

Environmental Study of the Effectiveness of Xtreme Bio® in Eliminating Porcine Epidemic Diarrhea Virus

Ryan Saltzman, DVM

VRI, LLC

Objective:

To determine the effectiveness of XTREME BIO® (XB) in eliminating the presence of Porcine Epidemic Diarrhea Virus (PEDv) in the environment.

Overview of the Environmental Contamination:

One isolation room containing two rows of four farrowing crates (8 crates total) was used to evaluate the effectiveness of XB in eliminating the presence of PEDv in the environment. The crates were 5 ft. x 7 ft. and had plastic slatted flooring. The crates previously held eight sows with litters that had been challenged with a virulent PEDv at ~4 days of age. The piglets remained on the dams for a period of 14 days following challenge (18 days of age). Although not directly involved for this evaluation, it should be noted that most of the sows went off feed following the challenge and several exhibited diarrhea for a few days. The piglets exhibited clinical signs (diarrhea, vomiting, dehydration, high mortality rate) typical of a PEDv challenge.

PreDisinfectant Phase:

Upon removal of the sows and any surviving piglets from the crates, all crates were individually wiped with a Swiffer® cloth over the entire flooring surface of the crates. After wiping the flooring, the cloth was placed in a one-gallon plastic baggie. Twenty-five milliliters of Phosphate Buffered Saline (PBS) was added to the baggie. The baggie was then manipulated several times so that the PBS could be absorbed into the cloth. The cloth was then squeezed to expel any liquid into a 50ml centrifuge tube to create an individual crate sample to be tested for PEDv qPCR. The samples were stored frozen until completion of the power-washing/disinfection phase.

Powerwashing/Disinfection Phase:

Per VRI Standard Operating Procedures, the sides and fronts of the crates were dismantled and stacked upon one another. The top side of each crate's flooring was then power-washed (hot water). After completion of power-washing the top side, the flooring was dismantled and the bottom surface of the crate flooring was exposed and power-washed. The flooring was then reassembled. This process occurred over the period of two days. Upon reassembly of the flooring, one row of four crates was sprayed (via a hose end sprayer) with plain water and the other row was sprayed with XB (0.5 oz/gallon). The sprayed water (plain or XB) was allowed to have ten minutes of contact time with the flooring surface. At the end of the ten minutes, a Swiffer® cloth was used to wipe each crate and create an individual crate sample as described previously (see PreDisinfectant Phase).

Testing of the Crate Samples:

Sixteen total crate samples were collected and submitted to Iowa State University Veterinary Diagnostic Laboratory for quantitative PEDv PCR testing. The results are given in the table below. Pens 1-4 were treated with XB and Pens 5-8 were treated with plain water.

PEDv PCR Results from Crate Samples					
Crate Id	Disinfectant	Sample Time*	qPCR Result	CT value	Genomic Copies /ml
1	None	Pre	Positive	30.1	89509
2	None	Pre	Positive	24.3	4574749
3	None	Pre	Positive	29.2	161750
4	None	Pre	Positive	28.8	210226
5	None	Pre	Positive	28.1	343604
6	None	Pre	Positive	29.8	112525
7	None	Pre	Positive	28.3	309585
8	None	Pre	Positive	30.6	63586
1	XB	Post	Negative	>=36	0
2	XB	Post	Negative	>=36	0
3	XB	Post	Negative	>=36	0
4	XB	Post	Negative	>=36	0
5	None	Post	Positive	31.0	48722
6	None	Post	Positive	34.0	6530
7	None	Post	Positive	32.3	20879
8	None	Post	Positive	33.1	11660

*Sample time: Pre = prior to power-washing/disinfectant. Post = following power-wash and disinfectant.

• CONCLUSIONS

Based on the results provided in previous table, XB is effective in eliminating the presence of PEDv in the environment when used in conjunction with a vigorous powerwashing (hot water) and applied at the concentration of 0.5 oz/gallon and allowed 10 minutes of contact time. Further evaluation may be warranted with a larger sample size.