Biosecurity measures for pig units

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What can be said about biosecurity which has not already been regurgitated many times? The methods have already been described and are well established and yet there is still disease breakdowns. Why is this?

It might be useful from the outset to give you my belief of what biosecurity is meant to be, which is to prevent a new disease getting into a livestock enterprise or passing between different groups of animals.

It has worried me that some of the perceived wisdom has not always had a good scientific basis to support it, and there appears to be little experimentation to support some of the recommendations.

As an eminent pig veterinarian from North America admitted one of his clients once said he had suffered many disease breakdowns with his pigs over a lifetime of pig keeping and survived them all, but the cost of implementing all the biosecurity recommendations might finally bankrupt him!

A review of the literature gives some interesting findings. Table 1 shows the results of a review of 122 units by M. R. Muirhead that was published in 1988 comparing herd breakdowns with their visitor policy.

The conclusions of a retrospective study to determine risk factors during the 1997/98 swine fever outbreak in Holland showed that the risk of a pig herd breaking down with swine fever (SF) increased if:

- There is commercial poultry on the farm in addition to pigs.
- If no boots and overalls are supplied by the farm for visitors.
- If the Pig Welfare Disposal Scheme collection lorry driver used his own boots.
- If the breeding herd size was between 500 to 1000 or over 7000 pigs on the unit.
- If there was aerosol spread from high pressure cleaning of electrocution equipment on an infected herd within 250 metres.

The risk of a pig herd breaking down with SFV decreased if:

- The farmer had more than 30 years experience in pig farming.
- The lorry used to transport pigs for the Pig Welfare Disposal Scheme vehicle was cleaned by the farmer outside the farmyard before it was allowed to enter.
- If the breeding herd size was less than 500 or there were between 1000 to 7000 pigs on the farm.

So, here is my list of potential sources of disease introduction into a pig herd in order of highest to lowest risk:

- Live pigs.
- 'Local spread'.
- Vehicles, especially livestock vehicles.
- Contaminated equipment, for example dirty boots.
- Wildlife/vermin.
- Feed, water, bedding.
- People.

Therefore, the recommendation has to be that a pig unit must be established in a remote region (Sahara, Antarctic?), would need to be closed with no new introductions of breeding stock or AI, have its own processing plant, produce its own pig feed, be covered by a biosphere and only staffed by prisoners serving a life sentence!

No wonder farmers become worried about the cost implications of some of these recommendations.

The real world is that although there is a trend to establish new large units in some fairly remote locations, most are sited where there is a history of pig farming, close to animal feed supplies and other essential services and a source of local labour (although this is becoming more difficult) and reasonably close to a meat processing plant. It is concerning though that the tendency is towards longer journeys for the transportation of live pigs.

Despite what politicians and 'ambulance chasing' solicitors might say, life is full of hazards and accidents do happen – all we can do is try to minimise the risks. So, what can be done that is practical?

An old lorry container is used to make an effective loading area on an outside breeding unit.

Factor	Increases risk by
Proximity of infected herd	9 times
High gilt intake	4.5 times
Salmonella on unit	2.8 times
Large herd (400 sows or more)	2.3 times

Table 2. Results of postal survey by the Veterinary Laboratory Agency in the UK to pig farmers to determine risk factors associated with PMWS.

Live pigs

The trend is towards setting up single age herds which remain closed, although they still take in AI. This makes sense if it is part of a bigger company with several herds to smooth out the cash flow of the empty period and low productivity at the start and end.

It is being successfully carried out in the UK with several integrators using outdoor breeding herds as these can move site and so considerably reduce the clean down costs.

Another method is to have in-herd multiplication. In large herds, that can run the GP's as a separate herd, this can work well, but in my experience it is very difficult to carry out properly in many commercial herds.

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Table 1. Comparison of herd breakdowns with visitor policy.

	Visitor policy – time since being in contact with other pigs			
	Overnight or more		No time limits	
Disease	No. of units/ no. of breakdowns	Breakdowns (%)	No. of units/ no. of breakdowns	Breakdowns (%)
Enzootic pneumonia	20/35	57	1/2	50
Streptococcal meningitis	4/39	10	3/81	3.7
Swine dysentery	0/37	0	4/81	4.9
Atrophic rhinitis	2/37	5	2/69	2.8
Mange	1/24	4	0/13	0

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This can have a negative effect on the performance of the breeding herd. If gilts are not available when required, the temptation is then to use slaughter generation females from the finishing house.

Whether setting up a new herd or taking in replacement breeding stock it is essential to establish the health status of the recipient herd and what the health of the incoming breeding stock or the AI stud is.

I am still surprised at how often very little consultation takes place about this, when it is well accepted how much influence disease has on the financial performance of a herd.

I would always expect a 'vet to vet' communication between the breeding company and the consultant veterinarian of the recipient pig herd.

Not only ask the breeding company what the health status is of the supply unit or AI centre, but how that is monitored and what biosecurity measures do they have in place to protect that status.

Local spread

This is the most difficult to prevent as in so many cases it has not been possible to establish how a disease was spread to a neighbouring unit.

In the UK foot and mouth outbreak it is believed that the critical and most significant spread was from the initial breakdown in an indoor pig unit to neighbouring sheep that were grazing in fields some distance away.

The most plausible explanation is that this was windborne spread, so how could anyone protect against this? Even the Canadians were reporting spread of PMWS in units that were at least 9km apart.

So, unless there is the luxury of being able to establish a unit in a pig free area, then it is best to concentrate on the other risk factors

Vehicles

The potential source here is not always obvious. Are wheel dips worth it?

During normal driving a tyre becomes extremely hot and will probably kill most organisms, the risks are more likely to be under the wheel arches, the driver's boots and clothing, inadequately cleaned out livestock lorries between batches and even bulk bin blower pipes on feed lorries that often get dragged on the ground.

Try to keep lorries off the unit, and I would strongly recommend that all pig (live or dead) transfers take place at the perimeter of the unit. This means always using a dedicated pig loading ramp or area and siting the dead pig collection area on the outside of the perimeter. Use a concrete or other suitable surface which can be cleaned and disinfected.

An isolated unit, but where does the labour force come from?

Contaminated equipment

Veterinarians, lorry drivers, vermin control operatives, electricians, builders, plumbers, animal health delivery people, straw contractors, slurry and effluent removal contractors, assurance scheme auditors, and others – the list of visitors nearly all bringing equipment onto the unit, is far longer than most unit managers will admit to.

It is well established beyond doubt that some major disease breakdowns have been caused by some fairly simple and unnecessary failure in biosecurity.

I am aware of reports of both swine dysentery and swine fever being introduced on to units simply because the lorry driver thought it would be helpful to come onto the unit and help get the pigs out of the pens!

So a few basic rules:

- All visitors to wear the unit's own boots and boiler suit/overalls. These should be clean to encourage visitors to put them on. A new boiler suit must be far cheaper than a disease breakdown.
- Ask visitors to wash and disinfect their hands.
- Possibly provide protective gloves, head cover and dust mask.
- All equipment, including vehicles (remember the experience of the Dutch with SF), coming onto the unit should be visibly clean and have been disinfected.

This means it should be checked and if not up to acceptable standard then either supervise the cleaning and disinfection off-site or turn them away.

- All visitors to be told about these rules before they visit the unit so there can be no confusion or argument.

Please make it reasonable for visitors. I can attest to the fact that changing into a faecal encrusted boiler suit and putting on boots two sizes too small, whilst standing outside in a pool of slurry with the snow blowing down my neck is not a pleasant experience.

It also told me a lot about the standards that the manager of the unit was aiming for!

Disinfectants

Most articles on biosecurity mention cleansing and disinfection as though these are the only factors required, but in reality they are only a part, albeit important part of it.

With more knowledge and expertise we should be able to use this to help reduce some of the costs of biosecurity. I have been onto a unit in France which can very successfully clean and disinfect a farrowing house so that sows are weaned and then it is refilled on the same day. It is well recognised that pig transporters can be a source of infection between loads if not properly cleaned out.

In the UK with the increase in two or three site production this has been of concern as often the same transport has been used in the morning to transport finishers to the abattoir and then later to take weaners to the finishing unit.

In the USA Scott Dee and workers have demonstrated the persistence of the PRRS virus in trailers which have not had an opportunity to dry out and are developing a disinfection protocol to overcome this.

Again there are a few basic rules when using disinfectants:

- The surfaces must be clean before applying the disinfectant as most are inactivated by organic material.
- How clean are the foot dips? If they are contaminated then they are a waste of disinfectant.
- Always follow the recommended concentration. When applying disinfectant to wet surfaces the concentration will have to be increased (I usually recommend doubling it).
- Disinfectants are always more effective if the surface was previously cleaned using a detergent.
- Only use disinfectants that have been approved and can demonstrate they are effective against the pathogens that they are being used against.
- Beware of toxicity to the pigs if disinfected pens have not been allowed to dry before the pigs are put in.

Unfortunately, even after taking all these precautions disease breakdowns can still happen, but again my experience suggests that those who take the most precautions will keep their pigs disease free the longest. ■