

# **Biosecurity Must Be Top Priority**

Dr. Kevin D. Brightbill, State Veterinarian
Bureau of Animal Health and Diagnostic Services
Pennsylvania Department of Agriculture



#### Mission of Pennsylvania Department of Ag

The Pennsylvania Department of Agriculture is committed to a sustainable and safe supply of food and agricultural products in the commonwealth − from the farm to the table − and to being good stewards of the land and Pennsylvania's natural resources. The department promotes the viability of farms, protects consumers, and safeguards the health of people, plants, animals and the environment.





#### **Domestic Animal Law**

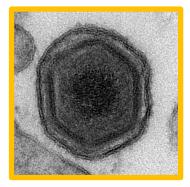
...animal health is of major economic interest in this Commonwealth. It is the declared policy of the Commonwealth to assure the health and welfare of animals kept in captivity, to prevent and control diseases and dangerous substances that threaten the health and safety of animals and humans... (Pa.C.S.Chapter 23)





#### **African Swine Fever Virus**

- More than 20 genotypes
  - Vary in virulence
  - High virulence: up to 100% mortality
  - Low virulence: seroconversion



Center for Food Security and Public Health, Iowa State University, 2018

- Highly resistant in environment, especially at lower temperatures
- Survival
  - Several days in feces
  - Month(s) in contaminated pens
  - Up to 18 months in blood
  - Over 140 days in some pork products (example: salted dried hams)
  - Years in frozen carcasses



#### **African Swine Fever**

#### **Species Affected**

- Domestic pigs
- Wild pigs:

Eurasian wild boars

Warthogs (reservoir)

Bush pigs (reservoir)

Giant forest hogs





#### **Virus Inactivation**

- Most disinfectants ineffective
- Disinfectants on nonporous surfaces
  - Sodium hypochlorite (high concentrations: 2000 ppm)
  - 2% Citric acid
  - Some iodine and quaternary ammonium solutions
- Unprocessed meat/tissue products
  - High temperature: 158° F (70° C) for 30 minutes to inactivate ASFV
- Can be inactivated:
  - pH below 3.9 or above 11.5
  - Higher pH needed if serum present



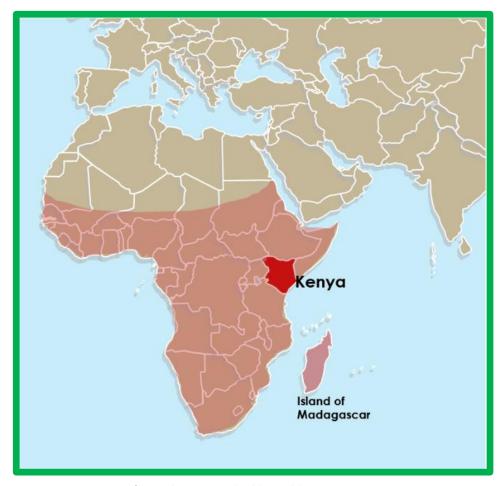




#### **History**

1921: Discovered in Kenya

Today ASF is endemic in most of Sub-Saharan Africa including the island of Madagascar



Center for Food Security and Public Health, Iowa State University, 2018



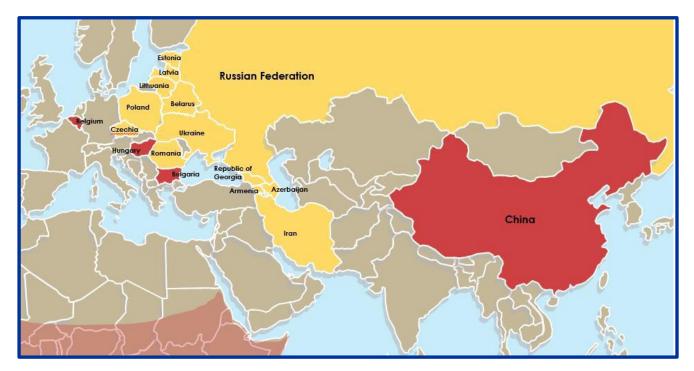
#### **2018-19 Outbreaks**

China: Domestic pigs

Belgium: Wild boars

Hungary, Estonia, Latvia, Lithuania, Russia, Poland, Ukraine, Bulgaria, Romania

\*July 2019: African swine fever virus detected in meat seized by port authorities in Northern Ireland - the first time the ASF virus has been detected in the UK.





## **History of Virus Introduction for Outbreaks**

- Uncooked/undercooked pork products fed to pigs (imported, illegal)
  - Portugal & Spain (1960)
  - Italy (1983)
  - Belgium (1985)
  - Russia (2008)
  - Romania & China (2018)



- Raw pork waste/garbage at airport or shipping ports
  - Lisbon (1957)
  - Malta & Sardinia (1978)
  - Georgia (2007)



- Movement of infected wild boars
  - Russia (2008)





## **Economic Impact**

- Animal health
  - High morbidity (signs of illness) and mortality (death)
  - Highly contagious
- Import and export bans
- Movement restrictions



- Quarantine and depopulation
  - Required for eradication

Romania: over 120,000 pigs in 2018

China: officials have reportedly culled more than 1.2 million pigs as of June 2019

Can become prolonged epidemic





#### **National Pork Producers Council**

**Economic Impact Studies** 

#### PENNSYLVANIA PORK PRODUCTION AT-A-GLANCE



3,097 FARMS PRODUCING HOGS

1,210,000 TOTAL HOGS



11,044 JOBS IN PORK PRODUCTION

\$435.1 MILLION OF PERSONAL INCOME GENERATED



\$634.8 MILLION GROSS STATE PRODUCT VALUE

\$261.1 MILLION VALUE OF HOGS MARKETED

PORK PRODUCTION SPANS ALL 50 U.S. STATES



#### **National Pork Producers Council**

**Economic Impact Studies** 

#### PORK EXPORT CONTRIBUTIONS TO PENNSYLVANIA ECONOMY



\$569 MILLION IN TOTAL SALES

\$133 MILLION IN ECONOMIC ACTIVITY GENERATED



2,319 JOBS



\$91 MILLION OF PERSONAL INCOME GENERATED

101,100 TONS OF PORK EXPORTED

PORK PRODUCTION SPANS ALL 50 U.S. STATES



#### **How is ASFV Transmitted?**

- Direct contact with infected pig
  - Usually oronasal
  - All secretions/excretions, blood, tissues
- Ingestion of contaminated pork products
  - Fed to pigs –swill, waste, garbage
  - Carcasses



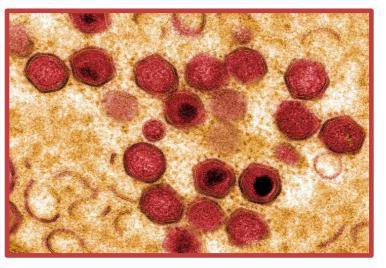
Center for Food Security and Public Health, Iowa State University, 2018

- Fomites objects such as clothing, vehicles, equipment
- Environmental contamination blood, diarrhea, feces
- Vectors
  - Biological: bite from soft ticks (*Ornithodoros* soft species of ticks)
  - Mechanical: other insects mosquitoes, biting flies (*Stomoxys*)



#### **Clinical Disease**

- Incubation period
  - 5-21 days following direct contact
  - < 5 days after tick bite
- ★ Forms of disease
  - Peracute sudden death
  - Acute
  - Subacute
  - Chronic
- No vaccine is currently available
- No treatment available



The Pirbright Institute 2019



## Clinical Signs: Acute Disease

- High fever
- Anorexia
- Lethargy
- Weakness, recumbency
- ▼ Erythema red skin
- ★ Hemorrhages skin, snout
- Diarrhea
- Abortion
- Respiratory dyspnea, nasal discharge
- Death 7 to 10 days









## **Clinical Signs: Chronic Disease**

- ▼ Intermittent, low fever
- Anorexia, depression
- Emaciation, stunting
- Respiratory coughing
- Joint Swelling
- Diarrhea
- Occasional vomiting
- Skin lesions
- May be fatal



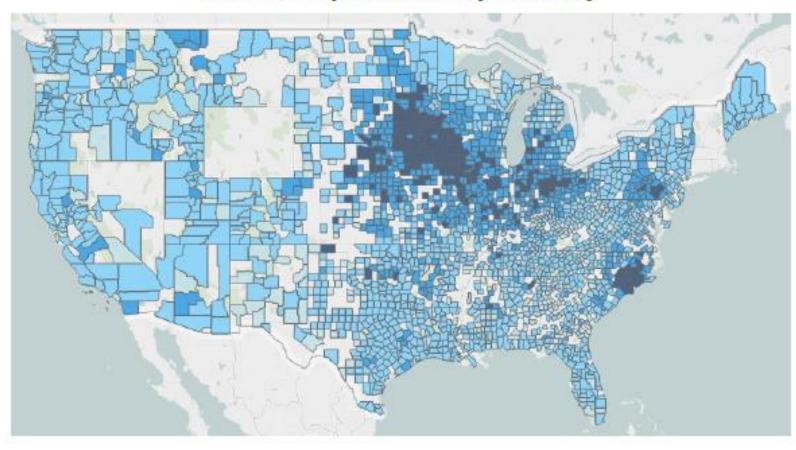


## **Are You Prepared For An Emergency?**

Do you have a biosecurity plan for your farm?



### Swine Population by County



- 0 40
- 40 1,500
- **1,500 60,000**
- **60,000 1,900,000**



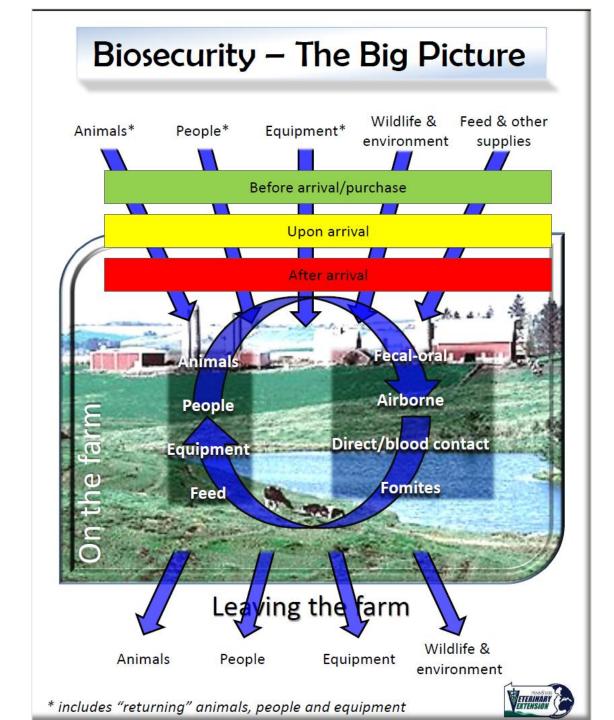
## Biosecurity is...

a method to protect livestock by preventing the introduction and/or spread of disease during an animal disease disaster.

To put it another way.....

biosecurity is the armor that protects a farm prior to, during and after an animal disease disaster.







#### What do I need to do? How do I do it?

- Develop a 'Biosecurity Plan' that describes the measures you'll take to prevent the potential spread of the disease agent.
- Before entering a facility, establish Work Zones, or at least a "Clean-Dirty" line, and set up a decontamination area.
- ➡ Properly handle all clothing and supplies to avoid spreading contamination from the "dirty" to the "clean" side.
- ➡ Personnel must exercise the utmost thought, patience, persistence, and care in creating and carrying out a biosecurity plan both under normal circumstances and during an outbreak.
- A little advance thought, planning, and extra effort in following biosecurity procedures can go a long way toward preventing pathogen transmission, protecting the well-being of livestock and poultry, and safeguarding Pennsylvania agriculture.



## **Biosecurity Resources for Producers**



http://www.securepork.org/pork-producers/biosecurity/

- Implementing enhanced biosecurity plans will help prevent exposing animals to foot and mouth disease (FMD), classical swine fever (CSF), and African swine fever (ASF).
- Be prepared to share your plan with State Animal Health Officials
  (Pennsylvania Department of Agriculture) prior to an outbreak. Biosecurity
  plans will allow for permitted movement of animals and products during an
  outbreak.
- Work with your herd veterinarian and use the resources offered by SPS to get started.



## **African Swine Fever (ASF)**

#### Biosecurity and education: your best prevention

- The biggest threat of ASF transmission is people.
- Biosecurity is your main tool to prevent this disease.
- ▼ Understanding all aspects of biosecurity on your farm from protocols in place to proper training of your team is crucial.
- ▼ Educate everyone who enters your farm on the importance of their role in your biosecurity plan.
- Avoid being a transmission vector for ASF:
  - 1. Avoid visiting countries that are ASF-positive.
  - 2. If travel to an ASF-positive country is unavoidable, follow mitigation protocol All shoes and clothing that you wear in contact with pigs should be thrown away and left in that country.
  - 3. Don't bring back pork or pork products from ASF-positive countries.
  - 4. Respect downtime if you have been in a pig population, you should stay away from other pigs for a set amount of time to avoid bringing the virus into another population.



## Secure Pork Supply (SPS) Plan

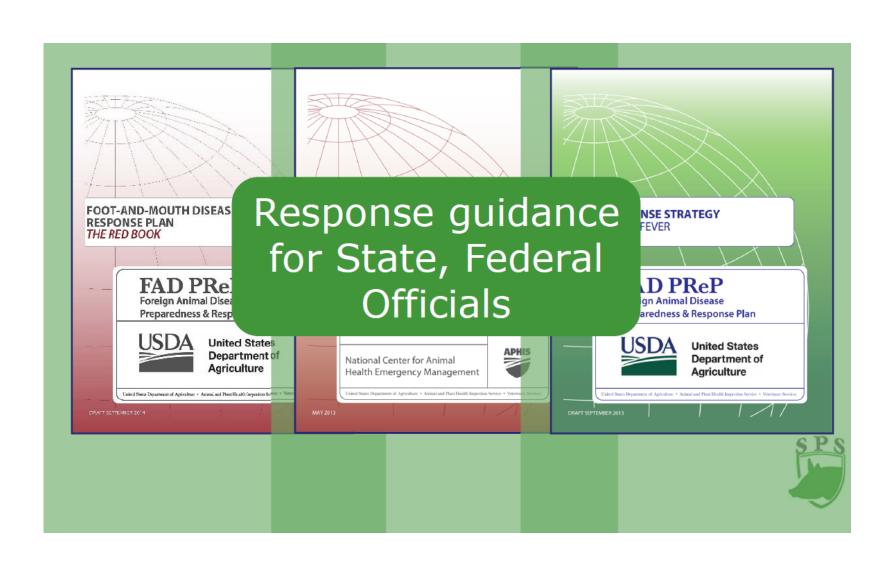
- How SPS fits into the disease response:
  - FMD, Classical Swine Fever, African Swine Fever
  - Movement of animals

- ★ The components of the SPS:
  - Biosecurity
  - Traceability
  - Surveillance (Disease Monitoring)





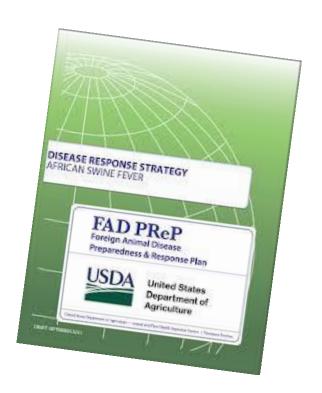
## What would happen during an outbreak?





## **U.S.** Disease Response Strategy

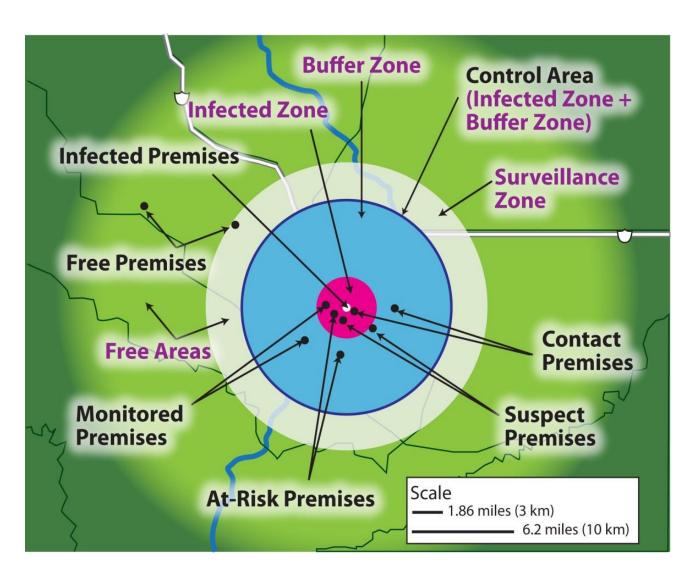
- USDA FAD PReP
- Stamping out approach is followed:
  - Quarantine and movement control
  - Biosecurity
  - Surveillance and investigation
  - Cleaning and disinfection





#### **Control Area: What is it?**

**Control Area = Infected Zone + Buffer Zone** 



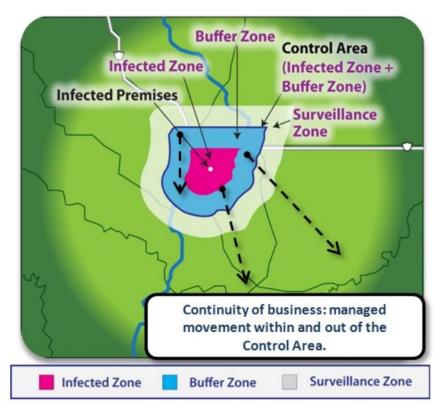


In an established Foreign Animal Disease (FAD) Control Area movement will only be allowed by permits and based on risk. Biosecurity plans will be required to get a permit.

Permits are the mechanism by which movements are allowed during an FAD outbreak. In a disease outbreak, permits are issued to approve and document movements of specific transports/items into, within, and out

of regulatory Control Areas.

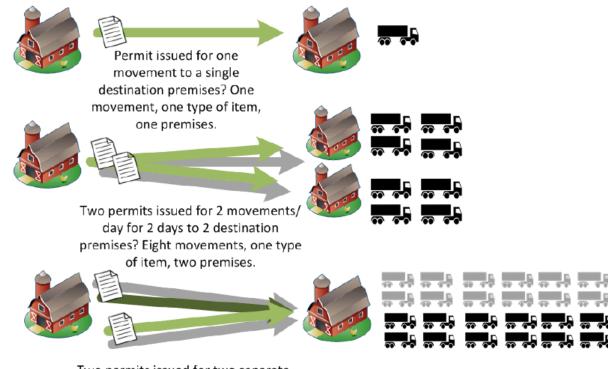
Secure Food Supply Plans:
Allow for continuity of
business for affected
farms, **not** infected farms





#### **Overview of Permitted Movements**

A MOVEMENT is always associated with a permit. A permitted movement occurs when the items/animals physically go from one premises to another.



Two permits issued for two separate items to a single destination premises, for 3 movements/day for 4 days for each item? 24 movements, two types of items, one premises.



### **Summary of Permit Types**

**Specific permits** - relate to controlling and containing the FAD outbreak, to achieve biocontainment (keeping the disease on Infected Premises) and bioexclusion (keeping the disease out of non-infected premises).

**COB permits -** help to facilitate **continuity of business for non-infected premises** that

are inside the Control Area.

Type of Permit		Type of Premises	Details	Into/Within/Out of Control Area?	Intrastate or Interstate?	Example
Specific Permit		Infected, Contact, Suspect	Includes critical movements (e.g., animal welfare) and essential movements (e.g., response activities). Specific permit may/may not be required based on risk and unified Incident Command recommendation.	Can be into, within, or out of Control Area; into or within Control Area is more common.	Usually intrastate, rarely interstate.	Movement of animals on a Suspect Premises to a slaughter establishment in the Control Area.
COB Permit	Operational Permit	At Risk, Monitored	Includes normal movements necessary to keep non-infected premises within the Control Area in business during an outbreak. Permit requirements/criteria based on unified Incident Command, APHIS National Incident Coordination Group, and State officials recommendation.	Usually within or out of Control Area.	Can be intrastate or interstate.	Movement of mortality off of an At-Risk Premises to outside of the Control Area. <sup>1</sup>
	SFS Permit	At Risk, Monitored	Includes animal and animal product movements into the supply chain for feeding, growing, processing, or to market. Helps to secure the U.S. food supply during an outbreak. Permit requirements/criteria based on SFS Plans and/or the unified Incident Command, APHIS National Incident Coordination Group, and State officials recommendation.	At-Risk Premises can only move within a Control Area; Monitored Premises can move within or out of a Control Area. Movements into the Control Area are less common.	Can be intrastate or interstate.	Movement of washed and sanitized shell eggs from a Monitored Premises to market outside of the Control Area.



#### **State Role in Permitted Movement**

#### **Before an Incident**

States may choose to use EMRS2, or any other information management system, before an animal health incident to store premise ID information **if provided by producer**.

#### **During an Incident**

The state will use either EMRS2 or their information management system for permitting during a FAD outbreak. At minimum, biosecurity plans will be required for facilities within a control area to be considered for movement.

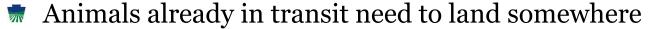
#### **Additional State Requirements**

States may establish additional surveillance and testing criteria for premises located in the Surveillance Zones/Free Areas.



#### Day 1 of an Outbreak

- Stop movement
  - No new movements initiated from FAD Control Area



- Continue on to their destination
- Return to site of origin
- Handled somewhere in between



Producers may need to manage their animals without moving them for several days to weeks



#### **Movement resumes**

- **™** Enhanced Biosecurity
- Surveillance
- ™ Movement Permits



Permits may be required for all movements onto, off of premises during the outbreak

#### Officials need to balance the risk:

Allowing live animal movement and possibly spreading the disease *vs*.

Welfare ramifications of not allowing animal movements



#### **Biosecurity – Protecting Your Pigs**

During the 2001 FMD outbreak, UK farmers with good biosecurity procedures were **5 times less likely to become infected** (Unpublished research: Carlisle

Epidemiology Team, DEFRA, UK 2001 Outbreak)



#### Four concepts emphasized

- 1. Biosecurity manager
- 2. Written site-specific biosecurity plan
- 3. Defined perimeter buffer area
- 4. Defined line of separation



#### **Biosecurity Manager**

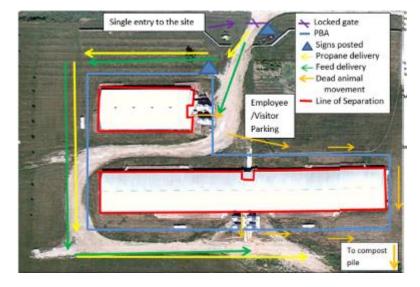
- Understand infectious diseases and production animal agriculture, familiar with facility
- **™** Use the Self-Assessment Checklist and Information Manual for Enhanced Biosecurity
- ★ Write site-specific biosecurity plan (with the assistance of the herd veterinarian)
- Responsible for employee training
- **The Ensure compliance on the site**





#### Written site-specific biosecurity plan

- Explain how your site meets all biosecurity measures listed in checklist
- SPS gives step by step instructions to creating a Premises Map for a Biosecurity Plan
- The biosecurity plan must include a premises map (satellite images are preferable) labeled with the following:
  - Location of site entry
  - Perimeter Buffer Area (PBA) and PBA Access Point(s)
  - Line of Separation (LOS) and LOS Access Point(s)
  - Cleaning and disinfection (C&D) station(s)
  - Designated parking area outside the PBA
  - Carcass disposal/pickup location and carcass removal pathways

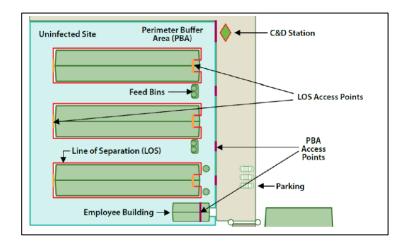


• Vehicle movement pathways (animal transport vehicles, deliveries, etc.)



#### Define the Perimeter Buffer Area (PBA)

- Established around all animal buildings serving as an outer control boundary to minimize contamination near the buildings
- ★ Enter the PBA only through a clearly marked and controlled PBA Access Point(s) following appropriate biosecurity measures
- The PBA should be clearly defined through a variety of methods including but not limited to: a road, fence, flags, signage, stakes, or ropes and clearly visible to employees, visitors, and delivery personnel so that no one enters the PBA without permission and following the proper biosecurity measures.





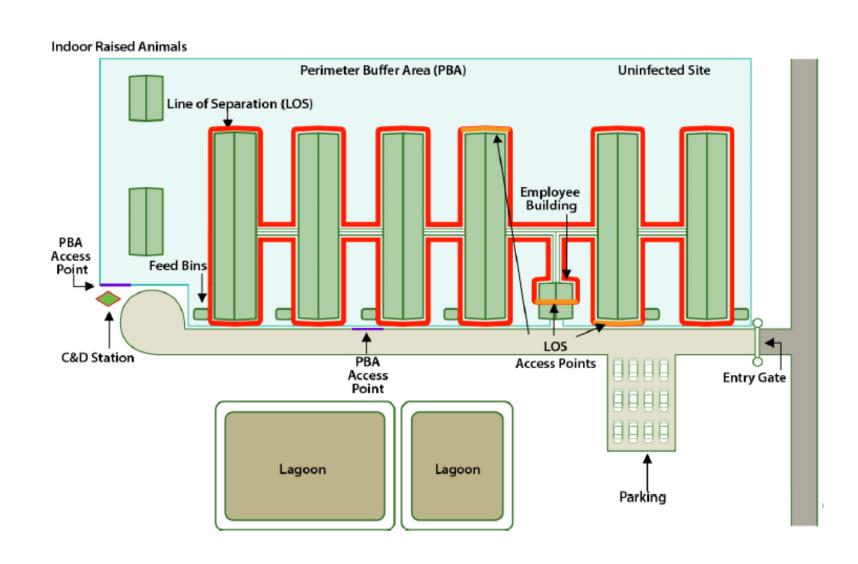
# **Define the Line of Separation (LOS)**

- Walls of the building housing the pigs
- People and items only cross the LOS through a clearly marked and controlled LOS Access Point(s) following appropriate biosecurity measures





# Perimeter Buffer Area and Line of Separation





# **Traceability - SPS Plan: PIN**

### Get PremIDs or PINs

- Request from the Pennsylvania Department of Agriculture −
   Allie Steck Animal Disease Traceability Coordinator 717.836.3235
- ▼ Include a valid 911 address associated where the animals are located
- Associate the PIN with animal movements and diagnostic laboratory submissions





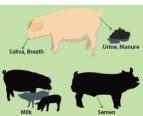
# **Surveillance (Disease Monitoring)**

#### Foot and Mouth Disease Also referred to as "Hoof and Mouth Disease"



#### What is foot and mouth disease (FMD)?

- Most contagious virus of cloven-hoofed livestock
- Does NOT affect public health or food safety
- Meat is safe for people to eat Causes blisters on the feet and the snout
- Other signs may include lameness, fever, and going off feed
- Piglets may die from heart infection
- Animals may be infected 2-4 days before
- showing signs Highly contagious
- Virus is shed in saliva, breath, milk, semen urine and manure
- Can be spread directly between animals OR spread indirectly on clothing, footwear, vehicles, equipment, and wildlife





- Foot and mouth disease is found in more than 2/3 of the world! Parts of South America, Asia, Africa, and the Middle East
- NOT in United States, Canada, Mexico, or Central America

How will foot and mouth disease affect pork producers if it enters the U.S.?

- Movements on and off farms in a regulatory Control Area could be stopped by state and federal officials to try and st
- Export markets close and prices drop
- When one animal on the farm becomes infected, the whole herd is likely to become sick

How can the Secure Pork Supply (SPS) Plan help protect your herd?

- . It recommends biosecurity standards that pork producers can put in place to help protect their pigs
- It includes steps producers can take to show that their pigs can be moved without spreading disease It provides an opportunity for pork producers to keep their business running if their pigs remain uninfected

#### Classical Swine Fever Also referred to as "Hog cholera"



#### What is classical swine fever (CSF)?

- Highly contagious virus of pigs (domestic and wild)
- Does NOT affect public health or food safety Meat is safe for people to eat
- Causes reddened and crusty eyes, skin discoloration fever, and constipation followed by diarrhea
- Other signs may include huddling, unsteadiness, and going
- Younger pigs often have a high mortality (death) rate Animals may be infected 2-15 days before showing signs
- Highly contagious Virus is shed in saliva, nasal discharge, semen, urine

and manure

- Can be spread directly between animals OR spread indirectly
- on clothing, footwear, vehicles, equipment, and wildlife
- CSF virus can also be spread to other pigs through undercooked pig meat (garbage feeding)





- Classical swine fever is found in more than 2/3 of the world!!
- Parts of Central and South America, Asia, Africa, and the Middle East
- CSF is still present among wild boar in some regions of western and central Europe

How will classical swine fever affect pork producers if it enters the U.S.?

- Movements on and off farms in a regulatory Control Area could be stopped by state and federal officials to try and stop disease spread
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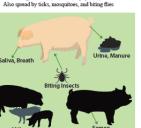
Photo credit: The USDA APHIS Foreign Animal Disease Diagnostic Laboratory and the Department of Homeland Security
Visual Information Service at the Plum Island Animal Disease Center and Dr. Alex Ramirez, Iowa State University

#### African Swine Fever



#### What is African swine fever (ASF)?

- Highly contagious virus of pigs (wild and domestic) Does NOT affect public health or food safety
- Meat is safe for people to eat
- Causes fever, skin discoloration, diarrhea, and death Other signs may include piling, tiredness, and going off feed
- Sudden deaths or abortions may be the first sign of infection in a herd
- Animals may be infected 3-21 days before showing signs Highly contagious
- Virus is shed in saliva, breath, milk, semen
- urine and manure
- Can be spread directly between animals OR spread indirectly on clothing, footwear, vehicles, equipment, and wildlife





· African swine fever is found in Africa and countries in Europe, Asia, and the Middle East

· NOT in United States, Canada, Mexico, or Central America

How will African swine fever affect pork producers if it enters the U.S.?

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Photo credit: The USDA APHIS Foreign Animal Disease Diagnostic Laboratory and the Department of Homeland Security Visual Information Service at the Plum Island Animal Disease Center and Dr. Alex Raminez, Iowa State University

\* Not a public health or food safety concern \*



# **Surveillance (Disease Monitoring)**

Swine Health Monitors... people who normally look at the pigs and can recognize when something is "off".

- ★ Caretakers trained to recognize abnormal production parameters or clinical signs suggestive of FMD, CSF, and ASF
- Work with veterinarian to determine if caretakers are prepared to collect their own samples, if permitted





### **Accredited Veterinarians**

- Federally and state trained
- First line of defense against foreign animal diseases (FADs) such as ASF
  - Recognize clinical signs
  - Report suspected cases to State Veterinarian's office
  - First step in the very time-sensitive diagnosis of dangerous transmissible diseases
- Vital to protecting on-farm biosecurity
- Critical to ensuring animal health and a wholesome food supply
- Crucial role in continuity of business and protecting ag markets across the state, nation and the world



### **Surveillance (Disease Monitoring)**

### **NASAL SWAB COLLECTION IN PIGS**

#### STEP 1



 Ensure the pig is adequately restrained with the head positioned upward. Young pigs may be restrained by holding animals against the handler's body or larger animals may be restrained with a snare. The snare should be positioned back in the mouth so that nasal openings aren't closed off.

#### STEP 2



- Wipe off snout and insert sterile swab deep into nasal cavity, avoiding contact with the outside of the nostril.
- Rotate swab hard enough on the inside of the nose to collect the sample, but not so hard as to draw a lot of blood (small amount OK) which may interfere with diagnostics.
- Repeat the process with the other nostril, using the same swab.

#### STEP 3



- Place the swab in the sample tube containing the medium, release the medium from the ampule at the end of the sheath (if applicable).
- Stir the swab in the medium to facilitate release of the sample. When applicable, break off the shaft within the tube and securely close the tube.

#### STEP 4



 Number each tube with a permanent marker. Appropriate paperwork must include the animal or group identification, Premises Identification Number, date, and species. Make a note that the sample is a nasal swab.

### COLLECTING SAMPLES FROM BABY PIGS

Nasal sweb sampling of baby pigs is possible. However, because of the smaller size of their nostrils, a mini sweb needs to be
used. Restraint can be accomplished by holding the piglet tight against the handler's body. Just as with older animals, both nostrils
should be swebbed with swebs handled the same way after collection.

Photos courtesy of Alex Ramirez, Iowa State University









# AFRICAN SWINE FEVER (ASF) A THREAT TO THE U.S. PORK INDUSTRY













Pigs infected with ASF may look similar to animals infected with several domestic and foreign animal diseases including classical swine fever (hog cholera), acute porcine reproductive and respiratory syndrome (PRRS), porcine dermatitis and nephropathy syndrome (PDNS), erysipelas, salmonellosis, actinobacillosis, Haemophilus parasuis infection (Glasser's disease) and pseudorables. When observing animals showing the clinical signs above, suspect ASF.

#### IF YOU SUSPECT A FOREIGN ANIMAL DISEASE:

If you suspect an ASF infection, quarantine your herd. Contact your State or Federal Animal Health Official to report your concerns. Contact information can be obtained by calling (866) 536-7583. You can also call the USDA APHIS Veterinary Services National Center for Animal Health Emergency Management at (800) 940-8524 (24 hours) for assistance.

Photo Credit: USDA APHIS Foreign Animal Disease Diagnostic Laboratory and Alex Raminez at lowa State University College of National Conference Memory.











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# Pennsylvania Animal Diagnostic Lab System (PADLS)

- Tripartite lab system
  - Pennsylvania Veterinary Laboratory, Harrisburg
  - Animal Diagnostic Laboratory, Penn State, University Park
  - New Bolton Center, University of Pennsylvania, Kennett Square
- Labs are situated across the state for wide availability
- System provides rapid and accurate diagnostic services to protect animal health –AAVLD accredited
- All three labs certified for ASF testing
- Increased funding investment from latest budget keeps resources at the ready





# Pennsylvania ASF Task Force

- Established in April 2019
- Members from state government, federal government, industry and academia
- Four committees:
  - "3D" (Depopulation, Disposal & Decontamination)
  - Information Management, Quarantine/Movement Control, Surveillance & Biosecurity
  - Lab & Diagnostics
  - Incident Coordination & Communications
- Challenges:
  - Depopulation and disposal on large operations
  - Movement control & permitting
  - Communication to wide range of producers on best biosecurity/prevention practices



### **ASF Exercise Series**

- Coordinated by USDA's Veterinary Services, National Training & Exercise Program (NTEP)
- November 2018 Policy-based exercise with State Animal Health Officials
- ▼ February 2019 Module-based exercise to enhance state's response plan
- ★ April 2019 "Tabletop" exercise to discuss actual scenarios
- September 23-26, 2019 Functional exercise/drill to test response capabilities



The best time to prepare for a crisis is before it happens!

Learn more at www.securepork.org





### **Contact Information**

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www.agriculture.pa.gov