



THE AUSTRALIAN PORK INDUSTRY

BIOSECURITY PROGRAM

PREFACE

In accordance with Clause 14(a) of the Government and Livestock Industry Cost Sharing Agreement (the Deed) in respect of emergency animal disease responses Australian Pork Limited (APL) has developed a program of risk reduction measures to reduce the risk of entry and spread of emergency animal diseases.

The Australian Pork Industry Biosecurity Program incorporates a series of practical improvements to existing biosecurity measures that can be implemented by individual producers. This code of practice complements the Australian Pork Industry Quality (APIQ) Program and in conjunction with the industry's crisis management plan, Porksafes, seeks to safeguard production of pork products for the domestic and international markets.

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Executive Summary

The Australian Pork Industry Biosecurity Program is one of three APL risk minimisation measures designed to safeguard the Australian pork industry. Together with Porksafes and APIQ¹, it seeks to safeguard our animal health status, pork meat quality, production, domestic and international trade, and to aid rapid and effective response in the event of an emergency disease outbreak that may impact on pork production. It is intended that the promotion of the Australian Pork Industry Biosecurity Program will occur under APL's integrated communication strategy for animal health.

The biosecurity program has been designed to control both endemic and emergency diseases by:

- Reducing the risk of emergency diseases infecting pig farms; and,
- Limiting the movement of infectious diseases of pigs from one farm to other pig units.

The program details a **Code of Practice (COP)** for the pig industry, which incorporates a series of practical improvements to existing biosecurity measures that can be implemented by individual producers. The COP has been designed to promote:

- Compliance with regulations prohibiting swill feeding.
- Separation of domestic pigs from other animals especially feral pigs and other animals of risk.
- Recording people, animal and transport movements.
- Provision of controlled entrance with hand washing facilities and the provision of farm boots and clothing for visitors.
- Training of staff in emergency disease recognition.

The code of practice is HACCP based and has been developed in a way that will enable it, at an appropriate time and at the discretion of the industry, to be integrated into the Australian Pork Industry Quality (APIQ) standards.

The time frame for implementation of the Australian pork industry Code of Practice is over a two-year period to enable producers sufficient time to meet the recommended management practices.

¹ Details of the APIQ and Porksafes Programs can be found at www.apl.au.com

1. The Australian pork industry biosecurity program

1.1 Definition of a biosecurity program

The Australian Pork Industry Biosecurity Program provides procedures to limit the movement of infectious diseases of pigs from one farm to others.

Infectious agents can be spread by direct pig to pig contact, by illegal importation and disposal of contaminated meat products, by semen, by aerosols, by contamination of clothes and boots and people then moving between farms, by contaminated animal handling equipment, by contamination of transport vehicles, by contaminated feed or water, by biting insects and by wildlife vectors.

The level of infection depends on the degree of amplification of the disease agent, the immune response and interaction with the environment. In the case of foot and mouth disease (FMD) pigs are an important species because once infected they amplify the virus and excrete it in huge numbers before any clinical signs are evident.

1.2 Aims and scope of the biosecurity code

The aims of the code are to assist pig producers to develop and adopt a biosecurity plan to reduce the risk of emergency diseases infecting pig farms and spreading to other pig units. The code of practice has been developed in a way that will enable it, at an appropriate time and at the discretion of the industry, to be integrated into the Australian Pork Industry Quality (APIQ) standards.

The scope of the code covers the breeding and production of pigs from their birth until sale. For the purpose of the code, a "farm" comprises the farm buildings and their immediate surrounds or, in the case of outdoor pig production units, the pig paddocks.

The code can be used for control of both endemic and emergency diseases but the Australian Veterinary Emergency Plan, (AUSVETPLAN) must be followed during any outbreak of emergency diseases.

1.3 Key elements of a biosecurity program for pig farms

From an emergency disease perspective the most important things Australian producers can do are to:

- Obey regulations about swill feeding, importation of animals and importation of semen.
- Minimize the risk of contact between domestic and feral animals especially pigs and goats.
- Reduce the risk of spread with appropriate controls on pig (including dead pigs), people and other animal movements.
- Recognize an emergency disease quickly and report it to either local, State or Federal veterinarians.
- Assist regulatory animal health staff with animal movement details by keeping accurate records of pig and transport vehicle movement.

1.4 Key elements for a biosecurity code of practice

It follows then that the key elements of any biosecurity code of practice are:

- Compliance with regulations prohibiting swill feeding.
- Separation of domestic pigs from other animals especially feral pigs and other animals of risk.
- A record of animal and transport movements.
- A controlled entrance and provision of farm boots and clothing for visitors.
- A record of personnel visits.
- Staff training or awareness in emergency disease recognition

For those farms using a herd veterinarian, consultation with the veterinarian should result in a biosecurity program best fitted to that farm.

2. Management practices and their relevance to a biosecurity code

2.1 Management practices

A biosecurity program will include consideration of a number of elements (as described below). However the degree to which each of these elements is integrated into the program for each farm depends on a range of factors specific to individual farms, and consistency with disease control procedures in other animal industry sectors.

Design of the program should be dominated by the awareness that most diseases are spread from pig to pig. While there are several ways diseases can be spread, in most cases these can be managed except with aerosol or insect spread of disease, where there is little anyone can do to prevent spread.

2.1.1 Compliance with regulations prohibiting swill feeding

A major emergency disease risk comes from illegal feeding of illegally imported meat products to pigs – either accidentally or as part of illegal swill feeding practices. Swill feeding has been illegal in Australia for many years but does occur. Compliance with regulations and reporting offenders are important elements in risk reduction.

2.1.2 Farm isolation

While new farms will endeavor to establish away from other pig farms to limit the risk of spread of endemic respiratory diseases there is little existing farms can do especially if they are in pig dense areas. Further, even if they are located well away from other pig farms it is likely that they will be reasonably close to populations of sheep and cattle. Facility isolation is desirable but an unrealistic compulsory element of a biosecurity code.

2.1.3 Separation from other animals

Pigs of any origin represent a substantial disease threat. In FMD epidemics they are a particular risk because they act as amplifying hosts and may be asymptomatic during viral excretion.

Most Australian farms have ignored the feral pig or feral goat risk. There have been feral boar incursions on too many large Australian pig farms that ought to have had better controls in place. They represent a worrying emergency disease risk. Feral goats present a less recognised risk. Ideally a one metre high ringlock fence with a closed gate surrounding a pig unit, will prevent direct access to pig sheds by feral pigs or goats. Such fencing might even be proposed for outdoor units. However no matter how high the fences nor how substantial, open doors or gates render them useless in preventing contact with feral animals.

Domestic animals in direct contact with pigs present few additional risks as far as direct disease transmission is concerned. They do however present a risk if they travel to different farms. Sheep or goats used to graze between pig buildings could pose a threat in the event of foot and mouth disease occurring in a piggery, as they may be infected and sold through sale yards while clinical signs in pigs or sheep are unapparent.

Birds have been implicated in the spread of transmissible gastroenteritis but are unimportant in an Australian pig disease transmission context.. It is unreasonable and impractical to require that indoor intensive buildings, straw based shelters and outdoor pigs farms are bird proofed. However, a plentiful supply of dead carcasses and spilt feed does encourage the expansion of bird populations, and it is not unreasonable to expect that access to carcasses and feed should be limited.

Flying foxes have been demonstrated to be a source of viral infections for several species of animals including pigs. In Australia flying foxes have been implicated in the spread of Menangle virus and in Malaysia Nipah virus spilled over from the bat population to the pig population and then to people. If access to pigs is considered excessive, bird netting and habitat reduction are the only practicable measures available.

2.1.4 Single source supply of breeding stock and records of pig introductions

Producers seem curiously willing to change breeding stock suppliers for little logical reason and contravene the most fundamental principle of disease control – single source supply of replacement breeding stock. However from time to time it will be necessary for producers to change their breeding supplier. They can do this by following a careful process of matching health status or reducing risk using different disease prevention strategies. The important issue is that the change in source of supply is carefully considered and not a random event. And should be done after consulting with a veterinarian. A record of the date of any introduction and the supplier of the pigs becomes an important element of disease management.

2.1.5 Isolation facility

Most farms don't have an isolation facility for new breeding stock. As a consequence herds are denied any real protection against diseases that could be introduced with breeding stock.

A quarantine facility located some distance from the main farm and a simple protocol will protect a herd against diseases introduced with imported breeding stock. To allow for extended periods before disease is detected in source herds, a five to eight week isolation period is recommended. The isolation facility, because it will hold relatively few pigs (usually less than 100), can be located within 100 metres of the main complex. The distance disease is transmitted by aerosol is proportional to the size of the herd originating the aerosol.

An isolation facility is most likely to be used in high health status herds. Most others won't comply. Where they don't comply, the introduced stock should at least be held for a period of a month for observation. In this case close observation becomes the principal biosecurity tool. A trained person should inspect introduced stock on a regular basis. This will never prevent introduction of asymptomatic animals infected with disease but it is a good starting point.

While an isolation facility may be appropriate for herds introducing breeding stock it is impractical to apply the same conditions to farms which regularly introduce growing pigs as part of multi-site management practices. Yet not dissimilar risks apply. In well run operations, an all in all out system should ensure a degree of isolation of each batch, and any introduced disease should remain contained.

2.1.6 A load out area beyond the farm perimeter

Load out areas present a risk if a pig transport vehicle arrives on farm carrying pigs. The risk exists from aerosols and from movement of pigs onto the truck then back to the farm by mistake. Risk can be reduced by providing a "dirty" loading area that can be separated from "clean" farm areas, with a no return policy, "no return" gates, and appropriate signage.

While perimeter load outs are desirable they are only practicable on small farms. To accommodate this element pigs would have to be walked prohibitive distances to load out on large farms.

2.1.7 People movement and controlled entry

Most farms have some sort of control on visitors. People can carry infectious agents on contaminated boots and clothes and their skin can be contaminated, but basic commonsense personal hygiene together with a change to farm boots and clothes is sufficient to reduce to a very low level the risk of movement of disease between pig farms.

Signage and locked doors and gates are measures necessary to discourage pig and feed truck drivers, or unauthorised visitors, from entering sheds.

Clearly demarcated clean and dirty areas reinforce the biosecurity principles associated with people movement. Demarcated areas permit people to remove their off farm "dirty" clothes and footwear on one side of a barrier, and put on "clean" farm boots and clothing and wash their hands on the other side.

The "familiarity breeds contempt" phenomenon means that staff movement may be as much a risk as visitor movement. The biosecurity program should be designed to keep piggery staff aware of the risks entailed in off site contact with other pigs. The rules for staff entry should be similar to the rules for visitors. Staff exit is as important as entry, e.g. "clean" clothing should not be worn into the "dirty" area, or into town to do a few jobs.

Because of the consequences of disease introduction the added security provided by a pig free period of 12 hours or overnight, and a shower in policy, for some high health status herds is not an unreasonable impost, but cannot be made part of an industry wide code until accepted by the Industry.

Foot and mouth disease virus has been recovered from the nose of people working with FMD infected animals after 28 hours but not 48 hours, but down time rules can readily be invoked if there is an FMD emergency. Transmission of swine influenza virus to human caretakers despite the use of biosafety containment practices (coveralls, boots, goggles, gloves, hairnets and dust masks) has been recorded. However Australia remains free of swine influenza despite the movement of pig production sector people all over the world. A farm policy for staff and visitors with influenza provides additional security.

Footbaths have been shown to be practically useless in eliminating bacterial contamination. For them to provide any protection at all boots must be free of organic matter and spend in excess of five minutes in the disinfectant solution. For most farms it will be enough for the farm boots to be clean. Disinfectants provide little or no practical benefit beyond that.

A record of people movements will assist with trace-backs in the event of an emergency animal disease outbreak.

2.1.8 Equipment used by veterinarians and technicians

Farm codes and professional codes of practice must provide for mandatory disinfection of equipment, (such as snares or ultrasound pregnancy detection equipment,) which is moved from farm to farm. Syringes used for injection or needles used for blood collection should remain on farm. Post mortem implements used by veterinarians for sample collection should remain off farm or used in areas that are not in direct contact with the herd.

2.1.9 Vehicles

Vehicles are only a risk if they are carrying pigs or if they have not been cleaned before they arrive on the farm to collect pigs for shipment for sale or slaughter. Providing a loading area that is separated from "clean" farm areas with a no return policy can reduce the risk. Vehicles other than pig transports present little risk. Rather it is the drivers who may enter pig buildings that present the disease risk and this risk is covered by controlled entry.

2.1.10 Recognition of sick animals, disposal of dead stock and training programs for staff about disease control

Rapid recognition of abnormal disease patterns is the single most important element that will lead to prompt diagnosis and management of an emergency disease. For this to occur staff need to be trained in the recognition of animal disease and the usual and unusual diseases that may occur.

The next step in the awareness pathway is discussion of unusual signs with the herd's veterinarian hence a relationship with a vet is an important element in the recognition of emergency disease. Staff training, reinforcement and development should also occur in this environment. Understanding and implementation of hygiene programs necessary for good health control will follow.

While hygiene programs, including dead pig disposal, are part and parcel of good production practice, experience with endemic diseases has indicated that they do little to actually reduce the risk of introduction of disease. However it is likely that those farms applying good hygiene practice will be amenable to implementing biosecurity codes of practice.

For very small farms the relationship with a vet is unlikely to be achieved, so the best that can be expected is awareness of emergency disease issues and a broad sense that the local department of agriculture animal health officers should be notified of anything untoward. Disposal of dead animals via composting or burial, and a fence around the burial site, are required risk reduction practices.

3. Elements of the code of practice and time frame for implementation

3.1 The Australian pig industry biosecurity code of practice

Australian pig producers, in fulfillment of their obligations under the emergency disease agreement:

1. Comply with regulations prohibiting swill feeding.
2. Separate domestic pigs from other animals especially feral pigs and other animals of risk.
3. Record people, animal and transport movements.
4. Provide a controlled entrance with hand washing facilities and provide farm boots and clothing for visitors.
5. Train staff in emergency disease recognition.

3.1.1 Comply with regulations prohibiting swill feeding

Regulations are in place to prohibit swill feeding. Except for a few unusual cases the industry complies with this element. It can be implemented immediately.

3.1.2 Separate domestic pigs from other animals, especially feral pigs and other animals of risk

To fully implement this element of the code will, ideally, require that pig producers erect a one metre high ringlock pig proof fence around their farms and secure it with a locked gate or grid or appropriately secure their buildings to prevent access of feral pigs to the domestic pigs. While it is a sensible precaution and part of basic security, many farms will not have either of these measures of security and so will have to replace or repair doors or repair or construct a fence.

3.1.3 Record people, animal and transport movements

This element requires little additional effort or cost. The forms have been designed and part of this report. It can be implemented once the industry has had a chance to conduct an awareness and publicity campaign.

3.1.4 Provide a controlled entrance with hand washing facilities and provide farm boots and clothing for visitors

Commonsense disease control and personal hygiene make this a key part of normal farm process. While it will be common on most large farms it will not be done on many smaller farms.

3.1.5 Train staff in emergency disease recognition

Farm staff are skilled in the recognition of diseases, but this element requires an ongoing training program. It could form the basis of an industry wide biosecurity awareness program conducted over a two-year period.

3.2 Time frame for implementation of the Australian pig industry code of practice

The time frame for implementation of the Pig Industry Code of Practice is over a two-year period to enable producers' sufficient time to meet the requirements.

Element of the code	Years for implementation	Due Date
Comply with regulations prohibiting swill feeding	0	2002
Separate domestic pigs from other animals, especially feral pigs and other animals of risk.	2	2004 (end)
Record people, animal and transport movements	0	2003 (end)
Provide a controlled entrance and provide farm boots and clothing for visitors	2	2004 (end)
Train staff in emergency disease recognition	2	2004 (end)

Appendix one

Hazard Analysis and Critical Control Point (HACCP) based biosecurity plan

HACCP techniques form the basis of the Australian Pork Industry Quality program. HACCP provides an organisational framework to identify hazards and develop monitoring and control procedures at critical points with some objectivity.

The steps below provide the basis for implementing a farm HACCP biosecurity plan.

Step	Action
1	Form a HACCP team and define the scope of the HAACP plan
2	Describe the products produced by the farm
3	Construct a detailed flow chart of the production process and conduct on site verification
4	List all the potential emergency disease hazards associated with each stage of the production process, conduct a hazard analysis and consider any control measures to control hazards
5	Determine critical control points (CCP)
6	Determine critical limits for each CCP
7	Establish a monitoring system for each CCP
8	Establish corrective action plans for CCP deviations
9	Establish record keeping and documentation
10	Establish verification procedures
11	Train staff for HACCP implementation
12	Commence monitoring the CCPs

1. Form a HACCP team and define the scope of the HAACP plan

The HACCP plan best comprises 3-5 people who work on the farm. It could also include some technical advisors – a vet or management consultant. The scope of the plan relates to the biosecurity of the farm in relation to emergency diseases.

2. The products produced by the farm

The products produced are pigs for sale at a range of different ages (from weaners through to adult breeding stock) for sale as growing pigs, breeding pigs and for slaughter.

In addition to the pigs farms also produce effluent and or bedding from sheds that is distributed to other farms as fertilizer or sold commercially as fertilizer for horticulture and home gardens.

3. Sample flow chart of processes, inputs and operating procedures for production of pigs

Processes	Inputs	Operating procedures
Cleaning the quarantine area prior to introduction of new pigs	Breeding stock	Piggery operation
Unloading pigs		Herd health
Introducing new breeding pigs	Semen	
Introducing semen		
Introducing growing pigs	Growing pigs	
Housing breeding pigs	People	People & equipment movement procedures
Pig breeding		
Housing farrowing sows	Equipment	
Farrowing pigs	Temperature	
Processing baby pigs	Water	Checking water points
Housing weaners	Vehicles	Feeding
Weaning		
Separating sick pigs to sick bays	Feed and by products Medication	Staff training
Treating pigs		Inspecting pigs
Housing growing pigs	Aerosols	Moving pigs
Growing pigs		
Selecting pigs for sale		
Cleaning pens	Disinfectants Insects	
Loading pigs		APIQ program checks
Selling pigs		Managing the farm environment
Disposing of dead pigs	Rodents, feral animals, domestic animals	Vermin control procedure
Selecting pigs for sale or breeding		Segregating farm pigs
Litter removal		Managing effluent disposal
Introduction of litter	Litter	
Transporting pigs		

4. List all the potential disease hazards associated with each stage of the production process, conduct a hazard analysis and consider any control measures to control hazards.

4.1 For each stage of the flow chart the following questions should be asked:

- What are the inputs that could result in disease hazards?
- What emergency disease hazards are likely to be introduced by these inputs?
- The HACCP team should compile a list of inputs (such as those provided below) that could result in a (disease) hazard entering the herd.

Hazards, Means of Spread and Control Measures

Disease Hazard	Means of spread via inputs	Control Measures
Foot and mouth disease (FMD)	Direct pig to pig contact, semen, aerosols, meat products, swill feeding, fomite spread ² , via people or heavily contaminated water.	Movement controls on semen, people and products that have been on other farms or are derived from animals. Swill feeding prohibition. Chlorinate water supplies or prevent direct stock access to drinking water.
Swine vesicular disease (SVD)	Direct contact, semen, meat products, swill feeding, fomite spread.	Movement controls on animals, semen, people and products that have been on other farms or are derived from animals. Swill feeding prohibition.
Vesicular exanthema (VE)	Direct contact, semen, meat products, swill feeding.	Movement controls on pigs, semen. Swill feeding prohibition.
Vesicular stomatitis (VS)	Biting insects, fomites	Movement controls on pigs, semen.
Aujeszky's disease (AD)	Direct contact, semen, aerosols, contamination of feed by dead rats, mice and cats.	Movement controls on pigs & semen. Filters on grain entry points to silos.
African swine fever (ASF)	Direct pig to pig contact, semen, meat products, swill feeding, fomite spread, Ornithodoros ticks	Movement controls on pigs, semen and people. Swill feeding prohibition.
Classical swine fever (CSF)	Direct pig to pig contact, semen, meat products, swill feeding, fomite spread,	Movement controls on pigs, semen and people. Swill feeding prohibition.
Rabies (R)	Dog or bat bites	Fencing to prevent dog movements
Trypanosomiasis (Tp)	Biting flies	Movement controls on pigs
Trichinosis (Ts)	Contact with infected rats or swill feeding	Movement control on pigs or meat products

² Fomite: inanimate object or material on which infectious agents may be conveyed, e.g. bedding, decks of trucks used to transport pigs, syringes, AI catheters, faeces, boots and clothes.

Hazards, Means of Spread and Control Measures (continued)

Disease Hazard	Means of spread via inputs	Control Measures
Swine influenza (SI)	Pig to pig contact. Human spread theoretically possible	Movement control on pigs. Sick persons policy for farms
Porcine respiratory coronavirus (PRCV)	Pig to pig contact	Movement control on pigs
Porcine epidemic diarrhoea Virus (PEDV)	Pig to pig contact	Movement control on pigs
Transmissible gastroenteritis (TGE)	Pig to pig contact	Movement control on pigs
Menangle virus (MV)	Flying foxes to pigs	Movement controls on pigs Location of pig farms outside flying fox habitat. Bird netting installed
Nipah virus (NV)	Flying foxes to pigs	Movement controls on pigs.. Location of pig farms. Bird netting installed
Porcine reproductive & respiratory syndrome (PRRS)	Direct contact, semen, aerosols	Movement control on pigs & semen

4.2 What is the significance (severity and risk) of the disease hazard?

4.2.1 Hazard analysis matrix to determine significance (severity and risk) of a hazard

The modified matrix below permits a consistent and objective approach to determining the significance or otherwise of any identified disease hazard. This then allows for the identification of CCP status control measures at a glance, i.e. for those control measures developed to eliminate, prevent or reduce *significant* hazards to an acceptable level at least *one* must be a CCP.

Each disease hazard is scored for its severity or consequence and risk likelihood.

Severity (consequence)

1. Can result in business failure
2. Can lead to serious illness or significant economic loss
3. Can result in economic loss
4. Can disrupt product supply
5. Not of significance

Risk (likelihood)

- A. Common occurrence
- B. Known to occur or "it has happened at our premises"
- C. Could occur or "I've heard of it happening" (published information)
- D. Not likely to occur
- E. Practically impossible

4.2.2 Significant hazards: combining severity and risk

Numbers in boxes are indicators of the severity of the hazard combined with the likelihood of its occurrence.

A value of 1-10 indicates a **significant hazard** (i.e. above the line) which signifies that a CCP (s) should be put in place. CCP's are established using a CCP decision tree. Hazards that are not significant will have values of 11-25. It is up to the HACCP team to determine whether it makes good sense to have any control measures in place (i.e. CP status control measures) to further reduce the risk of the hazard.

By recording the values in the hazard analysis worksheets, others can then better understand the logic applied by the original HACCP team.

	RISK				
SEVERITY	A	B	C	D	E
1	1	2	4	7	11
2	3	5	8	12	16
3	6	9	12	17	20
4	10	14	18	21	23
5	15	19	22	24	25

4.2.3 Significance of disease hazards

Disease hazards	Severity	Risk	Significance
Foot and mouth disease	1	C	4
Swine vesicular disease	1	C	4
Vesicular exanthema	1	C	4
Vesicular stomatitis	1	E	11
Aujeszky's disease	2	C	8
African swine fever	2	C	8
Classical swine fever	2	C	8
Rabies	2	D	12
Trypanosomiasis	4	E	23
Trichinosis	2	D	12
Swine influenza	3	B	9
Porcine respiratory coronavirus	3	C	13
Porcine epidemic diarrhoea virus	3	C	13
Transmissible gastroenteritis	2	C	8
Nipah virus	2	C	8
Menangle virus	2	C	8
Porcine reproductive & respiratory syndrome (PRRS)	2	C	8

4.2.4 Hazard analysis chart

Input	Hazard	Significance	Control measure
Breeding stock	FMD, SVD, VE, VS, AD, ASF, CSF, R, Tp, Ts, SI, PRCV, PEDV, TGE, PRRS, MV	4,8,12, 13, 23	Purchase of breeding stock from an approved source Inspection of pigs on arrival by trained staff
Semen	FMD, SVD, VE, VS, AD, ASF, CSF, PRRS	4, 8, 12	Purchase of semen from approved suppliers
Growing pigs	FMD, SVD, VE, VS, AD, ASF, CSF, R, SI, PRCV, PEDV, TGE, PRRS,	4,8,12, 13, 23	Pigs supplied from approved herds of known health status.
Equipment includes veterinary equipment, pregnancy testing devices, backfat testers, AI equipment, cameras, clipboards	FMD, SVD, ASF, CSF,	4,8,12	Only approved or disinfected equipment permitted to enter
People includes staff, consultants and maintenance staff	FMD, SVD, VE, VS, AD, ASF, CSF, R, SI, PRCV, PEDV, TGE, PRRS,	4, 8, 12	Essential visitors only policy Controlled entrance Boots and clothing supplied
Vehicles	FMD, SVD, VE, VS, AD, ASF, CSF, R, SI, PRCV, PEDV, TGE, PRRS	4, 8, 12	Vehicle drivers not permitted onto "clean" farm premises or boots and clothing supplied. Load out ramp at farm perimeter Decks of pig transport vehicles cleaned and disinfected
Feed	AD	8	In the event that AD becomes endemic grains supplied are filtered to prevent accidental contamination of feed with dead animals
Drinking water	FMD, CSF, SVD, ASF	4	Prevent direct contact between feral and domestic animals and water used for farm supply or use chlorinated water.
Litter, bedding	FMD, SVD	4	Bedding sourced from grain farms where no animals suspected of emergency disease infection are kept
Rodents, feral animals, flying foxes, domestic animals	FMD, SVD, VE, VS, AD, ASF, CSF, R, SI, PRCV, PEDV, TGE, PRRS, NV, MV	4,8,12	A ringlock fence one metre high surrounding the farm or buildings that prevent direct contact with feral pigs, goats or dogs.
Aerosols	FMD, SVD, AD, SI, PRRS	4,8,12	Pig farms geographically isolated
Insects	JE, VS, Tp	4,8,12,23	None possible
Effluent and used litter	FMD, SVD, CSF, ASF	4	Prevent direct contact between fresh effluent and other domestic animals

4.2.5 What control measures can prevent, reduce or eliminate the hazard?

- 4.2.5.1 Purchase of breeding stock or growing pigs from an approved source.
- 4.2.5.2 Inspection of pigs on arrival by trained staff.
- 4.2.5.3 Purchase of semen from approved suppliers.
- 4.2.5.4 Visitors policy
- 4.2.5.5 Controlled entrance
- 4.2.5.6 Boots & clothing supplied by the farm.
- 4.2.5.7 Only approved or disinfected equipment permitted to enter.
- 4.2.5.8 Load out ramps at farm perimeter or a non return area used.
- 4.2.5.9 Decks of transports cleaned and disinfected.
- 4.2.5.10 Grain filtered.
- 4.2.5.11 Bedding used sourced from FMD free areas.
- 4.2.5.12 A ringlock fence surrounding the pig farm and effluent disposal area.
- 4.2.5.13 Locate farms in areas away from other pigs.
- 4.2.5.14 Prevent direct contact between fresh effluent and other animals.

5. Critical control points

A critical control point (CCP) is the stage of the production process at which a control measure that is essential to prevent or eliminate the hazard or reduce it to an acceptable level can be applied. A CCP is where a "must do" control measure is applied.

A key premise in determining if a CCP exists is that if a subsequent step in the process eliminates or reduces a hazard, then a CCP allocated prior to this process stage is not required. However, this does not preclude a Control Point (CP), or where a "should do" control measure is applied, at a prior process stage.

A Hazard Analysis Chart (see 4.2.4) should be compiled to ensure all Process Stages are considered and as a source of information for auditors as to how CCP's were developed.

5.1 Processes, hazards, critical control points and critical limits

Process	Hazard	CCP	Critical limit
Introduction of breeding and growing pigs.	FMD, SVD, VE, VS, AD, ASF, CSF, SI, PRCV, PEDV, TGE, PRRS, JE	Ordering pigs Inspection on arrival by trained staff	Stock only sourced from approved suppliers Only trained staff inspect introduced pigs No sick pigs with signs of emergency disease permitted entry Pigs enter via gate through secure perimeter
Introduction of semen	FMD, SVD, VE, VS, AD, ASF, CSF, SI, PRCV, PEDV, PRRS, JE	Ordering semen	Semen purchased only from an approved centre operating under a biosecurity code of practice
Entry of equipment	FMD, SVD, VE, VS, AD, ASF, CSF, SI, PRCV, PEDV, TGE, PRRS	On arrival	Equipment is visibly clean and has been disinfected by an approved method
Entry of people – staff and visitors	FMD, SVD, VE, VS, AD, ASF, CSF, SI, PRCV, PEDV, TGE, PRRS	On arrival	Only prescheduled healthy people (including staff) are permitted entry. They are supplied with clean farm boots and clothing and wash hands before entry
Transporting pigs	FMD, SVD, VE, VS, AD, ASF, CSF, SI, PRCV, PEDV, TGE, PRRS	On booking transport services and arrival at loading ramp	Only approved transporters permitted to carry stock. Transports are visually clean.
Introduction of litter or bedding	FMD	On ordering litter or bedding	No FMD in Australia

The process stages presented above were considered to be critical control points for the significant hazards listed.

5.2 HACCP audit table

Hazard	Control measure	Critical limit	Monitoring	Corrective action	Records
FMD, SVD, VE, VS, AD, ASF, CSF, SI, PRCV, PEDV, TGE, PRRS, JE, MV, NV	Breeding pigs supplied from approved herds of known health status.	Breeding stock supplier has a veterinarian available for consultation	What: Pigs How: questioning When: On ordering Who: Trained staff	Reject pigs	List of approved suppliers and copy of delivery docket
FMD, SVD, VE, VS, AD, ASF, CSF, SI, PRCV, PEDV, TGE, PRRS, JE, MV, NV.	Inspection of pigs by trained staff	Pigs healthy on arrival	What: Pigs Where: Farm boundary How: Inspection and questioning When: On arrival Who: Trained staff	Reject pigs	Date of inspection, copy of delivery docket and actions taken
FMD, SVD, VE, VS, AD, ASF, CSF, SI, PRCV, PEDV, TGE, PRRS, JE, MV, NV.	Purchase of semen from approved suppliers	Semen centre operates under an approved biosecurity code of practice	What: Semen centre How: questioning When: On ordering Who: Trained staff	Reject semen	Date of ordering, copy of delivery docket and actions taken
FMD, SVD, VE, VS, AD, ASF, CSF, SI, PRCV, PEDV, TGE, PRRS, JE, MV, NV.	Growing pigs supplied from approved herds of known health status.	Supplier has a veterinarian available for consultation and records of health checks	What: Pigs How questioning When: On ordering Who: Trained staff	Reject pigs	Date of inspection, copy of delivery docket and actions taken
FMD, SVD, VE, VS, AD, ASF, CSF, SI, PRCV, PEDV, TGE, PRRS.	Only prescheduled visitors essential to the farm's business are permitted entry.	Prescheduled visitors supplied with clean farm boots and clothing. Visitors wash hands before entry	What: Visitors Where: Entrance How: Log records When: On arrival Who: Trained staff	Deny entry	Entry log and actions taken

HACCP audit table continued

Hazard	Control measure	Critical limit	Monitoring	Corrective action	Records
FMD, SVD, VE, VS, AD, ASF, CSF, SI, PRCV, PEDV, TGE, PRRS.	Decks of pig transport vehicles cleaned and disinfected	Approved transport suppliers follow an approved code of practice. Transports to be visually clean.	What: Transports Where: Boundary How: Inspection, questioning and list of approved suppliers When: On arrival Who: Trained staff	Deny entry and disinfect by an approved method	Supplier list, date of inspection, shipping log and actions taken
FMD, SVD, VE, VS, AD, ASF, CSF, SI, PRCV, PEDV, TGE, PRRS.	Bedding sourced from approved grain farms where no animals suspected of emergency disease infection are kept	Declaration of emergency disease in Australia	What: Litter How: questioning and list of approved suppliers When: On ordering Who: Trained staff	Reject bedding	Activated in the event of emergency disease: Date of entry Delivery docket
FMD, SVD, VE, VS, AD, ASF, CSF, SI, PRCV, PEDV, TGE, PRRS.	A ringlock fence one metre high surrounding the farm or buildings that prevent direct contact with feral pigs.	A fence with a gate that <u>has</u> to be opened or buildings that preclude direct contact with feral pigs, goats or dogs or a management program that minimizes the risk of contact with feral animals or rodents	What: Fence, buildings or feral animal or rodent program Where: Farm boundary How: Inspection When: Monthly Who: Trained staff	Repair fences or buildings. Implement feral animal/rodent control program	Dates of inspections or activation of programs, records of feral animal incursions, and any actions taken.
FMD, SVD, VE, VS, AD, ASF, CSF, SI, PRCV, PEDV, TGE, PRRS.	A fenced dead pig disposal area	A fence around the dead pit area	What: Fence Where: Outside pig farm boundary How: Inspection When: Six monthly Who: Trained staff	Repair fences	Dates of inspections and any actions taken.
FMD, SVD, VE, VS, AD, ASF, CSF, SI, PRCV, PEDV, TGE, PRRS.	Prevent direct contact between fresh effluent and animals	Effluent distributed or , composted in an approved manner	What: Effluent or litter How: Inspection When: On disposal Who: Trained staff	Remove from farm or store in an approved manner	Date of inspection, and actions taken

5.3 Critical limits, monitoring, corrective action and records

The critical limit or limits for each control measure represents the boundaries of control acceptable for that control measure.

Monitoring of critical limits by either inspection or tests determines whether the hazard is controlled at that process stage. Five key aspects need to be defined for each critical limit, namely what, how, where, when and who? See table 5.2.

Corrective action should include a decision on what to do when limits for a CCP are exceeded, correction of any part of the process stage if warranted and documentation of the corrective action taken to prevent further violations of the critical limits.

Records are easily kept by designing record forms, examples of which are given in Appendix 3

An appropriate means of developing and recording the key components of the Biosecurity Plan is to produce a HACCP Audit Table (see 5.2). Significant hazards and control measures defined in the Hazard Analysis Chart (see 4.2.4) are transferred to the HACCP Audit Table to rows identifying process stages in the flow charts to which they apply. Critical limits for each CCP, monitoring systems and corrective action plans are then added to the HACCP Audit Table.

5.4 Step 10 – verification program

The Biosecurity HACCP Plan should be verified to ensure that when followed correctly it achieves the documented aims. This may be achieved by:-

Independent audits of control measures by farm management or a technical advisor.

Independent audits of CCP critical limits by farm management or technical advisor in addition to the routine monitoring undertaken under the HACCP Plan.

Evidence that diseases have not occurred on farms because standards have been achieved.

The technical adviser within the HACCP team will be helpful in developing procedures to implement this step.

Third party auditors will require documented details of how and when the various elements of the HACCP Plan were verified.

5.5 Step 11 – Training

Staff may need to undergo training to understand HACCP principles. Personnel nominated to monitor CCP's need to be adequately trained to do so. Records should be kept of training activities identifying the training description, the date undertaken and signed off by the trainee.

5.6 Step 12 – commence monitoring the CCP's

A “work instruction” should be prepared to detail how control measures at a CCP are to be implemented and monitored. Some examples of standard operating procedures (SOP's) are attached. They complement SOP's that might currently exist as part of farm APIQ plans.

For the CCP's identified in this code, work instructions should be developed for:

- Health procedures
- Vermin control
- Introduction of pigs and semen
- Pig movement and loading
- Staff training
- Segregation of farm pigs from other animals
- People and equipment movement