

SWINE TRANSLATIONAL

PSVI-4 Efficacy of Medium Chain Fatty Acids and Fatty Acid-based Feed Additives as a Mitigation Strategy Against Porcine Epidemic Diarrhea Virus and Porcine Reproductive and Respiratory Syndrome

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Recent research has demonstrated that swine viruses can be transmitted via feed. Chemical feed additives have been suggested for the mitigation of these viruses in complete feed. Therefore, the objective of this study was to evaluate the efficacy of a commercially available formaldehyde-based feed additive, medium chain fatty acid blend (MCFA), and commercially available fatty acid-based products for mitigation of porcine epidemic diarrhea virus (PEDV) and porcine reproductive and respiratory syndrome virus (PRRSV) in a feed matrix. Treatments consisted of: 1) non-treated positive control, 2) 0.33% commercial formaldehyde-based product (Sal Curb; Kemin Industries, Inc.; Des Moines, IA), 3) 0.5% MCFA blend (1:1:1 ratio of C6:0, C8:0, and C10:0, Sigma Aldrich, St. Louis, MO), 4) 0.25%, 5) 0.5%, or 6) 1% of commercial dry mono and diglyceride-based product (Furst Strike; Furst-McNess Company, Freeport, IL), 7) 0.25%, 8) 0.5%, or 9) 1% of commercial dry mono and diglyceride-based product (Furst Protect; Furst-McNess Company, Freeport, IL), 10) 0.25%, 11) 0.5%, or 12) 1% dry mono and diglyceride-based experimental product (Furst-McNess Company, Freeport, IL) with 3 replications/treatment. Treatments were applied to complete swine feed before inoculation with 10^6 TCID₅₀/g of feed with PEDV or PRRSV. Post inoculation feed was held at ambient temperature for 24 h before being analyzed via qRT-PCR. The analyzed values represent the cycle threshold. Formaldehyde and MCFA decreased ($P < 0.05$) the detectable RNA of PEDV and PRRSV

compared to all other treatments. Furst Strike, Furst Protect, and the experimental product did not significantly impact detectability of PEDV or PRRSV RNA. In conclusion, MCFA and formaldehyde treatments are effective at reducing detection of RNA from PEDV and PRRSV in feed.

Keywords: feed, medium chain fatty acid, porcine epidemic diarrhea virus