

## Evaluating the Efficacy of Boot Baths with Wet and Dry Disinfectants for Porcine Epidemic Diarrhea Virus and Porcine Reproductive and Respiratory Syndrome Virus

Olivia Harrison, Catherine Grace Elijah, Allison K. Blomme, Haley Ottot, Jianfa Bai, Elizabeth Poulsen-Porter, Jason C. Woodworth, Chad B. Paulk, Jordon T. Gebhardt, Cassandra K. Jones  
Kansas State University

Maintaining biosecurity between barns is challenging. Boot baths, either wet or dry, can be implemented to limit pathogen spread. The objective was to evaluate the efficacy of boot baths using wet or dry disinfectants for porcine epidemic diarrhea virus (PEDV) and porcine reproductive and respiratory syndrome virus (PRRSV).

Treatments included 1) control, 2) wet disinfectant (Synergize, Neogen, Lexington, KY), and 3) dry disinfectant (Traffic C.O.P., PSP, LLC, Rainsville, AL). Prior to disinfection, 0.5 mL of both PRRSV ( $\sim 1 \times 10^5$  TCID<sub>50</sub>/mL) and PEDV ( $\sim 1 \times 10^5$  TCID<sub>50</sub>/mL) was placed onto a new boot with a layer of autoclaved corn dust and allowed to dry for 15 minutes. After the mixture dried, the boot was put on and stepped into its respective boot bath. After 3 seconds, the boot was lifted out of the bath and stepped onto a stainless-steel coupon to simulate walking through a facility. Both boot and coupon were allowed to dry for 1 minute before swabs were taken from both surfaces. Samples were analyzed in a duplex PCR at the Kansas State Veterinary Diagnostic Laboratory. Cycle Threshold values were analyzed using SAS BLIMMIX v 9.4 (SAS, Inc., Cary, NC).

There was no evidence of a treatment  $\times$  surface  $\times$  virus interaction ( $P > 0.10$ ). The interaction between treatment  $\times$  surface impacted ( $P < 0.05$ ) the quantity of detectable RNA. The control had greater concentration of virus on the coupon than the boot. The reverse was true for boots treated with wet disinfectant, where the boot had a greater concentration of virus than the coupon. Treatment  $\times$  virus also impacted detectable RNA ( $P < 0.05$ ), where wet and control boots had greater quantities of PEDV RNA than PRRSV. There was no detectable virus when dry disinfectant was used. For this trial, dry disinfectant was the most efficacious in reducing the viral RNA on both boots and subsequent surfaces; however, further research in commercial settings is warranted.

**Table 1.** Detection of PRRSV and PEDV on surfaces after disinfection with a wet or dry disinfectant

		Treatment			Trt $\times$ Surface	$P < 0.0001$
		Control	Wet disinfectant	Dry disinfectant		
Ct <sup>1</sup>	Boot	37.0 <sup>c</sup>	38.1 <sup>c</sup>	45.0 <sup>a</sup>		
	Coupon <sup>2</sup>	34.0 <sup>d</sup>	42.2 <sup>b</sup>	45.0 <sup>a</sup>		
Positive samples						
	Boot	19/24	21/24	0/24		
	Coupon <sup>2</sup>	22/24	9/24	0/24		

<sup>1</sup>Ct is the average cycle threshold value for both PEDV and PRRSV

<sup>2</sup>Coupon was a 4 $\times$ 4 in stainless-steel coupon which was autoclaved prior to experiment

<sup>abcd</sup>Means with differing superscripts differ significantly ( $P < 0.05$ )

<https://doi.org/10.1093/jas/skac064.029>