Influenza - Pigs, Poultry and People....Getting the Story Straight!

ISU veterinary diagnostician Dr. Bruce Janke presented at the Iowa Veterinary Medical Association’s Winter conference this month on pandemic influenza and how some “possible scenarios or hypotheses” are developing into “facts”, in large part due to media hype. Dr. Janke cautions that real risks should not be discounted, but that the swine and poultry industries should not be unjustly penalized by unproven theories. He looked at 2 recent studies related to influenza and the interaction of people, pigs and poultry...

- A study published in “Clinical Infectious Diseases” compared the influenza antibody titers of people who worked with swine vs. those who did not. The conclusion was that swine workers were being exposed to influenza virus more frequently than non swine workers and that this was a health risk. In fact, the study showed that swine workers had a greater “probability” of having antibodies against H1 viruses, but there was no difference between the groups regarding the H3N2 virus. Researchers assumed swine workers would have no greater exposure to human influenza viruses and were not more likely to be vaccinated than the general population...hence it was concluded that swine were the source of the greater H1 antibody titers. But the question remains if this is truly a health risk and/or evidence of a pathway to a pandemic influenza outbreak…OR would swine workers be better protected against influenza than the general population due to them having some degree of immunity??

- Another study looked at non or low pathogenic avian influenza (LPAI) infections in poultry. Chicken and turkey flocks in Iowa have been serologically monitored since fall 2003 with no evidence of the highly pathogenic (HPAI) H5 or H7 viruses. A low percentage are found to show infection with H1 or H3 viruses. Numerous reports confirm infection of turkeys with swine H1N1 and H1N2 viruses and in some cases, positive turkey flocks in Iowa were on sites operated by people with potential exposure to swine. But subtypes H1 and H3 viruses are the most common viruses infecting people, so who is to say whether the source of the poultry infections is swine or people?? Dr. Janke points out this is probably just a rhetorical question since LPAI viruses don’t appear to be a health concern for poultry, workers or poultry consumers. But it’s important to understand the epidemiology of influenza among poultry, swine and people.

Dr. Janke states that “studies on influenza infections in swine in the U.S. over the last nearly 10 years would suggest that swine are more at risk of being infected with human influenza viruses than vice versa”. Also swine have NOT been identified as playing a role in the avian influenza outbreaks of poultry and people in southeast Asia.

Because swine can be infected with influenza viruses originating in other species (humans and birds) and because reassortment between 2 different influenza viruses resulting in a new virus can occur in swine, swine have been labeled as the probable “mixing vessel” for the production of a virus that could cause a human pandemic. But researchers are not able to say whether the avian virus that caused the 1918 human pandemic first infected people and then moved into swine or vice versa. Also, it is thought that the pandemics of 1957 and 1968 were due to reassortment of human and avian viruses which occurred in either humans or birds because the H2N2 virus (implicated in both pandemics) has never been found in swine. According to Dr. Janke, recent developments related to highly pathogenic avian influenza and live bird markets (in Asia and the U.S.) have shown that direct infection of humans with avian viruses can occur - without the involvement of swine.

In summary, swine are susceptible to infection with influenza viruses from multiple species and reassortment may occur. Some of the human viruses continue to circulate in swine populations and infection often results in a new virus for which they have less immunity - but to date, none of these viruses have re-emerged as a significant disease problem in humans. Increased risk of influenza infection for people working with swine is probably minimal...and swine seem to be more at risk for disease from human influenza viruses than the other way around!
**Kohlnhofer Farms** in Lake City, Minnesota was featured in the February/March 2006 issue of “Farm and Ranch Living” magazine. The family swine operation is owned by Mike, Jeff and Yon Kohlnhofer.

Drs. Paul Yeske and Darwin Reicks will present at this year’s AASV meeting in Kansas City. Dr. Yeske will present “Grant Writing: A Practitioner’s Perspective”. Dr. Reicks will present “Blood Swab Techniques - Research and Clinical Case Reviews”.

Dr. Reicks will also present at a meeting in Manitoba on “PRRS Contingency Planning for Boar Studs” and “Quality Control Monitoring for Semen”.

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**Ventilation Audits - Dr. Eisenmenger Focuses on “The Basics”**

Dr. Mike Eisenmenger was featured in cover story of the January 15th issue of “National Hog Farmer” magazine. “Audits Return to the Basics” was the title of the article which focused on Dr. Mike’s approach to ventilation management. Never an easy task with the multitude of systems and controllers in use today, he uses a 4-step program to evaluate barn ventilation and “ensure that everything works as a system”. A brief summary of the ventilation audit used by Dr. Eisenmenger follows...

1. **Make sure outside air is pulled through the attic.** Evaluation of fan power and whether or not soffits allow air to be drawn into the attic. Dr. Mike points out that compromised soffit material (dust, rust, water vapor, etc.) restricts or prevents air from flowing into the attic.

2. **Make sure adequate air flows into the room.** Number of fans, cfms/pig and number of barn inlets are taken into consideration for this calculation. Even though there may be enough inlets, they need to be checked to make sure they are being properly managed and maintained.

3. **Make sure producers know how to operate the whole system, understanding the complete ventilation package.**

4. **Make sure environmental conditions are right in the barns.** Temperature and humidity conditions need to be monitored and compared with barn settings. Recording devices must be positioned correctly for an accurate assessment (away from heaters and inlets). Dr. Mike recommends the use of sensitive temperature probes instead of regular thermometers to avoid missing rapid temperature changes that can occur.

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**Successful Use of Pig Islet Cells to Reverse Effects of Diabetes**

On February 19th, an exciting breakthrough in human medicine was reported online in “Nature Medicine” medical journal. A press release on February 20th confirmed that researchers from University of Minnesota’s Diabetes Institute for Immunology and Transplantation successfully reversed diabetes in monkeys using transplanted islet cells from pigs. Islet cell transplantation has been used in the past to successfully reverse type 1 diabetes in humans, but a safe and reliable source of islet cells was needed in order to make this an option for the thousands of people that could benefit from this treatment. Associate professor of surgery and lead researcher Dr. Bernhard Hering says “These results suggest it is feasible to use pig islet cells as a path to a far-reaching cure for diabetes”.

Spring Point Project is a non-profit corporation planning to build and operate biosecure facilities in which to raise high health pigs for pig islet cell transplant trials in humans. The company will coordinate its efforts with University researchers with a goal of having donor pigs available by the time it’s safe for clinical human trials to proceed, hopefully within the next 3 years!

Successful transplant patients will no longer require insulin injections to regulate glucose levels and the risk of secondary diabetes complications involving heart, circulatory system, eyes, nerves and kidneys could be significantly reduced. **Pigs could become man’s new best friend!**

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**SVC Clients in the News**

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