DISEASE RESPONSE STRATEGY
AFRICAN SWINE FEVER

FAD PReP
Foreign Animal Disease
Preparedness & Response Plan

United States
Department of Agriculture

This ASF Disease Response Strategy was last updated in March 2019. Please send questions or comments to:

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March 2019
USDA Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS)
Strategy & Policy • National Preparedness and Incident Coordination

This version of the *USDA APHIS African Swine Fever (ASF) Disease Response Strategy (March 2019)* has been updated according to comments received to the 2013 version of this document and ongoing VS Training and Exercise Program work related to ASF. The following list summarizes edits that were made to this document:

- Incorporates updated ASF case definition.
- Includes revisions to diagnostic information as verified by the National Veterinary Services Laboratories Foreign Animal Disease Diagnostic Laboratory.
- Expands the Control and Eradication section.
- Adds more “Outbreak Info” boxes to help explain what to expect during an ASF incident.
- Includes changes made to related documents, including FAD PReP Manuals.
- Provides additional information on quarantine and movement control.

The *USDA APHIS ASF Disease Response Strategy* may not answer all of your questions about how to prepare for or respond to an ASF disease outbreak. We acknowledge that significant work remains to respond effectively to ASF. Preparing for and responding to an ASF outbreak is and will be a complex effort that requires collaboration and cooperation from all stakeholders.

This document will be reviewed and updated as needed. As such, if you have comments or suggestions on this document, please send an email to FAD.PReP.Comments@usda.gov for consideration and possible incorporation into future versions.

The FAD PReP mission is to raise awareness, define expectations, and improve capabilities for FAD preparedness and response. For more information, please go to [www.aphis.usda.gov/fadprep](http://www.aphis.usda.gov/fadprep).
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INTRODUCTION

African swine fever (ASF)—first described in Kenya in the 1920s—is a contagious hemorrhagic disease of wild and domestic pigs. It is often characterized by high morbidity and mortality rates. ASF is a notifiable disease to the World Organization for Animal Health (OIE). The disease does not pose a risk to human health.

ASF is currently widespread and endemic in sub-Saharan Africa, parts of West Africa, and Sardinia. Spain and Portugal eradicated ASF in the mid-1990’s; it was also eradicated from the Caribbean following outbreaks from 1977–1980. In the last decade, ASF has spread through Eastern Europe and the Caucasus. In the last few years, the disease has continued to spread in the European Union, primarily in wild boar. In August 2018, China reported the first ASF detections in their domestic swine population. ASF has never been reported in the United States, Canada, Australia, or New Zealand.

SCOPE

Due to the potential threat of ASF in the United States from ongoing transmission throughout China and parts of Europe, this response strategy was updated in 2019. It is intended to provide animal health emergency responders with critical information necessary to execute an effective response. It is difficult to predict what an ASF outbreak in the United States would look like. As such, much of this document provides considerations and guidance for State and Federal officials rather than prescriptive processes or procedures.

This document does not cover, in detail, incident coordination or general foreign animal disease (FAD) response. For more information on these aspects, please refer to the APHIS Foreign Animal Disease Framework: Roles and Coordination (FAD PReP Manual 1-0) and the APHIS Foreign Animal Disease Framework: Response Strategies (FAD PReP Manual 2-0). These documents cover general roles and responsibilities as well as general FAD response strategies, respectively. These documents and others are available here: https://www.aphis.usda.gov/fadprep.

Additionally, this document does not provide response policy guidance that may change in an outbreak (e.g., specific virus elimination guidance, stamping-out policies, indemnity processes, etc.). Past experience has demonstrated that this
type of information is more effective as distinct, short, concise documents that can be distributed and updated rapidly.

NATURE OF THE DISEASE/VIRUS

This is a very brief introduction to ASF virus (ASFV), which is a complex virus with variable clinical presentations.

Overview

ASFV belongs to the Asfivirus genus of the Asfarviridae family and is an enveloped virus with a double-stranded DNA genome. ASFV is unique, as it is the only known arthropod-borne DNA virus. There is no known vaccine or treatment.

Currently, there is only one recognized serotype of ASFV, however, more than 20 different genotypes have been described within that single serotype. There are significant variations in virulence across genotypes. Infection with ASFV presents in four different clinical forms (peracute, acute, subacute, and chronic), which are based on strain virulence, immune status, clinical signs, and gross lesions.

Susceptible species include all members of the pig family (Suidae): domesticated swine, European wild boar, warthogs, bush pigs, and giant forest hogs. While susceptible, warthogs and bush pigs are resistant to signs of clinical disease. Some members of the Suidae family native to the Americas, such as peccaries (Tayassu spp.), are believed to be resistant to infection.\(^1\)

Introduction & Transmission

There are three modes of transmission for ASFV: direct contact, indirect contact (fomites), and vector-borne. Direct transmission occurs when infected animals come into contact with healthy animals through contact with infected saliva, respiratory secretions, urine and feces. Indirect transmission can occur through contaminated fomites, an example of which is the practice of “garbage-feeding” in which swine become infected when fed food waste contaminated with uncooked pork products. Soft ticks (Ornithodoros spp.) serve as a vector for transmission, passing the virus to swine hosts when taking their blood meal.

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In sub-Saharan Africa, ASF is maintained through the sylvatic cycle—reoccurring transfer between bushpigs, warthogs, and giant forest hogs of Africa and *Ornithodoros* species ticks. These pigs are inapparently infected and act as reservoir hosts for ASFV. Infected ticks are also able to transmit ASFV to other ticks (sexual), to their offspring (transovarial), and from one life cycle to another (transstadial). ASFV is able to persist in its tick host for more than 5 years.

In other areas of the world, ASFV has been introduced and transmitted by illegal movement of infected swine and contaminated products (and their contact with naïve swine). In addition, wild boar populations have been implicated in sustained transmission of ASFV, particularly in parts of the European Union. To-date, *Ornithodoros* species of ticks do not appear to be critical to the maintenance of ASFV in European wild boar populations.

### Incubation Period

The incubation period varies by route of transmission, ranging from 3–21 days. For the purpose of the OIE *Terrestrial Animal Health Code*, the incubation period in *Sus scrofa* (domestic and wild swine) is 15 days. A shorter incubation period is typically observed with the acute form of disease.

### Clinical Signs

Clinical signs vary by virus strain and disease form caused by the virus (peracute, acute, subacute, and chronic). Swine affected with the peracute form of ASF, death is often the first indication of disease. Swine affected with the acute form may develop fever (105–107.6°F/40.5–42°C), anorexia, listlessness, cyanosis, incoordination, increased pulse and respiratory rate, leukopenia and thrombocytopenia (at 48–72 hours), vomiting, diarrhea, and abortion in pregnant sows.

Swine affected with subacute forms of ASF present with less intense, but similar clinical signs including slight fever, reduced appetite, and depression. Abortion in pregnant sows is also possible. Swine infected with the chronic form of the virus typically exhibit appetite loss, transient low fever, respiratory signs, necrosis of the skin, chronic skin ulcers, and swelling of the joints. They also can experience

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recurring episodes of disease, which could eventually lead to death. Table 1 summarizes these signs.

**Table 1. Clinical Signs Caused by the Different Forms of ASF**

<table>
<thead>
<tr>
<th></th>
<th>Peracute</th>
<th>Acute</th>
<th>Subacute</th>
<th>Chronic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Virulence of strain</strong></td>
<td>High</td>
<td>High</td>
<td>Moderate to low</td>
<td>Low</td>
</tr>
<tr>
<td><strong>Immune status</strong></td>
<td>Death before seroconversion</td>
<td>Many die before seroconversion</td>
<td>Seropositive</td>
<td>Seropositive</td>
</tr>
<tr>
<td><strong>Clinical signs</strong></td>
<td>Often found moribund or dead</td>
<td>Febrile (40.5°C–41.5°C), leukopenia, anorexia, blood in feces, reluctant to move, abortion in sows, erythemic skin progressing to cyanosis near death</td>
<td>Variable but typically similar to, though less severe than, acute ASF</td>
<td>Mild fever for 2–3 weeks; pregnant sows may abort; reddened then dark, raised, dry, and necrotic skin lesions, especially over pressure points</td>
</tr>
<tr>
<td><strong>Gross lesions</strong></td>
<td>Death occurs before distinct lesions form</td>
<td>Spleen enlarged (up to 3 times normal), dark and friable; multiple hemorrhages of internal organs, especially kidneys and heart; hemorrhagic lymph nodes; edema of gall bladder and lungs; congestion of meninges and choroid plexus</td>
<td>Lesions are similar but milder than acute ASF; spleen may be 1.5 times normal size; lymph nodes enlarge but only mildly hemorrhagic; few petechial on kidneys</td>
<td>Fibrinous pleuritis, pleural adhesions, caseous pneumonia, hyperplastic lymphoreticular tissues, nonseptic fibronous pericarditis, necrotic skin lesions</td>
</tr>
</tbody>
</table>


**Morbidity and Mortality**

For all forms of the disease, morbidity rates are very high. Mortality rates vary by form. For the peracute form, mortality can reach 100 percent and occur in the absence of any clinical signs within 7–10 days after exposure to the virus. The acute form is also associated with mortality rates that approach 100 percent, often with death occurring within 6–13 days post inoculation. The mortality rate for the subacute form is dependent on the age of the affected populations; younger pigs have higher rates (70–80 percent), while older pigs experience significantly lower rates (less than 20 percent). For those affected by the chronic form of ASF, mortality is typically low.

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6 New experimental research suggests that a carrier status for ASFV is unlikely or may have been overstated as a contributor to ongoing transmission: Petrov, A. et al. (2018). No evidence for long-term carrier status of pigs after African swine fever virus infection. *Transboundary and Emerging Diseases*. 65(5), 1318–1328.
Persistence of ASFV

ASFV is a very resilient virus that can withstand low temperatures, fluctuations in pH, and remain viable for long periods in tissues and bodily fluids. Table 2 provides a breakdown of ASFV resistance to physical and chemical action. These factors must be considered when determining appropriate response strategies, including disinfection techniques.

Table 2. Resistance of ASFV to Physical and Chemical Action

<table>
<thead>
<tr>
<th>Action</th>
<th>Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>Highly resistant to low temperatures. Heat inactivated by 56°C/70 minutes; 60°C/20 minutes.</td>
</tr>
<tr>
<td>pH</td>
<td>Inactivated by pH &lt; 3.9 or &gt; 11.5 in serum-free medium. Serum increases the resistance of the virus, e.g., at pH 13.4—resistance lasts up to 21 hours without serum, and 7 days with serum.</td>
</tr>
<tr>
<td>Chemicals/disinfectants</td>
<td>Susceptible to ether and chloroform. Inactivated by 8/1000 sodium hydroxide (30 minutes), hypochlorites—2.3 percent chlorine (30 minutes), 3/1000 formalin (30 minutes), 3 percent ortho-phenylphenol (30 minutes) and iodine compounds.</td>
</tr>
<tr>
<td>Survival</td>
<td>Remains viable for long periods in blood, feces, and tissues; especially infected uncooked or undercooked pork products. Can multiply in vectors (Ornithodoros sp.).</td>
</tr>
</tbody>
</table>


Treatment and Vaccination

To date there is no treatment or vaccine available for ASF. In the past, live attenuated vaccines have been used in Spain and Portugal but with accompanying safety issues that make the vaccine inadequate for use. All other attempts with subunit vaccines and DNA vaccines have been unable to confer complete protection.

Outbreak Info—Early Information

- As more information becomes available about the ASFV and its behavior in U.S. swine facilities, APHIS will distribute this knowledge to States and stakeholders to facilitate early detection and awareness (e.g., most common clinical signs, estimated incubation period if known, etc.).
- Additional guidance about disinfectants and virus elimination activities will be developed: this information will also be posted online and distributed to affected States and stakeholders.
- In any ASF outbreak, it is a priority for all stakeholders to communicate that ASF is not a threat to public health and is not a food safety concern.
ASF RESPONSE: CONTROL AND ERADICATION

Goals

The APHIS goals of an FAD response are to (1) detect, control, and contain the disease in animals as quickly as possible; (2) eradicate the disease using strategies that seek to stabilize animal agriculture, the food supply, the economy, and to protect public health and the environment; and (3) provide science- and risk-based approaches and systems to facilitate continuity of business for non-infected animals and non-contaminated animal products.

Achieving these three goals will allow individual livestock facilities, States, Tribes, regions, and industries to resume normal production as quickly as possible. They will also allow the United States to regain ASF-free status without the response effort causing more disruption and damage than the outbreak itself.

Control and Eradication Strategy

For ASF, the primary control and eradication strategy is stamping-out. There is no effective vaccine. Stamping-out is the depopulation of clinically affected swine and, as appropriate, swine that are considered to be exposed to the virus. This strategy is supported by critical activities such as quarantine and movement control, biosecurity, surveillance, and cleaning and disinfection.

This response to ASF is based on three epidemiological principles:

1. Prevent contact between ASFV and susceptible animals.

2. Stop the production of ASFV by infected or exposed animals.

3. Stop the transmission of ASFV by vectors.

The next section further discusses the critical activities that support these epidemiological principles and must be conducted to control and eradicate the virus.

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7 For relevant definitions of swine for ASF response, please see Attachment A.
8 The OIE defines stamping-out as follows: “a policy designed to eliminate an outbreak by carrying out under the authority of the Veterinary Authority the following: (a) the killing of the animals were are affected and those suspected of being affected in the herd or flock, and, where appropriate, those in other herds or flocks which have been exposed to infection by direct animal to animal contact, or by indirect contact with the causal pathogenic agent; animals should be killed in accordance with Chapter 7.6, (b) the disposal of carcasses and, where relevant, animal products by rendering, burning or burial, or by any other method described in Chapter 4.12, (c) the cleansing and disinfection of establishments through procedures defined in Chapter 4.13.” OIE. (2018). Glossary. Terrestrial Animal Health Code. www.oie.int.
APHIS acknowledges that there may be significant challenges to eradicate ASF, depending on the outbreak (e.g., if feral swine are infected). Movement control measures are critical since ASF is easily spread through fomites; however, extensive movement controls disrupt normal business and are difficult and resource-intensive to implement. APHIS is committed to achieving the stated goals of ASF response.

FERAL SWINE

With any feral swine activities during an ASF outbreak, there are two priorities: (1) prevent contact between feral swine and commercial or backyard swine, and (2) prevent ASFV from becoming established in feral swine populations. An immediate epidemiological assessment must be conducted to determine whether feral swine are potentially infected. Feral swine may be depopulated in areas with known ASF infection. If located, dead feral swine should be disposed of appropriately to minimize ongoing transmission—decomposing carcasses can result in significant environmental contamination and the ASF virus can persist for extended periods.

Critical Activities

CASE DEFINITIONS & REPORTING

The following case definitions are draft definitions from October 2018. In any ASF outbreak, case definitions may be edited after the first presumptive or confirmed positive case (index case). The case definition will be reviewed throughout the outbreak and modified on the basis of additional information or the changing needs of the eradication effort.

Suspect case: An animal having clinical signs consistent with ASF or an epidemiologic link to ASFV.

Presumptive positive case: A suspect case with a non-negative screening laboratory test result for ASFV (polymerase chain reaction [PCR]) at National Veterinary Services Laboratories (NVSL) Foreign Animal Disease Diagnostic
Laboratory (FADDL) or National Animal Health Laboratory Network (NAHLN) laboratory approved for ASF preparedness or surge testing, or

A suspect case that is positive for ASFV antibodies by two different antibody tests at NVSL FADDL.

*Confirmed positive case:* An animal from which ASF virus has been isolated and identified at NVSL FADDL or a laboratory designated by the Secretary of Agriculture, or

A presumptive positive case with a positive confirmatory ASFV antigen test at NVSL FADDL.

ASF is a U.S. FAD and an OIE-notifiable disease. Suspect cases should be reported to a State Animal Health Official or Area Veterinarian in Charge who will decide if the report is credible and assign a Foreign Animal Disease Diagnostician to further investigate the possibility of ASF infection. For more information on FAD investigation procedures please refer to Veterinary Services (VS) Guidance Document 12001 and the *FAD Investigation Manual* (FAD PReP Manual 4-0).

**DIAGNOSTICS**

**Laboratory Diagnosis**

Confirmatory diagnostic testing for ASF will be performed at NVSL FADDL at Plum Island. Tests performed to determine the presence of ASFV include virus isolation, antigen detection through direct fluorescent antibody (DFA) testing, enzyme-linked immunosorbant assays (ELISA), and immunofluorescence assays (IFA), and PCR tests.

Table 3 shows diagnostic tests performed by FADDL, the required specimen and the minimum time to results. Table 4 details what specimens should be collected for diagnostic testing at FADDL. Figure 1 shows the diagnostic test flow at FADDL for ASF samples received.

For detailed information concerning the handling and shipping of diagnostic specimens as well as overall guidance on sample collection and submission, please see VS Guidance Document 12001 and the *Foreign Animal Disease Investigation Manual*. 
Table 3. Diagnostic Tests Performed for ASFV at NVSL FADDL

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Specimen</th>
<th>Minimum test time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ab ELISA</td>
<td>Serum</td>
<td>1</td>
</tr>
<tr>
<td>DFA</td>
<td>Tissue (tonsil, lymph node, spleen)</td>
<td>1</td>
</tr>
<tr>
<td>IFA</td>
<td>Serum</td>
<td>1</td>
</tr>
<tr>
<td>Real time PCR</td>
<td>Blood, tissue (tonsil, lymph node, spleen)</td>
<td>3 hours</td>
</tr>
<tr>
<td>Virus Isolation (VI)</td>
<td>Blood, tissue (tonsil, lymph node, spleen)</td>
<td>21 (three 7-day cycles)</td>
</tr>
</tbody>
</table>

Note: Test time may vary depending on the number of samples or need to repeat the test. These are typical times that can be expected. Further information for an initial investigation is provided in Figure 1.

Table 4. Sample Collection for Diagnostic Testing

<table>
<thead>
<tr>
<th>Specimen</th>
<th>Medium</th>
<th>Shipping preservative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serum</td>
<td>Red top tube (10ml)</td>
<td>Ice pack</td>
</tr>
<tr>
<td>Whole blood Heparin – VI</td>
<td>Green top tube (10ml)</td>
<td>Ice pack</td>
</tr>
<tr>
<td>Whole blood EDTA – PCR</td>
<td>Purple top tube (10ml)</td>
<td></td>
</tr>
<tr>
<td>Fresh tissue: tonsil, gastrohepatic or renal lymph node, spleen</td>
<td>Separate Whirlpak bag per tissue type</td>
<td>Ice pack</td>
</tr>
<tr>
<td>Set of tissues</td>
<td>Formalin (10:1)</td>
<td>Ice pack</td>
</tr>
</tbody>
</table>

Source: Plum Island New York (FADDL), Catalog of Services/Fees.
Figure 1. Diagnostic Test Flow for Initial Investigation of ASF in the United States

Estimated Time to Test Completion (dependent on priority):
- Ab ELISA – 3 hrs or overnight
- DFA-FAT – 4 to 24 hours
- VI – 7-21 days
- rPCR – 3 hours

Initial Investigation of Suspected ASFV in the United States

Whole Blood – Heparin and EDTA
- Spleen, tonsil, lymph node
- Tonsil scraping (live animal)

Sample Type
(Samples of all types should be sent)

Priority Level

Priority 1 or A

Priority 2 or 3

Simultaneous testing with
(1) virus isolation (2) rPCR
(3) DFA-FAT (4 hours)

Neg

Pos

STOP

Field Infection

Sanger sequencing of P72 and CVR regions and NGS full genome

Neg

Pos

STOP

Field Infection

Sanger sequencing of P72 and CVR regions and NGS full genome

Neg

Pos

STOP

Field Suspect

IFA*

Neg

STOP

Estimated Time to Test Completion: Sanger sequencing from initial PCR, if sufficient quality sample / high viral load, otherwise from VI – 9 hours
NGS [next gen sequencing] (incomplete coverage) – as above, otherwise from VI – 33 hours

Stop means not infected unless there is a circumstantial reason to request additional samples and conduct additional diagnostic testing.

*IFT [indirect immunoperoxidase test] – undergoing validation will replace IFA.
Differential Diagnosis

When considering a potential diagnosis of ASF in the United States the following diseases should also be included in the differential diagnosis:9

- Classical swine fever,
- Porcine reproductive and respiratory syndrome,
- Erysipelas,
- Salmonellosis,
- Aujeszky’s disease (or pseudorabies) in younger swine,
- Pasteurellosis, and
- Other septicemic conditions.

Surge Capacity

NAHLN laboratories may also be approved to conduct diagnostics for ASF preparedness and surge testing. At the time of writing, there are 11 laboratories that are currently approved to conduct the real-time PCR. APHIS realizes that, in an ASF outbreak, collecting and testing diagnostic samples will require significant resources. It is a priority to ensure that additional NAHLN laboratories have this diagnostic capacity in the immediate future.

Surveillance

The purpose of surveillance is to define the extent of the disease, detect new outbreaks, and establish disease-free zones. Surveillance activities can aid in establishing priorities in terms of control and mitigation strategies and help evaluate the efficacy of response efforts. They are also critical to maintaining continuity of business and providing evidence of disease freedom following an outbreak.

Surveillance personnel are involved in the case definition development, definition and design of surveillance sampling schemes, and the collection, assessment, and reporting of surveillance findings. It is critical to coordinate between the personnel conducting surveillance activities and those responsible for epidemiological investigations, quarantine and movement control, and biosecurity.

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Biosecurity

Strict biosecurity measures may help to prevent or slow the spread of ASF. Owners, producers, veterinarians, and responders should observe strict biosecurity measures during an incident or suspected incident. Proper biosecurity during an ASF outbreak has two key functions: containing the virus on Infected Premises (biocontainment) and preventing the introduction of ASFV from the movement of personnel and fomites to naïve premises (bioexclusion).

Preventing exposure of swine to ASFV in blood, fluids, carcasses, and the environment is critical in preventing ASF transmission. Biocontainment and bioexclusion measures can also be implemented within a premises to slow or limit the spread between pens and buildings when ASF has been diagnosed; this can help facilitate control and containment activities.

APHIS acknowledges that identifying and depopulating infected or potentially infected feral swine may be difficult. As such, it is critical for producers to implement and maintain biosecurity measures that prevent contact between feral swine and commercial or backyard swine. Producers should seriously reevaluate any outdoor production of pigs on premises that are in proximity to an Infected Premises.

An additional area of consideration is garbage feeding, which is regulated by APHIS; States determine whether or not to allow this regulated garbage feeding within their State. During an ASF outbreak, APHIS and/or State officials may implement additional requirements or inspections related to garbage feeding.

Epidemiology

Epidemiological activities are critical for controlling and eradicating ASF. In particular, an epidemiological investigation can identify the index case, determine risk factors for transmission, and support the development of mitigation strategies. Intensive tracing activities will also be required during an ASF outbreak to identify all Contact Premises. Tracing should identify all movement on to or off of an Infected Premises and is typically conducted for 2 incubation periods – in this case, 30 days (based on the OIE incubation period for ASF).
Administering epidemiological questionnaires and tracing activities are typically activities conducted by a unified Incident Command. Additional virtual support may be necessary from other personnel that have epidemiology expertise. No two incidents are the same: questionnaires, procedures, and priorities will be determined based on the specific circumstances of the incident.

Evidence from recent outbreaks in previously ASF-free countries suggests that ticks may not play an epidemiologically significant role (if any role) in sustained transmission; other modes of direct and indirect transmission pathways should be the focus of control and containment activities. However, any epidemiological investigation should assess whether Ornithodoros spp. ticks are implicated in, or present a risk for, ongoing transmission.

**QUARANTINE AND MOVEMENT CONTROL**

Quarantine and movement control measures are fundamental to any ASF response effort; movement of infected animals and contaminated fomites spread ASF. Quarantines and movement controls prevent contact between ASFV and susceptible animals.

**Outbreak Info – The Difference between Quarantines and Movement Controls**

- **Quarantine:** A quarantine most commonly imposes restrictions on entering or leaving a premises, area, or region where disease exists or is suspected. In particular, quarantines stop the movement of animals, animal products, and other fomites off of Infected, Contact, and Suspect Premises.
- **Movement Control:** Movement controls regulate the movement of people, animals, animal products, vehicles, equipment in a specific area subject to certain criteria. Movement control is typically accomplished through a permit system. Permitting allows entities to make necessary movements without creating an unacceptable risk of disease spread. Criteria required for movement will depend on the risk of that movement, but may include biosecurity, cleaning and disinfection, and/or diagnostic testing depending on the specific permit.

It is likely that a temporary hold order, a quarantine, and/or some type of stop movement issuance will occur upon strong suspicion of ASF on a premises. State and Federal officials should immediately discuss any quarantine and/or movement control issues upon suspicion of ASF in the United States. Confirmation of ASF by NVSL is not necessary to implement quarantines and/or movement controls.
Because each State has different quarantine authorities, each State’s animal health emergency response plan should describe the implementation of quarantines and movement controls. USDA may also impose a Federal quarantine and restrict interstate commerce from infected States. Should this occur, USDA may ask States to provide the resources to maintain and enforce the quarantine.

Decisions regarding movement controls and permitting should be based on science-based assessments of the ASFV and risk of transmission from any given movement. Granted, such information may not be readily available, particularly in the initial stages of the incident. The benefits of movement controls (disease control, prevention of further transmission) must be weighed carefully by State and Federal officials against the consequences of business disruption (lost revenue, animal welfare issues). Because of the highly-integrated nature of the swine industry, often including interstate movements, it will also be necessary to consider these networks in all quarantine and movement control activities.

Zone, Area, and Premises Designations

Appropriate premises, zone, and area designations support the implementation of quarantine and movement control measures. Attachment B contains the standard definitions of these designations. Typically in an incident, the unified Incident Command works with the Operations Section and Planning Section to determine establish an Infected Zone and a Buffer Zone within 12 hours of the index case. This Control Area (the Infected Zone and the Buffer Zone) may change as the outbreak progresses. Permitting is typically conducted for designated movements into, within, and out of a Control Area.¹⁰ Due to the specific characteristics of the swine industry, zone, area, and premises designations may also include network premises that are not all in the same, or contiguous, geographical area.

HEALTH & SAFETY AND PERSONAL PROTECTIVE EQUIPMENT

Though ASF is not a threat to public health, responders may be exposed to other health hazards; prevention of adverse human health events related to emergency response efforts is very important. For general information, please see the National Animal Health Emergency Management System (NAHEMS) Guidelines: Health and Safety and NAHEMS Guidelines: Personal Protective Equipment. In

¹⁰ For information on permitting, please see Permitted Movement (FAD PReP Manual 6-0), www.aphis.usda.gov/fadprep.
an incident, refer any health and safety questions or concerns to the Safety Officer or other designated response official.

INDEMNITY AND COMPENSATION

The Animal Health Protection Act (AHPA) (7 U.S.C. §8301 et seq.) provides broad authority to the Secretary of Agriculture to prevent, detect, control, and eradicate diseases and pests of animals. It also provides authority to pay claims for animals, articles, or means of conveyance that are destroyed. In order for USDA to consider paying indemnity, USDA must approve any depopulation or destruction activities before depopulation or destruction of animals or materials occurs.

Further guidance is provided in the Code of Federal Regulations (CFR), particularly in 9 CFR Part 53, which is generally considered to be—for most purposes, absent any extraordinary emergency declaration by the Secretary—the regulatory authority governing indemnity and compensation during an ASF outbreak. Please refer to 9 CFR 53 for more information. All responders should familiarize themselves with the specific language governing indemnity and compensation in this section.

EUTHANASIA/MASS DEPOPULATION

During an ASF outbreak, euthanasia or mass depopulation is likely to be used to prevent or mitigate pathogen spread, and protect the agricultural and national economy. In an ASF outbreak, euthanasia or mass depopulation should be provided to the affected animals as safely, quickly, efficiently, and humanely as possible.

The method of depopulation will depend on animal considerations, facility characteristics, method characteristics (practicality, reliability, irreversibility, and compatibility), personnel considerations, carcass considerations, equipment considerations, and the environment where the animals are maintained. With ASFV, significant environmental contamination can result from blood and fluids from infected swine—this should also be considered when selecting depopulation (and disposal) methods.

DISPOSAL

Proper disposal of animal carcasses and materials (e.g., bedding, feed) prevents or mitigates spread of ASFV. The goal is to conduct operations in a timely, safe, biosecure, aesthetically acceptable, and environmentally responsible manner. Wastes requiring disposal may include carcasses, animal products, contaminated manure, litter, bedding, contaminated feed, contaminated personal protective equipment, and contaminated materials and equipment that cannot be cleaned and disinfected.
Due to the persistent nature of ASFV, options for disposal are limited. For example, composting may not be feasible when there are large amounts of biomass; resources for rendering are currently limited. Burial poses significant challenges with environmental contamination and the ability of the ASFV to persist in the environment. Each option has its own environmental, logistical, and managerial challenges. APHIS and State officials and subject matter experts will collaborate to determine best approaches.

Disposal may involve other State and Federal agencies: USDA may coordinate with the Department of Health and Human Services, the Department of Homeland Security, and/or the Environmental Protection Agency to provide technical assistance and guidance, in alignment with Federal, State, and local regulations.

**CLEANING AND DISINFECTION/VIRUS ELIMINATION**

The goal of cleaning and disinfection (C&D) is to destroy, inactivate, or eliminate ASFV to prevent further spread from Infected Premises. Cleaning is the removal of gross contamination, organic material, and debris; disinfection destroys or eliminates the pathogen through heat or chemical means (Table 3 provides information on ASFV susceptibility). A combination of methods may be required. Virus elimination is conducting C&D with the primary purpose of destroying, inactivating, or eliminating ASFV in the most cost-effective manner possible.

A C&D plan should be defined, including the area/materials to be C&D, methods, personnel, materials, supplies, equipment and other relevant considerations. When performing C&D procedures, it is important to do so in the safest manner possible. The plan may also include the scientific rationale for C&D parameters, the process by which the premises will be evaluated and recorded as successfully C&D, specific protocols, and procedures for handling damaged private property due to C&D activities.


**WILDLIFE MANAGEMENT AND VECTOR CONTROL**

ASFV can infect many different members of the Suidae family including wild boar which can be found in the United States. However, peccaries, which are also found in North America, are believed to be resistant to infection with ASFV. In the event of an ASF outbreak in commercial swine, APHIS VS will work in close collaboration and coordination with other agencies, entities, and units that have primary jurisdiction over wildlife species that may be involved.

There are increasing numbers of feral swine in the United States and there are also increasing numbers in urban areas. It is important to recognize the risk posed by feral swine feeding of uncooked waste in urban garbage dumps (potentially
contaminated by illegal imports). Controlling and eliminating feral swine may be a difficult, resource-intensive activity.

ASF can be transmitted by soft ticks (*Ornithodoros* spp.), and potential vectors for ASFV do exist in the United States. Ticks can remain infected with ASFV for the duration of their life and ASFV can persist in tick colonies for extended periods. APHIS and State officials would need to assess if vector control measures are necessary and/or cost-effective.

**RECOVERY**

Criteria for Proof of Freedom

The OIE does not grant official recognition for ASF-freedom, but as a member of the OIE, the United States can self-declare the entire country, zone, or compartment free of ASF. Please refer to the most current OIE *Terrestrial Animal Health Code* for provisions on ASF-freedom in a country or zone, compartment, establishment of a containment zone free from ASF, recovery of free status, and recommendations for importation of swine and swine products from countries not free of ASF.

Trading partners will evaluate, on an individual or multilateral basis, all self-declarations from the United States for ASF-freedom both after an incident and for any regionalization activities that may occur during an incident. Trading partners determine whether to lift or modify trade restrictions based on information that is provided by the United States.

**OIE Terrestrial Animal Health Code**

For the purposes of the OIE *Terrestrial Animal Health Code* (2018), as stated in Article 15.1.1., there is a distinction between domestic and captive wild pigs, wild and feral pigs, and African wild suid species. Per Article 15.1.2, “commodities of domestic or captive wild pigs can be traded safely in accordance with the relevant articles of this chapter from countries complying with the provisions of this article, even if they notify infection with ASFV in wild or feral pigs or African wild suids.”

**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 15.1.6 RECOVERY OF FREE STATUS**

Should an outbreak of ASF occur in a previously free country or zone, its status may be restored three months after the disinfection of the last infected establishment, provided that:

1. a stamping-out policy has been implemented and, in the case where ticks are suspected or known to be involved in the epidemiology of the infection, has been followed by the use of sentinel pigs in the infected establishments for two months;
2. surveillance in accordance with Article 15.1.30 has been carried out with negative results.

Otherwise, the provisions of point 2) of Article 15.1.3 apply.


**Restocking**

During an ASF incident in the United States, APHIS and/or State officials will provide additional guidance for restocking previously Infected Premises, including any sentinel activities that are required. A primary goal of the response is to ensure that response efforts do not cause more damage and disruption than the disease outbreak itself; however, caution is urged in restocking premises since re-infection strains resources and perpetuates the risk of ASF transmission.
SELECTED REFERENCES


Attachment A. Swine Definitions (Industry Segments)

For the purposes of ASF response in the United States:

**Backyard swine**: Domestic swine raised for food production in smaller numbers than commercial swine operations (<1,000 per premise) and kept either in a housing facility with solid-sided walls, or with access to the outdoors surrounded by a fence or other barrier. Backyard swine can also be transitional swine.

**Breeder swine**: Sexually intact swine over 6 months of age (from 9 CFR 71).

**Commercial swine**: Domestic swine raised for food production with large numbers of animals (>1,000) per premise and confined to a housing facility with solid-sided walls designed to prevent exposure to transitional and feral swine.

**Domestic swine**: Any swine species owned in a captive environment, whether the confinement is in a building or behind a fence or other barrier.

**Feeder swine**: Swine under 6 months of age that are not slaughter swine (from 9 CFR 71).

**Feral swine**: Free-roaming swine (from 9 CFR 78).

**Transitional swine**: Swine with any access to the outdoors, but still housed behind a fence or other barrier. These swine have a higher potential to be exposed to feral swine.

**Slaughter swine**: Swine being sold or moved for slaughter purposes only (from 9 CFR 71).

Attachment B. Zone, Area, and Premises Designations

Table B-1 and B-2 contain a summary of the zone, area, and premises designations. For more information please refer to the APHIS Foreign Animal Disease Framework: Response Strategies (FAD PReP Manual 2-0) found at www.aphis.usda.gov/fadprep.

Table B-1. Summary of Premises Designations

<table>
<thead>
<tr>
<th>Premises</th>
<th>Definition</th>
<th>Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infected Premises (IP)</td>
<td>Premises where a presumptive positive case or confirmed positive case exists based on laboratory results, compatible clinical signs, ASF case definition, and international standards.</td>
<td>Infected Zone</td>
</tr>
<tr>
<td>Contact Premises (CP)</td>
<td>Premises with swine that may have been exposed to ASF, either directly or indirectly, including but not limited to exposure to animals, animal products, fomites, or people from Infected Premises.</td>
<td>Infected Zone, Buffer Zone</td>
</tr>
<tr>
<td>Suspect Premises (SP)</td>
<td>Premises under investigation due to the presence of swine reported to have clinical signs compatible with ASF. This is intended to be a short-term premises designation.</td>
<td>Infected Zone, Buffer Zone, Surveillance Zone, Vaccination Zone</td>
</tr>
<tr>
<td>At-Risk Premises (ARP)</td>
<td>Premises with swine, but none of those swine have clinical signs compatible with ASF. Premises objectively demonstrates that it is not an Infected Premises, Contact Premises, or Suspect Premises. At-Risk Premises may seek to move susceptible animals or products within the Control Area by permit. Only At-Risk Premises are eligible to become Monitored Premises.</td>
<td>Infected Zone, Buffer Zone</td>
</tr>
<tr>
<td>Monitored Premises (MP)</td>
<td>Premises objectively demonstrates that it is not an Infected Premises, Contact Premises, or Suspect Premises. Only At-Risk Premises are eligible to become Monitored Premises. Monitored Premises meet a set of defined criteria in seeking to move susceptible animals or products out of the Control Area by permit.</td>
<td>Infected Zone, Buffer Zone</td>
</tr>
<tr>
<td>Free Premises (FP)</td>
<td>Premises outside of a Control Area and not a Contact or Suspect Premises.</td>
<td>Surveillance Zone, Free Area</td>
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</tbody>
</table>
Table B-2. Summary of Zone and Area Designations

<table>
<thead>
<tr>
<th>Zone/Area</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infected Zone (IZ)</td>
<td>Zone that immediately surrounds an Infected Premises.</td>
</tr>
<tr>
<td>Buffer Zone (BZ)</td>
<td>Zone that immediately surrounds an Infected Zone or a Contact Premises.</td>
</tr>
<tr>
<td>Control Area (CA)</td>
<td>Consists of an Infected Zone and a Buffer Zone.</td>
</tr>
<tr>
<td>Surveillance Zone (SZ)</td>
<td>Zone outside and along the border of a Control Area.</td>
</tr>
<tr>
<td>Free Area (FA)</td>
<td>Area not included in any Control Area.</td>
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</table>

Figure B-1. Example Premises, Zones, and Areas

Note: Figures are not to scale.
## Attachment C. Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>APHIS</td>
<td>Animal and Plant Health Inspection Service</td>
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<td>AHPA</td>
<td>Animal Health Protection Act</td>
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<tr>
<td>ASF</td>
<td>African swine fever</td>
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<tr>
<td>ASFV</td>
<td>African swine fever virus</td>
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<tr>
<td>C&amp;D</td>
<td>cleaning and disinfection</td>
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<td>CFR</td>
<td>Code of Federal Regulations</td>
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<tr>
<td>DFA</td>
<td>direct fluorescent antibody</td>
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<tr>
<td>DNA</td>
<td>deoxyribonucleic acid</td>
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<tr>
<td>ELISA</td>
<td>enzyme-linked immunosorbent assay</td>
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<td>FAD</td>
<td>foreign animal disease</td>
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<td>FAD PReP</td>
<td>Foreign Animal Disease Preparedness and Response Plan</td>
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<tr>
<td>FADDL</td>
<td>Foreign Animal Disease Diagnostic Laboratory</td>
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<td>IFA</td>
<td>immunofluorescence assays</td>
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<td>NAHEMS</td>
<td>National Animal Health Emergency Management System</td>
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<td>NAHLN</td>
<td>National Animal Health Laboratory Network</td>
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<td>NVSL</td>
<td>National Veterinary Services Laboratories</td>
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<td>OIE</td>
<td>World Organization for Animal Health</td>
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<td>PCR</td>
<td>polymerase chain reaction</td>
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<tr>
<td>TDD</td>
<td>telecommunications device for the deaf</td>
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<tr>
<td>USDA</td>
<td>U.S. Department of Agriculture</td>
</tr>
<tr>
<td>VI</td>
<td>virus isolation</td>
</tr>
<tr>
<td>VS</td>
<td>Veterinary Services</td>
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