

REVISED DRAFT

GUIDELINES FOR CLASSIFICATION OF PHASES AND TYPES OF AN AFRICAN SWINE FEVER OUTBREAK AND RESPONSE

April 6, 2019

Version 3.1

The following guidelines are developed as an aid for rapid decision making to facilitate response planning and development of business continuity plans in the event of an African swine fever (ASF) outbreak in the United States.

INTRODUCTION

Having pre-defined phases and potential types of an ASF outbreak will facilitate development of adaptable emergency response and business continuity plans for the swine industry in the United States. The phase is a temporal stage in an ASF outbreak response, the type is a categorical measure based on the virulence of the ASF virus (ASFV) involved in the outbreak and the potential magnitude of the outbreak. The phase and type of the ASF outbreak is expected to change over time and could be designated by the authorities responsible for managing the response. Different regions of the United States or segments of the swine industry may be designated as being involved in different phases or types of an ASF outbreak simultaneously.

Goals for Response to an ASF Outbreak:

- Take all measures possible to prevent disease spread and eliminate ASF from the United States as quickly as possible. This will require a very aggressive stop movement, surveillance, tracing and stamping-out program and potentially the need to eliminate feral swine in an area
- Prevent ASF from becoming established in feral swine
- Ensure that the response to the outbreak does not cause more damage to the industry and economy than the disease itself
- Conduct surveillance to rapidly re-establish United States freedom from ASF, including tick surveillance to look for introduction of the pathogen into the potential vector populations.

The internationally accepted standards for regaining ASF-free status are found in the World Organization for Animal Health (OIE) Terrestrial Animal Health Code (TAHC) (2018) (<http://www.oie.int/international-standard-setting/terrestrial-code/access-online/>) (Chapter 15.1).

The phase and type designations below are guidelines and may be modified by the responsible authorities to best fit the specific outbreak. Descriptors defining different phases and types (for example, focal, moderate, regional, high virulence, low virulence) are intentionally left vague in a recognition that responsible authorities will need to make decisions based on available information regarding specific outbreak characteristics.

IMPORTANT FACTS TO CONSIDER IN PLANNING FOR THE RESPONSE TO AN ASF OUTBREAK IN THE UNITED STATES

African swine fever (ASF) is a serious viral disease of pigs which has long been endemic in Africa (http://www.cfsph.iastate.edu/Factsheets/pdfs/african_swine_fever.pdf). It has recently spread to the Caucasus, parts of Europe and Asia. **ASF virus only infects swine (*Sus scrofa*) and closely related species. It does not infect other livestock and is not a human health or food safety concern.**

ASF virus can potentially be transmitted by ticks, direct contact, fomites (including vehicles, feed, and equipment), or consumption of uncooked pork. Other bloodsucking insects such as mosquitoes and biting flies may also be able to transmit the virus mechanically, but the importance of this in the natural setting is unknown. In *Ornithodoros spp.* soft ticks, transstadial, transovarial and sexual transmission occur. In Africa, ASF virus is thought to cycle between newborn warthogs and the soft ticks (*Ornithodoros moubata*) that live in their burrows. Individual ticks can apparently remain infected for life, and infected soft tick colonies can maintain this virus for years. The American *O. turicata*, *O. hermsi*, *O. parkeri*, *O. talaje*, and *O. coriaceus* ticks are potential vectors of ASF virus. ASF virus is found in all tissues and body fluids. Very high levels are found in blood. Massive environmental contamination can result if blood is shed during necropsies or if pigs develop bloody diarrhea. There is evidence that some recovered pigs may become carriers, however, recent evidence indicates that they may not readily transmit the virus to naïve pigs (Petrov et al. 2018).

The ASF virus is highly resistant to environmental conditions. It can survive for a year and a half in blood stored at 4° C, 11 days in feces at room temperature, and at least a month in contaminated pig pens. The virus will also remain infectious for 150 days in boned meat stored at 4° C, 140 days in salted dried hams, and several years in frozen carcasses.

ASF virus (ASFV) is highly contagious for swine and can spread rapidly in pig populations if pigs are exposed to infected blood or carcasses. Recent experience in Europe indicates that under field conditions, ASFV transmission (a highly virulent genotype II strain) can be slowed when animals are in direct contact with infected animals if exposure to blood and carcasses is avoided (Chenais et al. 2019). Therefore, animals that are suspected of being infected with ASFV and dead animals should be removed from pens as soon as they are observed.

When ASF was introduced into Latvia in January 2014, most outbreaks were associated with swill feeding or feeding potentially contaminated fresh grass or crops. ASFV had a very low transmission rate and clear evidence of pig-to-pig transmission during the early stage of infection was lacking (Olsevskis et al. 2016). A case report of an ASF outbreak in a large commercial pig farm in Latvia in 2017 concluded that failure to fulfill biosecurity requirements due to human behavior was the main vulnerability for introduction of virus. They also concluded that early detection of ASF by passive surveillance is crucial. They recommended that in risk areas, dead pigs should be compulsorily tested for ASF, even if farm mortality is below the normal threshold (Lamberga, et al. 2018).

Epidemiology and transmission of ASFV is very different from foot and mouth disease virus (FMDV) and high pathogenic avian influenza virus (HPAIV). The response to ASFV infection should take into consideration these differences. Both FMDV and HPAIV replication and shedding in infected animals will be stopped by the immune response after several days. In the case of HPAI, the birds may die rapidly

before the immune response clears the virus. FMDV and HPAIV need to replicate to high titers in the infected animals and be transmitted to new susceptible animals through aerosols, respiratory droplets, or other body secretions within a few days in order to maintain the outbreak. Both of those viruses are relatively fragile and easily inactivated in the environment. ASFV is maintained in the warthog population in nature through long term infection in soft ticks which inhabit warthog nesting areas and by massive contamination of the environment by infected blood (e.g. bloody diarrhea) and decomposing carcasses. The ASF virus is robust and persists for very long periods of time in decomposing carcasses and in the soil. These characteristics reduce the likelihood of rapid pig to pig transmission as compared to FMD and HPAI. Effective control of FMD or HPAI outbreaks require rapid depopulation (preferably within 24 hours) of infected herds or flocks to prevent expansion of the outbreak. Rapid whole herd depopulation with ASF may be less important. Avoiding exposure of pigs to, and contamination of the environment with, blood, other fluids and carcasses from infected pigs plays a much more important role in preventing ASF transmission. Rapid detection and removal of the first pigs infected with ASF virus and dead pigs is an important step for slowing spread of ASF virus within a pen, building and premises. Removal, euthanasia, necropsy and disposal should be accomplished without exposing other pigs to blood or fluids. Blood, fluids and carcasses from infected animals should be contained and disposed of without contamination of the environment.

ASF virus isolates vary in virulence from highly virulent strains that cause near 100% mortality of infected animals to low-virulence isolates that can be difficult to detect clinically. In the absence of an effective surveillance program, low virulence strains may become widespread before detected and will be difficult to trace based on clinical signs alone. Infection with high virulence isolates may go undetected if sick and dying animals are quickly removed from pens and herds without diagnostic testing.

There is no vaccine or treatment currently available for ASF and it is unlikely that an effective vaccine will become available to aid in the control of an outbreak in the foreseeable future. This increases the importance of rapid detection and aggressive measures to stamp out infected herds. Unlike FMD and classical swine fever (CSF), for which effective vaccines exist, there is no potential to use vaccination to suppress an extensive outbreak of ASF before entering the final phase of disease eradication.

ASF-free trade status cannot be recovered after an outbreak unless extensive surveillance fails to find ASFV in any pigs, including both domestic and feral pigs, in the country or zone. There is a provision in the 2018 OIE Terrestrial Animal Health Code (TAHC) (Article 15.1.3) (See Appendix A for relevant sections of the 2018 OIE TAHC) to gain ASF free status for domestic and captive wild pigs if feral swine in the country are infected, but it is difficult to achieve. There is also a provision in the OIE TAHC (Article 15.1.14) that enables continued exports of pork from premises and packing plants that pro-actively institute biosecurity and surveillance procedures. If ASF becomes established in feral swine and soft tick reservoirs, it will likely be necessary to implement zoning, compartmentalization or recommendations found in OIE TAHC Articles 15.1.3 or 15.1.14 to partially regain export markets. ASF is a serious problem in many African countries. Disease outbreaks have also occurred in Asia, Europe, South America and the Caribbean, and the cost of eradication has been significant. During outbreaks in Malta and the Dominican Republic, the swine herds of those countries were completely depopulated. In Spain and Portugal, ASF became endemic in the 1960s and complete eradication took more than 30 years.

PROPOSED PHASES AND TYPES OF ASF OUTBREAKS

HEIGHTENED ALERT PHASE: ASF OUTBREAK IN CANADA, MEXICO, OR THE CARIBBEAN BUT NOT THE UNITED STATES

ASF virus in Canada, Mexico or the Caribbean could threaten to spread to the United States, especially if ASF Control Areas are near or cross over the U.S. border or epidemiologically-linked premises export swine or uncooked swine products to the United States. Steps to take if ASF is detected in Canada, Mexico or the Caribbean:

- Discontinue all imports of susceptible animals and animal products from the affected country into the United States.
- Work collaboratively with the affected country to:
 - Establish Control Areas around Infected Premises and Contact Premises if the Control Area extends into the United States
 - Implement controlled movement of susceptible animals in the U.S. portion of the Control Area and restrict other movements (vehicles, animal products, etc.) as appropriate
 - Initiate stamping-out of contact herds in the U.S. portion of the Control Area
 - Enforce established biosecurity protocols within the U.S. portion of the Control Area
 - Conduct additional surveillance for ASF in U.S. regions associated with the foreign Control Area
- Advise State and Tribal authorities to ensure that their swine premises ID data is up to date and to be prepared for animal tracing.
- Prepare to activate Incident Management Teams, an Incident Coordination Group or logistics and communication support as needed. Be prepared to stand-up a Unified Incident Command.
- Implement an enhanced national ASF surveillance plan including feral swine.
- Enhance surveillance for ASF virus at slaughter plants and ports of entry in the United States.
- Conduct tracing and surveillance of swine imported from the ASF-affected country within the last two incubation periods (30 days, maximum incubation period = 15 days) prior to the date of first infection of the index case. Conduct epidemiological investigations of herds that received imported swine.
- Initiate stop movement, quarantine and perhaps stamping-out of herds in the United States with epidemiological evidence of direct or indirect contact with infected herds.
- Encourage U. S. Customs and Border Patrol's level of alert and increase scrutiny of travelers and inspections seeking animal products brought into the United States from countries where ASF is present.

STEPS TO TAKE UPON THE FIRST CASE OF ASF IN THE UNITED STATES AND TO CONTINUE FOR THE DURATION OF THE OUTBREAK:

- Advise all swine operations (including markets, fairs, exhibitions, etc.) in the United States to implement ASF-specific biosecurity plans and continue until freedom from ASF is re-established. This may include ceasing such operations perceived to be a high risk.

- Emphasize, and enhance enforcement of requirements related to garbage feeding of swine in the United States. Increase surveillance/investigations for unlicensed garbage feeding operations?
- Allow movement of non-susceptible animals and their products (including eggs and milk) from the Control Area into commerce with enhanced truck and driver biosecurity for the duration of the outbreak.

PHASE 1

Phase 1 is the period of time from the confirmation of the first ASF case in the United States until there is reasonable evidence to estimate the extent of the outbreak. The transition to Phase 2 should be accomplished as soon as possible, with a goal of less than 4 days.

- Establish Control Areas around Infected Premises and Contact Premises.
- A national movement standstill of susceptible species for 48 to 72 hours may be recommended by USDA and or State Animal Health Officials (SAHOs). SAHOs will decide if and how to implement the standstill in their state.
- Activate a Unified Incident Command.
 - Logistics support will be required.
 - Activate a Joint Information Center; coordinate communication, including public hotlines and other resources.
- Activate Incident Coordination Group and Multiagency Coordination Group(s), if not previously established.
- Implement controlled movement of susceptible animals in the Control Area and restrict other movements in the Control Area (vehicles, etc.) as appropriate (as permitted by SPS plans, see Appendix D: Factors to Consider in Implementing Controlled Movement of Swine).
- Initiate quarantine and stamping-out of infected and contact herds
- Implement a validated, enhanced national ASF surveillance plan for the Control Area(s) and Free Area.
- Recommend enhanced biosecurity protocols according to the SPS plan within the Control Area(s).
- Work with USDA APHIS Wildlife Services and other appropriate Federal, State, and Tribal authorities to initiate the containment, testing, and then eradication of feral swine in the Control Area (if possible).
- States may activate livestock emergency response teams or notify to be on “standby”.

PHASE 2

Phase 2 is the period of time after surveillance and epidemiologic investigation provide timely evidence of the extent of the outbreak and the virulence of the ASF virus strain to support planning and decision making by the Unified Incident Command, including Area Commands. Response strategy may depend on whether the ASF strain is of high virulence or low virulence, the extent of the outbreak, and whether feral swine are involved in ASF virus transmission and maintenance in the environment.

Type 1 ASF Outbreak: Any Outbreak of ASF virus that can logistically be stamped out in domestic and feral swine and carcasses safely disposed of.

An outbreak of a high virulence strain of ASF virus which produces obvious clinical signs and death may be detected quickly and should be able to be traced efficiently based on clinical signs, supplemented with laboratory testing. Infected animals will develop severe disease. However, there may not be a high mortality rate. Implement aggressive stop movement and stamping-out of infected and contact herds, stamping out of feral swine populations in the Control Area and continue until ASF-free status is obtained.

An outbreak of a low virulence strain of ASF virus may be widespread before it is detected and will be difficult to trace based on clinical signs alone. The management of an outbreak with a low virulence strain may depend on the magnitude and location of the outbreak. An outbreak of low virulence ASF virus with one or a few focal areas of infection limited to a region with low to moderate swine numbers on small to medium size premises should be aggressively stamped out. An extensive outbreak with low virulence ASF virus would be considered a Type 2 ASF outbreak (see below).

During a Type 1 ASF outbreak:

- Pre-emptively stamp-out herds with epidemiological evidence of direct or indirect contact with infected herds.
- Rapid depopulation of infected and contact premises with implementation of biocontainment, cleaning, virus elimination, and carcass disposal in a manner that does not contaminate the environment or expose wildlife, including feral swine to blood, body fluids, feces or carcasses.
- All herds in a Control Area should submit approved samples (whole blood, lymph nodes, tonsil, or spleen) from all dead pigs for ASF PCR testing at a NAHLN laboratory each day. Dead pigs and pigs with clinical signs suggestive of ASF should immediately be removed from their pen while minimizing blood or other body fluid leakage into the pen or environment.
- Necropsies should be conducted in an area with no pig or other animal access. All blood and bodily fluids should be contained during necropsy and properly disposed of. Blood and bodily fluids could potentially be flushed down a drain to a municipal waste treatment system or to a septic tank with underground drainage fields.
- Carcasses must be disposed of in a manner that does not contaminate the environment, allow access by scavengers, or exposure of swine.
- If there is evidence of infected feral swine, depopulate all swine premises in the Control Area that do not have sufficient biosecurity to ensure that feral swine do not infect domestic swine. Consider recommending prohibition of outdoor production of pigs on premises in the Control Area that do not have a means to exclude feral swine from direct or indirect contact with domestic swine with a high degree of confidence.
- Only allow movement of pigs from the Control Area after an epidemiologic evaluation indicates no evidence of direct or indirect contact with infected swine (domestic or feral). Biosecurity (according to the SPS plan) should be in place on a premises before animals from that premises can move from the Control Area. Surveillance testing of herds, including daily ASFV PCR testing of all dead pigs, demonstrating lack of evidence of infection may be required before movement from the Control Area.

- Trace back and trace forward animal movements from Infected Premises for the previous two incubation periods (30 days).
- Work with entomologists to survey infected premises for presence of ASF virus soft tick vectors or their life cycle stages.
- Conduct intensive surveillance of swine in the Control Area(s) and Surveillance Zone(s), including feral swine.
- Work with Wildlife Services, and appropriate Federal, State, and Tribal authorities to contain, test and then eradicate feral swine in the Control Area(s) if possible. Dispose of all feral swine carcasses in a biosecure manner.
- If there is evidence of infected feral swine, depopulate all swine premises in the Control Area that do not have sufficient biosecurity to ensure that feral swine do not infect domestic swine.
- Swine production systems infected with ASFV should develop a plan acceptable to the Unified Incident Command for controlled depopulation and repopulation of premises.

Type 2 ASF Outbreak:

An outbreak of ASF that has become established in feral swine with continuing outbreaks in domestic swine and no realistic chance of stamping out infection in feral swine in the foreseeable future.

OR

An outbreak of low virulence ASFV that has become widespread before it was detected.

If feral swine are endemically infected with ASFV, and domestic herds are becoming infected, the United States will not be able to regain ASF free status for a prolonged time. In an outbreak of low virulence ASFV that has become widespread before it was detected, it is likely that subclinically infected pigs may have been slaughtered and it must be assumed that some pork in the United States may contain ASFV. Since ASF is not a food safety concern and the animals passed FSIS ante-mortem and post-mortem inspection, the meat is safe and wholesome for consumption. However, it will be very important to strictly enforce laws against feeding garbage to pigs and laws requiring adequate cooking of garbage in those states that allow garbage to be fed to pigs.

- Implement all of the recommendations under a Type 1 ASF outbreak, with the exception that a modified stamping-out policy may be used.
- It may be decided to use controlled marketing of healthy animals that can pass FSIS inspection as part of the plan to depopulate herds that have pigs diagnosed with ASF.
- All Infected Premises should be de-populated by either stamping-out or controlled marketing (or a combination), cleaned and virus eliminated. Re-population with ASFV-free sentinel animals may be recommended to ensure they are ASF negative before resuming normal business.
- Swine producers and production systems with evidence of ASF infected pigs that wish to request controlled marketing as part of the plan for depopulation must submit an acceptable plan to responsible regulatory authorities (eg. federal, state, tribal

authorities) for biocontainment, controlled marketing/depopulation, removal of sick and dead pigs, carcass disposal, virus elimination and surveillance.

PHASE 3

Phase 3 is the period of time after surveillance and epidemiologic evidence indicates that the outbreak is under control in both domestic and feral swine. One of the following three methods may be used to regain some or all export markets for fresh pork:

- Surveillance and epidemiologic evidence indicates that the outbreak is under control in both domestic and feral swine and a plan is implemented to regain ASF virus-free status (OIE TAHC 2018 Article 15.1.6).
- If the ASF virus is circulating in feral swine, but not domestic swine, the U.S. could work toward freedom in domestic and captive wild pigs as defined in OIE TAHC Article 15.1.3.
- Some production systems and packing plants may collaborate to implement OIE TAHC Article 15.1.14 to regain some export markets for fresh meat of domestic and captive wild pigs

PHASE 4

Phase 4 is the period of time after the United States achieves one or more of the three methods outlined in Phase 3 to regain some or all export markets. The USDA continues to work to convince trading partners to accept United States exports of swine and pork products.

References

Chenais, E. et al. Epidemiological considerations on African Swine fever in Europe 2014–2018. *Porcine Health Management*, (2019)5:6. <https://doi.org/10.1186/s40813-018-0109-2>

Lamberga, K. et al. African swine fever outbreak investigations in a large commercial pig farm in Latvia: A case report. *Berliner und Munchener Tierarztliche Wochenschrift*. 2018. DOI 10.2376/0005-9366-18031

Olsevskis, E. African swine fever introduction into the EU in 2014: Experience of Latvia. *Res in Vet Sci*. 105 (2016) 28-30. <http://dx.doi.org/10.1016/j.rvsc.2016.01.006>

Petrov, A. et al. No evidence for long-term carrier status of pigs after African swine fever infection. 2018. *Transbound Emerg Dis*. 65:1318–1328.

Please send comments and suggestions to:

James A. Roth, DVM, PhD, DACVM
Director, Center for Food Security and Public Health
College of Veterinary Medicine
Iowa State University
Ames, Iowa 50011
Phone: 515-294-8459
Email: jaroth@iastate.edu

Appendix A:

OIE Terrestrial Animal Health Code 2018

Chapter 15.1.

African swine fever

(<http://www.oie.int/international-standard-setting/terrestrial-code/access-online/>)

Article 15.1.3.

Country or zone free from ASF

1. Historical freedom

A country or [zone](#) may be considered free from ASF without pathogen-specific [surveillance](#) if the provisions of point 1 a) of Article [1.4.6.](#) are complied with.

2. Freedom in all suids

A country or [zone](#) which does not meet the conditions of point 1) above may be considered free from ASF when it complies with all the criteria of Article [15.1.2.](#) and when:

- a. [surveillance](#) in accordance with Articles [15.1.27.](#) to [15.1.32.](#) has been in place for the past three years;
- b. there has been no [case of infection](#) with ASFV during the past three years; this period can be reduced to 12 months when the [surveillance](#) has demonstrated no evidence of presence or involvement of *Ornithodoros* ticks;
- c. pig [commodities](#) are imported in accordance with Articles [15.1.7.](#) to [15.1.20.](#)

3. Freedom in domestic and captive wild pigs

A country or [zone](#) which does not meet the conditions of point 1) or point 2) above may be considered free from ASF in domestic and [captive wild](#) pigs when it complies with all the criteria of Article [15.1.2.](#) and when:

- a. [surveillance](#) in accordance with Articles [15.1.27.](#) to [15.1.32.](#) has been in place for the past three years;
- b. there has been no [case of infection](#) with ASFV in domestic or [captive wild](#) pigs during the past three years; this period can be reduced to 12 months when the [surveillance](#) has demonstrated no evidence of presence or involvement of *Ornithodoros* ticks;
- c. pigs and pig [commodities](#) are imported in accordance with Articles [15.1.7.](#) to [15.1.20.](#)

Article 15.1.7.

Recommendations for importation from countries, zones or compartments free from ASFFor domestic and captive wild pigs

[Veterinary Authorities](#) should require the presentation of an [international veterinary certificate](#) attesting that:

1. the animals showed no clinical sign of ASF on the day of shipment;
2. the animals were kept in a country, [zone](#) or [compartment](#) free from ASF since birth or for at least the past three months;
3. if the animals are exported from a free [zone](#) or [compartment](#) within an infected country or [infected zone](#), necessary precautions were taken to avoid contact with any source of ASFV until shipment.

Article 15.1.8.

Recommendations for importation from countries or zones not free from ASF

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 ASF on the day of shipment;
2. and either:
 - a. were kept since birth or for the past three months in a *compartment* free from ASF; or
 - b. were kept in a *quarantine station*, isolated for 30 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.

Article 15.1.14

Recommendations for importation from countries or zones not free from ASF

For fresh meat of domestic and captive wild pigs

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

1. the entire consignment of *fresh meat* comes from animals which originated from *herds* in which *surveillance* in accordance with Articles *15.1.27.* to *15.1.29.* demonstrates that no *case* of ASF has occurred in the past three years. This period can be reduced to 12 months when the *surveillance* demonstrates that there is no evidence of tick involvement in the epidemiology of the *infection*. In addition, samples from a statistically representative number of animals were tested for ASF, with negative results;
2. the entire consignment of *fresh meat* comes from animals which have been slaughtered in an approved *slaughterhouse/abattoir*, have been subjected with favourable results to ante- and post-mortem inspections in accordance with Chapter *6.3.*;
3. necessary precautions have been taken after *slaughter* to avoid contact of the *fresh meat* with any source of ASFV.