AUTOGENOUS PRRSV VACCINE

Collaborating Researchers: Drs. Alyssa Betlach and Paul Yeske, Swine Vet Center, St Peter, MN; Drs. Doug Stine, Ben Hause, Emily Collin, Cambridge Technologies, Worthington, MN

Porcine Reproductive and Respiratory Syndrome (PRRSV) continues to be one of the most frustrating challenges that veterinarians and producers face. When dealing with affected closed herds, the median time-to-stability (TTS) has remained consistent at around 36 weeks, an increase of nearly 10 weeks from 2011 statistics.

Leading swine veterinarians have partnered with Cambridge Technologies to research how autogenous vaccines can be used to lessen the effects of PRRSV on herds. In this particular study, doctors from the Swine Vet Center of St. Peter, MN, worked with Cambridge researchers to investigate the effect of a quadrivalent heterologous inactivated PRRSV vaccine on TTS for an infected breeding herd that has undergone an elimination program.

MATERIALS AND METHODS

A commercial, 2700-head Category 1A was selected. The farm has been PRRSV infected since June of 2023, and has undergone an elimination program consisting of closure and live-resident virus inoculation. PRRSV variant has been characterized as wild type, 1-2-4 L1C.5 The herd was negative for *Mycoplasma hyopneumoniae* and PEDV.

Table 1. Timing of live-resident virus inoculation post-PRRS break (June 5, 2023)

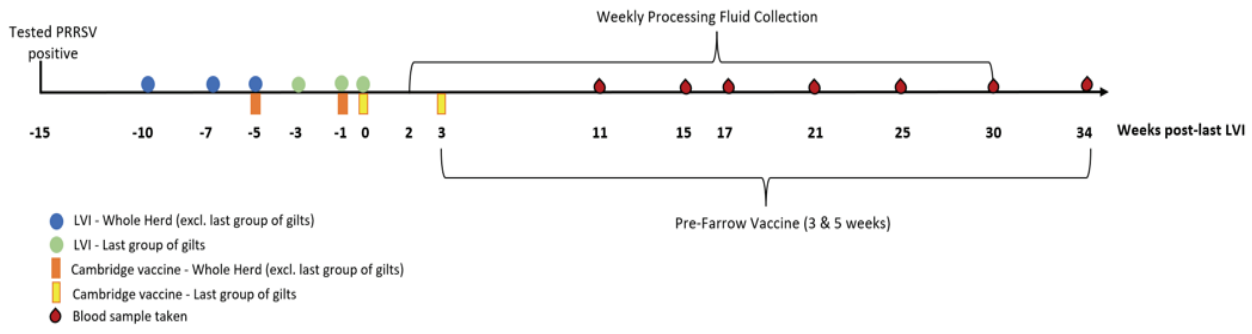
LVI	WHOLE HERD	LAST GROUP OF GILTS
FIRST	5 WEEKS POST-BREAK	12 WEEKS POST-BREAK
SECOND	8 WEEKS POST-BREAK	14 WEEKS POST-BREAK
THIRD	10 WEEKS POST-BREAK	15 WEEKS POST-BREAK (Start of Closure/Day 0)

A PRRSV quadrivalent heterologous inactivated vaccine with ≤97.9% nucleotide similarity to the field variant was manufactured by Cambridge Technologies. Vaccine was administered twice to the entire herd, followed by pre-farrow. Timing of vaccination was strategically chosen to maximize immunity against PRRSV following LVI-induced immune response:

1. Initial dose given at recipient's last LVI (see Table 1)
2. Approximately four weeks later
3. Pre-farrow given 3- and 5-weeks pre-farrow, starting three weeks post-last LVI until end of closure

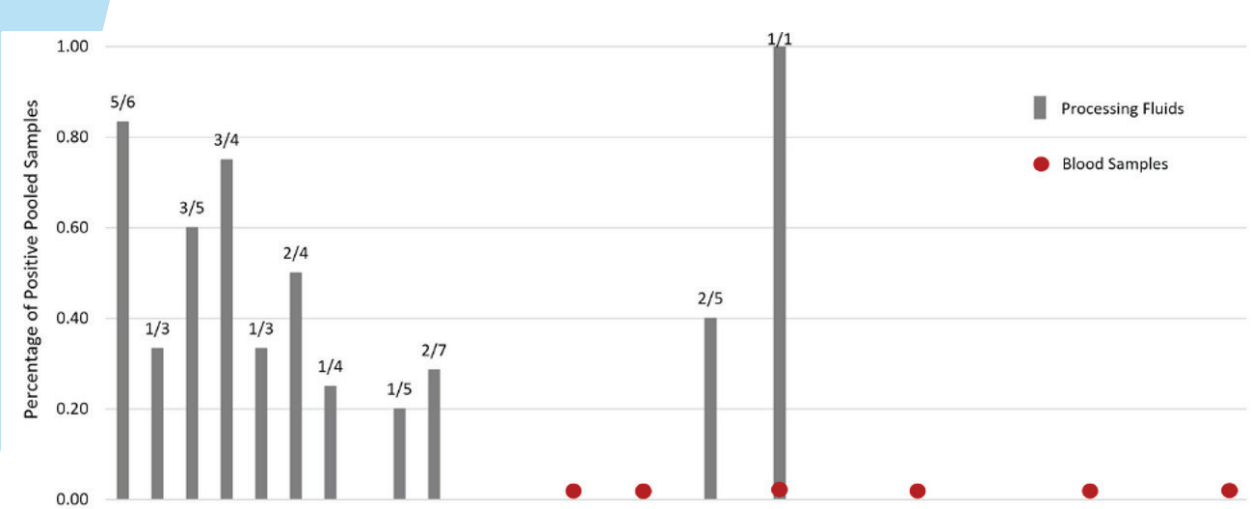
Beginning two weeks post-final LVI (17 weeks post-break), processing fluids were collected weekly until the end of herd closure. Additionally, thirty blood samples were collected monthly from due-to-wean pigs and pooled 5:1. All samples were tested by Cambridge Technologies Diagnostic Laboratory for detection of PRRSV genetic material using qRT-PCR.

Figure 1. Timeline of vaccination and sample collection events post-last LVI (in weeks)



RESULTS

Figure 2. Percentage of PRRS PCR positive samples based on weeks post-last LVI and sample type



After 12 weeks post-last LVI, processing fluids tested PRRS PCR negative throughout the end of the closure, except for two time points. During closure, all pooled serum samples were PRRS PCR negative. **Time-to-stability was determined to be 34 weeks based on these results. This was numerically shorter by 12 weeks compared to other PRRSV L1C.5 breaks that had occurred within the production system between 2018-2023.**

Table 2. Comparison of time-to-stability for the enrolled herd with respect to remaining herds within the same production system that broke with PRRSV from 2018-2023

Time-to-Stability (weeks)

	Enrolled Herd	*Production System*	
	1-2-4 L1C.5 Variant (n=1)	All Variants (n=21)	Other L1C.5 Variants[1] (n=12)
Minimum	---	28	28
25th Percentile	---	36	38
Median	34	45	46
75th Percentile	---	70	53
Maximum	---	92	87

[1]PRRS classification based on Paploski et al. (2021) and Yim-im et al. (2023) guidelines.

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877.298.1321 cambridgetechnologies.com info@cambridgetechnologies.com