Comparative efficacy evaluation of two modified-live PRRS vaccines

G. Haiwick, A. Neubauer, J. Hermann, M. Roof, B. Fergen, R. Philips
Boehringer Ingelheim Vetmedica, Inc., MO, USA

INTRODUCTION

The implementation of a systematic methodology for PRRS control that utilizes modified-live vaccine (MLV) for the control of wild type-PRRSV infections can mitigate the consequences of infection on health and performance. It is necessary for MLV to be effective against heterologous challenge with current PRRSV field isolates. The objective of this study was to directly compare the efficacy of Ingelvac PRRS® MLV (Boehringer Ingelheim Vetmedica, Inc., St. Joseph, MO) and Prime Pac™ PRRS+ (Merck Animal Health, Omaha, NE) against a heterologous PRRSV challenge.

MATERIALS AND METHODS

The study was performed in seventy, PRRS naïve three-week-old pigs. On Day 0, Group 1 (n = 20) was vaccinated with Ingelvac PRRS® MLV (2 ml IM per label). Group 2 (n = 20) was vaccinated with Prime Pac™ PRRS+ (1 ml IM per label). Group 3 (n = 20) was a non-vaccinated challenge control group (NVC). Group 4 (n = 10) was an Ingelvac PRRS® MLV vaccinated, non-challenged group. On Day 28, Groups 1, 2 and 3 were challenged intranasally with 2.0 ml containing 4.1logTCID50 / ml of virulent PRRSV SDSU-73. On Day 42, 10 pigs were selected from each of Groups 1 – 3, necropsied, and lung lesions scored. The study was terminated on Day 70 and the remaining pigs were necropsied and lung lesions scored. Blood was collected from all pigs to assess the serologic response and viremia (Quantitative PCR; BIVI HMC Ames, Iowa). Rectal temperatures and ADWG were also measured and evaluated.

RESULTS

Both vaccinated groups demonstrated a large reduction in PRRSV associated lung lesions (Group 1, 0.5 %; Group 2, 1.3 %) compared to NVC (28.6 % – median lung lesion) at day 42. At day 70, lung lesions had essentially resolved in all treatment groups. From day 42 to 63, Group 1 demonstrated fewer percent PCR positive pigs than the Group 2 and NVC pigs. The reduction of viremia following challenge occurred earlier in the Group 1 compared to the Group 2, and the pattern of viremia reduction in Group 2 was similar to the NVC. Group 1 maintained lower average temperatures throughout the challenge phase (days 28 – 42) compared to Group 2 and challenge control group. Between days 28 and 70, Group 1 had a 17 % higher ADWG when compared to both the Group 2 and the NVC. Group 4 (vaccinated, non-challenged) demonstrated the best ADWG across treatment groups.

DISCUSSION AND CONCLUSION

Virulent PRRSV challenge has a biologic impact as measured by increased temperature and viremia and their influence on ADWG. This study is another example demonstrating the ability of modified-live PRRS vaccines to protect against a relevant PRRSV challenge. Implementing vaccine in a systematic methodology for PRRS control can mitigate the consequences of infection and subsequently improve the health and performance of pigs.

Table 1: Study Design

Group	No. Ingelvac PRRS® MLV Vaccinated Pigs	No. Prime Pac™ PRRS Vaccinated Pigs	No. Challenge Control Pigs	PRRSV SDSU-73 Challenge Dosage (Log10T-CID_{50} / ml)	Necropsy Subset of groups 1,2 & 3 (lung lesion evaluation)	Necropsy Remaining pigs
	Day 0	Day 0	Day 0	Day 28	Day 42	Day 70
1	20	-	-	4.1	10	10
2	-	20	-	4.1	10	10
3	-	-	20	4.1	10	10
4	10	-	-	None	-	10

Table 2: Day 42 lung lesions (median %) and ADWG in vaccinated and non-vaccinated pigs challenged with PRRSV SDSU-73

Group	Treatment	Median Percent Lung Score	ADWG in g/day
1	Ingelvac PRRS® MLV	0.5	640
2	Prime Pac™ PRRS	1.3	530
3	Challenge Control (non-vaccinated)	28.6	535
4	Ingelvac PRRS® MLV (non-challenged)	–	757

Figure 1: Percentage of viremic pigs per treatment group following PRRSV SDSU-73 challenge

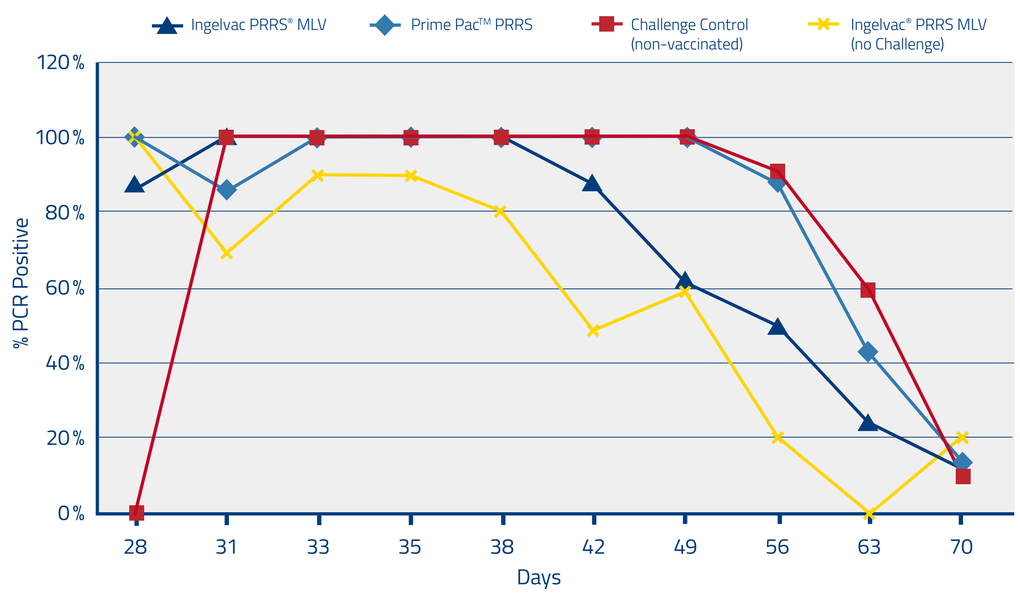

Figure 2: Average daily temperature by treatment group