

Evaluating the *in vitro* efficacy of FeedARMOR™ feed mitigant as well as Furst Strike Direct™ toward H4N6 influenza and PEDV.



FEED**ARMOR**™

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. There has previously been no published data on the mitigation of influenza (flu) virus, and it is important to continue to evaluate FeedARMOR against recent strains of PEDV. In addition, McNess has a nutritional health portfolio for drinking water application including Furst Strike Direct and Furst Protect Direct.™ Recently, it was presented that finishing pigs going through a PRRSV and influenza challenge, when nutritionally supplemented with Furst Strike Direct, had lower levels of fall out and subsequent mortality and medical treatments through nutritionally supplementing the pigs to support how they overcome the disease challenge. We know that viruses can enter farms in many different ways including feed, animals, people, water contamination or contaminated equipment. Therefore, it is helpful to know, in the case of non-feed introduction of viruses on farm, whether water supplementation in the early phase of a challenge has an impact on the amount of virus in the overall environment. If we can reduce the overall virus load on a farm, the race between animal immunity and virus replication is weighted in favor of the animal and can reduce the overall time and severity of a viral challenge.

EXPERIMENTAL DESIGN¹

- Trials were run and data was created by The Schroeder Laboratory, College Veterinary Medicine, University of Minnesota
- This was an *in vitro* experiment where high levels (10^8) of virus particles (100,000,000) were added to solution, and different levels of FeedARMOR or Furst Strike Direct 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 0.3%
4. Control + Furst Strike Direct 0.1%
5. Control + Furst Strike Direct 0.3%

RESULTS

- Both the low and high level of FeedARMOR was extremely effective at neutralizing both H4N6 influenza virus and PEDV with 100% reduction of PEDV
 - 2 to 3 log reductions of H4N6 influenza virus were noted
 - An extraordinarily large 5 log reduction of PEDV was seen
- There was a dose-dependent response to virus elimination for the low and high levels of Furst Strike Direct
 - The low level of Furst Strike Direct 0.1% yielded a 94% reduction of H4N6 and a 99.6% reduction of PEDV
 - The high level of Furst Strike Direct 0.3% yielded a 100% reduction of H4N6 and a 99.8% reduction of PEDV
- The key here is that the initial virus levels were very high, so 99% and above elimination is extremely high
- FeedARMOR as a feed mitigant shows high level of protection against both the influenza virus (Figure 1), and critically, towards PEDV (Figure 2) which is a primary feed risk virus
- Furst Strike Direct was evaluated as both H4N6 influenza virus and PEDV is excreted from the gastrointestinal tract, so if during a break we could supplement additional neutralizing power through drinking water, we can impact on farm viral load

FIGURE 1.

The impact of FeedARMOR and Furst Strike Direct on H4N6 influenza virus where work was conducted at The Schroeder Laboratory, University of Minnesota.

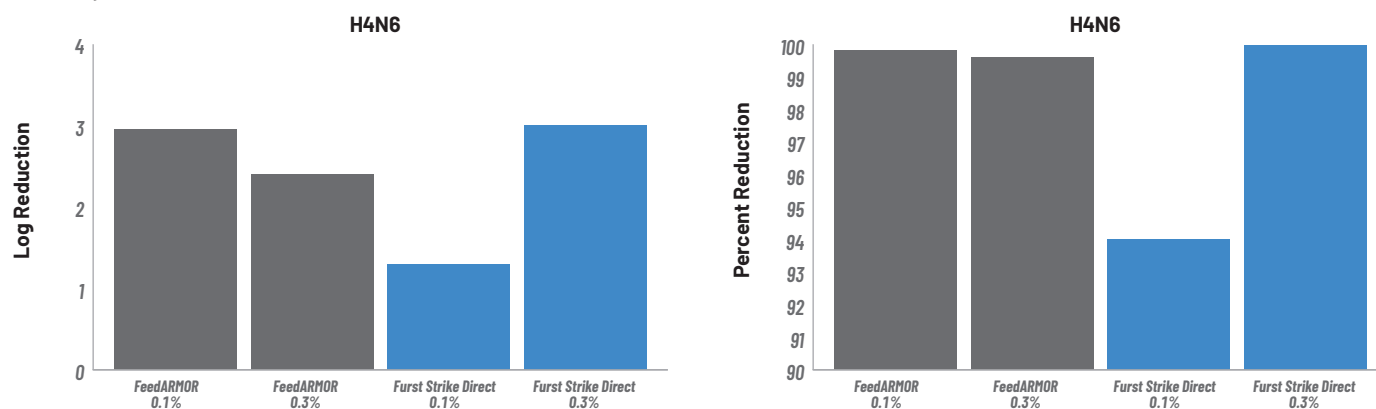
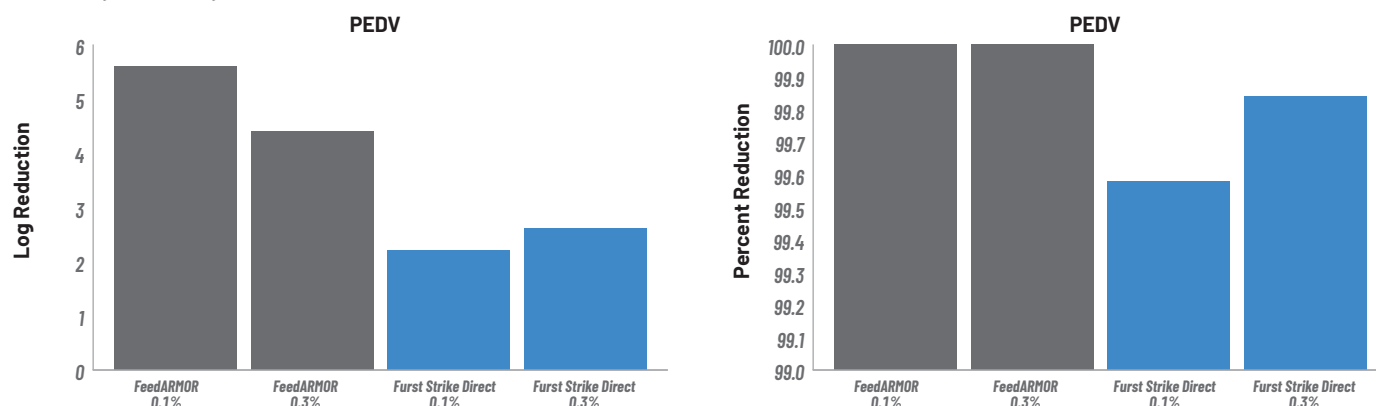


FIGURE 2.

The impact of FeedARMOR and Furst Strike Direct on PEDV in an *in vitro* testing model where work was conducted at The Schroeder Laboratory, University of Minnesota.



RESEARCH SUMMARY

FeedARMOR is a significant feed mitigant with high levels of efficacy against key viruses such as H4N6 influenza and PEDV

- 100% reduction of PEDV from a very high initial virus level
- These results are supportive of *in vivo* study, where FeedARMOR prevented sow infection from PEDV in feed
- Furst Strike Direct nutritional water supplement was demonstrated to be a significant supportive tool in the case a farm experienced a challenge and could aid in reducing the overall disease cycle by reducing overall on farm virus load



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¹ Furst-McNess Company. Data on file.