The effect of killed and/or MLV vaccination on exposure to late term pregnant gilts

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Introduction

PRRS virus is the most significant swine disease in the industry today, probably the most significant swine disease in history for North America. The AASV has made a challenge to eradicate the virus within the next two decades. In order to do this, we must be able to stop farms from becoming re-infected. There is significant economic loss to the sow farm. Unfortunately the losses downstream are even more substantial. Any intervention which can reduce or eliminate the amount of virus shedding from a farm in the outgoing pigs improves our chances of keeping regions PRRS negative. One intervention to reduce the amount of virus exiting a sow farm with the pigs, or to help stabilize sow farms and increase the likelihood of sending out negative pigs, is to vaccinate. While not perfect, in the field, vaccination has been shown to reduce viral load. Two new and novel approaches have arisen in the industry recently, which hope to further stabilize a sow herd and improve the chance of producing negative pigs. There also is the anticipation that if re-infected, the clinical disease and financial losses at the sow herd itself can be lessened. While both of these killed vaccines are being used in the field, controlled scientific data as to their real merit is lacking.

Presentations at the 2008 Leman Swine Conference briefly described the basis behind two different companies that have released a subunit based killed vaccine (MJ Biologics and Sirrah Bios). Dr. Mike Roof also presented a review of previous research attempts involving various combinations of MLV and Killed vaccines.¹ The summary of those reviews was that experimentally, there is no conclusive evidence that killed vaccines offer benefit to just MLV vaccine alone. Both the MJ Biologics vaccines and Sirrah Bios vaccines need to be evaluated as they offer a different take by utilizing subunit technology to induce immunity.²⁻³ The idea for this technology had part of its origin from work by Osorio,⁴ which showed that virus neutralizing antibodies to PRRS were protected against challenge.

The objective of this study was to determine the effect of MLV PRRS ATP vaccine, with or without either of two new age killed vaccines, on pregnant gilt death loss, abortion rates, the percent of piglets alive at day 1 and at weaning, and PCR results of late gestation gilts exposed to PRRS strain 1-8-4.

Materials and methods

A total of 86 PRRS naïve gilts were used in the trial. Fifteen gilts served as true negative controls and remained offsite at the known negative sow farm. The remaining animals were synchronized with Matrix and bred at two separate facilities. Of these remaining 71, 35 were kept at an isolated site until exposure and vaccinated with saline 4 times, MJPRRS 5 times (MJ Biologics), or PRRVENT 4 times (Sirrah Bios). Thirty-six gilts were kept at a third site. They were initially vaccinated with PRRS ATP (Boehringer Ingelheim) and divided into three groups. One of the groups was then boostered with MJPRRS 3 times and a second group boostered with PRRVENT 3 times. A third group received 1 booster of PRRS ATP. Other than the true negative controls, all gilts were moved to an isolated farrowing facility and exposed to PRRS 1-8-4 at 90 days of gestation. Data collected included: number of off-feed days, number of fever days, abortions, death loss, quantitative PCR (at 0, 8, and 16 days post exposure), piglet survivability to day 1, and percent of total born and born alive that were full value at weaning.

Results and discussion

(Table 1) There were more off-feed and with fever in the killed only groups when compared to the other groups. In the ATP groups, only one gilt was positive at 8 days post exposure. Other than the saline group, very few gilts were PCR positive 16 days post exposure. The negative control group and the three groups that received ATP, whether alone or with a killed vaccine booster, had a higher percent of piglets survive to day 1 of age. Of the piglets alive in the uterus at the time of exposure (90 days of gestation), 68-77% survived to weaning in the three ATP groups compared to 92% in the negative controls.

Summary and conclusions

All of the vaccinated groups and combinations thereof had reduced performance when compared to the negative controls. In many of the parameters measured, results were
similar among the three groups given a priming dose of MLV ATP vaccine. In most of the parameters measured, the saline, MJPRRS, and Sirrah groups had less favorable results. In this study involving exposure of pregnant gilts at 90 days of gestation to PRRS 1-8-4, none of vaccines or combinations were able to match the performance of the negative controls. The groups with the modified vaccine used alone or as a primer for Killed Vaccines did perform better than the saline or killed only groups in all parameters measured.

### References


