

Influenza A viruses in pigs

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Animal Biosecurity, Biosecurity and Food Safety

Nature of the disease

Influenza A viruses can cause an acute, highly contagious disease of the respiratory tract of pigs.

Case definition

A case of influenza A virus in pigs is defined as laboratory-confirmed infection with an influenza A virus in or more pigs.

At the time of an outbreak, revised or subsequent case definitions may be developed, with the agreement of the Consultative Committee on Emergency Animal Diseases.

Aetiology

Influenza A viruses of the family *Orthomyxoviridae* can infect a wide variety of animal species.

These viruses are constantly evolving and have the ability to form new subtypes, possibly with alterations in characteristics such as virulence, infectivity and host range. The three subtypes usually associated with disease in pigs are H1N1, H1N2 and H3N2, and multiple strains are recognised within these subtypes.

Pigs may also be infected by influenza viruses from other species, particularly humans and birds. In 2009, a novel H1N1 virus (H1N1pdm09) emerged in humans in North America, rapidly establishing as a worldwide pandemic.

Susceptible species

Although influenza A viruses in general may infect a wide range of species, pig-adapted strains circulate predominately in pigs. Infection of humans with these viruses occurs occasionally.

World distribution and occurrence in Australia

Influenza A viruses are considered ubiquitous in pig populations worldwide (OIE 2009).

Influenza A viruses have been detected in Australian pig populations, but have not been associated with significant production or public health issues.

Epidemiology

The incubation period for influenza A viruses in pigs is usually 1-3 days. Pigs begin excreting virus within 24 hours of infection and may shed virus for 7-10 days (OIE 2009), although peak shedding occurs around 48-72 hours.

Within herds, influenza A viruses are primarily transmitted among pigs in close contact through nasal discharges and aerosols from sneezing and coughing.

Between herds, the main method of spread of influenza A virus is through the movement of infected pigs. Influenza A virus may also spread on contaminated fomites such as equipment. Live virus and viral antigens have not been detected in meat or viscera (Brookes et al 2010, Vincent et al 2010). Therefore, it would be highly unlikely that known influenza A viruses could be transmitted in pork or pork products.

Humans and birds may also be a source of infection for pigs, and pigs for humans and birds.

Diagnostic criteria

In naïve herds, infection with an influenza A virus typically presents as an acute to chronic respiratory disease. Infected pigs may show fever, anorexia, weight loss, coughing, sneezing, nasal discharge, and respiratory difficulty. Infection can also occur with no clinical signs. An early sign in commercial piggeries is a fall in feed consumption. Influenza A virus may cause reproductive problems in sows, depending on the stage of gestation at infection. Although all pigs in a herd may become sick, case mortality ratios are generally low (1-3%), and, in the absence of complications, most affected pigs recover within 5-7 days. Severe bronchopneumonia may develop as a complication and is a high risk factor for mortality.

A confirmed diagnosis requires detection of an influenza A virus in pigs by polymerase chain reaction or virus isolation. Genetic analysis is required to fully characterise the viral subtype. Serology is most useful as a surveillance tool; serological detection would require further investigation before an active infection could be confirmed.

Appropriate samples include nasal, oral or respiratory swabs from active clinical cases and serum samples from recovered cases.

Vaccination and/or treatment of infected animals

Vaccines to protect pigs against influenza A viruses are not currently available in Australia.

Treatment of affected herds is usually ineffective, although antimicrobial treatment is often used to lessen the impact of secondary bacterial infections.

Public health implications

The symptoms in humans infected with influenza A viruses from pigs resemble seasonal influenza – that is, fever, cough, sore throat and lethargy. Maintaining high-coverage seasonal influenza vaccination in humans at risk (such as piggery and abattoir workers, and

transporters) may help to prevent transmission of influenza virus both from humans to pigs and from pigs to humans, therefore reducing opportunities for reassortment.

Principles of control and eradication

Good farm biosecurity and management practices are the most effective measures to prevent introduction and spread of influenza A viruses. Virus may disappear from individual premises, particularly those that are all-in-all-out systems; however, the immunity acquired by recovered animals is short lived, making them susceptible to reinfection and disease if re-exposed.

Policy and rationale

The policy for the response to an outbreak of influenza A virus in the NSW pig population will be determined by a risk assessment, taking into consideration, for example, how early the outbreak is detected, the extent of the outbreak, the location of affected premises, the subtype of virus involved and its zoonotic potential, the nature and severity of any clinical signs, and whether other respiratory pathogens that could complicate the clinical picture are present.

Development of control strategies will be undertaken by the NSW Chief Veterinary Officer (CVO), in consultation with industry, private and/or Local Land Services district veterinarians as appropriate. The NSW CVO will collaborate with public health authorities when a zoonosis is suspected. No action will be required unless the risk assessment indicates an unacceptable threat to animal or public health.

Acknowledgements

This primefact is adapted from the Australian Veterinary Emergency Plan 'Influenza A viruses in swine' response policy brief, available at <https://www.animalhealthaustralia.com.au/our-publications/ausvetplan-manuals-and-documents/>.

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