet with 11 pigs/pen and 8 pens/diet with 31 pigs/pen. Data were analyzed as a randomized complete block design using SAS PROC MIXED with pen as the experimental unit. Pigs naturally experienced acute diarrhea and septicemia in week 1 and PRRSV in weeks 4-6. There was a significant interaction between diet and group size for ADG ($P = 0.012$); PC compared to NC increased ADG in large and small pens (0.33 vs. 0.26 and 0.33 vs. 0.29 kg/d, respectively; $P < 0.05$) and ZA increased ADG only in large pens (0.28 vs. 0.26 kg/d; $P < 0.05$). Small pens had increased ADG compared to large pens when fed NC or DR diets (0. 29 vs 0.26 and 0.28 vs 0.25 kg/d; $P < 0.05$). Similarly, PC increased ADFI (0.47 vs. 0.40 and 0.47 vs. 0.43 kg/d for large pens and small pens fed PC vs. NC, respectively; $P < 0.05$). Compared to NC, ZA increased ADFI (0.43 vs. 0.40 kg/d) in large pens only ($P < 0.05$; diet*group size $P = 0.015$). Pigs fed PC had greater G:F than NC (0.69 vs. 0.66; $P < 0.05$), and small pens had greater G:F than large pens (0.67 vs. 0.65; $P < 0.05$). In conclusion, compared to NC, ZA increased ADG and ADFI in large pens and PC improved performance in both pen sizes. Small pens had increased G:F compared to large pens.

Key Words: Feed additives, Group size, Swine

285 Medium Chain Fatty Acid Mitigation Activity Against Porcine Epidemic Diarrhea Virus (PEDV) in Nursery Pig Diets after 40 d of Storage. J. T. Gebhardt*, J. C. Woodworth, M. D. Tokach, J. M. DeRouchey, R. D. Goodband, C. K. Jones, S. S. Dritz, *Kansas State University, Manhattan, KS*

Medium chain fatty acids (MCFA) are six to twelve carbon length molecules with significant promise as mitigants of biological hazards in feed and feed ingredients. Residual mitigation activity allows for post-processing contamination control and prevention. However, duration of mitigation activity has not been established. Therefore, the objective of this experiment was to characterize the mitigation properties of MCFA-treated swine feed when inoculated 40 d (June to July 2017) following feed manufacture. Treatments (n=8) consisted of a dose response including 0, 0.25, 0.50, 1.0, and 1.5% dietary addition of a MCFA blend (1:1:1 ratio C6, C8, and C10) as well as 0.50% C6, 0.50% C8, or 0.50% C10 alone. Diets were stored in paper bags at barn temperature and humidity for 40 d following manufacture. Feed was then sampled and inoculated (3 replicates/treatment×day combination) with PEDV for a final titer of 10^4 $TCID_{50}$/g. Samples were analyzed on d 0 and 3 after inoculation using qRT-PCR and a linear mixed model (PROC GLIMMIX; SAS Institute, Inc., Cary, NC) was used with individual bottle as the experimental unit. Samples with a lower cycle threshold (Ct) indicate a greater quantity of detectible virus. A significant treatment×day interaction ($P<0.001$) was observed, where Ct increased over time in some treatments and was reduced in others. When evaluating increasing inclusion of MCFA blend, an inclusion level × day interaction was observed (quadratic, $P=0.023$). This was because PEDV Ct values increased in a quadratic manner ($P=0.001$) on d 0 and a linear ($P<0.001$) manner on d 3 with increasing MCFA blend diet concentrations. On d 0 after inoculation, the addition of C6, C8, or C10 alone resulted in greater Ct values compared to no supplemented MCFA ($P<0.05$; Ct=29.7, 30.0, 28.7, 27.1, for the C6, C8, C10, control, respectively). There was no evidence that the addition of 0.50% C6 and 0.50% C8 influenced Ct value ($P>0.05$) compared to the 0.50% MCFA blend; however, adding 0.50% C10 resulted in a lower ($P<0.05$) Ct value (28.7 vs 30.9) compared to the 0.50% MCFA blend. On d 3 after inoculation, the addition of 0.50% C6 or 0.50% C10 resulted in greater Ct values compared to control diet ($P<0.05$), whereas, no evidence of improvement was observed in the 0.50% C8 diet compared to control ($P>0.05$). In summary, inclusion of MCFA in feed reduces detection of PEDV even after a significant time period following feed manufacturing. Further assessment of MCFA viral infectivity is warranted.

Key Words: medium chain fatty acid, mitigation, PEDV