Risks and Consequences of an Introduction of a Foreign Animal Disease into the U.S.

Cow-Calf Council

Dustin Pendell

December 7, 2016

Kansas State University | Department of Agricultural Economics

Infectious Diseases

- Almost 60 percent of known human pathogens are of animal origin (Woolhouse and Gaunt, 2007)

- On average, a new disease has emerged or re-emerged each year over the past several decades with 75 percent of these being zoonotic (King, 2004)

- Between 1940 and 2004, found that of 60 percent of EIDs in the United States were zoonotic, with 72 percent originating in wildlife (Jones et al., 2008)

Infectious Diseases

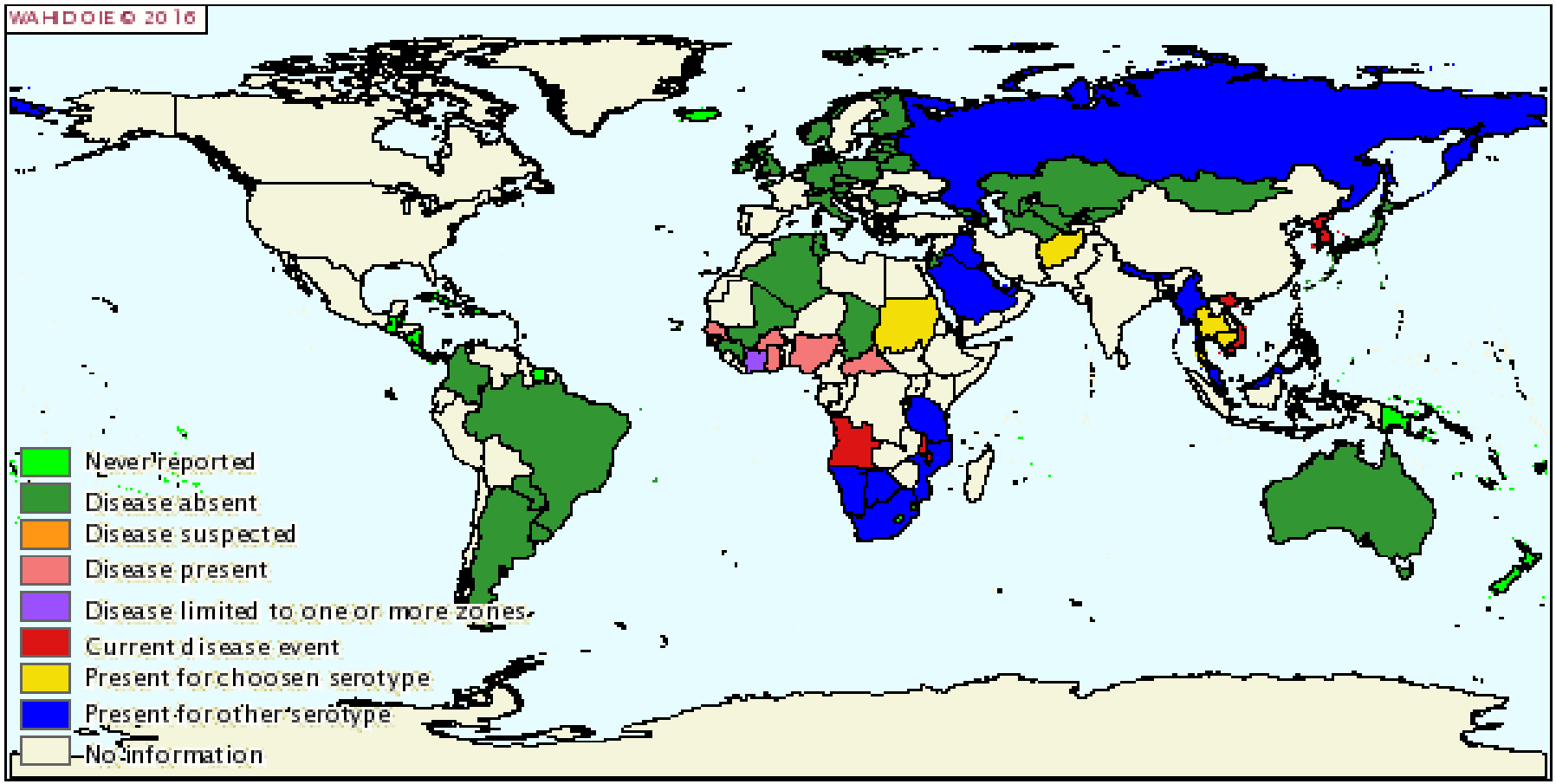
- Increasing EIDs are a result of three drivers:
  - Ag. and food systems
    - Spatial livestock production, mixed biosecurity, trade
  - Ecosystems
    - Land use and climate change
  - Human living environment
    - Population, standard of living, travel

How big is the risk? We worry about opening the border to chilled beef from Brazil. Can we put the risks of an outbreak of FMD or other diseases in perspective?

Foot-and-Mouth Disease: Why Do Care?

- Highly contagious and morbidity
  - Most important livestock disease in terms of economic impacts
- Occurrence throughout the world
- World travel and globalization

Foot-and-Mouth Disease Occurrence



Source: OiE

International Tourist Arrivals, 2015

World: 1,194 million
Americas: 191 million
United States: 120 million

Source: UN World Tourism Organization

FMD Risk from Imported Beef

- USDA conducts a risk analysis as a decision-making tool
- Risk assessment:
  - Release assessment
  - Exposure assessment
  - Consequence assessment
  - Risk estimation

If one is introduced, what are the options for control?

Options for Control

- Animal movement bans
- Set up zones
  - Infected, Buffer, Surveillance
- Stamping-out
  - Known infected and in-contact susceptible

Options for Control

- Stamping-out with Modified Emergency Vaccination
  - Emergency vaccination to kill
  - Emergency vaccination to slaughter
  - Emergency vaccination to live
- Emergency Vaccination to Live without Stamping-Out

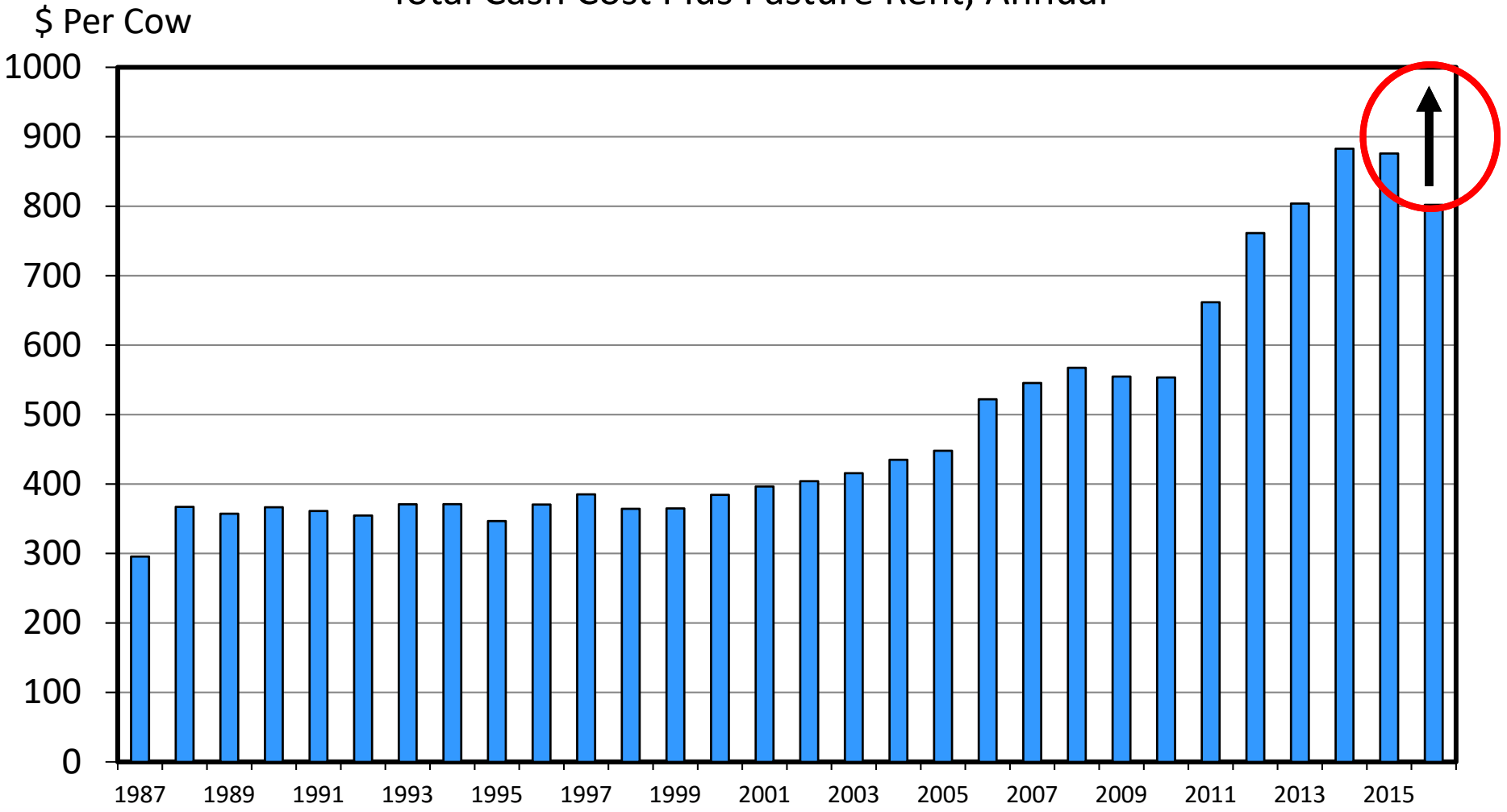
How big a step-up in bio-security would individual operations have to put in place, and what would they look like?

Bio-Security Measures

- Increased active surveillance by producers, among other biosecurity measures…

ESTIMATED AVERAGE COW CALF COSTS

Total Cash Cost Plus Pasture Rent, Annual

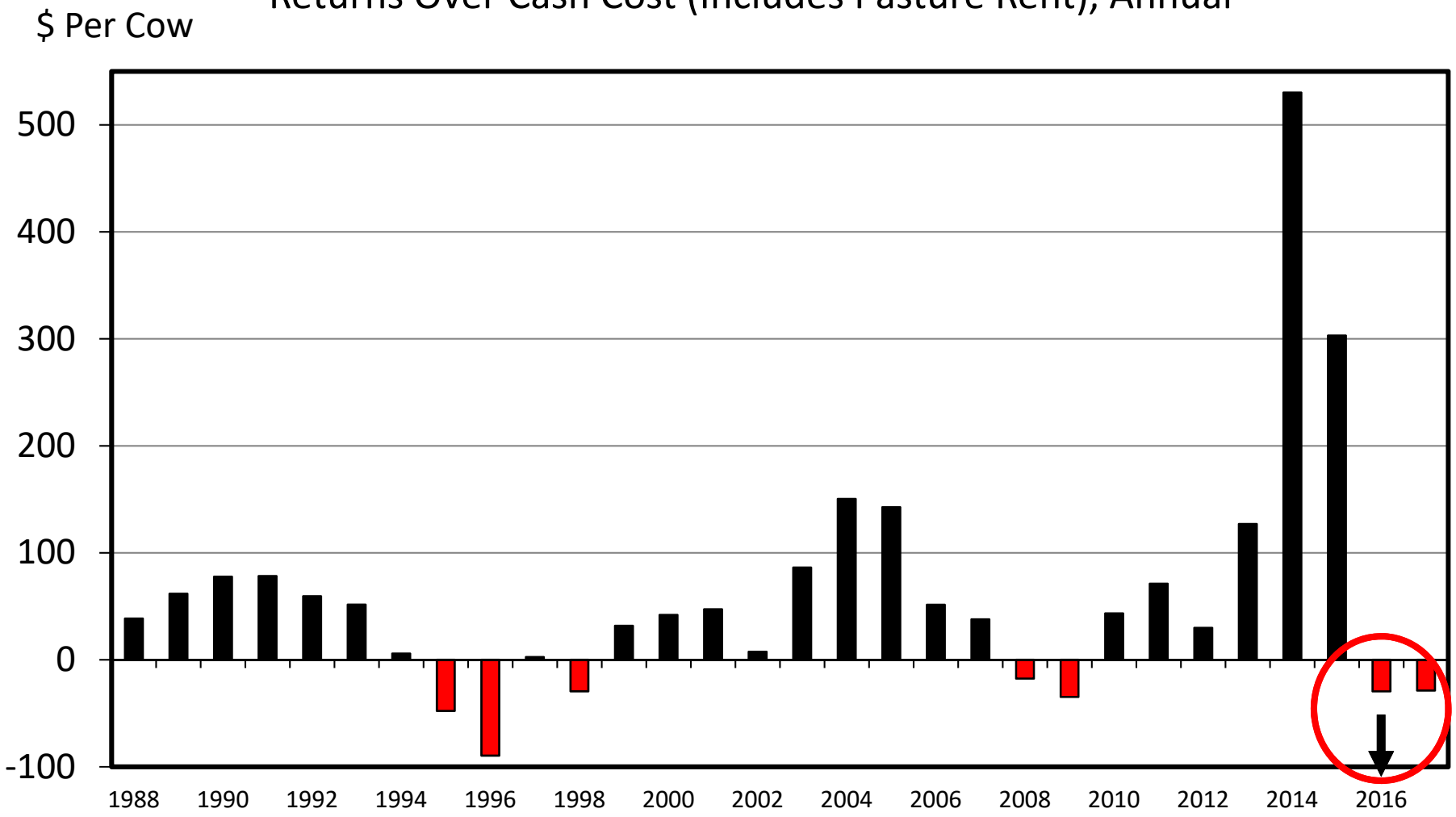


Data Source: USDA & LMIC, Compiled by LMIC

Livestock Marketing Information Center

ESTIMATED AVERAGE COW CALF RETURNS

Returns Over Cash Cost (Includes Pasture Rent), Annual



Data Source: USDA & LMIC, Compiled by LMIC

Livestock Marketing Information Center

ral Economics

C-P-66
11/01/16

What happens if it gets into the wildlife population?

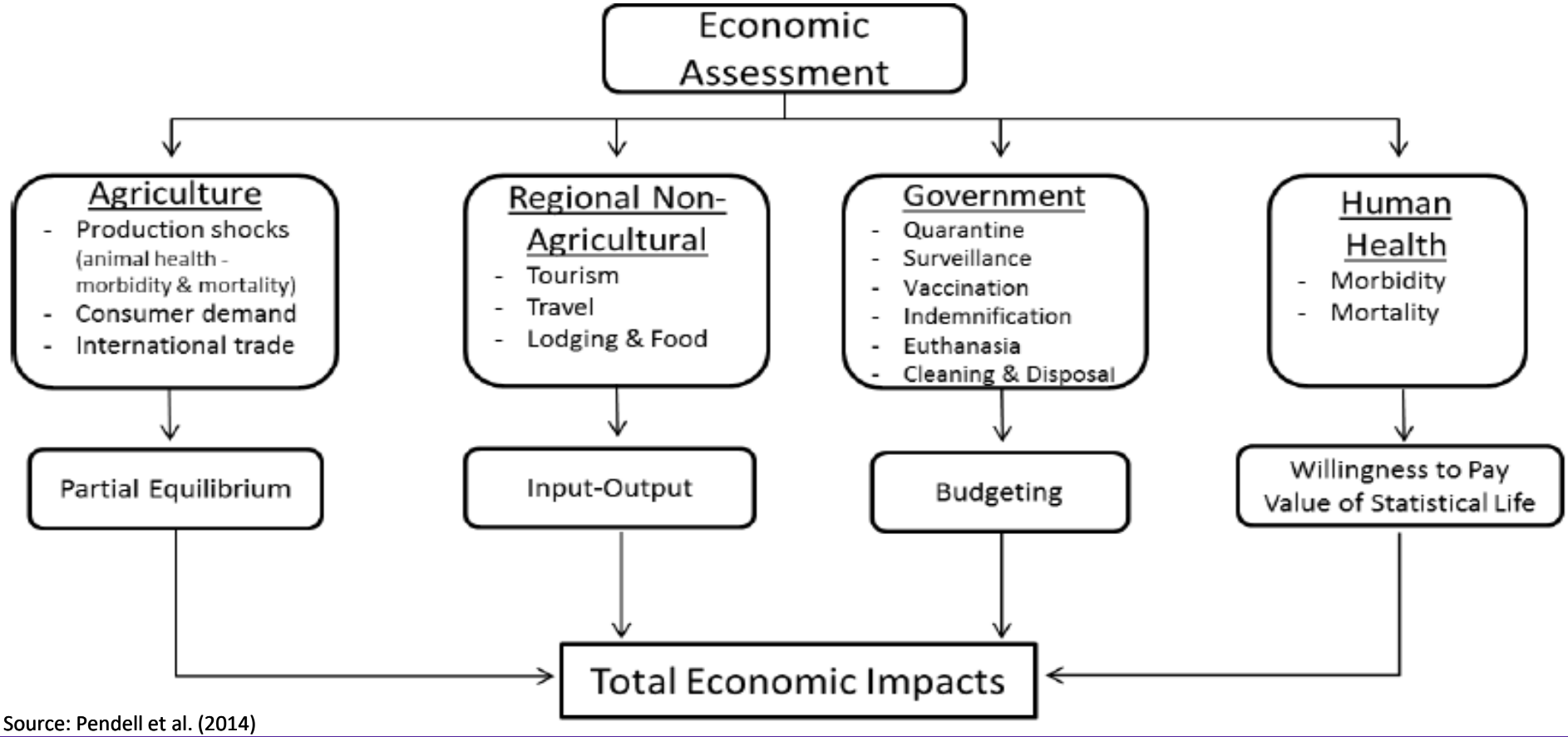
Wildlife Population

- Travel bans
  - Animal and human
- Outdoor recreation in Nebraska
  - $2.4 billion in annual economic impact in 2015
    - Hunting - $848 million; 8,856 jobs
    - Fishing - $324 million; 3,076 jobs
    - Wildlife Viewing - $722 million; 4,818 jobs
    - State Parks - $749 million; 8,199 jobs

source: Nebraska Game and Parks Commission (2015)

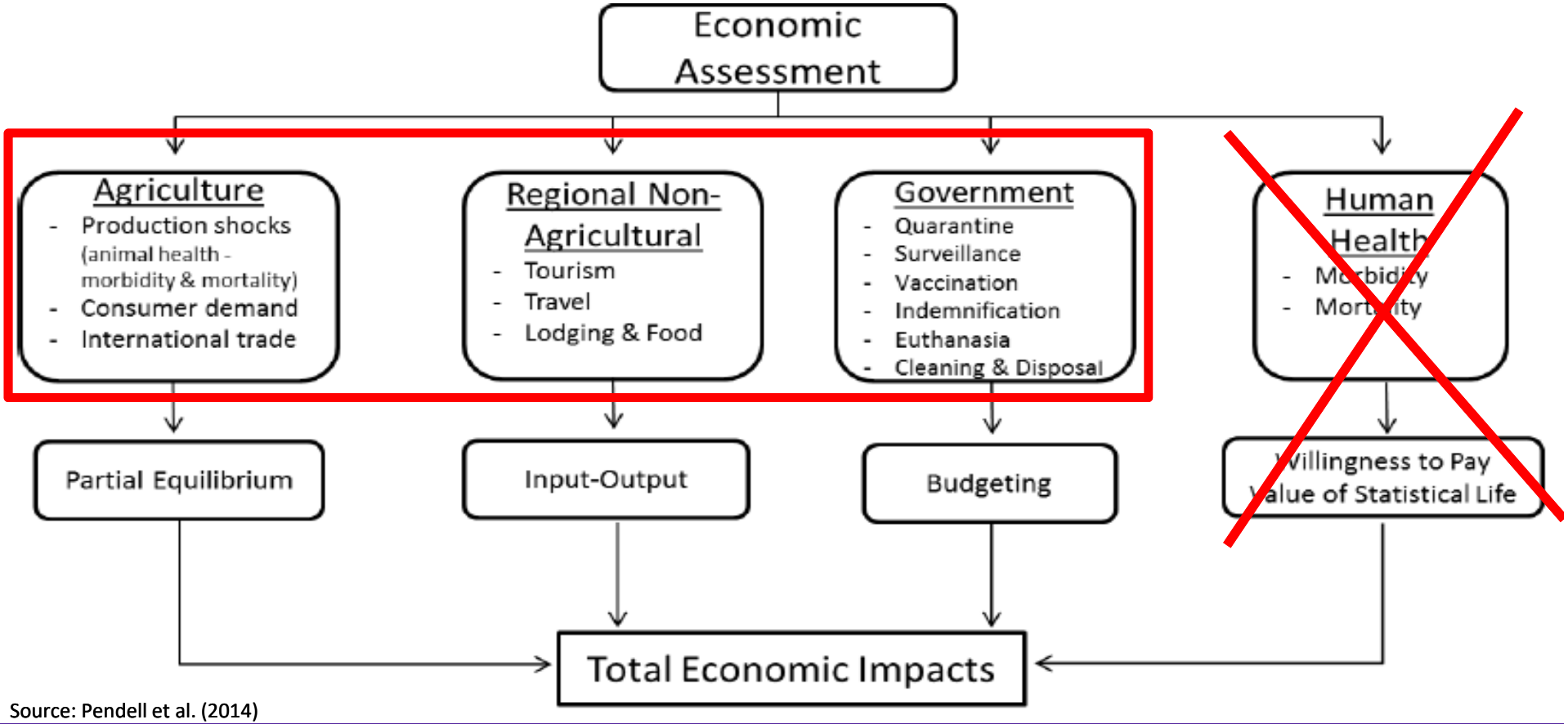
What are the economic consequences of an outbreak in terms of the market, consumer fears, global exports, and trade between regions?

Foot-and-Mouth Disease: Economic Implications



Source: Pendell et al. (2014)

Foot-and-Mouth Disease: Economic Implications



Source: Pendell et al. (2014)

U.S. Production

- Hard to say…
  - Disease spread
    - Limited vs. widespread
  - Disease control methods
    - Stamping-out

U.S. Consumer Response

- Can be a major driver of economic impacts

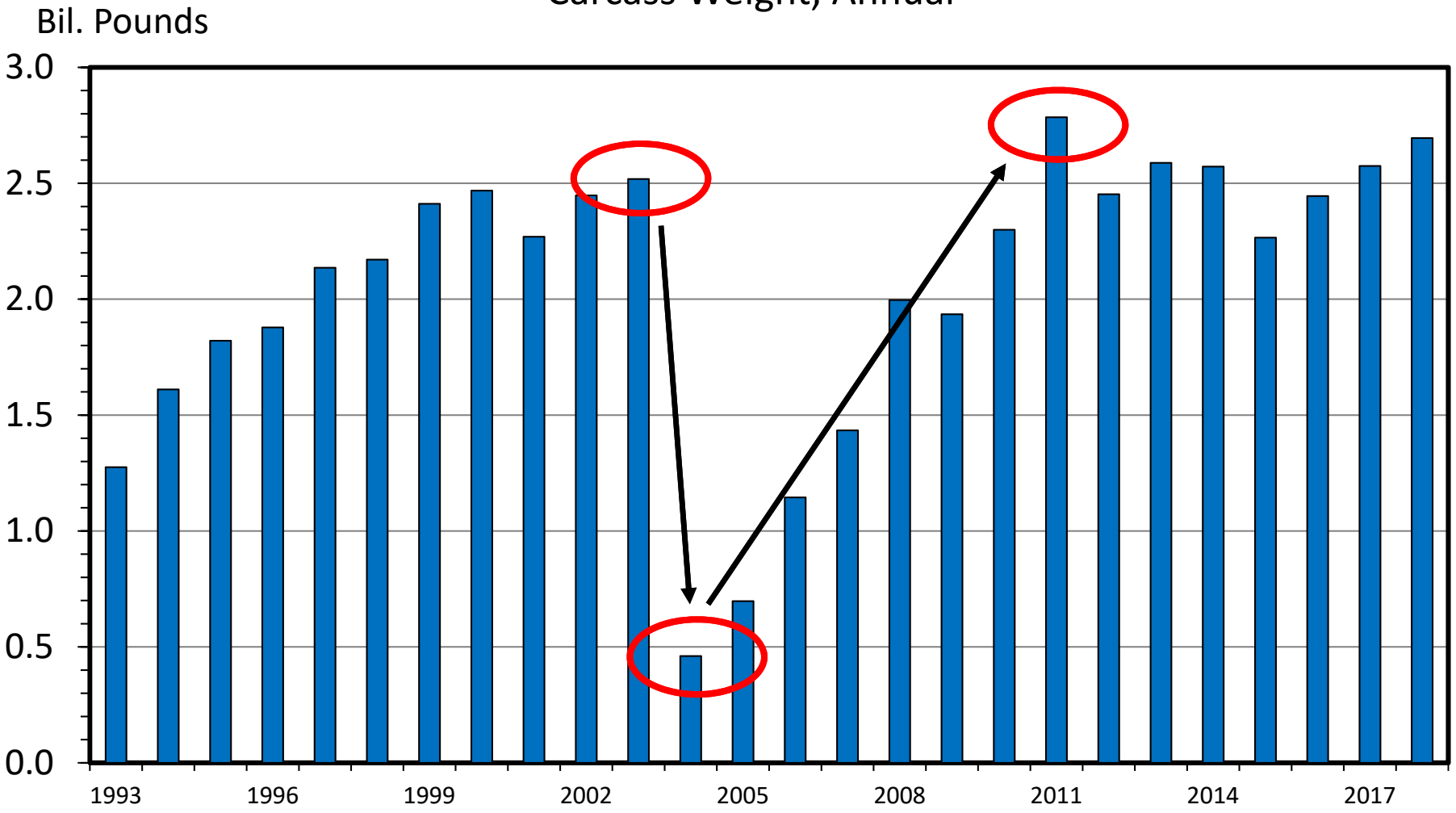
- Studies have quantified consumer demand impact to livestock/meat disease outbreaks and food safety events
  - Small and short lived
    - UK consumers decreased meat consumption by 2.7% decline (between 2001/02)

International Trade

- Another major driver of economic impacts
  - Extent and duration of export loss/recovery
- Export recovery and 2003 BSE event
- International FMD outbreaks
  - 2001 UK: Recovery was slow and lasted well after UK regained FMD-free status under OIE
  - 2001 Netherlands: Recovery was fast

US BEEF AND VEAL EXPORTS

Carcass Weight, Annual

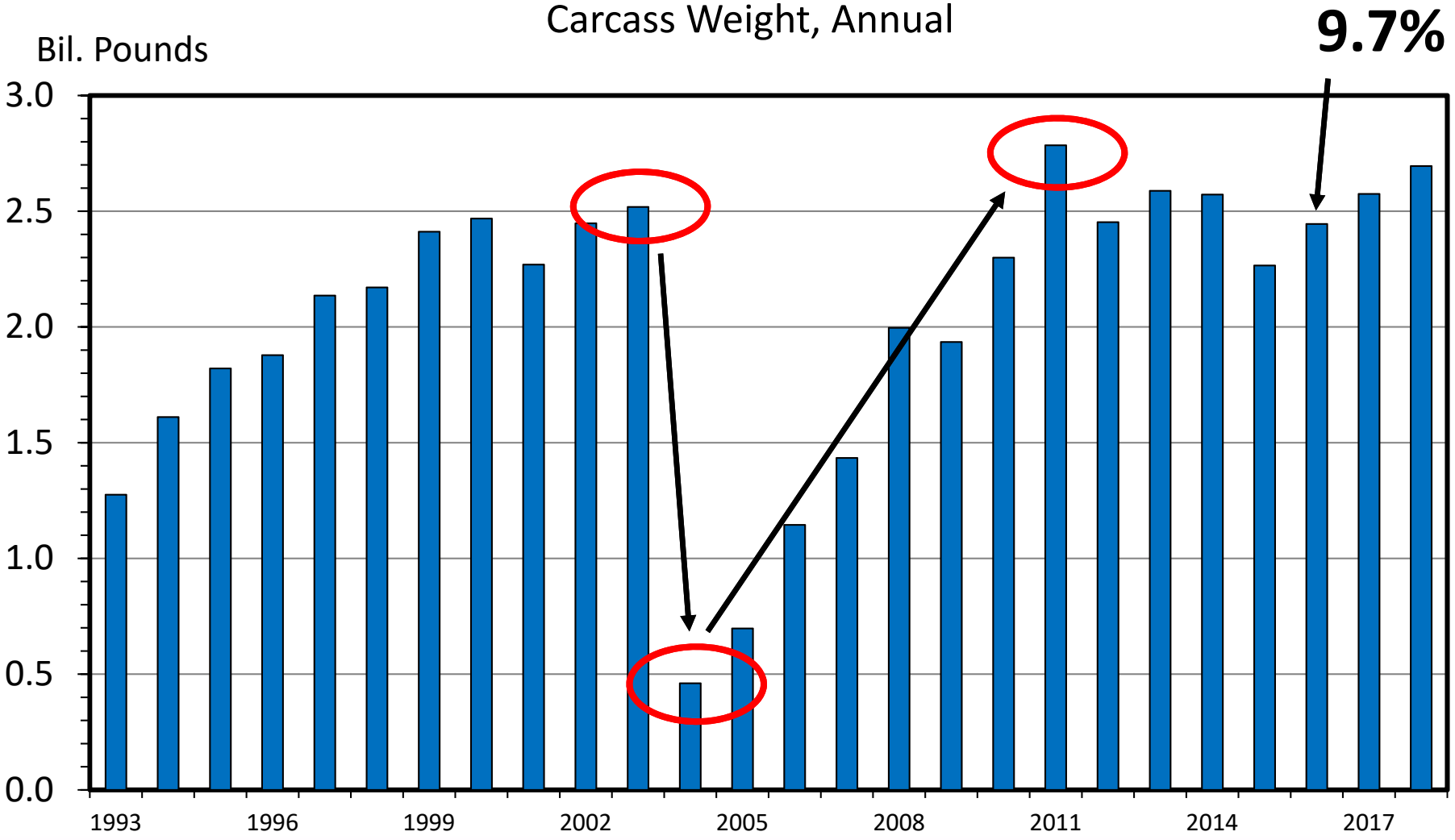


Data Source: USDA-ERS & USDA-FAS, Compiled & Analysis by LMIC

Livestock Marketing Information Center

US BEEF AND VEAL EXPORTS

Carcass Weight, Annual



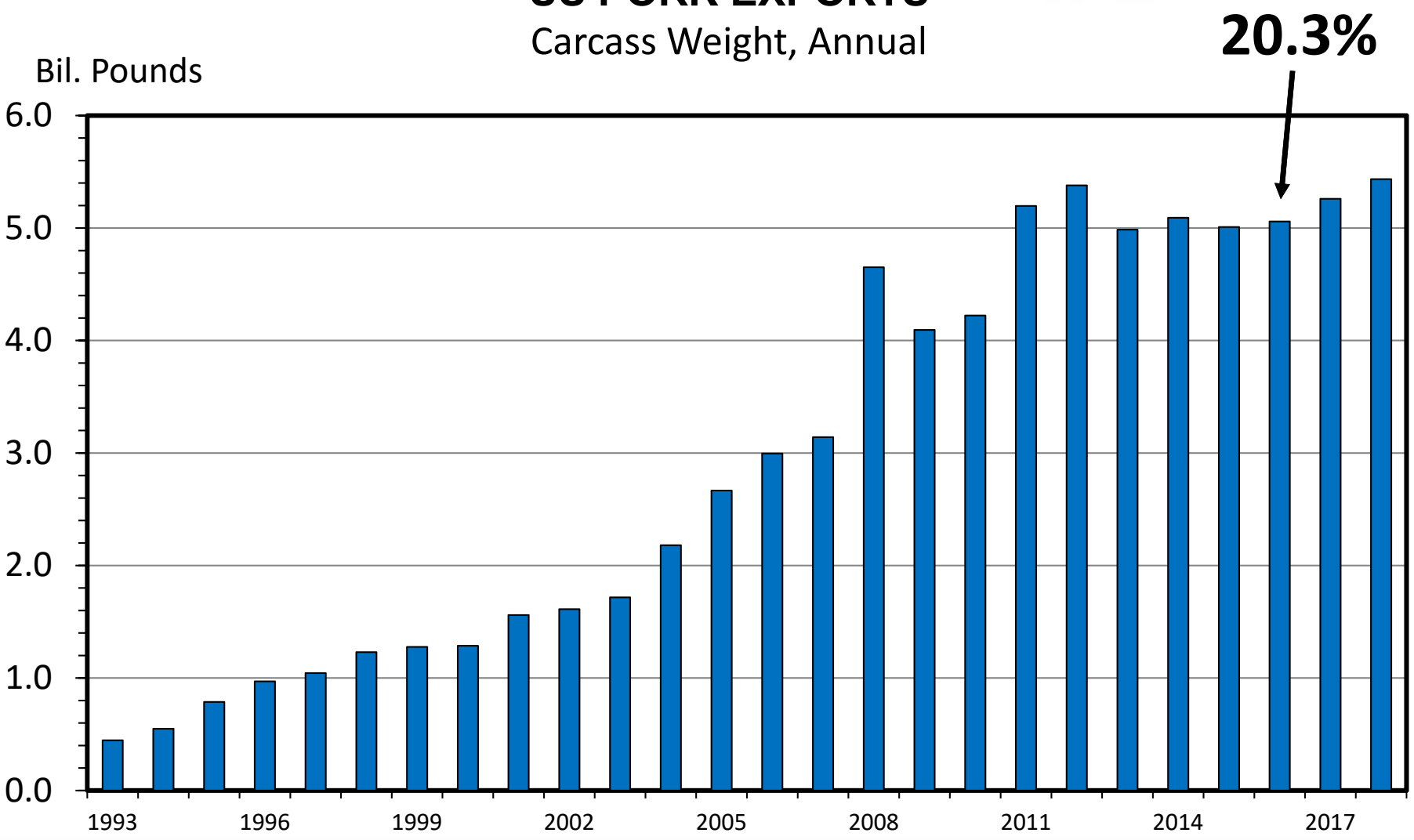
Data Source: USDA-ERS & USDA-FAS, Compiled & Analysis by LMIC

Livestock Marketing Information Center

ural Economics

US PORK EXPORTS

Carcass Weight, Annual

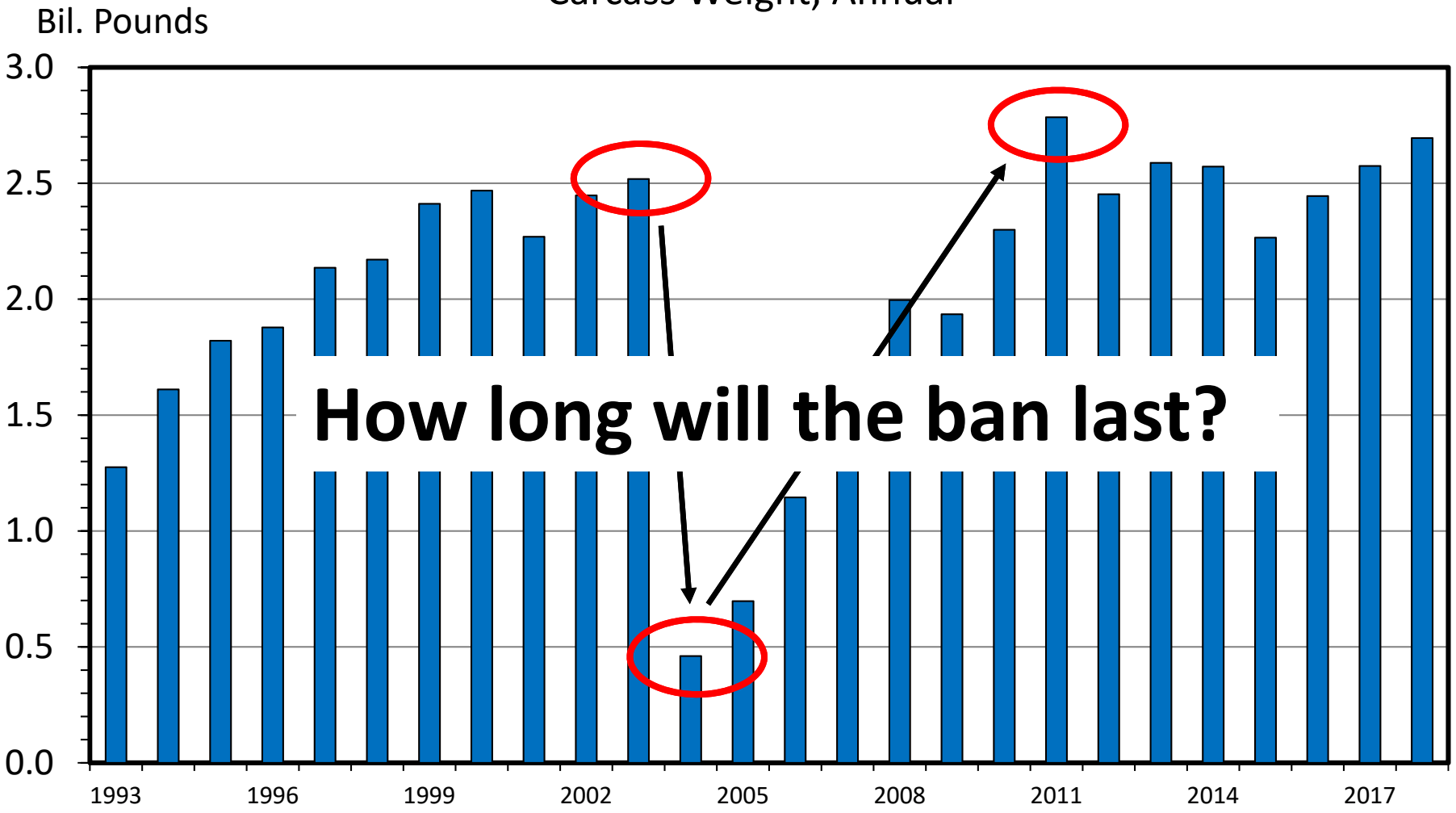


Data Source: USDA-ERS & USDA-FAS, Compiled & Analysis by LMIC

Livestock Marketing Information Center

US BEEF AND VEAL EXPORTS

Carcass Weight, Annual



Data Source: USDA-ERS & USDA-FAS, Compiled & Analysis by LMIC

Livestock Marketing Information Center

ural Economics

Previous FMD Research

- 2001 UK
  - Lasted 221 days, 2,026 cases, 6 million destroyed
  - 10 day span, 24,500 sheep entered Longtown market
  - 57 premises infected by February 20th
  - 119 premises infected by February 23rd
- Thompson et al. (2002)
  - Direct losses of tourism were equal to the losses to the agricultural sector
  - Indirect effects to tourism were 20 times larger than indirect effects to agriculture

Study Region

Epidemiology Results

Sector	Animals Depopulated (million head)	Animals Vaccinated (million head)
Feedlot cattle	0 – 12.3	0 – 8.3
Beef cows	0 – 0.3	0 – 21.9
Dairy cows	0 – 1.2	0 – 1.7
Swine	0 – 14.8	0 – 30.9
Sheep	0 – 0.1	0 – 2.1
Duration (days)	0 – 533	

Results: Economic - General Observations

- Total losses range from about $16 to $140 billion in damage
  - Producers share the largest burden in losses ($19 to $64 billion)
  - Consumers realize negative or positive effects (-$62 to +$4 billion)
  - Regional non-ag. losses ranged from under $1 to over $6 billion
  - Indemnification costs range from $0.004 to nearly $10 billion
  - Non-indemnification costs $0.001 billion to over $5 billion

Recap

- Size of risk. Put the risks in perspective?
- Options for control
- Bio-security in individual operations
- Wildlife population
- Economic consequences

Risks and Consequences of an Introduction of a FAD into the U.S.

Cow-Calf Council

Dustin L. Pendell
Associate Professor
dpendell@ksu.edu
www.agmanager.info