DISEASE RESPONSE STRATEGY
AFRICAN SWINE FEVER

FAD PReP
Foreign Animal Disease Preparedness & Response Plan

USDA

United States Department of Agriculture

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The Foreign Animal Disease Preparedness and Response Plan (FAD PReP)—*Disease Response Strategy: African Swine Fever (2013)* provides strategic guidance for responding to an animal health emergency caused by African swine fever (ASF) in the United States.

This *ASF Disease Response Strategy* was last updated in **September 2013**. Please send questions or comments to:

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INTRODUCTION

African swine fever (ASF), first described in the 1920s in Kenya, is a highly contagious hemorrhagic disease of wild and domestic suids with extremely high morbidity and mortality rates. ASF is a notifiable disease with the World Organization for Animal Health (OIE) due to its ability to spread rapidly and cause severe illness. ASF does not pose a risk to public health. ASF is unique, as it is the only known arthropod-borne, DNA virus. The disease is endemic in Sardinia, most countries of sub-Saharan Africa, and some West African countries. Spain and Portugal eradicated ASF in the mid-1990's; it was also eradicated from the Caribbean following outbreaks from 1977–1980. However, the unimpeded spread of ASF through Russia and the Caucasus and elsewhere is cause for concern. ASF has never been reported in the United States, Canada, Australia, or New Zealand.

Due to the potential threat of ASF in the United States, this response strategy was drafted. It is intended to provide animal health emergency responders with the critical information necessary to mount an effective response effort against ASF in the United States. This disease strategy will cover the pertinent etiology and ecology of ASF and control and eradication strategies. In-depth reviews of ASF etiology and ecology are listed at the end of this document.

Other documents provide further detail on incident coordination and general foreign animal disease (FAD) response. The *APHIS Foreign Animal Disease Framework: Roles and Coordination* (FAD PReP Manual 1-0) provides an introduction to APHIS FAD preparedness and response, an overview of the roles and responsibilities of different government agencies involved in an FAD response effort as well as information on funding, incident management, and communication strategy. Additionally, an overview of FAD response strategies is available in the *APHIS Foreign Animal Disease Framework: Response Strategies* (FAD PReP Manual 2-0). These documents and others are available here: http://www.aphis.usda.gov/animal_health/emergency_management/materials_ref.shtml or on the APHIS Intranet for APHIS employees: http://inside.aphis.usda.gov/vs/em/fadprep.shtml.

NATURE OF THE DISEASE

African swine fever virus (ASFV) belongs to the Asfivirus genus of the *Asfarviridae* family and is an enveloped virus with a double-stranded DNA

genome. Currently, there is only one recognized serotype of ASF, however, 22 different genotypes have been described within that serotype. Susceptible species include all members of the pig family (Suidae): domesticated swine, European wild boar, warthogs, bush pigs, and giant forest hogs. While susceptible, wild African pigs are resistant to clinical disease and show few or no signs or symptoms of infection. Some members of the Suidae family native to the Americas, such as peccaries (*Tayassu* spp.), are believed to be resistant to infection. 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. Standard nomenclature of ASFV includes the city or country where it was first isolated, and the last two digits of the year it was isolated.

Transmission

ASF is maintained through the sylvatic cycle, in other words, reoccurring transfer between wild bushpigs and warthogs of Africa and *Ornithodoros* species ticks. The infected pigs do not develop clinical illness. It should be noted that in Western Africa, the sylvatic cycle is not responsible for the perpetuation of ASF; rather, the illegal movement and trade of infected swine and their subsequent contact with naïve swine maintain the spread of the disease.[1]

There are three modes of transmission for ASF: 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 domestic swine become infected when fed food waste contaminated with uncooked pork products. Argasid ticks (*Ornithodoros* spp.) serve as a vector for transmission, passing the virus to swine hosts when taking their blood meal. Infected ticks are also able to transmit ASFV to other ticks (sexual), to their offspring (transovarial), and from one life cycle to another (transstadial).

Incubation Period

The incubation period varies by route of transmission, ranging from 3–15 days. For the purpose of the OIE, the incubation period in *Sus scrofa domesticus* (domestic swine) is 15 days.[2]

Clinical Signs

Clinical signs and symptoms vary by virus strain and disease form caused by the virus (peracute, acute, subacute, and chronic). For animals affected with the

[1] Sanchez-Vizcaino JM, et al. 2012. "African Swine Fever: An Epidemiological Update." *Transboundary and Emerging Diseases.* 59(Suppl. 1): 27–35.

[2] OIE. Article 15.1.1, *Terrestrial Animal Health Code*, 2013. www.oie.int.

peracute form of ASF, death is often the first indication of disease. Cases 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. Any survivors become lifelong ASFV carriers.

Swine affected with subacute forms of ASF present with less intense symptoms including slight fever, reduced appetite, and depression. Abortion in pregnant sows is also possible.

Cases affected with the chronic form of the virus exhibit weight loss, irregular temperature spikes, respiratory symptoms, necrosis of the skin, chronic skin ulcers, arthritis, pericarditis, and swelling of the joints. Pigs with chronic ASF will experience recurring episodes of acute disease, which could eventually lead to death.

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

	Peracute	Acute	Subacute	Chronic
Virulence of strain	High	High	Moderate to low	Low
Immune status	Death before seroconversion	Many die before seroconversion	Seropositive	Seropositive
Clinical signs	Often found moribund or dead	Febrile (40.5°C–41.5°C), leukopenia, anorexia, blood in feces, reluctant to move, erythemic skin progressing to cyanosis near death	Variable but typically similar to, though less severe than, acute ASF	Mild fever for 2–3 weeks; pregnant sows may abort; reddened then dark, raised, dry, and necrotic skin lesions, especially over pressure points
Gross lesions	Death occurs before distinct lesions form	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	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	Fibrinous pleuritis, pleural adhesions, caseous pneumonia, hyperplastic lymphoreticular tissues, nonseptic fibronous pericarditis, necrotic skin lesions

Adapted from: Kleiboeker, S.B. 2002. “Swine fever: Classical swine fever and African swine fever.” Vet Clin Food Anim 18:431–451.

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. ASF does not pose a risk to public health.

Differential Diagnosis

When considering a potential diagnosis of ASF in the United States the following diseases should also be included in the differential diagnosis:[3]

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

Laboratory Diagnosis

Laboratory diagnostic testing for ASF will be performed at the National Veterinary Services Laboratories, Foreign Animal Disease Diagnostic Laboratory (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 polymerase chain reaction (PCR) tests. According to the OIE, ELISA is the prescribed test for international trade. The OIE also provides guidance regarding the use of IFA, which should be used as a confirmatory test for sera from ASF free areas that are ELISA positive, and for sera from endemic areas that have inconclusive ELISA results.[4] Table 2 shows diagnostic tests performed by FADDL, the required specimen and the minimum time to results. Table 3 details what specimens should be collected for diagnostic testing at FADDL.

[3] World Animal Health Organization (OIE), 2009. Technical Disease Card, African Swine Fever. www.oie.int.

[4] World Animal Health Organization (OIE), 2009. Technical Disease Card, African Swine Fever. www.oie.int.

Table 2. Diagnostic Tests Performed for ASF at NVSL FADDL

Procedure	Specimen	Minimum test time (days)
Ab ELISA	Serum	1
DFA	Tissue (tonsil or lymph node)	1
IFA	Serum	1
Real time PCR	Blood, tissue (tonsil or lymph node)	3 hours
Virus Isolation (VI)	Blood, tissue	21

Table 3. Sample Collection for Diagnostic Testing

Specimen	Medium	Shipping preservative
Serum	Red top tube (10ml)	Ice pack
Whole blood	Green top tube (10ml) Purple top tube (10ml)	Ice pack
Fresh tissue: tonsil, gastrohepatic or renal lymph node, spleen	Separate Whirlpak bag per tissue type	Ice pack
Set of tissues	Formalin (10:1)	Ice pack

Source: Plum Island New York (FADDL), Catalog of Services/Fees.

The OIE recommends that all diagnostic testing be performed in laboratories that adhere to guidelines for Group 3 and Group 4 pathogens. These requirements are equivalent to the USDA Biosafety Level 3-Agriculture (BSL-3Ag) guidelines.

For detailed information concerning the handling and shipping of diagnostic specimens as well as overall guidance on FAD investigation please see Veterinary Services (VS) Guidance Document 12001.1 (previously APHIS VS Memorandum 580.4) and the *Foreign Animal Disease Investigation Manual*.

Treatment and Vaccination

To date there are no treatments or vaccines 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, DNA vaccines, and others have been unable to confer complete protection.

Persistence of ASFV

ENVIRONMENTAL

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 4 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 4. Resistance of ASF Virus to Physical and Chemical Action

Action	Resistance
Temperature	Highly resistant to low temperatures. Heat inactivated by 56°C/70 minutes; 60°C/20 minutes.
pH	Inactivated by pH < 3.9 or > 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.
Chemicals/disinfectants	Susceptible to ether and chloroform. Inactivated by 8/1000 sodium hydroxide (30 minutes), hypochlorites—2.3 percent chlorine (3 minutes), 3/1000 formalin (30 minutes), 3 percent orthophenylphenol (30 minutes) and iodine compounds.
Survival	Remains viable for long periods in blood, feces, and tissues; especially infected uncooked or undercooked pork products. Can multiply in vectors (Ornithodoros sp.).

Source: OIE Technical Disease Card for African Swine Fever, 2009.

WITHIN HOST

As previously mentioned, the chronic form of ASF makes infected swine carriers for life and contributes to the dissemination of the virus. Furthermore, ASFV is able to persist in its tick host for more than 5 years.[5]

Criteria for Proof of Freedom

According to the OIE *Terrestrial Animal Health Code* (2013).

1. Historically free status: A country or zone may be considered free from ASF without formally applying a specific surveillance program if the provisions of Article 1.4.6 [*General principles for declaring disease freedom*] are complied with.

2. Free status as a result of an eradication program: A country or zone which does not meet the conditions of point 1 above or a compartment may be considered free from ASF when:

    a. there has been no outbreak of ASF during the past three years; this period can be reduced to 12 months when there is no evidence of tick involvement in the epidemiology of the infection;

    b. no evidence of ASFV infection has been found during the past 12 months;

[5] Sanchez-Vizcaino JM, et al. 2012. "African Swine Fever: An Epidemiological Update." Transboundary and Emerging Diseases. 59(Suppl. 1): 27–35.

c. surveillance has been in place in domestic pigs for the past 12 months;

d. imported domestic pigs comply with the requirements in Article 15.1.5 [*Recommendations for importation from ASF free countries, zones or compartments (For domestic pigs)*] or Article 15.1.6 [*Recommendations for importation from countries or zones considered infected with ASF (For domestic pigs)*].

AND

Based on surveillance, ASF infection has been demonstrated not to be present in any wild pig population in the country or zone, and:

e. there has been no clinical evidence, nor virological evidence of ASF in wild pigs during the past 12 months;

f. no seropositive wild pigs have been detected in the age class 6–12 months during the past 12 months;

g. imported wild pigs comply with the requirements in Article 15.1.7 [*Recommendations for importation from ASF free countries or zones (For wild pigs)*].

ASF RESPONSE: CONTROL AND ERADICATION

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.

Case Definitions

The following case definitions are APHIS-VS Centers for Epidemiology and Animal Health (CEAH) National Surveillance Unit (NSU) draft definitions from February 2011 and are currently under review.

Suspect case: An animal having clinical signs and epidemiological information consistent with ASF.

Presumptive positive case: A suspect that has positive screening laboratory results [IFA, or ELISA, or PCR or fluorescent antibody test (FAT)] for ASF.

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.

REPORTING

ASF is a U.S. FAD and an OIE-notifiable disease. Suspect cases should be reported to a State Animal Health Official or Assistant District Director 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 the conduct of FAD investigations please refer to VS Guidance Document 12001.1 (which is replacing VS Memorandum 580.4) and the *FAD Investigation Manual*.

Control and Eradication Strategies

Control and eradication strategies are based on four 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.
4. Increase the disease resistance of susceptible animals to ASFV.

The primary control and eradication strategy for ASF in domestic swine is stamping-out. Stamping-out is the depopulation of clinically affected and in-contact susceptible swine.

Stamping-Out: Critical Goals

- Within 24 hours of (or as soon as possible after) a premises being classified as an Infected Premises (IP), infected swine will be depopulated in the quickest, safest, and most humane way possible. In some cases, swine on Contact Premises (CP) may also be depopulated as soon as possible.
- Where resources are limited, premises will be prioritized so that those with the highest potential for active ASF spread are 'stamped-out' first.
- Based on the epidemiology of the outbreak, prioritizing the swine to depopulate first may be necessary.
- Public concerns about stamping-out require a well-planned and proactive public relations and liaison campaign. Stakeholders, the public, and the international community must be involved.
- Care should be taken to consider mental health implications for owners and responders in the event a stamping-out strategy is implemented.

SURVEILLANCE

Visual and diagnostic surveillance is essential for control and eradication of an FAD agent. 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 proving disease freedom following an outbreak.

Surveillance personnel are involved in the case definition development and classification process, premises classification, and collection, assessment, and reporting of surveillance findings. Therefore, coordination between personnel conducting surveillance activities and those responsible for quarantine and movement control, biosecurity, disease reporting, and health and safety is critical for an effective response effort.

Currently there is no active surveillance being conducted in the United States for ASF.

EPIDEMIOLOGY INVESTIGATION AND TRACING

Epidemiological investigation and movement tracing during an outbreak are critical in controlling and eradicating FAD outbreaks. An epidemiological investigation involves identifying the index case, characterizing the nature of the outbreak, identifying risk factors for transmission, and developing mitigation strategies. The results of an investigation and tracing lead to identification of all IP and CP and subsequent premises classification. Tracing identifies all movements from or onto an IP. In the case of ASF, it will be necessary to trace

both animal and human movements since both populations can play a role in direct and indirect transmission.

Tracing

Trace Back: Identifying the origin of all animals, animal products, suspected contaminated fomites, people, vehicles, and possible vectors that have been imported onto an IP in order to establish the original source of infection.

Trace Forward: The tracing of all animals, people, and fomites that have left IP and could have possibly transmitted infection to new premises. The premises that received the animals and goods should be investigated and kept under surveillance or quarantine.

Epidemiological investigation and tracing are the responsibility of two staff components within the Incident Command System (ICS): the Epidemiology Cell (Situation Unit, Planning Section) and the Tactical Epidemiology Group (Disease Surveillance Branch, Operations Section).

QUARANTINE AND MOVEMENT CONTROL

The epidemiological first principle, prevent contact between ASF virus and susceptible animals, can be partly accomplished through quarantine and movement control.

Quarantine refers to imposing restrictions on entering or leaving a premises, area, or region where disease exists or is suspected. Quarantine stops the movement of infected animals, contaminated animal products and fomites from Infected, Contact, and Suspect Premises.

Movement control refers to activities regulating the movement of people, animals, animal products, vehicles, and equipment in an area subject to certain criteria. Movement control is accomplished through a permit system that allows entities to make necessary movements without creating an unacceptable risk of disease spread.

Each State's animal health emergency response plan should describe the implementation of quarantine and movement controls, including a permit system. USDA may impose a Federal quarantine and restrict interstate commerce from infected States, asking the States (or adjoining countries) to provide resources to maintain and enforce the quarantine.

All decisions in regard to quarantine and movement control will be based on science-based assessments of the disease agent, routes and risk of transmission, and the interaction of other factors such as available vectors and weather.

Zone, Area, and Premises Designations

Appropriate premises designations are required for implementation of quarantine and movement control measures. The Incident Commander will work with the Disease Surveillance Branch (Operations Section) and Situation Unit (Planning Section) to establish an Infected Zone (IZ) and a Buffer Zone (BZ) within 12 hours of the identification of the index case. Once the Control Area [CA (IZ + BZ)] is established, quarantine and movement controls, including a permit system, will be implemented. See Attachment A for further information on zone, area, and premises designations.

WILDLIFE MANAGEMENT AND VECTOR CONTROL

Wildlife management and vector control (WMVC) is an important component of an FAD outbreak response effort. Wild animals may become exposed, serve as a reservoir, or contribute to the transmission of the disease to domestic animals or humans either as biological or mechanical vectors. Furthermore, wild animals may potentially complicate efforts to establish freedom from disease. WMVC involves identifying susceptible wildlife species, determining how many species may be infected, and preventing the spread by implementing control measures.

ASFV can infect many different members of the Suidae family including *Sus scrofa* (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. There are increasing numbers of feral swine in the United States and there are increasing numbers in urban areas. It is important to recognize the risk posed by feral swine feeding on uncooked waste in urban garbage dumps and possibly becoming infected from illegal imports.

In the event of an ASF outbreak in domestic swine, APHIS VS will work in close collaboration and coordination with other agencies, entities, and units that have primary jurisdiction over wildlife.

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 further information, please see the *NAHEMS Guidelines: Health and Safety* and *NAHEMS Guidelines: Personal Protective Equipment.*

EUTHANASIA/MASS DEPOPULATION

During an ASF outbreak, euthanasia or mass depopulation may be used to prevent or mitigate pathogen spread, and protect the agricultural and national economy. USDA APHIS personnel, in coordination with Incident Command, make the final decision on whether to euthanize or depopulate animals. 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, compatibility), personnel considerations, carcass considerations, equipment considerations, and the environment where the animals are maintained.

The *NAHEMS Guidelines: Mass Depopulation and Euthanasia* contains additional information.

DISPOSAL

Proper disposal of animal carcasses and materials (e.g., bedding, feed) can be used to prevent or mitigate pathogen spread. The goal is to conduct operations in a timely, safe, biosecure, aesthetically acceptable, and environmentally responsible manner. Wastes requiring disposal following an FAD outbreak include carcasses, animal products, contaminated manure, litter, bedding, contaminated feed, contaminated personal protective equipment (PPE), and contaminated materials and equipment that cannot be cleaned and disinfected.

Due to the persistent nature of ASFV, the options for disposal are limited. Composting might not be feasible when there are large amounts of biomass and resources for rendering are limited. Each option has its own environmental, logistical, and managerial challenges.

Disposal will involve multiple Federal agencies due to its impact on health and the environment. USDA will coordinate with the Department of Health and Human Services, the Department of Homeland Security, and the Environmental Protection Agency (EPA) to provide technical assistance and guidance, in alignment with State and local regulations.

CLEANING AND DISINFECTION

The goal of cleaning and disinfection (C&D) is to inactivate pathogens at IP and prevent the off-site spread of pathogens. When performing C&D procedures it is vitally important to do so in the safest manner possible. When planning a C&D task the following components should be carefully thought through: definition of the area to be cleaned and disinfected, C&D methods, personnel, regulatory permits, and materials, supplies, and equipment needed. The plan should also include the scientific rationale for C&D parameters, the process by which the premises will be certified and recorded as successfully cleaned and disinfected, protocols for cleaning and disinfection, and procedures for handling damaged private property due to activities.

There are various methods of C&D that may be applied to a site. Examples include steam cleaning, pressure washing, or scrubbing by hand; shoveling, vacuuming, or sweeping out bulk materials; chemical disinfection, and physical

(heat, ultraviolet light, or desiccation) methods. As previously mentioned in Table 3, ASF is susceptible to ether and chloroform and is inactivated by 8/1000 sodium hydroxide (for 30 minutes), hypochlorites, 2.3 percent chlorine (for 3 minutes), 3/1000 formalin (for 30 minutes), 3 percent orthophenylphenol (for 30 minutes), and iodine compounds. Table 5 provides a list of EPA approved pesticide options for use against ASF.

For ASF, it will also be necessary to take into account vector control during the cleaning and disinfection process and how that necessitates changes or modifications to plans.

Table 5. List of EPA-Registered Products for Use against ASF

EPA reg. no.	Product name*	Manufacturer	Active ingredient(s)	Pest and use site(s)
211-25	Pheno Cen Germicidal Detergent	Central Solutions, Inc.	o-Phenylphenol, potassium salt p-tert-Amylphenol, potassium salt Potassium 2-benzyl-4-chlorophenate	ASFV in livestock pens, manure, equipment (livestock, feeding and watering, farm), hog farrowing house, hog houses, animal quarters, and shoe baths.
211-62	Low pH Phenolic 256	Central Solutions, Inc.	o-Phenylphenol 2-Benzyl-4-cholophenol	ASFV in livestock premises, equipment (feeding and watering, livestock, animal), livestock/animal transportation vehicles, hog farrowing houses, hog barns/houses/parlors/ pens, farrowing equipment, and shoe baths.
71654-6	Virkon S®	E.I. du Pont de Nemours & Company	Sodium chloride Potassium peroxymonosulfate	ASFV in animal feeding/watering equipment, livestock barns, pens, stalls, stables, equipment, hog farrowing pen premises, hog barns/houses/parlors/pens, animal quarters, animal transportation vehicles, agricultural premises, agricultural equipment, and human footwear.
71847-2	Klor-Kleen®	Medentech Ltd.	Sodium dichloro-s-triazinetrione	ASFV in animal quarters and animal living quarters.

Source: USDA APHIS, 2011. Potential pesticides to Use Against the Causative Agents of Selected Foreign Animal Disease in Farm Settings.

*NO endorsement implied.

C&D protocols, procedures, and methods, along with safety issues and precautions are more thoroughly discussed in the *NAHEMS Guidelines: Cleaning and Disinfection.*

APPRAISAL AND COMPENSATION

Appraisal and compensation for assets lost during a disease response effort reduce the spread of disease by encouraging owners to report suspected disease. The Department of Agriculture is authorized by the Animal Health Protection Act (7 U.S.C. 8301 et seq.) to pay claims to owners for any assets taken or destroyed in the course of a response effort. Title 9 of the Code of Federal Regulations (CFR) Part 53 outlines the expenses that the Department may pay for purchasing, destroying, and disposing of animals and materials in these situations. Fair market value appraisals will be made for animals and materials destroyed to prevent the spread of an FAD. Please refer to the APHIS Livestock Appraisal, Indemnity, and Compensation website for further information.

REFERENCES AND RESOURCES

APHIS-USDA. 2013. *African Swine Fever SOP: Etiology and Ecology.*

APHIS-USDA. 2011. *NAHEMS Guidelines: Cleaning and Disinfection.*

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Attachment A Zone, Area, and Premises Designations

Table A-1 and A-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) available at http://inside.aphis.usda.gov/vs/em/fadprep.shtml (for APHIS employees), or http://www.aphis.usda.gov/animal_health/emergency_management/ (publicly available).

Table A-1. Summary of Premises Designations

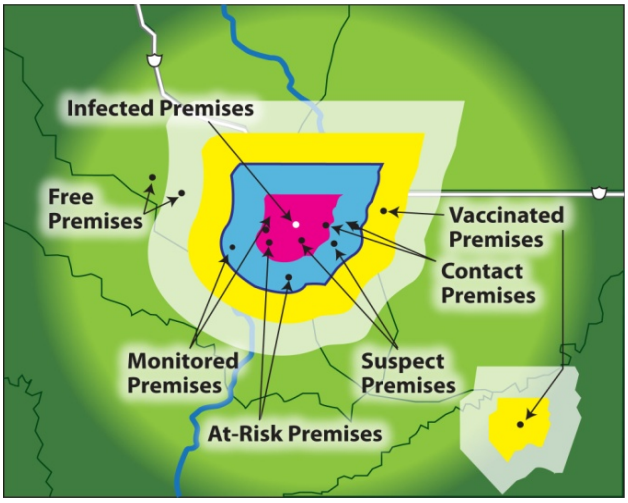
Premises	Definition	Zone
Infected Premises (IP)	Premises where a presumptive positive case or confirmed positive case exists based on laboratory results, compatible clinical signs, ASF case definition, and international standards.	Infected Zone
Contact Premises (CP)	Premises with susceptible animals 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.	Infected Zone, Buffer Zone
Suspect Premises (SP)	Premises under investigation due to the presence of susceptible animals reported to have clinical signs compatible with ASF. This is intended to be a short-term premises designation.	Infected Zone, Buffer Zone, Surveillance Zone, Vaccination Zone
At-Risk Premises (ARP)	Premises with susceptible animals, but none of those susceptible animals have clinical signs compatible with ASF. Premises objectively demonstrates that it is not an Infected Premises, Contact Premises, or Suspect Premises. At-Risk Premises seek to move susceptible animals or products within the Control Area by permit. Only At-Risk Premises are eligible to become Monitored Premises.	Infected Zone, Buffer Zone
Monitored Premises (MP)	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.	Infected Zone, Buffer Zone
Free Premises (FP)	Premises outside of a Control Area and not a Contact or Suspect Premises.	Surveillance Zone, Free Area
Vaccinated Premises (VP)	Premises where emergency vaccination has been performed. This may be a secondary premises designation.	Containment Vaccination Zone, Protection Vaccination Zone

Table A-2. Summary of Zone and Area Designations

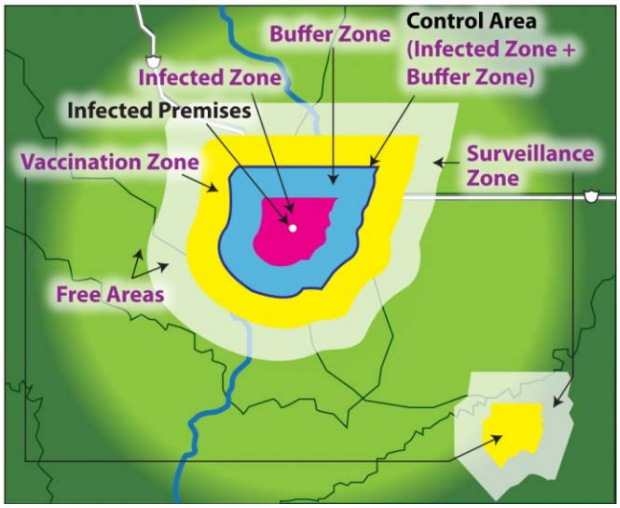
Zone/Area	Definition
Infected Zone (IZ)	Zone that immediately surrounds an Infected Premises.
Buffer Zone (BZ)	Zone that immediately surrounds an Infected Zone or a Contact Premises.
Control Area (CA)	Consists of an Infected Zone and a Buffer Zone.
Surveillance Zone (SZ)	Zone outside and along the border of a Control Area.
Free Area (FA)	Area not included in any Control Area.
Vaccination Zone (VZ)	Emergency Vaccination Zone classified as either a Containment Vaccination Zone (typically inside a Control Area) or a Protection Vaccination Zone (typically outside a Control Area). This may be a secondary zone designation.

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

Premises



Zones and Areas



Attachment B Abbreviations

APHIS	Animal and Plant Health Inspection Service
ASF	African swine fever
ASFV	African swine fever virus
BSL	Biosafety Level
BZ	Buffer Zone
C&D	cleaning and disinfection
CA	Control Area
CEAH	Centers for Epidemiology and Animal Health
CFR	Code of Federal Regulations
CP	Contact Premises
CSF	classical swine fever
DFA	direct fluorescent antibody
DNA	deoxyribonucleic acid
ELISA	enzyme-linked immunosorbent assay
EPA	Environmental Protection Agency
FAD	foreign animal disease
FAD PReP	Foreign Animal Disease Preparedness and Response Plan
FADDL	Foreign Animal Disease Diagnostic Laboratory
FAT	fluorescent antibody test
ICS	Incident Command System
IFA	immunofluorescence assays
IP	Infected Premises
IZ	Infected Zone
NAHEMS	National Animal Health Emergency Management System
NSU	National Surveillance Unit
NVSL	National Veterinary Services Laboratories
OIE	World Organization for Animal Health
PCR	polymerase chain reaction
PPE	personal protective equipment

PRRS	porcine reproductive and respiratory syndrome
SOP	standard operating procedure
TDD	telecommunications device for the deaf
USDA	U.S. Department of Agriculture
VI	virus isolation
VS	Veterinary Services
WMVC	wildlife management and vector control