255 Using environmental swabbing to quantify the effectiveness of chemical disinfectant to reduce the quantity of porcine epidemic diarrhea virus RNA on feed manufacturing surfaces. M. B. Muckey[1], R. A. Cochrane[1,*], J. C. Woodworth[1], S. S. Dritz[1], C. R. Stark[1], A. D. Yoder[1], J. F. Bai[1], J. Zhang[2], P. C. Gauger[2], R. G. Main[2], C. K. Jones[1], *[1]Kansas State University, Manhattan, [2]Iowa State University, Ames*.

Porcine epidemic diarrhea virus (PEDV) is a possible hazard in feed mills that could impact swine health. If the virus enters a feed mill, it quickly becomes widely distributed and is difficult to decontaminate from surfaces. The objective of this study was to evaluate a variety of liquid and dry sanitation treatments that could be used to reduce the amount of PEDV found on feed manufacturing surfaces in feed mills. This experiment was replicated 3 times and was designed as a 5 × 10 factorial with main effects of 5 different feed manufacturing surfaces and 10 sanitizing treatments. Surfaces included stainless steel, plastic, rubber, woven polypropylene tote bag, and sealed concrete coupons (103 cm^2). One milliliter (1 × 10^5 $TCID_{50}$/mL) of stock PEDV was applied to each surface and allowed to completely dry for 60 min. Next, chemical treatments were applied for 15 min: 1) no sanitation treatment (control); 2) untreated rice hulls; 3) rice hulls treated with formaldehyde-based commercial product (Sal CURB; Kemin Industries Inc., Des Moines, IA), 4) liquid formaldehyde-based commercial product (Sal CURB); 5) dry commercial benzoic acid and eubiotic blend (VevoVitall and CRINA; DSM Nutritional Products Inc., Parsippany, NJ); 6) liquid ammonium chloride, isopropanol, and hydrogen peroxide–based commercial food-grade sanitizer (DrySan Duo; Ecolab, St. Paul, MN); 7) liquid hydrogen peroxide commercial product (INTERvention; Virox Technologies Inc. Ontario, Canada); 8) liquid quaternary ammonium glutaraldehyde commercial product (Synergize; Preserve International, Reno NV); 9) liquid sodium hypochlorite commercial sanitizer (Bleach; Clorox, Oakland, CA); and 10) liquid medium-chain fatty acid blend of caprylic, capronic, and capric acids. The quantity of PEDV RNA was determined using quantitative reverse transcription PCR (qRT-PCR). All main effects and interaction were highly significant ($P \leq 0.001$). Concentrated liquid Sal CURB was the sanitizer most effective at removing PEDV RNA across surfaces followed by liquid bleach (42.9, 35.2, and 26.2 CT for Sal CURB, bleach, and untreated control, respectively). Rubber belting obtained from a bucket elevator retained the most PEDV RNA of any tested surface, whereas the polyethylene tote bag retained the least (28.0 and 31.4 CT for rubber and tote bag, respectively). Additional research is necessary to identify the role of sanitizer on PEDV infectivity and to develop dry sanitizers capable of removing PEDV mRNA on animal food manufacturing surfaces.

Key Words: feed manufacturing surfaces, porcine epidemic diarrhea virus, sanitation
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256 Evaluating the roles of surface sanitation and feed sequencing on mitigating *Salmonella* enteritidis contamination on animal food manufacturing equipment. M. Muckey*, A. D. Yoder, R. A. Cochrane, A. R. Huss, S. S. Dritz, J. C. Woodworth, C. K. Jones, *Kansas State University, Manhattan*.

The objective of this study was to evaluate the efficacy of flushing surfaces with untreated feed vs. the use of 2 different chemical sanitizers on residual surface and feed *Salmonella* enteritidis contamination. First, a *Salmonella*-negative batch of poultry feed was mixed in 9 laboratory-scale paddle mixers. A feed sample was collected, and targeted locations on surfaces within the mixer were swabbed to confirm *Salmonella*-negative status. Next, a *Salmonella*-positive batch of poultry feed was mixed and sampled, and mixer surfaces were swabbed. Mean *Salmonella* enteritidis contamination across all 9 mixers was 3.63 cfu/g for sampled feed and 1.27 cfu/cm^2 for surface contamination. Next, the mixers manufactured one of the following treatments (3 mixers/treatment): 1) none (control), 2) concentrated commercial product containing a eubiotic blend of essential oils (benzoic acid and blend of essential oils: thymol, eugenol, piperine, and other essential oil compounds), or 3) rice hulls treated with a 10% (wt/wt)

Table 254.

	CON	Prot	PV	PVH	SEM	*P*-value
Nursery ADG, kg/d	0.29	0.29	0.29	0.31	0.015	0.22
Nursery ADFI, kg/d	0.42^{b}	0.42^{b}	0.42^{b}	0.45^{a}	0.018	0.05
Nursery G:F	0.69	0.68	0.69	0.68	0.013	0.93
End nursery BW, kg	15.85	15.80	15.70	16.39	0.790	0.24
Finisher ADG, kg/d	0.87	0.86	0.84	0.88	0.015	0.15
Finisher ADFI, kg/d	2.33	2.32	2.34	2.45	0.054	0.17
Finisher G:F	0.38^{x}	0.37^{xy}	0.36^{y}	0.36^{xy}	0.005	0.09
End BW, kg	137.4	135.9	133.7	139.7	2.48	0.15
Phase 2 ATTD ash, %	80.9^{a}	82.2^{b}	81.6^{ab}	81.0^{a}	0.42	0.05
d 12 WBC, 1,000/μL	13.34^{b}	18.15^{a}	16.28^{ab}	19.11^{a}	1.25	0.03
d 12 hematocrit, %	30.7^{y}	32.2^{xy}	34.2^{x}	34.6^{x}	1.08	0.07