**INTRODUCTION**

It has previously been demonstrated that the duration of immunity after a single dose of SPF Mycoplasma Hyopneumoniae Bacteria, PHb, is at least 4 months. The purpose of this study was to evaluate the onset and 24-week duration of immunity. Because a single vaccination does not elicit a notable systemic antibody response to M. hyopneumoniae, antibodies in bronchoalveolar lavage (BAL) fluids were evaluated, as it has been reported that local antibodies may be an important component of the protective immune response to mycoplasma infections.

**MATERIALS AND METHODS**

Three-week-old pigs from a M. hyopneumoniae, swine influenza virus, PMWS, and PRV negative, high-health status herd were randomized into 2 treatment groups and vaccinated immunologically with either a single 1 mL dose of PHb or a placebo (Table 1). The lung homogenate challenge was administered intranasally. Swine were monitored daily for clinical cough scores. Coughing was scored as absent, mild, or severe (scores of 1, 2, or 3, respectively). At necropsy, the percent lung consolidation was scored, based on relative lobe weight as a percentage of total lobe weight.

**RESULTS AND DISCUSSION**

**LUNG SCORES:** Swine were protected from challenge at both 3-weeks (vaccinate median score 119%; control median score 65%1;0003) and 24-weeks (vaccinate median score 65%1;0003) post-challenge as evidenced by the highly significant reduction in lung consolidation scores compared to controls (Figure 1). The median percent reduction in lung score in the vaccinated group was 80% at the 3-week and 24-week challenge, respectively. The distribution of lung scores for the two studies are presented in Figures 2 and 3. At the 3-week onset of immunity challenge, all but one control pig (95%8) had lung scores greater than 1%, and 54.2% of the controls had severe lesions with scores greater than 5%. At the 24-week duration of immunity challenge, 76% of the controls had scores greater than 1% and 72% had severe lesions with scores greater than 5% (Figure 3). This was in contrast to the vaccinated, where 57.1% had a score of less than 1% and 10% had a severe score of greater than 5%.

**SERUM ANTIBODY TITERS:** All pigs were negative for M. hyopneumoniae antibodies prior to vaccination (data not shown). The single vaccination did not elicit a positive DAKO antibody response in a majority of swine (Figure 4). However, following challenge, a higher percentage of vaccines were positive for a significantly higher than the controls (p=0.0003). DAKO antibody tests were compared to IDEXX antibody tests in the 24-week duration of immunity study (Table 2). The IDEXX test detected a higher number of positive antibody tests after vaccination with PHb. However, following challenge, the DAKO test detected a higher number of positive swine in both the vaccine and control groups. These results are consistent with previous data comparing the sensitivity of both ELISA tests after a single dose vaccination with PHb. The DAKO test detected a significantly higher number of positive antibody tests after vaccination with PHb. However, following challenge, the DAKO test detected a higher number of positive swine in both the vaccine and control groups. These results are consistent with previous data comparing the sensitivity of both ELISA tests after a single dose vaccination with PHb. The DAKO test detected a significantly higher number of positive antibody tests after vaccination with PHb. However, following challenge, the DAKO test detected a higher number of positive swine in both the vaccine and control groups. These results are consistent with previous data comparing the sensitivity of both ELISA tests after a single dose vaccination with PHb.

**BAL ANTIBODY TITERS:** Local isotype-specific antibodies in BAL fluids were also measured (Figure 5). Vaccinates in the onset study had higher levels of IgA (p=0.0003) and IgM (p=0.0042) in BAL fluids. In the duration study, vaccinates had higher levels of IgA (p=0.0047) and IgM (p=0.0032) and a level of IgG that approached significance (p=0.0597).

**COUGH SCORES:** Vaccinates had a highly significant lower cough score than controls after the 3-week challenge (Table 2). Coughing was minimal in all of the older swine challenged at 24-weeks post-vaccination, and there was no difference between vaccinated and controls in the duration of immunity study.

**SUMMARY**

Swine were protected when challenged at 3 and 24 weeks after vaccination with a single dose of PHb. Consistent with previous results, a single dose did not elicit a high humoral antibody response. However, a strong post-challenge serum arnomic response and significantly higher levels of antibodies in BAL fluids indicate that the single dose effectively protected the immune response for the subsequent challenge. Local antibodies in the lung may be an important component in the protective immunity established after vaccination with PHb.