

TECHNICAL PAPER

RESEARCH SUMMARY

Evaluating the *in vitro* efficacy of FeedARMOR™ towards EhV (ASFV surrogate virus).



FEEDARMOR™

BACKGROUND

FeedARMOR is a next-generation feed mitigant that was shown in an ice-cube challenge model to protect sows from feed contaminated with Porcine Reproductive and Respiratory Syndrome Virus (PRRSV), Porcine Epidemic Diarrhea Virus (PEDV) and Seneca Valley Virus (SVA) as compared to a negative control feed without mitigation, where all sows became sick. Furthermore, in this trial, 2 lbs per ton of FeedARMOR gave the same level of protection as 6.5 lbs per ton of a liquid formaldehyde product. To further develop our understanding of how FeedARMOR works, we are continuing to work with both viruses and bacteria. Dr. Declan Schroeder developed the *Emilia huxleyi* Virus (EhV) model as a safer alternative to working directly with African swine fever virus (ASFV). The EhV is very similar to ASFV in many aspects and is considered a very robust virus. Ramirez et al. (2024) showed that storing EhV in corn, soybean meal, distillers grains, extruded soybean meal, soybean hulls and complete feed at 40°F, 75°F and 93°F did not reduce viral viability.¹ They concluded:

"Storing EhV at 40°F, 75°F and 93°F for up to 120 days did not result in the inactivation of EhV in any of the ingredients, complete feed or the control with no matrix. These results demonstrate that ASFV-like Nucleocytoplasmic large DNA viruses (NCLDVs) are extremely resilient and can maintain viability in various feed matrices during long-term storage and suggest that extending storage time alone may not be an effective mitigation practice against African swine fever virus."

Therefore, having protection for this type of complex and very large virus is critical for swine producers. Furthermore, in this trial, we also compared a FeedARMOR composition that had additional flow agent for high humidity conditions called FeedARMOR Flow+.

EXPERIMENTAL DESIGN²

- Trials were run and data created by The Schroeder Laboratory, College Veterinary Medicine, University of Minnesota
- This was an *in vitro* experiment where extremely high levels (10^8) of virus particles (100,000,000) were added to solution, and different levels of FeedARMOR or FeedARMOR Flow+ were added
- The trial was run over a very short time – only one hour of exposure
- Viable virus was determined, not only viral material – so the measure is what viable virus is remaining

TREATMENTS

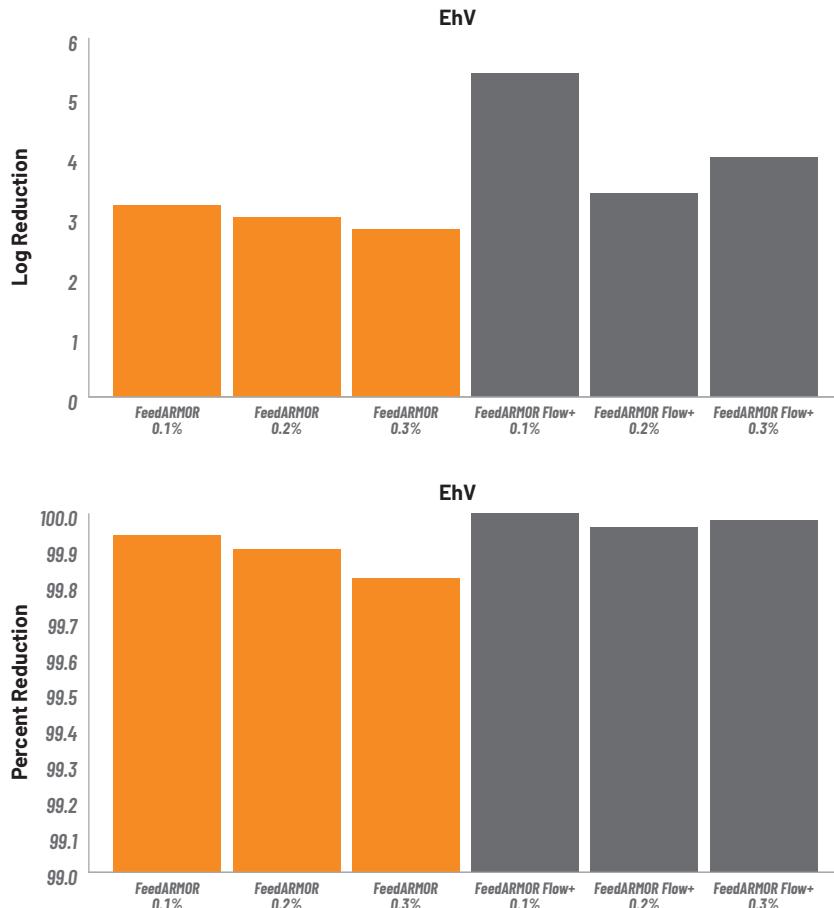
1. Control
2. Control + FeedARMOR 0.1%
3. Control + FeedARMOR 0.2%
4. Control + FeedARMOR 0.3%
5. Control + FeedARMOR Flow+ 0.1%
6. Control + FeedARMOR Flow+ 0.2%
7. Control + FeedARMOR Flow+ 0.3%

RESULTS

- Both FeedARMOR and FeedARMOR Flow+ were highly effective at neutralizing EhV (ASFV surrogate)
- Both technologies yielded in only one hour more than 3 to 4 \log_{10} reductions in virus titre
- As can be seen for the percentage reduction, this is 99.9% reductions towards 100% reductions in an hour
- It can also be concluded that FeedARMOR and FeedARMOR Flow+ are equally effective
- The results are shown in Figure 1

FIGURE 1.

The impact of FeedARMOR and FeedARMOR Flow+ on EhV virus in an *in vitro* evaluation.



RESEARCH SUMMARY

FeedARMOR and FeedARMOR Flow+ effectively neutralized EhV and ASFV surrogate virus:

- 99.99% reduction within one hour exposure
- 3 to 4 \log_{10} reductions in viral load – very large reductions
- With this level of impact, the amount of virus expected in contaminated feedstuffs would be very effectively neutralized



FEEDARMOR™

¹ Ramirez C, Schroeder D, Shurson GC, Urriola PE. (2024). PSI-5 Evaluation of EhV (surrogate for African swine fever virus) inactivation in corn- and soybean-based feed ingredients and diets at various times and temperatures during storage. *J Anim Sci.* 2024;4(Suppl 2):347-348.

² Furst-McNess Company. Data on file.