Our understanding of the importance of influenza A infection in pig production has evolved rapidly over the past 15 years. Recent detection of novel subtypes of influenza A, such as H3N2, H1N2, and pandemic H1N1 in swine have heightened our awareness of this pathogen as a primary cause of swine disease and significant zoonotic (from animals to people) and reverse-zoonotic (from people to animals) risk. This paper reviews some ways in which influenza A impacts the pig producer and swine veterinarian.

**IMPACT #1: PIG HEALTH, WELFARE, AND PRODUCTIVITY**

Emergence of ‘triple-reassortant’ H3N2 swine influenza in Ontario in 2005 reminded us that novel strains of influenza, occurring in a naïve population, cause significant clinical signs and loss of productivity. The classic indications of ‘outbreak’ influenza were seen: pigs with fevers and loss of appetite; abortion and other reproductive signs; and growth and efficiency challenges (Olsen et al., 2006). These breaks usually had a defined beginning and end, and thus the economic impact was relatively easy to measure. In 2007 the impact of swine influenza was ranked only second to PRRSv in terms of breeding herd productivity (Holtkamp et al., 2008).

However, the more common situation in Ontario in 2013 is an ‘endemic’ presentation, where the breeding herd is often quite stable, but the nursery and finisher populations may exhibit low-level symptoms of influenza, punctuated by occasional periods where clinical signs become more pronounced. The true impact of influenza is harder to measure in this situation, especially considering that there are almost always co-infections such as PRRSv or M. hyopneumoniae that result in complicated respiratory disease.

Some data and opinion on the cost of influenza are available. Donovan (2005) suggested that H1N2 (an uncommon subtype in Canada) resulted in 2.9% more wean-to-finish mortality, as compared to a similar, uninfected pigflow. Other researchers reported on a survey of swine veterinarians in which the reduction in feed efficiency of influenza A-infected pigs was figured at 0.05 (nursery) and 0.04 (finisher), and the combined nursery-finisher mortality was suggested to be 2.5% (Holtkamp et al., 2007).

In addition to mortality and feed conversion, influenza increases medication usage in an attempt to control secondary bacterial infections; H. parasuis, for example, is known to cause more severe disease following influenza infection (Brockmeier et al, 2010).

Treatment and control options may mitigate some of the impact of influenza. Treatment options are limited to alleviating symptoms; water-soluble ibuprofen, for example, appears promising as a treatment for fever in influenza-infected pigs (Hawkins et al., 2010).

Vaccination against influenza A with commercially available influenza vaccines is often at least partially effective to reduce clinical signs, shedding of virus, and transmission between pigs (Romagosa et al. 2011; Corzo et al., 2012). However, as the genetic diversity of influenza virus increases, cross-protection from one strain to another decreases, so there have been numerous frustrating situations in which commercial vaccines have failed to provide satisfactory benefit.
In recent years many swine veterinarians have used autogenous vaccines to try and provide immune stimulation with a ‘homologous’ influenza subtype; in some cases, the results have been positive (Rodibaugh, 2008).

Some veterinarians believe that we need to take a similar approach to influenza that we have taken with PRRSv. In other words, we need much more information about how influenza spreads from farm to farm, and from pig to pig, so that we can implement effective long-term control and eradication strategies. Eradication of influenza from farms or systems has been reported (St-Hilaire and Derosiers, 2010; Torremorrell et al., 2009).

**IMPACT #2: PUBLIC HEALTH**

The ability to profitably produce pigs depends not only on the internal factors of the industry itself, but also on the goodwill of the public and regulators to not interfere with normal production practices. This goodwill hit a speed-bump in 2009 when pH1N1 (or ‘swine flu’) caused the public to consider the risk that swine populations potentially pose as a reservoir for influenza A. There are documented cases of influenza transmission from people to pigs (Forgie et al., 2011), and vice versa (Kitikoon et al., 2011). The recent explosion in the detection of novel subtypes and strains of influenza in pigs indicates that the possibility of a novel pandemic strain associated with pigs is real, and is a potential impact that should be avoided if possible.

At this time we do not have clarity on what role, if any, vaccination of pigs ought to play as part of a broad-based public health program for influenza A viruses. Some other actions may be more straightforward. Pig producers and pig veterinarians may choose to receive seasonal influenza A vaccination; strive to stay out of the barn when experiencing flu-like symptoms; restrict unnecessary human visitors from the barn; segregate poultry and wild birds from swine, (knowing the pigs’ ability to become infected with avian subtypes of influenza); use personal protective equipment (PPE; respirator masks and gloves, for example) when in contact with pigs; and work together to implement influenza control programs that limit pig-to-pig and farm-to-farm transmission.

In recent years the pig industry has paid full attention to PRRSv and PCV2 as the biggest animal health threats; because of its importance to animal health and productivity, and human public health, influenza A will deserve our full attention in the future as well.

**REFERENCES**


