Technical Bulletin # 001
Pulse 200 Effective Application Method for Schering Plough Vaccines
September 5, 2002; by; David L. Cook, Ph.D.

Objective: The Pulse 200 is the first needle- free method for administering swine vaccines. In this study a combination vaccine containing *Mycoplasma hypopneumoniae (M.hyo)* and swine influenza virus with SPAH's proprietary Emunade adjuvant was administered with the Pulse 200 as well as conventional needle and syringe application and the antibody responses compared.

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 Pulse 200 device (Felton International, Lenexa, KS).
Group 3(n=10) with 1 ml using the Pulse 200 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 (-14 Post Revac), second vaccination (0 Post Revac), and weekly until 21 days Post revac.

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 Pulse 200 injected pigs at 21 days after the second dose.

Figure 1. Antibody Response to SIV H1N1

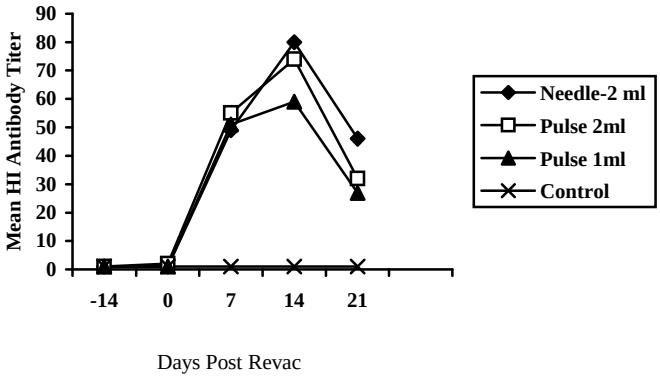


Figure 2. Antibody Response to SIV H3N2

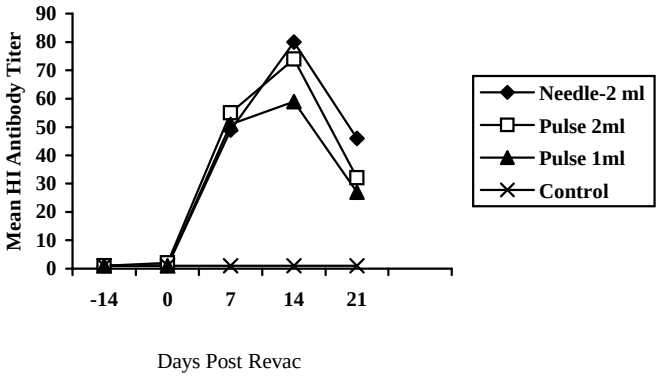
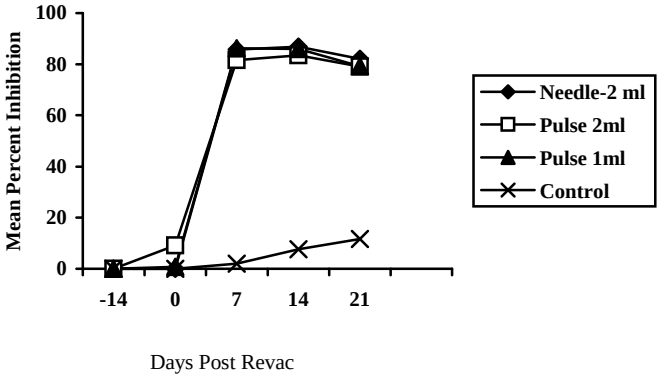


Figure 3. Antibody Response to M. hyo



Sumamry

1. Injection of a combination vaccine containing *Mycoplasma hyopneumoniae (M. hyo)* and swine influenza virus with SPAH's proprietary Emunade® adjuvant, with the Pulse 200 results in similar serological responses to conventional needle injection.
2. Injection of a combination vaccine containing *Mycoplasma hyopneumoniae (M. hyo)* and swine influenza virus with SPAH's proprietary Emunade® adjuvant with the Pulse 200 will not result in more tissue damage when compared to conventional needle injection.
3. The Pulse 200 is and effective tool for administering Schering Plough's oil adjuvanted vaccines.