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Effect of *Mycoplasma hyopneumoniae* vaccination on the economic performance of pigs co-infected with *M. hyopneumoniae* and Porcine Circovirus Type 2 (PCV2)

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Mycoplasma hyopneumoniae (M. hyo) infection increases PCV2 replication and the incidence of PCV2 associated lesions and disease (PCVAD) (Opressnig et al. 2004). This study was conducted to evaluate the effect of *M. hyo* vaccination on the development of PCVAD and on the economic performance of *M. hyo* and PCV2 co-infected pigs.

Materials and Methods

High-health status weaned pigs (n=272) were housed in a contemporary wean-to-finish double-sided curtain building with slatted floors and randomly allocated to one of four treatment groups. The study was a generalized block design with body weight and pen location used as blocking factors. The vaccines tested were RespiSure® and two other USDA-licensed *M. hyo* bacterins containing an oil-based adjuvant (Competitor A) or an aqueous-based adjuvant (Competitor B). Vaccines, or a placebo, were administered at 3- and 5-weeks of age as per label directions. All pigs were challenged with *M. hyo* 232 lung homogenate and PCV2 infectious clone 40895 cell culture, 3 and 5 weeks after the second vaccination, respectively. At periodic time-points pigs were necropsied to assess PCVAD lesions, weighed for calculation of average daily gain (ADG) and serum samples collected for PCV2 and *M. hyo* antibody titers. The study was closed out on Study Day 131 when the average weight of the heaviest pen was approximately 260-265 pounds and market value was estimated as per current industry grid. The numbers of pigs with low body weights at study close out ("sort loss" defined as < 230 lb at close out) was also determined. Analysis was performed with a mixed model or categorical procedure (SAS/STAT Version 8) and the 5% level of significance ($P \leq 0.05$) was used to assess all statistical differences. This study was conducted within the guidelines of the IACUC of Veterinary Resources, Inc.

Results

There were no significant differences in the number of pigs that developed PCVAD during this study. Pigs in all vaccine groups had significantly higher mean body weights and ADG at close out compared to the placebo controls (Table 1). There were no significant differences in the number of "sort loss" pigs at close out and all vaccine groups had a higher mean market value than the placebo group (Table 2).

Table 1: Close Out Weights and ADG (lb)

Group	Mean±SE	P value	ADG	P value
Placebo	246.4±2.39	na	1.71	na
RespiSure	259.3±2.44	0.0001	1.81	0.0001
Comp. A	255.6±2.44	0.0028	1.78	0.0027
Comp. B	257.6±2.47	0.0003	1.80	0.0003

P values compared to Placebo
ADG calculated from Day –2 to Day 131.

Table 2: Sort Loss and Average Market Value

Group	No. Pigs	% Sort Loss	Market Value
Placebo	38	18.4%	US$128.52
RespiSure	36	8.3%	US$138.15
Comp. A	36	8.6%	US$134.35
Comp. B	35	11.4%	US$135.65

Discussion

There was no evidence of enhancement of the clinical expression of PCVAD associated with *M. hyo* vaccines formulated with an oil or aqueous adjuvant. To the contrary, higher body weights, ADG and market value in all vaccine groups indicate that control of *M. hyo* is important in pig populations where both *M. hyo* and PCV2 are circulating. Thus, the use and appropriate timing of *M. hyo* vaccination is an important tool to reduce production losses associated with PCV2- and *M. hyo*-induced respiratory disease complex.