**Vaccination of Swine: A Primer..**

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## *Introduction: Goals and expectations of vaccination programs in swine intended for show purposes*

A comprehensive strategy to address disease problems in swine, like all other species might entail vaccination strategy, biosecurity practices and disease surveillance programs. In as much as *proactive* programs of vaccination can maximize protection of the show animal against specific diseases, vaccination remains an integral component of any strategy to maximize disease resistance in the show animal. However, be aware the show violates one of the single most important concepts in disease prevention: mixing groups of animals causes disease problems. The reason is simple: when populations of animals are assembled from a wide variety of sources and herds, many disease causing agents are assembled together as well. Disease resistance as well as disease agents are very different within each herd and therefore the general show population represents a collection of pathogens floating about in a population of animals with no to very high levels of resistance to each disease agent. Realistically speaking, vaccination prior to assembly will never, ever guarantee infectious disease problems will not arise in the show animals either at the show or soon after the return home.

Realistically speaking, the greatest transmitted diseases that could potentially be a problem in swine is by far respiratory disease. Respiratory disease is usually transmitted by direct contact between animals, contaminated utensils and contaminated animal caretakers. Realize respiratory agents are always transmitted via aerosolized agents in the breath. The most common respiratory agents in swine are Porcine Reproductive and Respiratory Syndrome Virus (PRRS), Influenza virus, Mycoplasma agents the bacterial agents Streptococcus suis, Haemophilus parasuis, Actinobacillus pleuropneumonia and Mannhiemia hemolytic. Although vaccines exist against many of these agents, the value in vaccination against the bacterial agents is highly questionable for a variety of reasons. Accordingly, vaccination against many bacterial agents may not prove to be of significant value. Never the less, the goal of any vaccination program in show swine should be to maximize vaccine induced immunity against many of the respiratory agents as possible. Other common agents causing disease problems in swine are Transmissible gastroenteritis virus (TGE), Porcine Parvovirus, Leptospiral agents and Erysipelothrix rhusiopathiae and Clostridum perfringens Type C. Thus ensuring swine have developed sufficient immunity against several of these agents is important.

As in all species vaccine induced immunity should begin at a very young age and then be built upon up until weeks prior to the show season. Vaccination of the young very much depends upon the level of immunity passed by the dam's colustrum to the newborn. Generally speaking if the sow has been well vaccinated then the level of colustrum immunity will be high and last up to 4-6 weeks of age. After that time, vaccination of the newborn should become a priority. If the sow has not been vaccinated, then the newborns will likely lack any specific protection. Vaccination can begin within 2 weeks of life in these individuals even though it is often delayed up until 4-6 weeks or age. Regardless, a core vaccine program should be instituted early in all newborns and boosted thereafter during several strategic times prior to the show season. Vaccination at the time of the show season or 1-2 weeks prior to the show season is never a good strategy to maximize immunity. Often times this becomes an unnecessary stress on show animals and results in incomplete immunity. This becomes a real problem in stressed animals (show stress) assembled from a variety of sources (mixing animals). Disease agents circulating in highly stressed animals mixed with groups of animals from many sources becomes a recipe for disease outbreaks.

## *Concepts and Principles behind an Essential Vaccine Program in Swine.*

Minimum Essential Program: The minimal basic program should include vaccination against the respiratory viruses PRRS and Influenza, Porcine Parvovirus, the bacterial agents of porcine pleuropneumonia (Actinobacillus pleuropneumonia), Erysipelothrix rhusiopathiae, leptospirosis and Clostridium perfringens Type C. A reasonable core program is listed in the following table.

***Core Vaccines and Vaccination Programs for Swine:***

| Bacterial Vaccine Schedules for Swine | | |
|---|---|---|
| Group | Vaccine | Comments |
| 3 weeks to 1 month | Porcine Reproductive and Respiratory Syndrome Virus (PRRS), Influenza virus, Mycoplasma hyopneumonia, Clostrium perfringens type C, Erysipelothrix rhusiopathiae | Optional consideration should be given to vaccination against Porcine rhinitis with the agents Bordatella bronchiseptica and Pasteurella multicida. This vaccine should be administered within the first 7-10 days of birth. |
| 3-4 months | Porcine Parvovirus<br>Leptospira 5 way must include Leptospira 5 way must include L. pomona, L. canicola, L. icterohaemorrhagica, L. grippotyphosa and L. hardjo.<br>Actinobacillus pleuropneumonia<br><br>Boost with Actinobacillus pleuropneumonia Porcine Reproductive and Respiratory Syndrome Virus (PRRS), Influenza virus, Mycoplasma hyopneumonia, Clostrium perfringens type C, Erysipelothrix rhusiopathiae | Critical to start immunity early in young stock. Follow initial exposure with a 2 week boost just before breeding.<br>No boost----no protection! |
| Breeding adults 3-4 weeks prior to breeding season | PRRS, Porcine Parvovirus, Erysipelothrix rhusiopathiae, Leptospira 5 way must include L. pomona, L. canicola, L. icterohaemorrhagica, L. grippotyphosa and L. hardjo. | Boost at this time is essential to generate strong immunity to protect pregnancy. Thereafter a semi-annual boost is required 2-3 weeks post partum for the rest of adult life. |
| Breeding sows 2-3 weeks prior to farrowing | Transmissible gastroenteritis virus (TGE)<br>Porcine rhinitis (Bordatella bronchiseptica and Pasteurella multicida)<br>E. coli (K99 pilus, K88 pilus)<br>Clostrium perfringens type C | Vaccination prior to farrowing generates high level of immunity in the sow's colustrum that is passed on to the litter. |
| | | |

Notes and Comments: Parasitic infestations are also a problem in swine, particularly young swine. The greatest problems arise from Ascaris suum and the porcine whip worm Trichuris suis being the greatest problem. Deworming for ascarids and Trichuris suis (whipworms) should be performed at 4-6 weeks of age and repeated within 30 days. Ivermectin, doramectin or pyrantel embonate are all effective against ascarids and ivermectin, doramectin are very effective against Trichuris suis.

**Special Word on H1N1 (Swine Influenza)**

Anyone working with swine need to understand that swine have been infected by a variety of influenza viruses for as long as swine have been around. These influenza viruses have historically been quite different from the current H1N1 influenza responsible for the current 2009 influenza pandemic in people. These historical influenza viruses are very different from the H1N1 virus and are not infective for humans.

The H1N1 influenza virus that has caused the flu pandemic in humans during 2009 is clearly able to be transmitted from people to swine. This means all precautions should be taken to reduce this cross species route of transmission.

Signs of swine influenza in pigs include:

- sudden onset of fever
- lethargy, lack of alertness
- poor appetite)
- coughing that is sometimes quite persistent
- discharge from the nose or eyes, eye redness or inflammation
- sneezing
- breathing difficulties that can appear as though the pig chest is pumping for air. This is also referred to as so-called “thumps”.

**Controlling Influenza Infection in Swine**

- Proper hand hygiene that includes washing hands with soap and water after handling swine or any utensils that come in contact with swine.
- Avoid rubbing eyes, mouth, nose and face with hands after contact with swine.
- Wear appropriate protective clothing that can be easily removed and cleaned after working with swine. The best clothing, though sometimes not practical is disposable coveralls that are laundered at work after each use. The clothing should be removed after working with swine and washed prior to re-exposure. Disposable or washable gloves made of nitrile, vinyl or rubber that can be disinfected are excellent forms of protection. Protective hand gear should be disposed of properly or at least washed after working with swine.

- Consider wearing eye protection particularly if signs consistent with swine influenza infection appear in your pigs.
- Shower with thorough washing using soap as soon as possible after working with swine.
- Avoid moving from one population of swine to another without a complete shower and change of clothes, head wear and outer protective garments.

Recent USDA data clearly shows H1N1 transmission from infected humans to a few animal species can be a problem. The species listed are the domestic cat and pet ferrets. The H1N1 virus has also been isolated from turkey outbreaks. There are only a few rare instances where infected people appeared to transmit their influenza H1N1 to swine. The virus has also been isolated from healthy swine located at several different state fairs in 2009 as well. This means swine can be infected by humans and possibly other infected species.

**Vaccination Against Swine Influenza:**

Many agencies continue to recommend vaccinating against swine influenza viruses. Unfortunately the vaccines that are available commercially are only partially protective against swine influenza viruses that traditionally infect swine. These vaccines will likely offer even less protection against the H1N1 influenza virus. Owners should be aware influenza vaccination of swine with commercial vaccines will at best offer incomplete, partial immunity against the H1N1 strain of influenza. Thus, be aware, vaccination with standard swine influenza vaccines can give owners a false sense of security against H1N1. The best approach is prevention of exposure to infected individuals.