

TERRESTRIAL ANIMAL HEALTH STANDARDS COMMISSION

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CHAPTER ~~8~~15.~~16~~4.**SWINE VESICULAR DISEASE**Article ~~8~~15.~~16~~4.1.

The pig is the only natural host for swine vesicular disease (SVD) virus. The definition of pig includes all varieties of *Sus scrofa*, both domestic and wild.

~~For the purposes of the *Terrestrial Code*, the incubation period for swine vesicular disease (SVD) shall be 28 days.~~

~~For the purposes of this Chapter, the *Terrestrial Code*, SVD is defined as an infection of susceptible animals include domestic and wild pigs.~~

Domestic pig is defined as all domesticated pigs, permanently captive or farmed free range, used for the production of *meat* for consumption, for the production of other commercial products or for breeding these categories of pigs.

For the purposes of the *Terrestrial Code*, the incubation period for SVD shall be 28 days.

~~For the purposes of this Chapter, a case includes an animal infected with SVD virus (SVDV).~~

~~For the purposes of *international trade*, †This chapter deals not only with the occurrence of clinical signs caused by SVDV virus (SVDV), but also with the presence of infection with SVDV in the absence of clinical signs. For the purposes of this Chapter, virus presence of with SVDV as demonstrated by:~~

1. virus isolation, or detection of virus antigen or virus nucleic acid, or
2. seroconversion, or
3. clinical signs associated with serological evidence, or
4. clinical signs or serological evidence associated with an epidemiological link.

Standards for diagnostic tests are described in the *Terrestrial Manual*.

A Member should not impose trade bans in response to a notification of infection with SVDV in wild pigs according to Article 1.2.3. of the *Terrestrial Code*.

Article 15.4.1. bis.**Determination of the SVD status of a country, zone or compartment**

The SVD status of a country, ~~zone~~ or *compartment* can only be determined after considering the following criteria, as applicable:

1. SVD should be notifiable in the whole territory, and all clinical signs suggestive of SVD should be

subjected to appropriate field and/or laboratory investigations;

2. an on-going awareness programme should be in place to encourage reporting of all cases suggestive of SVD;
3. the Veterinary Authority should have current knowledge of, and authority over, all domestic pigs in the country, zone or compartment;

Annex XXIX (contd)

4. the Veterinary Authority should have current knowledge about the population and habitat of wild pigs in the country or zone;
5. for domestic pigs, appropriate surveillance, capable of detecting the presence of infection even in the absence of clinical signs, is in place; this may be achieved through a surveillance programme in accordance with Articles 15.4.14. to 15.4.19.

Article ~~815.164~~.2.

SVD free country, zone or compartment

Susceptible animals in the SVD free country or zone or compartment should be separated from neighbouring infected countries or zones by animal health measures (bio-security measures, which may include a buffer zone) that effectively prevent the entry of the virus, or by physical barriers.

The SVD status of a country, zone or compartment can only be determined by applying surveillance recommendations described Chapter 1.4. according to two possibilities:

1. Historically free status

A country or zone may be considered free from the disease without formally applying a pathogen specific surveillance programme if the provisions of Article 1.4.6. are complied with.

2. Free status as a result of a specific surveillance programme

A country, zone or compartment which does not meet the conditions of point 1 above may be considered free from SVD when:

- a) surveillance for both SVD and SVDV infection in accordance with Articles 15.4.14 -15.4.19 and Chapter 1.4. has been in place for at least 3 years;
- b) no outbreak of SVD and no evidence of SVDV circulation has been found during the past 3 years;
- c) regulatory measures for the prevention and control of SVD have been implemented, including the control of the movement of ~~susceptible animals~~ pigs and other relevant measures for preventing the entry of the virus.

If a stamping-out policy was applied in respect of the most recent outbreak, the requirement of 3 years in points a) and b) above is shortened to 12 months.

Article ~~815.164~~.3.**SVD infected country or zone**

A ~~an~~ SVD infected country or *zone* is ~~a country or zone~~ one that does not fulfill the requirements to be considered as free.

Article ~~815.164~~.4.**Establishment of a containment zone within ~~an~~ SVD free country or SVD free zone**

In the event of ~~a~~ limited *outbreak*~~s~~ within ~~an~~ SVD free country or SVD free *zone*, a single *containment zone*, which includes all *cases*, can be established for the purpose of minimizing the impact on the entire country or *zone*. For this to be achieved, the *Veterinary Authority* should be able to provide documented evidence that:

1. the *outbreak* is limited based on the following factors:
 - a) immediately on suspicion, a rapid response including notification has been made;
 - b) standstill of ~~animal~~ pig movements has been imposed, and effective controls on the movement of other *commodities* mentioned in this chapter are in place;
 - c) the infection has been confirmed;
 - ~~ed~~ epidemiological investigation (trace-back, trace-forward) has been carried out~~completed~~;
 - ~~de~~ the primary outbreak has been identified and investigations of the likely ~~the~~ source of the *outbreak* has~~ve~~ been ~~identified~~ carried out;
 - e~~f~~) all *cases* have been shown to be epidemiologically linked;
2. *surveillance* in accordance with Articles15.4.14 -15.4.19 and Chapter 1.4. is in place and demonstrates that there are no undetected *cases* in the *containment zone*;
3. a *stamping-out policy* has been applied;
4. the pig population within the containment zones should be clearly identifiable as belonging to the containment zone;
45. increased passive and targeted *surveillance* in accordance with Articles15.4.14 -15.4.19 and Chapter 1.4. in the rest of the country or *zone* has been carried out and has not detected any evidence of *infection*;
56. measures to prevent spread of the *infection* from the *containment zone* to the rest of the country or *zone*, are in place.

The free status of the area outside the *containment zone* would be suspended pending the establishment of the *containment zone*. The suspension of free status of this area could be lifted irrespective of the provisions of Article ~~815.164~~.5., once the *containment zone* is clearly established, by complying with points 1 to 56 above.

The recovery of the SVD free status of the *containment zone* should follow the provisions of Article ~~815.164~~.5.

When importing from *containment zones*, provisions of Articles ~~815.164.6.~~, ~~815.164.98.~~, ~~815.164.140.~~, 15. 4.12. and ~~815.164.13.~~, concerning the importation from countries or *zones* considered infected with SVD, should be applied.

Article ~~815.164.5.~~

Recovery of free status

When an SVD ~~outbreak or SVDV infection~~ occurs in an SVD free country or *zone*, one of the following waiting periods is required to regain the status of SVD free country or *zone*:

1. 2 months after the *stamping-out* of the last *case*, where a *containment zone* and serological *surveillance* have been applied in accordance with this chapter and Chapter 1.4.; or
2. 12 months after the *stamping-out* of the last *case*, where the conditions for the establishment of a *containment zone* are not fulfilled, a *stamping-out policy* and serological *surveillance* have been applied in accordance with this chapter and Chapter 1.4.

Where both a *stamping-out policy* and serological *surveillance* in accordance with this chapter ~~XX~~ have not been practiced, the above waiting periods do not apply, and Article ~~815.164.2.~~ applies.

Article ~~815.164.6.~~

Direct Transfer of pigs from an infected zone for directly to slaughter of SVD-susceptible animals from an infected zone to in a free zone within a country

In order not to jeopardise the status of a free zone, pigs SVD-susceptible animals should only leave the an infected zone if moved by mechanised transported directly to slaughter in to the nearest designated abattoir, located in the buffer zone (if established), directly to slaughter under the following conditions:

In the absence of an *abattoir* in the *buffer zone*, or in the absence of a *buffer zone*, live SVD-susceptible animals can be transported to the nearest *abattoir* in a free *zone* directly to *slaughter* only under the following conditions:

1. no SVD-susceptible animal pig has been introduced into the *establishment* of origin and no animal pig in the *establishment* of origin has shown clinical signs of SVD for at least 60 days prior to movement;
2. a representative sample of animals of pigs in the *herd* of origin, including all animals pigs to be moved for *slaughter* has been serologically tested with negative findings;
3. the animals pigs were kept in the *establishment* of origin for at least 2 months prior to movement;
4. SVD has not occurred within a 1 kilometre radius of the *establishment* of origin for at least 2 months prior to movement;
5. the animals pigs ~~must should~~ be transported under the supervision of the *Veterinary Authority* in a *vehicle*, which was cleansed and disinfected before *loading*, directly from the *establishment* of origin to the *abattoir* without coming into contact with other susceptible animals pigs;
6. such an *abattoir* is not approved for the export of *fresh meat* during the time it is handling the *meat* of animals pigs from the *infected zone* and, to be re-approved, ~~must should~~ apply *disinfections* ~~able to~~ that will destroy ~~any~~ residual infectivity;

7. *vehicles* and the *abattoir* ~~must~~ should be subjected to thorough cleansing and *disinfection* ~~able to~~ that will destroy ~~any~~ residual *infectivity* immediately after use.

All products obtained from the ~~animals~~ pigs and any products coming into contact with them ~~must~~ should be identified and traded only on domestic market.

~~Animals~~ Pigs moved into a free *zone* for other purposes ~~must~~ should be moved under the supervision of the *Veterinary Authority* and comply with the conditions in Article ~~815.164.98~~.

Article ~~815.164.7~~

Recommendations for importation from SVD free countries, zones or compartment

for domestic pigs

Veterinary Authorities should require the presentation of an *international veterinary certificate* attesting that the ~~animals~~ pigs:

1. showed no clinical sign of SVD on the day of shipment;
2. were kept in an SVD free country, *zone* or *compartment* since birth or for at least the past 60 days.

Article ~~8.16.8~~

Recommendations for importation from SVD free countries or zones

for wild pigs

~~*Veterinary Authorities* should require the presentation of an *international veterinary certificate* attesting that the ~~animals~~ pigs:~~

1. showed no clinical sign of SVD on the day of shipment;
2. come from an SVD free country or *zone*;

~~if the country or *zone* of origin has a common border with a country or *zone* considered infected with SVD:~~

3. were kept in a *quarantine station* for the 60 days prior to shipment and were subjected to a prescribed serological test for SVD with negative results ~~during~~ that period.

Article ~~815.164.98~~.

Recommendations for importation from countries or zones considered infected with SVD

for domestic and wild pigs

Veterinary Authorities should require the presentation of an *international veterinary certificate* attesting that the ~~animals~~ pigs:

1. showed no clinical sign of SVD on the day of shipment;
2. were kept in a *quarantine station* for the 60 days prior to shipment and were subjected to a prescribed serological test for SVD with negative findings at the end of ~~during~~ that period.

Article ~~815.164.109~~.

Recommendations for importation from SVD free countries or zones or compartments

for semen of pigs

Veterinary Authorities should require the presentation of an *international veterinary certificate* attesting that:

1. the donor animals:
 - a) showed no clinical sign of SVD on the day of collection of the semen;
 - b) were kept in an SVD free country or *zone* or *compartment* for not less than 60 days prior to collection;
2. the semen was collected, processed and stored in conformity with the provisions of Chapter 4.6.

Article ~~815.164.110~~.

Recommendations for importation from countries or zones considered infected with SVD

for semen of pigs

Veterinary Authorities should require the presentation of an *international veterinary certificate* attesting that:

1. the donor ~~animals~~ pigs showed no clinical sign of SVD on the day of collection of the semen and were subjected to a prescribed serological test for SVD with negative findings;

Annex XXIX (contd)

2. the donor ~~animals~~ pigs were kept in the *exporting country* or *zone* for the 60 days prior to collection, in an *establishment* or *artificial insemination centre* where no *case* of SVD was officially reported during that period, and that the *establishment* or *artificial insemination centre* was not situated within one km from an *outbreak* occurring in the last 60 days;
3. a representative sample of ~~animals~~ pigs ~~of in~~ the *herd* of origin has been serologically tested with negative findings;
4. the semen was collected, processed and stored in conformity with the provisions of Chapter 4.6.

Article ~~815.164.121~~.

Recommendations for importation from SVD free countries, zones or compartments

for fresh meat of pigs

Veterinary Authorities should require the presentation of an *international veterinary certificate* attesting that the entire consignment of *meat* comes from animals:

1. which have been kept in an SVD free country, *zone* or *compartment* since birth or for at least the past 60 days;

2. which have been slaughtered in an *approved abattoir* and have been subjected to ante-mortem and post-mortem inspections for SVD with favourable outcome.

All the necessary measures have been taken to avoid cross contamination.

Article 15.4.12.

Recommendations for importation from SVD infected countries, zones or compartments

for meat products of pigs

Veterinary Authorities should require the presentation of an international veterinary certificate attesting that the entire consignment of meat products have been processed in an establishment approved by the Veterinary Authority so as to ensure the destruction of the SVD virus by either:

1. Heat treatment in a hermetically sealed container with an F0 value of 3,00 or more, or
2. heat treatment at a minimum temperature of 70 °C, which must be reached throughout the meat, or
3. heat treatment in a hermetically sealed container to at least 60 °C for a minimum of 4 hours, during which time the core temperature must be at least 70 °C for 30 minutes, or
4. natural fermentation and maturation of not less than nine months, resulting in the following characteristics: Aw value of not more than 0,93 or a pH value of not more than 6,0 , and
5. all the necessary measures have been taken to avoid cross contamination.

Article ~~815.164~~.13

Recommendations for the importation of *meat products* of pigs (~~either domestic or wild~~), or for products of ~~animal~~ pig origin (from *fresh meat* of pigs) intended for use in animal feeding, for agricultural or industrial use, or for pharmaceutical or surgical use, ~~or for trophies derived from wild pigs~~

Veterinary Authorities of importing countries should require the presentation of an *international veterinary certificate* attesting that the products:

4. have been prepared:
 - a1. ~~exclusively from fresh meat~~ meeting the conditions laid down in Article ~~815.164.121~~, as relevant; or
 2. from meat products meeting the conditions laid down in Article 15.4.12.;
- b) ~~in a processing establishment:~~
 - i) ~~approved by the Veterinary Authority for export purposes;~~
 - ii) ~~processing only meat meeting the conditions laid down in Article 8.16.12, as relevant;~~

OR

2. ~~have been processed in an establishment approved by the Veterinary Authority for export purposes so as to ensure the destruction of the SVD virus.~~

Article 15.4.14.

Surveillance: introduction

The Articles 1i.4.14. – 15.4.19. define the principles and provides a guide for the *surveillance* of SVD complementary to Chapter 1.4., applicable to Members seeking to determine their SVD status for the whole country or a *zone*, or a *compartment*. Guidance on *surveillance* for countries seeking re-establishment of freedom from SVD for the whole country or a *zone*, or a *compartment* following an *outbreak*, as well as for demonstrating the maintenance of SVD free status is also provided.

Consideration should be given to the known characteristics of SVD epidemiology, which include the impact of different production systems on *disease* spread, the lack of pathognomonic gross lesions and clinical signs, and the frequency of clinically inapparent *infection*. Serological cross-reactivity with other agents has to be taken into consideration when interpreting data from serological surveys.

Clinically, SVD may be indistinguishable from foot and mouth disease (FMD) and this is its main importance. And since any vesicular condition in pigs may be FMD, it is therefore essential that *cases* of SVD be distinguished urgently from FMD by laboratory investigation.

Article 15.4.15.

Surveillance: general conditions and methods

1. A surveillance system in accordance with Chapter 1.4. should be under the control of the *Veterinary Authority*.
 - a) a formal and ongoing system for detecting and investigating *outbreaks* of *disease* or SVDV infection should be in place;
 - b) a procedure should be in place for the rapid collection and transport of samples from suspect cases of SVD to a *laboratory* for SVD diagnosis as described in the *Terrestrial Manual*;
 - c) a system for recording, managing and analysing diagnostic and *surveillance* data should be in place.
2. The SVD *surveillance* programme should:
 - a) include an early warning system throughout the production, marketing and processing chain for reporting suspicious cases. Farmers and workers, who have day-to-day contact with livestock, as well as diagnosticians, should report promptly any suspect case of SVD. All suspected cases of SVD should be investigated immediately. Where suspicion cannot be resolved by epidemiological and clinical investigation, samples should be taken and submitted to an approved *laboratory*. This requires that sampling kits and other equipment are available for those responsible for the *surveillance*. Personnel responsible for the *surveillance* should be able to call for assistance from a team with expertise in vesicular diseases diagnosis and control;
 - b) implement when relevant, regular and frequent clinical inspection and serological testing of high-risk groups of *animals* (*risks* linked to the types of production cycle, local trade pattern, holding with poor bio-security measures, possible direct or indirect contact with other pigs).

An effective *surveillance* system will periodically identify suspicious cases that require follow-up and investigation to confirm or exclude that the cause of the condition is SVD. The rate at which such suspicious cases are likely to occur will differ between epidemiological situations and cannot, therefore, be reliably predicted. Recognition for freedom from SVD infection should, as a consequence, provide

details of the occurrence of suspicious cases and how they were investigated and dealt with. This should include the results of laboratory testing and the control measures to which the *animals* concerned were submitted during the investigation (quarantine, movement stand-still orders, etc.).

Article 15.4.16.

Surveillance strategies

1. Introduction

The population targeted by *surveillance* programs aimed at identifying *disease* and *infection* should include domestic pig populations within the country or *zone* or *compartment* to be recognised as free from SVD.

Given the existence of clinically inapparent *infection* and difficulties associated with clinical diagnosis of SVD, serology is often the most effective and efficient *surveillance* methodology. In some circumstances, which will be discussed later, clinical and virological *surveillance* may also have a value.

2. Clinical surveillance

SVD can be sub-clinical, mild or severe depending on the strain of virus involved, the route and dose of infection, and the husbandry condition under which the pigs are kept.

Clinically, SVD is indistinguishable from FMD and, when a vesicular condition is seen in pigs, it must be assumed to be FMD until investigated by *laboratory* tests and proven otherwise.

Nevertheless, SVD caused by mild strains may remain unobserved, and in this case the value of clinical examination alone is insufficient as a *surveillance* tool: in this case serology is often the most effective and efficient *surveillance* methodology.

Clinical *surveillance* and laboratory testing should always be applied in series to clarify the status of suspected cases detected by either of these complementary diagnostic approaches. Laboratory testing may confirm clinical suspects, while clinical *surveillance* may contribute to confirmation of positive serology. Any sampling unit within which suspicious *animals* are detected should be classified as infected until contrary evidence is produced.

Identification of suspected cases is vital to identify the sources of SVDV. It is essential that SVDV isolates are sent regularly to a Reference Laboratory to enable the determination of the molecular, antigenic and other biological characteristics of the virus.

3. Virological surveillance

Virological *surveillance* using tests described in the *Terrestrial Manual* should be conducted:

- a) to monitor an at risk population;
- b) to confirm clinically suspected cases;
- c) to follow up positive serological results.

The most suitable samples for virological testing are vesicular lesion materials from clinically affected pigs and faeces from pigs without lesions.

4. Serological surveillance

Serological surveillance aims at the detection of antibodies against SVD. Positive SVD antibody test results can have three possible causes:

- a) natural infection with SVD;
- b) maternal antibodies derived from immune sows (no published data exist so far on the duration of maternal passive immunity against SVD);
- c) non-specific reactors.

Article 15.4.17.

The use and interpretation of serological tests

Any positive test result should be followed up immediately using appropriate clinical, epidemiological, serological and virological investigations of the reactor animals at hand, and of susceptible animals of the same epidemiological unit and those that have been in contact or otherwise epidemiologically associated with the reactor animals. If the follow-up investigations provide no evidence for SVDV active infection, the reactor animal shall be classified as non SVD infected. In all the other cases, including the absence of such follow-up investigations, the reactor animals should be classified as SVD positive.

It is suggested that in the primary sampling units where at least one animal reacts positive to the screening test, the following strategy should be applied (Figure 1):

1. In case of positive results to the screening test (ELISA), all positive sera from the herd should be tested using the Virus Neutralization (VN) test. If there are pigs that test serologically positive by VN test, the positive sample may be tested to identify the isotype of antibody (IgM or IgG).
2. The positive herd should undergo clinical examination with collection of samples for virological testing (vesicular lesions and/or faeces). In the presence of symptoms compatible with SVD and/or detection of virus, the herd is to be considered infected.
3. Identification of the isotype of antibody present in positive sera can be helpful in the evaluation of the epidemiological meaning of results, as sera from recently infected pigs usually contain specific IgM alone, subsequently both IgM and IgG, and later exclusively IgG. Therefore, in the sero-positive herd:
 - a) The clinical examination and virological testing of sero-positive animals and animals in contact should be targeted to the IgM positive animals and to those living in their proximity, rather than to the IgG positives.
 - b) The presence of IgG positives exclusively may indicate a low likelihood of SVDV circulation.
 - c) The presence of a single reactor, containing exclusively IgM also on re-testing, without increase of VN titre, in the absence of symptoms and seroconversion in animals in contact, is usually due to non-specific reaction.
4. In the case of seroreactor herds without clinical signs or positive virological findings, after an adequate interval of time has lapsed (at least 7 days), following clinical examination, a second serum sample should be collected from the positive animals and also from a representative number of pigs in contact with the positives in the primary sampling. These samples are tested using ELISA and VN test and antibody titres at the time of retest should be equal to or lesser than those observed in the initial test if virus is not circulating.
5. In case of the detection of an outbreak, an epidemiological investigation has to be performed and a representative sample of animals in all epidemiologically linked herds should be serologically tested.

Possible alternative strategies may be adopted, but in this case the country should justify the procedure chosen as adequate to detect the presence of SVDV infection. Possible shortcomings in the sensitivity of alternative diagnostic strategies should be addressed by appropriate changes in the *surveillance* design and in the sample size.

Fig 1: Should confirm that SVD virus could be demonstrated in samples from pigs on seroreactor *herds* before declaring an *outbreak*, even if clinical signs suggestive of SVD were found.

Article 15.4.18.

Countries, zones or compartments declaring freedom from SVD: Additional surveillance procedures

1. Country or zone free of SVD

In addition to the general conditions described in this chapter, a Member declaring freedom from SVD for the entire country or a *zone* should provide evidence for the existence of an effective *surveillance* programme. The strategy and the design of the *surveillance* programme will depend on the prevailing epidemiological circumstances. It will be planned and implemented to demonstrate the absence of SVDV infection in susceptible populations, during the preceding 3 years, according to general conditions and methods described in this chapter. This requires the support of a national or other *laboratory* able to undertake identification of SVDV infection through virus detection and antibody tests described in the *Terrestrial Manual*.

This *surveillance* may be targeted to a pig population at specific *risks* linked to the types of production, local trade patterns, holdings with poor bio security measures in place.

2. Compartment free of SVD

The objective of *surveillance* is to demonstrate the absence of SVDV infection in the *compartment*. The provisions of Chapters 4.3. and 4.4. should be followed. The frequency and intensity of *surveillance* should be defined and adapted to the prevailing epidemiological situation in the country or *zone*. Any deterioration in the epidemiological situation should trigger a review of the biosecurity measures and an intensification of *surveillance*.

Article 15.4.19.

Recovery of status: Additional surveillance procedures

In addition to the general conditions described in this chapter, a country, *zone* or *compartment* regaining freedom from SVDV infection should show evidence of an active *surveillance* programme aimed to demonstrate the absence of the *infection*.

The population under this *surveillance* programme should include:

- a) in the *establishments* in the area of the *outbreak*;
- b) in the *establishments* epidemiologically linked to the *outbreak*;
- c) used to re-populate affected *establishments*.

This will require *surveillance* incorporating virus detection and antibody tests described in the *Terrestrial Manual*.

In all circumstances, a Member self-declaring freedom of a country, *zone* or *compartment* after an *outbreak*, should report the results of an active *surveillance* programme in which pigs undergo regular active *surveillance*, planned and implemented according to the general conditions and methods described in this chapter.

Figure 1. Use and interpretation of serological tests

