

# NEEDLE-FREE VACCINATION FOR *Mycoplasma hyopneumoniae* AND SWINE INFLUENZA VIRUS

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## Introduction and Objectives

Many of the vaccines currently used in swine are administered by the use of needles, which creates employee and food safety issues with broken needles (1). A study was done to compare needle vaccination with a jet injection device using a combination vaccine containing *Mycoplasma hyopneumoniae* (*M. hyo*) and swine influenza virus with SPAH's proprietary Emunade® adjuvant.

## Materials and Methods

A combination vaccine containing inactivated *M. hyo*, SIV H3N2, and SIV H1N1 formulated in Emunade® adjuvant was tested. Pigs, 7 to 9 weeks of age, were randomly allotted to four groups. Group 1 (n=10) was vaccinated with 2 ml using a syringe and needle. Group 2 (n=10) was vaccinated with 2 ml and Group 3 (n=10) with 1 ml using a Jet Injector device (Felton International, Lenexa, KS). Group 4 (n=5) remained as unvaccinated controls. Two vaccinations were administered intramuscularly, 2 weeks apart. Pigs were monitored for injection site reactions following each vaccination. In addition, 2 pigs from each group were randomly selected for post-mortem analysis for lesions at the injection sites at 21 days after the second dose. Antibody titers were measured on the day of first vaccination (0DPV1), second vaccination (0DPV2), and weekly until 21 days PV2. Antibodies to *M. hyo* were measured by DAKO ELISA (DAKO Corp. Carpinteria, CA) and reported as percent inhibition relative to the control. Antibodies to SIV were measured at SPAH by hemagglutination inhibition assay and titers <10 were considered negative.

## Results and Discussion

All pigs were seronegative to *M. hyo* and SIV (H3N2 and H1N1) at the time of first vaccination. By 7 days after the second vaccination, all vaccinated pigs seroconverted to all three antigens, while controls remained seronegative throughout the study. The magnitude and kinetics of the antibody response was similar for Groups 1, 2, and 3 for SIV H1N1 (Figure 1), SIV H3N2 (Figure 2), and *M. hyo* (Figure 3). Injection site swellings were detected (by palpation only) in 30-80% of the pigs inoculated with the jet injector compared to 10% of pigs given needle injection. However, the swellings were transient in nature, detected at 2 days and resolved by 5 days. No gross lesions at the injection site were detected at necropsy of jet injected pigs at 21 days after the second dose. These data indicate that jet injection of vaccines may be a safe and effective alternative to needles.

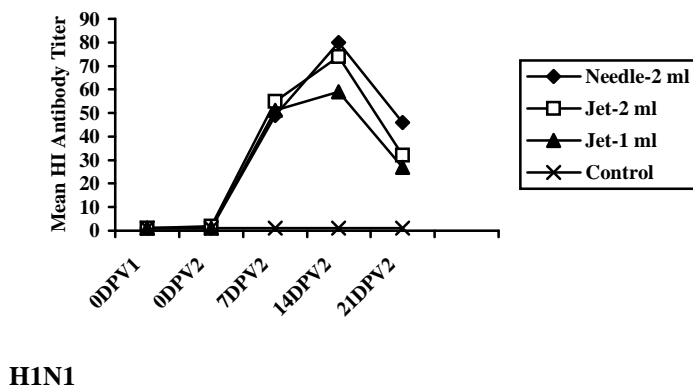


Figure 1. Antibody Response to SIV

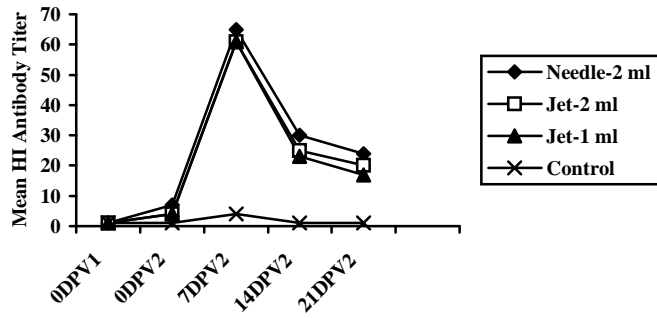


Figure 2. Antibody Response to SIV

H3N2

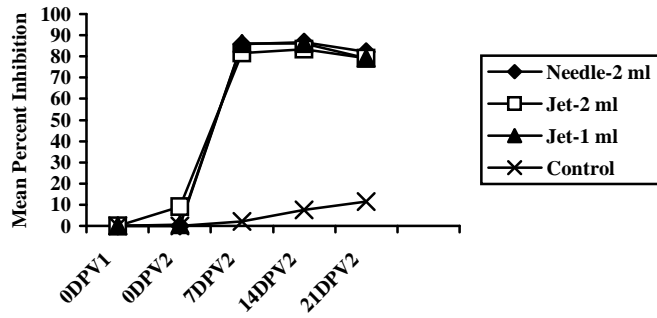


Figure 3. Antibody Response to M.

hyo

References

1. 2000 PorkAlert 2:1.

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