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PIG HEALTH AND WELFARE

Contingency Plan for the Control and Elimination of Porcine Epidemic Diarrhoea

1. Introduction

1.1. The objective of the Pig Health and Welfare Council Contingency Plan for the Control and Elimination of Porcine Epidemic Diarrhoea virus is to identify, contain and eliminate any new highly virulent strains of the virus from Great Britain as quickly as possible.

1.2. The Contingency Plan focuses on the control and elimination of Porcine Epidemic Diarrhoea virus but a broadly similar approach could be used to tackle other significant new and emerging diseases, eg. highly pathogenic strains of PRRS from the US or Asia.

1.3. The approach taken to the control and elimination of PEDv will be cascaded as follows:

- Strategic
- Operational
- Tactical

1.4. This document outlines the strategic and operational elements of the Contingency Plan. It does not include tactical activity as this will be contingent on the specifics of the unit, timings and emerging knowledge and will be determined by the PEDv Core Group and the PEDv Control Centre.

1.5. The Contingency Plan contains a primary and secondary strategy.

- **Strategy 1: Pig Unit Specific Containment and Elimination.** This will be the initial strategy based on an outbreak infecting up to a maximum of 5 individual pig units with targeted intensive epidemiological investigation, interventions and monitoring
- **Strategy 2: Industry Containment and Elimination.** This emergent strategy will be adopted following confirmation that an outbreak has occurred on more than 5 individual pig units. It is considered that at this point a broader approach to PEDv control and elimination will be required as it is highly likely infections will become more widespread.

2. Delivery of the Contingency Plan

2.1. This is reliant on the following actions/activity being established. Each of these activities is outlined at a strategic and operational level.

1. Early identification of infected site or site(s)
2. Mapping of positive sites and tracings of contacts
3. Identification of source of infection and risk assessment
4. Enhanced monitoring and surveillance to detect any wider spread
5. Enhanced general industry biosecurity
6. Development of a tailored virus elimination strategy
 - a. Controlled exposure of herd to virus
 - b. Partial depopulation:repopulation
 - c. Depopulation:repopulation

- d. Return of herd to virus negative status
7. Monitoring of virus circulation within herd
8. Controlled movements from infected sites
9. Intensive cleaning and disinfection
10. Manure management and fallen stock disposal
11. Confirmation of 'free' status

2.2. The effectiveness of the PEDv Contingency Plan is reliant on the support and commitment from the industry and supply chain. The voluntary commitment made by producers and the industry to control the spread of *Brachyspira hyodysenteriae* has ensured the success of the Swine Dysentery Producer Charter particularly in East Anglia, with much emphasis on:

- Open sharing of information from the outset
- Responsible attitude of affected units both to containing the infection and minimising the risk to others

2.3. Porcine Epidemic Diarrhoea virus can spread very easily by direct contact with infected pigs or indirect contact with faeces from infected pigs or material contaminated with faeces from infected pigs. With robust national and farmgate biosecurity there is no reason why Porcine Epidemic Diarrhoea virus should ever come in contact with pigs on British farms.

2.4. The UK has remained free of the US and Asian highly pathogenic strains of PRRS for over 20 years. But if PEDv does get on a farm or farms in the UK there would be considerable value to the industry from containing the infection and eliminating the virus from the UK – c.500,000 piglets per year in years 1 and 2 and up to a further 1 million piglets in the following 5 years. A concerted government-industry effort eliminated Aujeszky's disease in the 1980s and freedom from the virus has been maintained.

3. Industry support

3.1. Delivery of the proposed contingency plan will require considerable investment in manpower, testing and diagnostic resources and data collection and analysis.

3.2. On confirmation of a positive case a government/industry Disease Outbreak Steering Group would be established comprising the following organisations:

- Defra
- AHVLA
- BPEX
- NPA
- BPA
- PVS
- BMPA
- AIMS
- Red Tractor

3.3. The Disease Outbreak Steering Group would implement the initial disease containment and elimination strategy focused on the first 3 to 5 herds infected. The group would, at that point, review the risk of onward spread. If the risk is high that the disease had spread more widely there may need

to be a change in emphasis to general support for containment, control and elimination. Specific supports would include:

- Porcine Epidemic Diarrhoea Control Centre set up and running costs
- Mapping of infected units
- Tracing of movements and risk assessment of contacts
- PED Rapid Response Team set up and running costs – team would try to identify source of infection and advise on control options
- Additional testing and monitoring to establish infected sites and wider industry spread
- Intensive support for additional costs of containment and elimination of the PED virus on initial (up to 5) outbreak units
- Intensive cleaning and disinfection on farm to eliminate virus
- Monitoring of progress in eliminating PED virus on farm
- Wider industry advice for improving standards of biosecurity
- Temporary suspension of assurance assessments in the infected area

3.4. It is estimated that the cost for effectively and rapidly implementing the initial control and elimination strategy may be up to c. £1m covering administration, industry communication and general advice; additional testing and monitoring to detect spread; detailed investigations and advice on controls.

3.5. If the outbreak spread beyond 5 herds then monitoring and providing the industry with general support would be estimated at a further £1 million per annum.

3.6. BPEX has already invested levy funds to provide producers with free testing of samples at AHVLA laboratories as well as developing more advance diagnostic capabilities within AHVLA to type strains of PEDv. Delivery of this wider contingency plan will also be in part supported by BPEX levy funds.

4. Contingency Plan

1. Early identification of infected site or site(s)

Strategic:

Early identification of pigs affected (or suspected to be) by highly virulent strains of Porcine Epidemic Diarrhoea virus (hvPEDv) is critical to the success of any strategy to contain and eliminate the virus from GB. Delays in diagnosis increase the risk of undetected spread of the virus.

Actions at farm level and at industry level flow from the identification of the infected unit. Essential that producers report any suspicion of PED as well as confirmed cases as reporting is critical to the strategy to contain, control and eliminate hvPEDv.

Diagnostic samples submitted to AHVLA from outbreaks of diarrhoea are being tested for PEDv by PCR on a weekly batch basis under the Defra-funded scanning surveillance project.

In addition, BPEX has agreed with AHVLA that samples can be submitted from pigs with unexplained diarrhoea at no cost to farmers if the only test required is to check for PED virus.

BPEX has invested in a project to enhance PEDv diagnostics at AHVLA. This will enable rapid determination between UK, EU and US variants of PEDv. Key aim is to develop and validate PED virus tests

- PCR on faeces, oral fluids and swabs
- Serology – ELISA, IFA, neutralisation assay
- Gross and histopathology (Immunohistochemistry)

Operational:

Stockworkers will be on the frontline for detection and it is important that farm staff are aware of the signs of the disease and the importance of contacting their vet as soon as possible to get unusual clinical signs checked out. Rapidly spreading diarrhoea with high mortality in young piglets is less likely to be missed than the more transient scour seen in growers and finishers.

Farmers must take responsible approach and report any suspicions immediately to their farm vet who should contact and/or send samples to the AHVLA.

Assuming the farm vet is the first port of call, they must be aware of the symptoms of PED and act quickly to deliver samples to AHVLA or SAC. It is strongly recommended (and may become a legal obligation) to contact AHVLA as soon as possible if there is suspicion of PEDv to organise rapid PCR testing. Ideal samples in a suspected outbreak are pooled freshly voided diarrhoeic faeces from affected pigs, packaged and sent according to usual AHVLA guidelines, with a completed submission form to AHVLA Weybridge as detailed in the appendix, and also to be found on the BPEX website.

AHVLA would report the PEDv PCR result to the submitting farm vet in the usual manner to pass to the farmer. If positive, this information would be communicated to the pig industry, at present, AHVLA could not share the farm and submitting vet details beyond the geographical region, clinical signs and type of unit.

Actions:

- | | |
|--|---------------------|
| 1. Publication and promotion of PEDv case definition and photographs (NPA/BPEX websites, PigWorld etc) | BPEX/NPA? |
| 2. Publication and promotion of PEDv footage from infected unit (NPA/BPEX websites) | BPEX/NPA? |
| 3. BPEX Biosecurity Roadshows and forthcoming webinar with US farmer with PED experience | BPEX |
| 4. Promotion free PED testing in unexplained scours | PVS/AHVLA |
| 5. Forthcoming PVS CPD course on EED including PED | PVS |
| 6. Promotion of PEDv reporting hotline (Local AHVLA centre)? Need to decide if necessary or if farm vet would automatically contact AHVLA to discuss? | |
| 7. Currently AHVLA/SAC can only report limited information regarding a PED positive case due to data protection legislation. PED Core Group working on this... | |
| 8. Awaiting PED Core Group decision on whether PED becomes notifiable with legal obligation to report suspicion and positive diagnosis to AHVLA (or other) | PED Core Grp |

Resources:

1. Flow Diagram of first steps

2. Mapping of positive sites and tracings of contacts

Strategic:

Once there is a confirmed positive, data from the electronic Animal Movement Licensing system will be used for tracings and management of the containment strategy.

Information on location of infected units, neighbouring units and recent contacts will be mapped and used to identify farms at high risk of lateral spread. Following risk assessment more intensive monitoring for signs of disease and more intensive containment biosecurity could also be put in place on any higher-risk farms.

Operational:

PED Control Centre set up within BPEX. Responsibilities would broadly include:

1. Utilising the eAML2 database and mapping programs to collect:
 - a. Farm location
 - b. All pig movements on and off farm in last 90 days
 - Details of supplying farms or markets
 - Details of destination farms, markets, collection centres or hauliers
 - Details of hauliers
 - c. Details of all pig holdings within 3 miles of affected farm (including markets, abattoirs, collection centres)
2. Provide immediate support and advice to:
 - a. Positive farm and it's vet
 - b. Any pig holdings within 3 miles of positive farm (including their vets)
 - c. Hauliers involved with any movements on/off farm
 - d. Any pig holdings associated with movements of any species on/off positive farm (including their vets)
 - e. Feed company supplying the farm
3. Communicate key information to industry
 - a. Knowledge of PEDv breakdown
 - b. Further information regarding farm location and details only as permitted legally
4. Provide protocols/guidance on approaches to hvPEDv prevention, containment, control and elimination
5. Assist farmers in developing tailored control and elimination plans for their farm
6. Assist with organising movements of infected pigs
7. Provide advice to abattoirs, hauliers, feed companies and fallen stock collectors on preventing spread of hvPEDv
8. Liaise with Red Tractor to discuss possible temporary suspension of assurance visits in infected areas
9. Record all farms being declared hvPEDv free after an outbreak

Actions:

1. Who and what does the PED Control Centre look like?
2. Awaiting PED Core Group decision on notifiable status
3. Investigate current legal restrictions in revealing individual farm details

BPEX
PED Core Grp

Resources:

- | | |
|----------------------------|------|
| 1. BPEX PED Control Centre | BPEX |
| 2. eAML2 | BPEX |
| 3. Mapping program | BPEX |

3. Identification of source of infection and risk assessment

Strategic:

Identifying the probable source of infection will be critical to identifying other farms at potential risk. There will be a particular focus on all movements of animals, animal products, animal by-products, people, feed, bedding, equipment and anything else which may have been in contact with pig faeces.

Operational:

Rapid Response Team forms and works alongside PED Control Centre to begin rapid epidemiological investigation. Time is of the essence as virus in potential source materials may lose infectiousness and memories fade over time.

Rapid Response Team consists of;

- a. Farm vet
- b. PVS expert member if appropriate
- c. VIO or Field Epi VO as available
- d. Member of PED Control Centre

Standardised Investigation Questionnaire to be used on all positive farms. Canadians found much merit in verbally conducting the questionnaire as enabled different routes of conversation to be followed. Suggest completed by farm vet as has background knowledge of farmer and the farm.

Must also include record of movements of other animal species on or off farm if associated with other pig holdings (BPEX obviously cannot access this through eAML2).

Essential that standardised answers from questionnaire are entered in same format onto a database to enable searches and trend analysis. PED Control Centre would be responsible for entering the answers from the Investigation Questionnaire.

Samples of material suspected as potential sources of infection should be taken and refrigerated pending decisions on testing (covered in **SOP 2**).

Actions:

- | | |
|---|----------|
| 1. Need list of PVS experts who would be available to assist in Rapid Response Team if required | PVS |
| 2. Confirm availability (both geographical and time) of VOs, VIOs and Field Epi VOs | SW/AHVLA |
| 3. Finalise the Investigation Questionnaire (part of SOP 1) | AHVLA/KY |
| 4. Write SOPs 1 and 2 | AHVLA |
| 5. Determine whether existing VIRDO database would be sufficient, or start developing PED specific one to handle data for searches and trends | RS/AK/KY |

Resources:

1. Rapid Response Team
2. Investigation Questionnaire
3. PED Control Centre
4. PED database

SOP 1: Investigation of a Porcine Epidemic Diarrhoea breakdown **AHVLA**

SOP 2: Sampling strategy and collection, handling and storage of samples for use **AHVLA**
in investigation of a Porcine Epidemic Diarrhoea breakdown

4. Enhanced monitoring and surveillance to detect any wider spread

Strategic:

On confirmation of the identification of hvPEDv in the UK an immediate programme of targeted testing should be carried out to check for PED in high risk areas such as; markets, abattoirs, collection centres, fallen stock, fell mongers and haulier yards.

Cleaning and disinfection should be stepped up when positive samples are discovered at those locations. This will help identify how widely the virus has spread, if at all. Information on pattern and degree of spread will be very useful in making decisions on where to target resources to best contain, control and eliminate the virus from the UK.

Environmental sampling at the industry service providers should be useful but will have limitations. Regular random sampling in regions or compartments which don't have PED may be sufficient but if PED is diagnosed in the UK, sampling at the large sites should be on a daily basis. It will be important to set out what the objectives of the program are (i.e prevalence, proof of negative status, etc) and then set the sampling based upon those objectives. It will also be important to have an exit strategy established from the beginning..

Operational:

Pilot sampling should be carried out in advance of any outbreak to identify practical arrangements for sampling – who, where, when, what, how – and to establish any baselines and level of false positives arising from testing.

Experience in the pilot should be used to develop and review **SOP 2** on sampling strategy and collection, handling and storage of samples for use in investigation of a Porcine Epidemic Diarrhoea breakdown.

Actions:

1. Ascertain AHVLA and SAC capacity for processing surveillance samples. Could potentially be huge volume of sampling required **SW/AHVLA**
2. Likely to have commercial IDEXX PED test available soon and predict that independent labs would take this up. Consider tendering for contracts for environmental sampling to reduce burden on AHVLA/SAC **BPEX**
3. Develop SOP for additional sampling and surveillance (**2b** in **SOP 2**). Wealth of information and experience on this from North America **AHVLA**

4. Organise pilot sampling project, perhaps at a abattoir?

Resources:

SOP 2: Sampling strategy and collection, handling and storage of samples for use in investigation of a Porcine Epidemic Diarrhoea breakdown, including surveillance sampling **AHVLA**

5. Enhanced general industry biosecurity

Strategic:

On confirmation of the identification of hvPEDv in the UK general industry biosecurity should move to the highest alert status. Standards of biosecurity at farmgate and quality of cleaning and disinfection of pig lorries would have to be stepped up.

Operational:

Farm level (ref **SOPs 4, 5 and 6**):

- All farms should enforce a clear line of separation at all farm entrances
- Restrict all unnecessary visitors
- Visitors should only cross the line of separation if they follow Danish entry protocols (see **SOP 4**)
- Farm staff who inadvertently cross the line of separation eg step on to a lorry should also follow Danish entry protocols before re-entering the unit
- Vehicles onto farm pose particular risk (knackerman, feed lorries, visitors etc)
- No pig lorry should be allowed on pig farm without an intact seal linked to a current certificate of cleaning and disinfection
- Consider using separate boots and overalls for loading pigs or putting overalls in the wash as soon as finish cleaning up the loading area after loading pigs
- Cleaning the loading area should be part of the SOP for loading so it is done immediately not as a separate operation

Abattoir/collection centre/market level (ref **SOP 3**):

- Standard of lorry washing of particular note
- Correct detergents and disinfectants must be used
- No water recycling permitted
- No lorry should leave an abattoir without audit and certification of the level of cleaning and disinfection followed by sealing

Actions:

1. The following SOPs must be completed, published and most importantly publicised. Emphasis should also be made on the importance of these procedures regardless of a PED breakdown. They are the essence of good health management. **BPEX/NPA/KY**

Resources:

SOP 3:	General industry biosecurity standard	NPA
SOP 4:	Farmgate biosecurity – people	BPEX
SOP 5:	Farmgate biosecurity – vehicles	BPEX
SOP 6:	Farmgate biosecurity – line of separation, loading	BPEX
SOP 7:	Cleaning and disinfection of vehicles used to transport infected pigs	BPEX

6. Development of a tailored virus elimination strategy

Strategic:

The overall goals of the strategy for affected units should be to:

1. Contain infection within the unit
2. Reduce any risk of spread to other units
3. Eliminate hvPEDv from affected farm
4. In order to return the unit to producing virus-free weaners as quickly as possible

Options include:

- a. Controlled exposure of herd to virus
- b. Partial depopulation:repopulation
- c. Depopulation:repopulation

Depopulation of a unit is only likely to be economically realistic if there is reasonable certainty that only 1-5 units have been affected at the time of first identification of the virus.

Operational:

The Rapid Response Team should make an initial assessment of the options for containment, control and elimination of hvPEDv from an affected farm. The options should be reviewed by expert advisors to the central PED Control Centre. International consultants with previous experience of managing the disease may also prove useful.

A decision on whether to use controlled exposure of the herd to the virus should be taken without delay. As it is improbable that viral spread within the unit could be contained controlled exposure is preferable to natural exposure. The only realistic alternative is depopulation of the site, and this is only likely to be economically realistic if there is reasonable certainty that only 1-5 units have been affected at the initial identification of the virus.

To reduce the level of virus production it may be necessary to consider euthanasia of piglets from non-immune sows at birth and/or create a four week free of farrowing window.

Intensive cleaning and disinfection will be needed on-farm to remove all traces of virus and prevent viral exposure to piglets. This will include emptying all slurry channels and cleaning and disinfection of pits beneath slats. Pig flow and procedures may need to be adapted on farm to create the potential for all-in:all-out management by building. It may also be necessary to create clean and dirty areas on farm with separate footwear, overalls and equipment as cleaning and disinfection progresses.

Actions:

1. Develop **SOP 8** in detail. There is a need to differentiate between Indoor and Outdoor herds. **PVS**

 SOP 8a: Indoor herds

 SOP 8b: Outdoor herds
2. PVS have already published excellent legal guidelines on Controlled Exposure, but need more detailed plan of how to carry out on farm step by step in **SOP 9** (including reference to outdoor production) **PVS**
3. Consider industry position on: **BPEX/NPA**
 - a. euthanasing piglets less than 10 days of age
 - b. euthanasing in-pig sows

Resources:

- SOP 8:** Containment, control and elimination of infection (Indoor /Outdoor) **PVS**
SOP 9: Controlled exposure of herds to virus **PVS**

7. Monitoring of virus circulation within herd

Strategic:

Monitoring of virus circulation within the positive herd will be necessary to assess when the target of virus free weaner production has been achieved.

Operational:

Sampling and testing for monitoring of virus circulation in herds should be included in **SOP 2** for Sampling strategy and collection, handling and storage of samples for use in investigation of a Porcine Epidemic Diarrhoea breakdown.

Actions:

1. Complete **SOP 2** including the new annexes to cover all sampling scenarios **AHVLA**
2. North American experience useful here

Resources:

- SOP 2:** Sampling strategy and collection, handling and storage of samples for use in investigation of a Porcine Epidemic Diarrhoea breakdown **AHVLA**
- 2a** - wider on-farm testing after initial confirmation
 - 2b** - wider industry surveillance sampling
 - 2c** - monitoring of virus circulation within herd

8. Controlled movements from infected sites

Strategic:

Any movement of pigs or pig faeces from a positive site poses a great risk to further spreading the PED virus, but movement restrictions are unlikely to be imposed.

A responsible voluntary approach to movement controls is critical. The success of the Swine Dysentery Charter in the East of England in controlling the outbreak was in part due to sensible controls on movements and by stepping up cleaning and disinfection of vehicles in contact with the unit or pigs from the unit.

Operational:

Ideally there should be no movement of pigs or pig faeces (or other species of animals that may move to a holding with pigs) from a hvPEDv infected farm until plans have been put in place to control the risk of virus spread. This might include identifying biosecure locations to which weaners could be moved with appropriate intensive cleaning and disinfection of vehicles involved in the movement. Alternatives, such as temporary weaner accommodation on the site could also be considered.

As PED is not a food safety risk finished pigs could move to abattoir for processing ideally at the end of the week with more intensive cleaning and disinfection of vehicles, the lairage and of the washing facilities at the abattoir.

Any movement would require a joint commitment from the farm, haulier and destination (farm or abattoir only) and would need to be planned in advance with agreement from all parties and all risks assessed. The lorry driver in particular is key to the success.

The PED Control Centre could take a role in advising or co-ordinating movements with a check list of things to consider.

Actions:

1. Develop **SOP 10** assuming that movements would only be to either an abattoir or another pig holding **NPA**
2. Haulier education and co-operation essential. Is there a better way to get 'buy-in' other than from farmer enforced instruction?

Resources:

SOP 10: Controlled movements from infected sites **NPA**

9. Intensive cleaning and disinfection

Strategic:

Essential to eliminate PEDv from the farm once all animals have been rapidly exposed to it. Strict cleansing and disinfection protocols must be followed to return farm to negative status.

Operational:

The effective elimination of PEDv is reliant on high quality cleansing and disinfection.

Pig flow and procedures may need to be adapted on farm to create the potential for all-in:all-out management by building. It may also be necessary to create clean and dirty areas on farm with separate footwear, overalls and equipment as cleaning and disinfection of the unit

Cleaning includes emptying all slurry channels and cleaning and disinfection of pits beneath slats. Chlorine gas has been used effectively in North America, although with obvious personal safety considerations. Removing manure from the farm is also critical (see **10**).

Dirt inactivates most disinfectants and dirt also physically protects the virus. As well as helping to make cleaning more effective detergents have some effect on PED virus and should become a standard routine. Detergents must always be used in addition to disinfection, not a replacement. Surfaces should be "white glove" clean before applying disinfectant.

PEDv is inactivated by most virucidal disinfectants, including phenols, peroxygen, chlorine, sodium hydroxide (2%), formalin (1%), sodium carbonate (4% anhydrous or 10% crystalline, with 0.1% detergent), ionic and non-ionic detergents, strong iodophors (1%) in phosphoric acid.

Information on disinfectants effective against PEDV should be maintained as an annex to the contingency plan.

Drying is critical. Heating to 70°C for 10 minutes would be ideal as this inactivates the virus but vehicles and buildings should be completely dry before reuse to minimise risk.

Leave buildings empty for as long as possible to allow drying and sunlight to eliminate residual viral infectivity. Looking at North American experience to gauge if an realistic time could be specified.

Waterlines should be cleaned and disinfection.

Rodent control precautions should be evaluated and improved as required.

Repainting or whitewashing should be considered for difficult to clean areas eg. wood.

Actions:

1. Write **SOP 11** in full detail including all of the above **BPEX**
2. Look at North American experience in particular with detergent and disinfectant products and timings

Resources:

SOP 11: Intensive cleaning and disinfection of unit following breakdown **BPEX**

10. Manure management and fallen stock disposal

Strategic:

PED virus transfers via faeces and survives in manure for extended periods of time. Any object that becomes contaminated with pig manure can be a source of infection for pigs. It is critical to prevent PED from being moved from farm to farm during manure spreading and this may impact on the timing of application and where manure should be spread.

Similarly deadstock pose a significant threat for spreading virus and should be handled, stored and disposed of quickly and biosecurely.

Operational:

Manure Management:

- If using a contractor then must explain the potential risks
- Good communication with those who may have pigs locally at risk is essential
- It may be possible to identify areas where the potentially contaminated manure can be spread at least risk
- Plans should be drawn up for entrance and exit to the site with minimal cross-over with the path for the manure spreading and the rest of farm traffic or areas used by farm staff
- Explain clearly the routes that will be used to transport manure to fields
- Agree in advance how any manure spills, particularly on public roads, are to be handled
- Additional time will need to be factored in for cleaning and disinfection of equipment used in manure spreading
- Options for longer-term storage to allow time for virus to die off may also need to be considered

Fallen Stock:

- The ideal scenario is obviously on-farm incinerators, and it may be worthwhile considering hiring a mobile incinerator during the peak of an outbreak
- If this is not possible special arrangements should be agreed with the fallen stock collector
- Fallen stock should be placed in sealed containers at an agreed collection point outside the unit
- The outsides of the containers should be rinsed and disinfected once filled and sealed
- They should be collected either as a separate collection at the end of the day or as the last collection at the end of the day
- Ideally vehicles normally used for other species should be used for collecting high risk material
- The material should be taken to a secure location for incineration
- Collection should only be by companies specifically approved to transport high risk material with procedures in place to thoroughly wash and disinfect vehicle and all equipment used
- All contaminated protective gear should also be properly cleaned or disposed of them to ensure no virus is transferred to other farms
- The same criteria is applicable to fallen stock of other species on a PED positive farm, as they pose the same risk of contamination by carrying infected pig faeces

Actions:

1. Develop **SOPs 12 and 13**
2. Look into possibility of mobile incinerators

BPEX/IC

Resources:

BPEX

SOP 12: Manure management

Ian Campbell

SOP 13: Fallen stock

11. Confirmation of 'free' status

Strategic:

Following return of farms to production of virus-free weaners ongoing monitoring for clinical signs and testing for virus should be planned for at least 6 months to check that the virus has been eliminated or that re-emergence of the virus is detected as quickly as possible.

Operational:

Testing to confirm freedom of PEDv is essential to the elimination strategy.

The PED Control Centre would be responsible for keeping updated records of farms now considered 'negative'.

Actions:

1. Develop **SOP 14** with details of above
2. Need details of which surveillance tests to use, number of samples required, which animals, frequency of testing etc
3. How long should we routinely test for following a PEDv outbreak?
4. Look to North American experience of surveillance

PVS

Resources:

SOP 14: Confirming return to disease 'free' status

PVS

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PIG HEALTH AND WELFARE

	Standard Operating Protocols	Responsibility	Target Date
SOP 1:	Investigation of a Porcine Epidemic Diarrhoea breakdown	AHVLA	
SOP 2:	Sampling strategy and collection, handling and storage of samples for use in investigation of a Porcine Epidemic Diarrhoea breakdown To include <ul style="list-style-type: none">- 2a - wider on-farm testing after initial confirmation- 2b - wider industry surveillance sampling- 2c - monitoring of virus circulation within herd	AHVLA	
SOP 3:	General industry biosecurity standard	NPA	
SOP 4:	Farmgate biosecurity – people	BPEX	
SOP 5:	Farmgate biosecurity – vehicles	BPEX	
SOP 6:	Farmgate biosecurity – line of separation, loading	BPEX	
SOP 7:	Cleaning and disinfection of vehicles used to transport infected pigs	BPEX	
SOP 8:	Containment, control and elimination of infection <ul style="list-style-type: none">- 8a: Indoor herds- 8b: Outdoor herds	PVS	
SOP 9:	Controlled exposure of herds to virus	PVS	
SOP 10:	Controlled movements from infected sites	NPA	
SOP 11:	Intensive cleaning and disinfection of unit following breakdown	BPEX	
SOP 12:	Manure management	BPEX	
SOP 13:	Fallen stock	Ian Campbell	
SOP 14:	Confirming return to disease ‘free’ status	PVS	

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PIG HEALTH AND WELFARE

EXOTIC AND EMERGING DISEASE PROTOCOLS

ADVICE FOR VEHICLES CARRYING HIGH RISK PIGS

Many pig diseases can spread through contact with faeces and other body secretions and excretions. Disease causing organisms can survive in manure for extended periods of time. Any object that is contaminated with pig manure can be a source of infection for pigs.

These protocols are for vehicles carrying pigs which are infected or at risk of having been exposed to an exotic or emerging disease. Drivers and other vehicle occupants should also see Biosecurity Protocols - Advice for Visitors.

Check that any disinfectants used are effective against the target disease and always use at the concentration recommended on the label or product information sheet as effective for its control.

KEY POINTS

- Only allow essential vehicles to enter the site.
- All vehicles visiting the unit should be kept outside the biosecurity perimeter if possible.
- Clearly define and mark a **Line of Separation** to mark the separation between the farm facilities, its animals and its staff from lorries, trailers and people who must remain outside of the pig production area.
- Vehicles should be thoroughly cleaned and disinfected before arrival at the unit.
- Wheels, tyres and wheel arches should be cleaned and disinfected upon arrival at the unit using wheel dips or sprays

BEFORE ARRIVAL AT THE FARM

1. Schedule transport so that stock from high risk farms is carried at the end of the week and never immediately before stock from disease-free farms.
2. If possible use dedicated transport for positive and high risk stock.
3. Ensure that vehicles are appropriately cleaned and disinfected before arrival at the farm. You don't want to transfer other diseases to the farm.
 - a. The cab of the truck, including floor-boards, pedals, steering wheel, gear shift handle, door handles, etc, should be cleaned and disinfected
 - b. The trailer should be
 - i. washed clean and free of any visible manure or bedding material;
 - ii. Disinfected with an appropriate disinfectant, at the correct rate, for the proper contact time, and applied so that all surfaces are covered, and
 - iii. Allowed to dry completely.
 - c. All equipment, including sort-boards, paddles, etc. need to be thoroughly cleaned, disinfected, and dried.
4. Clean boots, coveralls, gloves, knee pads, etc. should be used for each load and stored in a designated clean area.
5. The site manager should make expectations for loading and unloading animals clear to the livestock haulier before arrival. A clear **Line of Separation** should be identified and communicated.
 - a. No human foot traffic is allowed to cross the **Line of Separation** from either direction.
 - b. Farm staff move the animals up to the **Line of Separation**.
 - c. The driver handles the animals after they cross the **Line of Separation**.

- d. No farm equipment or transportation equipment may cross the **Line of Separation** to be shared for loading pigs
6. Give all drivers specific instructions as to the risk of the stock they are carrying.
7. Use adequate waterproof protective clothing, waterproof boots and equipment that can be easily cleaned and disinfected.
8. Ensure availability of a disinfectant that is effective against the target disease.
9. Plan for good cleaning and disinfection after carrying pigs.
10. Plan for weather extremes.

AT THE FARM

1. Disinfect wheels and wheel arches on arrival.
2. Change into protective clothing and boots at arrival. Take care not to contaminate normal clothing and footwear.
3. Load at perimeter if possible.
 - a. The loading area and chute should be clean and ready for pigs
 - b. All equipment in the loading area should be clean and in good working order
 - c. Clearly communicate where the **Line of Separation** is located. This marks the separation between the farm facilities, its animals and its staff from lorries, trailers and people who must remain outside of the pig production area.
 - d. An effective **Line of Separation** is the back of the trailer but may be at the barn door, the chute or gate.
 - e. Be sure the **Line of Separation** is clearly marked and visible to all.
 - f. There should be enough trained farm personnel available to help load pigs from the site
 - g. The lorry driver should never cross the **Line of Separation** to help move pigs from the barn.
 - h. Provide plastic disposable footwear and a place to dispose of the footwear for the driver if they must to cross the **Line of Separation**.
4. Lorry drivers should never enter pig buildings and should avoid heavily contaminated areas.
5. Drivers should avoid contaminating the cab. Use disposable or disinfectable mats in the footwell. Do not re-enter the vehicle with contaminated clothing or footwear.
6. On leaving remove and dispose of or clean and disinfect protective clothing and boots. A separate area for storage should be used for these articles after they are used and until they can be cleaned and disinfected for future use.
7. Clean and disinfect wheels and wheel-arches of the lorry on leaving the farm.

RESPONSIBILITIES DURING THE LOADING PROCESS

1. Livestock hauliers
 - a. Must stay on the out-bound side of the **Line of Separation** at all times for load out.
 - b. No driver equipment may cross the **Line of Separation** or be used on the farm.
 - c. No pigs should be allowed to off the trailer during the load out process.
 - d. The driver should remove boots and clothing on the vehicle side of the **Line of Separation**.
 - e. All dirty boots and coveralls should be placed in a designated area, outside the cab (for example in a dirty boot box).
 - f. Hand paperwork to farm load crew personnel away from the lorry and the pig facilities
2. Loading crew or farm personnel
 - a. The farm staff must stay behind the **Line of Separation** at all times.
 - i. If the **Line of Separation** is crossed, farm staff MUST follow reentry biosecurity measures (such as shower in/out or change of clothes/boots and wash of hands) before they can resume the loading process.
 - ii. Dirty coveralls or gloves should be placed in container or directly into a washer.

- iii. Dirty boots should be placed where they can be washed and disinfected away from farm clothing. Do not place them where everyday foot traffic occurs.
- iv. Do not share loading equipment with livestock hauliers.
- b. Do not cross foot traffic at any time with livestock hauliers including after pigs are loaded.
- c. No farm equipment should be shared with the livestock hauliers.
- d. Do not allow drivers to help load pigs out of the barn.
- e. Do not allow drivers to fill out paperwork in the office.

RESPONSIBILITIES AFTER THE LOADING PROCESS

1. Farm personnel should clean and disinfect the loading area immediately after the transport vehicle has been loaded and pulled away.
2. Farm personnel who cross the **Line of Separation** to clean the chute or loading area must follow biosecurity protocols, such as shower in/out or change of clothes and boots and wash hands.

AFTER MOVING PIGS

1. The vehicle must be thoroughly cleaned and disinfected inside and outside.
 - a. Remove all organic matter, dung, bedding and food.
 - b. Pressure wash thoroughly preferably using a heavy duty detergent. Pay special attention to gates, moveable decks and crevices. Walk from top to bottom and do inside followed by outside finishing on wheels and wheel arches.
 - c. Avoid contamination from other vehicles or splash back from contaminated ground.
 - d. Disinfect thoroughly using a disinfectant active for the target disease at the concentration recommended on the label as effective
 - e. Check on containment and disposal of manure, bedding and other material as well as waste water from the cleaning process.
2. At the same time clean and disinfect equipment used such as pig boards, scrapers etc.
3. Clean and disinfect storage boxes and contents.
4. Clean and disinfect cab paying special attention to footwells and pedals.
5. Finally clean and disinfect overalls and boots used in the clean up procedure.
6. Allow to stand and dry as long as possible. If the lorry is next carrying disease-free pigs this should be a minimum of overnight.
7. Clean down and disinfect the area in which your lorry has been standing during C&D to make sure that there is no risk of contaminating other vehicles.

DISEASE SPECIFIC INFORMATION – Porcine Epidemic Diarrhoea virus

Porcine Epidemic Diarrhoea virus is moderately stable at 50°C, but lost infectivity at ≥ 60°C
Stable between pH 5.0 and 9.0 at 4°C and between 6.5 and 7.5 at 37°C

Effective Disinfectants:

- Phenols: Tek-Trol ; 1 Stroke Environ;
- Peroxygen: Virkon S;
- Chlorine: Chlorox –sodium hypochlorite with at least 5% (50g/litre or 50000 ppm) available chlorine
- Combination product: Synergize a quaternary/glutaraldehyde cleaner/disinfectant

note: brand names are from US

It may also be possible to inactivate trailers contaminated by PEDv Diarrhoea virus by heating to a temperature of 71°C for 10 minutes or holding them at a temperature of 20°C for 7 days.

Diseases Like to Hitch a Ride, Separate Yourself From Cross Contamination

The organisms that cause disease in pigs (bacteria, viruses and parasites) can survive in many different types of materials. Organic matter (shavings, manure) or water, mud or snow can carry pathogens on boots, clothing, tyres, undercarriages, trailers, shovels, sorting panels and people that can infect healthy pigs. Other activities, such as walking into a contaminated barn or abattoir lairage can increase risk for pathogen spread because boots and trailers can become contaminated with pathogens the farms you serve are trying to keep out. Assume every site you touch is a risk. Do not be responsible for pathogen transfer.

Appendix 2



BPEX FUNDING FOR PORCINE EPIDEMIC DIARRHOEA TESTING IN OUTBREAKS OF DIARRHOEA

In order to increase the chances of early detection of virulent porcine epidemic diarrhoea virus (PEDv) which has been spreading in North America and elsewhere in the world, BPEX are funding PEDv PCR testing of faeces or intestinal contents from outbreaks of diarrhoea in any age of pig on premises in England and Wales.

In order to access this testing, where a farmer, pig keeper and/or veterinary surgeon encounters an outbreak of diarrhoea, a pooled sample of faeces (or terminal small or large intestinal contents if pigs are dying) should be collected from up to five pigs affected with diarrhoea. The faeces should be freshly passed and collected from pigs early in the course of disease. The samples must be submitted with a **fully completed** AHVLA submission form found on this link www.defra.gov.uk/ahvla-en/files/form-vla3.pdf selecting **AHVLA Bury St Edmunds** at the top of the form and writing "**PEDv PCR BPEX**" in the Tests box.

Samples must be packaged according to usual requirements for AHVLA diagnostic samples in robust leakproof containers with sufficient absorbent material to prevent fluid escape in the event of leakage and sent to **AHVLA Weybridge**:

Sample reception area, AHVLA Weybridge Woodham Lane, New Haw, Addlestone Surrey KT15 3NB

The PEDv PCR results will be reported to the submitting veterinary practice from AHVLA Bury St Edmunds. No chargeable diagnostic testing will be performed on these samples.

It is worth noting that if samples are submitted to AHVLA from pigs with diarrhoea for chargeable diagnostic testing, this PEDv PCR will be performed anyway and it is not necessary to send additional samples to Weybridge – the above testing is for outbreaks where no diagnostic testing at AHVLA is being undertaken.

Typically, virulent porcine epidemic diarrhoea (PED) occurs as an explosive outbreak of rapidly spreading diarrhoea with reduced appetite and lethargy, sometimes with vomiting, affecting all ages of pig and often causing high mortality (30-100%) in sucking (preweaned) piglets in litters from all parities of sow.

Additional points to note: The diarrhoea may be watery and piglets rapidly dehydrate. Piglets may be found dead before diarrhoea is noticed especially on outdoor units. High mortality in sucking pigs would be an early signal of virulent PED but the diarrhoea may resemble other causes of enteric disease in older pigs. Diarrhoea due to virulent PEDv in weaned and older pigs is transient and pigs recover but intercurrent infections such as salmonellosis could mean that more prolonged diarrhoea or deaths are seen in growing pigs. A poor response to antimicrobial treatment would be expected in preweaned piglets.

If you have any queries about this testing please contact one of the following:

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