Economic Impacts of FMD in the United States

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History

• 2011 Checkoff hosted a FAD Economics Working Group
• Cross representation of State, Federal and industry stakeholders and economists
• Objectives
  – Identify economic costs of response polices
  – Identify inputs for economic models to help in industry decision making
Participants

- Mr. Bobby Acord (Consultant National Pork Producers Council)
- Dr. Dermot Hayes (Iowa State University)
- Dr. Steve Meyer (Paragon Economics)
- Dr. Jim Roth (Iowa State University)
- Dr. Liz Wagstrom (University of Minnesota)
- Mr. Cody McKinley (Iowa Pork Producers Council)
- Dr. Gay Miller (University of Illinois)
- Dr. David Schmidt (Iowa Department of Agriculture and Land Stewardship)
- Dr. Bill Hartmann (Minnesota Board of Animal Health)
- Mr. Doug Metcalf (Indiana State Board of Animal Health)
- Dr. Ann Seitzinger (USDA APHIS VS)
- Dr. Harry Snelson (American Association of Swine Veterinarians)
- Dr. John Zack (USDA APHIS VS Emergency Management and Diagnostics)
Key outcomes

• The Phase and Type of the outbreak is important

• Stamping out not economically viable for widespread catastrophic outbreak
Outcomes

- In order to ensure economic viability the pork industry must place a high priority on the development of criteria and the facilitation of agreements to allow interstate movements of swine during all phases and types a foreign animal disease outbreak.
Outcome

• Develop an economic model that looks as cross commodity impacts of FMD.
  
  – Checkoff contracted with Dr. Dermot Hayes and Center for Agricultural and Rural Development Food and Agricultural Policy Research Institute (CARD FAPRI) to do this study
So what are the economic impacts of FAD's? 

- Previous studies looking at losses to producers and processors shed some light
Supply reductions, export restrictions, and expectations for hog returns in a potential classical swine fever outbreak in the United States

- Paarlberg et al.
  
  Losses for hogs, including the value of animals destroyed, range from $2.6 billion to $4.1 billion

Impacts of Regionalization of a HPAI Outbreak in the United States

• Paarlburg et al.
  – Returns to capital and management in the poultry meat and egg sectors would fall between $602 million and $853 million

Paarlberg PL, Hillberg Seitzinger, Lee JG
Economic Impacts of Regionalization of a HPAI Outbreak in the United States Journal of Agricultural and Applied Economics, 2007 vol. 39 issue 02

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Economic Impacts of Foreign Animal Diseases (FMD)

- Paarlberg et al.
  - Total losses to livestock related enterprises over 16 quarters range between $2.8 Billion and $4.1 Billion

Updated SSRA for NBAF

- Estimated unintentional release of FMD would cost between 16 B to 140 B dollars.
Potential revenue impact of an outbreak of foot-and-mouth disease in the United States

- Paarlberg et al.
  - Estimated decrease of $14 billion (9.5%) in US farm income.
  - Losses in gross revenue for each sector

Philip L. Paarlberg, PhD; John G. Lee, PhD; Ann H. Seitzinger, PhD Potential revenue impact of an outbreak of foot-and-mouth disease in the United States JAVMA, Vol 220, No. 7, April 1, 2002
Economy Wide Impact of a Foreign Animal Disease

Dermot Hayes, Jacinto Fabiosa, Amani El Obeid and Miguel Carriquiry
Overview

• Purpose
• The scenario
• Methodology
• Assumptions
• Results
Purpose

• To calculate the economic impact of a FAD on the US economy
• To measure the costs of such an outbreak on all commodities and on employment
• To measure the benefit of any measure that would eliminate or reduce the probability of such an event
The Scenario

• US feral hogs or deer are infected by accident or by a terrorist act
• The US loses all export markets for beef and pork over a ten year period
• The meat that would have been exported is consumed in the US
• Importing countries switch to chicken and to pork and beef from other countries
• At first prices fall and eventually the industry downsizes
Methodology

• FAPRI produces an annual baseline where it projects worldwide production, consumption and trade in temperate agricultural crops
• This baseline projects continued increases in US beef and pork exports
• Shock this model by restricting US beef and pork exports and then allow the model to find a new equilibrium
• Compare baseline and scenario
Methodology

• Complete elimination of US beef, pork and live animal exports
• Prices on US livestock and meat markets fall to encourage the US consumer to eat the additional meat
• The model shows that US meat imports fall to almost zero
• Livestock producers react to low prices and eventually cut back on production
• Markets reach a new equilibrium in 2016
Figure 1. Impact of FMD on Beef Prices and Net Revenue of Beef Producers

- Percent Change in the Price of US Steers and Heifers
- Percent Change in the Revenue of the US Beef Industry
Figure 2. Impact of FMD on Hog Prices and Net Revenue of Pork Producers
Impact on Net Returns in Pork
(Average annual loss is $1.8 billion)
Net revenue and gross revenue

• The earlier slides show net revenue i.e. profit
• But employment depends on gross revenue because input industries also provide employment
• The next slides show total revenue impacts
Impact of FMD on US beef Industry Beef
Cumulative Lost Value = $71 Billion
Impact on the Pork Industry
Cumulative Loss = $57 Billion
Revenue in Poultry Falls by one billion dollars
Corn and soybean revenues

- Corn prices fall by about $0.20 per bushel and soybeans by $0.60 per bushel
- These price impacts last for the entire period
- Cumulative revenues for corn growers fall by $44 billion and by $24.9 billion for soybean producers
Impact on Corn Prices

Dollars Per Bushel

Baseline
FMD Scenario
Impact on Soybean Prices

Dollars per Bushel

- Baseline
- FMD Scenario
Employment

• The cumulative impact on both sectors over the ten year period is $128.23 billion and average $12.8 billion per year. The USDA has estimated that each billion dollars of export value supports 4,528 jobs directly and 12,000 jobs throughout the economy (Edmonson, 2008)

• Using this as a measure of the labor intensity of these industries the annual jobs impact of a $12.8 billion reduction in industry revenue is 58,066 in direct employment and 153,876 in total

• Compare this job loss with total US based GM employment (salaried and hourly) of 79,000.
Distribution of Dec 2012, Lean Hog Futures Prices as Implied by Futures and Option Prices on the CME, November 17th, 2011. (Futures Price $81.5 Options Implied Volatility 19.5%)
Value of eliminating this possibility

• The option data suggests a 0.76 percent chance of a price reduction of 50% or greater
• This suggests that the CME traders believe that there is a less than 1% chance that this will occur in 2012.
• If we multiply the probability of an outbreak (0.76%) by the expected reduction in net revenues in the event of an outbreak ($1.8) billion, then the burden of this disease can be estimated at $137 million per year
• In other words, the possibility of this disease adds an expected cost to the US Pork industry of $137 million per year
• It would be worth at least this much to US pork producers to eliminate the possibility of a disease outbreak or to buy insurance that protect margins in the event that the disease occurs.
Underscores importance of:

- Nationally coordinated and internationally recognized livestock disease surveillance system
- Funding for vaccine research, development and production for FMD and other FADs.
- Developing robust secure food supply plans
- Developing risk mitigation measures for producers such as catastrophic animal disease insurance