CHAPTER 15.2.

INFECTION WITH CLASSICAL SWINE FEVER VIRUS

Article 15.2.1.

General provisions

For the purposes of the *Terrestrial Code*, classical swine fever (CSF) is defined as an *infection* of pigs with classical swine fever virus (CSFV).

The following defines *infection* with CSFV:

1) a strain of CSFV (excluding vaccine strains) has been isolated from samples from a pig;

OR

2) viral antigen (excluding vaccine strains) has been identified, or viral ribonucleic acid specific to a strain of CSFV has been demonstrated to be present, in samples from one or more pigs epidemiologically linked to a confirmed or suspected *outbreak* of CSF, or giving cause for suspicion of previous association or contact with CSFV, with or without clinical signs consistent with CSF;

OR

3) virus specific antibodies to CSFV that are not a consequence of *vaccination* or *infection* with other pestiviruses, have been detected in samples from one or more pigs in a *herd* showing clinical signs consistent with CSF, or epidemiologically linked to a confirmed or suspected *outbreak* of CSF, or giving cause for suspicion of previous association or contact with CSFV.

The pig is the only natural host for CSFV. The definition of pig includes all varieties of *Sus scrofa*, both domestic and *wild*. For the purposes of this chapter, a distinction is made between:

– domestic and *captive wild* pigs, permanently captive or farmed free range, used for the production of *meat*, or other commercial products or use, or for breeding these categories of pigs;

– *wild* and *feral* pigs.

Pigs exposed to CSFV prenatally may be persistently infected throughout life and may have an *incubation period* of several months before showing signs of disease. Pigs exposed postnatally have an *incubation period* of 2–14 days, and are usually infective between post-*infection* days 5 and 14, but up to 3 months in cases of chronic *infections*.

A Member Country should not impose bans on the trade in *commodities* of domestic and *captive wild* pigs in response to a *notification* of *infection* with CSFV in *wild* and *feral* pigs provided that Article 15.2.2. is implemented.

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

Article 15.2.2.

General criteria for the determination of the CSF status of a country, zone or compartment

1) CSF is notifiable in the whole territory, and all pigs showing clinical signs suggestive of CSF are subjected to appropriate field or *laboratory* investigations;

2) an ongoing awareness programme is in place to encourage reporting of all cases suggestive of CSF;

3) the *Veterinary Authority* has current knowledge of, and authority over, all domestic and *captive wild* pig *herds* in the country, *zone* or *compartment*;

4) the *Veterinary Authority* has current knowledge about the population and habitat of *wild* and *feral* pigs in the country or *zone*;

5) for domestic and *captive wild* pigs, appropriate *surveillance* in accordance with Articles 15.2.26. to 15.2.32. is in place;

6) for *wild* and *feral* pigs, if present in the country or *zone*, a *surveillance* programme is in place in accordance with Article 15.2.31., taking into account the presence of natural and artificial boundaries, the ecology of the *wild* and *feral* pig population, and an assessment of the *risks* of disease spread.

7) Based on the assessed *risk* of spread within the *wild* and *feral* pig population and in accordance with Article 15.2.29., the domestic and *captive wild* pig population should be separated from the *wild* and *feral* pig population by appropriate measures.

Article 15.2.3.

CSF free country or zone

A country or *zone* may be considered free from CSF when Article 15.2.2. is complied with, and when:

1) *surveillance* in accordance with Articles 15.2.26. to 15.2.32. has been in place for at least 12 months;

2) there has been no *outbreak* of CSF in domestic and *captive wild* pigs during the past 12 months;

3) no evidence of *infection* with CSFV has been found in domestic and *captive wild* pigs during the past 12 months;

4) no *vaccination* against CSF has been carried out in domestic and *captive wild* pigs during the past 12 months unless there are means, validated in accordance with Chapter 3.8.3. of the *Terrestrial Manual*, of distinguishing between vaccinated and infected pigs;

5) imported pigs and pig *commodities* comply with the requirements in Articles 15.2.7. to 15.2.14.

The country or the proposed free *zone* will be included in the list of CSF free countries or *zones* only after the submitted evidence, based on Chapter 1.9., has been accepted by the OIE.

Retention on the list requires that the information in points 1) to 5) above be re-submitted annually and changes in the epidemiological situation or other significant events should be reported to the OIE in accordance with the requirements in Chapter 1.1.

Article 15.2.4.

CSF free compartment

The bilateral recognition of a CSF free *compartment* should follow the relevant requirements of this chapter and the principles laid down in Chapters 4.4. and 4.5.

Article 15.2.5.

Establishment of a containment zone within a CSF free country or zone

In the event of limited *outbreaks* or *cases* of CSF within a CSF free country or *zone*, including within a *protection zone*, a *containment zone*, which includes all *outbreaks*, can be established for the purposes of minimising the impact on the entire country or *zone*.

For this to be achieved and for the Member Country to take full advantage of this process, the *Veterinary Authority* should submit documented evidence as soon as possible to the OIE.

In addition to the requirements for the establishment of a *containment zone* outlined in Article 4.4.7., the *surveillance* programme should take into consideration the involvement of *wild* and *feral* pigs and measures to avoid their dispersion.

The free status of the areas outside the *containment zone* is suspended while the *containment zone* is being established. The free status of these areas may be reinstated irrespective of Article 15.2.6., once the *containment zone* is clearly established. It should be demonstrated that *commodities* for *international trade* have originated outside the *containment zone*.

In the event of the recurrence of CSF in the *containment zone*, the approval of the *containment zone* is withdrawn.

The recovery of the CSF free status of the *containment zone* should follow Article 15.2.6.

Article 15.2.6.

Recovery of free status

Should a CSF *outbreak* occur in a free country or *zone*, the free status may be restored where *surveillance* in accordance with Articles 15.2.26. to 15.2.32. has been carried out with negative results either:

1) three months after the last *case* where a *stamping-out policy* without *vaccination* is practised;

OR

2) where a *stamping-out policy* with emergency *vaccination* is practised:
   a) three months after the last *case* and the *slaughter* of all vaccinated animals, or
   b) three months after the last *case* without the *slaughter* of vaccinated animals where there are means, validated in accordance with Chapter 3.8.3. of the *Terrestrial Manual*, of distinguishing between vaccinated and infected pigs;

OR

3) where a *stamping-out policy* is not practised, Article 15.2.3. should be followed.

The country or *zone* will regain CSF free status only after the submitted evidence, based on Chapter 1.9., has been accepted by the OIE.

Article 15.2.7.

Recommendations for importation from countries, zones or compartments free from CSF

For domestic and captive wild pigs

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

1) showed no clinical sign of CSF on the day of shipment;
2) were kept in a country, *zone* or *compartment* free from CSF since birth or for at least the past three months;
3) have not been vaccinated against CSF, nor are they the progeny of vaccinated sows, unless there are means, validated in accordance with Chapter 3.8.3. of the *Terrestrial Manual*, of distinguishing between vaccinated and infected pigs.

Article 15.2.8.

Recommendations for importation from countries or zones considered infected with CSFV

For domestic and captive wild pigs

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

1) showed no clinical sign of CSF on the day of shipment;
2) were kept since birth or for the past three months in a CSF free *compartment*;
3) have not been vaccinated against CSF nor are they the progeny of vaccinated sows, unless there are means, validated in accordance with Chapter 3.8.3. of the *Terrestrial Manual*, of distinguishing between vaccinated and infected pigs.

Article 15.2.9.

Recommendations for the importation of wild and feral pigs

Regardless of the CSF status of the country of origin, *Veterinary Authorities* should require the presentation of an *international veterinary certificate* attesting that the animals:

1) showed no clinical sign of CSF on the day of shipment;
2) were kept in a *quarantine station* for 40 days prior to shipment, and were subjected to a virological test and a serological test performed at least 21 days after entry into the *quarantine station*, with negative results;
3) have not been vaccinated against CSF, unless there are means, validated in accordance with Chapter 3.8.3. of the *Terrestrial Manual*, of distinguishing between vaccinated and infected pigs.

Article 15.2.10.

Recommendations for importation from countries, zones or compartments free from CSF

For semen of domestic and captive wild pigs

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

1) the donor animals:

   a) were kept in a country, *zone* or *compartment* free from CSF since birth or for at least three months prior to collection;

   b) showed no clinical sign of CSF on the day of collection of the semen;

2) the semen was collected, processed and stored in accordance with Chapters 4.6. and 4.7.

Article 15.2.11.

Recommendations for importation from countries or zones considered infected with CSFV

For semen of domestic and captive wild pigs

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

1) the donor animals:

   a) were kept in a *compartment* free from CSF since birth or for at least three months prior to collection;

   b) showed no clinical sign of CSF on the day of collection of the semen and for the following 40 days;

   c) met one of the following conditions:

      i) have not been vaccinated against CSF and were subjected to a serological test performed at least 21 days after collection, with negative results; or

      ii) have been vaccinated against CSF and were subjected to a serological test performed at least 21 days after collection and it has been conclusively demonstrated that any antibody is due to the vaccine; or

      iii) have been vaccinated against CSF and were subjected to a virological test performed on a sample taken on the day of collection and it has been conclusively demonstrated that the boar is negative for virus genome;

2) the semen was collected, processed and stored in accordance with Chapters 4.6. and 4.7.

Article 15.2.12.

Recommendations for importation from countries, zones or compartments free from CSF

For *in vivo* derived embryos of domestic pigs

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

1) the donor females showed no clinical sign of CSF on the day of collection of the embryos;

2) the embryos were collected, processed and stored in accordance with Chapters 4.8. and 4.10., as relevant.

Article 15.2.13.

Recommendations for importation from countries or zones considered infected with CSFV

For *in vivo* derived embryos of domestic pigs

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

1) the donor females:
   a) were kept in a *compartment* free from CSF since birth or for at least three months prior to collection;
   b) showed no clinical sign of CSF on the day of collection of the embryos and for the following 40 days;
   c) and either:
      i) have not been vaccinated against CSF and were subjected, with negative results, to a serological test performed at least 21 days after collection; or
      ii) have been vaccinated against CSF and were subjected to a serological test performed at least 21 days after collection and it has been conclusively demonstrated by means, validated in accordance with Chapter 3.8.3. of the *Terrestrial Manual*, that any antibody is due to the vaccine;
2) the embryos were collected, processed and stored in accordance with Chapters 4.8. and 4.10., as relevant.

Article 15.2.14.

Recommendations for importation from countries, zones or compartments free from CSF

For fresh meat of domestic and captive wild pigs

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

1) have been kept in a country, *zone* or *compartment* free from CSF, or which have been imported in accordance with Article 15.2.7. or Article 15.2.8.;
2) have been slaughtered in an approved *slaughterhouse/abattoir*, have been subjected to ante- and post-mortem inspections in accordance with Chapter 6.3. and have been found free from any sign suggestive of CSF.

Article 15.2.15.

Recommendations for the importation of fresh meat of wild and feral pigs

Regardless of the CSF status of the country of origin, *Veterinary Authorities* should require the presentation of an *international veterinary certificate* attesting that the entire consignment of *fresh meat* comes from animals:

1) which have been subjected to a post-mortem inspection in accordance with Chapter 6.3. in an approved examination centre, and have been found free from any sign suggestive of CSF;
2) from each of which a sample has been collected and has been subjected to a virological test and a serological test for CSF, with negative results.

Article 15.2.16.

Recommendations for the importation of meat and meat products of pigs intended for use in animal feeding, for agricultural or industrial use, or for pharmaceutical or surgical use

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

1) have been prepared:
   a) exclusively from *fresh meat* meeting the conditions laid down in Article 15.2.14.;
   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 15.2.14.;

OR

2) have been processed in an establishment approved by the *Veterinary Authority* for export purposes so as to ensure the destruction of the CSFV in accordance with one of the procedures referred to in Article 15.2.23., and that the necessary precautions were taken after processing to avoid contact of the product with any source of CSFV.

Article 15.2.17.

Recommendations for the importation of pig products not derived from fresh meat intended for use in animal feeding

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

1) originated from domestic and *captive wild* pigs in a CSF free country, *zone* or *compartment* and have been prepared in a processing establishment approved by the *Veterinary Authority* for export purposes; or

2) have been processed in an establishment approved by the *Veterinary Authority* for export purposes so as to ensure the destruction of the CSFV in accordance with Article 15.2.22., and that the necessary precautions were taken after processing to avoid contact of the product with any source of CSFV.

Article 15.2.18.

Recommendations for the importation of pig products not derived from fresh meat intended for agricultural or industrial use

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

1) originated from domestic and *captive wild* pigs in a CSF free country, *zone* or *compartment* and have been prepared in a processing establishment approved by the *Veterinary Authority* for export purposes; or

2) have been processed in an establishment approved by the *Veterinary Authority* for export purposes so as to ensure the destruction of the CSFV, and that the necessary precautions were taken after processing to avoid contact of the product with any source of CSFV.

Article 15.2.19.

Recommendations for the importation of bristles

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

1) originated from domestic and *captive wild* pigs in a CSF free country, *zone* or *compartment* and have been prepared in a processing establishment approved by the *Veterinary Authority* for export purposes; or

2) have been processed in an establishment approved by the *Veterinary Authority* for export purposes so as to ensure the destruction of the CSFV, and that the necessary precautions were taken after processing to avoid contact of the product with any source of CSFV.

Article 15.2.20.

Recommendations for the importation of litter and manure

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

1) originated from domestic and *captive wild* pigs in a CSF free country, *zone* or *compartment* and have been prepared in a processing establishment approved by the *Veterinary Authority* for export purposes; or

2) have been processed in an establishment approved by the *Veterinary Authority* for export purposes so as to ensure the destruction of the CSFV, and that the necessary precautions were taken after processing to avoid contact of the product with any source of CSFV.

Article 15.2.21.

Recommendations for the importation of skins and trophies

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

1) originated from domestic and *captive wild* pigs in a CSF free country, *zone* or *compartment* and have been prepared in a processing establishment approved by the *Veterinary Authority* for export purposes; or

2) have been processed in an establishment approved by the *Veterinary Authority* for export purposes so as to ensure the destruction of the CSFV in accordance with one of the procedures referred to in Article 15.2.25., and that the necessary precautions were taken after processing to avoid contact of the product with any source of CSFV.

Article 15.2.22.

Procedures for the inactivation of the CSFV in swill

For the inactivation of CSFV in swill, one of the following procedures should be used:

1) the swill should be maintained at a temperature of at least 90°C for at least 60 minutes, with continuous stirring; or

2) the swill should be maintained at a temperature of at least 121°C for at least 10 minutes at an absolute pressure of 3 bar.

Article 15.2.23.

Procedures for the inactivation of the CSFV in meat

For the inactivation of CSFV in *meat*, one of the following procedures should be used:

1. Heat treatment

   Meat should be subjected to one of the following treatments:

   a) heat treatment in a hermetically sealed container with a Fo value of 3.00 or more;

   b) heat treatment at a minimum temperature of 70°C, which should be reached throughout the *meat*.

2. Natural fermentation and maturation

   The *meat* should be subjected to a treatment consisting of natural fermentation and maturation having the following characteristics:

   a) an Aw value of not more than 0.93, or

   b) a pH value of not more than 6.0.

   Hams should be subjected to a natural fermentation and maturation process for at least 190 days and loins for 140 days.

3. Dry cured pork meat

   a) Italian style hams with bone-in should be cured with salt and dried for a minimum of 313 days.

   b) Spanish style pork *meat* with bone-in should be cured with salt and dried for a minimum of 252 days for Iberian hams, 140 days for Iberian shoulders, 126 days for Iberian loin, and 140 days for Serrano hams.

Article 15.2.24.

Procedures for the inactivation of the CSFV in casings of pigs

For the inactivation of CSFV in *casings* of pigs, the following procedures should be used: salting for at least 30 days either with phosphate supplemented dry salt or saturated brine (Aw < 0.80) containing 86.5% NaCl, 10.7% Na_2HPO_4 and 2.8% Na_3PO_4 (weight/weight/weight), and kept at a temperature of greater than 20°C during this entire period.

Article 15.2.25.

Procedures for the inactivation of the CSFV in skins and trophies

For the inactivation of CSFV in skins and trophies, one of the following procedures should be used:

1) boiling in water for an appropriate time so as to ensure that any matter other than bone, tusks or teeth is removed;
2) gamma irradiation at a dose of at least 20 kilogray at room temperature (20°C or higher);
3) soaking, with agitation, in a 4% (w/v) solution of washing soda (sodium carbonate – Na_2CO_3) maintained at pH 11.5 or above for at least 48 hours;
4) soaking, with agitation, in a formic acid solution (100 kg salt [NaCl] and 12 kg formic acid per 1,000 litres water) maintained at below pH 3.0 for at least 48 hours; wetting and dressing agents may be added;
5) in the case of raw hides, salting for at least 28 days with sea salt containing 2% washing soda (sodium carbonate – Na_2CO_3).

Article 15.2.26.

Surveillance: introduction

Articles 15.2.26. to 15.2.32. define the principles and provide a guide on the *surveillance* for CSF, complementary to Chapter 1.4., applicable to Member Countries seeking the OIE recognition of CSF status. This may be for the entire country or a *zone*. Guidance is also provided for Member Countries seeking recovery of CSF status for the entire country or for a *zone* following an *outbreak* and for the maintenance of CSF status.

The impact and epidemiology of CSF may vary in different regions of the world. The *surveillance* strategies employed for demonstrating freedom from CSF at an acceptable level of confidence should be adapted to the local situation. For example, the approach should be tailored in order to prove freedom from CSF for a country or *zone* where *wild* and *feral* pigs provide a potential reservoir of *infection*, or where CSF is present in adjacent countries. The method should examine the epidemiology of CSF in the region concerned and adapt to the specific risk factors encountered. This should include provision of scientifically based supporting data. There is, therefore, latitude available to Member Countries to provide a well-reasoned argument to prove that absence of *infection* with CSFV is assured at an acceptable level of confidence.

Surveillance for CSF should be in the form of a continuing programme designed to establish that susceptible populations in a country, *zone* or *compartment* are free from *infection* with CSFV or to detect the introduction of CSFV into a population already defined as free. Consideration should be given to the specific characteristics of CSF epidemiology which include:

– the role of swill feeding, the impact of different production systems and the role of *wild* and *feral* pigs on disease spread;
– the role of semen in transmission of the virus;
– the lack of pathognomonic gross lesions and clinical signs;
– the frequency of clinically inapparent *infections*;
– the occurrence of persistent and chronic *infections*;
– the genotypic, antigenic, and virulence variability exhibited by different strains of CSFV.

Article 15.2.27.

Surveillance: general conditions and methods

1) A *surveillance* system in accordance with Chapter 1.4. and under the responsibility of the *Veterinary Authority* should address the following aspects:
   a) formal and ongoing system for detecting and investigating *outbreaks* of disease or *infection* with CSFV should be in place;
   b) a procedure should be in place for the rapid collection and transport of samples from suspected cases to a *laboratory* for CSF diagnosis;
   c) a system for recording, managing and analysing diagnostic and *surveillance* data should be in place.

2) The CSF *surveillance* programme should:

a) include an *early warning system* throughout the production, marketing and processing chain for reporting suspected cases. Diagnosticians and those with regular contact with pigs should report promptly any suspicion of CSF to the *Veterinary Authority*. The *notification* system under the *Veterinary Authority* should be supported directly or indirectly (e.g. through private *veterinarians* or *veterinary paraprofessionals*) by government information programmes. Since many strains of CSFV do not induce pathognomonic gross lesions or clinical signs, cases in which CSF cannot be ruled out should be immediately investigated. Other important diseases such as African swine fever should also be considered in any differential diagnosis. Personnel responsible for *surveillance* should be able to call for assistance from a team with expertise in CSF diagnosis, epidemiological evaluation, and control;

b) implement, when relevant, regular and frequent clinical inspections and laboratory testing of high-risk groups (for example, where swill feeding is practised), or those adjacent to a CSF infected country or *zone* (for example, bordering areas where infected *wild* and *feral* pigs are present).

An effective *surveillance* system will periodically identify suspected cases that require follow-up and investigation to confirm or exclude *infection* with CSFV. The rate at which such suspected cases are likely to occur will differ between epidemiological situations and cannot, therefore, be reliably predicted. Applications for recognition of CSF status should, as a consequence, provide details in accordance with Chapter 1.9. of the occurrence of suspected cases and how they were investigated and dealt with.

Article 15.2.28.

Surveillance strategies

1. Introduction

The population covered by *surveillance* aimed at detecting disease and *infection* should include domestic and *wild* pig populations within the country or *zone* to be recognised as free from *infection* with CSFV.

The strategy employed to establish the prevalence or absence of *infection* with CSFV may be based on randomised or targeted clinical investigation or sampling at an acceptable level of statistical confidence. If an increased likelihood of *infection* in particular localities or sub-populations can be identified, targeted sampling may be an appropriate strategy. This may include:

a) swill fed farms;

b) pigs reared outdoors;

c) specific high-risk *wild* and *feral* pig sub-populations and their proximity.

Risk factors may include temporal and spatial distribution of past *outbreaks*, pig movements and demographics, etc.

For reasons of cost, persistence of antibody levels and the existence of clinically inapparent *infections*, serology in unvaccinated populations is often the most effective and efficient *surveillance* methodology. In some circumstances such as differential diagnosis of other diseases, clinical and virological *surveillance* may also have value.

The *surveillance* strategy chosen should be justified as adequate to detect the presence of *infection* with CSFV in accordance with Chapter 1.4. and the epidemiological situation. Cumulative survey results in combination with the results of routine *surveillance*, over time, will increase the level of confidence in the *surveillance* strategy.

When applying randomised sampling, either at the level of the entire population or within targeted sub-populations, the design of the sampling strategy should incorporate epidemiologically appropriate design prevalences for the selected populations. The sample size selected for testing should be large enough to detect *infection* if it were to occur at a predefined minimum rate. The choice of design prevalence and confidence level should be justified based on the objectives of *surveillance* and the epidemiological situation, in accordance with Chapter 1.4. Selection of the design prevalence in particular, needs to be based on the prevailing or historical epidemiological situation.

Irrespective of the approach selected, the sensitivity and specificity of the diagnostic tests should be considered in the survey design, the sample size determination and the interpretation of the results obtained.

The *surveillance* system design should anticipate the occurrence of false positive reactions. This is especially true of the serological diagnosis of CSF because of the recognized cross-reactivity with ruminant pestiviruses. There needs to be an effective procedure for following up positives to ultimately determine with a high level of confidence, whether or not they are indicative of *infection* with CSFV. This should involve confirmatory and differential tests for pestiviruses, as well as further investigations concerning the original sampling unit as well as *animals* which may be epidemiologically linked.

2. Clinical surveillance

Clinical *surveillance* continues to be the cornerstone of CSF detection. However, due to the low virulence of some CSFV strains and the spread of diseases such as African swine fever, and those associated with porcine circovirus 2 *infection*, clinical *surveillance* should be supplemented, as appropriate, by serological and virological *surveillance*.

Clinical signs and pathological findings are useful for early detection; in particular, any cases where clinical signs or lesions suggestive of CSF are accompanied by high morbidity or mortality, these should be investigated without delay. In *infections* with CSFV involving low virulence strains, high mortality may only be seen in young animals and adults may not present clinical signs.

Wild and *feral* pigs rarely present the opportunity for clinical observation, but should form part of any *surveillance* scheme and should, ideally, be monitored for virus as well as antibody.

3. Virological surveillance

Virological *surveillance* should be conducted to:

a) monitor at risk populations;

b) investigate clinically suspected cases;

c) follow up positive serological results;

d) investigate increased mortality.

Molecular detection methods can be applied to large-scale screening for the presence of virus. If targeted at high-risk groups, they provide an opportunity for early detection that can considerably reduce the subsequent spread of disease. Epidemiological understanding of the pathways of spread of CSFV can be greatly enhanced by molecular analyses of viruses in endemic areas and those involved in *outbreaks* in disease free areas. Therefore, CSFV isolates should be sent to an OIE Reference Laboratory for further characterisation.

4. Serological surveillance

Serological *surveillance* aims at detecting antibodies against CSFV. Positive CSFV antibody test results can have five possible causes:

a) natural *infection* with CSFV;

b) *vaccination* against CSF;

c) maternal antibodies;

d) cross-reactions with other pestiviruses;

e) non-specific reactors.

The *infection* of pigs with other pestiviruses may complicate a *surveillance* strategy based on serology. Antibodies to bovine viral diarrhoea viruses (BVDV) and Border disease virus (BDV) can give positive results in serological tests for CSF, due to common antigens. Such samples will require differential tests to confirm their identity. One route by which ruminant pestiviruses can infect pigs is the use of vaccines contaminated with BVDV.

CSFV may lead to persistently infected, sero-negative young animals, which continuously shed virus. CSFV *infection* may also lead to chronically infected pigs which may have undetectable or fluctuating antibody levels. Even though serological methods will not detect these animals, such animals are likely to be in a minority and would not confound a diagnosis based on serology as part of a *herd* investigation.

It may be possible to use sera collected for other survey purposes for CSF *surveillance*. However, the principles of survey design and the requirement for statistical validity should not be compromised.

In countries or *zones* where *vaccination* has been recently discontinued, targeted serosurveillance of young unvaccinated animals can indicate the presence of *infection*. Maternal antibodies are usually found up to 8-10 weeks of age but may be occasionally last up to four and a half months and can interfere with the interpretation of serological results.

Marker vaccines and accompanying DIVA tests which fulfil the requirements of the *Terrestrial Manual* may allow discrimination between vaccinal antibody and that induced by natural *infection*. The serosurveillance results using DIVA techniques may be interpreted either at *animal* or *herd* level.

Member Countries should review their *surveillance* strategies whenever an increase in the *risk* of incursion of CSFV is perceived. Such changes include but are not limited to:

a) an emergence or an increase in the prevalence of CSF in countries or *zones* from which live pigs or products are imported;

b) an increase in the prevalence of CSF in *wild* or *feral* pigs in the country or *zone*;

c) an increase in the prevalence of CSF in adjacent countries or *zones*;

d) an increased entry from, or exposure to, infected *wild* or *feral* pig populations of adjacent countries or *zones*.

Article 15.2.29.

Additional surveillance procedures for Member Countries applying for OIE recognition of CSF free status

The strategy and design of the *surveillance* programme will depend on the prevailing epidemiological circumstances in and around the country or *zone* and should be planned and implemented in accordance with the conditions for status recognition described in Article 15.2.2. and 15.2.3. and methods described elsewhere in this chapter. The objective is to demonstrate the absence of *infection* with CSFV in domestic and *captive wild* pigs during the last 12 months and to assess the *infection* status in *wild* and *feral* pig populations as described in Article 15.2.31.

Article 15.2.30.

Additional surveillance procedures for recovery of free status

In addition to the general conditions described in this chapter, a Member Country seeking recovery of country or *zone* CSF free status, including a *containment zone*, should show evidence of an active *surveillance* programme to demonstrate absence of *infection* with CSFV.

Populations under this *surveillance* programme should include:

1) *establishments* in the proximity of the *outbreaks*;

2) *establishments* epidemiologically linked to the *outbreaks*;

3) animals moved from or used to re-populate affected *establishments*;

4) any *establishments* where contiguous culling has been carried out;

5) *wild* and *feral* pig populations in the area of the *outbreaks*.

The domestic and *captive wild* pig populations should undergo regular clinical, pathological, virological and serological examinations, planned and implemented in accordance with the general conditions and methods described in these recommendations. Epidemiological evidence of the *infection* status in *wild* and *feral* pigs should be compiled. To regain CSF free status, the *surveillance* approach should provide at least the same level of confidence as within the original application for recognition of freedom.

Article 15.2.31.

Surveillance for CSFV in wild and feral pigs

1) The objective of a *surveillance* programme is either to demonstrate that *infection* with CSFV is not present in *wild* and *feral* pigs or, if known to be present, to estimate the distribution and prevalence of the *infection*. While the same principles apply, *surveillance* in *wild* and *feral* pigs presents additional challenges including:

   a) determination of the distribution, size and movement patterns associated with the *wild* and *feral* pig population;

   b) relevance and practicality of assessing the possible presence of CSFV *infection* within the population;

   c) determination of the practicability of establishing a *zone* taking into account the degree of interaction with domestic and *captive wild* pigs within the proposed *zone*.

   The geographic distribution and estimated size of *wild* and *feral* pig populations need to be assessed as a prerequisite for designing a monitoring system. Sources of information to aid in the design of a monitoring system may include governmental and non-governmental *wildlife* organisations such as hunter associations.

2) For implementation of the monitoring programme, it will be necessary to define the limits of the area over which *wild* and *feral* pigs range, in order to delineate the *epidemiological units* within the monitoring programme. It is often difficult to define *epidemiological units* for *wild* and *feral* pigs. The most practical approach is based on natural and artificial barriers.

3) The monitoring programme should involve serological and virological testing, including animals found dead, road kills, animals showing abnormal behaviour or exhibiting gross lesions during dressing.

4) There may be situations where a more targeted *surveillance* programme can provide additional assurance. The criteria to define high risk areas for targeted *surveillance* include:

a) areas with past history of CSF;

b) sub-regions with large populations of *wild* and *feral* pigs;

c) border regions with CSF affected countries or *zones*;

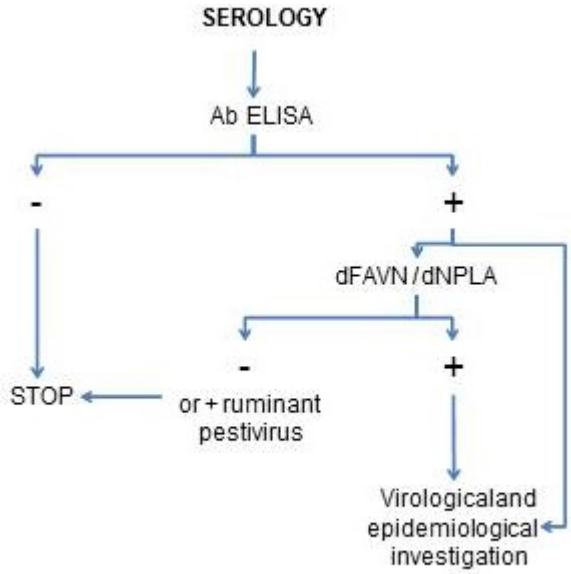
d) interface between *wild* and *feral* pig populations, and domestic and *captive wild* pig populations;

e) farms with free-ranging pigs;

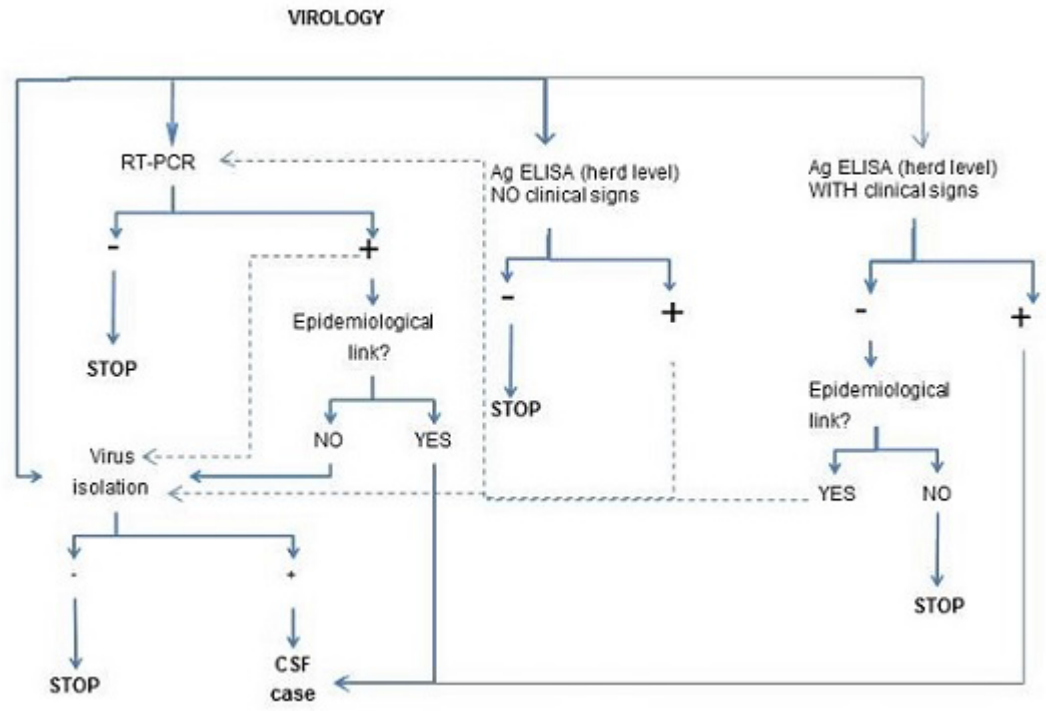
f) other risk areas determined by the *Veterinary Authority* such as garbage dumps and picnic and camping areas.

Article 15.2.32.

The use and interpretation of diagnostic tests in surveillance



Key words:	
Ab ELISA	Antibody detection ELISA
dFAVN	Differential fluorescent virus neutralisation
dNPLA	Differential neutralisation peroxidase linked assay



Key words:	
Ag ELISA	Antigen capture ELISA
RT-PCR	Reverse transcription polymerase chain reaction

NB: FIRST ADOPTED IN 1968; MOST RECENT UPDATE ADOPTED IN 2013.