

September 13, 2021

Industry Guidance: Pork Packer African Swine Fever Response Strategy

Section 1: Overview and Scope

This document outlines the general steps slaughter establishments should take in response to a positive finding of African Swine Fever (ASF) at the establishment, or upon confirmation that the establishment has received pigs from a supplier that has a confirmed case of ASF on their premises. It does not cover enhanced biosecurity or other measures establishments should take during an ASF outbreak if they have not received ASF-positive animals. Each situation will be unique depending on plant location, plant layout, and normal plant operations. This document is intended to provide a roadmap for plants to use to develop their own response strategies.

Section 2: Nature of the Disease/Virus (adapted from the APHIS ASF Red Book¹)

African Swine Fever virus (ASFV) belongs to the *Asfivirus* genus of the *Asfarviridae* family. It is the only known tick-borne DNA virus. Only members of the pig family are susceptible to the virus, and there is no known vaccine or treatment.

2.1. Transmission

There are three main modes of transmission of ASFV:

- 1) Direct contact
- 2) Indirect contact (or transmission via fomites such as boots, trucks/trailers, garbage-feeding, etc.)
- 3) Vector-borne (soft ticks of *Ornithodoros* species pass the virus to swine hosts when feeding)

2.2. Incubation period

The incubation period for ASFV ranges from 3 to 21 days. The OIE *Terrestrial Animal Health Code*² cites 15 days as the incubation period.

2.3 Clinical Signs

When swine are affected with the peracute form of ASF, death is often the first sign observed. Swine affected with the acute form of the disease will often

¹ USDA APHIS African Swine Fever Response Plan (The Red Book).

https://www.aphis.usda.gov/animal_health/emergency_management/downloads/asf-responseplan.pdf. Accessed February 9, 2021.

² OIE. (2019). Article 15.1.1. *Terrestrial Animal Health Code*. www.oie.int. Accessed February 13, 2021.

develop a fever, stop eating, and display a loss of appetite; depression; redness of the ears, abdomen, and legs; elevated heart and respiratory rate; and sometimes vomiting/diarrhea. The illness rates are very high, while the death rate varies from 20% in older pigs to 100% in pigs that experience the peracute or acute forms of the disease.

2.4 Persistence of ASFV

The ASF virus is resilient, and can survive in low temperatures and a large pH range. It remains viable for long periods of time in tissue and body fluids.

2.4.a. Temperature: ASFV is highly resistant to low temperatures. It can be inactivated by heat at 56°C (132.8°F) for 70 minutes or 60°C (140°F) for 20 minutes.

2.4.b. pH: the virus is inactivated by a pH less than 3.9 or over 11.5 in serum-free medium. Serum increases the resistance of the virus, e.g., at a pH of 13.4, resistance lasts up to 21 hours without serum, and 7 days with serum.

2.4.c. Chemicals/disinfectants: The virus is inactivated by ether and chloroform, and a number of other chemicals or disinfectants. A list of APHIS- and EPA-approved disinfectants, can be found in Appendix B of this document.

2.4.d. ASFV remains viable for long periods in blood, feces, and body tissues, including infected uncooked or undercooked pork products.

Section 3: Relevant Authorities

It is important to understand the different regulatory authorities that play into a foreign animal disease response. The following information is provided for establishments to review and ensure that they are well-informed on the various authorities they may work with during an ASF outbreak. Establishments should keep a list of relevant authorities at the federal, state, and local levels, including points of contact and contact information, in order to facilitate quick communication during an outbreak situation. This list should be kept in the establishment's response plan and updated regularly.

3.1. Animal Health Protection Act: The Animal Health Protection Act (AHPA)³ authorizes the Secretary of Agriculture to restrict the importation, entry, or further movement in the United States or order the destruction or removal of animals and related conveyances and facilities to prevent the introduction or dissemination of livestock pests or diseases. It authorizes related activities with respect to

³ 7 U.S. Code 8301 et seq.

exportation, interstate movement, cooperative agreements, enforcement and penalties, seizure, quarantine, and disease and pest eradication.⁴

The AHPA does not give APHIS complete authority in the management of animal disease within states, rather, it gives regulatory authority to APHIS when considering interstate movement of animals. Each state is responsible for disease (foreign and domestic) management, including quarantine, intrastate movement control, and permitting, unless the Secretary of Agriculture determines that an extraordinary emergency exists or that a State's actions to control or eradicate a disease are inadequate. Therefore, the States and APHIS will work together in the event of an ASF outbreak to control and eradicate the disease by issuing quarantines (State), limiting animal movements (State and APHIS), issuing permits for the movement of animals in a control area (State and APHIS), and eradicating the disease (State and APHIS).

3.1.a. Extraordinary emergency: The AHPA also authorizes the Secretary of Agriculture—after notice to review and consultation with certain State or Tribal officials—to declare that an extraordinary emergency exists because of the presence of a pest or disease of livestock and because this presence threatens the livestock of the United States.⁵ This provides the Secretary with additional authority to hold, seize, treat, apply other remedial actions to, destroy (including preventively slaughter) or otherwise dispose of any animal, article, facility, or means of conveyance; and prohibit or restrict the movement or use within a State, or any portion of a State, of any animal or article, means of conveyance, or facility.⁶

3.2. State Animal Health Official (SAHO): The State Animal Health Official is usually the State Veterinarian in your state. It is important that slaughter establishment management know who this person is, and how to contact them. As stated above, the AHPA leaves the authority for disease management to each state. Individual states are responsible for disease (foreign and domestic) management, including quarantine, intrastate movement control, and permitting, unless the Secretary of Agriculture determines that an extraordinary emergency exists or that a State's actions to control or eradicate a disease are inadequate. Most state responses to animal diseases are adequate, but aid can be provided by APHIS in the case of a foreign animal disease outbreak. Therefore, the States and APHIS will work together in the event of an ASF outbreak to control and eradicate the disease by issuing quarantines (State), limiting animal movements (State and APHIS), issuing permits for the movement of animals in a control area (State and APHIS),

⁴ USDA APHIS African Swine Fever Response Plan (The Red Book).
https://www.aphis.usda.gov/animal_health/emergency_management/downloads/asf-responseplan.pdf. Accessed February 9, 2021.

⁵ See Footnote 1.

⁶ *Id.*

and eradicating the disease (State and APHIS). A list of State Animal Health Officials and their contact information can be found on the APHIS website.

3.3. Animal and Plant Health Inspection Service (APHIS): APHIS is the federal agency tasked with protecting the health of plants and animals in the United States. The majority of its authority is derived from the Animal Health Protection Act.

3.3.a. USDA APHIS Incident Management: APHIS provides National Incident Management Teams (NIMTs) to coordinate the incident response, manage public messages, and take measures to control and eradicate ASF. The Incident Management Teams help APHIS and the States implement synchronized management and organizational structure to support control and eradication actions taken during an ASF outbreak.

3.4. Food Safety and Inspection Service (FSIS): FSIS is the federal agency tasked with ensuring the safety of the United States' supply of meat, poultry, and liquid egg products. The agency's authority is derived from the Federal Meat Inspection Act and Poultry Products Inspection Act.

3.5 Other local authorities

3.5.a. Departments of Natural Resources: Slaughter establishments may have to dispose of carcasses or rendered material that cannot enter commerce because ASF-positive pigs will likely not pass ante- or post mortem inspection. It is important to understand disposal options for such material. Local Departments of Natural Resources or Pollution Control Agencies will be helpful in determining how this material can be properly disposed of.

3.5.b. Environmental Protection Agencies/Departments: Slaughter establishments that have received pigs affected by ASF will be required to thoroughly clean and disinfect all areas in the facility, including lairage and unloading, before it can continue operations. Additionally, during a quarantine and while under enhanced biosecurity measures, livestock trucks and trailers will likely require thorough cleaning and disinfection before leaving the establishment. It is important to understand how water runoff will be treated and where it will go before an outbreak occurs. Some states or local municipalities will require extra permits for management of wastewater or runoff from truck washes. Slaughter establishments should be aware of the local regulations surrounding wastewater and runoff, and work with the local environmental departments to obtain permits to handle such materials.

3.6 Relevant guidance documents:

3.6.a. APHIS Foreign Animal Disease Preparedness:

https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/emergency-management/ct_fad_prep_disease_response_documents

3.6.b. APHIS VS Guidance: Policy for the Investigation of Potential Foreign Animal Disease/Emerging Disease Incidents,
www.aphis.usda.gov/animal_health/lab_info_services/downloads/VSG_12001.pdf

3.6.c. FSIS Directive 6100.1, Rev. 1: Responsibilities Related to Foreign Animal Diseases (FADs) and Reportable Conditions,
www.fsis.usda.gov/wps/wcm/connect/2b2e7adc-961e-4b1d-b593-7dc5a0263504/6100.1.pdf?MOD=AJPERES

3.6.d. NAMI FAD Guidance:

<https://www.meatinstitute.org/index.php?ht=d/sp/i/157365/pid/157365>

Note: Establishments may wish to keep a copy of these resources at the front of their response “playbook” for easy access in the event of a real event at their location.

Section 4: An Establishment’s Control Area Status

In the event of a FAD outbreak in the U.S., the State will establish control areas around any livestock operation infected with the disease (infected zone) or at heightened risk for the disease (buffer zone). Depending on the establishment’s location relative to the control areas, components of a response will differ.

4.1. Establishments outside of the control area.

Establishments outside the control area should continue normal operations, with enhanced biosecurity measures that focus upon prevention of the disease in their facilities. Such measures can include requiring a negative on-farm test for the relevant FAD before receiving hogs, establishing cleaning/disinfection stations at relevant access points into the establishment, and/or requiring that livestock haulers stay in their trucks during the unloading process.

4.2 Establishments inside the control area.

Establishments in control areas or establishments that have received animals from farms in control areas should focus upon the containment of the disease within their facilities. **The focus of this document is a slaughter establishment’s response to a positive finding of ASF at the establishment, or upon confirmation that the establishment has received pigs from a supplier that has a confirmed case of ASF on their premises.**

Section 5: Response Goal

The goal of a slaughter-establishment-specific response to a positive ASF finding is to return to normal business operations as soon as possible, with minimal risk for contaminating associated (supply) premises. Normal business operations may require that enhanced biosecurity, cleaning and disinfection, and surveillance measures be implemented.

Section 6: Epidemiological Principles

There are four epidemiological principles⁷ APHIS and the States will follow during an ASF outbreak:

1. Prevent contact between ASF and swine. This is accomplished through:
 - a. Quarantine of infected swine and movement controls in the control area. In the slaughter establishment, this means that no pigs from control areas will be allowed to move to slaughter unless the pigs have been tested, no signs ASF are observed, and are moved under a permit issued by the state of origin and accepted by the state of destination and the slaughter establishment.
 - b. Using Network-Based Controls (NBCs) to address movement and its role in disease transmission. An NBC can be a direct trace or indirect trace. For example, if a slaughter establishment unknowingly received pigs from an infected premise, the slaughter establishment is considered an NBC.
 - c. Enhanced biosecurity procedures
2. Stop the production of ASF by infected or exposed swine. This is accomplished by mass depopulation and disposal of infected and potentially infected swine. Slaughter establishments may be involved in depopulation and disposal efforts if they are willing, or if an establishment receives infected or exposed pigs, those pigs could be slaughtered and rendered. Alternatively, a decision may be made to humanely euthanize and dispose of the animals. Up-front conversations with your rendering company/rendering partners and/or the local landfill operators should occur when considering acceptance of such animals.
3. Stop the transmission of ASF by vectors. In the initial days of an ASF outbreak, APHIS will stop all movement of pigs for 72 hours after receiving confirmation of an ASF-positive pig in the United States. This will help decrease spread of the disease and help the agency understand the extent of the outbreak. After the initial 72-hour stop-movement order, slaughter establishments can help implement this principle by ensuring they only receive ASF-negative pigs (by requesting negative test results or by receiving only pigs that come from outside a control area) and by implementing enhanced biosecurity practices.

⁷ *Id.*

3.a. The SAHO will likely quarantine movement on and off establishment premises (pending test results) if they are notified that testing of an animal showing clinical signs of ASF occurred at your establishment.

4. Prevent ASF from becoming established in feral swine populations.

Section 7: Initial Response Actions

It should be noted these actions appear to be linear as outlined in this document, but in an actual outbreak event, the steps outlined below may not occur in a linear fashion. Rather, multiple steps will likely be carried out at the same time.

When a presumptive positive case of ASF has been detected, the APHIS Administrator or Chief Veterinary Office (CVO) can authorize APHIS personnel, in conjunction with State, Tribal, and unified Incident Command personnel, to initiate response activities for the index case.⁸

7.1. Activities associated with the finding of a presumptive positive case of ASF.

7.1.a. Steps of a Foreign Animal Disease investigation in a slaughter facility.

The response steps outlined here are specific to slaughter establishments that have identified pigs in lairage displaying clinical signs of ASF or pigs that, upon postmortem exam, display abnormalities consistent with clinical signs of ASF. **Again, it is important to note that the activities outlined here may not occur in a step-wise fashion, but all of the following activities will occur during an outbreak response. Some activities outlined in various steps may occur at the same time, depending upon the facility's operations, the availability of regulatory officials, and the speed at which information can be communicated.**

Step 1: If clinical signs of ASF are detected by an establishment or FSIS Inspector, the individual should notify establishment management immediately and the FSIS public health veterinarian (PHV).⁹ Management should communicate the situation to the appropriate contact at the establishment's company headquarters.

Step 2: The specific group(s) of animals displaying clinical signs should be separated from lots of animals not showing clinical signs. The animals may

⁸ The index case is the first ASF-infected pig or premise that has been detected.

⁹ USDA FSIS Directive 6000.1, Rev. 1: Responsibilities related to foreign animal diseases (FADs) and reportable conditions. www.fsis.usda.gov/wps/wcm/connect/2b2e7adc-961e-4b1d-b593-7dc5a0263504/6100.1.pdf?MOD=AJPERES

be grouped by their common tattoo number, their farm of origin, the establishment's lotting process, or by separating healthy animals from those displaying clinical signs. Regardless of the way the animals are grouped, establishments should hold the entire group containing the affected animals and any associated product until they receive further direction from the SAHO, APHIS, and FSIS. Additionally, the establishment should check to see if they currently have other animals from the same producer/farm on establishment premises or en route to the establishment, and notify FSIS, APHIS, and the SAHO. At this time, the establishment should continue normal operations and continue slaughtering healthy hogs that have passed antemortem inspection.

Step 3: The establishment manager or the PHV will notify the State Animal Health Official (SAHO) and/or the APHIS Area Veterinarian in Charge (AVIC) as soon as possible. The FSIS District Office should also be notified. At this time, the establishment manager or PHV should be able to provide, at minimum, the origin of the affected lot, the time of detection, the severity of the lesions, and the number of animals in the lot.

Step 4: The SAHO or the AVIC will determine how the case should be handled. If an investigation is warranted, a Foreign Animal Disease Diagnostician (FADD) will be sent to the establishment to investigate. If there is strong suspicion of the presence of an FAD, it is likely that the SAHO will quarantine the establishment before test results are available.

Step 5: The plant should notify their procurement, quality control, and other appropriate teams to help gather information on the lot's history. Such information should include:

- Premise ID number
- Name, address, and phone number of supplier production facility
- Species of animals involved
- Number of animals in the affected lot(s)
- Identification of drivers/trucks delivering the lot(s) to the establishment
- Time of arrival at the plant
- Time at which the trucks carrying the affected animals left the establishment, and any information about the next destination
- Information on other lots from the same live animal production facility arriving at the establishment
- Antemortem pen cards
- Clinical signs present/gross lesions
- Any history of the animals showing clinical signs

- The last 30 days of records for live animal movement to the establishment, including any reshipments of animals

The establishment should also notify the dealer and suspend further shipments from the site until all test results are negative, or the disease is determined a non-foreign animal disease.¹⁰

Step 6: When the FADD arrives at the establishment, he/she will gather the information collected (above), and collect samples from the affected animals¹¹ and send them to a National Animal Health Laboratory Network (NAHLN) laboratory for preliminary testing. Samples will also be sent to the National Veterinary Services Laboratory's Foreign Animal Disease Diagnostic Laboratory at Plum Island, NY for confirmation of test results.¹² Samples may include:

- Tonsils
- Lymph nodes
- Spleen
- Blood for serum

Step 7: Results of testing.¹³ Preliminary results of testing from the NAHLN lab should be available within 24 hours of diagnostic sample submission. If preliminary results are positive, the State will likely put a quarantine in place and await confirmatory test results. If confirmatory tests are:

- Negative: All animals are released for routine slaughter if they have passed ante- and postmortem inspection, and the production facility of origin may ship animals as normal.
- Negative for ASF, but positive for a domestic disease (such as SVV): animals at the establishment are released for slaughter after passing FSIS ante- and postmortem inspection, animals at the originating live animal producer facility are held until all symptoms of the disease are gone.¹⁴

¹⁰ *Id.*

¹¹ USDA APHIS Veterinary Services Guidance 12001.2: Policy for the investigation of potential foreign animal disease/emerging disease incidents (FAD/EDI).
www.aphis.usda.gov/animal_health/lab_info_services/downloads/VSG_12001.pdf. Accessed February 9, 2021.

¹² *Id.*

¹³ *Id.*

¹⁴ If official lab results have been communicated to FSIS personnel assigned to the official establishment and acute signs are no longer observable in livestock at the live animal producer facility, that live animal producer facility can resume sending livestock for harvest (however, this is subject to FADD observations; USDA APHIS Veterinary Services Guidance 7406.2, dated 04/06/16).

<https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=3&ved=0ahUKEwjn->

- Positive: FAD Incident Command (SAHOs and/or APHIS) will take over, and all personnel should follow the direction of Incident Command. Incident Command will be available 24 hours a day, 7 days a week while the establishment is under quarantine and as it works with authorities to have the quarantine removed.

7.2. Other activities associated with the finding of a presumptive positive ASF case.

In the time between finding a suspect case of ASF (a presumptive positive) and confirmation of the ASF case, the State and APHIS will work with the establishment to complete the following:

7.2.a. Establish quarantine and hold orders on the slaughter establishment. If a presumptive positive for ASF is identified at a slaughter establishment, or if there is strong suspicion that the establishment has received animals affected by ASF, the SAHO will issue a quarantine for the establishment. Quarantine lines will be determined by the SAHO, APHIS, and the establishment. An aerial map of the establishment premises with appropriate geographical or man-made boundaries will be helpful for establishing a quarantine line. The layout of each establishment is different and thus the quarantine lines will be establishment specific. Some establishments entire property may be inside the quarantine boundary and other establishments quarantine boundary may not include the entire property. Other issues that must be addressed when a quarantine is established include the following.

- Traffic out of the establishment will be stopped for an unknown period of time until a decontamination line is set up. Incoming traffic will be allowed at the discretion of the SAHO (likely for animal welfare purposes, etc.). The SAHO may ask the establishment to stop production, so the establishment will work with the SAHO to determine how to manage outgoing traffic of employees leaving the facility. Employees, contractors, and visitors will follow all enhanced biosecurity and cleaning/disinfection measures implemented for the quarantine before leaving the establishment.
- Establishments may not be able to receive pigs, but will be able to slaughter all pigs remaining in lairage that pass FSIS antemortem inspections. Product that has been inspected and passed may be held until the SAHO determines it is safe to move.

- Establishments will have a plan to dispose of affected or suspect pigs that prevents further spread of ASF and considers the welfare of animals. This plan may be that pigs will be not be removed from their lairage pen until results of confirmatory tests are received (usually within 24 hours) or the plant may dispose of pigs as soon as samples are collected to protect animal welfare and to be able to clean and disinfect lairage sooner. Animals should be rendered or must be disposed of in a manner approved by the SAHO—likely this will mean disposal of the rendered material or whole carcasses in a landfill or compost site. The SAHO will work with the establishment to determine how affected pigs that die or must be depopulated will be disposed of.
 - Additionally, the SAHO will determine how to dispose of product that cannot be rendered, including down animals, hides, and blood for establishments that do not have a rendering facility on-site.
- Product may be able to move under a permit issued by the SAHO, if the establishment is able to meet the cleaning and disinfection requirements outlined by the SAHO.

7.2.b. Establish a quarantine area, a control area(s), and movement controls for incoming/outgoing traffic. Working with APHIS, the SAHO will establish boundaries for a quarantine line around the establishment. APHIS and the SAHO will also establish a control area around the infected establishment. Again, an aerial map of the establishment premises with appropriate geographical or man-made boundaries will be helpful for establishing a quarantine line. Movement in and out of the quarantine and control areas will be heavily restricted. Trucks moving in and out of the quarantine area will undergo cleaning and disinfection.

A control area will also be established, around the establishment, which will be larger than the original quarantine area. In some states, all production facilities within this control area would be under quarantine as well. Swine movement in and out of the control area will be restricted based on the epidemiologic data collected by the SAHO and APHIS.

7.2.c. Collect epidemiologic investigation and tracing activities. The SAHO and APHIS will begin an epidemiologic investigation to determine the extent of a possible outbreak. The establishment can aid in the investigation by gathering and preparing to share the following information:

- Premise ID number of the supplier of affected pigs
- Name, address, and phone number of production facility
- Species of animals involved

- Number of animals in the affected lot(s)
- Identification of drivers/trucks delivering the lot(s) to the establishment
- Time of arrival at the plant
- Time at which the trucks carrying the affected animals left the establishment, and any information about the next destination
- Information on other lots from the same live animal production facility arriving at the establishment
- Information about the livestock trucks/trailers that brought pigs to the facility in the time between the affected hogs' arrival and confirmation of a positive case of ASF.
 - Destination(s) after leaving the establishment premises
- Antemortem pen cards
- Clinical signs present/gross lesions
- Any history of the animals showing clinical signs
- Destination of product, including fresh, frozen, offal, blood, and rendered products
- The last 30 days of records for live animal movement to the establishment, including any information on hogs that may have been reshipped from the establishment

7.2.d. Implement enhanced biosecurity measures. Enhanced biosecurity measures must be implemented if the establishment intends to operate after a thorough cleaning and disinfection. Guidance on enhanced biosecurity measures can be found in Section 8 of this document.

7.2.e. Activate State and National Incident Management Teams. The SAHO or APHIS Area Veterinarian in Charge (AVIC) will serve as commander of a unified Incident Coordination Structure. National Incident Management Teams (NIMTs) will be formed to coordinate the incident response, manage public messages, and take measures to control and eradicate ASF. The Incident Management Teams help APHIS and the States implement synchronized management and organizational structure to support control and eradication actions taken during an ASF outbreak.

Companies or individual establishments are encouraged to develop their own incident management teams within the plants, and designate a point of contact for the National Incident Management Team. This person will interact with the NIMT on an hourly or daily basis, in order to help make decisions and communicate information from the NIMT to the company/establishment employees.

7.2.f. Incident Management to begin data collection and information management in the Emergency Management Response System 2.0

(EMRS2) and in State systems. The State and APHIS will begin collecting and using the information from the slaughter establishment to track data in the EMRS2 system, which is the APHIS database for managing information during an outbreak response.

7.2.g. Prepare communication plans and notifications. Slaughter establishments/companies should prepare to inform other industry entities and customers of the situation by working with their internal team.

However, while waiting for confirmation of an ASF diagnosis, no information should be shared with anyone other than the SAHO and APHIS. The State and USDA will take the lead on messaging to stakeholders, and all information will be distributed by USDA before any other entity should share information publicly. There are severe consequences, both domestically and internationally, for sharing information on a presumptive or confirmed case of any foreign animal disease before the information is distributed by USDA. Internationally, trading partners may stop trade with the U.S. based on a false report before testing is complete, which is why it is essential that any communication to any forum come directly from USDA.

After USDA has reported a confirmed diagnosis to the World Organization for Animal Health (OIE), the company/establishment should work with APHIS, the SAHO, and industry experts to develop talking points to share publicly.

7.3. Activities associated with the confirmation of a case of ASF.

When APHIS and the State receives confirmation of a positive finding of ASF at a slaughter establishment, they will start the following actions:

7.3.a. Begin steps to declare a USDA extraordinary emergency. When an outbreak has been confirmed, USDA will declare an extraordinary emergency, giving the agency authority to oversee the response to an outbreak. The States will continue to have authority to allow movement of animals within the state, so APHIS and the States will work closely together, even after USDA declares an extraordinary emergency.

7.3.b. Implement a National Movement Standstill for 72 hours. By declaring an extraordinary emergency, APHIS can implement a national movement standstill. It is anticipated that the standstill will last approximately 72 hours from the time a confirmatory test result is received, giving APHIS and SAHOs time to determine the extent of an ASF outbreak. During the standstill, no live swine or swine germplasm may move in the United States. Movement of pork products should not be affected. However, individual states may implement their own standstill that may include other

items such as pork products, and a state's standstill could last longer than 72 hours. It is important for establishments to communicate with their SAHOs before an outbreak occurs to understand what movement constraints might be implemented.

The affected slaughter establishment can use this time to empty lairage (through regular slaughter of unaffected hogs and euthanasia/rendering of affected pigs), and clean and disinfect the entire establishment, including lairage and unloading docks, and any empty trucks/trailers still on the premises. During this time, it is important for establishments to communicate the consequences of a standstill to its suppliers and customers—the establishment will likely not be able to receive pigs for a certain amount of time, and customer expectations may exceed the establishment's capacity during and after the standstill.

7.3.c. Initiate depopulation and disposal plans. Any pigs on establishment premises diagnosed with or showing clinical signs of ASF must be depopulated and disposed of in a manner that minimizes spread of the disease. The SAHO and likely other regulatory bodies will be involved in decisions around depopulation and disposal.

If animals can be depopulated and rendered on-site, this will likely be the best solution, as long as the establishment can show that the process successfully inactivates the virus. However, the rendered material must be disposed of, and some establishments may not have on-site rendering to aid in the disposal process. Additionally, many rendering facilities are not equipped to accept whole hog carcasses. Local landfills may be an option for some establishments, but those establishments must communicate with the landfills to ensure they will accept pig carcasses, parts of carcasses, or any affected tissue that may be a product of depopulation efforts. Establishments should work with their SAHO and pertinent regulatory bodies, such as environmental agencies or Departments of Natural Resources *before* an outbreak occurs, to prepare an appropriate disposal plan for any pigs that must be depopulated.

Disposal may also include disposal of product, edible or inedible, that is deemed unacceptable for import by international trading partners. It is likely that in the event of an ASF outbreak, trading partners would refuse pork products in transit (either via truck or ship) from the US. A sudden return of all pork products in transit to other countries would cause a large back-up of product, much of which may have to be destroyed because of spoilage. Slaughter establishments and companies should consider returned product in their disposal plans as well, with the understanding that

rendering capacity could be greatly diminished because of ongoing depopulation efforts.

7.3.d. Continue epidemiological investigations and tracing activities.

The State and APHIS will require more information from the slaughter establishment, including information on all lots received in the last 30 days and truck schedules and truck destinations after leaving the establishment in order to investigate other premises in direct contact with the slaughter establishment and establish Network Based Controls (NBCs).

Establishments should work with transport companies to obtain logistical information such as TQA numbers, trailer numbers, PINs for hog supplies, and other pertinent information.

7.3.e. Implement surveillance plans. In the event of an ASF outbreak, APHIS and SAHOs may implement surveillance plans. Most of the surveillance done should remain on-farm, as slaughter establishments will likely not provide useful data for an epidemiologic investigation.

7.3.f. Initiate public awareness messaging and communication campaign; Activate communication plans and provide notifications to stakeholders. The USDA will be the first to announce that an outbreak of ASF has occurred in the United States. There are severe consequences, both domestically and internationally, for sharing information on a presumptive or confirmed case of any foreign animal disease before the information is distributed by USDA. Slaughter establishments/companies should inform other industry entities and customers of the situation only after USDA has confirmed an outbreak of ASF in the US.

7.3.g. Implement and enforce enhanced biosecurity measures. The State, APHIS, and the slaughter establishment will work together to determine the necessary enhanced biosecurity measures for the establishment. Section 8 outlines considerations for such enhanced measures.

Section 8. Enhanced Biosecurity Measures

The specific enhanced biosecurity measures implemented will depend upon the location and state-specific requirements, but regardless of where the outbreak occurs, all facilities will be affected in some way. **The measures outlined here can be implemented at any establishment at any time, whether they are infected or not, but the focus of this document remains the response to a case of ASF diagnosed at a slaughter facility.**

To prepare for an ASF outbreak, every slaughter facility should have an enhanced site-specific, written biosecurity plan ready for implementation. This

plan should address the specific layout and standard operating procedures of the plant, and how the slaughter facility will implement the heightened biosecurity measures defined in this document. The enhanced biosecurity plan should clearly define the slaughter facility premises and the animals and animal housing associated with the premises. All slaughter facilities should obtain and keep a premises identification number (PIN) in their biosecurity plan. The plan should be accessible to authorized individuals with responsibility for implementing the plan, and should be made available to the State Animal Health Official upon request.

8.1. Biosecurity manager

Each facility should designate a Biosecurity Manager who is in charge of developing the enhanced biosecurity plan, keeping the plan updated, and training employees on biosecurity measures and how they will be implemented in the event of an FAD outbreak. The Biosecurity Manager should have authority to ensure compliance with biosecurity protocols and take corrective action as needed, and should strive to create a culture of biosecurity awareness at all times.

8.2. Components of the Enhanced Biosecurity Plan

8.2.a. Premises map

An important part of the written response plan is the premises map. A premises map should be an up-to-date diagram or schematic of the facility and grounds (a satellite image is ideal), with the following clearly labeled:

- Line of separation or quarantine line
 - This is an imaginary line drawn to indicate the separation of the establishment premises to establish a quarantine or to separate establishment property from surrounding properties. Working with APHIS and the SAHO, the facility will establish a quarantine line(s) for vehicles and foot traffic entering and leaving establishment property. The quarantine line should be large enough to contain the major risks to disease spread, but the establishment should work with the SAHO to determine what needs to be included in quarantine (for example, it is ideal that employee parking not be bounded by the quarantine line).
 - No product, animals, trucks, employees, or other entity may cross this line unless approved by the facility and SAHO or until the proper authority lifts restrictions.
- Access points (in and out)¹⁵ for:
 - Livestock trucks/trailers
 - Employee vehicles
 - Incoming supply deliveries

¹⁵ While it is ideal to have traffic flow one-way and have different access points for incoming and outgoing traffic, some establishments may have both incoming and outgoing traffic moving through access points.

- Outgoing human food product
- Other products (incoming and outgoing):
 - Rendered materials
 - Pharmaceutical products
 - Trash waste
- Cleaning and disinfection stations for biosecurity purposes
- Designated parking areas
 - Employees
 - Company employees
 - USDA employees
 - Contracted employees
 - Visitors
 - Trucks/trailers
 - Livestock
 - Product
 - Human food
 - Other products (rendered, etc.)
- All vehicle movements (i.e. traffic flow for all vehicles in order to assess cross-traffic)
- Flow of wastewater

8.2.b. Flow of traffic

If an establishment has not done so already, it should create traffic maps to determine animal, product, and employee movement in the plant. This can be done before a FAD outbreak even occurs. If possible, flow of all animals, products, and employees should be one-way. Efforts should be made to eliminate cross-contamination of products and trucks. All biosecurity plans should include flow charts for the following:

- Truck traffic
 - Live animals
 - Incoming products
 - Supplies/raw materials
 - Of animal origin and otherwise
 - Chemicals
 - Equipment (tools, used pallets, combo bins, *etc.*)
 - Outgoing products
 - Human food
 - Raw
 - Cooked
 - Raw offal
 - Rendered product
 - Animal feed/feed ingredients
 - Pet food
 - Pharmaceutical products

- Hides
- Blood and blood products
- Other byproducts (fertilizer ingredients, tallow, etc.)
- Employees
 - Company employees
 - USDA employees
 - Employee vehicles
 - Footpath traffic flow for employee
- Other traffic
 - Contractors and visitors
 - Pest control
 - Maintenance
 - Landscaping services
 - Laundry service
 - Garbage service
 - Recycling service
 - Waste water
 - How is it treated?
 - Where did it go?

The establishment should work with the SAHO and APHIS to prioritize movement of the above items by need and by risk.

8.2.c. Visitors/international travel

All establishments should have a visitor/contractor log in place before an outbreak occurs. Establishments should also have in place a requirement that all personnel and any visitors have had adequate downtime between international travel and any visits to the establishment. Currently, the USDA Foreign Animal Disease Diagnostic Laboratory on Plum Island recommends a 5-day downtime for anyone planning to have contact with susceptible species after working with diseases and animals in an affected area. If an FAD outbreak occurs in the United States, establishments should restrict entry into the plant to only essential personnel, and the 5-day downtime and enhanced biosecurity practices must be followed.

If under quarantine, an establishment should consider halting contractor and visitor entry into the establishment. If the establishment must allow non-essential personnel on the premises during an outbreak, those individuals should be aware of the current FAD outbreak situation, and be informed that they have to follow the establishment's enhanced biosecurity procedures, including but not limited to: boot changing or thorough cleaning, changing of clothing, and cleaning of vehicles at the establishment or at the nearest car/truck wash.

8.2.d. Employees

Employee foot and driving traffic routes should be considered when implementing a FAD biosecurity plan. Parking areas for personal vehicles should not overlap with routes by which contaminated trucks can enter the establishment. Footpaths should be established for all employees to follow when entering/exiting the plant. All street clothing and shoes should be stored in the locker room, and a clean/dirty line should be established in each locker area. Designated plant clothing and footwear should be removed before entering the clean locker area. Employees should leave the locker area and the plant via the designated clean footpaths established to avoid cross-contamination. Much care should be taken to keep employees from coming into contact with infected or exposed animals outside the work environment.

It is recommended that employees who work in the receiving and lairage areas should be required to wear plant-issued clothing/outerwear, and to change into clean clothes before leaving the plant premises. However, if an employee working in lairage is wearing his/her own street clothes and an FAD is detected on the slaughter establishment premises, the establishment should be prepared to issue new clothing and shoes for the employee to wear home. All clothing that has been in contact with live animals displaying signs of an FAD should be left at the establishment to be washed and disinfected.

Establishments should also account for employees who may not be assigned to a specific station or area of the plant (such as FSQA, management, maintenance, etc.). This may involve shifting responsibilities or limiting access to certain areas of the plant, or designating certain employees only to certain areas of the plant.

8.2.e. Lairage

The lairage area is the area where the highest risk of cross contamination and disease spread occurs. A plan for disposal of animals/carcasses that do not pass inspection should be in place. Each state is charged with developing a carcass disposal plan in the event of a FAD outbreak, and the establishment should follow the plan that the state has put in place if it is necessary to dispose of a carcass in lairage.

Regular cleaning and disinfection of the lairage area is recommended, and should be implemented before an outbreak occurs. This will help SAHOs make decisions on establishing quarantine lines and collecting trace-back information. If the establishment can refer to a specific point in time that the lairage area was cleaned and disinfected, this may decrease the amount of epidemiological information needed by the SAHO and APHIS.

As stated previously, when a plant is determined to be in a control area, it is imperative that no live or dead animals leave the facility after they have been

brought onto establishment premises, unless given specific consent and direction from APHIS and State Animal Health Officials.

8.2.f. Trucks/trailers

It is important for the establishment to communicate with truck drivers and inform them of any increased biosecurity practices that might be in place. Some biosecurity practices that may be implemented in an outbreak situation include the requirement to don booties and coveralls when leaving the truck cab, and doffing them when getting back inside, or having truck drivers remain in their trucks while their trailers are unloaded.

Livestock trailers should go through a thorough cleaning before leaving the slaughter establishment. Depending on the proximity of the slaughter establishment to a truck wash, SAHOs may direct livestock haulers to a local truck wash, or they may choose to set up a cleaning and disinfection station on establishment premises.

8.2.g. Rendering

A flow chart outlining the flow of blood and other by-products such as pharmaceuticals and the rendering process should be prepared before the event of an outbreak. Such a document should include each product produced, whether or not it is produced in the rendering area, and at what times and temperatures such products are exposed to before leaving the establishment.

Many rendering operations already have this information outlined in documents used to demonstrate Food Safety Modernization Act (FSMA) compliance. Such documentation will help the SAHO determine whether or not the material was subject to appropriate times/temperatures which can kill or inactivate the ASF virus, and will allow permitting and movement decisions to be made in a timely manner.

Employee cross-contamination and the movement of rendering trucks and their drivers should also be considered in an establishment's biosecurity plan. Eliminating cross-traffic of these employees and trucks with other employees and trucks will likely be the best way to prevent cross-contamination.

Additionally, if an establishment uses an outside rendering company for carcasses and other material, it must consider that the carcasses and other material may not be allowed to move outside the quarantine line. The outside rendering company may not accept material from a plant that has had infected pigs on the premises. Establishments should communicate with their outside rendering companies before an outbreak occurs to ensure that a plan is in place for an outbreak situation.

Section 9: Cleaning and Disinfection

The slaughter establishment should have cleaning and disinfection protocols in place or ready to be implemented when it is determined that the establishment is within a control zone and/or has received infected or exposed animals. Cleaning and disinfection will depend upon traffic patterns and logistics of the plant. Below, the cleaning and disinfection of the highest-risk areas is outlined. Other areas of the plant, such as the clean side of the plant, fabrication areas, and RTE areas, should have sufficient cleaning and sanitation protocols in place to greatly decrease the risk of spreading the virus in these areas. However, the establishment should work with the SAHO before an outbreak occurs to confirm if the plant's SSOPs are acceptable for mitigating the risk of spreading ASF.

In an outbreak situation, establishments are encouraged to set up cleaning and disinfection sites at all access points for movement into and out of the premises. Employees operating the cleaning and disinfection stations should be well-versed in the company's enhanced biosecurity plan, the safe use of disinfectants, and the personal protective equipment necessary to protect themselves from any harmful effects of the disinfectants (which will be stated on the product label). A list of APHIS and EPA-approved disinfectants can be found in Appendix B of this document.

9.1. Lairage

In the event of a confirmed case of ASF in a slaughter establishment, a thorough cleaning and disinfection of the unloading docks, weigh scales, lairage area, and any associated materials such as paddles and sort boards must be performed. All organic material should be removed from the pens, either by skid loaders or manually. All surfaces, including walls and ceilings, should be washed. After a thorough washing of all surfaces an APHIS-approved disinfectant should be applied. Because many lairage areas are mostly composed of concrete, care should be taken to ensure all porous surfaces have sufficient contact time with the disinfectant. Ideally, the unloading docks/chutes and weigh scales should be cleaned and disinfected to reduce the risk of contamination of other trailers unloading during the investigation process. The National Pork Board has more information on contact time for disinfectants on porous surfaces.¹⁶

9.2. Livestock trucks/trailers

The establishment should have a program in place to aid livestock trailers in not carrying disease off the establishment. Establishments may set up a station for trucks to go through a thorough cleaning before leaving the slaughter establishment, or set up a station to clean the wheel wells and undercarriage. Depending on the proximity of the slaughter establishment to a truck wash, SAHOs

¹⁶ National Pork Board. 2015. Disinfection of foreign animal disease viruses on surfaces relevant to the Pork Packing Industry. NPB website: <https://www.pork.org/research/disinfection-of-foreign-animal-disease-viruses-on-surfaces-relevant-to-the-pork-packing-industry/>. Accessed February 23, 2021.

may direct livestock haulers to a local truck wash, or they may choose to set up a cleaning and disinfection station on establishment premises. If a SAHO works with an establishment to set up a truck cleaning and disinfection station, the Iowa Department of Agriculture and Land Stewardship (IDALS) provides resources specific to setting up and operating a temporary cleaning and disinfection station.¹⁷

In either case, all organic material should be removed from the trailer, including bedding. Bedding should be rendered or composted, and disposed of in a way that is satisfactory to the SAHO. Trucks and trailers should be washed, and an APHIS-approved disinfectant should be applied after washing. In the case of cold weather, the Canadian Food Inspection Agency has determined that the addition of 40% propylene glycol to various disinfectants can keep them liquid at temperatures as low as -20°C (-4°F).¹⁸

Finally, an establishment's plan should include consideration of the waste water from cleaning and disinfecting trucks and trailers. The establishment should be able to identify where the water drains, when/how it is treated, and where it is released in order to determine 1) whether the protocol in place is safe for humans, animals, and the environment, and 2) whether the protocol in place can successfully mitigate the spread of the ASF virus. A plan should also be in place to address any solids that are separated from the water during the treatment process.

9.3. Trucks/trailers hauling product and by-products

Trucks and trailers hauling product and by-products such as offal or rendered material will also be subject to cleaning and disinfection, but on a scale less stringent than livestock trucks and trailers. Using the IDALS resources for setting up a cleaning and disinfection station, slaughter establishments can clean and disinfect the wheels, wheel wells, and undercarriages of trucks leaving the premises. Trucks hauling product will be pulling enclosed trailers, and the inside of the trailers should be cleaned and disinfected after product has been delivered, (this includes any pallets, combo bins, etc. that product was shipped on or in).

Further processors receiving product should be aware of the outbreak situation and should have cleaning and disinfection procedures in place for equipment that may come into contact with product. This equipment includes pallets, combo bins, and any other containers that the further processor intends to send back to a slaughter establishment.

¹⁷ Iowa Department of Agriculture & Land Stewardship Biosecurity website. <https://iowaagriculture.gov/animal-industry-bureau/biosecurity>. Accessed February 23, 2021.

¹⁸ Rohonczy, E, B Brooks, S Theriault, D Carruthers, and L. Miller. 2012. Cold Weather Decontamination (Validation of Decontamination Processes in the Agri-Food Context). 4th International Symposium on Managing Animal Mortality, Products, By Products and Associated Health Risk. Dearborn, MI. https://www.researchgate.net/publication/281107862_Cold_Weather_Decontamination. Accessed February 23, 2021.

9.4. Employee vehicles

Ideally, all employee parking at a slaughter establishment will be in a designated spot away from livestock areas, and outside the established quarantine. However, each establishment is different. In the event of a confirmed case of ASF at a slaughter establishment, cleaning and disinfection stations should be set up at access points for employee parking. Care should be taken to direct employee vehicles in a manner that prevents cross-contamination of vehicles and trucks hauling livestock. At minimum, all employee vehicles and trucks/trailers hauling livestock or product should go through a cleaning and disinfection station before they arrive at any cross-point in vehicle traffic leaving the establishment.

9.5. Employee workwear

It is imperative that no contaminated clothing or equipment be brought home with plant personnel. In an ideal situation, the establishment can issue clothing to employees and collect the clothing at the end of the day. However, if employees wear street clothes regularly, an establishment's plan may consider establishment-issued clothing only for employees with the highest risk of coming into contact with such materials. Establishments should consider the areas with the highest risk for contamination, such as areas where employees come into contact with animals themselves, feces, and blood, and ensure the strongest biosecurity measures are implemented in those areas.

All clothing (establishment-issued or otherwise) should be washed with standard detergent and bleach. All plant-issued equipment should be collected and washed/disinfected at the end of each shift.

Section 8: Continuity of Business

The requirements a plant must fulfill to return to normal business operations after ASF has been detected in the establishment will vary from state to state as well as the disease status of the premise.

Permits will be needed to move pigs, product, and any other material associated with a packing plant, in and out of quarantine and control zones. Permitting is required for two reasons: 1) to determine that product movement is safe, and 2) to enable officials to trace movement of pigs, product, etc. in the case of a problem or further spread of the disease. Incident Command, which will be comprised of state and APHIS officials, will issue permits for movement of all live animals, product, and any material leaving an establishment during an outbreak situation.

Anything from an infected premise must have a permit for movement. If an establishment is in a control area, but not infected, a blanket permit may be issued.

For all permitting purposes, establishments must provide records on destination of the product, material, etc. Permitting decisions will be made by Incident Command with a focus on the risk of spreading ASF through movement of animals, product, and other material. It is recommended that every establishment communicate with state officials to understand how permitting might be implemented in their state.

An establishment that has identified the ASF virus on the premises will likely have to go through the following phases, but the below is NOT an exhaustive list of all requirements a state might have:

- Quarantine
- Risk assessment
- Implement enhanced biosecurity
- Cleaning and disinfection
- Verification
- Permitting

Establishments that find themselves in a control area, but have not identified ASF virus on the premises, and have not received pigs from an ASF-affected site may have to implement the following:

- Risk assessment
- Implement enhanced biosecurity
- Cleaning and disinfection
- Permitting

Establishments outside a control area should practice increased vigilance and implement enhanced biosecurity measures, such as requiring truck drivers to stay in their cabs during unloading, or donning/doffing booties and coveralls. Additionally, establishments in control areas should communicate with suppliers of pigs to ensure that they do not receive pigs that may have been exposed to the virus.

Section 9: Communication Strategies

If a case of ASF is confirmed in a slaughter facility or anywhere in the United States, USDA APHIS will be the first to publicly announce it. If an ASF case is found in a slaughter establishment, the establishment management and, if such is the case, the company's corporate headquarters must follow USDA's lead in their communication efforts. It is imperative that no information be shared publicly before USDA announces the confirmation.

Slaughter establishments/companies should prepare to inform other industry entities and customers of the situation by working with their internal team.

However, while waiting for confirmation of an ASF diagnosis, no information should be shared with anyone other than the SAHO and APHIS. The State and USDA will take the lead on messaging to stakeholders, and

all information will be distributed by USDA before any other entity should share information publicly. There are severe consequences, both domestically and internationally, for sharing information on a presumptive or confirmed case of any foreign animal disease before the information is distributed by USDA. Internationally, trading partners may stop trade with the U.S. based on a false report before testing is complete, which is why it is essential that any communication to any forum come directly from USDA.

After USDA has reported a confirmed diagnosis to the World Organization for Animal Health (OIE), the company/establishment should work with APHIS, the SAHO, and industry experts to develop talking points to share publicly.

The company/establishment should work very closely with USDA to align messaging and response to the initial announcement. USDA will hold regular stakeholder updates to keep the industry informed. Some calls may be held daily to ensure all learnings from epidemiological investigations are shared in a timely manner. Additionally, it is anticipated that industry trade associations such as the North American Meat Institute and the National Pork Producers' Council will keep their membership up-to-date with regularly-scheduled calls during any outbreak situation.

Within a company, a communication plan should be developed before an outbreak occurs. This plan should identify a core team of individuals from which all information will flow. This team should include the Biosecurity Manager and appropriate points of contact for company employees, suppliers, customers, industry partners/entities, and general inquiries. Managers or company leadership should be in constant communication with USDA APHIS and FSIS officials such as the AVIC and the IIC, rather than employees and inspectors sharing information. Messaging should be transparent, clear, and concise, and should follow USDA guidance on information sharing. Each company's communication plan will be different, and just like biosecurity and response plans, it is imperative that companies outline a communications plan *before* an outbreak occurs.

Appendix A: Additional Training Materials on FADs and Enhanced Biosecurity

- USDA APHIS African Swine Fever Web Page: <https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/animal-disease-information/swine-disease-information/african-swine-fever/seminar>
- NAMI Foreign Animal Disease Guidance Documents: <https://www.meatinstitute.org/index.php?ht=d/sp/i/157365/pid/157365>
- Secure Pork Supply: <http://www.securepork.org/training-materials/>
- National Pork Board Foreign Animal Disease Resources: <https://www.pork.org/production/animal-disease/foreign-animal-disease-resources/>
- Iowa Department of Agriculture and Land Stewardship Biosecurity Web Page: <https://iowaagriculture.gov/animal-industry-bureau/biosecurity>.
- Pork Quality Assurance: <https://www.pork.org/certifications/pork-quality-assurance-plus/>
- Pork Transport Quality Assurance: <https://www.pork.org/certifications/transport-quality-assurance/>
- World Organization for Animal Health: <https://www.oie.int/animal-health-in-the-world/oie-listed-diseases-2019/>
- Food and Agriculture Organization: <http://www.fao.org/animal-health/en/>

Appendix B: List of Disinfectants for Specific FADs*

Active ingredients	Product name	Manufacturer	EPA #	Susceptible virus
Sodium chlorite, potassium peroxymonosulfate	Virkon S	E.I. DuPont de Nemours & Company	71654-6	FMD, CSF, ASF
Hydrogen peroxide, peroxyacetic acid	Oxonia Active	Ecolab, Inc.	1677-129	FMD
Alkyl dimethyl benzyl ammonium chloride, didecyl dimethyl ammonium chloride, octyl decyl dimethyl ammonium chloride, dioctyl dimethyl ammonium chloride	Lonza DC 101	Lonza, Inc.	6836-86	FMD
Sodium chlorite, sodium dichloroisocyanurate dihydrate	Aseptrol S10-TAB	BASF Catalysts, LLC	70060-19	FMD
Sodium chlorite, sodium dichloroisocyanurate dihydrate	Aseptrol FC-TAB	BASF Catalysts, LLC	70060-30	FMD
o-phenylphenol, potassium salt; p-ter-amyphenol, potassium salt; potassium 2-benzyl-4-chlorophenolate	Pheno Cen Germicidal Detergent	Central Solutions, Inc.	211-25	CSF, ASF
o-Pheynylphenol, ethyl alcohol	Pheno-Cen Spray Disinfectant/Deodorant	Central Solutions, Inc.	211-32	CSF
p-tert-amyphenol, sodium salt; sodium 2-benzyl-4-chlorophenolate; sodium o-phenylphenolate	Tri-Cen	Central Solutions, Inc.	211-36	CSF
Alkyl dimethyl benzyl ammonium chloride, didecyl dimethyl ammonium chloride, octyl decyl dimethyl ammonium chloride, dioctyl dimethyl ammonium chloride	Q5.5-5.5NPB-2.5HW	Central Solutions, Inc.	211-50	CSF
o-phenylphenol, 2-benxyl-4-chlorophenol	Low pH Phenolic 256	Central Solutions, Inc.	211-62	CSF, ASF
Glutaral	Ucarsan Sanitizer 420	Dow Chemical Company	464-689	CSF
Glutaral	Ucarsan Sanitizer 4128	Dow Chemical Company	464-696	
2-benzyl-4-chlorophenol, o-phenylphenol, 4-tert-amyphenol	1-Stroke Environ	Steris Corporation	1043-26	CSF
Chlorhexidine diacetate	Nolvasan Solution	Zoetis	1007-99	CSF
Sodium dichloro-s-triazinetriene	Klor-Kleen	Medentech Ltd.	71847-2	ASF

*Adapted from the USDA APHIS document entitled "Potential Pesticides to Use Against the Causative Agents of Selected Foreign Animal Diseases in Farm Settings: https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/emergency-management/ct_disinfectants/lut/p/z1/tVNLc5swEP4tPeTlaBEKEkewHcDGdqd-xVwYIYOhBeGA4tT99RWuZ9pJYqeHVrfid_aSd7yEUo0cUS34s91yVjeSVrrexnczMgQ-MmJE_GprgBk44CagNMDDR5gwY-G5AaAQAhGEIh14wpM4UILRRrMfjeYBND3DoL5wRhLP1w5RF1JoHBK1RjGIh1UEVaMsPRdklopEqkyqpyrTI7ekOOp40z22SN-

Also see:

- Disinfection of foreign animal disease viruses on surfaces relevant to the pork packing industry: <https://www.pork.org/research/disinfection-of-foreign-animal-disease-viruses-on-surfaces-relevant-to-the-pork-packing-industry/>
- USDA APHIS list of disinfectants recently approved for Section 18 exemption for use in the event of high consequence animal diseases: https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/emergency-management/ct_disinfectants