

# Iowa African Swine Fever State Response Plan



This is a draft plan and is subject to change

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## 1. Introduction

Since there is no treatment for or vaccination against ASF, the primary strategy to mitigate its impact on Iowa's agricultural economy is to prevent it from entering Iowa or eradicating it as quickly as possible if it does enter. This may be accomplished through instituting restricted and/or controlled movements of swine if the virus is detected in the U.S. and stamping-out positive or epidemiologically linked herds in Iowa. Identifying all premises before a potential outbreak would greatly increase IDALS' ability to control and mitigate an ASF introduction into Iowa.

In the event of an outbreak the primary transmission risk to Iowa herds is direct transmission from infected pigs to susceptible pigs or indirect transmission from fomites (contaminated people, supplies, or equipment). Due to the range of soft ticks (*Ornithodoros* spp.) in the U.S., the climate of Iowa, and the majority of Iowa swine operations being closed systems, transmission from infected ticks is unlikely [1] [2] [3]. While feral swine are reported in three bordering states (Missouri, Illinois, and Wisconsin); with the exception of Crawford County, Wisconsin (separated from Iowa by the Mississippi River), no county directly borders Iowa and the introduction of ASF from feral swine is unlikely at this time [4]. The risk of intentional release of ASF into an Iowa herd is unknown.

During any foreign animal disease (FAD) outbreak IDALS will work collaboratively with USDA to respond. The goals of any FAD response include: (1) detecting, controlling, and containing the disease as quickly as possible; (2) eradicating the disease using strategies that seek to stabilize animal agriculture, food supplies, the economy, and to protect public health and the environment; and (3) providing science- and risk-based approaches and systems to facilitate continuity of business for non-infected animals and non-contaminated products.

## 2. Pre-Outbreak Actions

### i. Biosecurity

- a. IDALS places the responsibility of implementing good biosecurity practices on the producers and owners of a premises. At a minimum IDALS recommendations premises utilize existing enhanced biosecurity outbreak guidance available in the [NAHEMS Guidelines for Biosecurity](#) [5] and those outlined in the [Secure Pork Supply \(SPS\)](#), but also practice increased biosecurity practices, where appropriate, on a daily basis.
- b. IDALS further recommends:
  - Premises that do not allow pigs to have outdoor access utilize guidance available in the [Self-Assessment Checklist for Enhanced Pork Production Biosecurity: Animals Raised Indoors](#) [6];
  - Premises that allow pigs to have outdoor access utilize USDA biosecurity recommendations as highlighted in the [USDA Biosecurity Checklist for Pigs with Outdoor Access](#) [7] and well as

84 the [Self-Assessment Checklist for Enhanced Pork Production](#)  
85 [Biosecurity: Animals with Outdoor Access](#) [8];

- 86 • All premises implement personnel policies that restrict employees  
87 (and visitors) from:
  - 88 ○ returning for work for 5 days after hunting feral pigs and  
89 interacting with their carcasses or waste;
  - 90 ○ entering a premises for a minimum of 5 days after arriving  
91 in the U.S. after visiting any country or area of the world  
92 experiencing active ASF cases;
  - 93 ○ bringing any clothing (including footwear) that was worn  
94 when hunting feral swine or visiting a country or area of  
95 the world experiencing active ASF cases before it is  
96 completely washed and laundered;
  - 97 ○ entering a premises without showering-in and showering-  
98 out (when possible);
    - 99 ■ when this is not possible completely changing or  
100 covering all outerwear, including footwear, with  
101 PPE provided at the premises and not worn on any  
102 other premises;
  - 103 ○ eating pork products produced off-site on the premises due  
104 to the longevity of the virus in pork meat [9];
  - 105 ○ Bringing cellular phones and other outside materials that  
106 have not been properly disinfected onto a premises; and
- 107 • Controlling potential mechanical vectors (such as flies) that may  
108 be present on the premises.

## 109 ii. Premises Registration

110 Premises registration of all livestock premises (including those housing swine)  
111 and assignment of a premises identification number will greatly enhance IDALS'  
112 ability to respond to and mitigate an ASF outbreak.  
113

## 114 3. Classifications of an ASF Outbreak in relation to Iowa

115 There are three classifications of an ASF outbreak in relation to Iowa that would prompt  
116 IDALS to initiate a response. Formal notification of confirmed ASF cases outside of  
117 Iowa would be announced by USDA. Any confirmation of ASF within Iowa would be  
118 announced jointly by IDALS and USDA.  
119

120 The three classifications of an ASF outbreak in relation to Iowa are:  
121

- 122 • **Continental:** ASF outbreak in Canada or Mexico but not in the U.S.
- 123
- 124 • **Domestic:** Confirmation of the first ASF case in the U.S. but not in Iowa.
- 125
- 126 • **In-State:** Surveillance shows a positive case in Iowa or epidemiologic  
127 evidence proves a connection of an Iowa herd to an infected herd.
- 128
- 129

130  
131 Iowa Code [163.1](#) describes IDALS legal authority to control infectious or contagious  
132 diseases affecting animals. Therefore during any ASF outbreak classification, IDALS  
133 may take the following actions:  
134

135 **i. Continental: ASF outbreak in Canada or Mexico but not in the U.S.**  
136

137 During this classification IDALS may:  
138

- 139 • Receive confirmation of an ASF outbreak in North America (Canada or Mexico)  
140 from USDA and receive reports on trade status with the infected country.
- 141 • Notify internal staff of the potential threat and initiate frequent communication to  
142 ensure stand-by readiness to deploy if necessary.
- 143 • Confer with the Iowa Veterinary Diagnostic Laboratory to review submission  
144 procedures for the National Animal Health Laboratory Network (NAHLN), including  
145 the designated National Veterinary Service Laboratory (NVSL) [Foreign Animal](#)  
146 [Disease Diagnostic Laboratory \(FADDL\)](#).
- 147 • Communicate the threat to stakeholders and the public. IDALS will explain the  
148 disease and its effect on susceptible livestock, provide a description of the current  
149 response, make recommendations on how producers should protect their herds,  
150 explain how to report suspected cases or unusual disease, and provide resources to  
151 find more information. Complete details on communication pathways can be found in  
152 the *IDALS' Foreign Animal Disease Communications Plan*.
- 153 • The State Veterinarian may issue quarantine orders or special import rules/orders in  
154 cases where there is a potential ASF threat to Iowa agriculture. Import rules may  
155 include:
  - 156 ○ Special import permits or requirements for swine entering Iowa.
  - 157 ○ Negative results to diagnostic tests. Diagnostic tests may be utilized to the  
158 highest degree possible to demonstrate a lack of evidence of infection.
- 159 • Notify veterinary and other professional associations, licensed and accredited  
160 veterinarians, livestock and trade associations, livestock producers, transit companies,  
161 and others of any changes to import regulations.
- 162 • Conduct historic tracing and surveillance of swine imported from the ASF-affected  
163 country within a minimum of two incubation periods (30 days) prior to the date of  
164 onset (or best approximation) of the index case.
  - 165 ○ Information may be gathered from a number of sources, including Certificates  
166 of Veterinary Inspection (CVIs), entry permits, producer records, and  
167 livestock market and slaughter facility records. These may include shipments

168 from high-risk areas such as the infected country, production systems  
169 associated with the outbreak, or from other states with frequent movements  
170 from the infected country (e.g., movements from Mexico into Texas).

171 • Begin a more aggressive surveillance program to try to determine if ASF has been  
172 introduced into Iowa. Available diagnostic testing will be utilized to the highest  
173 degree possible as a tool to help determine the ASF status of individual animals or  
174 herds.

175 ○ Tests may be conducted on:

176 ■ Animals based on epidemiological link(s);

177 ■ Animals showing suspicious clinical signs;

178 ■ Recent samples submitted to the Veterinary Diagnostic Laboratory at  
179 Iowa State University for diagnosis of illness (i.e. targeted samples);  
180 and/or

181 ■ Samples collected from concentration points, such as slaughter  
182 facilities, buying stations, livestock markets, etc.

183 • If it is anticipated that the incident may require support beyond IDALS resources,  
184 IDALS will notify the Governor's office and coordinate with Iowa Department of  
185 Homeland Security and Emergency Management (HSEMD) to review needed  
186 resources and purchasing procedures to support a response.

187 • Continuously update the Governor's Office and HSEMD, and collectively anticipate  
188 future needs and evaluate the need for a Declaration of Emergency.

189 **ii. Domestic: Confirmation of the first ASF case in the U.S. but not in Iowa**

190  
191 In addition to the activities and considerations listed for the Continental classification, if ASF  
192 is detected in the U.S. but not Iowa IDALS may:

193  
194 • Be in frequent communication with USDA to confirm:

195 ○ Situational awareness of the ASF status of other states, including current  
196 response strategy (stamping-out) and epidemiological links to Iowa and other  
197 states;

198 ○ The identity of ASF contacts that may have been transported to Iowa within  
199 the last 30 days at a minimum;

200 ○ Status of trade with U.S.'s international trading partners;

201 ○ If USDA is considering a Secretarial Emergency Declaration for the affected  
202 state(s).

- 203                   ○ If USDA is recommended a national standstill order for all swine.
- 204                   • Conduct surveillance to provide the highest degree of confidence possible that animal  
205                   and/or animal product movements can occur to support business continuity without  
206                   spreading infection. This may include monitoring for clinical signs and testing of live  
207                   animals including, but not limited to, screening serum samples stored at the Iowa  
208                   Veterinary Diagnostic Laboratory and/or testing animals at packing plants.
- 209                   • Carefully evaluate the risk of animals and animal products to be imported. Imports  
210                   that pose a high-risk of introducing ASF will be prohibited from entering Iowa.  
211                   Imports from certain geographical areas, production systems associated with the  
212                   outbreak or other locations that may have epidemiological links to ASF Infected  
213                   Premises will be carefully screened before being allowed to enter Iowa.
- 214                   • Implement all, or aspects of, the [\*IDALS' General Standstill Protocol\*](#).
- 215                   • Investigate imports into Iowa within the last 30 days that may pose a risk to Iowa  
216                   livestock.
- 217                   • Continue the surveillance program for ASF to determine any epidemiological links to  
218                   premises in Iowa.
- 219                   • Activate a Departmental Operations Center.
- 220                   • Ready the premises identification database to facilitate the identification of premises  
221                   that may be at-risk or infected.
- 222                   • Communicate with veterinary and other professional associations, licensed and  
223                   accredited veterinarians, livestock and trade associations, livestock producers, transit  
224                   companies, and others concerning the elevated threat, and provide information on  
225                   monitoring the health of susceptible animals, and implementing enhanced biosecurity.
- 226                   • Re-evaluate the threat and take action to protect Iowa livestock. In addition to  
227                   movement controls, actions may include epidemiological investigations, reminders of  
228                   reporting requirements, and enhanced surveillance at livestock markets and slaughter  
229                   facilities, among other activities.
- 230                   • Confer with USDA to evaluate federal resources that may be available, if needed.
- 231                   • Request HSEMD to notify appropriate personnel from supporting local and state  
232                   agencies.
- 233                   • Reassign and/or pre-position IDALS staff members to locations of anticipated need,  
234                   such as to the Departmental Operations Center (DOC), the State EOC, the Joint  
235                   Information Center (JIC), or an existing Incident Command Post.
- 236                   • Coordinate with HSEMD to anticipate needed resources and purchasing procedures to

237 support a response to a potential outbreak.

238 • Request specific agencies provide support for response activities, which may include  
239 implementing a call center to respond to questions from veterinarians, producers,  
240 allied businesses, and the public, instituting Just-In-Time Training for response tasks,  
241 providing outreach to a variety of audiences to keep them aware of the threat and  
242 mitigation measures, and requesting supporting agencies send representatives to the  
243 JIC to develop and distribute messages to appropriate stakeholders.

244 • Notify all producers, processors, and transit companies about the changes to Iowa’s  
245 import and movement criteria, and provide information about the permitting system  
246 and requirements.

247 • Continue to monitor all states.

248 • Closely monitor any epidemiologically linked premises to determine what, if any,  
249 additional actions need to occur on that premises to stop the outbreak. This would  
250 designate a transition from the Continental to In-State classification.

251 **iii. In-State: Confirmation of ASF in Iowa or Epidemiologic link of Iowa herd to infected**  
252 **herd**

253  
254 In the event of confirmation of ASF in Iowa or the epidemiologic link of an Iowa herd to an  
255 infected herd IDALS is the lead agency for the emergency response to eradicate the disease  
256 and initiate recovery. In addition to the activities and considerations listed for the Continental  
257 and Domestic classifications, if ASF is suspected or detected in Iowa IDALS may:

258  
259 • Receive notification of an epidemiological contact from an Infected Premises, or may  
260 be notified of suspicious clinical signs in a pig in Iowa.

261 • Conduct epidemiological investigations (with or without the assistance of the USDA)  
262 to identify Infected Premises and Contact Premises.

263 • Collaborate with USDA to dispatch a state or federal Foreign Animal Disease  
264 Diagnostician (FADD) to conduct an investigation and collect diagnostic samples for  
265 laboratory submission. Divided samples will be provided to the Iowa State University  
266 Veterinary Diagnostic Laboratory in Ames and sent to the designated Foreign Animal  
267 Disease Diagnostic Laboratory (FADDL) for confirmation and virus isolation. An  
268 FADD investigation is conducted according to [\*VS Guidance Document 12001.2 -\*](#)  
269 [\*Policy for the Investigation of Potential Foreign Animal Disease/Emerging Disease\*](#)  
270 [\*Incidents \(FAD/EDI\).\*](#)

271 • Collaborate with the U.S. Department of Homeland Security (DHS) and Federal  
272 Bureau of Investigation (FBI) to determine if ASF was intentionally introduced into  
273 Iowa.

- 274 • Initiate containment activities on the Infected (or Suspect) Premises. Initially, in most  
275 cases this will include quarantine, setting up premises biocontainment, and a review  
276 of producer records to trace recent animal movements into and out of the herd (*see*  
277 *Appendix 3: Mitigation, subsection ii. Quarantine*).
- 278 • Form a Unified Command with USDA to exercise state and federal authority to  
279 protect animal health. Initially, local USDA representatives will participate. Positions  
280 may rotate to other USDA representatives over time and as more assistance is  
281 requested.
- 282 • Assign personnel to Incident Command System positions to manage the emergency  
283 response activities with the help of supporting agencies.
- 284 • Prompted by a positive laboratory result confirming ASF, establish a Control Area  
285 around the Infected Premises, and institute movement controls (*see Appendix 3:*  
286 *Mitigation, subsection ii. Quarantine and subsection iii. Permitting*), as well as  
287 epidemiological tracing (*see Appendix 2: Epidemiological Investigation and*  
288 *Surveillance*).
- 289 • Through HSEMD, request supporting agency representatives to report to the SEOC  
290 with knowledge of available capabilities and resources.
- 291 • Continue disease surveillance to detect other Infected Premises or potential spread of  
292 ASF.
- 293 • Communicate through HSEMD with local emergency managers and officials of the  
294 affected areas to determine local resource needs and availability.
- 295 • Based on a stamping-out strategy dependent on the size of the herd, implement a  
296 depopulation plan with greatest probability of depopulating the herd in a timely  
297 manner with a goal of 24 hours (*see Appendix 3: Mitigation, subsection v. Mass*  
298 *Depopulation*).
- 299 • Collaborate with Iowa’s Department of Natural Resources (DNR) to approve the  
300 animal owner’s disposal plan for carcasses and other associated materials (*see*  
301 *Appendix 3: Mitigation, subsection vi. Carcass Disposal*).
- 302 • Require biocontainment protocols to prevent spread of ASF from Infected Premises  
303 (*see Appendix 3: Mitigation, subsection iv. Biocontainment*).
- 304 • If not already instituted, implement a system of permitted movement to approve and  
305 document movements into, within, and out of the Control Area (*see Appendix 3:*  
306 *Mitigation, subsection iii. Permitting*).
- 307 • Develop protocols for cleaning and disinfection to decontaminate buildings, areas and  
308 articles on the premises after infected animals have been removed. Protocols will be  
309 guided by [FAD PReP Guidelines: Cleaning and Disinfection](#).



- 310
- 311
- 312
- Decide the method of releasing a Control Area and restrictions imposed on movements into, out of, and within the Control Area. The Control Area may be released as a whole or in parts to gradually reduce the size. Considerations include:
    - 313 ○ Premises due to be released do not appear to pose a risk for further spread of
    - 314 ASF;
    - 315 ○ Results of epidemiological surveillance and confirmed/suspected cases in the
    - 316 vicinity;
    - 317 ○ Disease status of other neighboring premises;
    - 318 ○ Progress of the eradication effort and current response approach; and/or
    - 319 ○ Reasonable confidence that the non-infected premises due to be released will
    - 320 not be vulnerable to re-exposure (*see Appendix 3: Mitigation, subsection iii.*
    - 321 *Permitting*).
  - 322 • Recommend slaughter or euthanasia of any exposed or recovered pigs due to chance
  - 323 that some pigs exposed to low-virulence ASF strains can become carriers [10].
  - 324 • Allow repopulation once infected/contagious animals have been removed and the
  - 325 environment of a premises is no longer a risk to spread ASF (through cleaning and
  - 326 disinfection or a fallow period - *see Appendix 3: Mitigation, subsection vi. Cleaning*
  - 327 *and Disinfection*). Conditions for repopulation may change if the response strategy
  - 328 transitions from stamping-out.
  - 329 • Continue disease surveillance to detect new infections, and also to collect data to
  - 330 prove ASF freedom if possible.
  - 331 • Initiate regular briefings for the media and for information release to the general
  - 332 public through the JIC.

333

## Appendix 1: Standstill Order

During an ASF outbreak IDALS may implement aspects of the [\*IDALS' General Standstill Protocol\*](#). While the order is in effect, no unpermitted swine movements would be allowed within the state. Exceptions may be made, depending on the epidemiology of the outbreak, for critical movements (i.e. slaughter, etc.) at the discretion of IDALS.

## Appendix 2: Epidemiological Investigation and Surveillance

During an ASF outbreak the following premises definitions will be used:

- **Infected Premises (IP):** any premises with laboratory confirmed ASF
- **Contact Premises (CP):** any premises with an established epidemiological link to a IP in the previous 30 days at a minimum

The following are IDALS' initial goals of an ASF epidemiological investigation conducted in Iowa:

- identify each potential IP through tracing activities, assign a premises classification and investigation priority;
- identify any CP (this includes all potential CP within a production system where sites may be separated by large geographic distances); and
- characterize the nature of the ASF outbreak, identifying any potential lateral transmission pathways and mitigation strategies.

Identifying potential CP within the same production system may include, but is not limited to, IDALS auditing the following aspects of movement onto and off a premises:

- live animal movement logs,
- animal product movement logs,
- feed delivery logs,
- personnel logs,
- visitor logs (both domestic and international),
- list of equipment shared between premises,
- animal disposal logs (i.e. rendering, etc.), and
- supply delivery logs (i.e. fuel delivery, etc.)

In addition to active investigations, the need for statewide ASF surveillance may become necessary. This will take two forms: 1) passive surveillance and 2) active surveillance.

**Passive surveillance** will occur from veterinarian and producer reporting of suspicious clinical signs and mortalities noted in swine. IDALS will widely communicate that anyone suspecting a possible ASF introduction into Iowa reports it immediately to IDALS and/or the USDA. At which time either an IDALS or USDA FADD will be dispatched to the premises to conduct an investigation.

380 **Active surveillance** will occur through screening diagnostic samples that are  
 381 collected on a regular basis. This would include any swine samples submitted to  
 382 the Iowa Veterinary Diagnostic Laboratory, for any purpose, as well as samples  
 383 retained at the Laboratory from the previous 60 days. Swine samples may be  
 384 screened with the following diagnostic tests:  
 385

Test	Sample Types
Virus Isolation	Blood, Tissue
DFA (Direct Fluorescent antibody)	Tissue (tonsil or lymph node)
ELISA (Enzyme-linked immunosorbent assays)*	Serum (10mL Red top tube)
IFA (Immunofluorescence assays)**	Serum (10mL Red top tube)
PCR (Polymerase chain reaction)	Blood or tissue (tonsil or lymph node)

386 \*ELISA is the prescribed test for international trade per OIE

387 \*\*IFA is a confirmatory test from ASF free areas with a positive ELISA test per OIE

388  
 389 At the onset of the surveillance program any sample that screens positive would  
 390 be sent to a designated National Veterinary Service Laboratory (NVSL) Foreign  
 391 Animal Disease Diagnostic Laboratory (FADDL) for confirmatory testing. This  
 392 would continue until testing became decentralized and more widely available at  
 393 other laboratories.  
 394

395 Depending on the capacity/capabilities of the Iowa State University Veterinary  
 396 Diagnostic Laboratory in Ames and other reference laboratories, oral fluid testing  
 397 may also be incorporated into a statewide surveillance program.  
 398

399 Any sample that tests and is then confirmed positive, regardless of the sample  
 400 type, would prompt an epidemiologic investigation to determine where the  
 401 infected pig originated and where it could have potentially exposed other pigs.  
 402

### 403 **Appendix 3: Mitigation**

#### 404 **i. Quarantine**

405 Any premises with confirmed ASF or that is epidemiologically linked to a confirmed  
 406 ASF case will likely be placed under a quarantine as established in the [IDALS's General](#)  
 407 [Quarantine Protocol](#). If a premises is part of a large production system, the entire system  
 408 may or may not be temporarily placed under a quarantine while the epidemiologic  
 409 investigation of that system is ongoing.  
 410

#### 411 **ii. Control Area**

412 During an ASF outbreak a Control Area will be established to contain the infection,  
 413 target stamping-out activities, and control animal movements. The function and minimum  
 414 size of the Control Area is explained in the [IDALS General Control and Monitoring](#)  
 415 [Zones Protocol](#). However, during an ASF outbreak IDALS may expand the outer  
 416

417 boundaries of the Control Area or include multiple premises within one production  
418 system in the Control Area based on the epidemiology or scale of the outbreak.  
419

### 420 **iii. Permitting**

421 Premises inside the Control Area may be allowed permitted movements based on  
422 protocols established in the [IDALS General Animal Permitting Protocol](#). Any premises of  
423 a large production system with an epidemiological link to one of their premises in the  
424 Control Area may be designated a CP.  
425

### 426 **iv. Mass Depopulation**

427 To maximize biocontainment procedures and reduce the overall viral burden of an  
428 infected premises the goal is to have all infected and exposed swine on that premises  
429 depopulated within the first 24 hours of confirming the first positive pig. The size and  
430 strength of pigs compared to other species, necessary animal restraint, as well as the  
431 safety and expertise of available responders may factor into IDALS' selection of an  
432 appropriate depopulation method. IDALS may consider various methods during an ASF  
433 outbreak and the method chosen may depend on resource availability, premises and herd  
434 size, and worker safety concerns. However, regardless of the method chosen, if a  
435 producer wishes to seek indemnity for depopulated animals, IDALS and USDA APHIS  
436 must preapprove the method. Any pig that dies prior to depopulation will not qualify for  
437 indemnity.  
438

439 The following is a list of some depopulation methods in alphabetical order IDALS may  
440 chose during an ASF outbreak:

- 441 ○ Carbon dioxide and other gasses,
- 442 ○ Firearms,
- 443 ○ Penetrating captive bolt,
- 444 ○ Ventilation shutdown
- 445
- 446

447 Potential depopulation methods:

- 448 ● *Carbon Dioxide and Other Gasses:* Carbon dioxide (CO<sub>2</sub>) has been used  
449 commercially in harvesting poultry and swine to stun the animal prior to  
450 exsanguination. Asphyxiates such as carbon dioxide, nitrogen, argon, and carbon  
451 monoxide exclude oxygen. An animal exposed to an atmosphere which is  
452 completely devoid of oxygen will lose consciousness very rapidly. Some farms  
453 use carbon dioxide as their primary method of euthanasia for suckling or nursery  
454 pigs (up to 70 lb [154 kg]). The AVMA has categorized the use of CO<sub>2</sub> as  
455 “preferred method” for the depopulation of swine [11].  
456

457 Personnel involved in the procedure must be trained. Safety procedures along  
458 with appropriate safety equipment must be utilized according to guidelines  
459 reviewed or established by the Safety Officer.  
460

- 461 ● *Firearms:* When firearms (gunshot) is the method of choice, it is important that  
462 firearm handlers use a caliber of firearm, projectile, and propellant load that are

463 appropriate for the species being euthanized, the location of the procedure, and  
464 the overall situation. The shooter should comply with all guidelines established by  
465 the Safety Officer such as the use of protective head and eye gear. The AVMA  
466 has categorized the use of firearms as a “preferred method” for depopulation of all  
467 swine other than suckling pigs [11]. However, for large herds this may take a  
468 substantial amount of time and labor to complete.

469  
470 For reference purposes in choosing a suitable firearm for euthanasia of livestock,  
471 [FAD PReP/NAHEMS Guidelines: Mass Depopulation and Euthanasia](#) provides  
472 the weight of the projectile, muzzle velocity, and muzzle energy available with  
473 various cartridges that are in common use. This document also describes the  
474 proper use, target area, and safety considerations in the use of firearms for  
475 euthanasia.

- 476  
477 • *Penetrating Captive Bolt*: Euthanasia by penetrating captive bolt is appropriate for  
478 most hoofstock. This method targets the cerebral region and the brainstem. In the  
479 hands of trained and experienced personnel, this method produces rapid and  
480 humane death and is especially useful in field situations to euthanize numerous  
481 animals and/or avoid carcass residues associated with some chemical methods.

482  
483 Penetrating captive bolt devices are placed in contact with the skull to deliver a  
484 lethal blow to the animal through direct trauma to the brain. The use of an  
485 extended length penetrating captive bolt is usually fatal when properly conducted.  
486 Personnel must be prepared to administer an adjunct measure such as pithing or  
487 IV KCL administration to ensure rapid death if the use of the penetrating captive  
488 bolt fails to result in death.

489  
490 For large herds this may take a substantial amount of time to complete as well as  
491 be labor intensive. For example, with the approximate onsite of cardiac arrest  
492 taking 2 to 8 minutes [12], a 1,000 head gestation/breeding barn may take at a  
493 minimum between 33 hours to 5.5 days to depopulate.

494  
495 Refer to [FAD PReP/NAHEMS Guidelines: Mass Depopulation and Euthanasia](#)  
496 for the proper use, target area, and safety considerations in the use of penetrative  
497 captive bolt for euthanasia.

498  
499 Non-penetrating captive bolts are intended to deliver concussive trauma to render  
500 an animal unconscious, and have not been specifically designed to result in death.  
501 They should be used with an adjunct measure to ensure death. The AVMA has  
502 categorized the use of non-penetrating captive bolt guns as a “preferred method”  
503 for depopulation of all swine [11].

- 504  
505 • *Ventilation Shutdown (VSD)*: While AVMA preferred methods will first be  
506 considered in an ASF response, VSD may be considered if these methods will not  
507 achieve depopulation of infected herds (based on the presumptive positive result)  
508 within a timely manner or be accomplished in a way that assures human safety.

509 VSD is an adjunct method that may be considered by IDALS for depopulation of  
510 infected swine based on the defined policy and considered on a premises-by-  
511 premises basis. However, VSD should be used only after a full consideration of  
512 the epidemiologic threat posed concludes that no other method can be completed  
513 in a timely manner to minimize the chance of the virus spreading. Timely  
514 implementation would significantly reduce virus amplification and the risk of  
515 ongoing transmission while also protecting nearby and epidemiologically linked  
516 production facilities [13]. However, depending on weather conditions and facility  
517 design, VSD may require supplement heating for buildings during colder seasons  
518 and/or an added source of CO<sub>2</sub> gas. The AVMA has categorized the use of VSD  
519 as “permitted in constrained circumstances” for depopulation of all swine [11].  
520

#### 521 **v. Carcass Disposal**

522 In most cases during an ASF outbreak IDALS will require on-site disposal of animal  
523 carcasses and other associated materials. On-site disposal eliminates the need to move  
524 carcasses great distances and eliminates potentially moving live virus off the premises.  
525 During an ASF outbreak in most cases IDALS will require the animal owner to utilize  
526 one of the following on-site disposal methods:  
527

- 528 • above ground burial,
- 529 • burning,
- 530 • composting,
- 531 • incineration, or
- 532 • natural in-place decomposition.

533  
534 Explanations on disposing of carcasses using burial, burning, composting, and  
535 incineration can be found in the [NAHEMS Guidelines: Disposal](#).  
536

537 If IDALS elects to go with natural in-place decomposition several factors need to be  
538 considered. The first is the amount of time it will take for the carcasses to reach a point  
539 where they are easier to move. With pig carcasses indoors and not exposed to the  
540 elements, decay rates will be slowed [14] [15]. In addition, pigs weighing more than 50  
541 lbs may take 3 times as long to decompose as pigs weighing less [16] [17]. This would  
542 require more time for facilities housing pigs larger than nursery piglets, with gestation  
543 barns potentially taking the longest to reach the ideal decomposition phase. While no  
544 studies have been performed on the rate of natural carcass decay inside a swine facility it  
545 has been shown that on average swine carcasses left outdoors during the spring, summer,  
546 and fall take approximately 2 weeks to reach skeletonization to a few months during the  
547 winter [18]. Therefore when ambient temperatures fall below 60°F it may become  
548 necessary to heat facilities to expedite the decomposition process. If facilities are kept at  
549 60°F or higher, carcasses >50 lbs should reach skeletonization and be removed after  
550 approximately three weeks with carcasses <50 lbs taking approximately two weeks. At  
551 this stage, remains can be disposed of using another method.  
552

553 The second is the potential occupational safety issues when entering a barn where natural  
554 in-place decomposition has occurred. When entering the barn to remove decomposed  
555 carcasses personnel should wear appropriate PPE including respirators.

556  
557 Lastly proper insect control should be implemented to prevent flies and other insects as  
558 serving as mechanical vectors and carrying the virus to other premises.

559

#### 560 **vi. Cleaning and Disinfection**

561 In general Cleaning and Disinfection (C&D) protocols for ASF should follow the basic  
562 principles outlined in the [IDALS's General Cleaning and Disinfection Protocol](#). The  
563 following are disinfections currently approved for ASF [19]:

564

- 565 • Virkon S
- 566 • Clearon Bleach Tablets
- 567 • Klor-Kleen
- 568 • Klorsept
- 569 • Klorkleen 2

570

571 Additional information on these disinfectants can be found on the [USDA APHIS](#)  
572 [webpage](#).

573

#### 574 **vii. Vaccination**

575 To-date no vaccination against ASF exists and vaccines previously tried at most resulted  
576 in partial immunity [3].

577

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