Biosecurity Challenges: An Industry Perspective

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Recent Foreign Animal Disease Outbreaks

- Taiwan - Foot-and-Mouth Disease, March 1997
- Netherlands, Dominican Republic - Classical Swine Fever, February 1997
- Malaysia - Nipah Virus, 1998
- Korea, Japan, Argentina, Brazil, Egypt, and South Africa - Foot-and-Mouth Disease, 2000
- France, Republic of Korea - Classical Swine Fever, 2002
- Republic of Korea - Foot-and-Mouth Disease, 2002
Increasing Risk of a Foreign Animal Disease

- International Visitors
- U.S. Producer/Veterinarian/Animal Scientist Travel
- Increase in Imports
- Illegal Importation of Products and Animals
- Agroterrorism
Primary Diseases of Concern

- **Foreign Animal Diseases**
  - Foot-and-Mouth Disease (FMD)
  - Classical Swine Fever (CSF)
  - African Swine Fever (ASF)
Security/Biosecurity - National and Herd

■ National
  - The Measures Taken by Government, Industry and the Public to Protect Animal Agriculture From Adverse Health Situations

■ Herd
  - Good Management Practices to Prevent the Entry of New Diseases to a Herd and the Spread of Diseases between and within Herds
Biosecurity Challenges - National

- No Natural Exposure or Vaccination Programs
- Number of Easily Accessible Agents
- Large Number of Livestock Operations
- Significant Animal Movements Within Country and Canada and Mexico
- Lack of Public Awareness to Potential Threats
- Illegal Importations - Passengers and Cargo
- Limited Government Resources - Funding and Personnel
- Lack of Real-Time Diagnostics
- Limited Awareness/Training - Veterinarians and Producers
- Limited Research and Laboratory Infrastructure
Biosecurity Challenges - Herd

- Accessible
- 24-7 Security - not feasible
- Farm Traffic/Deliveries - Feed, Semen, Equipment Repair, Supplies, Manure Disposal, Visitors - International, Veterinarians, Carcass Removal
- Employee Turnover
- Farm Inputs - Feed, Water
- Genetic inputs
- Transportation
- Wildlife/Pests
- Location
Current Strategies for Protecting U.S. Animal Agriculture

- **Producer/Practitioner Education**
  - Awareness
  - Recognition of Reporting Responsibilities
  - Practitioner training at Plum Island in FADs
  - More than 300 practitioners assisted in the 2001 UK FMD outbreak

- **Research and Diagnostic Development**

- **National Coordination for Emergency Management**
  - Prevent
  - Prepare
  - Respond
  - Recover
Producer Educational Efforts

- Producer On-Farm Biosecurity
  - Information in Publications
  - Videos
  - Presentations
  - Satellite Programs
  - Mailings
  - Radio Interviews
  - Web Sites
  - Quality Assurance Programs
American Feed Industry Association
Guide to Biosecurity Awareness

Introduction

In response to potential attacks on the safety of the nation's food supply, the
Departments of Agriculture and Health and Human Services have requested
that industry leaders involved in animal agriculture assume a leading role in
raising biosecurity awareness. Grain, processed ingredients, animal feed, pet
food and their delivery vehicles all serve as potential vectors for intentional
contamination, resulting in injury to humans and animals.

One should not assume that consumers are a terrorist’s sole targets. Terrorists
may also cause severe economic hardship and market disruptions by damaging
production assets and distribution methods.

The time is right for promoting biosecurity for the feed industry. AFIA offers
this publication as a guide to biosecurity awareness. It is not intended as an
operational manual and is not a substitute for good manufacturing practices.
Instead, this publication is a tool toward strengthening companies’ overall
feed/food safety plans.

Each employee has a role in assuring the quality of manufactured products.
Starting with top management, the message must be conveyed that all employ-
ees should remain vigilant in protecting a company’s assets and reputation.
Consider conducting employee-training meetings using this guide and the
related PowerPoint™ presentation, available at www.afia.org

In the event of an attack upon its facility, a company should contact law
enforcement authorities immediately. AFIA stands ready to assist any company
should such an unfortunate event occur. AFIA will also serve as a clearing-
house of information to enable others to quickly protect industry assets.
Collectively, AFIA and the industry can help insure the safety of our nation’s
food supply by continuing to provide safe feed, while maintaining a safe work
environment.

Threats to Biosecurity

Certain safe substances may be used to produce unsafe or harmful combina-
tions if used incorrectly or indiscriminately. These include ammonium nitrate
or urea fertilizer, concentrated pesticides and animal drugs. Secure and
account for such products and report anyone acting suspiciously or wishing to
purchase abnormal quantities.

Generally, feed and feed ingredients may become adulterated by the following
means:

- Biological (bacteria, toxins, viruses, parasites, etc.)
- Chemical (classical chemical warfare agents, such as nerve, blister, blood
  and choking, and toxic industrial chemicals, such as pesticides, rodenti-
  cides and heavy metals)
- Radiological (agents that can be delivered in liquid or solid form)
- Physical (e.g. ferrous and non-ferrous metal, glass and plastic)

Any biosecurity program should anticipate attempts to introduce these agents
into the animal feed production and distribution process.
FMD & BSE
What every producer needs to know.

The United States is working to remain free of BSE and FMD. Preventing these different diseases requires different actions.
Protecting Your Farm Or Ranch

Authorities with USDA and the FBI advise producers to contact local authorities first to report suspicious activities, intruders or circumstances on your property. If local authorities are not immediately available — contact your local FBI office. That number will be in the blue pages of your phone book. License plate numbers and descriptions of infringements should be recorded. Be aware that prior to Sept. 11, domestic terrorist groups had already attacked people, places and companies that work with animals or agriculture in ways these groups oppose. Livestock producers and veterinarians are urged to check livestock regularly and immediately report signs of disease.

Dr. Bob Smith, vice chairman of the Cattle Health and Well-Being Committee for National Cattlemen’s Beef Association, says farmers and ranchers should watch their herds for signs of anything out of the ordinary. The following are signs that could be symptoms of different, across diseases:

- Sudden, unexplained death loss in the herd or flock
- Severe illness affecting a high percentage of animals
-Bloated around an animal’s mouth, nose, udders or hooves
- Large numbers of animals suddenly going off feed

Minimum biosecurity measures

- Visitors should avoid livestock areas, pens and barns unless it is necessary.
- Park your vehicle on paved or concrete areas that are away from production sites on farm to avoid contact with dirt, mud or manure. If this is not possible, be certain that tires are free of dirt and debris by hosing the tires and wheel wells before leaving the premises. If this does not clean the tires adequately, take the vehicle to a pressure car wash.
- Wash hands with soap and water or an antibacterial gel before entering and after leaving the premises to avoid transmitting disease agents from person to person.

Anthrax & Livestock

In many states anthrax is a reportable disease. If you suspect an outbreak in either livestock or wildlife, immediately call your veterinarian as there are other diseases that exhibit similar signs. Anthrax cases should be managed by a veterinarian.

Anthrax is a naturally occurring disease. Outbreaks can occur after heavy rains or during drought seasons, which can bring spores to the ground surface. Some outbreaks have been attributed to close grazing that disturbed the soil where spores were present. Often, outbreaks occur where there has been one in the past, or where the soil in previously contaminated areas is disturbed by excavation.

Deaths come quickly for infected livestock, often within hours to a few days after exposure. Some animals may be saved if treated very early with penicillin or tetracyclines.

What to watch for

In cattle and sheep, the clinical signs include high fever, muscle tremors, respiratory distress and convulsions, which often go unnoticed due to the speed of the disease.

After death, there may be bloody discharges from the natural openings of the body, rapid breathing, and the presence of unclotted blood. Discharges and secretions from the carcass or dying animals will contaminate the ground and anthrax spores will develop. These can cause infection years later as anthrax spores can survive in the soil for many years.

Pastures cannot be disinfected with chemicals. Only burning ensures that the anthrax bacteria has been killed.

Protecting animals during an outbreak

Effective anthrax vaccine is available and the injection should be administered only by veterinary practitioners. When exposed animals are treated with antibiotics and/or vaccinated, new cases can occur for 12 to 14 days. Vaccinated, healthy livestock should be moved away from infected animals. Carcasses to clean pastures, if possible. Know that animals that are vaccinated cannot be slaughtered for 60 days. The vaccine is recommended for:

- livestock residing in or near an outbreak;
- animals that will be moved into the area, such as horses transported to trail rides.

Safe handling of deadstock

1. Do not open the body for inspection. Once exposed to air, anthrax changes from a vegetative state to spores. These can be carried on the wind or live in the soil for years.
2. Do not salvage hides, horns, antlers or any other tissue from the carcasses. Anthrax can survive, even if bones are bleached.
3. If possible, it is best to burn the carcass of the dead animal where it lies. If this is not reasonable, it should be buried in a pit 10-feet deep and covered with quicklime.
4. If the animal was housed in a barn, burn the animal’s bedding, manure and the surrounding soil. To disinfect panels, trailers or equipment, use an ammonia-based disinfectant labeled as effective for anthrax. Follow label directions to prevent respiratory irritation.
Foot and Mouth Disease

Top Ten Steps Dairy Producers Can Take Against FMD

We have been receiving a number of inquiries as to what precautions dairy farmers can take to minimize exposure to infectious diseases such as FMD and be better prepared in the event of an outbreak in the U.S.

It is of the utmost importance that every dairy farmer institute a biosecurity plan. Biosecurity is managing the herd to prevent the introduction and spread of infectious diseases. The following is a list of NMPF’s “Top Ten Things Dairy Farmers Should Do to Protect Their Livestock from Infectious Diseases.”

(1) Maintaining a healthy herd with proper biosecurity protections. The best biosecurity protection is a healthy, closed herd.

(2) Do not purchase any animals from any foreign country or source where cattle may have been exposed to a foreign animal disease such as FMD. Likewise, do not purchase replacement animals from domestic sources without determining the herd health status, particularly with regard to emerging cattle diseases such as Johne’s Disease.

(3) Do not allow any visitors on the farm if they have been outside the continental United States in the past two weeks, unless you can verify that
Fact Sheet: Food Security in the Meat and Poultry Industry

As an industry that sells nutritious food to more than 95 percent of Americans, meat and poultry companies place a high priority on ensuring food security. While food security is a new concept for some consumers and the news media, it is not a new concept to meat and poultry processors.

The meat and poultry industry is one of the most heavily regulated and inspected industries in the U.S. and has operated in a secure mode for decades. The security infrastructure that we have built and refined over time to meet a variety of challenges is serving us well given the nation’s heightened state of concern.

Plant Security

Meat and poultry processors recognize that they have an enormous responsibility in providing safe and wholesome products to millions of Americans. Meat and poultry plants by design are closed, secure operations. Fences and security guards are commonplace to ensure that only authorized personnel are permitted to enter plants. Visitors are heavily restricted. The rare person who is granted access to a plant typically may be required to:

- Provide photo identification
- Be escorted
- Remove all jewelry, watches, pagers, telephones and photographic equipment
- Wear special boots, hairnets and sanitary frocks
- Observe all sanitation and microbial control procedures, like washing hands and boots at regular intervals and not entering some parts of the plant at all.

Employees in meat and poultry plants are assigned to particular areas and often wear colored hardhats to designate the areas in which they work. This helps ensure that appropriate staff are in appropriate places. For example, someone who comes in contact with live animals should not be entering a packaging area due to the potential for cross-contamination. Security cameras monitor movement and production within many plants.

Meat and poultry plants in many states also participate in a special program with the Immigration and Naturalization Service that allows employers to do on line employment verification to ensure that employees are legal and presenting valid documents. Programs like these help ensure the integrity and stability of our workforce, which play a vital role in providing safe and wholesome products.

Internal Food Safety Checks Can Serve Food Security Needs

Meat and poultry companies benefit by selling the safest possible meat and poultry. Plants employ a variety of technologies and strategies to ensure safety. These same strategies can be useful in identifying a food security breaches that are physical, chemical or microbiological in nature. They include:

- Veterinary inspection of all animals prior to slaughter to identify suspect or ill animals that may not be fit for human consumption
- Government and private laboratory screening for unusual levels of compounds in animal tissues.
FOREIGN ANIMAL DISEASES

How Can I Protect My Herd?

Foot-and-Mouth Disease (FMD) outbreaks have caused severe animal and economic losses in the United Kingdom, Europe, and other countries. With the proliferation of worldwide trade, animal movement, and travel, it would take only one incursion to spread the virus to other parts of the world. Checkoff dollars have been used to test the U.S. sow herd for foreign animal diseases such as FMD by working closely with government agencies charged with safeguarding the United States. The pork industry is making the necessary resources available to help pork producers protect their herds. The following are some commonly asked questions by pork producers regarding the prevention of foreign animal disease.

How does FMD virus spread?

Bovine-type practices are very important as the FMD virus can be introduced into a herd through a variety of means. These include:

- People wearing contaminated clothes or boots or using contaminated equipment.
- Animals carrying the virus.
- Communicated facility or vehicles.
- Feed or improperly cooked well containing contaminated meat or animal products.
- Hay, straw, bedding, or other materials contaminated with virus.

What are some examples of FMD virus survival times and distances?

Virus survival times depend on temperature, humidity, and other factors. Examples from literature include:

- Building: 4 weeks
- Clothing: 7 weeks
- Feed: 7 weeks
- Ground, water, snow: 7 weeks
- Air (wind): 21 miles
- Human: 24 hours

What is being done in the United States to prevent an outbreak of FMD?

At the national level, the pork industry has worked with other commodity groups, state and federal animal health officials, and veterinarians to ensure implementation of effective prevention measures.
Are you hosting international visitors to your farm?

✔ Did you know that many swine viruses can survive on clothing, footwear or equipment for weeks and in some cases months?
  • Supply a complete set of **coveralls, hairnet and boots**. If they are disposable, immediately collect them in a plastic bag and incinerate them. If they are not disposable, immediately wash them in a solution of chlorine bleach (30 ml of bleach to 1 gallon of water) or other disinfectant.
  • Do not allow cameras, equipment, food items or other items that cannot be properly disinfected into areas where livestock are present.
✔ Visitors should have had **no contact with livestock for at least 48 hours** prior to visiting your pork production site. If visitors are from a Foot-and-Mouth Disease infected country they should **have no contact with livestock for at least 5 days** prior to visiting.
✔ Utilize **shower in / shower out**, if possible.
✔ Supply a **dust mask** for all visitors to wear. The mask should be tight fitting and have two straps to secure it over the mouth and nose.
✔ All visitors should completely **wash their hands**, including **scrubbing fingernails**, with a disinfectant soap prior to entering the farm and again before exiting.
✔ **Control the traffic flow** and allow visitors only in carefully selected areas. Do not allow them to unnecessarily handle the livestock.

Biosecurity
to minimize potential for introduction of disease during pork production site visits
Biosecurity Practices

- Discuss Health Status with Source Herds.
- Isolate New Animals.
- Limit Visitors - Keep Visitor Log.
- Supply Clothing and Boots for Visitors or Shower.
- Require Visitor to Scrub Hands with Disinfectant.
- Allow Only Clean Equipment into Farm.
- Establish Traffic Pattern for People and Pigs.
- Use Clean Trucks.
- Change Clothes Shower After Farm, Fair, Market, or Show Visits
Foreign Animal Disease Biosecurity Precautions

- Limit Visitors - Sign in Log.
- Observe Pig “Free” Times.
  - USDA Recommends Five Days for FMD Countries.
- Do Not Allow Imported Meat Products into Production Area.
- No Clothing or Equipment from International Production Sites.
Security

Guide for Pork Producers

F. Computers

- Restrict access to computers.
- Protect data with virus protection programs.
- Connect critical computers to Uninterruptible Power Supplies.
- Give each user a password and change passwords frequently.
- Use encryption to protect passwords and usernames.
- Set the computer to time out and ask the user to login again after a certain period of inactivity.
- Lock desktop computers and monitors to office furniture using cable locks.
- Protect wiring from environmental damage and tampering using conduit.
- End computer access when an employee is terminated.
- Back up all data frequently.
- Review procedures for backing up critical data systems periodically.
- Test the data security system and procedures periodically.

G. Preparation for an emergency

- Maintain a protocol for triaging and investigating emergencies.
- Identify critical security decision makers to whom employees should report security problems.
- Inform the herd veterinarian immediately if a foreign animal disease is suspected (See Appendix A).
- The herd veterinarian will notify authorities if warranted.
- Post contact information for fire, police, and other emergencies.
- Identify a person in the farm to handle the media and provide them with press statements and briefings.
- Maintain and clearly post an evacuation plan. Give the evacuation plan and a current list of responsible persons to local fire department. Have evacuation drills periodically test the plan.
- Include strategy for continued operation (e.g., alternate facility).
- Keep a current inventory of all hazardous materials and flammable products.
- Maintain an employee roster and visitor log to enable a head count if evacuation is necessary.

Backup records to keep on and off site in case originals are destroyed

- Prioritized list of supplies, equipment, and facilities needed to maintain functions
- Inventory of equipment and supplies (part numbers, quantity kept on hand)
- Accounts receivable
- Accounts payable
- Accounts payable
- List of customer names and contact information
- List of suppliers' names, contact information, items you purchase and how many
- Vehicle maintenance schedules, payment schedules, and registration information
- Exact payroll numbers
Security Guide for Pork Producers

Purpose

- Review current security procedures at farm level

- Increase pork producers’ awareness of security risks

- Develop farm specific security plans that will be effective and efficient

- Enhance farm level security
A. Preventing unauthorized entry
B. Employees
C. Hazardous materials
D. Deliveries
E. Phone threats
F. Computers
G. Preparation for an emergency
H. Recall strategy for semen or pig shipments
I. Agroterrorism
J. Water security
K. Feed
L. Evaluation of security program
Purpose

- Review current biosecurity procedures and identify strengths and weaknesses

- Increase pork producers’ awareness of biosecurity principles

- Promote more cautious behavior if risk cannot be avoided

- Reduce the risk of a new disease agent being introduced into the herd
Biosecurity Guide - Content

- Isolation Biosecurity
  - Facility location
  - Pig flow
  - Personnel
  - Health monitoring and interpretation
  - Acclimation
Biosecurity Guide - Content (cont’d)

- Indirect Spread
  - Facility location
  - Access deterrents
  - Pest and wildlife control
  - Feed
  - Transportation
  - Personnel and visitors
  - Semen
  - Cleaning and disinfecting
  - Carcass removal
  - Supply and product deliveries
Security/Biosecurity Guide - New Inserts

- Semen Supplier Questionnaire
- Security/Biosecurity Considerations for Pigs Exposed to the Outdoors
- Disinfectant Classification Chart
- Detection and Notification Worksheet
- Phone Threat Worksheet
Rapid detection of a foreign animal disease is crucial to prevent the spread of the disease across our nation. The problem grows as the time between infection and detection increases. Producers and veterinary practitioners are on the front lines in defense of U.S. animal agriculture. Pork producers play a vital role in keeping our nation’s food supply secure. Please call your veterinarian immediately if you observe:

- Blisters or vesicles on animals’ snout or feet
- Discoloration of the ears, belly, rump, legs, or tail
- Unusually high number of sick animals
- Unusually high number of deaths
- Unusually high number of lame animals
- Unusually high number of animals with fevers
- Unusually high number of animals not eating
- Unusually high number of animals that do not want to get up

Your veterinarian will contact the State Veterinarian or the Federal Area Veterinarian in Charge (AVIC) if he/she suspects a foreign animal disease. Hundreds of suspected foreign animal disease cases are investigated every year in the United States. Please do not hesitate to call your veterinarian. If you do not have a herd veterinarian, call your State Veterinarian or the AVIC. Investigation of all suspicious illnesses will better protect U.S. animal agriculture than not detecting an outbreak of a foreign animal disease.

For quick reference, write clear directions to your farm in the space provided below.

____________________________________________________________________________________________________________________________________
## Phone Threat Worksheet

**“Listen very carefully. I’m only going to say this once.”**

Most phone threats begin with these words. Keep a copy of this guide by the phone along with a pen and pad of paper. If you receive a phone threat, try to remain calm. Record the call or write notes during and after the telephone call. Try to write down everything that the caller says. The questions below are a guide to help you remain calm while recording information that will be helpful to police for tracing the origin of the threat.

<table>
<thead>
<tr>
<th>Time call began</th>
<th>Time call ended</th>
<th>Length of the call</th>
<th>Caller’s name</th>
<th>Caller’s organization</th>
<th>Threat that was made (in the caller’s words)</th>
<th>Demands that were made</th>
<th>Did the caller say that he or she would call again?</th>
<th>NO</th>
<th>YES</th>
</tr>
</thead>
</table>

**Voice characteristics (Circle those that apply):**

- Accent (NO YES (describe) )
- Speech impediment (NO YES (describe) )

**Gender of caller:**

- MALE
- FEMALE
- UNABLE TO DETERMINE

**How old did the caller sound?**

- CHILD
- TEEN
- ADULT
- SENIOR

**Caller’s attitude:**

- CALM
- EXCITED
- INTOXICATED
- RATIONAL
- IRRATIONAL
- ANGRY
- VULGAR
- OTHER

**Background noises:**

- NO
- YES (describe) ________________

**Did the call sound like it was made from a car or telephone booth?**

- NO
- YES

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**After the call ends:**

1. Hang up the phone.
2. Immediately pick up the receiver again and dial *57 to mark the caller’s call.
3. Call the police and tell them that you have marked the call by dialing *57.
4. Finish filling out this sheet
5. Notify your supervisor.
6. Write your name here_____________________________________________
Current Strategies for Protecting U.S. Animal Agriculture

- Producer/Practitioner Education
  - Awareness
  - Recognition of Reporting Responsibilities

- Research and Diagnostic Development

- National Coordination for Emergency Management
  - Prevent
  - Prepare
  - Respond
  - Recover
NPB Swine Health Research Priorities

- Emerging Diseases and Syndromes
- Biosecurity Research
  - Transmission of Domestic Diseases
  - Transmission of Foreign Animal Diseases
  - Cleaning and Disinfection
- National Biosecurity Center Projects
  - www.biosecuritycenter.org
Emergency Preparedness Research

ARS National Planning Workshop 2001

- Develop knowledge of animal disease characteristics outside of live host.

- Improve methods of disease agent eradication on-farm and in post-harvest processing.

- Develop optimal response mechanisms for large-scale, on-farm animal mortality and product contamination.

- Develop optimal on-farm recovery protocols resulting from catastrophic animal disease.
Current Strategies for Protecting U.S. Animal Agriculture

- Producer/Practitioner Education
  - Awareness
  - Recognition of Reporting Responsibilities

- Research and Diagnostic Development

- National Coordination for Emergency Management
  - Prevent
  - Prepare
  - Respond
  - Recover
NAHEMS

- Joint Federal-State-Industry effort to improve the United States’ ability to address animal health emergencies
Definition of an Animal Health Emergency

- Appearance of a disease with the potential for a sudden negative economic impact through:
  - direct impact on productivity
  - real or perceived risk to public health
  - real or perceived risk to a foreign country which imports from the U.S.
Paradigm Shift in Emergency Management

- From: “Call Government”
- To: “Everyone Has A Role”

“A sense of shared responsibility between the animal industry, practitioners, and State and Federal government animal health officials should replace the attitude of emergency management being solely a Federal responsibility.”

- NAHEMS Steering Committee
Animal Health Emergency Model

- Defines Roles and Responsibilities for Federal, State and Industry Groups for:
  - Prevention
  - Preparedness
  - Response
  - Recovery
Prevention - Producers/Practitioners

- Provide input in development of import policies
- Develop priorities for research
Preparedness - Producers/Practitioners

- Participate in test exercises

- Disseminate educational information
Response - Producers/Practitioners

- Active participants in decisions on quarantine zones, disposal methods, and use of vaccines

- Encourage reporting
Recovery - Producers/Practitioners

- Assure availability of indemnity funds

- Provide feedback to improve future responses
United States National Animal Health Emergency Management System (NAHEMS)

March 2002
Developed by:
The National Animal Health Emergency Management (NAHEM)
Steering Committee

Representing:
American Veterinary Medical Association (AVMA)
Animal Agriculture Coalition (AAC)
American Association of Veterinary Laboratory Diagnosticians (AAVLD)
Federal Emergency Management Agency (FEMA)
National Emergency Management Association (NEMA)
United States Department of Agriculture (USDA)
   Agricultural Research Service (ARS)
   Animal and Plant Health Inspection Service (APHIS)
   Cooperative State Research, Education, and Extension Service (CSREES)
   Food Safety and Inspection Service (FSIS)
United States Animal Health Association (USAHA)
Industry Guidelines

- National Industry Guidelines
- Regional/State/Local Industry Guidelines
National Industry Guidelines

A. Emergency Management Plan
B. Written Agreements
C. Authorities and Policies
D. Surveillance
E. Communication
F. Training and Education
G. Funding
H. Cross-Species Coordination
NAHEMS is a joint state-federal-industry effort to improve the United States' ability to deal successfully with animal health emergencies. These emergencies can range from flood and drought to introductions of deadly foreign animal diseases such as foot-and-mouth disease, hog cholera, or African swine fever.

In addition to addressing the threat of a major foreign animal disease outbreak, NAHEMS looks at bioterrorism, emerging diseases, and diseases that pose a threat to production and international trade.

By being better able to deal with animal health emergencies, we reduce the threat to the nation's food supply and help maintain the economic well-being of U.S. animal agriculture.

Our focus is on four key elements:

- Prevention
- Preparedness
- Response
- Recovery
Conclusion

- Producers are the front-line defense for animal agriculture

- Continued efforts are needed in...
  - National coordination for detection and response
  - National Surveillance System for diseases
    » domestic, emerging, and exotic diseases
Conclusion

- Continued efforts are needed in...
  - Training, Education, and Public Awareness
    » Practitioner training Plum Island, other
    » Increase awareness of the risk
    » Increase awareness of roles
    » Security/biosecurity principles
  - Diagnostic Laboratory Enhancements
  - Research
    » Diagnostic tests
    » Improved vaccines
    » Pathogen ecology and epidemiology