MJPRRS®

Technical Bulletin

Information from Phibro Technical Services

Information to Improve Swine Production: Benefits of Using a Killed Autogenous PRRS Vaccine in the Face of a New Viral Introduction

Since being identified in the late-1980's, Porcine Reproductive and Respiratory Syndrome (PRRS) virus has been economically devastating to the US swine industry. With losses in the $700 million range annually, the PRRS virus will likely continue to cause production losses of this magnitude if permitted to continually evade the pig's immune system. While there is some benefit to prior PRRS virus exposure before a new PRRS virus introduction occurs, no guarantee can be made that this prior exposure will be of benefit in reducing all production and economic losses[1]. What is measurable is the reduction in viral load experienced during and following a PRRS virus introduction. In fact, reduction, and in many cases complete elimination, of viral load in a population is a critical component of an effective PRRS preparedness program[1].

To date a single solution for maintaining PRRS immunity and preparedness within a population has been consistently inconsistent. Viral mutations occur without apparent pattern or predictability and can result in immunity disruptions in a previously PRRS exposed population. Immune disruptions in one population can unnecessarily put other populations at risk of a challenge that it has never before encountered. Simply stated, a PRRS control program works well as long as a new virus is not introduced or the virus currently in a population does not mutate or change to an unrecognized immune presentation.

MJPRRS® autogenous vaccine Grouping Technology has a patented method of categorizing viruses into groups of immunological similarities. These groups of shared characteristics help explain how viruses can be highly dissimilar genetically yet clinically demonstrate a low incidence within a population. Conversely, small viral changes that have been highly clinically relevant within a population may have shifted groups and thus present themselves as different immunologically to the population.

The following experiment was run to evaluate the ability of vaccinated gilts to respond to a genetically new PRRS virus introduction. The challenge virus was a D-7 and the group of gilts receiving ***MJPRRS*** vaccine did see a killed D-7 virus as one of the five components of the vaccine. The two D-7 viruses (vaccine and challenge viruses) did not originate from the same source and are heterologous, conventionally defined as being greater than 0.5% different from each other.

Gilts acquired at five weeks post-breeding (confirmed pregnant) were randomly assigned to one of three treatments:

Treatment 1 – T1 - Naïve gilts

Treatment 2 – T2 - Modified-Live Vaccinated gilts

Treatment 3 – T3 - Vaccinated ***MJPRRS*** autogenous vaccine gilts.

A schedule of pre-challenge preparation activities is found below:

Treatment	N	Modified-Live Priming Dose	*MJPRRS* autogenous Vaccine 2.0 ml/IM	Heterologous PRRS Challenge	# Challenged	Gilt Serum Collected	Piglet Serum Collected (5/litter)
Treatment 1 – T1 Naïve gilts Non-Vaccinated	11	N/A	N/A	Day 59	9	Day 0, Day 28, Day 49, Day 59 Farrow and Wean	Farrow+1 Day Weaning
Treatment 2 - T2 Modified-Live Vaccine PRRS - ATP	11	Day 0	N/A	Day 59	9	Day 0, Day 28, Day 49, Day 59 Farrow and Wean	Farrow+1 Day Weaning
Treatment 3 - T3 ***MJPRRS*** vaccine Gilts PRRS - ATP + Two dose ***MJPRRS*** vaccine	11	Day 0	Day 28, Day 49	Day 59	9	Day 0, Day 28, Day 49, Day 59 Farrow and Wean	Farrow+1 Day Weaning

Nine (9) gilts were challenged in each group. Prior to challenge, one gilt from T3 had aborted and a second was eliminated for lameness, two gilts from T2 aborted, two (2) gilts from T1 were randomly eliminated to match the number challenged across treatments.

Diagnostic evaluations were compared between treatment groups for gilts up to the point of challenge and for piglets beyond farrowing. Diagnostic information is found below:

Gilt Serology and PCR

	29-Aug-16	29-Sep-16	17-Oct-16	27-Oct-16	
Tmt	Elisa Arrival	Elisa 1st Vaccine	Elisa 2nd Vaccine	Elisa Chal.	Elisa Farr
1	0.00	0.00	0.00	0.00	2.08
2	0.00	2.16	2.17	2.18	2.82
3	0.00	2.13	2.16	2.06	2.41
Tmt	PCR Pos/Neg	PCR Pos/Neg	PCR Pos/Neg		
1	Neg	Neg	Neg		
2	Neg	Pos	Pos		
3	Neg	Pos	Neg		

Litter PCR and Viral Ct Counts

PCR Results Litter Pools at Farrowing

Tmt	Pos	Neg
1	9	0
2	6	3
3	3	6

Chi-Square Testing - Pair Wise

	Value	P Value
1 vs 2	3.56	<.06
1 vs 3	8.86	<.005

Comparisons drawn from the number of negative pools at each time point

PCR Results Litter Pools at Weaning

Tmt	Pos	Neg
1	7	0
2	7	2
3	5	3

Chi-Square Testing - Pair Wise

	Value	P Value
1 vs 2	2.21	<.14
1 vs 3	3.56	<.005

Comparisons drawn from the number of negative pools at each time point

Average Ct of PCR Positive Pools

Tmt	Pig Farrow PCR	Pig Weaning PCR
1	21.05	19.13
2	27.90	23.62
3	31.33	26.12

The study demonstrates that viral load can be beneficially manipulated with an ***MJPRRS*** autogenous vaccine vaccination protocol relative to controls when presented with a heterologous viral introduction. With the goal of minimizing the overall environmental viral load, it may be of benefit to utilize ***MJPRRS*** autogenous vaccine to assist in lowering the viral contribution from the breeding population, with fewer PRRS PCR positive litters farrowed, and with lowered average viral loads per positive litter.

[1]Linhares, DCL. Johnson, C. Morrison, RB. Economic Analysis of Vaccination Strategies for PRRS Control. PLOS ONE pp 1-10. December, 2015.

Potency and efficacy of autogenous biologics have not been established.

MJPRRS Autogenous Vaccines manufactured by and distributed to veterinarians by Phibro Animal Health Corporation.