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A field trial to assess the efficacy of an inactivated subunit vaccine (Porcilis ® PCV) against porcine circovirus type 2 (PCV2) in a Canadian pig herd with PCV2-associated disease.

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Introduction

In 2004 in Canada, the severity and clinical presentation of PCV2 associated disease (PCVAD) changed. Until this time the disease was primarily confined to the nursery. In the new presentation the most common age group affected was the grower-finishers, about 14 to 18 weeks of age or older. The clinical signs varied from herd to herd with enteric disease as well as respiratory signs being common, in addition to severe weight loss. Mortality was reported to be as high as 50% in certain herds with an average around 10 to 20%. Porcilis PCV has been shown to be safe and effective under controlled (laboratory) conditions.

The primary objective of this trial was to assess the efficacy of Porcilis PCV in reducing mortality and improving growth performance compared to controls receiving water for injection, in a Canadian pig herd where PCV2-associated disease had been diagnosed as a serious problem.

Materials and Methods

The trial was performed in a Canadian pig herd where PCV2-associated disease had been diagnosed as a serious problem. The mortality records for the last three fills in the nursery and the grower-finisher barn used in this study were 1.6%, 1.5% and 1.3% for the nursery, and 5.5%, 11.75% and 6.25% for the grower-finisher barn.

A total of 408 pigs were randomly assigned to the trial, 201 vaccinates and 207 controls. They were housed in 22 pens with approximately equal numbers of vaccinates and controls per pen and they were the only pigs in the room. The piglets in the vaccinated group were injected intra-muscularly with Porcilis PCV (manufactured by Intervet International BV, The Netherlands) on entry to the nursery (3 weeks of age) and a booster was administered 3 weeks after the initial injection. Controls were given a placebo. The researcher making observations was kept blind to treatment.

Results

Growth rate was similar between the vaccinated pigs and the control animals as measured by the mean ADG, with vaccinates growing at 749 g per day and controls at 744 g per day from weaning until shipping to market. Growth was better (P<0.05) for vaccinated pigs in the grower phase (838g per day vs. 878g per day for control and vaccinates, respectively). Three vaccinated pigs died (1.5%), and PCV2 was not detected from these animals and the post mortem findings were not indicative of a PCVAD infection. Among the control animals 9 pigs died (4.5%) and 4 of these pigs showed lesions consistent with a PCVAD diagnosis with PCV2 identified by PCR. Over the entire study period, the mortality risk was 1.49% in the vaccinated and 4.34% in the non-vaccinated group (P=0.14; Risk Ratio=0.34).

Based on results from an ELISA on serum obtained from control and vaccinated pigs, there was a difference in the proportion of pigs positive to antibodies to PCV2 at 9 weeks of age, with vaccinates demonstrating higher levels of antibodies to PCV2 compared to controls (P<0.01).

Using Polymerase Chain Reaction (PCR), pigs in the control group were more likely to test positive for PCV2 at end of the finishing stage compared to vaccinated pigs (P<0.01). There was no difference between the two groups for the presence or absence of PCV1.

Discussion

Vaccination of weanling pigs with an inactivated subunit vaccine (Porcilis PCV) appeared to be effective in controlling PCVAD. The vaccine produced active immunity as measured by serology at 9 weeks of age. Antibody response occurred in the control pigs later in the growing phase as a result of natural infection. Higher incidence of the virus was demonstrated in the control sera using PCR and was the cause of mortality in the control animals proving that a natural challenge did occur. The mortality, even in the control animals was lower than in the previous groups suggesting that vaccination caused a reduced challenge. A greater difference in performance might have occurred if vaccinated and control animals had been housed separately.

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