Update to Iowa Foot and Mouth Disease (FMD) and Livestock Emergency Management Plans

James A. Roth, DVM, PhD Center for Food Security and Public Health College of Veterinary Medicine Iowa State University



Two Critical Preparedness Activities to Manage an FMD Outbreak

Managing the disease outbreak

Managing the financial crisis



FMD: The MOST Contagious Disease of Animals

FMD is the major animal disease preventing world trade of animals and animal products

Adults: Mortality is low but morbidity is high

Young animals: High mortality associated with some strains

Not a public health or food safety concern





FMD Causes lesions on Mouth, Feet, and Teats





Foot and mouth disease (FMD)

- Found in Africa, some countries in South America and many countries in Asia and the Middle East
- FMD is endemic in 96 countries



United States has had Nine Outbreaks of FMD

- 1870, 1880 and 1884: Due to importation of infected animals
 - Since development of Federal system of inspection and quarantine of imported livestock, no outbreak has been attributed to admission of live animals
- 1902, 1908, 1914, 1924 (two separate outbreaks) and 1929
- All outbreaks were controlled by stop movement and stamping out



We Must be Prepared to Respond in New Ways





"US livestock industries have changed dramatically since 1929"



Factors Requiring a Change in the Planned Response to FMD

Stamping Out May Not be an Option

- Very large herd sizes
- Extensive movement of animals
- Public resistance to stamping out
- Environmental concerns with carcass disposal
- Increased numbers of deer and feral swine



Day 1 of an FMD Outbreak

- Notification of World Organization for Animal Health (OIE) and member countries
 - All exports of cattle, swine, sheep, goats and their uncooked products will be STOPPED
- Control Area(s) established to manage movements
- Prices will drop
- Consumer confidence at risk



Percent of Federally-Inspected (F.I.) Beef and Pork Exported from the U.S. 1988-2016



Beef, pork, and dairy exports = ~ \$19 billion/year Cost of treatment, control and eradication = ?? Commodity prices would drop dramatically

SECURE FOOD SUPPLY PLANS

Source: http://www.qtagonline.com/ginzel-weekly-hog-pork-report-4-8-2016/

Time to Regain FMD Freedom



Economic Impacts of FMD

- Center for Agricultural and Rural Development Food and Agricultural Policy Research Institute (CARD FAPRI) model (Dr. Dermot Hayes) (2011)
 - Cumulative losses over 10 years = \$199.8
 Billion
 - Pork 57 Billion
 - Beef 71 Billion
 - Poultry 1 Billion
 - Corn 44 Billion
 - Soybeans 25 Billion
 - Wheat 1.8 Billion



Iowa has More at Stake than any Other State

- Most livestock dense state (26 million FMD susceptible animals)
- Number 1 in corn and (often) soybean production
- Many Iowans employed in production and processing industries
- State tax revenues dependent on agriculture



Managing the Financial Crisis

- Dramatic decrease in livestock and grain commodity prices
- Decrease in land prices
- Drop in employment in production, processing, and agriculture support industries
- Decrease in tax revenues



Tools for Control of FMD

- Stop Movement
- Biosecurity
- Stamping Out
 - Depopulate all clinically affected and in-contact susceptible animals (within 24 hours or as soon as possible)
- Trace-back/Trace-forward
 28 days prior to outbreak
- Rapid Diagnostics
- Vaccination
 - Strain specific: Requires 23 different vaccines to cover all strains



In Shipments of Hogs to All U.S. States, Iowa



SECURE FOOD SUPPL

Figure 4. Concept of Pig Flow



Secure Food Supply Plans

Federal, State, Industry, and Academic Partnerships



Secure Food Supply Plans

Movement from Premises with No Evidence of Infection

HPAI

- Secure Egg Supply
- Secure Turkey Supply
- Secure Broiler Supply

FMD

- Secure Milk Supply
- Secure Beef Supply FMD, CSF & ASF
 - Secure Pork Supply*

All funded by USDA APHIS *Some funding also provided by National Pork Board





Control Area Established Around Each Infected Premises

Secure Food Supply Plans work toward enabling movement of animals or products from flocks/herds with no evidence of infection in a Control Area





Common Components of Secure Food Supply Plans

- Guidelines only
- Voluntary pre-outbreak preparedness
- Biosecurity
- Surveillance
- Epidemiology questionnaires
- Movement permit guidance
- Risk assessments
 - Completed and in process



Potential Types of an FMD Outbreak



Response Shifts from Emphasis on Stamping-Out to Emphasis on Alternate Strategies (duration of FMD response)



The US does not have an Adequate Source of FMD Vaccine for an Emergency Response

FMD Vaccine

- Killed virus vaccine
- 7 distinct serotypes
 - Not cross protective
 - Approximately 65 Subtypes
 - Cross-protection varies between strains within a serotype
 - 23 strains are recommended for FMD vaccine banks
 - Essential to isolate virus and identify serotype to select correct vaccine

North American FMD Vaccine Bank

- Vaccine antigen concentrate (VAC) currently held by NAFMDVB is intended to be shared by U.S., Canada, Mexico
- Vaccine manufacturers can produce 2.5 million doses in 21 days upon receiving VAC from NAFMDVB
 - Iowa: 3.9 million cattle, 20.8 million hogs
- Additional vaccine* production can take as long as 14 weeks

*Created from a master seed and not currently stored as VAC



Animal Ag Coalition has Requested Annual funding in the next farm bill

- -\$150 million to establish an adequate FMD vaccine stockpile
- -\$30 million to enhance the National Animal Health Laboratory Network's (NAHLN) ability to respond to a foreign animal disease emergency
- –An additional \$70 million be made available to states to increase response capability through block grants administered by APHIS



Highly Pathogenic H5N2 Avian Influenza in Iowa, 2015

Estimated \$1.2 billion impact on Iowa economy Nearly \$1.0 billion cost to federal government

Total Poultry Affected	31,502,052
Layers	24,725,086
Pullets	5,624,336
Turkeys	1,128,729
Hatchery	18,791
Backyard Flocks	5,110

April 13 to June 16, 2015

77 infected sites

- 6 "Backyard" sites
- 71 Commercial sites

Major problems with carcass disposal



http://www.iowaagriculture.gov/AvianInfluenza.asp

Recommended Enhanced Biosecurity for Producers

New biosecurity recommendations emphasize four concepts that may be new to most biosecurity plans and should be strongly considered for implementation in all commercial operations:

- 1. Biosecurity Manager
- 2. Written site-specific biosecurity plan
- 3. Line of Separation
- 4. Perimeter Buffer Area



Biosecurity Self-Assessment Checklist

- Biosecurity Manager and Written Plan
- Training
- Protecting the Herd
- Vehicles and Equipment
- Personnel
- Animal and Semen Movement
- Carcass Disposal
- Manure Management
- Rodent, Wildlife, and Other Animal Control
- Feed



Self-Assessment Checklist for

Enhanced Pork Production Biosecurity: Animals Raised Indoors



1

http://www.cfsph.iastate.edu/Secure-Food-Supply/



milk, turkey, and pork projects have been in



Center for Food Security and Public F State University 2017 Voluntary Implementation of the Components of the SFS Plans Before an Outbreak

- Reduces the likelihood that a herd will become infected with the FAD
- Enables movement of animals sooner after the start of the outbreak
- Contributes to the overall successful control of the outbreak



Questions or Comments? jaroth@iastate.edu

"The Gentle Doctor" by Christian Peterson Iowa State University, College of Veterinary Medicine