

## Biosecurity principles and program

### Preamble

It is now a requirement of PigCare that each farm has a documented biosecurity program that was developed in consultation with their veterinarian. The following are notes to assist you in putting together such a program as opposed to a cut-and-paste template as it is not possible to have a 'one size fits all' generic biosecurity program. Every farm has its own location, unique setup and contacts with the outside world and thus its own unique risk profile. Furthermore, the measures that are both practical and possible to manage particular risks will differ between farms. Consequently, the more you tailor your biosecurity program to your own farm, the more relevant and effective it is likely to be.

To start the process, think about the contacts that occur between your farm (e.g. staff, pigs) and the world beyond your gate (e.g. other farms, abattoirs, other pigs) and what connects them (e.g. trucks, drivers, service personnel). All of these contacts and connections present a biosecurity risk - that is the potential for an unwanted organism to enter the herd. The risk or probability of a particular event occurring may be very low or very high and anywhere in between. It is important to identify these risks to determine what measures may reasonably be taken to reduce or eliminate the likelihood that they will occur. Some risks can be managed at the point of entry to the farm, its perimeter, e.g. those associated with people or vehicle movements, while others such as airborne transmission and bird movements are largely uncontrollable at this point. Some control over birds can be achieved by managing local bird populations and, for indoor farms, by bird-proofing buildings. Similarly, by keeping sources of airborne contaminants as far away from your farm as is possible, the risk they present to you is reduced – but cannot be eliminated. This is no reason not to do whatever you can practically and affordably do.

Amongst those risks that can be managed either partially or completely it is also important to determine which risks are the riskiest and to understand the consequences of potential breaches in order to get the most benefit from your efforts. For instance, an event that carries a biosecurity incursion risk of 0.01 per event but where the event occurs only twice a year presents less risk to the herd's health status than an event with a risk of 0.00001 that occurs 10 times each day i.e. an annual risk of 0.02 and 0.036 respectively. Of course, knowing what the actual 'risk' associated with any given event is may be impossible to determine but common sense would suggest that a dirty truck presents a much greater risk than a clean one.

While contacts present a biosecurity risk, the specific diseases particular contacts may introduce will vary. For instance, the probability that a wild pig that gets onto the farm will introduce lice may be high, while the risk of it introducing *Mycoplasma hyopneumoniae* (MH) may be low. Conversely, if a truck loaded with pigs from another farm that was both MH-positive and infected with lice was to park outside the farm gate, there is a risk that MH may enter the farm through airborne spread while it would be extremely unlikely to introduce lice. Similarly, were this event to happen once a week, the risk of disease introduction would be far greater than if it only happened once. The risk of airborne spread will also depend on how many pigs are on the truck, what their MH-status is (are they vaccinated), air conditions and wind direction.

The consequences of a disease entering the herd will depend on the disease. Some are far more disruptive than others. The relative impact of the introduction of MH or lice is vastly different. Lice would have little impact on farm profitability and could be affordably and easily eradicated

from the herd. whereas the same cannot be said for MH, which would introduce significant ongoing control costs and production losses and would be a challenge to eradicate.

The biosecurity threat different events pose to your farm can be managed by mitigation steps you impose upon each event, either by reducing the risk associated with the event or the frequency with which the event occurs. For instance, there may be little you can do to stop trucks driving past the farm with pigs on them, but you may be able to stop the truck from parking near the farm. Every time a person re-enters the farm they present a risk, and one of the greatest risks must be farm staff simply because they re-enter the farm on a daily basis. You can, however, almost eliminate this risk by minimising the contacts staff have with 'risky' activities (no visiting other farms, no pigs to be kept at home, no pig hunting) and by imposing a period of down time between any off-farm pig contact and a return to work. In addition, you could require staff to undergo some form of decontamination before they re-enter the farm. The most effective measure would be to require staff to 'shower-in' although you could achieve a lot by simply requiring them to leave off-farm footwear and vehicles outside the farm perimeter. It is your responsibility to determine which mitigation steps you will impose on each risk you identify.

Each measure taken to reduce the risk of an incursion has an associated cost. It is important to balance this cost with the anticipated reduction in risk, the consequences of realised risk and your tolerance of risk. Some risks can be eliminated by simply removing the risky activity. For instance, the risk live pigs present can be removed by closing the herd and the risk visitors present can be removed by not allowing visitors.

So, in putting together a biosecurity programme for your farm, first identify all the risky activities you can think of (trucks collecting pigs, feed deliveries, school visits), which of these you can eliminate completely by avoiding, and what you can do to reduce the risk associated with those activities that are necessary. Approach it with the underlying assumption that everything beyond the farm gate (people, vehicles, machinery) may be contaminated with unwanted organisms, how this contamination may occur, how this could be transferred onto the farm and how this may be transmitted to pigs.

Your documented biosecurity programme, **unlike this document**, need not long and verbose. One or two sides of bullet-points may be all that is needed. What is important is that it is clear, as simple as possible and actual protects your farm.

### *Unwanted organisms*

Unwanted organisms include both those endemic and exotic too New Zealand that may infect and affect pigs and that are not on your farm at present. They also include different strains of organisms that may already be in your herd. For instance, your herd may have APP (*Actinobacillus pleuropneumoniae*) but it probably only has one or if you are unlucky two serotypes. You don't want the others!

Don't assume that just because a disease is not in New Zealand it is not a risk to your farm. For instance, we know a portion of imported pork carries viable PRRS virus. Some of this pork may unintentionally enter your farm in a lunchbox. So do you allow staff on your farm to bring pork products to work? The reality is we probably will not know if ASF virus is in New Zealand until it shows up in one of your herds. But we do know you can keep it out if adequate biosecurity measures are in place – but what's adequate? - how well is the truck that carts your pigs to market cleaned after it last went to the abattoir? – shall we continue?

Start by considering possible routes of entry.

### *Routes of entry*

Below are some of the routes by which organisms may enter your farm. This list is unlikely to be complete - but it is hoped that it will give you a starting point.

- 1 Commercial pigs
- 2 Transport vehicles and their drivers
- 3 Staff (including their body, clothing, footwear, vehicles, lunchbox)
- 4 Other visitors and people (including their equipment and vehicles)
- 5 Feed and feed ingredients
- 6 Airborne
- 7 Other livestock, vermin and birds
- 8 Semen
- 9 Straw
- 10 Wild pigs

### *Pigs*

You will be aware that pigs carry pig diseases. Indeed, the risks presented by most of the other routes above are largely the consequence of pigs albeit indirectly.

- Operate a closed herd. An overriding principal is to limit the number of pigs entering your farm. If you can limit these to zero, well and good. It is the position New Zealand as a country takes. There are other considerations, however, and these may mean that you buy in replacements or weaners. If you buy in pigs, you are totally dependent on the biosecurity measures taken by your supplier(s).
- Limit the sources of pigs. If you buy pigs e.g. replacement boars, buy these from only one source and make sure that source has even better biosecurity than you. Similarly, if you buy in weaners to finish, source these from as few sources as possible and avoid introducing new sources.
- Quarantine pigs on arrival. This can double as a period of acclimatization although that is not the focus here. If you get a delivery of gilts once a month, keep the latest delivery isolated for as much of the month as you can before the next delivery arrives. Use a facility as far away from the herd as possible for quarantine e.g. an old hay shed on the other side of the farm. Remember why they are in isolation. It's because they may have a bug you don't want. For this reason, you need to impose biosecurity barriers between the isolation facility and your herd. For instance, if its possible have someone other than piggery staff service the gilts. If the gilts must be serviced by farm staff, change boots and overalls before servicing the gilts and do it last thing in the day so that the relevant person will have at least one shower/bath before having contact with the herd again. Have a footbath with disinfectant at the door to the isolation facility and stand in it for at least a couple of minutes whenever you exit.

Document what your policy and procedures are in your biosecurity programme. It need only be one or two bullet points e.g.

- No live pigs are to be brought onto the property under any circumstances
- Semen is only to be sourced from (?)

### *Transport vehicles and their drivers*

The principles outlined here focus on trucks but many of these principles apply to other risk items. Consideration needs to be given to how vehicles or their drivers may become contaminated, how this contamination may be conveyed to the farm and then onto the farm, and how this contamination may then be transmitted to pigs. Stopping one of these transmission mechanisms is all that is needed if it is fool proof. But few things are. To address this, try to break the chain of events at more than one point if possible.

An example of a chain of events may be: driver of stock truck exits vehicle at abattoir to off-load pigs from another farm; his footwear becomes contaminated either by the pigs he is unloading or from faecal contamination from yet other pigs unloaded previously; on re-entering the cab of the truck the footwell becomes contaminated; truck driver exits cab of truck to load your pigs [a few days may have passed and the truck hosed out in the interim]; driver transfers contamination from the footwell wherever he walks on your farm during the loadout process; your staff walk over this ground, in turn, contaminating their footwear; after loadout staff enter pig buildings without cleaning and disinfecting their foot wear and transfer organisms into pig pens; one pig picks up the organism; hey presto!

Such as scenario would be sufficient to transmit diseases such as the PED (Porcine Epidemic Diarrhoea virus).

Think about all the regular truck movements onto your farm. Where might they become contaminated? For most of you this comes down to the truck carting your pigs to market ± those delivering feed. If the stock truck carts pigs from farms other than yours, the truck will be heavily and permanently contaminated. There is **no** truck cleaning facility in New Zealand that would change this reality significantly – so don't kid yourself that its clean just because it was 'hosed out'. Even if the truck only carts your pigs, it carts them to an abattoir that kills other pigs, often from many farms. The abattoir is thus a high-risk area for contamination of the truck and driver.

So, in summary, identify where contamination of the truck may occur e.g.

#### **For a stock truck**

- when carrying pigs other than those from your farm;
- by the transfer of pig manure onto the truck e.g. by driver;
- wheels of the truck by driving over ground that is contaminated by other trucks, drivers, pig manure or pigs;
- by the driver entering the cab with footwear contaminated when loading other pigs or unloading at the abattoir and contaminating the footwell.

#### **For a feed truck**

- when delivering feed to another farm;

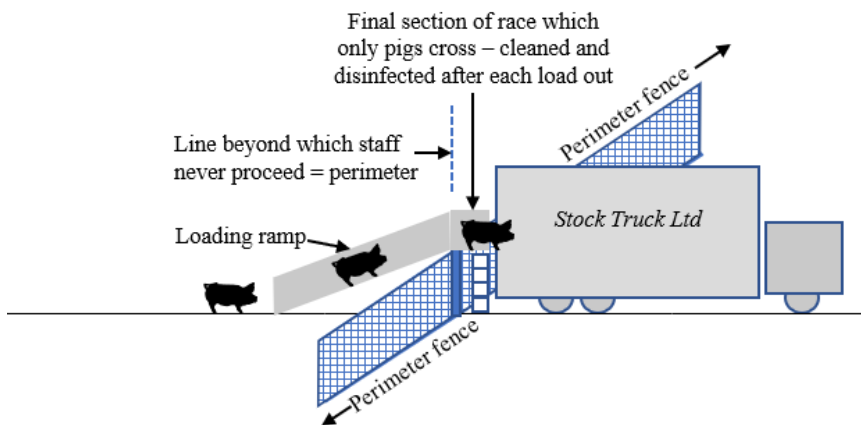
- when collecting the feed from the mill.

Once risk pathways have been identified, consideration should be given to how you can mitigate against these e.g. through cleaning and disinfection or by separation.

**With a stock truck** you must assume as an absolute minimum that contamination at the abattoir is possible (likely?). There is little you can do to avoid this unless you are the sole pig supplier to an abattoir. Focus on what can be done between the abattoir and your farm and at your farm.

You might ask yourself:

- is it possible to have your pigs carted by a truck/firm that carts no other pigs – yes/no?
  - If yes, why wouldn't you? Stipulate it in a contract with the trucking firm.
  - If no (or yes), what cleaning of the truck is achievable before visiting your farm?
  - What is done to decontaminate the footwell?
- When at your farm, does the truck have to enter the piggery facility? The ideal is NO i.e. lairage is on the perimeter and the loading ramp crosses the perimeter fence, access to the loading race is via a different driveway from that for other vehicles, the driver never enters the piggery perimeter and staff never go beyond the perimeter. A small stretch of 'no man's raceway' straddles the fence line that only pigs cross (in one direction) and this is cleaned and disinfected (in an inside to outside direction) after each loadout.

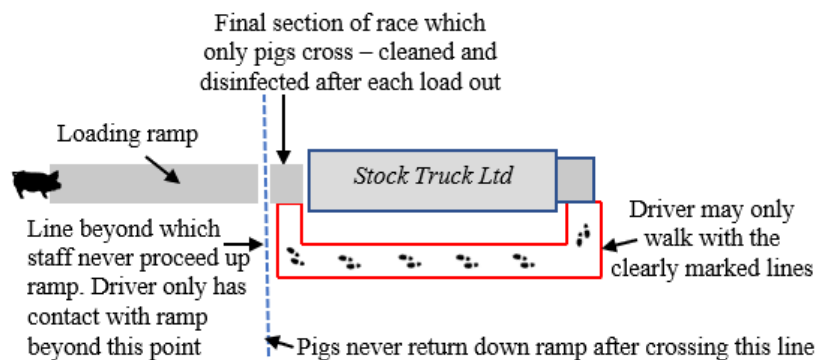


With an arrangement such as that above, the only part of the farm the truck has contact with is the section of race beyond the perimeter which is disinfected after each loadout – so any contamination on the back of the truck does not enter the farm. As there is a different access route, cross contamination from any organisms on the trucks tyres is avoided, The driver has no reason to enter the piggery and the ground he walks on from cab to the back of the truck is never walked on by staff – again avoiding cross contamination. It is essential that pig movement is one-way i.e. once a pig crosses the line of the perimeter fence it never returns. Staff do not proceed up the ramp beyond the perimeter fence.

- Could you achieve something like this on your farm?

- Could you adapt what you have?
- How will you document it in your biosecurity document?

The above is the 'ideal' but for many of you your lairage is within the farm's perimeter and to move it is not possible. How then could you best approach what the above achieves in your situation? That is, how can you limit contact between the truck and your farm? How can you minimise cross-over contamination with the driver? For instance, you can limit where the driver walks and manage that area e.g. your biosecurity document may specify that the truck driver may only walk within the area designated by the red lines.



As the loading race is always in the same place and the truck always parks in the same spot, there is no reason the driver should ever stray from the clearly demarcated lines. After each load-out this area could be decontaminated with disinfectant. You might also impose measures to limit the amount of contamination the driver is likely to cause by requiring the trucks footwell be disinfected before the truck collects your pigs, providing footwear for the driver and so on. As above, the last part of the loading race with the truck and driver make contact is not walked on by staff and is disinfected after each loadout.

Detail the procedure that you determine to be appropriate for your farm in your biosecurity document.

**With a feed truck** you should ask similar questions and apply similar controls. If you buy in compounded feed, it is best to have the silos situated on the perimeter so that feed can be augered into these without the delivery truck entering the piggery. This also negates any reason for the driver to enter the piggery. For many of you this is not possible given the layout of your farm. The same principals apply as were described for stock trucks above. Think about measures that you can impose that limit the exposure of your piggery to contamination from the truck and the driver e.g. restrict where the driver may walk within the piggery, require the footwell of the truck to be disinfected before entering your farm, provide alternative footwear for the driver to wear. It sounds simple, but there are fishhooks. For instance, you may provide footwear for the driver to wear while driving around the farm from silo to silo. However, if the footwell of the truck is contaminated – the least you will achieve is contamination of your footwear rather than protection of your farm. Ask questions such as:

- Has the truck made deliveries to any other farms that day? - that week? - which farms? - how far has it driven on tar seal in the meantime?

Assuming that contamination of the vehicle/truck may have occurred, it is necessary to consider whether the contamination is likely to survive the trip to the farm? For example, if the footwell of a truck entering your farm was contaminated six hours ago, say at the abattoir, it is likely to be just as contaminated now unless some targeted intervention occurred in the meantime. In contrast, the tyres of the same truck, despite becoming contaminated at the same time are likely to be significantly less contaminated now if the truck has just driven 300 km on tar seal.

Thus, ask the questions alluded to above i.e.

- how long an interval is there between exposure to the contaminant and arrival on the farm?
- was the footwell cleaned and disinfected prior to entering the farm?
- was the driver's footwear cleaned and disinfected before entering the farm?
- can you trust that the above actually happened?

Whatever measures you decide to impose, detail these in your biosecurity document.

### *Cleaning trucks*

This is something that needs to be done prior to the truck visiting your farm. At present truck cleaning in New Zealand is woeful at best. Hosing out the truck will not decontaminate it, but it will make it much less risky as loose hunks of manure that might otherwise fall off the truck will be removed – so encourage as much of this sort of thing as your carrier will wear. Disinfection of the truck is only reliable if it this is done after it is thoroughly washed.

Whatever cleaning of the truck occurs, or is said to occur, the bottom line in my opinion is that you should treat all trucks as contaminated and impose measures that you control to manage this– such as those described above.

### *Staff*

When considering biosecurity measures to impose on staff, as with trucks, one needs to ask 'how might staff become contaminated' and 'how might they bring this contamination to work'. Assuming contamination may occur, can staff be relied upon to (1) inform you/management and (2) take measures to avoid bringing the contamination to work? And, assuming management are aware of potential contamination, what measures are both reasonable and effective?

The **number one** exposure that needs to be avoided by staff is that with other pigs e.g.

Other pig → staff → Your pig

Other pig → staff clothing → Your pig

Other pig → house mate of staff → staff/staff-clothing/footwear → Your pig

Clearly the simplest preventative measure is to avoid contact with the 'Other pig'. Assuming such contact has occurred, the best means of interrupting the pathway to Your pig is for staff and their clothing to be decontaminated (showered/washed) before returning to work. While a blunt instrument, time increases the likelihood of such events occurring between exposure and a return to work and for this reason forms an important but uncertain part of most biosecurity programs.

Staff may also bring organisms to the farm as part of:

1. Themselves. Staff that are infected with an organism and come to work will bring that organism with them and may shed it at work e.g. influenza virus. It may be possible to reduce the risk presented by this pathway by excluding sick staff from the workplace but the disruption to the workplace is likely to far exceed the benefit. This is because shedding of the organism in conditions such as influenza usually commences before the onset of symptoms that would lead to the person concerned concluding that they were sick. Still, it's up to you if you decide to include something about staff staying away if they are sick in your biosecurity programme.
2. Their lunch. Food products brought onto the farm for personal consumption may contain unwanted organisms, especially pork. The potential for these products to be a source of infection for a pig need to be considered in order to adopt a sensible position. For instance, it is unlikely that staff will bring raw pork to work for lunch and most processing kills the majority of organisms – but some can survive depending on pH, temperature and so on. A sensible policy may simply be to require that 'staff may only eat in the lunchroom' and 'no food is to leave the lunchroom'. Of course, what you decide is up to you.
3. Contamination from other species. Staff may have no contact with pigs out of work but may carry unwanted organisms on their person or clothing that were derived from other species e.g. horse at home, especially if they attend to the animal just before they leave for work. A shower-in policy is probably the only thing that will eliminate this risk (if the risk exists i.e. staff have animals at home and those animals carry organisms you don't want).

Questions you ought to consider when determining what biosecurity measures to impose on staff include:

- How can staff contacts with other pigs occur e.g. directly through pig hunting/visiting another piggery or indirectly through co-inhabiting with someone who has contact with other pigs?
- How frequently are such contacts likely to occur? If a housemate works at another piggery it could literally be daily e.g. everyone in the house's footwear is left in a common pile at the backdoor.
- Can contacts be reasonably prevented? It's one thing saying don't live on a property with pigs but it's another to say no horses, no dogs, no sheep – all of these may carry organisms that could potentially impact on your herd e.g. *Strep zooepidemicus*, pestiviruses.
- Is it reasonable to expect staff to identify all the potential risks to which they may be exposed?
- What is a reasonable balance between access to work and downtime?
- Is downtime likely to achieve anything (?) e.g. if work footwear is contaminated during the exposure but not cleaned before a return to work, a 48-hour personnel downtime may be completely meaningless.
- What will your position be on staff 'sickness', lunches etc?
- What is or should you include in the employment contract?
- How restrictive do you really want to be?



You could eliminate most risks by imposing a raft of conditions on staff e.g. no pork products to enter farm, no contact with other animals, no life – which in the end may just leave you with no staff! And then you are totally reliant of the integrity of staff to abide by their contract.

- Might a better approach be to assume that all staff are potentially contaminated every day and so take steps to interrupt the transmission pathways at the farm gate (?) e.g. through a transition point?

Such an approach would mean you are not reliant on staff being cognisant of every risk or on their reliability to manage the risk appropriately. At the same time fewer restrictions need be placed on staff and this may increase observance of those you do apply.

- If a transition point is going to be imposed on staff, what does this entail?
  - Vehicles remain off-site?
  - Change of clothes/footwear and washing hands before entering farm?
  - Shower-in?

A shower-in policy where the shower also provides a gateway between the dirty exterior to the clean interior of the farm e.g. all external clothes and footwear stay on the dirty side of the shower and all farm clothing and footwear remains on the clean side of the shower, is the gold standard – with a few proviso's. Shower means shower i.e. washing hair, applying scrubbing brush to nails and so on.

It is my own view, and not necessarily that shared by others, that if you can separate service vehicles and their drivers from the farm (e.g. stock trucks) and you have a well set up shower-in system, the need for all other restrictions on people e.g. downtime are substantially reduced.

Downtime is a stock standard of biosecurity – but what does it achieve? If someone has an unwanted Strep or MRSA living in their throat, two (or even seven) days downtime will make no difference to the risk that person poses – and then what risk do they pose? If someone had had contact with ASF or FMD would I advocate a downtime – absolutely, but not without imposing other interventions such as cleaning and disinfection of themselves and their clothes (see suggested protocol for staff before returning to work after travelling to an ASF-infected area). Indeed, downtime results in some cleaning and disinfection by default in most instances as most people shower or bath at least once a day and change their clothes periodically – but again, if the same footwear is worn after as before the downtime and this has not been cleaned both the downtime and personal washing may have been for nought.

To overcome some of the issues raised here, include simple but practical measures in your biosecurity document e.g.

- A required downtime for staff after pig contact.
- Visitors only by prior arrangement.
- Visitors to report to the farm office or homestead on arrival.
- A requirement that visitors sign a compliance declaration before entering the piggery proper in which they declare that they have observed the downtime you wish to apply or at least disclose when they last had contact with pigs.
- Visitors may only enter the farm once they have

- Donned overalls and footwear belonging to the farm
- Showered-in
- Encourage staff to get the annual flu vaccine.

Mix and match to meet your needs e.g. *Biosecurity requirements for staff at Hogsback Farm*

- Staff must report any contact with pigs, both direct and indirect, before returning to work;
- A 48-hour unpaid downtime may be required of staff after off-farm pig contact (to be determined in consultation with the farm owner);
- During downtime, staff are required to shower at least once in every 24-hour period;
- Clothes and footwear worn at the time of off-farm contact or exposure must be cleaned and disinfected if they are to be worn to the farm;
- Staff are only to wear dedicated farm footwear provided by the farm when working on the farm;
  - Staff must change into farm footwear on arrival at work;
  - Work footwear must remain on the farm;
- Staff may only eat when in the staffroom;
- Meat products may only be brought onto the farm for personal consumption if they have been previously cooked;
- Any food remains/lunch leftovers must be disposed of in the appropriate rubbish bins.
- Staff are not permitted to feed any food to pigs other than that made by the farm for this purpose.

## Overseas travel

There is much discussion at the moment about what biosecurity measures should be applied to staff that have travelled overseas before they return to work given the spread of ASF. It is true that travel is a risk and ASF is not the only disease that you should be aware of. Common sense should also be applied. For instance, a staff member who goes to the Gold Coast for a week presents no more risk than one who goes to Queenstown – as of today – whereas the same cannot be said of a staff member who returns to Pangasinan province in the Philippines where ASF is now widespread. Most rural households in this region have (or perhaps now more rightly had) backyard pigs. The chance of virus contaminating a traveller to such an area is real.

This means that overseas travel should be treated on a case by case basis. Questions to consider when staff return or new staff arrive from overseas include:

- Where have they come from/been?
- Are any of the countries visited infected with ASF? PRRS? CSF? FMD?
- Have they had contact with pigs during their travel?
- When was this contact?

- If the person was exposed to organisms while overseas how might this be transmitted onto the farm (?) e.g. on their person, clothing, footwear.
- How might these transmission pathways be effectively negated?

While the talk is all about ASF, and ASF may elicit a more conservative approach, applying measures (e.g. downtime) to travels from the USA or parts of Europe without ASF is also wise.

A protocol I have advocated to farmers that have asked me to advise them on measures to apply to staff returning from destinations that are known ASF hotspots are as follows:

- Staff are to inform management of intended overseas travel prior to departure and identify all intended destinations.
- Appropriate biosecurity measures are to be determined on a case by case basis.
- Staff that have returned from a high-risk area will be expected to:
  - set aside a bag containing clean footwear and clothing to wear on their return;
  - on return to NZ, staff member goes directly to a motel by taxi;
  - farm owner meets the staff member at the motel with the bag of clothing left prior to departure;
  - staff member changes into clothing left prior to departure and puts all the clothing and footwear they have brought back from overseas into a bag;
  - the staff member is asked to shower twice a day while at the motel for two nights during which time they are to have no contact with anyone from the farm;
  - during this time, the owner launders the bag of clothing twice on their behalf with the first wash including Sterigene as a washing powder substitute;
  - if the footwear is of little consequence this is disposed of and replaced, alternatively it is (depending on type) either laundered with the clothes or cleaned and disinfected.

The costs are borne by the farm owner.

### *Other visitors, contractors, etc*

The types of measures you might include in your biosecurity programme have largely been covered under ‘Staff’. The default assumption should be that all visitors are potentially contaminated and thus potential vectors for disease transmission. For this reason, default conditions should be applied unless there is some basis to deviate from this e.g. downtime, limited access, etc.

Remember it is your right to apply whatever downtime you like even if there is no scientific basis for it, although applying an unreasonable downtime may simply prevent you from getting your fan fixed or plumbing sorted. It is not unreasonable to impose a 7-day downtime on MPI or council officers as such organisation should be able to find someone suitable to visit that does comply at almost any time.

Just remember that downtime does not in of itself remove the biosecurity risk associated with a visitor. Providing farm footwear and overalls, while not substitutes, may be just if not more valuable.

## Visitor equipment

Most visitors will bring some equipment or other to the farm, even if it is only their mobile phone. Such an item is very unlikely to have any direct contact with pigs either at a previous visit to a pig farm (A) or on your farm (B). The risk it presents is low even if risk exists i.e. Farm A has something Farm B doesn't. In comparison, if a pregnancy scanner is used on Farm A and then taken to be used on Farm B, it will have direct contact with pigs on both farms as well as being exposed to the wider piggery environment. If a risk exists, the risk would be very high – less ways when compared to that presented by the mobile phone. Most farmers would probably say no to latter example altogether. If not, they would require that the scanner be properly cleaned and disinfected between farms.

It is worthwhile having something in your biosecurity document to address this. You might include something along the lines of:

- All visitors and service persons entering the piggery must disclose any equipment such as .... they are taking onto site and make it available for inspection;
- Farm management will determine if the equipment requires cleaning and disinfection before entering the piggery.

## Birds

Birds are acknowledged to be an important biosecurity threat. Most piggeries in New Zealand do nothing to exclude birds and outdoor farms can do nothing to exclude birds at least from those parts that are outdoors. Be aware that birds may be infected with organisms that are known pig pathogens e.g. waterfowl and *Brachyspira pilisocoli*, and that they may also act as mechanical vectors. When a flock of seagulls moves from one outdoor sow herd to another, it is somewhat self-evident that whatever pathogens are present in the faeces of the sows on one farm will constantly be carted to the other by hundreds of little web-shaped gumboots with no biosecurity whatsoever. Not only will these convey bacteria and viruses but also worm eggs.

If you have an indoor farm you are in the privileged position of being able to exclude birds most of the time. It is hard to reconcile those farmers who are in a position to exclude birds but don't and yet claim to be serious about biosecurity.

## Wild pigs

This is largely a problem for outdoor sow farms located where feral pigs occur although I am familiar with the story of a Blenheim farmer who came across a wild boar mating a sow in his mating shed.

There are estimated to be about 110,000 feral pigs ranging over about a third of New Zealand. The disease risk that these pigs present to your herd is different to that of a commercial pig. For instance, it is unlikely that a feral pig will be shedding *Mycoplasma hyopneumoniae*, but there is a very high chance it is crawling with fleas, lice and mange and passing a variety of worm eggs. That's today. Should ASF establish within the feral pig population in an area, any commercial farm that is not pig-proof in that area will be at risk.

Under the new bovine TB-exclusion program in PigCare efforts to protect your farm from wild pigs is now a requirement. For the most part this means having a secure perimeter fence. If you have

an outdoor sow herd that is located in an area where wild pigs occur, even if rarely, you need to take the threat these pose seriously.

The perimeter fence is the key. Just keep them out. You also should detail any ongoing efforts in your documented biosecurity program e.g.

- How often is the integrity of the fence checked?
- Is it kept weed-free to allow it to be checked properly?
- How often is the area within the perimeter checked for the presence of wild pigs (and other unwanted livestock)?
- What do you do if a wild pig (or other unwanted livestock) are found within the perimeter?

### *Other livestock and vermin*

Other species may harbour organisms that may threaten the health status of your pigs. Exposure of the herd to these organisms is managed by minimising contact between the herd and these sources. It is not uncommon for farmers to graze sheep between buildings to keep the grass down. These are 'farmed' livestock and generally they don't have access to the raceways between sheds or other areas with which pigs come into direct contact. The concern in the biosecurity component of PigCare is 'unfarmed livestock' which could hypothetically carry bovine TB.

Your biosecurity programme may state something like:

- All of the area within the fenced perimeter must be inspected daily for the presence of unwanted livestock.
- Detection of unwanted livestock must be reported to (?) on detection.
- Immediate efforts must be taken to remove the unwanted livestock from within the fenced perimeter.

### **Vermin**

Your farm is also required to have an ongoing possum and rodent control program by PigCare. A similar program for cats is worth considering as these carry problem pathogens as well. *Toxoplasma* is ubiquitous in cats and their eggs are shed in large numbers by kittens. When ingested by pregnant sows these may have a significant impact on the pregnancy and viability of the pending litter.

Within your biosecurity document you might include a possum and cat section such as:

- Possum traps are to be set quarterly.
- If any possums are caught, a three-month trapping program is to be initiated.
- Cat traps are to be set wherever cat activity is detected.
- The rodent control program is to be followed.

Your rodent control program needs to be a standalone document, although the importance of controlling rats as part of a biosecurity program should be self-evident. Examples of pig pathogens that can persist in rats for months are well known e.g. *Brachyspira hyodysenteriae*, *Leptospira* spp.

## *Dead pigs*

Dead pigs should be disposed of as soon as possible after detection. As a minimum they should be removed from the pen immediately and taken to the disposal area (offal pit, compost, buried) daily. Rodent control around the disposal area is important.

## *Semen*

Semen is a highly effective mechanism for the transmission of pathogens.

As an industry we accept that the risk this presents is appropriately managed through the semen Import Health Standards and the disease monitoring and biosecurity programs at PIC and Waratah Farms.

In your biosecurity document you may state something such as:

- Semen is only to be sourced from PIC; or
- Semen is only to be sourced from Waratah Farms

## *Airborne spread*

Unless you have fully enclosed airtight sheds and filter the air entering the buildings, there is little you can do to prevent organisms entering the farm once they are in the air entering the farm. That said, even with air filtration you are not completely safe. Sow farms with air filtration in North America still break with PRRS about once in every five years.

Organisms vary in their potential for airborne spread e.g. for APP, 500 m is usually considered the limit while for *Mycoplasma hyopneumoniae* it is several kms. Quoted distances come with several qualifications e.g. how many pigs are in the source population? – is the source population up or downwind? – what organisms are present in the source population? - what is the level of disease expression in the source population?

What you don't want are pigs kept nearby nor do you want to have trucks carting pigs parking near your pig herd. While managing these risks is not something you would include in your biosecurity document, you might take steps to minimise these risks. For instance, if you know you have a neighbouring dairy farmer who buys in a litter of weaners each year to fatten on waste milk, you might approach the neighbour and offer to provide him with that litter of pigs (even at a loss), simply to ensure that other pigs with other bugs are not entering the area.

If stock trucks carting pigs other than yours are observed within 2 km of your herd's location, take note and try to determine the source of the pigs and/or the trucking company involved. A polite conversation may be all that is needed to persuade the trucking firm to use another route.

## *Straw and other bedding materials*

Many New Zealand producers raise pigs on straw or other bedding. Straw itself is unlikely to contain viable pig-specific pathogens capable of infecting the herd although cross-contamination in storage and handling is possible. For this reason, you may choose to store straw away from your actual pig buildings. Holding the straw for a period on farm (e.g. 12 weeks) before it is used will also decrease the potential for some unwanted organisms to remain viable in the straw – should they be there. This would certainly be an effective measure to manage the risk straw could present and one I would recommend to any farmer using straw were ASF to enter the country.

If you use straw or other bedding materials on your farm, consider what you might include in your biosecurity document e.g.

- Controls on trucks/drivers delivering bedding material;
- Storage location and time.

### *Equipment – both old and used*

Management of equipment accompanying visitors and service persons was discussed above. But what about equipment you bring onto the farm e.g. a silo or feeders you have purchased from a piggery that is closing down – or even brand new equipment from (say) China?

Apply common sense! If you buy used equipment from another piggery, this *should* be thoroughly cleaned and disinfected before you bring it onto your farm. As it may be a challenge to achieve the level of cleaning and disinfection required in some cases, many farmers simply would not consider procuring used equipment from other farms. New equipment is much less of a risk, but a hypothetical pathway can always be suggested.

### *Feed ingredients*

Most feed ingredients will not present a risk, but many of the micro-ingredients are imported e.g. amino acids, feed additives, and many of these are produced in China. It is theoretically possible for either or both the product and packaging to become contaminated. Perhaps far-fetched, but a pathway such as - person involved in loading containers with bags of amino acids in China has pigs at home; these pigs get ASF and shed virus; before the person is even aware of this they themselves become contaminated; this contamination is transferred to bags being loaded – might occur.

This risk (for the most part) can be managed by having a ‘downtime’ for the product e.g. product from (say) China is not distributed to farms for 12 weeks after it left China. It may be worthwhile asking the suppliers who provide you with products from (say) China about when the product was shipped.