Avian influenza (AI) is a highly contagious respiratory viral disease that affects both domestic and wild birds. AI viruses are classified into two types: 1) lowly pathogenic avian influenza (LPAI) which typically causes little to no clinical signs in poultry and 2) highly pathogenic avian influenza (HPAI) which typically causes high mortality. Waterfowl and shorebirds, such as ducks and geese, are natural hosts for the AI virus, and these birds can shed the virus, often without showing any signs of illness or death. Spring and fall are the peak seasons for bird migration, and many of these birds can be in your towns and neighborhoods, carrying the virus.

Backyard poultry are susceptible to AI infection and are at high risk. Many backyard flocks are kept outdoors, are free-range, have multiple ages, species and sources of birds, and have less strict standards for biosecurity compared to commercial flocks. This invariably results in mixing with other birds within the flock and contact with other wild waterfowl creates favorable conditions for disease spread within and between flocks. Many studies show that the backyard flocks with more types of poultry and flocks with lower sanitary conditions have higher incidences of AI.

If a flock has sudden (less than 24-48 hours), high death rates (close to or over 50%) or many birds with respiratory signs, suspect AI infection and proceed with testing. There is not an approved vaccine in the United States nor is there a treatment for AI. Good management and biosecurity practices are the only way to protect against AI infection in backyard poultry.

To learn more, your clients can contact the Iowa Poultry Association at no additional cost. An AI test is available through the ISU VDL. The test looks for antibodies (indicating previous exposure) against AI using a dozen eggs as the sample type. Commercial poultry in Iowa are routinely tested for AI along with several other pathogens to ensure healthy birds and safe meat and eggs.
Panchan Sitticharoenchai
Pathology

Dr. Panchan Sitticharoenchai, known to those around her as “Pan,” is originally from the busy city of Bangkok, Thailand. She received her DVM degree in 2012 and Master of Science degree in 2014 from Chulalongkorn University in Thailand. She moved to Ames in 2014 to pursue a combined PhD and anatomic pathology residency at Iowa State. After spending time in Ames, she fell in love with the Midwest lifestyle and accepted a position at the ISU VDL as a diagnostic pathologist in 2015. She is a pathology nerd and enjoys solving cases, assisting in diagnostic investigation, and loves a good discussion about disease pathogenesis.

Although she grew up half-way across the world, Pan is not foreign to the United States culture as she spent much of her spare time learning Thai food. She is always open for Thai recipe requests and recommendations.

Best Practices for Culture of Septicemic Bacteria from Diseased Swine for use in Autogenous Bacterins

Dr. Stevenson, Aruda, and Schwartz Diagnostic Pathologists

The most common septisic bacterial agents in swine culture for use in autogenous bacterins include Streptococcus suis, Actinobacillus suis, and Mycoplasma hyopneumoniae. Swine populations and individual pigs can harbor multiple virulent and avirulent strains of each of these bacteria, but one virulent strain usually predominates in outbreaks of disease. The efficacy of an autogenous bacterin depends, in part, on inclusion of the virulent strain of bacteria responsible for outbreaks of disease using best practices for isolates that the correct (virulent) strain is cultured from diseased pigs.

A. suis is a ubiquitous opportunistic pathogen that is commensal of the upper respiratory mucosa and tonsilar crypts of swine. There are differences between strains based on surface antigens and virulence, but routine methods of categorization based on species or virulence factors are not available. Certain virulent strains are opportunistic in the PRDC where they produce localized or diffuse fibronectinase-positive pneumonitis that is indistinguishable from A. pleuropneumoniae. Other virulent strains can invade and produce acute fatal septicemia or, following bacteremia, can localize and produce fibrinopurulent arthritis, polyserositis, vascular embolism, septicemia and meningitis.

M. hyorhinis is a sporadic opportunistic pathogen that is a commensal of the ciliated respiratory epithelium in the upper respiratory tract and conducting airways of swine. Genetic and antigenic variation in strains is known, but routine methods of categorization are not available. Certain virulent strains invade and cause fibrinopurulent polyserositis and polyarthritis in nursery- age pigs. Although a role for M. hyorhinis has been suggested by some, there is not compelling published evidence to support a role in PRDC.

Etiology, Epidemiology, and Disease

S. suis is an opportunistic pathogen and ubiquitous commensal of the upper respiratory tract, palate tonsil, and female reproductive tract, and it is also considered a normal flora in swine. Numerous serotypes are described, and strains vary greatly in virulence within and between serotypes. Numerous virulence factors are described, but the relative importance to pathogenicity of the strain is not understood.

Sampling

1. Select the right pigs to sample:

- Animals exhibiting acute typical clinical disease.
- Avoid euthanasia methods that result in fracture of the caverx (e.g. captive bolt/blunt force trauma).

2. Collect, preserve and transport the right samples:

- For cases of septicemia or localized systemic sites, the isolate should come from spleen or tissues with typical lesions, serum, cerebrospinal, serosal membranes, and/or vegetative lesions on heart valves.
- For cases with nervous disease, lesions of fibrinopurulent meningitis should always be confirmed when S. suis or A. suis is isolated for use in an autogenous bacterin. This is because transit of the blood brain barrier by these organisms occurs more frequently than meningitis. Cultures of these organisms especially A. suis that collection methodology minimized contamination. This is because these isolates have not demonstrated ability to invade and cause systemic disease.
- For cases of septicaemia or systemic disease, the isolates from the lung are NOT appropriate. This is because these isolates have not demonstrated ability to invade and cause systemic disease.
- High numbers in pure or nearly pure culture increase confidence that the isolate is the cause of disease and that collection methodology minimized contamination.
- When possible, isolates used in autogenous bacterins should be characterized by serotyping or sequencing for future susceptibility testing. The addition of many isolates in a single bacterin will reduce antigenic mass and thus efficacy for all included isolates.