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**Evaluation of efficacy of swine influenza virus subtype H3N2 vaccine in providing protection against heterologous challenge**

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**Introduction**
Swine influenza virus is one of the etiological agents associated with porcine respiratory disease complex. H1N1 subtype was the most predominant strain of influenza virus in the U.S pig population until 1998. There is mounting evidence to indicate the emergence of new subtypes.\(^1,2\) Swine influenza virus is constantly changing due to genetic changes as a result of antigenic drift and genetic reassortment. These genetic changes have resulted in emergence of new variants. Emergence of new variants necessitates constant updating of the vaccines to protect the pigs against these new variants. Schering-Plough Corporation has been collecting these new variants in an effort to update the vaccine to provide broad protection. An H3N2 virus isolate was recently obtained which appears to be different from the isolate contained in the current product based on gene sequence data and serological cross reactivity. Sequenced nucleotides of the HA gene of new isolate shared 99% homology to a contemporary SIV H3N2 (A/Sw/MN/2004), 90.7% homology to a triple reassortant SIV H3N2 reference strain (A/Sw/Texas/98) and 91.0% homology to a double reassortant SIV H3N2 reference strain (A/Sw/NC/98). Based on phylogenetic analysis, the new isolate was identified as clade 3 H3N2 virus. The purpose of this study is to evaluate the efficacy of a vaccine containing a new isolate of H3N2 following challenge with a recently isolated heterologous H3N2 strain which shares 95% homology to the vaccine strain.

**Materials and Methods**
One group of 17 pigs, 4 weeks of age were vaccinated intramuscularly with 2 doses of the vaccine. Another group of 16 pigs were used as placebo controls. Blood samples were collected prior to vaccination and also prior to challenge. The antibody titers were evaluated by hemagglutination inhibition assay to homologous vaccine and challenge virus. The pigs were challenged intranasally on Day 43 following initial vaccination with a heterologous H3N2 virus. The pigs were sacrificed and the lungs were examined for typical lung consolidation. Median lung scores between the groups were analyzed by Wilcoxon Exact Rank Sum Tests.

**Results and Discussion**
The lung consolidation score are shown in Figure 1. The pigs in vaccinate group demonstrated 90% reduction in lung consolidation compared to controls.

![Fig 1: Median Lung Score](image)

The antibody titers are shown in Figure 2. The pigs were seronegative at the time of vaccination. Following booster vaccination, the geometric mean antibody titer in the vaccinated group increased to 160 against the vaccine strain but not to challenge virus even though the pigs were protected. The control pigs showed no increase in antibody titer (<10).

![Fig 2: Geomean HI Titer in Vaccinated Pigs](image)

Reference: