Foreign Animal Disease Preparation 2022
Learning Objectives

• What participants should leave here with:
  – Knowledge of ASF signs and symptoms and how to report them
  – Understand how FAD preparedness programs work together
  – How to enroll in US SHIP
  – What to expect during the 72 hour standstill if my site is involved
  – Options if I have to extend feed in my bin in case I cannot order mine during standstill
  – Options for feed mitigation
  – Considerations for depopulation and disposal plans.
Agenda

• Update on ASF and how are we keeping it out
• FAD Preparedness Programs
• Response once FAD is diagnosed: 72 hour standstill
• What happens after the standstill is lifted?
  – Considerations for everyone NOT in control zones
• Checklist of FAD Preparedness activities
What should you expect to see in ASF Outbreak?

• Fever (105-108°F)
  – Be sure to carry your thermometers!!
• Hemorrhages
  – Ears, nose, hind quarters on live pigs
  – Petechial, ecchymosis to frank hematomas
• Bloody diarrhea (melena)
• Anorexia
• Recumbency (lying down, not getting up)
• Abortion (May be primary sign in Sow Herds)

Will just look like sick pigs initially!! (Salmonella, PRRS, Erysipelas, PCV2, etc)

If you observe any of these signs, contact your veterinarian!!
What post-mortem lesions might you see with ASF?

- Splenomegaly (large spleen)
  - Very large and friable
- Internal hemorrhages
  - Kidneys (very common)
  - Lymph nodes
    - Gastro-hepatic (very common)
    - Renal
    - Retropharyngeal
    - Others
  - Walls of intestine
  - Lumens
ASF: Yes or No??

• Case processed at ISU Veterinary Diagnostic Lab
  – PRRS
  – PCV2
  – *Salmonella cholerasuis*
What economic impact would an ASF outbreak have?

2 Models

Model 1: Eradicate in 2 years (no feral pig+)

- $15 Billion
- Minimal Job Loss due to industry contraction

Model 2: Endemic in feral pigs – 10 years

- $50 Billion
- Loss of 140,000 jobs due to industry contraction

Highlights the value of the loss of exports – 25-30% of the pigs produced are exported

Dominican Republic – Science and Politics

- DR/USDA cooperative surveillance since 2019
  - Samples collected and submitted by DR quarterly
  - Were concerned about samples collected in June 2021
- Depopulation is underway but difficult to stay ahead of ASF
  - Trust and indemnity
  - Garbage feeding is very prominent
  - Technical ability
Puerto Rico / U.S. Virgin Islands

Protection Zone

• Response to increased foreign disease risk from a neighboring country.

• Acceptance and recognition of this protection zone will occur on a country-by-country basis.
USDA Action in Puerto Rico

- Diagnostic laboratory improvements
- Increased inspections of legal and illegal boat traffic
- Increased inspection of licensed garbage feeders
  - Domestic swine also tested at these establishments
    - 165 premises
- Feral swine surveillance and removal
  - Testing of depopulated feral pigs (325 in 2021)
Beagle Brigade

• >165 canine teams
• 39-43 ports

Beagle Brigade Act of 2022

• Would specifically authorize National Detector Dog Training Center
USDA Wildlife Services

Feral swine surveillance

- Identified 30 high-risk counties
  - GA, FL, LA, TX
  - Active feral swine control programs
- Testing for ASF and CSF
What about vaccines for African Swine Fever (ASF)?

- **Still a LONG ways away from a vaccine to be used in the US.**
- **U.S. candidate (Plum Island Vaccine - 2020)**
  - First generation is the one that was licensed to a company in Vietnam for commercial production.
  - Good: Safe and effective – does not revert to wild type recombination and prevents wild type infection in pigs
  - Bad: Not DIVA→ can’t tell vaccinated from wild type infected animals
  - Bad: Will grow only in pig primary macrophages so it is very limited in production scalability.
    - Working on 2nd generation vaccine that could be grown on cell lines → scaled up.
FAD Preparation Programs

US SHIP
AgView
IDALS

SPS
CSSC
USDA-APHIS
Fundamentals among all programs

- Traceability
- Biosecurity
- Surveillance
US SHIP – A National Playbook for Preparedness

Sampling & Testing
Certified Sampler

Traceability
AgView

Biosecurity
Secure Pork Supply

US Swine Health Improvement Plan - Collaboration with NPB and SHIC
## Requirements for each program in FAD outbreak

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<th>Movement records last 30 days</th>
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<th>Electronically captured movement records</th>
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<td>Depopulation Plan</td>
<td>Disease Monitoring (Surveillance)</td>
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<td>Disposal Plan</td>
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Biosecurity

Complete a site-specific biosecurity plan
• Explain how site meets all biosecurity measures – Enhanced Biosecurity
• LOS and PBA
• Biosecurity updates are available

Important biosecurity measures
• Site-specific coveralls
• Supply-entry process
• Load-out area
In a confirmed FAD outbreak, samples will need to be collected and test negative for a movement permit to be issued within a Control Area.
Certified Swine Sample Collector (CSSC) Training Program

Overview:

ASF, CSF and FMD

Samples collected faster

• Increase lab results efficiency
• Reduce biosecurity risk

Standardized Curriculum Led by Certified Veterinarians

• Classroom
• Hands-on

securepork.org

Photo Source: Swine Medicine Education Center at Iowa State University, Ames, Iowa
CSSC Trainer Qualifications

a. USDA category II accredited veterinarians with swine experience (work with SAHO for training)
   a. Must attend iFAD training here in Iowa

b. Have a business relationship with the owner of the pigs on farms where individuals are trained
   OR
   Perform training by request of the site’s category II accredited veterinarian under who the collectors will be submitting samples
CSSC Trainee Qualifications

a. Be approved by category II accredited veterinarian
b. Have valid PQA Plus certification

c. Attend sample collection training session
d. Pass written exam covering training curriculum
e. Successfully complete hands-on evaluation demonstrating competency to collect, package, and submit samples
CSSC Access to Resources
securepork.org

Get Your PIN
LEARN MORE

SPS Plan for Continuity of Business

If foot and mouth disease (FMD), classical swine fever (CSF), or African swine fever (ASF) is found in United States livestock, Regulatory Officials will limit the movement of animals and animal products to try and control the spread of these very contagious animal diseases.

FMD, CSF, and ASF are not public health or food safety concerns. Meat will still be safe to eat.

The Secure Pork Supply (SPS) Continuity of Business Plan provides opportunities for businesses to voluntarily prepare before an outbreak. This will better position pork producers with animals that have no evidence of infection.:
+ Limit exposure of their animals through enhanced biosecurity.
+ Move animals to processing or another pork production premises under a movement permit issued by Regulatory Officials.
+ Maintain business continuity for the swine industry, including producers.

New! 
Certified Swine Sample Collector Training (CSSC)
LEARN MORE

Available in English and Spanish
What is AgView

- Ties All Pig Movement to Farm Premises
- Complements Other Software Platforms (Public/Private)
- Gathers Data Prior to an Incident
- Holds All Data Securely
- Releases Data Only at Producer Request
Getting Data into AgView  
- add premises and movements

1. Data entry – In the application

2. Upload Data
   • Application Program Interface (API) from 3rd party software
   • Export data from 3rd party software – clean/format to AgView standards – then upload
   • AgView formatted Excel spreadsheet template

Manuals available in binder and jump drive
<table>
<thead>
<tr>
<th>Premises Data</th>
<th>Movement Data</th>
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<tbody>
<tr>
<td>• Company name</td>
<td>• Source PIN</td>
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<tr>
<td>• Site name</td>
<td>• Destination PIN</td>
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<tr>
<td>• PIN</td>
<td>• Number in Shipment</td>
</tr>
<tr>
<td>• Address</td>
<td>• Shipment Date</td>
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<tr>
<td>• Lat/Long</td>
<td>• Shipment Type</td>
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<td>• Location type</td>
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<td>• Site capacity</td>
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<td>• # of barns</td>
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<tr>
<td>• # of pigs on site</td>
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<tr>
<td>• Emergency contact info</td>
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<td>(name, phone, e-mail)</td>
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Movement Types:
- Boar
- Cull Boar
- Cull Sows
- Feeder Pigs
- Inner Sanctum
- Market Pigs
- Replacement Gilt
- semen
- Truck Wash
- Wean Pigs
AgView in Action

Create an free account at porkcheckoff.org/AgView

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<tr>
<th>Date Moved</th>
<th>Type</th>
<th>Shipment Size</th>
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<tbody>
<tr>
<td>11/11/2021</td>
<td>Wean Pigs</td>
<td>202</td>
</tr>
<tr>
<td>10/25/2021</td>
<td>Wean Pigs</td>
<td>244</td>
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</table>
So what is US SHIP??
Development and Demonstration of a US Swine Health Improvement Plan (US SHIP) modelled after the National Poultry Improvement Plan

Industry, State, & Federal Partnership

Investigators from ISU, SDSU, UIUC, UMN, and KSU

Pilot Program Funded By USDA and NPB
National Poultry Improvement Plan (NPIP)

- NPIP is a cooperative industry, state, and federal partnership.

- Sustain export markets & ongoing interstate commerce in unaffected states and regions.
  - Demonstration of freedom of disease outside of trade-impacting control areas.

- NPIP serves to safeguard, certify, and represent the health of US poultry.

Established in 1935

- Participation is voluntary and ~ universal.
- Implemented across US poultry & egg industries.
- Officially recognized standards of poultry health.

HPAI: 2015 vs 2022
60 countries vs 2 countries
ASF-CSF Monitored Certification

US SHIP will establish a “national playbook” of technical standards to provide a uniform approach to disease prevention, response, and recovery by each of the participating states.

Modelled after the National Poultry Improvement Plan (NPIP)

US SHIP is modelled after the National Poultry Improvement Plan (NPIP), a collaborative effort involving industry, state, and federal officials providing standards for disease certification.

ASF/CSF Monitored certification will be held at the individual site level.

Participants:
- Farm Sites
- Slaughter Facilities

Centers on Prevention and Demonstration of Freedom of Disease Outside of Control Areas
ASF-CSF Monitored Certification

Modeled after basic tenets of the NPIP H5/H7 Avian Influenza

US Swine Health Improvement Plan

Biosecurity, Traceability, & Disease Surveillance
A total of 32 states have expressed an interest in participating in US SHIP pilot, > 99% of US Domestic Swine
US-SHIP Year 1 Requirements

- No garbage or swill feeding
- International visitors observe 5 days downtime
- Complete biosecurity survey
- No testing & Sampling in Year 1
- Keep live animal movement records & practice sharing with OSA

Current & Active VCPR
Why Should I Participate?

- Improved ASF/CSF preparedness with integration between producers, packers, state and federal animal health officials.
- Successful pilot program can build foundation for official program
  - Streamline interstate movements between certified sites
  - Establish international recognition for trade
  - Expand program to certify endemic diseases
    - Genetic stock certified free of specific diseases
    - Improved health in commercial production

National Playbook - Trade
How Do I Participate in US SHIP?

US SHIP Participant Checklist

How to become US SHIP Certified

Step 1. Enrollment

- Contact US SHIP Official State Agency (OSA) in which the participating premises is located
- Enroll live swine production and slaughter facility premises with the US SHIP OSA in which the participating premises is located
- Acknowledge understanding of and compliance with requirements for certification
- Complete biosecurity survey

US Swine Health Improvement Plan

Biosecurity, Traceability, & Disease Surveillance
FAQ on US-SHIP

• Is there any cost to be in the program?
  • Only costs are those that are associated with meeting or exceeding the standards.
  • Currently:
    • VCPR with herd veterinarian
    • Routine biosecurity and traceability standards
    • No testing standard for ASF/CSF currently.
FAQ on US-SHIP

• How are packers participating in US-SHIP?
  • They can enroll their participating plants with their state’s OSA.

• North American Meat Institute President and CEO Julianna Potts has indicated that their membership is fully supportive of US-SHIP as National Program.
Enrollment Forms: Single Site or Multi-Site

US Swine Health Improvement Plan (US SHIP)
A national strategy for biosecurity, traceability & disease surveillance

The U.S. Swine Health Improvement Plan (US SHIP) is a producer-driven national program that establishes consistent health standards for swine premises to prevent the introduction and spread of certain swine diseases.

Enroll Now

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<tr>
<th>Site Type</th>
<th>Description</th>
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<tbody>
<tr>
<td>Boar Stud</td>
<td>Production site with mature boars that distribute semen to other production sites.</td>
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<tr>
<td>Breeding Herd</td>
<td>Production site with breeding females and boars ≥ 1,500 breeding females, e.g., breed-to-wean, breeding/whelping or farrowing only, or on-site gestation/grow-out.</td>
</tr>
<tr>
<td>Growing Pigs</td>
<td>Production site with ≤ 1,000 feeder swine (weaner, grower, or finisher).</td>
</tr>
<tr>
<td>Farrow to Fleece/Finish</td>
<td>Production site with breeding females and grow feeder swine for purposes other than breeding stock replacement for this particular farm site, and have ≥ 1,000 feeder or finisher swine.</td>
</tr>
<tr>
<td>Small Holding</td>
<td>Production site with ≤ 50 and ≤ 1,000 total feeder or feeder swine.</td>
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<tr>
<td>Non-Commercial</td>
<td>Production site with &lt; 100 pigs, e.g., exhibition, e.g., exhibition, e.g., exhibition, e.g., exhibition.</td>
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<tr>
<td>Packing Plant</td>
<td>Production site with a facility that slaughters pigs.</td>
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<tr>
<th>Site (Premises) Information</th>
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<tr>
<td>Site Name (US SHIP Participant)</td>
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<tr>
<td>Address</td>
</tr>
<tr>
<td>City</td>
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<td>State</td>
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https://iowaagriculture.gov/ship
Biosecurity Survey

- Provides information to Biosecurity working groups
- Helps to create future biosecurity related standards
- Electronically captured information
- Only 10 questions

Biosecurity questions cover:
- SPS plans
- Perimeter fencing and outdoor access
- Mortality disposal methods
- Farm entry procedures
- Imported feed ingredients and holding times
- Transportation sanitation procedures
1.1 Sites by site type

As of August 10, 2022
- 6,889 sites
- 26 states
1.2 Number of sites by state

Number of sites that filled out a US SHIP biosecurity survey by state

Source: US SHIP biosecurity enrollment survey.
2 Secure Pork Supply

As of August 10, 2022, 49 Boar stud, 744 Breeding herd, 5891 Growing sites, 31 Farrow-to-feeder/Finish, 103 Small holdings, and 57 Non-commercial sites had filled out the biosecurity survey question related to Secure Pork Supply Plans.

Percentage of sites by site type that have completed the Secure Pork Supply Plans (SPS)

Source: US SHIP biosecurity enrollment survey.
On-Farm Preparedness
ASF Outbreak- *Prepared* Producer 1 in Control Area

- Certified in SHIP
- Traceability
  Verified PIN, tracking animal movements
- Biosecurity
  Written plan, implement prior to and remaining few
- Surveillance
  CSSCs trained on the farm
- AgView
  Account created and updates data regularly
ASF Outbreak - *Unprepared* Producer 2 in Control Area

- Not certified in SHIP
- Traceability
  - Verified PIN, but not tracking animal movements
- Biosecurity
  - Started a written plan, but didn’t finish and hasn’t implemented
- Surveillance
  - No one trained- counting on herd vet
- AgView
  - Meant to create account but hasn’t taken the time yet
Producer Call to Action – FAD Preparedness

1. **Enroll and become certified in US SHIP**
   - Contact the Official State Agency in your state
   - Find OSA Contact at usswinehealthimprovementplan.com under *Enroll and Certify*

2. **Enhance Traceability/Create an AgView Account**
   - porkcheckoff.org/agview
   - Verify if the PIN reflects the actual location of the animals
   - Track all animal movements onto and off of the farm

3. **Implement Biosecurity**
   - securepork.org
   - Complete a site-specific biosecurity plan using SPS templates or RABapp
   - Implement the plan

4. **Improve On-Farm Surveillance**
   - Learn about the clinical signs associated with African swine fever as shown at securepork.org
   - Ask your herd vet about getting trained to collect samples through CSSC program.
National Movement Standstill

What happens when the first case of FAD is diagnosed in the US??
National Movement Standstill

• Stop movement once disease is diagnosed in US
• Goal: Find the virus & limit spread
• Could include: Animals, semen, manure, rendering, feed, deliveries
• 72 hours minimum initially
• All new movements will stop
• Trucks in transit can go to destination
• Producers need to think through contingency plans

For planning purposes only. This information is subject to change in the event of a real disease outbreak.
Keys to Success in the Standstill

• PIN database up to date
• Coordination of testing
• Collaboration with producers and vets to identify epidemiological connections

For planning purposes only. This information is subject to change in the event of a real disease outbreak.
IDALS: Swine Records

- Records of any movement
  - At least last 30 days
  - Time to gather
- Prioritized order
- High-priority
  - Live animals
  - Animal products
  - Mortality collection
  - Regular employees
  - History of international travel


For planning purposes only. This information is subject to change in the event of a real disease outbreak.
National Movement Standstill

Farm infected with FMD

Control Areas designated

Zones and Areas

Standstill lifted for those outside Control Area

Permitting and Surveillance for those inside the Control Area (not known to be infected)
Infected Premises
Goal: Find the Disease as Fast as Possible

- Call IDALS
  - Office Hours: 515-281-5305
  - After Hours: 515-240-6632
FAD Investigation Steps

- Foreign Animal Disease Diagnostician (FADD) visit
  - Collect history
  - Examine animals
  - Collect samples if needed
  
  - Cost: Free
  
  - Confidential

Foreign Animal Disease Investigation: Producer Guidance

If you suspect a Foreign Animal Disease, report it immediately to your veterinarian, the Iowa Department of Agriculture and Land Stewardship (IDALS) at (515) 281-5000, or the USDA at (515) 284-6140. Below are the investigation steps and expectations for IDALS and the person reporting:

- A state or federal Foreign Animal Disease Diagnostician (FADD) will visit the operation, examine healthy and sick animals, and collect diagnostic samples (such as blood, nasal, etc.) from a live animal or tissue samples from a dead animal.
- If the FADD determines that samples should be collected, two sets will be collected:
  - One set of samples to the Veterinary Diagnostic Lab in Ames; one sent to a USDA Lab

There are no late fees when testing for FAD. There are fees if testing for endemic diseases.

While you are waiting for the FADD to arrive, please take the following steps:

- Do not leave the farm without first speaking to your veterinarian or a state/federal animal health official.
  - If you or any employees need to leave the premises:
    - Change into clean clothing/footwear, showering if able.
    - Leave equipment and vehicles that contacted poultry or livestock on the operation.
    - Do not handle any other susceptible animals without first talking to your veterinarian or a state/federal animal health official.
- Do not allow any animals to leave or arrive without first talking to your veterinarian or a state/federal animal health official.
  - Put your operation’s enhanced biosecurity plan in place.
  - During chases, care for the “healthy” animals first.
  - After chases, clean/disinfect your clothes/footwear.
- Gather records as the FADD will need to know:
  - Animal arrival and departure dates.
  - Animal products (seed, embryos, manure, milk, eggs, spent hens, etc.) arrival and departure dates.
  - People (traffic, visitors, and employees).
  - Feed and supply deliveries.
  - When the sick animals first started showing signs of illness.
  - Any increase in animal sickness or deaths over the last week.
  - Any wildlife presence on the property or known contact with animals.

While the FADD is on the operation:

- Be available to answer questions and guide them throughout your operation.
  - First show them the animals that appear healthy and sick animals last.
- Be prepared to assist with restraining animals and collecting samples if asked.
  - Exchange contact information so test results and next steps can be quickly communicated.
  - Discuss a plan to dispose of the prospective outerwear worn while on your operation.

Once the FADD leaves:

- Continue to implement enhanced biosecurity measures for animals, people, vehicles, equipment, supplies.
  - If placed under quarantine, no animals or animal products can arrive or leave unless by permission of Iowa’s State Veterinarian.

If samples were collected and test results are negative:

- Work with your local/State veterinarian to identify the cause of the disease on your farm.

If samples were collected and test results are positive OR if the clinical signs displayed on the farm are highly suspicious of an FAD:

- IDALS will start an FAD response.
- No animals, animal products, or equipment will be allowed to leave.
- An animal health official will be assigned to your operation to guide next steps and answer questions.
Initial findings of FADI

- FADD discusses onsite findings with AVIC and State Veterinarian
- Quarantine
- Determine priority for samples to be sent to FADDL
- Coordinate shipment of samples to FADDL if highly suspicious of FAD
Sample Testing

• IDALS, USDA work with producer

• One set: ISU Veterinary Diagnostic Lab in Ames

• One set: USDA National Veterinary Services Lab* to Plum Island (off coast of New York)

*swine samples
Infected Premises

- Assigned a case manager
- Quarantine and biocontainment
- Start trace-in and trace-out
- Indemnity paperwork
- Depopulation and disposal

Courtesy of the National Pork Board, Des Moines, Iowa
Biocontainment on Infected Premises

IDALS YouTube https://youtu.be/8zS3-1MtPpY
<table>
<thead>
<tr>
<th>Method</th>
<th>Approved for</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon dioxide (CO₂)</td>
<td>All ages but may not be practical for pigs over 70 lbs</td>
</tr>
<tr>
<td>Gunshot</td>
<td>Nursery pigs or older</td>
</tr>
<tr>
<td>Non-penetrating captive bolt</td>
<td>Pigs less than 70 lbs*</td>
</tr>
<tr>
<td>Penetrating captive bolt</td>
<td>Pigs greater than 12 lbs</td>
</tr>
<tr>
<td>Electrocution, head-to-heart</td>
<td>Pigs over 3 days of age</td>
</tr>
<tr>
<td>Electrocution, head only</td>
<td>Pigs over 3 days of age with a secondary step</td>
</tr>
<tr>
<td>Veterinarian administered anesthetic overdose</td>
<td>All ages but may not be practical</td>
</tr>
<tr>
<td>Manual blunt force trauma</td>
<td>Pigs up to 12 lbs</td>
</tr>
</tbody>
</table>

* Refer to page 9 to determine appropriate force and weight range combinations

AVMA Approved Euthanasia Methods

I3 What Is Euthanasia?

Euthanasia is derived from the Greek terms *eu* meaning good and *thanatos* meaning death. The term is usually used to describe ending the life of an individual animal in a way that minimizes or eliminates pain and distress. A good death is tantamount to the humane termination of an animal’s life.

AVMA 2020
Infected Premises: Depopulation

• **GOAL**: Stop virus spread
  • Dead pigs as fast as possible
• AVMA preferred Methods for Depop
  • Gunshot
  • Electrocution
  • Captive bolt
  • CO\textsubscript{2}
• Permitted in Constrained Circumstances
  • Ventilation Shutdown Plus
  • Sodium nitrite
• Research in Progress
  • Nitrogen Foam
  • Water Based Foam

**Goal: 24 hours**

The term depopulation refers to the rapid destruction of a population of animals in response to urgent circumstances with as much consideration given to the welfare of the animals as practicable. Urgent circumstances may include emergency situations, such as the need for immediate disease control or a response to natural or human-made disasters. These circumstances are to be avoided whenever possible, and the goal is to make the process humane and as rapid as possible.
Depopulation Equipment Summary

• Swine mass depopulation equipment
• Equipment existing or under development as of Dec 2021
• Summary of methods
• Pros and cons

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   e. Electrocution ..................................................................................................................................................... 4
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   g. Nitrogen Foam .................................................................................................................................................. 4
   h. Ventilation Shutdown Plus (VSD+) .................................................................................................................. 5

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Table 3: Swine depopulation equipment - additional attributes .................................................................................. 21

For planning purposes only. This information is subject to change in the event of a real disease outbreak.
Indemnity

• Information on USDA ASF website
• Provides and overview about financial processes for producers
  • Indemnity for pigs
  • Compensation for depop, disposal, and virus elimination
• Paperwork must be completed prior to depopulation
Carcass Disposal

• Main Options
  • Composting
  • Burial (Deep or Above Ground)
  • Incineration

• Work with your local DNR office to determine disposal options
  • Locate local contact at https://www.iowadnr.gov/fieldoffice
  • Call (515) 725-8694

Goal: On-Site Disposal
Control Area
Ongoing Actions After Confirmed Positive

• Continue tracing, investigations, and data entry into EMRS
• Determine Control Areas around infected premises
• Coordinate surveillance (not known to be infected sites)
  • Premises in the Control Area
  • Contact premises (premises linked to the infected premises)
FAD Diagnosed

- Infected Zone
  - Swine FADs: 3km (~1.86 miles) beyond perimeter of infected premises
- Buffer Zone
  - ASF: 2km (~1.24 miles)
  - FMD, CSF: 7km (~4.35 miles)
- Control Area = Infected + Buffer Zones
  - ASF: minimum 5km
  - FMD, CSF: minimum 10km

USDA, Overview of Zones, 2018
Areas and Zones

- Surveillance Zone
  - Outside, along border of Control Area
  - ASF: 5km (~3.2 miles)
  - FMD, CSF: 10km (~6.21 miles)
- Free Area
  - Includes Surveillance Zone and all areas not in Control Area(s)

USDA, Overview of Zones, 2018
Premises Designations

• **Contact Premises**
  • Susceptible animals
  • Exposed to FAD directly, indirectly
  • Animals, animal products, fomites, people
  • Subject to Network Based Controls

• **Suspect Premises**
  • Under investigation
  • Susceptible animals with compatible signs
  • Short-term designation

Contact = exposure
Suspect = signs
Premises Designations (cont’d)

• **At-Risk Premises**
  - Susceptible animals, NO clinical signs
  - Demonstrates not Infected, Contact, or Suspect Premises
  - Permitted movement *WITHIN Control Area*

• **Monitored Premises**
  - Demonstrates not Infected, Contact, or Suspect Premises
  - Meet set of criteria for permitted movements *OUT of Control Area*

USDA, Overview of Zones, 2018
Network Based Controls (NBC)

• Address movement between swine sites
• Relies on epidemiology, record keeping to find contacts
• Control Areas set up around other Infected Premises
  • NOT set up around Contact Premises

For planning purposes only. This information is subject to change in the event of a real disease outbreak.
Control Area

• Infected Premises
  • Quarantine
  • Biocontainment
  • Depopulation and disposal

• All other premises in CA
  • Quarantine
  • Surveillance
  • Permitting

Courtesy of the National Pork Board, Des Moines, Iowa
Quarantine

• All premises with susceptible species within Control Area subject to Quarantine

• IDALS Terms
  • Affected quarantine
    • Infected Premises
  • Not known to be infected quarantine
    • All other premises
Movement by Permit Only in Control Area

• Prevent disease spread
  • Criteria to meet to determine movement is as safe as possible

• Traceability – initially:
  • If infection found after a movement, trace to other premises
  • Transparency to industry, States, public

• Traceability – longer term:
  • Report to trade partners
  • Demonstrate outbreak control

USDA, Overview of Zones, 2018
## Permit

### Swine Moving from a Control Area Directly to Slaughter

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permit number</td>
<td></td>
</tr>
<tr>
<td>Date of issuance</td>
<td></td>
</tr>
<tr>
<td>Period permit is valid for</td>
<td></td>
</tr>
<tr>
<td>Animal type moving</td>
<td></td>
</tr>
<tr>
<td>Premises identification number (PIN) of origin of movement</td>
<td></td>
</tr>
<tr>
<td>Premises identification number (PIN) of destination of movement or 911 address</td>
<td></td>
</tr>
<tr>
<td>Name of person that collected samples</td>
<td></td>
</tr>
<tr>
<td>Electronic or hard signature of permit</td>
<td></td>
</tr>
<tr>
<td>applicant</td>
<td></td>
</tr>
</tbody>
</table>

*To be filled in by IDALS
**To be filled in by owner or authorized agent of owner
***If not collected by an accredited veterinarian
****Must be submitted by owner or authorized agent of the owner of the swine.
IDALS Permit Process

- Traceability information
  - PIN for origin, destination
  - Info on what needs to move

- Premises designation = Monitored
  - Not Infected, Suspect, Contact
  - Record evaluation
  - Surveillance testing

- Willingness to accept?
Summary of Permit Requirements

- Samples collected by accredited veterinarian, approved sampler
- All movements under this permit reported to EMRS, IDALS
  - Movement reports with vehicle, driver info
- Permit cancelled with
  - Presumed positive test results
  - Increases in daily mortality, clinical signs

---

For planning purposes only. This information is subject to change in the event of a real disease outbreak.
For More Information, Check Out Our Webinar

FAD Control Areas, Secure Pork Supply, and the Permitting Process in Iowa

Dr. Jeff Kaisand, State Veterinarian of Iowa
Dr. Jim Roth, Director, CFSPH, ISU
Ms. Amanda Chipman, Emergency Management Coordinator, IDALS

www.iowaagriculture.gov/foreign-animal-disease-webinars

For planning purposes only. This information is subject to change in the event of a real disease outbreak.
What happens if feed is involved in standstill?

• How would you feed your pigs if no feed could be delivered during the standstill?
  – Manage what feed is available on-site
  – Slow pig growth
  – Find alternative sources of feed
Experimental Design

• 1,407 mixed sex late-finishing pigs
  • 92 ± 11 kg BW
  • DNA 610 E x DNA 241 F1 genetics

• Pens randomly assigned to one of five treatments
  • n=12 pens/treatment, 22-24 pigs/pen

• 3-week study with 2 periods
  • Day 0 – 14: treatments in place (period 1) – 14 days
  • Day 14 – 21: *ad libitum* control diet (period 2) – 7 days

Following slides provided by Kayla Miller and Nick Gabler
Treatment strategies

1. *Ad libitum* (~3x maintenance energy requirement) access to feed (CON)
2. Feeding based on 1.45x maintenance energy requirement (1.45x)
3. Feeding based on 2x maintenance energy requirement (2x)
4. Closed feeders to tightest setting, with *ad libitum* access (Closed)
5. Whole corn kernels, offered *ad libitum* (Corn)

1.45 and 2x maintenance – restriction fed at pen level
Feeder adjustments

Control

Closed Feeder

Whole Corn
Materials & Methods

• Data collected on day 0, 14, and 21
  • Individual body weights and pen feed intake recorded to calculate ADG, ADFI and feed efficiency (G:F)

• Daily observations per pen were made on d 0 – 14 and d 21
  • To count tail bites, ear bites, side bites/ sores, other indicators of aggression

• Mortality and removals were recorded
### Average Daily Feed Intake

**Days 0-14**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Feed Intake (kg/d)</th>
<th>Percentage Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ad lib</td>
<td>3.21</td>
<td>-</td>
</tr>
<tr>
<td>1.45X</td>
<td>1.42</td>
<td>56%↓</td>
</tr>
<tr>
<td>2X</td>
<td>1.90</td>
<td>41%↓</td>
</tr>
<tr>
<td>Closed</td>
<td>2.49</td>
<td>22%↓</td>
</tr>
<tr>
<td>Corn</td>
<td>2.40</td>
<td>25%↓</td>
</tr>
</tbody>
</table>

**Letters**

- Ad lib: 3.21 kg/d
- 1.45X: 1.42 kg/d (56%↓)
- 2X: 1.90 kg/d (41%↓)
- Closed: 2.49 kg/d (22%↓)
- Corn: 2.40 kg/d (25%↓)

**Legend**

- Black: ad libitum
- Green: 1.45X
- Blue: 2X
- Red: Closed
- Yellow: Corn

**Letters a,b,c,d**
P < 0.05
Average Daily Feed Intake

Letters a,b,c,d $P < 0.05$
Average Daily Gain

Letters a,b,c,d P < 0.05
Feed efficiency (G:F)

Letters a,b,c,d P < 0.05
## Growth Performance – Body Weights, kg

<table>
<thead>
<tr>
<th>Item</th>
<th>Control</th>
<th>1.45x</th>
<th>2x</th>
<th>Closed</th>
<th>Corn</th>
<th>SEM</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 0</td>
<td>92.1</td>
<td>92.4</td>
<td>92.4</td>
<td>92.3</td>
<td>92.3</td>
<td>0.654</td>
<td>0.752</td>
</tr>
<tr>
<td>Day 14</td>
<td>107.5(^a)</td>
<td>92.6(^d)</td>
<td>97.3(^c)</td>
<td>102.4(^b)</td>
<td>98.1(^c)</td>
<td>0.739</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Day 21</td>
<td>113.3(^a)</td>
<td>103.6(^d)</td>
<td>107.8(^c)</td>
<td>110.8(^b)</td>
<td>105.7(^c)</td>
<td>0.686</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

\(^{a,b,c,d}\) Means within a row with differing superscripts differ significantly at \(P < 0.05\)

Body weights at d 14 were reduced ~5 to 15%

d 21 were reduced ~2 to 9%
### Carcass composition – Overall

<table>
<thead>
<tr>
<th>Item</th>
<th>Control</th>
<th>1.45x</th>
<th>2x</th>
<th>Closed</th>
<th>Corn</th>
<th>SEM</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live Weight, kg</td>
<td>130.0</td>
<td>121.5</td>
<td>124.7</td>
<td>127.5</td>
<td>123.2</td>
<td>0.656</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Carcass Weight, kg</td>
<td>95.3</td>
<td>88.3</td>
<td>91.4</td>
<td>93.9</td>
<td>90.6</td>
<td>0.829</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Fat depth, cm</td>
<td>1.21</td>
<td>1.11</td>
<td>1.16</td>
<td>1.20</td>
<td>1.21</td>
<td>0.031</td>
<td>0.007</td>
</tr>
<tr>
<td>Loin depth, cm</td>
<td>7.28</td>
<td>6.93</td>
<td>7.12</td>
<td>7.18</td>
<td>6.89</td>
<td>0.058</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Lean, %</td>
<td>57.8</td>
<td>57.2</td>
<td>57.4</td>
<td>57.4</td>
<td>56.9</td>
<td>0.119</td>
<td>0.001</td>
</tr>
<tr>
<td>Yield, %</td>
<td>74.0</td>
<td>73.6</td>
<td>72.7</td>
<td>73.8</td>
<td>73.9</td>
<td>0.502</td>
<td>0.215</td>
</tr>
</tbody>
</table>

\(^{a,b,c,d}\)Means within a row with differing superscripts differ significantly at \( P < 0.05 \)

- Whole corn decrease lean% and loin depth
- Restrict feeding reduces fat and loin depth
- Close feeders similar to the Control
Behavioral assessment – Total abrasions

- Total abrasions
- $P$ value
- Trt < 0.001
- Day < 0.001
- Trt*Day < 0.001

- $\text{ad libitum}$
- 1.45X
- 2X
- Closed
- Corn
FAD – After the standstill is lifted

• What is going to happen to those **NOT** in control zones?

• **Possibilities?**
  – Biosecurity changes
    • Loss of rendering? → What are your on farm disposal options?
    • Secure Pork Supply → PBA and C&D stations?
  – Movement testing?
    • Importance of CSSC
  – Feed mitigation – if feed was involved
  – Supply chain disruption due to loss of exports or plant in control zone?
COVID Supply Chain Disruption – 2020 lessons learned

- Diet manipulation
  - Slow growth diets
- IRCC
- Depopulation
- Disposal
NUTRITIONAL APPROACHES TO REDUCE GROWTH RATES IN FINISHING PIGS

1. Increasing neutral detergent fiber (NDF) content to “bulk up” the diet and lower energy content
   – Reduce appetite

2. Reducing protein and essential amino acids to restrict lean growth
   – Low Lysine
   – Lower branched chain amino acid (isoleucine) to create an imbalance

3. Increasing the dietary acidogenic salt (calcium chloride) to suppress appetite
Study 1: NUTRITIONAL APPROACHES TO REDUCE GROWTH RATES IN FINISHING PIGS (March-April 2020)

Objectives

1. To evaluate and provide data to the industry on nutritional approaches to reduce finishing pig growth rates for 28 days
   • Practical to implement
   • Welfare minded approaches (i.e. not restricting feed or water)

2. To evaluate compensatory growth responses for 14 days
Study 1: NUTRITIONAL APPROACHES TO REDUCE GROWTH RATES IN FINISHING PIGS (March-April 2020)

- 96 barrows and gilts (72 ± 4.5 kg BW; Camborough (1050) X 337) were blocked by body weight and sex, and assigned to 1 of 8 dietary treatments (n=12 pigs/trt). Dietary treatments:
  1. Control diet (CON)
  2. 15% Neutral detergent fiber (15% NDF)
  3. 20% Neutral detergent fiber (20% NDF)
  4. 25% Neutral detergent fiber (25% NDF)
  5. No Soybean meal (97% Corn) – no SBM or synthetic AA
  6. Half soybean meal of #1 (89% Corn) – reduced SBM and synthetic AA
  7. Anhydrous Calcium chloride 4% (4% CaCl$_2$)
  8. Anhydrous Calcium chloride 2% (2% CaCl$_2$)
Study 1: Performance results (0-28 days)

- CON
- 15% NDF
- 20% NDF
- 25% NDF
- 98% corn
- 88% corn
- 4% CaCl2
- 2% CaCl2

Delta BW, kg

Week

0 1 2 3 4
Study 1: Compensatory gains (28-42 days)

Delta BW, kg

Week

- CON
- 15% NDF
- 20% NDF
- 25% NDF
- 98% corn
- 88% corn
- 4% CaCl2
- -2% CaCl2
Summary

• Corn diet, or some variation of it, appears to be the most common option selected to reduce growth (lower lysine).
  – Is easy to implement and is effective
  – Often used in combination with tightening feeders and/or elevating barn temperature

• Calcium chloride diet appears to be popular only when growth needs to be stopped completely.

• No negative vice behaviors

• Slight increase in backfat from the 97% corn diet and a slight reduction in pH and tenderness of the calcium chloride loins.
  – These differences have the potential to reduce pork quality, but may not be big enough to be noticed by a pork consumer.
Finding the Right Resources:

Feed Additives to Mitigate the Risk of Virus-contaminated Feed

Mark Storlie
Swine Field Specialist
Feed ... risk of virus movement

Research trials have documented viruses can survive in feed ingredients and complete feed for transoceanic shipping (30 and 37 days) and transcontinental shipping (23 days.)

1. Viruses survival is variable and depends on specific properties of each virus
2. Certain feed ingredients or feed products present a better matrix for virus survival than others
3. Select ingredient matrices seemed to enhance the survival of multiple viruses.


Research has demonstrated that feed additives can mitigate the negative effects of virus contaminated feed

- ASF
- FMD
- PRRSV, PEDV, SVA


Factsheet available on IPIC website
https://www.ipic.iastate.edu/nutrition.html
### FEED ADDITIVES

#### Tested & Observed Results

<table>
<thead>
<tr>
<th>Product</th>
<th>Company</th>
<th>Description</th>
<th>Study Inclusion rate(s)</th>
<th>No evidence of infection via PCR in rectal, tonsil and serum samples</th>
<th>No signs of clinical disease and mortality level of &lt;1%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activate DA</td>
<td>Novus</td>
<td>A blend of organic acids and methionine hydroxy analogue (HMTBa)</td>
<td>0.5% or 0.15%</td>
<td>X (at 0.5%)</td>
<td></td>
</tr>
<tr>
<td>Sal CURB®</td>
<td>Kamin</td>
<td>A blend of aqueous formaldehyde and organic acids</td>
<td>0.275%</td>
<td>X (at 0.275%)</td>
<td>X (at 0.275%)</td>
</tr>
<tr>
<td>Sal CURB® K2</td>
<td>Kamin</td>
<td>An organic acid blend, including formic acid, ammonium formate, propionic acid, and lactic acid</td>
<td>0.275%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CaptiSURETM</td>
<td>Kamin</td>
<td>Medium-chain fatty acid blend</td>
<td>0.5% or 1.0%</td>
<td>X (at 0.5% and 1.0%)</td>
<td>X (at 0.5% and 1.0%)</td>
</tr>
<tr>
<td>Daalite® S</td>
<td>ADM</td>
<td>A source of fatty acids, including lauric and myristic acids and glycerol mono laurate</td>
<td>0.5% or 0.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daalite® Plus</td>
<td>ADM</td>
<td>Acidifier blend composed of short-chain fatty acids, formic, propionic acid, acetic acid, sorbic acids, and a blend of medium-chain fatty acids including lauric acid, caprylic acid, and glycerol-mono-laurate</td>
<td>0.5%</td>
<td></td>
<td>X (at 0.5%)</td>
</tr>
<tr>
<td>Dominate</td>
<td>Purina Animal Nutrition</td>
<td>A blend of 3 medium-chain fatty acids</td>
<td>0.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finio®</td>
<td>Anitox</td>
<td>A blend of propionic acid, trans-2-hexenal (leaf aldehyde), and nonanoic acid (pelargonic acid)</td>
<td>0.2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guardian</td>
<td>Alltech</td>
<td>A blend of organic acids and essential oils</td>
<td>0.44%</td>
<td>X (at 0.44%)</td>
<td></td>
</tr>
<tr>
<td>R2TM</td>
<td>Feed Energy</td>
<td>A natural lipid-based line of products made by a combination of short-, medium-, and long-chain fatty acids</td>
<td>3.0%</td>
<td>X (at 3.0%)</td>
<td></td>
</tr>
<tr>
<td>VVC</td>
<td>DSM</td>
<td>Pure benzoic acids with nature-identical flavorings</td>
<td>0.5% or 0.3%</td>
<td>X (at 0.3% and 0.5%)</td>
<td>X (at 0.3% and 0.5%)</td>
</tr>
<tr>
<td>Vigilox</td>
<td>Provimi</td>
<td>A blend of oils, bacterial fermentation products, whey products, plant protein, and natural flavorings</td>
<td>0.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pHorce</td>
<td>Anpano</td>
<td>A blend of liquid formic and propionic acids on a mineral carrier</td>
<td>0.3%</td>
<td>X (at 0.3%)</td>
<td></td>
</tr>
<tr>
<td>Dual Defender®</td>
<td>Raico</td>
<td>A blend of essential oils and prebiotic fiber</td>
<td>0.1%</td>
<td>X (at 0.1%)</td>
<td></td>
</tr>
<tr>
<td>Furst Protect</td>
<td>McNess</td>
<td>A blend of emulsifying monoglycerides of medium-chain fatty acids and essential oils, plus botanical extracts</td>
<td>0.4%</td>
<td>X (at 0.4%)</td>
<td></td>
</tr>
</tbody>
</table>


**Effective vs ASF at 0.33% inclusion**

**Equal Challenge of PRRS, SVA & PEDV**
Feed Additives Currently Available

“Summary of feed additives with scientific evidence evaluating efficacy against viral pathogens in swine feed”

Provides current product offerings, suggested inclusion rate per ton, relative cost per ton, and company contact information

Document is maintained at www.ksufeed.org periodically check for document updates

Following table is current as of April, 2022
<table>
<thead>
<tr>
<th>Company</th>
<th>Product name</th>
<th>Active ingredient(s)</th>
<th>Inclusion, lb/ton</th>
<th>Pricing¹</th>
<th># of published studies documenting efficacy²</th>
<th>Total # of published studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADM</td>
<td>Daafit &amp; Daafit S</td>
<td>Lauric and myristic acids and glycerol monolaurate</td>
<td>10 (Daafit S)</td>
<td>$</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>ADM</td>
<td>Daafit PLUS</td>
<td>Lauric Acid, GML-90, formic acid, short chain fatty acids</td>
<td>10</td>
<td>---</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Alltech</td>
<td>Guardian</td>
<td>Lactic acid, propionic acid, essential oils</td>
<td>8 (dry)</td>
<td>$$$ (dry)</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5.3 (liquid)</td>
<td>$$ (liquid)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anitox</td>
<td>Termin8</td>
<td>Formaldehyde, propionic acid (liquid or powder form)</td>
<td>6</td>
<td>---</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Anpario</td>
<td>pHorce</td>
<td>Formic acid, propionic acid, ammonium formate</td>
<td>6</td>
<td>$$</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>DSM Nutritional Products</td>
<td>VVC Premix</td>
<td>Blend of essential oil compounds and benzoic acid</td>
<td>7</td>
<td>$</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Feed Energy</td>
<td>R2</td>
<td>Short, medium, long chain fatty acids and essential oils</td>
<td>60 (R2 active ingredients along with added fats/oils)</td>
<td>$ (active ingredient)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Feedworks USA</td>
<td>LipoVital GL-90</td>
<td>Glycerol monolaurate</td>
<td>2 to 4</td>
<td>$$</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Form A Feed</td>
<td>Prohibio-R</td>
<td>Medium chain fatty acid and monoglyceride, organic acids</td>
<td>4-5</td>
<td>$$$</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Furst McNess</td>
<td>Furst Protect</td>
<td>Monoglycerides, Essential oil, natural extracts</td>
<td>8</td>
<td>$$$</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Kemin</td>
<td>FeedSURE MG</td>
<td>Monoglyceride blend, organic acids</td>
<td>6.5</td>
<td>$</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Kemin</td>
<td>Sal CURB</td>
<td>Formaldehyde, propionic acid</td>
<td>6.5</td>
<td>$</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Novus</td>
<td>Activate DA</td>
<td>Organic acids, 2-Hydroxy-4-Methylthio Butanoic acid</td>
<td>10</td>
<td>$$</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>PMI</td>
<td>Vitacy FeedLock</td>
<td>Blend of activated medium chain fatty acids</td>
<td>4</td>
<td>$</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Provimi</td>
<td>Vigilex</td>
<td>Fatty acids</td>
<td>8</td>
<td>$</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Ralco</td>
<td>Dual Defender</td>
<td>Phytonutrients</td>
<td>2</td>
<td>$$ to $$</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

¹Pricing at recommended inclusion. $ = <$10/treated ton; $$$ = $10-15/treated ton; $$$$ = > $15/treated ton. --- indicates that pricing estimate not available.

²Efficacy defined as a reduction in the infectivity of viral samples (PEDV, PRRSV, SVA, ASFV, FMDV) using either a cell culture based assay or swine bioassay. Other non-peer reviewed data may be available to support the products such as meeting abstracts and proceedings, but not considered in this summary.
Feed Additives to Mitigate the Risk

Claims of efficacy for reduction of viral contamination have not been reviewed and approved by the United States Food and Drug Administration for many of the products described in this presentation.

Therefore, within this presentation there are no claims directed (whether stated or implied) beyond what is provided on the manufacturer label.

Information is provided for awareness of products and formulations and is not a statement of endorsement for companies or products presented, nor is criticism implied for companies or products not listed.
Iowa Resource Coordination Center

• Public – Private Partnership

• Incident management team

• 1-stop for producer resources and technical assistance
  • Depopulation options
  • Disposal options
IRCC Process Model to Build Knowledge

Producer Calls IRCC
- Liaison gathers information
- Refers to IRCC Manual and Experts

Liaison contacts IPIC Expert(s)
- Discuss scenario/question
- Provide options

Liaison updates the IRCC Manual
- Document case and update manual
- Everyone learns together
### AVMA Guidelines for the Depopulation of Animals – Chapter 4: Swine

<table>
<thead>
<tr>
<th>Method</th>
<th>Preferred</th>
<th>Permitted in Constrained Circumstances</th>
<th>Not Recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon dioxide</td>
<td>Movement to slaughter</td>
<td>Sodium Nitrite</td>
<td>None listed</td>
</tr>
<tr>
<td>Electrocutation</td>
<td>Nonpenetrating captive bolt</td>
<td>Ventilation Shutdown Plus (VSD+)</td>
<td></td>
</tr>
<tr>
<td>Gunshot</td>
<td>Manual blunt force trauma</td>
<td>Compounded or nonpharmaceutical-grade injectable anesthetics and euthanasia agents</td>
<td></td>
</tr>
<tr>
<td>Penetrating captive bolt</td>
<td>Anesthetic overdose</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Can euthanasia methods be applied to this situation? Which method is most acceptable?  
*See the [AVMA Guidelines for the Euthanasia of Animals](https://avma.org/HumaneEndings)*

If euthanasia methods cannot be applied in this situation, can a “preferred” method of depopulation be used?  
*See the [AVMA Guidelines for the Depopulation of Animals](https://avma.org/HumaneEndings)*

If “preferred” methods of depopulation cannot be applied, can a “permitted in constrained circumstances” method be used?  
*See the [AVMA Guidelines for the Depopulation of Animals](https://avma.org/HumaneEndings)*

If “permitted in constrained circumstances” methods of depopulation cannot be applied, can a “not recommended” method be used?  
*See the [AVMA Guidelines for the Depopulation of Animals](https://avma.org/HumaneEndings)*

---

Source: avma.org/HumaneEndings
<table>
<thead>
<tr>
<th>Method</th>
<th>Worker Physical Danger</th>
<th>Worker Mental Danger</th>
<th>Other logistical issues</th>
<th>Total Hours/People (2min/animal 6000 sows)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gunshot</td>
<td>+++</td>
<td>+++</td>
<td>Acquiring guns and ammo, lack of training, ongoing cleaning, device gets hot, fatigue, blood</td>
<td>67 hours 84 people</td>
</tr>
<tr>
<td>Captive Bolt Gun</td>
<td>+++</td>
<td>+++</td>
<td>Acquiring guns and ammo, lack of training, ongoing cleaning, device gets hot, fatigue, blood</td>
<td>67 hours 84 people</td>
</tr>
<tr>
<td>Electrocution</td>
<td>+++</td>
<td>++</td>
<td>Specialized equipment currently not readily available. Small pigs only.</td>
<td>67 hours 84 people</td>
</tr>
<tr>
<td>CO2</td>
<td>+</td>
<td>+</td>
<td>Can only vaporize small amounts of CO2 (n=50 pigs). 30-minute cycles (100 adult pigs per hour). Only practical for small pigs currently.</td>
<td>46 hours 36 people</td>
</tr>
<tr>
<td>Anesthetic overdose</td>
<td>+</td>
<td>+</td>
<td>Availability, difficult to train and apply, lack of veterinarian availability</td>
<td>67 hours 84 people</td>
</tr>
</tbody>
</table>
Ambient air vaporizers

- Fill the LP tanks to 50-60 psi
  - 20-25 minutes
- Feather the tanks into the chamber over 5-minute period
- Let the CO₂ dwell in the chamber for another 15 minutes
- 100% efficacy

https://www.ipic.iastate.edu/information/Final%20CO2%20depopulation%20operations%20manual.pdf
Disposal Methods

• Deep Burial
• Shallow Burial
• Grind and Compost
• Compost
  – Cattle Manure
Shallow Burial

- SDSU – Bob Thaler
- On going projects at SDSU and OK State University
  - Keep from water table
  - Inactivates pathogens
- Cheaper option, so long as you have land available
- Still need carbon and earth moving equipment
- Modeled to be $5-7 per carcass
Grind and Compost

• Tree grinder (550-1100 hp)
• Have to have equal parts compost material and carcasses
  – Straw
  – Corn Stalks
  – Wood Chips
• Estimated 10 carcasses per minute
• Finalized material achieves >165 deg F in a couple of days
  – Completely composted within 30 days.
• Cost is $20-30 per carcass, depending the cost of the carbon source

Recent work in summer in Vietnam
ASF VI negative at 3 days of composting
DOI: 10.1111/tbed.14659
Construction of Compost Pile

1. Width: Start with 15-20 feet wide
2. Base layer of 12-24 inches bulking agent
3. Place mortalities in a single layer and at least 6 inches from the edge
4. Cover with 12-18 inches of bulking agent in a mound shape
Operation and Maintenance of Pile

1. Monitor temperature > 110 F in 5 days
2. Should maintain 130-160 degrees F
3. Turning pile will be necessary if temp drops to about 100 degrees
4. Inspect regularly and maintain cover
IPIC Checklist of Priorities

Prevention

❑ Join/register with US Swine Health Improvement Plan (https://iowaagriculture.gov/ship)
❑ Review biosecurity plan with all farm staff
❑ Consult with veterinarian to become proficient in identifying clinical signs and review with all farm staff
❑ Use SPS resources to create an enhanced biosecurity plan
❑ Verify all premises ID (PIN) (https://lms.pork.org/Premises)
❑ Maintain electronic pig movement records with PIN locations (i.e. using AgView)
❑ Maintain daily movement records (people, trucks, equipment, etc) in and out of site
❑ Have contact list of attending veterinarian, state veterinarian, DNR

Contingency planning

❑ Develop a plan for a national standstill (minimum of 72 hours) regarding movements
❑ Develop a plan if feed deliveries are included in standstill (minimum of 72 hours)
❑ Develop a plan for mortalities if rendering is not available during the standstill
❑ Think through a method for mass euthanasia
❑ Identify potential carbon source for disposal
❑ Identify a potential place for on-site disposal of carcasses and discuss options with DNR if needed
❑ Establishment of C&D station(s)
❑ Establish plan for “isolated/designated/alternative” caretaker routines in event of standstill
❑ Contact herd veterinarian for eligibility of Certified Swine Sample Collector program

Response

❑ Establish appropriate depopulation method WITH IDALS (do not do any euthanasia without consulting IDALS as indemnity request could be denied)
❑ Maintain appropriate documentation of method, number, age, etc during depopulation
❑ Establish carcass disposal method with IDNR approval
❑ Fill and submit appraisal and indemnity request forms with IDALS and USDA
Questions??

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