Guidance Document for the Management of Pandemic (H1N1) 2009 in Pig Enterprises

This guidance document provides information applicable to the enterprise level when an outbreak of pandemic (H1N1) 2009 has occurred in a pig herd. The information is in addition to that contained in the relevant AUSVETPLAN documents.

**Parent document**


**Background**

A new subtype of influenza A virus, subsequently known as the pandemic (H1N1) 2009, was detected amongst humans in North America in April 2009. The World Health Organization (WHO) declared a pandemic in June 2009 due to the rapid spread of the virus from person to person worldwide. As of late 2009, there had been approximately 37 000 confirmed human cases with the pandemic (H1N1) 2009 virus in Australia.

The large number of humans infected with the pandemic (H1N1) 2009 virus worldwide resulted in some spill-over infections to animals, including pigs, in a number of countries. From July to September 2009, a small number of piggeries in Australia were confirmed to be infected with the pandemic (H1N1) 2009 virus, the most likely source being infected people. The signs observed were mild, pigs recovered quickly and these outbreaks have all been resolved.

Australia’s approach to the management of pandemic (H1N1) 2009 infection in piggeries is framed within the broader approach to Swine Influenza (SI) as outlined in the AUSVETPLAN response policy brief. The policy is to implement a set of strategies appropriate to the circumstances to contain the spread of SI, including pandemic (H1N1) 2009, until the outbreak dies out or has been eradicated. In a situation where there is a reservoir in the human population and little effect on pigs (as has occurred with pandemic (H1N1) 2009), the policy will be one of minimal intervention, consistent with animal health, public health, and industry and marketing requirements that includes ensuring the process slaughter of pigs free from clinical


2 ‘Australian Influenza Surveillance Summary Report No. 27, 2009’, *Department of Health and Ageing*. The number of cases reported represents a small proportion of those that have occurred in the community.
signs of disease. This approach is consistent with the advice from the WHO, the Food and Agriculture Organization of the United Nations (FAO) and the World Organisation for Animal Health (OIE) that the risk of people becoming infected with this virus through the consumption of pork or pork products is negligible.

**Purpose**

In the event of a confirmed diagnosis of pandemic (H1N1) 2009 virus on a pig enterprise, the purpose of the guidance document will be to:

- supplement the information in the AUSVETPLAN Response Policy Brief Version 3.3, 2009
- assist with the development of a management plan that incorporates minimum intervention and will lead to an appropriate level of assurance regarding the elimination of pandemic (H1N1) 2009 virus from an enterprise in consultation with owners/managers and their consultants and in-line with stakeholder (public health, export/domestic markets, industry) requirements
- prevent the spread of virus to pigs on other properties (containment)
- implement systems to ensure that pigs with clinical signs of pandemic (H1N1) 2009 are not sent for processing, in-line with market requirements
- assist in minimising the risks of pig-to-human spread of infection
- ensure minimum government intervention and minimum negative impact to the farming enterprise.

**Case detection**

Current surveillance for influenza in pigs in Australia relies on the reporting of suspect cases — passive surveillance.

Passive surveillance can be obtained and enhanced through:

- educating pig producers, veterinarians and other stakeholders on pandemic (H1N1) 2009 in pigs
- assisting property owners/managers with diagnostic investigations when they do not have a pig health consultant
- providing advice to private and government veterinarians on pandemic (H1N1) 2009 for the purposes of ongoing herd health programs, as well as, diagnostic investigations of suspect pig herds
- undertaking appropriate laboratory diagnostic testing to support proof of freedom protocols
- undertaking laboratory confirmation for pandemic (H1N1) 2009, in conjunction with AAHL.
Diagnosis

In the event of notification of suspicion of disease consistent with the case definition, sampling and submission of samples will occur as per standard operating procedures for the jurisdiction.

Laboratory confirmation will occur at AAHL, in conjunction with the jurisdictional laboratory.

Management of the outbreak

Once diagnosis of pandemic (H1N1) 2009 has been made, the methods employed for the management of the outbreak will be determined by the needs of the affected enterprise and the risk to the enterprise or industry.

1. Description of standard biosecurity measures

Refer to Australian Pork Limited’s Biosecurity Code of Practice for recommendations on standard procedures.

All persons working with pigs should be vaccinated against pandemic (H1N1) 2009 and other relevant influenza strains circulating in the community on an annual basis.

2. Epidemiological assessment of an infected property

A detailed epidemiological assessment of the clinical presentation on the property should be conducted. This should include but not be limited to the following:

- Identification of all locations where pigs are housed (sheds, pens, paddocks) and cohorts of animals; record numbers and age-groups of animals in each location; type of housing, ventilation, group numbers and shed dynamics, and capacity
- Within property movement information – weekly movement routines, including timing, day of week of sow, weaner, grower finisher movement; sale day for finishers, sows, choppers etc
- Inter-property movements (e.g. to grow out facilities) – information, location, frequency of movement, capacity, frequency of sale, last movement, housing
- Tracing information on recent pig movements should be collated (for the two weeks prior to clinical signs of disease being first noticed)
- Identification of at-risk properties and assessing their likelihood of infection (grow-out units, close neighbours, recent recipients of potentially-infected pigs, location of any poultry units)
- Spread of disease, clinical signs and feral pig involvement
- Case definition of the clinical picture for that farm should be determined.

3. Containment

Where it has been determined that the property is low risk to other pig enterprises or markets (viz. the disease is unlikely to have spread to other piggeries via animal movements, airborne or vector transmission), the following should be undertaken.

a. imposition of additional biosecurity measures
Infected properties may be placed under regulatory restrictions at the discretion of the affected jurisdiction, in which confirmatory diagnostic testing and communication of these findings (by the pig enterprise) to the relevant stakeholders (processors, buyers, purchasers of live animals) occurs.

Restrict movements of pigs onto and off infected properties while clinical disease is active on property in accordance with risk criteria:

- Where properties are subject to regulatory restrictions by State/ Territory authorities, movement of pigs off the premises will be under the supervision of State/Territory authorities.
- Cohorts of pigs free from clinical signs may be sold for slaughter
- Pigs free from clinical signs may move for grow out as long as they pose an acceptably low risk to other animals/ herd; to be determined on a case by case basis in consultation with the property owner/manager and animal health advisors.
- Breeding stock may not be moved unless free from disease (PCR negative, seropositive or clinically recovered from infection)

b. enhance biosecurity between properties for people, vehicles and equipment to protect non-infected cohorts.

Enhanced biosecurity between properties
- Biosecurity measures for movement of people (shower on/off, change of clothing footwear, stand down period)
- Vehicle cleaning protocols between properties (pig vehicles cleaning and disinfection)
- Equipment biosecurity measures (handling and cleaning protocols)

Movement controls
- No or limited pig movements
  - only those that have been determined to have an acceptably low risk
  - Biosecurity measures to be followed prior to entry
  - Entry of non clinical animals from origin of known herd status (PCR negative or Seronegative)
- People movements limited between infected/non infected premises

4. Control

Pandemic (H1N1) 2009 appears to have very minor production effects in pigs. There is a paucity of information on successful elimination of influenza from pig herds. With these factors in mind, the decision to attempt to eliminate the virus should
incorporate economic considerations, and planning should be undertaken with advice from a specialist veterinarian. The guidelines below will assist in controlling the clinical disease. A property considered as high risk (viz. it poses a risk to other properties or through the sale of breeding stock) should undertake the containment requirements stated above, as well as control by one or a combination of the following:

4.1. Maximise Burnout

Burnout is facilitated by movement and mixing of clinically-affected cohorts with non-infected cohorts — this will be dependant on any concurrent clinical disease and is contrary to traditional all-in all-out movement protocols. For example, allowing sick weaners/growers/finishers to roam between/within pens, and moving non-affected pigs into pens previously occupied by clinically infected animals. The risks associated with this strategy include limited infectivity opportunity, few/no clinical signs to identify effectiveness of strategy, and other infectious disease(s) may be spread in this manner.

4.2. Production Break

The aim of a break in production is to stop the introduction of naïve animals (incoming purchases and newborn piglets) and facilitate exposure/immunity during this time, so that when farrowing re-commences, there is no virus remaining to infect piglets. This may be the only effective way to eliminate the cycling of pandemic (H1N1) 2009 virus in the herd (particularly in large herds)

- Close the herd to new incoming animals.
- Stop matings for a period of time, resulting in a break in farrowings. The break period for virus elimination has not been determined, but is likely to be around 1 month.
- Maximise burnout (see 5.1.1) during the farrowing break.
- Disinfect all facilities after the burnout period.

Such a program could be undertaken during elimination processes for other diseases. For example, during Swiss depopulation for *Mycoplasma hyopneumoniae*, stock less than 10 months of age are removed and the remaining stock on site are medicated. A similar approach could be used for elimination of pandemic (H1N1) 2009 but has not been tested.

5. Recovery/Proof of Freedom

The evidence required to prove that elimination of pandemic (H1N1) 2009 has occurred will depend on the level of assurance required. Stepwise protocols have been developed. The particular protocol to be used will be determined by the level of confidence that will meet the market requirements and provide minimum risk to other trading enterprises. Protocols 1, 2A, and 2B can be followed sequentially to provide increasing level of assurance.

Protocol 1 relates to the main strategy for pig enterprises when pandemic (H1N1) 2009 is endemic in the human population. It will be the minimum required to lift regulatory restrictions applying to a premises. Protocols 2A and 2B are relevant when pandemic (H1N1) 2009 is no longer endemic in the human population e.g. effective human vaccination has reduced the circulating viral load. However, commercial
market needs (export markets; movement through saleyards; restocking of pigs to high health status herds) may require a higher level of evidence of disease freedom (Level 2A or 2B assurance – see below).

1. **Evidence required for lifting regulatory restrictions**
   The policy for lifting regulatory restrictions must be the minimum intervention required to be consistent with animal health, public health, and industry and marketing requirements. This may vary over time depending on factors such as the epidemiological situation in the human population, requirements of trading partners and new information as it becomes available.

2A. **Minimum requirement for demonstrating herd immunity**
   The purpose and intent of the following protocol is to determine after control mechanisms have been implemented the level of herd immunity that has been achieved and the likelihood of successful eradication. This method could be used by closed herds which do not import animals into the herd or do not wish to go to the expense of sentinel pigs.

   **Sampling and testing protocol**
   1. Identify point at which all animals have been exposed and seroconverted.
      a. Allow at least three weeks post infection and mixing
         i. To allow maximum titre response
         ii. Seroconversion occurs within 7-10d post infection (PI)
         iii. Maximum titre 2-3wk PI
   2. Test appropriate sample size to check seroconversion (refer to Tables by Cannon and Roe (1982), ‘Livestock Disease Surveys —A Field Manual for Veterinarians’ for further explanation)
      a. Test by Cohort and/or shed
         i. Sows/dry sows/mating shed
         ii. Weaners
         iii. Grower/finisher
      b. Sample size required 99% confidence (cohorts of >300)
         i. Seroprevalence 30% 22 animals per cohort/shed
         ii. Seroprevalence 50% 10 animals per cohort/shed
   3. Use this point to determine likely elimination of virus
      a. If poor seroconversion then new strategy
      b. If >85% seroconversion – immune herd (as no carrier status exists in recovered animals).

2B. **Minimum requirement for demonstrating absence of active circulation of virus**
   The guideline for demonstrating the absence of active circulation of virus in the herd is for use by producers who may wish to demonstrate in a scientifically robust manner that virus circulation on farm has ceased. Producers that are selling breeding stock should be encouraged to eliminate/eradicate virus from their properties.

   **Sentinel animals**
   a. Selected from a seronegative herd
b. Inserted when adequate seroconversion determined or at a point no less than 22 days post-cessation of all clinical signs

c. 10 sentinel animals of appropriate age and size placed with each cohort
   i. Sows/dry sow/mating unit
   ii. Post weaning at 8 week (at mixing point)

d. Animals are tested between 10 and 21 days after mixing
   i. Interpretation of results at a herd level
   ii. Absence of 4-fold rise in titre in sentinel pigs is indicative of no active infection
   iii. Test sequentially at least twice (in addition to initial test)

e. Seroconversion of any sentinel animals in the cohort should be investigated. A four fold rise in titre indicates exposure to infective virus.

6. Market maintenance

- the pig enterprise(s) to notify processing plants and buyers of processed pigs of the diagnosis;
- the pig enterprise(s) to notify buyers of live pigs from the property of the diagnosis, to assist them with decision-making regarding the ongoing purchasing of pigs from that property;
- pigs to be slaughtered at domestic abattoirs must be free of clinical signs on the day of slaughter.
- particular requirements for pigs to be slaughtered at export abattoirs will depend on the importing country. It will be the responsibility of the producer to comply with these requirements. **AQIS must be consulted before pigs are permitted to move to an export abattoir.**

Animal Health Committee Working Group: for a national approach to the management of pandemic (H1N1) 2009 in pig enterprises

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