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Swine Center

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Swine influenza discussion

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What defines influenza disease?

The disease can affect pigs of all ages, but it is most commonly associated with growing pigs. When considering an acute flu outbreak, the first thing that comes to mind is the distinct set of the following clinical signs:

- High fevers
- Lethargy
- Classical "barking" cough
- Dyspnea
- Thoroughly widespread morbidity
- Pigs drowning in their own fluid filled, wet, heavy lungs

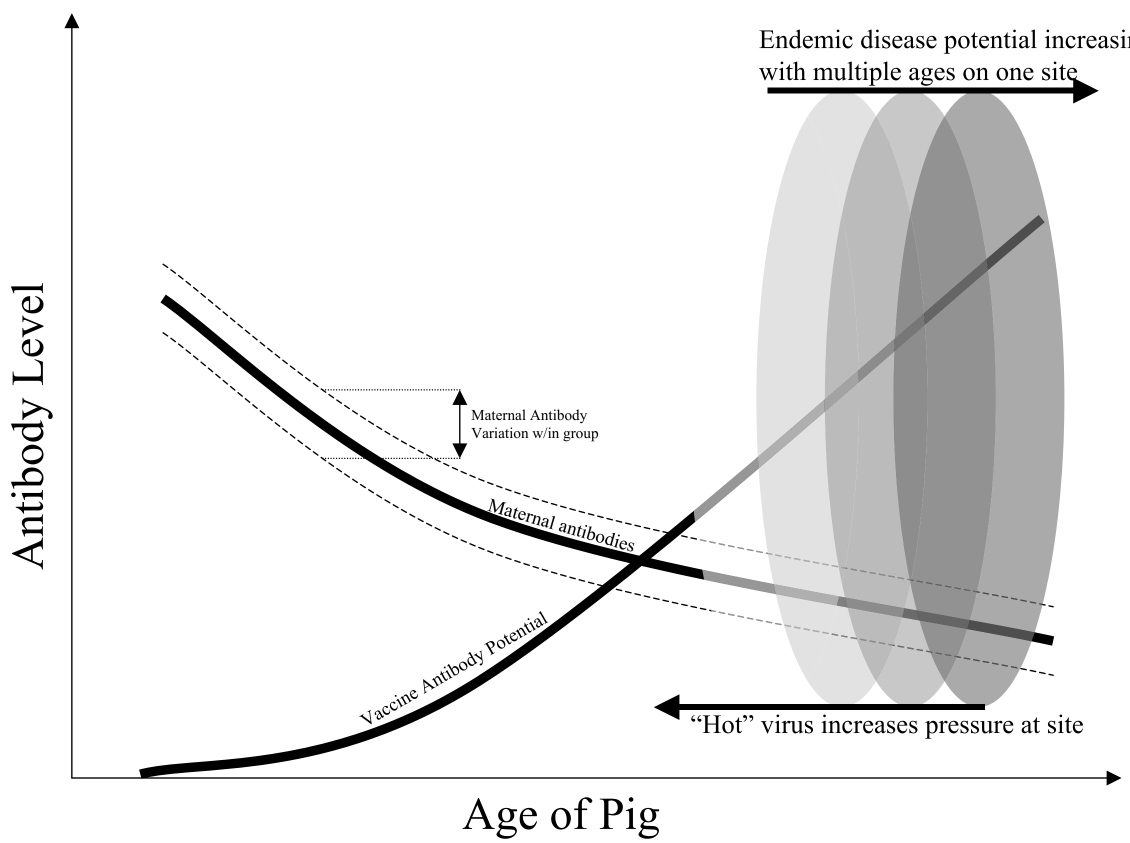
While not all breaks present this way, this is still a classical presentation.

Less obvious are the changes in performance parameters. Mortality often shows a distinct pattern. If multiple ages of pigs are on one site, then "slugs" of dead pigs are often seen. For a period of at least one week, pigs will eat less and grow less. Depending upon how well the pigs recover, this deleterious effect can be drawn out for the remainder of the grow-out.

The typical age at which pigs are affected may very well depend on interactions between the following factors (see **Figure 1**):

- Average maternal antibody level of a group
- Variation of the antibody levels within the group
- Presence and pressure of the virus on the farm site

Figure 1



Disease

- Age spread on the farm site
- Infectivity of the virus

Because of this "tug-of-war," it is often very difficult to pinpoint the onset of influenza disease or define the appropriate point to vaccinate the growing pigs.

Swine influenza virus can certainly affect the sow herd. In an unprotected population, all of the clinical signs seen in pigs can occur as well as an increase in abortions. Serologic tests are very useful in confirming a diagnosis of flu since the entire population should be seropositive at the time of infection. Vaccinated sow farms present a different problem. The incidence of frank disease is much less, and the usefulness of serology is greatly diminished. The only clinical sign may be a slight increase in reproductive failure.

One issue to investigate is the antibody levels in the gilt population. Multiple vaccinations prior to farrowing should bolster the level of passive antibodies passed to the pig population. Because of the cumulative effect of multiple vaccinations, highly variable or diminished antibody levels in the gilt population may indicate lack of vaccine compliance during gilt development, breeding, and gestation.

What defines the flu virus itself?

The virus can be defined by its genes. Type A influenza virus is most commonly known by HA and NA type. The descriptors, "H1N1," and "H3N2" have made their way into our everyday lexicon. More recently "H1N2" and "new variant H1N1" have begun to shape our view of the swine flu virus. Since the virus is defined by several genes in addition to the HA and NA genes, the question of "who" the virus is becomes even more complex. Genetic sequencing and more thorough genetic characterization can help to more accurately answer this question.

How can we attempt to control swine influenza virus?

The advent of commercial and autogenous flu vaccines have given producers the same advantages that the human population utilizes for influenza control. Although their true effectiveness is often called into question, they are still the only reliable means of endowing protection.

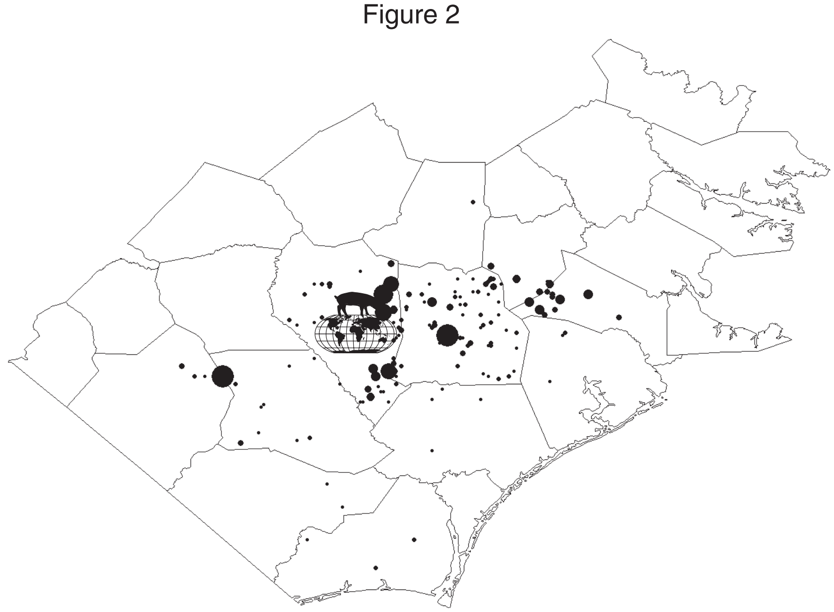
Several approaches can be taken for control strategies at the sow herd level:

- Prefarrow vaccination
- Post-farrow vaccination
- Mass vaccination
- No vaccination

These different strategies can result in different weaned pig populations. These populations need to be considered differently with respect to their immune status and the effectiveness of vaccination.

Management strategies can also influence disease control. One goal would be to place vaccines effectively beyond maternal antibody decline and ahead of infective pressure. Other strategies would be increasing biosecurity practices and grouping animals of similar immune status and age. In the event of an influenza infection, basic medication strategies can be used. Injectable treatment with antibiotics can be traumatic to compromised animals but is the most direct route of antibiotic administration. Water-soluble antibiotics often miss the animals that need treatment the most. Aspirin, caffeine, vitamins, and elec-

Figure 2



Disease

trolytes are often employed, but their positive effect is largely anecdotal.

What information are we still missing?

The viruses that we are isolating from field cases are often not characterized beyond “Type A Influenza Virus.” Often only the HA type is determined. Only recently has further characterization become more common in routine diagnostics. Even more genetic information will be needed to differentiate between a truly “classical” H1N1 virus and a “variant” H1N1 virus.

Geographic and flow patterns need to be studied to determine their impact on disease severity and disease spread (see **Figure 2**). How much of a risk factor is simple proximity to other swine units? What is the significance of an annual, undulating predominance of one flu type followed by a different flu type? Is there truly a seasonal influence on the incidence and severity of swine influenza?

Tomorrow?

The swine flu scenario of today is much different and more complex than the picture of ten or even five years ago. Answering these questions will begin to take us out of the darkness of guesswork. Beyond influenza virus’s impact on pig production, the virus is gaining global recognition for its potential to cause disease in humans. Understanding this virus and how it behaves will surely reach beyond the scope of swine veterinarians and pork producers.