

# Bulletin

Boehringer Ingelheim Vetmedica, Inc.

**TECHNICAL**

## **Evaluation of the Efficacy of Ingelvac® PRRS MLV and Ingelvac® PRRS ATP in Multiple Heterologous Respiratory Challenge Studies**

This paper is a summary of the data from nine independent trials, which evaluated Ingelvac® PRRS MLV and Ingelvac® PRRS ATP vaccine efficacy in the respiratory model.

### **Study Design and Methods:**

Conventional PRRSV negative weaned pigs were used in all trials. Pigs were vaccinated at 3 weeks of age followed by virulent PRRSV challenge exposure. All pigs were necropsied 14 days following challenge, and lungs were collected and scored to assess percent gross lung lesions/pneumonia associated with PRRSV exposure and to assess vaccine efficacy. A summary of the study design and treatment groups is shown in Table 1.

Seven different challenge strains were used in these studies. The genetic relationship of these challenge isolates differed from each other as well as from the 2 vaccines. The genetic relationship of the vaccine and field virus is shown in Table 2.

### **Results:**

The data from these studies indicate that vaccination with either Ingelvac® PRRS MLV or Ingelvac® PRRS ATP provides consistent and significant reduction of gross lung pathology regardless of the virulent PRRS challenge strain used in the trial. Vaccine reduced gross lung pathology in 9/9 trials and had from 54% - 97% reduction of gross lesions as compared to challenge controls. The efficacy results of the nine different trials are summarized in Table 3.

### **Summary and Key Points:**

- PRRS field isolates exist with varied levels of virulence and distinct genetic sequences.
- The data from these studies indicate that both modified-live vaccines provide consistent efficacious protection against gross lung lesions/pneumonia independent of the challenge strain used.
- Both modified-live vaccines provided protection from new and emerging challenge isolates, regardless of their relative ORF-5 sequence homology.
- Vaccination does not provide sterile immunity but is safe and efficacious against a wide variety of heterologous challenge strains with varied genetic sequence, and relative virulence.
- Vaccine should be used with the proper expectations and as part of a “program” to control PRRSV, which includes but is not limited to diagnostics, bio-security, management, and acclimation/isolation.

Table 1. Summary of vaccine, challenge, and critical time points in nine efficacy trials.

<i>Study Number</i>	<i>Vaccine (Day 0)</i>	<i># Vacc/#Challenge Controls/# strict controls</i>	<i>Challenge Day</i>	<i>Challenge isolate (RFLP)</i>	<i>Necropsy Day</i>
1	Ingelvac PRRS	6/60	Day 35	NADC 8, NADC 9, and NVSL 14 (Pool)	Day 49
2	Ingelvac PRRS	5/6/6	Day 28	VR 2332 (2-5-2)	Day 42
3	Ingelvac PRRS	15/18/0	Day 21	SDSU 73 (1-4-4)	Day 35
4	Ingelvac ATP	20/20/10	Day 28	SDSU 73 (1-4-4)	Day 42
5	Ingelvac PRRS	20/10/5	Day 42	SDSU 73 (1-4-4)	Day 56
6	Ingelvac ATP	20/22/10	Day 28	VR 2332 (2-5-2)	Day 42
7	Ingelvac PRRS	15/15/5	Day 42	17198-6 (1-4-2)	Day 56
8	Ingelvac PRRS	15/15/5	Day 21	VR 2332	Day 35
9	Ingelvac PRRS	10/10/5	Day 28	MN/01/A1 (1-8-4)	Day 42

Table 2. Sequence homology of field isolates compared to 2 commercial vaccines.

<b>Challenge Strain</b>	<i>% ORF 5-6 Sequence Homology</i>	
	<b>Ingelvac PRRS</b>	<b>Ingelvac ATP</b>
<b>NADC 8</b>	93.0%	90.4%
<b>NADC 9</b>	91.4%	88.2%
<b>NVSL 14</b>	89.7%	91.5%
<b>VR 2332</b>	99.7%	89.7%
<b>SDSU 73</b>	88.1%	91.7%
<b>17198-6</b>	88.7%	91.0%
<b>MN/01/A1</b>	84.9%	85.1%

Table 3. Summary of gross lung lesions

<i>Study Number</i>	<i>Vaccinates</i>	<i>Challenge Controls</i>	<i>Strict Controls</i>	<i>% Lesion Reduction</i>
1	0.85%*	31%	NA	97
2	9.9%*	38%	0.12%	74
3	10%*	81%	NA	88
4	18%*	70%	0%	74
5	8%*	47%	2%	83
6	6%*	23%	0%	74
7	1%*	26%	0%	96
8	2%*	16%	0%	88
9	12%	40%	0%	70

\* - indicates vaccinated treatment group is significantly (P<0.05) different from challenge controls.