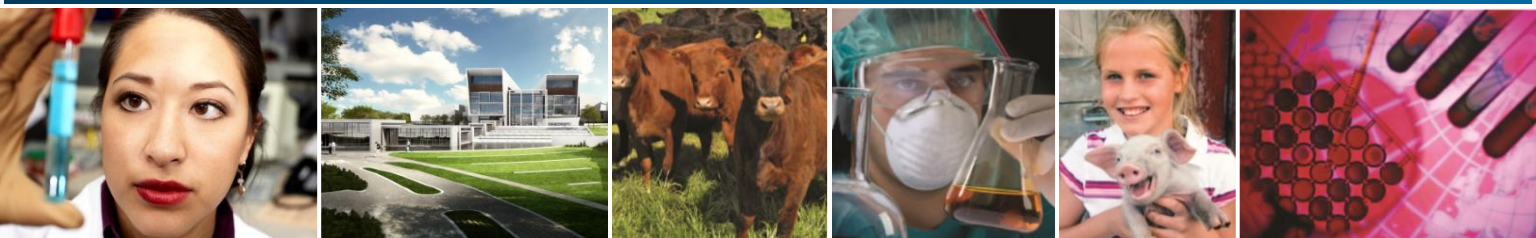




Updated Site-Specific Biosafety and Biosecurity Mitigation Risk Assessment



February 2012
Final Report

Executive Summary



**Homeland
Security**

Science and Technology Directorate

Defending America Against Foreign Animal Diseases

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Table of Contents

Glossary of Acronyms and Terms iii

ES-

Executive Summary 1

 NBAF Background 1

 Risk Assessment Process Summary 3

 Conclusions 4

 Large Animal BSL-4 Assessment 8

 Recommendations 8

Acknowledgements 11

Bibliography 27

Figures

ES-

Figure ES-1: Proportion of Risk Space by Pathway for FMD 5

Figure ES-2: Cumulative Probability of FMD Infection over the 50-Year Operating Lifetime of the NBAF .. 7

Tables

ES-

Table ES-1: Updated SSRA Recommendations Summary 9

Glossary of Acronyms and Terms

AAALAC	Association for Assessment and Accreditation for Laboratory Animal Care
AAHL	Australian Animal Health Laboratory
ABSL	Animal Biosafety Level
APHIS	Animal and Plant Health Inspection Service
APHIS-VS	Animal and Plant Health Inspection Service – Veterinary Services
ARF	Aerosol Release Fraction
ARS	Agricultural Research Service
AUSVETPLAN	Australian Veterinary Emergency Plan
ACVP	American College of Veterinary Pathologists
BDM	Biotechnology Development Module
BEA	Bureau of Economic Analysis
BMBL	Biosafety in Microbiological and Biomedical Laboratories
BRI	Biosecurity Research Institute
BSAT	Biological Select Agents and Toxins
BSC	Biological Safety Cabinet
BSL	Biosafety Level
CAFO	Concentrated animal feeding operation
CDC	Center for Disease Control (aka CDCP)
CDCP	Center for Disease Control and Prevention (aka CDC)
CEAH	Centers for Epidemiology and Animal Health
CFSPH	The Center for Food Security and Public Health
cGMP	current Good Manufacturing Practices
CSCHAH	Canadian Science Centre for Human and Animal Health
CSIRO	Commonwealth Scientific and Industrial Research Organization
CUP	Central Utility Plant
cwt	Hundredweight
D&B	Dunn and Bradstreet
DADS	Davis Animal Disease Simulation
DEFRA	United Kingdom, Department of Environment, Food and Rural Affairs
DHS	Department of Homeland Security
DoD	Department of Defense
DOT	Department of Transportation
DSAT	Division of Select Agent and Toxins
DTRA	Defense Threat Reduction Agency
DVM	Doctor of Veterinary Medicine
EDS	Effluent Decontamination System
EIS	Environmental Impact Statement

EOPs	Emergency Operations Plans
EPA	Environmental Protection Agency
EPCRA	Emergency Planning Community Right-to-Know Act
ERA	European Centre for Medium-Range Weather Forecasts Re-Analysis
ERA-Interim	European Centre for Medium-Range Weather Forecasts Interim Re-Analysis
ERP	Emergency Response Plan
ERS	Economic Research Service
EU	European Union
FAD	Foreign Animal Disease
FADD	Foreign Animal Disease Diagnostician
FADDL	Foreign Animal Disease Diagnostic Laboratory
FADRU	Foreign Animal Disease Research Unit
FAZD Center	National Center for Foreign Animal and Zoonotic Disease Defense
FEMA	Federal Emergency Management Agency
FMD	Foot and Mouth Disease
FMDv	Foot and Mouth Disease virus
GAO	Government Accountability Office [of US Congress]
GMP	Good Manufacturing Practices
GNL	Galveston National Laboratory
GSF	Gross Square Feet
HEPA	High Efficiency Particulate Air
HeV	Hendra virus
HHS	Health and Human Services
HPAC	Hazard Prediction and Assessment Capability
HSPD	Homeland Security Presidential Directive
HVAC	Heating, Ventilation and Air Conditioning
IAH	Institute of Animal Health
IATA	International Air Transport Association
ICC	International Code Council
ID	Infectious Dose
IMPLAN	Impact Analysis for Planning
ISC	Interagency Security Commission
ISO	International Standards Organization
JEM	Joint Effects Model
K-State	Kansas State University
LAI	Laboratory Acquired Infection
LEPCs	Local Emergency Planning Committees
LMIC	Livestock Marketing Information Center
MAR	Material available for release
MESA	Multiscale Epidemiological/Economic Simulation and Analysis

MFD	Manhattan Fire Department
MHK	Manhattan Regional Airport
MID	Minimum Infectious Dose
MOU	Memorandum of Understanding
MPH	Master of Public Health
MPH	Miles per hour
MPPS	Most Penetrating Particle Size
MRHC	Mercy Regional Health Clinic
MTV	Minute Tidal Volume
NAADSM	North American Animal Disease Spread Model
NAHLN	National Animal Health Laboratory Network
NAS	National Academy of Sciences
NASS	National Agricultural Statistics Service
NBACC	National Biodefense Analysis and Countermeasures Center
NBAF	National Bio and Agro-Defense Facility
NCAH	National Centers for Animal Health
NCAR	National Center for Atmospheric Research
NCEP	National Center for Environmental Prediction
NDP	NBAF Design Partnership
NEHRP	National Earthquake Hazards Reduction Program
NIH	National Institute of Health
NIMS	National Incident Management System
NiV	Nipah virus
NOAA	National Oceanic and Atmospheric Administration
NRC	National Research Council
NRC	Nuclear Regulatory Commission
NSF	Net Square Feet
NVSL	National Veterinary Services Laboratories
O&M	Operation and Maintenance
OHS	Occupation Health Services
OIE	World Organisation for Animal Health
OSHA	Occupational Safety and Health Administration
OSTP	Office of Science and Technology Policy (White House)
PFU	plaque-forming units
PIADC	Plum Island Animal Disease Center
PMP	Probable Maximum Precipitation
PPE	Personal protective equipment
PRpP	Preparedness and Response Plan
R&D	Research and Development
RCEM	Riley County Emergency Management

RIMS	Regional Input/Output Modeling System
RVF	Rift Valley Fever
RVFv	Rift Valley Fever virus
S&T	Science and Technology
SARA	Superfund Amendments and Reauthorization Act
SCIPUFF	Second-order Closure Integrated PUFF (model)
SME	Subject Matter Expert
SOMs	Self Organizing Maps
SOP	Standard Operating Procedure
SPC	Storm Prediction Center
SSO	Sanitary Sewer Overflow
SSRA	Site-Specific Risk Assessment
STAR	Science and Technology in Atmospheric Research (Institute)
TAD	Targeted Advanced Development
TCID	Tissue Culture Infectious Dose
U.S.	United States
UFC	Unified Facilities Criteria (Department of Defense)
UK	United Kingdom
USDA	United States Department of Agriculture
USDHHS	United States Department of Health and Human Services
USGS	U.S. Geological Survey
V.M.O.	Veterinary Medical Officer
WHO	World Health Organization
WWTP	Wastewater Treatment Plant

Executive Summary

The National Bio and Agro-defense Facility (NBAF) in Manhattan, Kansas, will be used by U.S. Department of Homeland Security (DHS), U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) Veterinary Services (VS) Foreign Animal Disease Diagnostic Laboratory (FADDL), and the USDA



Agricultural Research Service (ARS) Foreign Animal Disease Research Unit (FADRU) for critical U.S. research, diagnostic, and training needs. An Updated Site-Specific Risk Assessment (Updated SSRA) for the NBAF, based on the 65% Design documents, was performed for DHS. The quantitative results from modeling potential infection-causing accidental releases of viable Foot and Mouth Disease virus (FMDv) from the NBAF and risks associated with research on large animals within the highest containment level (Biosafety Level 4, or BSL-4) were determined and assessed to inform DHS on potential facility design modifications that will be considered prior to finalizing the construction documents. In addition, recommendations on the continuing development of operational and accident response strategies were provided to facilitate the evolution of the safest and most effective protocols and procedures during the culmination of the design period and while construction is underway. ***This Updated SSRA assessment indicates that the NBAF 65% Design is sound and has no evident fundamental flaws or design features that would prohibit the implementation of the best and safest practices used in animal and zoonotic pathogen research facilities.***

The Updated SSRA was performed as part of the DHS commitment to NBAF safety and to satisfy the Congressional requirements stipulated in Public Law 112–10, §1647. As required by Congress, cumulative (NBAF project lifetime) calculations on the probability of an FMD outbreak caused by an accidental release of the virus from the NBAF were also performed. The calculations performed in this Updated SSRA indicate that ***the estimated expected probability that an accidental release of viable FMDv from the NBAF will occur and result in a subsequent outbreak during the NBAF’s nominal 50-year operating lifetime is less than 0.11% (including catastrophic events such as tornadoes and earthquakes) and less than 0.008% when catastrophic events are excluded.***

NBAF Background

The research infrastructure that will be provided by the NBAF is necessary for continuing protection of the U.S. food and agriculture industry. This highly integrated, global, and complex industry is inherently vulnerable to foreign animal, emerging, and zoonotic disease outbreaks that could threaten the stability of the economy, food security, and the Nation’s public health. DHS has the responsibility and the

national stewardship mandate to detect, prevent, protect against, and respond to terrorist attacks within the U.S. (Homeland Security Act of 2002, 6 U.S.C 182). DHS shares these responsibilities, as they apply to the defense of animal agriculture, with the U.S. Department of Agriculture (USDA); hence, a coordinated agricultural research strategy (as called for in the Homeland Security Act of 2002 and Homeland Security Presidential Directive 9 (HSPD-9), “Defense of U.S. Agriculture and Food,” January 30, 2004) has been developed. HSPD-9 also specifically identified the need for “safe, secure, and state-of-the-art agriculture biocontainment laboratories that support research and develop diagnostic capabilities for foreign animal and zoonotic diseases.” The NBAF will provide the infrastructure needed to satisfy the need for these modern biocontainment laboratories.

The White House Office of Science and Technology Policy (OSTP) organized a Blue Ribbon Panel in 2003 to examine research and development requirements to support efforts to mitigate the potential threat of bioterrorism directed against agricultural livestock. This panel presented a series of recommendations, including a prioritization of pathogens requiring study [Kelly, 2003]. Subsequently, DHS and USDA partnered on the development of the list of high-consequence diseases that threaten the U.S. and will be researched in the NBAF: Foot-and-Mouth Disease, African Swine Fever, Classical Swine Fever, Japanese Encephalitis, Rift Valley Fever, and Contagious Bovine Pleuropneumonia. These diseases were identified for study based on the threats and consequences of their introduction into the U.S. In addition, the NBAF will be the first facility of its kind in the U.S. to conduct critical studies on Nipah and Hendra and other emerging zoonotic viruses in large animal models (*e.g.*, cattle and swine) in the highest containment level.

Foreign animal diseases (FADs) affect livestock, poultry, and wildlife and are not indigenous to the U.S. For the past 50 years, much of the Nation’s FAD research has been conducted off the coast of Long Island, New York, at the Plum Island Animal Disease Center (PIADC). Because the food and agriculture industries are significant contributors to U.S. economic prosperity, any disruptions from a deliberate or natural FAD introduction that caused a significant loss in the agro business chain would have significant economic consequences. In addition, FADs that also result in zoonoses (transmission from animals to humans) may cause a human health crisis. The NBAF will replace the PIADC and expand the research that is currently available. Facilities at the PIADC have limited laboratory space, antiquated infrastructure, and do not include Biosafety Level 4 (BSL-4) laboratories, which are required to safely conduct research on emerging and high-threat exotic pathogens such as the Nipah and Hendra viruses.

When operational, the NBAF will enable DHS and USDA to conduct comprehensive research of high-threat foreign animal and zoonotic diseases within the U.S. and will therefore serve to protect the Nation’s animal agriculture and public health against numerous foreign animal and emerging diseases. Specifically, the NBAF will provide:

- Capabilities to perform basic and advanced research;
- Enhanced means to perform laboratory diagnostic detection and response;

- Expanded capabilities for development of new vaccines against high-threat foreign animal diseases; and
- Facilities for training veterinarians in preparedness and response to high-consequence foreign animal disease outbreaks.

Safety and security are of paramount importance in the planning, design, construction, and operations of the NBAF. From selection of the site to the design of the facility and, finally, the operation of the NBAF, DHS is committed to understanding the associated safety and security risks and mitigating those risks through the necessary design, engineering, operational protocols, and response planning efforts. To date, DHS has completed an Environmental Impact Statement (EIS), including a Health and Safety Chapter [DHS, 2008], a Threat and Risk Assessment (December 2008), a Site-Specific Threat and Risk Assessment (intentional acts) [Sandia, 2010], and a Site-Specific Risk Assessment (SSRA) [DHS, 2010].

Since the 15% Design phase and completion of the 2010 SSRA, DHS has incorporated recommendations to include additional mitigation measures for carcass disposal systems, liquid waste treatment and management, fully redundant dual-HEPA exhaust systems, and tornado hardening. In addition, DHS has continued to advance operations and response plans that also reduce risks. ***The relatively low risk observed across the various potential release events evaluated in this Updated SSRA are the result of the design, operational plans, and response practices that have been adopted or improved upon since the 15% Design.***

Risk Assessment Process Summary

The Updated SSRA is part of the overall DHS risk management effort for the NBAF and is based on the 65% Design. This update satisfies Congressional requirements (Public Law 112–10, §1647), addresses feedback provided by the NAS SSRA Committee, incorporates additional data collected on the selected site (Manhattan, Kansas), uses the most up-to date modeling tools, and integrates updated design, operations, and accident response strategies into the assessment. DHS has completed the 50% and 65% Designs, thus satisfying the requirements of §1647(b)(1). The Updated SSRA satisfies the Congressional requirements for demonstrating how calculated risks have been significantly reduced by incorporating mitigations into the risk assessment and addressing shortcomings identified by the NAS SSRA Committee (§1647(b)(2), §1647(c)(1)) through the application of the following enhancements, and others, to the risk assessment process:

- Providing a more systematic approach to the assessment of potential accident events including the use of fault tree and event tree analyses;
- Characterizing uncertainties in calculated results based on standard deviations, unknowns, assumptions, and stochastic variability associated with inputs that are modeled in the assessment;
- Incorporating the use of a published tornado return period methodology;

- Providing additional knowledge and data collected for the NBAF location (e.g., susceptible populations, outbreak control measure resources, etc.) that were used in the predictive epidemiological modeling; and
- Developing and using a methodology to estimate the cumulative risk of an FMD infection that would result from an accidental release from the laboratory over the anticipated operating lifetime of the facility.

Other enhanced risk assessment methodologies used in the Updated SSRA comprise the use of updated epidemiological modeling and sensitivity analyses, higher-fidelity meteorological modeling, and advanced economic modeling of potential outbreaks.

In addition, this Updated SSRA satisfies §§1647(c)(2) and (3) by assessing the impact of surveillance, response, and mitigation plans, and providing an assessment of the overall risks associated with research involving large animal models in BSL-4 containment to assist the government in evaluation of the effectiveness of control measures and inform stakeholders on the feasibility of implementation.

Conclusions

The quantitative modeling of infrequent FMD outbreaks caused by unintentional pathogen release from the NBAF (excluding catastrophic earthquake and tornado events) indicated that human error and the associated transfer of virus from the laboratory by human vectors or fomites are the most likely causes of an accident that would result in an outbreak. The potential for the release of pathogenic material (viable FMDv) from the NBAF was assessed by modeling each accident event by the mechanism of virus transfer or pathway. The four transport pathways used to characterize all accident events were aerosol, solid waste, liquid waste, and transference (which includes human vectors and fomites). Among all non-catastrophic FMDv events, the transference pathway occupied approximately 75.3% of the overall risk (the product of frequency and consequences) space, as illustrated in Figure ES-1. The assessed risks for the aerosol, solid waste, and liquid waste pathways represent approximately 16.2%, 0.1%, and 8.4% of the risk space, respectively.

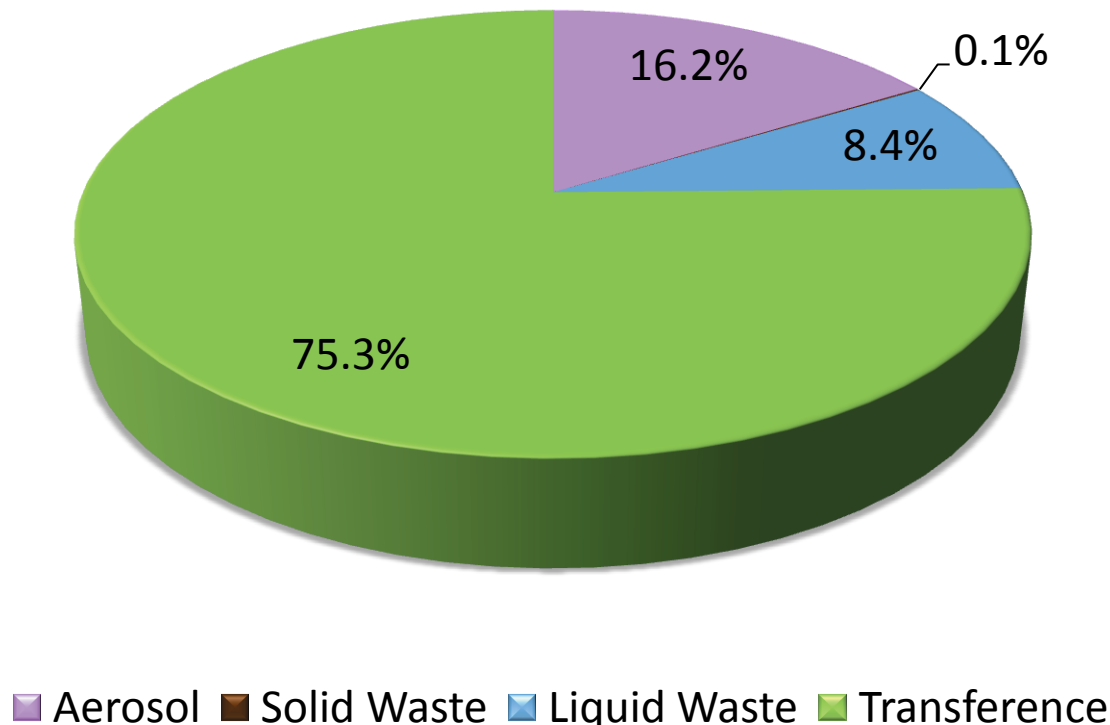


Figure ES-1: Proportion of Risk Space by Pathway for FMD

The catastrophic events, earthquakes and tornados, potentially involve multiple transport pathways. The most current NBAF design provides for maintaining laboratory containment even in tornado events with winds up to ~228 mph. However, the catastrophic events comprise approximately 81% of the total risk space when included in the calculations with the accident events. More than 99% of this 81% is attributed to the modeled risk from an earthquake (catastrophic tornado events comprise the remaining risk space). The large contribution to risk presented by earthquakes is a function of the modeled values for the frequency of an earthquake that could potentially compromise the containment integrity of the NBAF and possibly lead to an infection event. These frequencies are likely overestimated because the containment area modifications incorporated in the latest NBAF design that address the high wind and tornado risks will also provide benefit to the containment performance characteristics during an earthquake event, but these benefits have not yet been characterized. The detailed dynamic structural modeling that will characterize the present earthquake performance characteristics is currently being performed. When catastrophic events are included, the aerosol, solid waste, liquid waste, and transference events represent approximately 3.1%, 0.02%, 1.6%, and 14.3% of the risk, respectively. As modeled, the expected return period for the catastrophic earthquake is 2,500 years and for a catastrophic tornado the expected return frequency is 14.2 million years.

As required, cumulative risk estimates associated with the release and subsequent infection of susceptible species with FMD were estimated for the projected 50-year lifecycle of the NBAF. The risks assessed in the Updated SSRA were based on the projected research activities that are scheduled to begin around 2020. The uncertainties, assumptions, and unknowns associated with modeled research activities increase with time. For example, it is reasonable to assume that FMD research will still be a high priority in 2020, but it is more difficult to make the same assertion for 2070. The practice of numerically estimating risk over such a long period is not recommended (but required by Public Law 112–10, §1647), and care should be taken to avoid over-interpreting the cumulative risk estimates developed in the Updated SSRA. Also, the uncertainty associated with the estimates comprising the cumulative risk values are, in many cases, large relative to the estimated risks.

With these caveats, the estimated probability that a release of viable FMDv from the NBAF will occur and cause an infection was calculated for a single year (the first year) of NBAF operation and across the 50-year operating lifetime of the facility. For a single year of NBAF operation, when all events are considered (including catastrophic), the expected probability of at least one release resulting in an infection in a given year is 2.16×10^{-5} and the estimated range is approximately 3.07×10^{-11} to 4.23×10^{-4} . When catastrophic events are excluded, the probability of at least one release resulting in an infection in a given year is estimated to be between 3.07×10^{-11} and 2.33×10^{-5} with an expected value of 1.52×10^{-6} . The risk over all events for one year was \$0.70M when all events were included and \$0.13M when the catastrophic events were excluded.

The 50-year cumulative probability estimate for an FMD event is 1.08×10^{-3} (ranging from 1.54×10^{-9} to 2.35×10^{-2}) when all events were included and 7.61×10^{-5} (ranging from 1.54×10^{-9} to 1.17×10^{-3}) when catastrophic events were excluded. In other words, when all events (all causes) are considered, the probability of at least one release resulting in an FMD infection over the 50-year NBAF operating lifetime is estimated to be less than 0.11%, as illustrated in Figure ES-2. (The upper bound (95th percentile) and lower bound (5th percentile) are also illustrated in this figure. When catastrophic events are excluded, the probability of at least one release resulting in an infection over the 50-year NBAF operating lifetime is estimated to be less than 0.008%. The cumulative risk over the 50-year operating lifetime of the NBAF was \$35M when all events were included and \$7M when the catastrophic events were omitted. The uncertainty (standard deviation) in the 50-year cumulative risk was found to be approximately \$15B, regardless of whether catastrophic events are included.

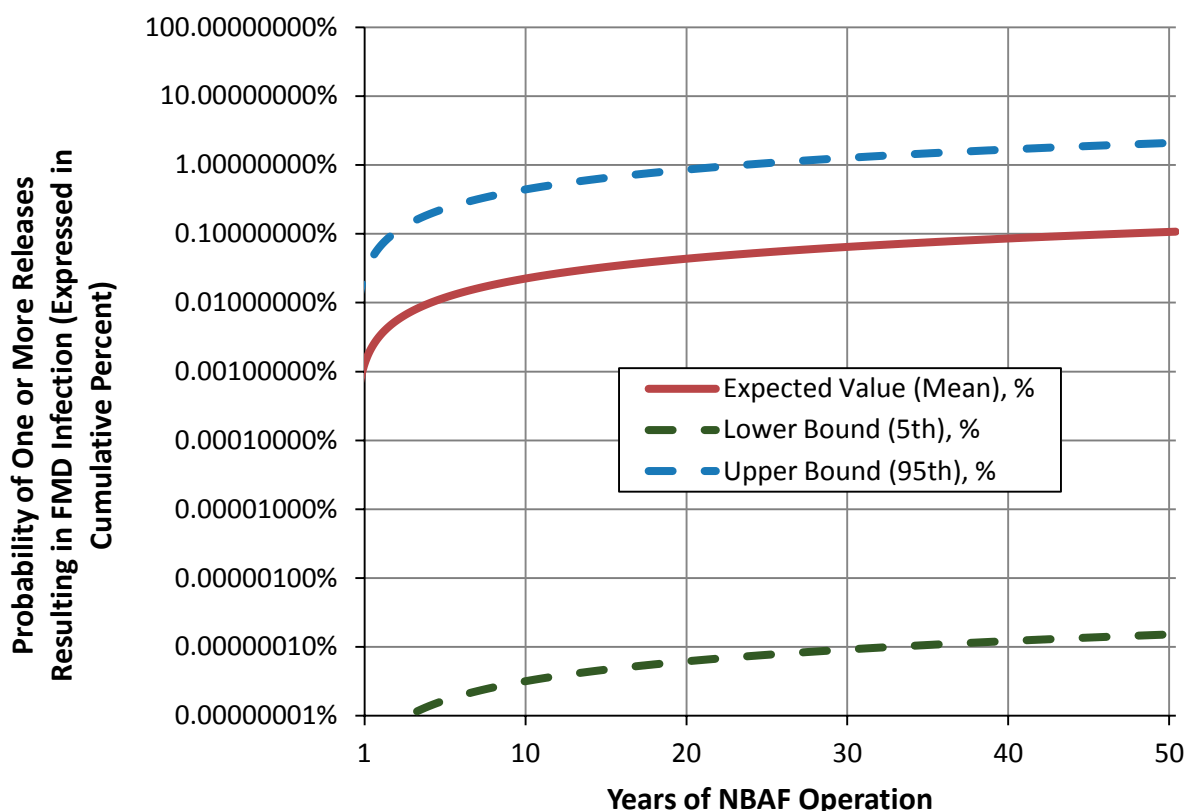


Figure ES-2: Cumulative Probability of FMD Infection over the 50-Year Operating Lifetime of the NBAF

The estimated probability (with the stipulated caveats) that an accidental release of viable FMDv from the NBAF will occur and result in a subsequent outbreak during the NBAF's nominal 50-year operating lifetime is less than 0.11%.

The Updated SSRA concludes that the NBAF 65% Design incorporates the most current validated biocontainment techniques and meets or exceeds required and recommended design and construction standards, and human factors (errors) again dominate the risk space, as was determined in the 2010 SSRA. Architectural features and engineered systems included in the design support the application of best operational biosafety and biocontainment practices, but sufficient personnel training will be required, as planned, to minimize the potential for an accidental pathogen release. Facility features and systems that were identified as being associated with elevated risks in the 2010 SSRA were addressed in the most current design by adding or changing appropriate facility features and systems. Compared to the 2010 SSRA, fewer recommendations that have risk-mitigating potential were made as a result of the Updated SSRA because of the addition of several mitigation measures in the maturing design and response strategies.

Large Animal BSL-4 Assessment

This Updated SSRA also provides an assessment of the risks associated with research on high-consequence zoonotic pathogens (Nipah and Hendra) with large animal models in BSL-4 laboratories.

Again, the risks were defined as the product of event frequency and consequences but the consequences were modeled with less fidelity since there is a lack of applicable and validated modeling tools for these pathogens. This assessment used the same transport pathways as the FMD assessment but the modeled events differed. The transference pathway for the BSL-4 events also dominated the risk space—more than 99.999% of the risk space was attributed to transference events for both Nipah and Hendra viruses. The recommendations derived from this assessment were aggregated with recommendations from the FMD assessment and are summarized below.

Recommendations

The recommendations for consideration by DHS, USDA, and other stakeholders presented in Table ES-1 are intended to inform NBAF planning processes on design features, operations-related concepts, and response strategies that may help further reduce risks associated with animal and zoonotic pathogen research. Recommendations have been derived from the quantitative assessment of FMD-related research in BSL-3Ag and BSL-3E facilities (including the Special Procedure areas) and the assessment of zoonotic pathogen research in the large animal BSL-4 facilities. Also considered in this assessment and the development of recommendations are the most current risk mitigation and planning efforts of DHS and USDA and all design modifications that have been implemented since the performance of the 2010 SSRA. As the design nears completion, DHS will intensify the operational and response planning efforts. Specifically, DHS has initiated or continued the following activities to further advance operational and response planning:

- Continued to engage the Plum Island Animal Disease Center (PIADC) to leverage 60 years of operating experience, knowledge, and planning documents;
- Leveraged and applied information from a highly successful CDC/USDA inspection of the National Biodefense and Countermeasures Center (NBACC) laboratory to support planning efforts;
- Engaged local and regional emergency responders to initiate Memorandums of Understanding (MOUs) for needed response capabilities;
- Established the Research and Transition Working Group to begin formulating training requirements;
- Continued stakeholder engagements to ensure full understanding by local and regional community of the NBAF mission; and
- Established appropriate baseline biosafety guidelines for incorporation into design basis and standard operating procedures.

DHS has also started the development of the initial operating capability (IOC) of the NBAF in preparation for the migration of personnel, equipment, and operations from the PIADC facility. In collaboration with USDA, DHS is in the beginning stages of developing the NBAF Emergency Response Plan (ERP). The NBAF ERP will provide guidance and direction to assure an integrated and coordinated response to emergency situations at the NBAF. The ERP will include the delineated steps and actions needed for mitigation, preparedness, response, and recovery and will provide guidance and direction to assure an integrated and coordinated response to emergencies at the NBAF.

While DHS has started the development of operational and response plans, it has been purposefully slow to publish protocols, practices, and strategies. With laboratory commissioning and operations still several (7-8) years away, there is adequate time to develop, review, and inculcate scientific users, personnel, and response stakeholders without the risk of prematurely developing plans that may not be relevant when the facility is finally constructed. As research priorities and technology advance, it is important to have practices and procedures that represent the best available at the time of commissioning and operation. In addition, there may be some concerns about the enhancement of strategic risks related to public disclosure of sensitive information on U.S. countermeasure programs. However, as described above, the collaborative process is underway.

In summary, new recommendations for the NBAF program are presented (Table ES-1) as part of the continuing effort to make the NBAF among the safest containment laboratories in the world, while providing infrastructure and facilities necessary to minimize the risks to U.S. agriculture.

Table ES 1: Updated SSRA Recommendations Summary

No.	Description	Status
1	Add permanent disinfection fixtures to the design in shower (water) areas between containment levels.	Accepted
2	Incorporate time-interlocked doors in shower area between the BSL-3E containment area and non-containment.	Accepted
3	Assess the enhanced earthquake performance that may be derived from the structural hardening and containment penetration specifications added for the high-wind and tornado design mitigations for the benefit of future risk assessments.	Accepted
4	Perform additional analyses, as needed, prior to incorporating beneficial reuse into designs and plans.	Accepted
5	Continue to include outside emergency and incident response stakeholders in the operational planning cycle and distribute plans (upon completion) for review and additional contributions.	Accepted
6	Begin periodic training on newly developed and evolving NBAF SOPs, plans, and practices.	Accepted

Table ES 1: Updated SSRA Recommendations Summary

No.	Description	Status
7	Develop practices and procedures that reduce handling of and exposure to potentially infectious packages outside of containment.	Accepted
8	Accelerate response planning efforts while including emergency and incident response stakeholders (Recommendation 5) and appropriate interested entities.	Accepted
9	To the extent possible, make vaccination response plans publicly available.	Accepted
10	Publish a high-level description of the cooperative arrangements and roles of public and veterinary health providers.	Accepted
11	Develop and implement a producer education program for livestock producers in the NBAF region.	Accepted

Acknowledgements

The Updated SSRA comprised a broad collaborative team that combined the experience, talents, and effort of a variety of domestic and international experts. Expertise was provided by individuals and consultants from private industry; academia; and international, national, state and local government entities, selected for their detailed knowledge of Department of Homeland Security (DHS) and United States Department of Agriculture (USDA) foreign animal disease programs or specific technical expertise. Below is a list of the individuals whose combined expertise and efforts performed the Updated SSRA and produced this Final Report. Some of these contributors were asked only to provide input and comments for subsections of the Updated SSRA. In such cases the reviewers and experts provided valuable input and suggestions and made substantive contributions to the Updated SSRA, but they were not asked to endorse the product in its entirety.

Contractors

This section lists the individuals who were compensated for their contributions to the Updated SSRA including the Prime Contractor, Signature Science, LLC's, key personnel and key personnel from subcontractors Gryphon Scientific, LLC, STAR Institute and SES Inc. This section also lists consultants who were paid under agreement with Signature Science, LLC or a subcontractor.

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- Abdalla, A., Beare, S., Cao, L., Garner, G. and Heaney, A. (2005). "Foot and Mouth Disease: Evaluating Alternatives for Controlling a Possible Outbreak in Australia," *ABARE eReport* 05.6., ABARE, Canberra.
- Abraham, Gordon, Le Blanc Smith, Peter Michael and McCabe, Phillip (1999). "HEPA Filter Replacement Experience in a Biological Laboratory," *Journal of the American Biological Safety Association*, 3(4), 134-142,
- Aggarwal, N., Zhang, Z., Cox, S., Statham, R., Alexandersen, S., Kitching, R. P. and Barnett, P. V. (2002). "Experimental studies with foot-and-mouth disease virus, strain O, responsible for the 2001 epidemic in the United Kingdom," *Vaccine*. 2002/06/12, 20 (19-20), 2508-2515, DOI: S0264410X02001780 [pii], 0264-410X (Print) 0264-410X (Linking), Retrieved: Jun 7, <http://www.ncbi.nlm.nih.gov/pubmed/12057606>.
- Aida, N., et al. (2008). "Population analysis of *Aedes albopictus* (Skuse) (Diptera: Culicidae) under uncontrolled laboratory conditions," *Tropical Biomedicine*. 25 (2), 117-125, http://www.msptm.org/files/117_-_125_Nur_Aida.pdf.
- Alexandersen, S., and Donaldson, A.I. (2002). "Further studies to quantify the dose of natural aerosols of foot-and-mouth disease virus for pigs," *Epidemiology and Infection*. 128 (2), 313-323, <http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=102581>.
- Alexandersen, S., et al. (2002). "Natural aerosol transmission of foot-and-mouth disease virus to pigs: minimal infectious dose for strain 01 Lausanne," *Epidemiol Infect.* 128, 301-312, <http://www.ncbi.nlm.nih.gov/pubmed/12002549>.
- Alexandersen, S., et al. (2002). "Quantities of infectious virus and viral RNA recovered from sheep and cattle experimentally infected with foot-and-mouth disease virus O UK 2001," *Journal of General Virology*. 83, 1915-1923.
- Alexandersen, S., et al., (2003). "The Pathogenesis and Diagnosis of Foot-and-Mouth Disease," *J. Comp. Path.* 129, 1-36.
- Alvarez, L. G., Webb, C. R. and Holmes, M. A. (2011). "A novel field-based approach to validate the use of network models for disease spread between dairy herds," *Epidemiology and infection*, 139(12), 1863-1874, DOI:10.1017/s0950268811000070,
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- Amassa, Sandra F, Masonb, Peter W., Pachecob, Juan M., Millerc, Cheryl A., Antonio Ramirezd, Clarka, L. Kirk, Raglanda, Darryl, Schneidera, Jessica L. and Kenyona, Simon J. (2004). "Procedures for preventing transmission of foot-and-mouth disease virus (O/TAW/97) by people," *Veterinary Microbiology*, 103, 143-149,
- American Society of Agricultural Engineers (2003). "Manure Production and Characteristics," ASAE. D384 (1 FEB03).
- (2005). "Manure Production and Characteristics."
- Amlot, Richard, et al. (2010). "Comparative Analysis of Showering Protocols for Mass-Casualty Decontamination," *Prehospital and Disaster Medicine*,
- Anderson, I. (2008, March 11). "Foot and Mouth Review: 2007, A Review and Lessons Learned," <http://archive.cabinetoffice.gov.uk/fmdreview/>.
- Ansari, S. A., et al. (1988). "Rotavirus survival on human hands and transfer of infectious virus to animate and nonporous inanimate surfaces," *J. Clin. Microbiol.* 26, 1513-1518.
- Ansari, Shamim A., et al. (1989). "In Vivo Protocol for Testing Efficacy of Hand-Washing Agents against Viruses and Bacteria: Experiments with Rotavirus and Escherichia coli," *Applied and Environmental Microbiology*. Dec, 3113-3118.
- Ansari SA, Springthorpe VS, et al (1991). "Potential role of hands in the spread of respiratory viral infections: studies with human parainfluenza virus 3 and rhinovirus 14. ," *Journal of Clinical Microbiology*. 29, 2115-2119.
- Arunkumar, R., et al. (2004). "Evaluation of Mass Emission Rates Down Stream of HEPA Filters as a Function of Source Terms and Selected Failure Modes," *WM '04 Conference*. February 29-March 4, 2004, Tucson, AZ, WM-4279.
- AUSVETPLAN (2006). "Australian Veterinary Emergency Plan (AUSVETPLAN), Edition 3, Disease Strategy Foot-and-Mouth Disease (VERSION 3.1)," Primary Industries Ministerial Council, Canberra, ACT.
- Ayliffe, G.A.J., et al. (1990). "Hygienic Hand Disinfection Tests in Three Laboratories," *J. Hosp. Infect.* 16, 141-149.
- Bachrach, H. (1968). "Foot-and-Mouth Disease," *Annual Review of Microbiology*. 201-244.
- Bardell, D. (1989). "Hand-to-hand transmission of herpes simplex virus type 1," *Microbios* 59, 93-100.
- Barnett, P. V. and Carabin, H. (2002). "A review of emergency foot-and-mouth disease (FMD) vaccines," *Vaccine*. 2002/02/23, 20 (11-12), 1505-1514, DOI: S0264410X01005035 [pii], 0264-410X (Print) 0264-410X (Linking), Retrieved: Feb 22, <http://www.ncbi.nlm.nih.gov/pubmed/11858856>.

- Barnett, P. V., Keel, P., Reid, S., Armstrong, R. M., Statham, R. J., Voyce, C., Aggarwal, N. and Cox, S. J. (2004). "Evidence that high potency foot-and-mouth disease vaccine inhibits local virus replication and prevents the 'carrier' state in sheep," *Vaccine*. 2004/03/09, 22 (9-10), 1221-1232, DOI: 10.1016/j.vaccine.2003.09.024 S0264410X03006984 [pii], 0264-410X (Print) 0264-410X (Linking), Retrieved: Mar 12, <http://www.ncbi.nlm.nih.gov/pubmed/15003651>.
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- Baxt, B. and Mason, P. W. (1995). "Foot-and-mouth disease virus undergoes restricted replication in macrophage cell cultures following Fc receptor-mediated adsorption," *Virology*, 207(2), 503-509, <http://www.ncbi.nlm.nih.gov/pubmed/7886954>.
- Bean, B., Moore, B. M., Sterner, B., Peterson, L. R., Gerding, D. N. and Balfour, H. H., Jr. (1982). "Survival of influenza viruses on environmental surfaces," *Journal of Infectious Diseases*. 1982/07/01, 146 (1), 47-51, 0022-1899 (Print) 0022-1899 (Linking), Retrieved: Jul, <http://www.ncbi.nlm.nih.gov/pubmed/6282993>.
- Bellamy, K., Alcock, R., Babb, J. R., Davies, J. G. and Ayliffe, G. A. (1993). "A test for the assessment of 'hygienic' hand disinfection using rotavirus," *J Hosp Infect*. 1993/07/01, 24 (3), 201-210, DOI: 0195-6701(93)90049-6 [pii], 0195-6701 (Print) 0195-6701 (Linking), Retrieved: Jul, <http://www.ncbi.nlm.nih.gov/pubmed/8104210>.
- Berhane, Yohannes, Berry, Jody D., Ranadheera, Charlene, Marszal, Peter, Nicolas, Brigitte, Yuan, Xin, Czub, Markus and Weingartl, Hana (2006). "Production and characterization of monoclonal antibodies against binary ethylenimine inactivated Nipah virus," *Journal of Virological Methods*, 132(1-2), 59-68, <http://www.sciencedirect.com/science/article/pii/S0166093405002879>.
- Berhane, Y., Weingartl, H. M., Lopez, J., Neufeld, J., Czub, S., Embury-Hyatt, C., Goolia, M., Copps, J. and Czub, M. (2008). "Bacterial Infections in Pigs Experimentally Infected with Nipah Virus," *Transboundary and Emerging Diseases*, 55(3-4), 165-174, <http://onlinelibrary.wiley.com.ezproxy.lib.utexas.edu/doi/10.1111/j.1865-1682.2008.01021.x/abstract>.
- Best, M., Springthorpe, V.S., Sattar, S.A., & Bact, D. (1994 abstract accessed online 20 December 2011). "Feasibility of a combined carrier test for disinfectants: studies with a mixture of five types of microorganisms," *American Journal of Infection Control*. Vol. 22 (Issue 3), pp. 152-162, <http://www.sciencedirect.com/science/article/pii/S0196655394900043>.
- Bidawid S, Farber JM et al (2000). "Contamination of foods by food handlers: experiments on hepatitis A virus transfer to food and its interruption," *Applied and Environmental Microbiology* 66, 2759-2763.
- Billings, Sue, DVM (2010, April 22). "KYdatNBAF," Office of the State Veterinarian, Kentucky Department of Agriculture, Personal correspondence.

- Blackwell, J. H., McKercher, P. D., Kosikowski, F. V., Carmichael, L. E. and Gorewit, R. C. (1982). "Concentration of foot-and-mouth disease virus in milk of cows infected under simulated field conditions," *Journal of Dairy Science*, 65(8), 1624-1631, <http://www.ncbi.nlm.nih.gov/pubmed/6292275>.
- Blake, A., Sinclair, M.T. and Sugiyarto, G., (2002). "The Economy-Wide Effects of Foot and Mouth Disease in the UK Economy," Cristel DeHaan Tourism and Travel Institute, Nottingham Business School, <http://www.nottingham.ac.uk/ttri/>.
- Blayney, D.P. (2005). "Disease-Related Trade Restrictions Shaped Animal Product Markets in 2004 and Stamp Imprints on 2005 Forecasts," USDA, Economic Research Service (August 2005), LDP-M-133-101.
- Bossart, K.N., Bingham, J., & Middleton, D. (2007). "Targeted Strategies for Henipavirus Therapeutics," *The Open Virology Journal*. Vol. 1, pp. 14-25.
- Bossart, K.N., Geisbert, T.W., Heinz, F., Zhongyu, Z., Feldman, F., Geisbert, J.B., Yan, L., Feng, Y., Brining, D., Scott, D., Wang, Y., Dimitrov, A.S., Callison, J., Chan, Y., Hickey, A.C., Dimitrov, D.S., Broder, C.C., & Rockx, B. (2011). "A Neutralizing Human Monoclonal Antibody Protects African Green Monkeys from Hendra Virus Challenge," *Science Translational Medicine*. Vol. 3 (Issue 105), pp. 1-8.
- Bouma, A., Dekker A et al (2004). "No foot-and-mouth disease virus transmission between individually housed calves," *Vet Microbiol* 98, 29-36.
- Brocchi, E., Bergmann, I. E., Dekker, A., Paton, D. J., Sammin, D. J., Greiner, M., Grazioli, S., De Simone, F., Yadin, H., Haas, B., Bulut, N., Malirat, V., Neitzert, E., Goris, N., Parida, S., Sorensen, K. and De Clercq, K. (2006). "Comparative evaluation of six ELISAs for the detection of antibodies to the non-structural proteins of foot-and-mouth disease virus," *Vaccine*. 2006/06/07, 24 (47-48), 6966-6979, DOI: S0264-410X(06)00500-7 [pii] 10.1016/j.vaccine.2006.04.050, 0264-410X (Print) 0264-410X (Linking), Retrieved: Nov 17, <http://www.ncbi.nlm.nih.gov/pubmed/16753241>.
- Broyles, J. M., O'Connell, K. P., and Korniewicz, D. M. (2002). "PCR-Based Method for Detecting Viral Penetration of Medical Exam Gloves," *J Clin Microbiol* 40, 2725-2728.
- Burrows, R. (1966). "The infectivity assay of foot-and-mouth disease virus in pigs," *J Hyg (Lond)*. 64, 419-429.
- Burrows, R. (1968). "The persistence of foot-and mouth disease virus in sheep," *The Journal of Hygiene*, 66(4), 633-640, <http://www.ncbi.nlm.nih.gov/pubmed/4303955>.
- Burrows R, Mann JA et al (1981). "The pathogenesis of natural and simulated natural foot-and-mouth disease infection in cattle," *J Comp Pathol* 91, 599-609.
- Burton, C.S., Stoeckenius, J.P. and Nordin, J.P. (1983). "The Temporal Representativeness of Short-Term Meteorological Data Sets: Implications for Air Quality Impact Assessments," (Docket No. A-80-46, II-G-11), Systems Applications Inc.

- Cadwallader, L.C. (1998, September). "Selected Component Failure Rate Values From Fusion Safety Assessment Tasks," Lockheed Martin, INEEL/EXT-98-00892.
- Cagnolati, V., Tempia, S. and Abdi, A. M. (2006). "Economic Impact of Rift Valley Fever on the Somali Livestock Industry and a novel surveillance approach in nomadic pastoral Systems," *Proceedings of the 11th International Symposium on Veterinary Epidemiology and Economics*.
- California Water Boards (2009). "Annual Performance Report - Fiscal Year 2008-09," Retrieved: June 9, 2010,
http://www.waterboards.ca.gov/about_us/performance_report/plan_assess/1241_sso_sewage_spills.shtml.
- Campbell, C. H. (1969). "Virulence, adsorbability, and antigenicity of foot-and-mouth disease virus selected by adsorption with homogenized mouse kidney," *Archiv Für Die Gesamte Virusforschung*, 26(3), 238-248, <http://www.ncbi.nlm.nih.gov/pubmed/4306368>.
- Carpenter, T. E., Christiansen, L. E., Dickey, B. F., Thunes, C. and Hullinger, P. J. (2007). "Potential impact of an introduction of foot-and-mouth disease into the California State Fair," *Journal of the American Veterinary Medical Association*. 2007/10/17, 231 (8), 1231-1235, DOI: 10.2460/javma.231.8.1231, 0003-1488 (Print) 0003-1488 (Linking), Retrieved: Oct 15.
- Carpenter, T. E., O'Brien, J. M., Hagerman, A. D. and McCarl, B. A. (2011). "Epidemic and economic impacts of delayed detection of foot-and-mouth disease: a case study of a simulated outbreak in California," *Journal of veterinary diagnostic investigation: official publication of the American Association of Veterinary Laboratory Diagnosticians, Inc.* 2011/01/11, 23 (1), 26-33, 1943-4936 (Electronic) 1040-6387 (Linking), Retrieved: Jan.
- Carrillo, C., Lu, Z., Borca, M. V., Vagnozzi, A., Kutish, G. F. and Rock, D. L. (2007). "Genetic and Phenotypic Variation of Foot-and-Mouth Disease Virus during Serial Passages in a Natural Host," *Journal of Virology*, 81(20), 11341-11351,
- Carroll, J. (2011). "Vice President Quality Assurance & Regulatory Affairs for Fluid Milk, Dairy Farmers of America".
- Casagrande, R. (2000). "Biological Terrorism Targeted at Agriculture: the threat to US national security," *The Nonproliferation Review*. Fall/Winter.
- Cassano, J.J., Uotila, P. and Lynch, A. (2006). "Changes in synoptic weather patterns in the polar regions in the twentieth and twenty-first centuries, Part 1: Arctic," *Int. J. Climatol.* 26, 1027-1049.
- CDC (2007). "Hendra Virus Disease and Nipah Virus Encephalitis," National Center for Infectious Diseases, Special Pathogens Branch,
<http://www.cdc.gov/ncidod/dvrd/spb/mnpages/dispages/nipah.htm>, 25 October 2011.
- CDM/BG Team (2009, March). "Sanitary Sewer Collection System Master Plan Update," City of Manhattan, Public Works Department,
<http://ci.manhattan.ks.us/DocumentView.aspx?DID=6200>.

- Chadha M., et al. (2006). "Nipah virus-associated encephalitis outbreak, Siliguri, India.," *Emerg Infect Dis*, 12, 125-240,
- Chen, L. and Gasteiger, J. (1997). "Knowledge discovery in reaction databases: landscaping organic reactions by a self organizing map," *J. Am. Chem. Soc.* 119, 4033-4042.
- Chen, Y. S. and Vaughn, J. M. (1990). "Inactivation of human and simian rotaviruses by chlorine dioxide," *Applied and Environmental Microbiology*, 56(5), 1363-1366, <http://aem.asm.org/content/56/5/1363.abstract>.
- Chua, K B (2003). "Nipah virus outbreak in Malaysia," *Journal of Clinical Virology*. 26(3), 265-275.
- Chua, K. B., Lam, S. K., Goh, K. J., Hooi, P. S., Ksiazek, T. G., Kamarulzaman, A., Olson, J. and Tan, C. T. (2001). "The Presence of Nipah Virus in Respiratory Secretions and Urine of Patients during an Outbreak of Nipah Virus Encephalitis in Malaysia," *Journal of Infection*, 42(1), 40-43, <http://www.sciencedirect.com/science/article/pii/S0163445300907825>.
- City of Manhattan (2011). Population, <http://www.city-data.com/city/Manhattan-Kansas.html>.
- Coffey, B., J. Mintert, S. Fox, T. Schroeder, L. Valentin (2005). "The Economic Impact of BSE on the U.S. Beef Industry: Product Value Losses, Regulatory Costs, and Consumer Reactions, MF-2678," Kansas State University Agricultural Experiment Station and Cooperative Service.
- Cohen, Hubal, et al. (2005). "Characterizing residue transfer efficiencies using a fluorescent imaging technique," *J Expo Anal Environ Epidemiol*. 15, 261-270.
- Cohen, Hubal, et al. (2007). "Comparing Surface Residue Transfer Efficiencies to Hands using Polar and Nonpolar Fluorescent Tracers," *Environ. Sci. Technol*. 42, 934-939.
- Conrad, J.M., P.S. Gibson, and M. Peek (2006, July 23-26). "Historical and Current Status of Elk in Kansas," *Prairie Invaders: Proceedings of the North American Prairie Conference*. 307-312, Joseph T. Springer and Elaine C. Springer, University of Nebraska at Kearney.
- Constantine, D.G. (2003). "Geographic Translocation of Bats: Known and Potential Problems," *Emerging Infectious Diseases*. Vol. 9 (No. 1), pp. 17-21.
- Cooper, S. M., Scott, H. M., de la Garza, G. R., Deck, A. L. and Cathey, J. C. (2010). "Distribution and interspecies contact of feral Swine and cattle on rangeland in South Texas: implications for disease transmission," *J Wildl Dis*. 2010/01/22, 46 (1), 152-164, DOI: 46/1/152 [pii], 1943-3700 (Electronic) 0090-3558 (Linking), Retrieved: Jan, <http://www.ncbi.nlm.nih.gov/pubmed/20090028>.
- Cottral, G. E., Patty, R. E., Gailiunas, P. and Scott, F. W. (1966). "Relationship of foot-and-mouth disease virus plaque size on cell cultures to infectivity for cattle by intramuscular inoculation," *Archives of Virology*, 18(3), 276-293,

- Cox, S. J., Aggarwal, N., Statham, R. J. and Barnett, P. V. (2003). "Longevity of antibody and cytokine responses following vaccination with high potency emergency FMD vaccines," *Vaccine*. 2003/03/05, 21 (13-14), 1336-1347, DOI: S0264410X02006916 [pii], 0264-410X (Print) 0264-410X (Linking), Retrieved: Mar 28, <http://www.ncbi.nlm.nih.gov/pubmed/12615428>.
- Cox, S. J. and Barnett, P. V. (2009). "Experimental evaluation of foot-and-mouth disease vaccines for emergency use in ruminants and pigs: a review," *Vet Res*. 2008/12/02, 40 (3), 13, DOI: 10.1051/vetres:2008051 v08306 [pii], 0928-4249 (Print) 0928-4249 (Linking), Retrieved: May-Jun, <http://www.ncbi.nlm.nih.gov/pubmed/19040829>.
- Cox, S. J., Carr, B. V., Parida, S., Hamblin, P. A., Prentice, H., Charleston, B., Paton, D. J. and Barnett, P. V. (2010). "Longevity of protection in cattle following immunisation with emergency FMD A22 serotype vaccine from the UK strategic reserve," *Vaccine*. 2010/01/09, 28 (11), 2318-2322, DOI: S0264-410X(09)01982-3 [pii] 10.1016/j.vaccine.2009.12.065, 1873-2518 (Electronic) 0264-410X (Linking), Retrieved: Mar 8, <http://www.ncbi.nlm.nih.gov/pubmed/20056183>.
- Cummings, Kristin J., Cox-Ganser, Jean, Riggs, Margaret A., Edwards, Nicole and Kreiss, Kathleen (2007). "Respirator Donning in Post-Hurricane New Orleans," *Emerging Infectious Diseases*, 13(5), 700-707,
- Cunliffe, H. R. (1962). "Antibody Response in a Group of Swine After Infection with Foot-and-Mouth Disease Virus," *Can J Comp Med Vet Sci*. 1962/08/01, 26 (8), 182-185, 0316-5957 (Print) 0316-5957 (Linking), Retrieved: Aug, <http://www.ncbi.nlm.nih.gov/pubmed/17649387>.
- Cunliffe, H. R. and Graves, J. H. (1963). "Formalin-Treated Foot-and-Mouth Disease Virus: Comparison of Two Adjuvants in Cattle," *Can J Comp Med Vet Sci*. 1963/08/01, 27 (8), 193-197, 0316-5957 (Print) 0316-5957 (Linking), Retrieved: Aug, <http://www.ncbi.nlm.nih.gov/pubmed/17649456>.
- Daszak, P., Plowright, R.K. and Epstein, J.H., Pulliams, J., Rahman, S.A., Field, H.E., Jamaluddin, A., Sharifah, S.H., Smith, C.S., Olival, K.J., Luby, S., Halpin, K., Hyatt, A.D., Cunningham, A.A., & the Henipavirus Ecology Research Group (HERG), Inc., New York, (2006). "The emergence of Nipah and Hendra virus: pathogen dynamics across a wildlife-livestock-human continuum," *Disease ecology: community structure and pathogen dynamics*, pp. 186-201.
- de Leeuw, PW, J.G. van Bakkum, J.W. Tiessink (1978). "Excretion of foot-and-mouth disease virus in oesophageal-pharyngeal fluid and milk of cattle after intranasal infection," *J Hyg (Lond)*, 81, 415-425,
- Dee, D. P., S. M. Uppala, et al. (2011). "The ERA-Interim reanalysis: configuration and performance of the data assimilation system," *Quarterly Journal of the Royal Meteorological Society* 137(656), 553-597,
- Defang, Gabriel N., Khetawat, Dimple, Broder, Christopher C. and Quinnan Jr, Gerald V. (2010). "Induction of neutralizing antibodies to Hendra and Nipah glycoproteins using a Venezuelan equine encephalitis virus in vivo expression system," *Vaccine*. 29 (2), 212-220, 0264-410X, <http://www.sciencedirect.com/science/article/pii/S0264410X10015549>.

- DEFRA (2009, December). "Contingency Plan for Exotic Diseases of Animals," *DEFRA's Framework Response Plan for Exotic Animal Diseases - DEFRA's Overview for Emergency Preparedness for Exotic Diseases of Animals (Version 4)*. London, UK.
- Dekker, A. (1998). "Inactivation of foot-and-mouth disease virus by heat, formaldehyde, ethylene oxide and γ radiation," *Veterinary Record*. 143, 168-169.
- Derrer, Denise (2010, May 7). "Imports 2007 thru 2009 per request from Derrer," *Personal correspondence*. Indiana State Board of Animal Health.
- Desta, M. G. (2007). "The Regulatory Framework for Trade in IGAD Livestock Products," IGAD LPI Working Paper No. 07 - 08.
- DHS (2008). *National Bio and Agro-Defense Facility Final Environmental Impact Statement*. Retrieved: 2010, May 12, http://www.dhs.gov/files/labs/gc_1187734676776.shtm.
- DHS (2010). *Site-Specific Biosafety and Biosecurity Mitigation Risk Assessment*. NBAF, Science and Technology Directorate, 417.
- DHS (2010, May). "User Group #1 Presentation, Waste Flow Diagrams," DHS and USDA.
- DHS Risk Steering Committee (2010, September). *DHS Risk Lexicon*.
- Disney, W. T., Green, J. W., Forsythe, K. W., Wiemers, J. F. and Weber, S. (2001). "Benefit-cost analysis of animal identification for disease prevention and control," *Rev Sci Tech*. 2001/09/13, 20 (2), 385-405, 0253-1933 (Print) 0253-1933 (Linking), Retrieved: Aug, <http://www.ncbi.nlm.nih.gov/pubmed/11552703>.
- Dodds, R. D., Guy, P. J., Peacock, A. M., Duffy, S. R., Barker, S. G. and Thomas, M. H. (1988). "Surgical glove perforation," *The British Journal of Surgery*, 75(10), 966-968, <http://www.ncbi.nlm.nih.gov/pubmed/3219543>.
- Doel, T. R., Williams, L. and Barnett, P. V. (1994). "Emergency vaccination against foot-and-mouth disease: rate of development of immunity and its implications for the carrier state," *Vaccine*. 1994/05/01, 12 (7), 592-600, 0264-410X (Print) 0264-410X (Linking), Retrieved: May, <http://www.ncbi.nlm.nih.gov/pubmed/8085375>.
- Donaldson, A. (1986). "Aerobiology of foot-and-mouth disease (FMD): an outline and recent advances," *Rev Sci Tech Off Epiz* 5. 315-321.
- Donaldson A.I., Herniman K.A., Parker J., Sellers R.F. (1970). "Further investigations on the airborne excretion of foot-and-mouth disease virus," *J Hyg (Lond)*. 68, 557-564.
- Donaldson, A. I., C. F. Gibson, et al. (1987). "Infection of cattle by airborne foot-and-mouth disease virus: minimal doses with O1 and SAT 2 strains," *Research in veterinary science* 43, 339-346.
- Donaldson, A.I. (1997). "Risks of spreading foot and mouth disease through milk and dairy products," *Revue Scientifique et Technique de l'Office International des Epizooties*. 16, 117-124.

- Donaldson, A. I., Alexandersen, S., Sorensen, J. H. and Mikkelsen, T. (2001). "Relative risks of the uncontrollable (airborne) spread of FMD by different species," *Vet Rec.* 2001/06/02, 148 (19), 602-604, 0042-4900 (Print) 0042-4900 (Linking), Retrieved: May 12, <http://www.ncbi.nlm.nih.gov/pubmed/11386448>.
- Donaldson, A.I. and Alexanderson, S. (2002). "Predicting the spread of foot and mouth disease by airborne virus," *Revue scientifique et technique (International Office of Epizootics)*. 21 (3), 569-575.
- Donaldson, A. I. and Kitching, R. P. (1989). "Transmission of foot-and-mouth disease by vaccinated cattle following natural challenge," *Res Vet Sci.* 1989/01/01, 46 (1), 9-14, 0034-5288 (Print) 0034-5288 (Linking), Retrieved: Jan, <http://www.ncbi.nlm.nih.gov/pubmed/2537993>.
- Donaldson, C. (1973). "Atmospheric turbulence and the dispersal of atmospheric pollutants". *AMS Workshop on Micrometeorology*, American Meteorological Society.
- (2007). "DuPont™ TYVEK® / DuPont™ TYCHEM Technical Handbook."
- Dvorak, Glenda (2008). "Disinfection 101," www.cfsph.iastate.edu.
- Eaton, Bryan T., Broder, Christopher C., Middleton, Deborah and Wang, Lin-Fa (2006). "Hendra and Nipah viruses: different and dangerous," *Nature Reviews. Microbiology*. 4 (1), 23-35, 1740-1526, <http://www.ncbi.nlm.nih.gov/pubmed/16357858>.
- Eaton, B.T., C.C. Broder, D. Middleton and Wang, L. (2005). "Hendra and Nipah viruses: different and dangerous," *Nature Reviews Microbiology*, Vol. 4, pp. 23-35,
- Elbakidze, L., et al. (2009). "Economics Analysis of Mitigation Strategies for FMD Introduction in Highly Concentrated Animal Feeding Regions," *Applied Economic Perspectives and Policy*. 31 (4), 931-950.
- Environmental Protection Agency (2005). "Revision to the Guideline on Air Quality Models: Adoption of a Preferred General Purpose (Flat and Complex Terrain) Dispersion Model and Other Revision," Vol. 70, No. 216.
- EPA (2011). "Regulatory Definitions of Large CAFOs, Medium CAFO, and Small CAFOs," Environmental Protection Agency, National Pollutant Discharge Elimination System http://www.epa.gov/npdes/pubs/sector_table.pdf.
- E-Z Pack Manufacturing (2011). "Specifications," *Hercules Commercial Front Loader*,
- FCSHWM (Florida Center for Solid and Hazardous Waste Management) (2003). *Litter from Solid Waste Collection Trucks*, Report #03-04,
- Fellowes, O. N. and Suttmoller, P. (1970). "Foot-and-mouth disease virus: biological characteristics of virus from bovine carriers," *Archives of Virology*, 30(2), 173-180,

- FEMA (2003, February 18). "Tornado Background," *FEMA News Release*.
<http://www.fema.gov/news/newsrelease.fema?id=2549>.
- Field, H., Schaaf, K., Kung, N., Simon, C., Waltisbuhl, D., Hobery, H., Moore, F., Middleton, D., Crook, A., Smith, G., Daniels, P., Glanville, R. & Lovell, D. (2010). "Hendra Virus Outbreak with Novel Clinical Features, Australia," *Emerging Infectious Disease*. Vol. 16 (No. 2), pp. 338-340.
- Finney, D.J. (1952). "Probit Analysis: A Statistical Treatment of the Sigmoid Response Curve," 2nd edition Cambridge University Press.
- Forde-Folle, Kim (2011). "Correspondence concerning USDA NAADSM parameters". M. Rush. Washington DC.
- Fowler, Kent, DVM (2010, May 6). "Jan-Dec 2009_CA_Cattle&Swine," *Personal correspondence*. California Department of Food and Agriculture.
- Fox, L. (2005, July). "Deer Check Stations, 2004: Performance Report, Statewide Wildlife Research and Surveys," Kansas Department of Wildlife and Parks.
- Fox, Loyd (2011). "Interview with Kansas Department of Wildlife and Parks". S. I. Matt Lawrence.
- Freidberg, A.N., M.N. Worthy, B. Lee, M.R. Holbrook (2010). "Combined chloroquine and ribavirin treatment does not prevent death in a hamster model of Nipah and Hendra virus infection," *Journal of General Virology*, 91, 765-772,
- French, N.P. and Kelly, L, et al (2002). "Dose-response relationships for foot and mouth disease in cattle and sheep," *Epidemiol Infect* 128, 325-332.
- Gailiunas, P., G.E. Cottral (1966). "Presence and persistence of foot-and-mouth disease virus in bovine skin," *Journal of Bacteriology*, 91(6), 2333-2338,
<http://www.ncbi.nlm.nih.gov/pubmed/4287587>.
- Gailiunas, P. and Cottral, G.E. et al (1969). "Survival of foot-and-mouth disease virus on meat packaging materials," *Proceedings, annual meeting of the United States Animal Health Association*. 73, 425-436.
- Garner, Dale (2011). "Interview on wildlife with Iowa Department of Natural Resources," Personal communication received by Matt Lawrence.
- Garner, MG and Cannon, RM (1995). "Potential for windborne spread of foot-and-mouth disease virus in Australia," *Bureau of Resources Sciences, Australia*. Volume 98.
- Geisbert, Thomas W., Daddario-DiCaprio, Kathleen M., Hickey, Andrew C., Smith, Mark A., Chan, Yee-Peng, Wang, Lin-Fa, Mattapallil, Joseph J., Geisbert, Joan B., Bossart, Katharine N. and Broder, Christopher C. (2010). "Development of an Acute and Highly Pathogenic Nonhuman Primate Model of Nipah Virus Infection," *PLoS One*, 5(5), e10690-e10690,
<http://dx.doi.org/10.1371/journal.pone.0010690>.

- Georges-Courbot, M. C., Contamin, H., Faure, C., Loth, P., Baize, S., Leyssen, P., Neyts, J. and Deubel, V. (2006). "Poly(I)-Poly(C12U) but Not Ribavirin Prevents Death in a Hamster Model of Nipah Virus Infection," *Antimicrob. Agents Chemother.*, 50(5), 1768-1772, <http://aac.asm.org/cgi/content/abstract/50/5/1768>.
- Gesch, D., Oimoen, M., Greenlee, S., Nelson, C., Steuck, M. and Tyler, D. (2002). "The National Elevation Dataset," *Photogrammetric Engineering and Remote Sensing*. 68 (1), 5-11.
- Gloster, J., et al. (2007). "Foot-and-mouth disease - quantification and size distribution of airborne particles emitted by healthy and infected pigs," *The Veterinary Journal*. 174 (1), 42-53, DOI: 10.1016/j.tvjl.2006.05.020.
- Gloster, John, et al. (2008). "Foot-and-mouth disease: Measurements of aerosol emission from pigs as a function of virus strain and initial dose," *The Veterinary Journal*. 177, 374-380.
- Goh, K.J., C.T. Tan, Chew, N.K., Tan, P.S.K., Kamarulzaman, A., Sarji, S.A., Wong, K.T., Abdullah, B.J.J., Chua, K.B. and Lam, S.T. (2000). "Clinical Features of Nipah Virus Encephalitis among Pig Farmers in Malaysia," *The New England Journal of Medicine*, Vol. 342(No. 17), pp. 1229-1235,
- Graham, et al. (2008). "A Guide to Emergency Quarantine and Isolation Controls of Roads in Rural Areas," National Cooperative Highway Research Program.
- Graves, John H., McVicar, John W., Suttmoller, Paul, Trautman, Rodes and Wagner, Gerald G. (1971). "Latent Viral Infection in Transmission of Foot-and-Mouth Disease by Contact between Infected and Susceptible Cattle," *the Journal of Infectious Diseases*, 124(3), 270-276, <http://www.jstor.org/stable/30108451>.
- Green, Francis H.Y., Yoshida, Ken (1990). "Characteristics of Aerosols Generated During Autopsy Procedures and Their Potential Role as Carriers of Infectious Agents," *Applied Occupational and Environmental Hygiene*. 5:12, 853-858.
- Greene, W.H. (2007). "NLOGIT Version 4.0 Reference Guide," Plainview, NY: Econometric Software.
- Grubman, M. J., Zellner, M. and Wagner, J. (1987). "Antigenic comparison of the polypeptides of foot-and-mouth disease virus serotypes and other picornaviruses," *Virology*, 158(1), 133-140, <http://www.ncbi.nlm.nih.gov/pubmed/2437694>.
- Guillaume, V., et al. (2009). "Acute Hendra virus infection: Analysis of the pathogenesis and passive antibody protection in the hamster model," *Virology*. 387, 459-465.
- Guillaume, V., Contamin, H., Loth, P., Georges-Courbot, M. C., Lefevre, A., Marianneau, P., Chua, K. B., Lam, S. K., Buckland, R., Deubel, V. and Wild, T. F. (2004). "Nipah Virus: Vaccination and Passive Protection Studies in a Hamster Model," *J. Virol.*, 78(2), 834-840, <http://jvi.asm.org/cgi/content/abstract/78/2/834>.
- Guillaume, V., Contamin, H., Loth, P., Grosjean, I., Courbot, M. C. Georges, Deubel, V., Buckland, R. and Wild, T. F. (2006). "Antibody Prophylaxis and Therapy against Nipah Virus Infection in Hamsters," *J. Virol.*, 80(4), 1972-1978, <http://jvi.asm.org/cgi/content/abstract/80/4/1972>.

- Guillaume, Vanessa, Lefevre, Annabelle, Faure, Caroline, Marianneau, Philippe, Buckland, Robin, Lam, Sai Kit, Wild, T. Fabian and Deubel, Vincent (2004). "Specific detection of Nipah virus using real-time RT-PCR (TaqMan)," *Journal of Virological Methods*, 120(2), 229-237, <http://www.sciencedirect.com/science/article/pii/S0166093404001569>.
- Gurley, E.S., et al. (2007). "Infection Control and Hospital Epidemiology," *Chicago Journals*,. Published on behalf of The Society of Healthcare Epidemiology of America, Vol. 28, No.6 (June), 740-742.
- Gwaltney, J. M., Jr., Moskalski, P. B. and Hendley, J. O. (1978). "Hand-to-hand transmission of rhinovirus colds," *Annals of Internal Medicine*, 88(4), 463-467, <http://www.ncbi.nlm.nih.gov/pubmed/205151>.
- Hackett, E.T., Jr. (2001). "Effect of Pinholes on Sterile Barrier Properties," Presented at HealthPak, March 2001, in St. Petersburg, Florida, http://www2.dupont.com/Medical_Packaging/en_US/assets/downloads/mar2001healthpak.pdf.
- Hahn, W., Perry, J., and Southard, L. (2009). "Comparing Two Sources of Retail Meat Price Data, ERR-88," U.S. Dept. of Agri., Econ. Res. Serv.
- Hall, C. B., Douglas, R. G., Jr. and Geiman, J. M. (1980). "Possible transmission by fomites of respiratory syncytial virus," *Journal of Infectious Diseases*, 141(1), 98-102, <http://www.ncbi.nlm.nih.gov/pubmed/7365274>.
- Halpin, K., et al., (2011). "Pteropid Bats are Confirmed as the Reservoir Hosts of Henipaviruses: A Comprehensive Experimental Study of Virus Transmission," *Am J Trop Med Hyg*, 85(5), 946-951,
- Hanna, J.N., et al. (2006). "Hendra virus infection in a veterinarian," *MJA* 2006. 185;562-564.
- Harit, A.K., et al. (2006). "Nipah/Hendra virus outbreak in Siliguri, West Bengal, India in 2001," *Indian J. Med Res* 123. (April 2006), 553-560.
- Heady, E. O., Sonka, S. (1974). "Farm Size, Rural-Community Income, and Consumer Welfare," *American Journal of Agricultural Economics*. 56 ((3)), 534-542.
- Health and Safety Executive (2007 September). *Final report on potential breaches of biosecurity at the Pirbright site 2007*.
- Heckert, R.A., et al. (1997). "Efficacy of Vaporized Hydrogen Peroxide against Exotic Animal Viruses," *Applied and Environmental Microbiology*. Oct. 1997 Vol. 63 No.10, 3916-3918.
- Henderson W.M., and Brooksby J.B. (1948). "The survival of foot-and-mouth disease virus in meat and offal," *J Hyg (Lond)*. 46, 394-402.
- Hensher, D.A, Rose, J.M. and Green, W.G. (2005). "Applied Choice Analysis: A Primer," Cambridge University Press.

- Hewitson, B.C. and Crane, R.G. (2002). "Self-organizing maps: applications to synoptic climatology," *Clim. Res.* 22, 13-26.
- Highfield, L. D., Ward, M. P., Laffan, S. W., Norby, B. and Wagner, G. G. (2010). "The impact of potential mitigation strategies on the predicted spread of foot and mouth disease in white-tailed deer in south Texas," *Prev Vet Med.* 2010/02/26, 94 (3-4), 282-288, DOI: S0167-5877(10)00032-2 [pii] 10.1016/j.prevetmed.2010.01.015, 1873-1716 (Electronic) 0167-5877 (Linking), Retrieved: May 1, <http://www.ncbi.nlm.nih.gov/pubmed/20181400>.
- Hill, J. (2011). "The Use of Captive Bolt Technology for the Humane Destruction of Hogs," *Agriculture and Rural Development, Food Safety and Animal Health Division, Government of Alberta*.
- Hollis, L. (2011). "Interview with Kansas State University Professor A. Wilson, SES, Inc."
- Homaira, N. (2010, October). "Cluster of Nipah Virus Infection, Kushtia District, Bangladesh, 2007," *Epidemiol. Infect.* Volume 5 (10 e13570), 138, 1630-1636.
- Hoogenboezem, W., et al. (2001). "Cryptosporidium and Giardia: Occurrence in sewage, manure and surface water," *RIWA/RIVM/RIZA-Report*. Amsterdam, The Netherlands.
- House, Carol, et al. (1990). "Inactivation of viral agents in bovine serum by gamma irradiation," *Can J. Microbiol.* 36, 737-740.
- House, J. A. and Yedloutschnig, R. J. (1982). "Sensitivity of seven different types of cell cultures to three serotypes of foot-and-mouth disease virus," *Canadian Journal of Comparative Medicine*, 46(2), 186-189,
- Hughes, G.J., R.P. Kitching, M.E. Woolhouse (2002a). "Dose-dependent responses of sheep inoculated intranasally with a type O foot-and-mouth disease virus.," *J Comp Pathol* (127), 22-29.
- Hughes GJ, V. Mioulet, Haydon DT and Kitching RP, Donaldson AI, Woolhouse ME (2002b). "Serial passage of foot-and-mouth disease virus in sheep reveals declining levels of viraemia over time," *J Gen Virol* 83, 1907-1914.
- Hyde, J. L., Blackwell, J. H. and Callis, J. J. (1975). "Effect of pasteurization and evaporation on foot-and-mouth disease virus in whole milk from infected cows," *Canadian Journal of Comparative Medicine*, 39(3), 305-309,
- IAH (2008, July). *The economic and social impact of the Institute for Animal Health's work on Foot and Mouth Disease*,
- Ihle, C., Razafitrimo, G., Razainirina, J., Andriaholinirina, N., Goodman, S.M., Faure, C., Georges-Courbot, M., Rousset, D., & Reynes, J. (2007). "Henipavirus and Tioman Virus Antibodies in Pteropodid Bats, Madagascar," *Emerging Infectious Disease*. Vol. 12 (No. 1), pp.159-161.
- ILC Dover (2002). "Protection Factor Test Results - ILC Dover Chemturbation Model 3525,"

- International Organization for Standardization (ISO) (2009). "Risk management-Principles and guidelines," *International Standard, ISO 31000*. First edition 2009-11-15, Reference number ISO 31000:32009(E).
- Irving, Louise, Smith, F. A. (1981 Jan). "One-Year Survey of Enteroviruses, Adenoviruses, and Reoviruses Isolated from Effluent at an Activated-Sludge Purification Plant," *Applied and Environmental Microbiology*. Vol 41, No. 1, 51-59.
- Irwin, E.G., A.M. Issermann, A.M. M. Kilkenny, and M.D. Partridge (2007). "A Century of Research on Rural Development and Regional Issues," *American Journal of Agricultural Economics* 89, 582-595.
- Jennings, L. C., Dick, E. C., Mink, K. A., Wartgow, C. D. and Inhorn, S. L. (1988). "Near disappearance of rhinovirus along a fomite transmission chain," *Journal of Infectious Diseases*. 1988/10/01, 158 (4), 888-892, 0022-1899 (Print) 0022-1899 (Linking), Retrieved: Oct, <http://www.ncbi.nlm.nih.gov/pubmed/2844923>.
- Johnson, John (2011). "Kansas Feral Swine Control Program, April 2011 Quarterly Update," United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services.
- Joutsiniemi, S.L., Kaski, S. and Larsen, T.A. (1995). "Self-organizing map in recognition of topographic patterns of EEG spectra," *IEEE Trans. Biomed. Eng.* 42, 1062-1068.
- Julian, T. R., Leckie, J. O., Boehm, A. B. (2010). "Virus transfer between fingerpads and fomites," *Journal of Applied Microbiology*. 109, 1868-1874.
- Julian, T.R. and Canales, R.A., et al. (2009). "A model of exposure to rotavirus from nondietary ingestion iterated by simulated intermittent contacts," *Risk Analysis*. 29, 617-632.
- Just, R.E., D. L. Hueth, and A. Schmitz (2004). "The Welfare Economics of Public Policy: A Practical Evaluation to Project and Policy Evaluation," Edward Elgar.
- Kalnay, E, Kanamitsu, M, Kirtler, R, Collins, W, D, Deaven, L, Gandin, M, Iredell, Saha, S, White, G, Woollen, J, Zhu, Y, Chelliah, M, Ebisuzaki, W, Higgins, W, Janowiak, J, Mo, KC, Ropelewski, C, Wang, J, Leetma, A, Reynolds, R, Jenne, R and D, Joseph (1996). "The NCEP/NCAR 40-year reanalysis project," *Bulletin of the American Meteorological Society*. 77, 437-471.
- Kampf, G. and Kramer, A. (2004). "Epidemiologic background of hand hygiene and evaluation of the most important agents for scrubs and rubs," *Clinical Microbiology Reviews*. 2004/10/19, 17 (4), 863-893, table of contents, DOI: 10.1128/CMR.17.4.863-893.2004, 0893-8512 (Print) 0893-8512 (Linking), Retrieved: Oct, <http://www.ncbi.nlm.nih.gov/pubmed/15489352>.
- Kansas Department of Wildlife and Parks (2010). "Correspondence regarding KS Deer Survey Data," Extracted from the figure in Slide 8.
- Kansas State Online (Accessed November 2011). "Equine in Kansas - Overview," *Kansas State University Animal Sciences & Industry; Kansas Horse Council*. <http://www.asi.ksu.edu/p.aspx?tabid=43>; <http://www.kansashorsecouncil.com/index.html>.

- Kaski, S., Kangas, J. and Kohonen, T. (1998). "Bibliography of Self-Organizing Map (SOM) papers: 1981 – 1997," *Neural Comput. Surv.* 1, 102-350.
- Kay-Sin, TAN, et al. (1999). "Epidemiological aspects of Nipah virus infection," *Neuro. J. Southeast Asia.* 1999:4, 77-81.
- Kelly, T.C., et al. (2003, December 8-9). "The Office of Science and Technology Policy Blue Ribbon Panel on The Threat of Biological Terrorism Directed Against Livestock," *Conference Proceedings*. <http://www.whitehouse.gov/files/documents/ostp/NSTC%20Reports/2003%20Livestock%20Blue%20Ribbon.pdf>.
- Kennedy, J., Bek, J., Griffin, D. (2000 accessed online 20 December 2011). "Selection and Use of Disinfectants," *NebGuide*. Published by the University of Nebraska-Lincoln Extension, Animal Diseases (F-8), <http://www.triton-vet.com/uso%20y%20seleccion%20desinfectantes.pdf>
- Kenny, M.T. and Sabel, F.L (1968). "Particle size distribution of *Serratia marcescens* aerosols created during common laboratory procedures and simulated laboratory accidents," *Appl Microbiol*, 16, 1146-1150,
- Kingsbury, N. (2008). "DHS Lacks Evidence to Conclude That Foot-and-Mouth Disease Research Can Be Done Safely on the U.S. Mainland," Subcommittee on Oversight and Investigations, Committee on Energy and Commerce, House of Representatives, U.S. Government Accountability Office, GAO-08-821T.
- Kingsbury, N., et al. (2009). "Biological Research: Observations on DHS's Analyses Concerning Whether FMD Research Can Be Done as Safely on the Mainland as on Plum Island," (GAO-09-747), Report to Congressional Committees, <http://www.gao.gov/new.items/d09747.pdf>.
- Kitching, R. P. (2002). "Clinical variation in foot and mouth disease: cattle," *Revue scientifique et technique (International Office of Epizootics)*. 21 (3), 499-504, 0253-1933, <http://www.ncbi.nlm.nih.gov/pubmed/12523690>.
- Klein, R. C., Party, E., and Gershey, E. L. (1990). "Virus penetration of examination gloves," *BioTechniques*. 9, 196-199.
- Knobben, B. A. S., et al. (2007). "Transfer of bacteria between biomaterials surfaces in the operating room-An experimental study," *Journal of Biomedical Materials Research*. Part A 80A, 790-799.
- Knudsen, R. C., Card, D. M. and Hoffman, W. W. (1986). "Protection of guinea pigs against local and systemic foot-and-mouth disease after administration of synthetic lipid amine (Avridine) liposomes," *Antiviral Research*, 6(2), 123-133, <http://www.sciencedirect.com/science/article/pii/016635428690032X>.
- Knudsen, R. C., Groocock, C. M. and Andersen, A. A. (1979). "Immunity to foot-and-mouth disease virus in guinea pigs: clinical and immune responses," *Infection and Immunity*, 24(3), 787-787,

- Kohonen, T. (1982). "Self-organized information of topologically correct feature maps," *Biol. Cyber.* 43, 59-69.
- Kohonen, T., Hynninen, J., et al. (1996). "The Self-Organizing Map Program Package (SOM_PAK)," Espoo, Finland, Helsinki University of Technology, Laboratory of Computer and Information Science.
- Kohonen, T. (1998). "The self-organizing map," *Neurocomputing.* 21, 1-6.
- Kohonen, T. (2001). *Self-Organizing Maps, 3rd Edition.* (3rd Edition), 521, Springer, 3540679219.
- Korniewicz, Denise M., Garzon, Laurel, Seltzer, Judy and Feinleib, Manning (2004). "Failure rates in nonlatex surgical gloves," *American Journal of Infection Control*, 32(5), 268-273, <http://www.sciencedirect.com/science/article/pii/S019665530400358X>.
- Korniewicz, D. M et.al. (1990). "Leakage of virus through used vinyl and latex examination gloves," *J. Clin. Microbiol.* . 28, 787-788.
- Kowalski, W.J., et al. (1999). "Filtration of Airborne Microorganisms: Modeling and Prediction," *ASHRAE Trans.* 105, 4-17.
- Ksiazek, Thomas G., Rota, Paul A. and Rollin, Pierre E. (2011). "A review of Nipah and Hendra viruses with an historical aside," *Virus Research*, (0), <http://www.sciencedirect.com/science/article/pii/S0168170211003790>.
- K-State (2011). Enrollment, Registrar's Office.
- Kuchler, F., and Abebayehu, T. (2006). "Did Bse Announcements Reduce Beef Purchases?," *Economic Research Report 7251.* United States Department of Agriculture, Economic Research Service.
- Lam, S.K., Chau, K.B. (2002). "Nipah virus encephalitis outbreak in Malaysia," *Clinical Infectious Diseases.* 34(suppl 2), S48-51.
- Landsberg, H. E. and Jacobs, W. (1951). "Applied Climatology," *Compendium of Meteorology*, T. F. Malone. Boston, MA, American Meteorological Society: 976-992.,
- Le Blanc Smith, Peter M., et al. (2002). "Biological Testing of a Laboratory Pathological Waste Incinerator," *Applied Biosafety.* 7(2), 52-63.
- Lee, S. H., Jong, M. H., Huang, T. S., Lin, Y. L., Wong, M. L., Liu, C. I. and Chang, T. J. (2009). "Pathology and viral distributions of the porcine foot-and-mouth disease virus strain (O/Taiwan/97) in experimentally infected pigs," *Transboundary and Emerging Diseases*, 56(5), 189-201, <http://www.ncbi.nlm.nih.gov/pubmed/19432640>.
- Leontief, W. W. (1936). "Quantitative Input and Output Relations in the Economic Systems of the United States," *The Review of Economics and Statistics.* 18 (3), 105–125.
- Lewellen, W.S. (1977). "Use of invariant modeling." *Handbook of Turbulence*, pp. 237-280.

- Lewis, Raymond G., PE (2002). "Practical Guide to Autoclave Validation," *Pharmaceutical Engineering*. July/August.
- Li D, Bai XW, Sun P and Fu YF, Xie BX, Lu ZJ, Chen YL, Cao WJ, Liu ZX (2010). "Effect of the route of foot-and-mouth disease virus infection of piglets on the course of diseases," *Acta Virol*. 54, 311-313.
- Li, Mingyi, Embury-Hyatt, Carissa and Weingartl, Hana M. (2010). "Experimental inoculation study indicates swine as a potential host for Hendra virus," *Vet Res*, 41(3),
- Lingaas, E., Fagernes, M. (2009). "Development of a method to measure bacterial transfer from hands," *Journal of Hospital Infection*. 72, 43-49.
- Little, C., and Doeksen, G. (1968). "Measurement of Leakage by Use of an Input-Output Model," *American Journal of Agricultural Economics*. 50 (4), 921-934.
- Liu, Y., Weisberg, R. H. and Mooers, C. N. K. (2006). "Performance evaluation of the self-organizing map for feature extraction," *Journal of Geophysical Research*. 111 (C5), 1-14, DOI: 10.1029/2005jc003117, Retrieved: 05-25, <http://www.agu.org/journals/jc/jc0605/2005JC003117/2005JC003117.pdf>.
- Lodder, W.J., de Roda Husman, A.M. (2005 March). "Presence of Noroviruses and Other Enteric Viruses in Sewage and Surface Waters in The Netherlands," *Appl Environ Microbiol*. 71(3), 1453-1461.
- Loeffler, F., P. Frosch (1897-1898). *Reports of the Commission for the Investigation of foot and mouth disease at the Institute for Infectious Diseases in Berlin*, Zbl.. Bakt. I(Orig 1897; 22/1898; 23), 257-259/371-391,
- Loftkin, J.M., et al. (1996). "Evaluation of cattle insecticide treatments on attraction, mortality, and fecundity of mosquitoes," *Journal of the American Mosquito Control Association*. 12 (1), 17-22.
- Luby, S.P., et.al. (2009). "Transmission of Human Infection with Nipah Virus," *Clinical Infectious Diseases*. 49:1743-8, <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2784122/>.
- Madhanmohan, M., Nagendrakumar, S. B., Narasu, M. L. and Srinivasan, V. A. (2010). "Effect of FMD vaccine antigen payload on protection, sub-clinical infection and persistence following needle challenge in sheep," *Comp Immunol Microbiol Infect Dis*. 2009/11/10, 33 (6), e7-13, DOI: S0147-9571(09)00053-8 [pii] 10.1016/j.cimid.2009.10.001, 1878-1667 (Electronic), 0147-9571 (Linking), Retrieved: Dec, <http://www.ncbi.nlm.nih.gov/pubmed/19896714>.
- Mahy, B. W. J. (2005). "Global Epidemiology and Prospects for Control of Foot-and-Mouth Disease," *Foot-and-Mouth Disease Virus*. 137.
- Maisner, A., Neufeld, J. and Weingartl, H. (2009). "Organ-and endotheliotropism of Nipah virus infections in vivo and in vitro," *Thromb Haemost*, 102, 1014-1023,
- Mak, J. (1989). "The Economic Contribution of Travel to State Economies," *Journal of Travel Research*. 28, 3-5.

- Maramorosch, K. (1961). "For Determination of the conversion of TCID₅₀ to PFU," *Advances in Virus Research*. The Plaque Assay of Animal Viruses, Chapter 8 p. 351, <http://books.google.com/books?id=-AT-SK60Py0C&lpq=PA319&ots=ja4uhVNE91&dq=fmdv%20%22one%20ID50%22&lr&pg=PA351#v=onepage&q&f=false>
- Mardones, F. (2010). "Parameterization of the duration of infection stages of serotype O foot-and-mouth disease virus: an analytical review and meta-analysis with application to simulation models," *Journal of Veterinary Research*. 41 (4), 45, DOI: 10.1051/vetres/2010017.
- Marsh, T.L., T. C. Schroeder, and J. Mintert (2004). "Impacts of Meat Product Recalls on Consumer Demand in the USA," *Applied Economics*. 36, 897-909.
- Martinsen, J. S. (1970). "The Effect of Diethylaminoethyl Dextran and Agar Overlay pH on Plaque Formation by Two Plaque-size Variants of Foot-and-Mouth Disease Virus," *Canadian Journal of Comparative Medicine*, 34(1), 13-19,
- Mathieu, Cyrille, Pohl, Christine, Szecsi, Judit, Trajkovic-Bodennec, Selena, Devergnas, Severine, Raoul, Herve, Cosset, Francois-Loic, Gerlier, Denis, Wild, T. Fabian and Horvat, Branka (2011). "Nipah Virus Uses Leukocytes for Efficient Dissemination within a Host," *J. Virol.*, 85(15), 7863-7871, <http://jvi.asm.org/cgi/content/abstract/85/15/7863>.
- Mbithi, J. N., Springthorpe, V. S., Boulet, J. R. and Sattar, S. A. (1992). "Survival of hepatitis A virus on human hands and its transfer on contact with animate and inanimate surfaces," *Journal of Clinical Microbiology*, 30(4), 757-763, <http://www.ncbi.nlm.nih.gov/pubmed/1315331>.
- Mbithi, J. N., Springthorpe, V. S. and Sattar, S. A. (1993). "Comparative in vivo efficiencies of hand-washing agents against hepatitis A virus (HM-175) and poliovirus type 1 (Sabin)," *Appl Environ Microbiol*, 59(10), 3463-3469, <http://www.ncbi.nlm.nih.gov/pubmed/8250567>.
- McColl, K. A., Westbury, H. A., Kitching, R. P. and Lewis, V. M. (1995). "The persistence of foot-and-mouth disease virus on wool," *Aust Vet J*. 1995/08/01, 72 (8), 286-292, 0005-0423 (Print) 0005-0423 (Linking), Retrieved: Aug, <http://www.ncbi.nlm.nih.gov/pubmed/8579558>.
- McCullough, M., Marsh, T.L. and Huffaker, R. (2010). "Reconstructing Market Reactions to Consumption Harms," Working paper, School of Economic Sciences, Washington State University.
- McDowell, Margaret A., et al. (2008). "Anthropometric Reference Data for Children and Adults: United States, 2003-2006,," *National Health Statistics Reports*. No. 10, USDHHS/CDC.
- McEachern, Jennifer A., Bingham, John, Cramer, Gary, Green, Diane J., Hancock, Tim J., Middleton, Deborah, Feng, Yan-Ru, Broder, Christopher C., Wang, Lin-Fa and Bossart, Katharine N. (2008). "A recombinant subunit vaccine formulation protects against lethal Nipah virus challenge in cats," *Vaccine*. 26 (31), 3842-3852, 0264-410X, <http://www.sciencedirect.com/science/article/pii/S0264410X08005720>.

- McVicar, J.W., Eisner, R.J. (1983, April 19). "Aerosol exposure of cattle to foot-and-mouth disease virus," *The Journal of Hygiene*. 91, 319-328, Cambridge University Press, Retrieved: January 27, 2010, <http://www.jstor.org/pss/3862908>.
- McVicar, J. W. and Sutmoller, P. (1976). "Growth of foot-and-mouth disease virus in the upper respiratory tract of non-immunized, vaccinated, and recovered cattle after intranasal inoculation," *J Hyg (Lond)*. 1976/06/01, 76 (3), 467-481, 0022-1724 (Print), 0022-1724 (Linking), Retrieved: Jun, <http://www.ncbi.nlm.nih.gov/pubmed/180177>.
- McVicar, J. W., Sutmoller, P. and Andersen, A. A. (1974). "Foot-and-mouth disease virus: plaque reduction neutralization test," *Archives of Virology*, 44(2), 168-172,
- Melius, Carl, Robertson, Alex and Hullinger, Pam (2006). "Developing Livestock Facility Type Information from USDA Agricultural Census Data for use in Epidemiological and Economic Models," Department of Homeland Security, Lawrence Livermore National Laboratory, UCRL-TR-226008.
- Middleton, D. J., Morrissy, C. J., van der Heide, B. M., Russell, G. M., Braun, M. A., Westbury, H. A., Halpin, K. and Daniels, P. W. (2007). "Experimental Nipah virus infection in pteropid bats (*Pteropus poliocephalus*)," *Journal of Comparative Pathology*, 136(4), 266-272, <http://www.ncbi.nlm.nih.gov/pubmed/17498518>.
- Middleton, D. J., Westbury, H. A., Morrissy, C. J., van der Heide, B. M., Russell, G. M., Braun, M. A. and Hyatt, A. D. (2002). "Experimental Nipah virus infection in pigs and cats," *Journal of Comparative Pathology*, 126(2-3), 124-136, <http://www.ncbi.nlm.nih.gov/pubmed/11945001>.
- Mohamed, F., Swafford, S., Petrowski, H., Bracht, A., Schmit, B., Fabian, A., Pacheco, J. M., Hartwig, E., Berninger, M., Carrillo, C., Mayr, G., Moran, K., Kavanaugh, D., Leibrecht, H., White, W. and Metwally, S. (2011). "Foot-and-mouth disease in feral swine: susceptibility and transmission," *Transbound Emerg Dis*, 58(4), 358-371, DOI:10.1111/j.1865-1682.2011.01213.x, <http://www.ncbi.nlm.nih.gov/pubmed/21418546>.
- Monaghan, Andrew J., Rife, Daran L., Pinto, James O., Davis, Christopher A. and Hannan, John R. (2010). "Global Precipitation Extremes Associated with Diurnally Varying Low-Level Jets". *Journal of Climate*. 23, pp. 5065-5084.
- Montgomery, J.M., et al. (2008). "Risk Factors for Nipah Virus Encephalitis in Bangladesh," *Emerging Infectious Diseases* Vol.14, No.10, October 2008.
- Moonen, P., Jacobs, L., Crienen, A. and Dekker, A. (2004). "Detection of carriers of foot-and-mouth disease virus among vaccinated cattle," *Vet Microbiol*, 103(3-4), 151-160, DOI:S0378-1135(04)00261-5 [pii], 10.1016/j.vetmic.2004.07.005, <http://www.ncbi.nlm.nih.gov/pubmed/15504586>.
- Mounts, A.W., et al. (2001). "A cohort study of health care workers to assess nosocomial transmissibility of Nipah virus, Malaysia," *J Infectious Diseases* 2001:183(810-813),

- Mungall, Bruce A., Middleton, Deborah, Crameri, Gary, Bingham, John, Halpin, Kim, Russell, Gail, Green, Diane, McEachern, Jennifer, Pritchard, L. Ian, Eaton, Bryan T., Wang, Lin-Fa, Bossart, Katharine N. and Broder, Christopher C. (2006). "Feline Model of Acute Nipah Virus Infection and Protection with a Soluble Glycoprotein-Based Subunit Vaccine," *Journal of Virology*. 80 (24), 12293-12302, <http://jvi.asm.org/content/80/24/12293.abstract>.
- NAADSM Development Team (2011) NAADSM version number 3.2.18. Free program distributed via the Internet at <http://www.naadsm.org>.
- NABC/KSU (2004). "Carcass Disposal: A Comprehensive Review," Chapters 4 and 6, <http://hdl.handle.net/2097/662>.
- National Center for Atmospheric Research (2010). "The Joint Effects Model Global Climate Database," 27.
- National Climatic Data Center (2001). "Climates of the States," *Climatology of the United States* No. 60, Climate of Kansas, http://hurricane.ncdc.noaa.gov/climatenormals/clim60/states/Clim_KS_01.pdf.
- National Climatic Data Center (2010). "Comparative Climatic Data," <http://ols.nndc.noaa.gov/plolstore/plsql/olstore.prodspecific?prodnum=C00095-PUB-A0001>.
- National Climatic Data Center (2010). "Quality Controlled Local Climatological Data (Manhattan Regional Airport Hourly ASOS Observations)," (January 30, 2010), <http://www.ncdc.noaa.gov/oa/ncdc.html>
- National Geospatial-Intelligence Agency "U.S. Military Specification Digital Terrain Elevation Data (DTED)".
- NDP (2010). *Update to Proposed Tissue Disposal System*. June.
- NDP (2011, 19 August). "50% Construction Documents," *Basis of Design*. DHS NBAF.
- Nelson, F.J., and Schertz, L.P. (1996). "Provisions of the Federal Agriculture Improvement and Reform Act of 1996," *USDA, Economic Research Service*. AIB729, <http://www.ers.usda.gov/publications/aib729/>.
- Nelson, J. R., et al. (1999). "A whole-glove method for the evaluation of surgical gloves as barriers to viruses," *American Journal of Contact Dermatitis* 10, 183-189.
- Nogueira, L., T. L. Marsh, P.R. Tozer and D. Peel (2011). "Foot-and-Mouth Disease and the Mexican Cattle Industry," *Agricultural Economics*. 42 (supplement), p:33-44.
- NRC 1.76 (2007). "Design-Basis Tornado and Tornado Missiles for Nuclear Power Plants," *Regulatory Guide 1.76*,

- NRC (2010). "Evaluation of a Site-Specific Risk Assessment for the Department of Homeland Security's Planned National Bio- and Agro-Defense Facility in Manhattan, Kansas: Preliminary Letter Report," *The National Academies Press*,
- NVS Countermeasures Working Group (2007). "National Veterinary Stockpile Countermeasures Working Group Report Foot-and-Mouth Disease," USDA Agricultural Research Service.
- O'Connell, K. P., et al. (2004). "Testing for viral penetration of non-latex surgical and examination gloves: a comparison of three methods," *Clin. Microbiol. Infect.* 10, 322-326.
- O'Shea, T.J., Bogan, M.A., and Ellison, L.E. (2003). "Monitoring Trends in Bat Population of the United States and Territories: Status of the Science and Recommendations for the Future," *US Geological Survey, University of Nebraska - Lincoln*.
- Odde, Ken (2011). "Interview with KSU Animal Science Department Head". A. Wilson, SES, Inc.
- O'Donnell, Vivian, LaRocco, Michael, Duque, Hernando and Baxt, Barry (2005). "Analysis of Foot-and-Mouth Disease Virus Internalization Events in Cultured Cells," *Journal of Virology*, 79(13), 8506-8518,
- O'Donnell, V. K., Pacheco, J. M., Henry, T. M. and Mason, P. W. (2001). "Subcellular distribution of the foot-and-mouth disease virus 3A protein in cells infected with viruses encoding wild-type and bovine-attenuated forms of 3A," *Virology*, 287(1), 151-162, <http://www.ncbi.nlm.nih.gov/pubmed/11504550>.
- OIE (2009). "OIE Terrestrial Manual," <http://www.oie.int/en/international-standard-setting/terrestrial-manual/>.
- OIE (2010). "Animal Diseases Data: Rift Valley Fever; Contagious Bovine Pleuropneumonia; Nipah; Japanese Encephalitis; Classical Swine Fever; Foot and Mouth Disease," Retrieved: May 12, 2010, http://www.oie.int/eng/maladies/en_technical_diseasecards.htm.
- OIE (2010). "Manual of Diagnostic Tests and Vaccines for Terrestrial Animals 2010," Retrieved: 2 Feb 2012, <http://www.cabi.org/ahpc/default.aspx?site=160&page=3323>.
- Ojajärvi, J. (1981). "The Importance of Soap Selection for Routine Hand Hygiene in Hospital," *J. Hyg. Cambridge*. 86, 275-283.
- Olsen, Robin J., Lynch, Patricia, Coyle, Marie B., Cummings, Jeanne, Bokete, Teresa and Stamm, Walter E. (1993). "Examination Gloves as Barriers to Hand Contamination in Clinical Practice," *JAMA: The Journal of the American Medical Association*, 270(3), 350-353, <http://jama.ama-assn.org/content/270/3/350.abstract>.
- Orsel, K., de Jong, M. C., Bouma, A., Stegeman, J. A. and Dekker, A. (2007). "The effect of vaccination on foot and mouth disease virus transmission among dairy cows," *Vaccine*. 2006/09/05, 25 (2), 327-335, DOI: S0264-410X(06)00901-7 [pii], 10.1016/j.vaccine.2006.07.030, 0264-410X (Print), 0264-410X (Linking), Retrieved: Jan 4, <http://www.ncbi.nlm.nih.gov/pubmed/16949184>.

- Orsel, K., Dekker, A., Bouma, A., Stegeman, J. A. and de Jong, M. C. (2005). "Vaccination against foot and mouth disease reduces virus transmission in groups of calves," *Vaccine*. 2005/07/09, 23 (41), 4887-4894, DOI: S0264-410X(05)00534-7 [pii], 10.1016/j.vaccine.2005.05.014, 0264-410X (Print), 0264-410X (Linking), Retrieved: Sep 30, <http://www.ncbi.nlm.nih.gov/pubmed/16002192>.
- Paarlberg, P.L., J.G. Lee, and A.H. Seitzinger (2003 April). "Measuring Welfare Impacts of an FMD Outbreak in the United States," *Journal of Agricultural and Applied Economics*. 35 (1), 53-65.
- Paarlberg, P.L., et al. (2008, May). "Economic Impacts of Foreign Animal Disease," *USDA, Economic Research Service*. ERR-57, <http://www.ers.usda.gov/publications/err57/>
- Paarlberg, P.L., Hillberg, S.A., Lee, J.G., Mathews Jr., K.H. (2009). "Supply reductions, export restrictions, and expectations for hog returns in a potential classical swine fever outbreak in the United States," *J Swine Health Prod* 17 (3), 155-162.
- Palakal, M.J., Murthy, U., Chittajallu, S.K and Wong, D. (1995). "Tonotopic representation of auditory responses using self-organizing maps," *Math Comput Model*. 22, 7-21.
- Pallister, J., Middleton, D., Broder, C. C. and Wang, L. F. (2011). "Henipavirus Vaccine Development," *J Bioterr Biodef S*. 1, 2-2.
- Pallister, Jackie, Middleton, Deborah, Wang, Lin-Fa, Klein, Reuben, Haining, Jessica, Robinson, Rachel, Yamada, Manabu, White, John, Payne, Jean, Feng, Yan-Ru, Chan, Yee-Peng and Broder, Christopher C. (2011). "A recombinant Hendra virus G glycoprotein-based subunit vaccine protects ferrets from lethal Hendra virus challenge," *Vaccine*. 29 (34), 5623-5630, 0264-410X, <http://www.sciencedirect.com/science/article/pii/S0264410X11008796>.
- Pancic, F., Carpentier, D. C. and Came, P. E. (1980). "Role of infectious secretions in the transmission of rhinovirus," *Journal of Clinical Microbiology*. 1980/10/01, 12 (4), 567-571, 0095-1137 (Print) 0095-1137 (Linking), Retrieved: Oct, <http://www.ncbi.nlm.nih.gov/pubmed/6252242>.
- Parida, S., Mahapatra, M., Kumar, S., Das, S. C., Baron, M. D., Anderson, J. and Barrett, T. (2007). "Rescue of a chimeric rinderpest virus with the nucleocapsid protein derived from peste-des-petits-ruminants virus: use as a marker vaccine," *J Gen Virol*. 2007/06/08, 88 (Pt 7), 2019-2027, DOI: 88/7/2019 [pii], 10.1099/vir.0.82913-0, 0022-1317 (Print), 0022-1317 (Linking), Retrieved: Jul, <http://www.ncbi.nlm.nih.gov/pubmed/17554036>.
- Parker, J. (1971). "Presence and Inactivation of Foot-and-Mouth Disease Virus in Animal Faeces," *The Veterinary Record*. 88 (659-662).
- Patil, P., Bayry, J., Ramakrishna, C., Hugar, B. , Misra, L. and Prabhudas, K. (2002). "Immune Responses of Sheep to Quadravalent Double Emulsion Foot-and-Mouth Disease Vaccines: Rate ofDevelopment Immunity and Variations among Other Ruminants.," *Journal of Clinical Microbiology*. 40 (11), 4367-4371.
- Peel, M. C., Finlayson, B. L. and McMahon, T. A. (2007). "Updated world map of the Köppen-Geiger climate classification," *Hydrology and Earth System Sciences*. 11, 1633-1644.

- Pelzer, Jeremy (2011). "Nebraska's wild pig population concerns Wyoming state veterinarian," *Wyoming Star-Tribune (Trib.com)*.
- Pendell, D.L. (2006). "Value of Animal Traceability Systems in Managing a Foot and Mouth Disease Outbreak in Southwest Kansas," Graduate Dissertation, Kansas State University, <http://hdl.handle.net/2097/199>
- Pendell, D.L., et al. (2007). "The Economic Impacts of a Foot-And-Mouth Disease Outbreak: A Regional Analysis," *Journal of Agricultural and Applied Economics*. 39 (Oct.), 13-33, <http://purl.umn.edu/37093>.
- Piggott, N., Marsh, T.L. (2004, February). "Does Food Safety Information Impact U.S. Meat Demand?," *American Journal of Agricultural Economics*, Vol. 86(No. 1), pp. 154-174,
- Playford, E.G., et al. (2010, February). "Human Hendra Virus Encephalitis Associated with Equine Outbreak, Australia, 2008," *Emerging Infectious Diseases*. Vol.16, No.2, <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2957996/>.
- Plowright, R.K., et al. (2011, April). "Urban habituation, ecological connectivity and epidemic dampening: the emergence of Hendra virus from flying foxes (*Pteropus* spp.)," *Proceedings of the Royal Society B*, <http://rspb.royalsocietypublishing.org/content/early/2011/05/06/rspb.2011.0522.short?rss=1>.
- Plum Island Safety Committee (1979). *Final Committee Report: Exploratory Analysis - FMD Outbreak in Animal Supply*. Fax to USDA.
- Polatnick, Jerome (1967). "Chemically Characterized Media for Study of Foot-and-Mouth Disease Virus in Baby Hamster Kidney Cells," *Applied Microbiology*, 15(2), 228-232,
- Polatnick, Jerome and Bachrach, Howard L. (1978). "Effect of Zinc and Other Chemical Agents on Foot-and-Mouth Disease Virus Replication," *Antimicrobial Agents and Chemotherapy*, 13(5), 731-734,
- Porotto, M., Orefice, G., Yokoyama, C.C., Mungall, B.A., Realubit, R., Sganga, M.L., Aljofan, M., Whitt, M., Glickman, F. and Moscona, A. (2009). "Stimulating Henipavirus Multicycle Replication in a Screening Assay Leads to Identification of a Promising Candidate for Therapy," *Journal of Virology*. 83(10), 5148-5155.
- Queensland (Australia) Government, Brisbane (2009 cited 2010). *Guidelines for veterinarians handling potential Hendra virus infection in horses*. 3rd ed (Jan 14), <http://www.dpi.qld.gov.au>.
- R Development Core Team (2011). "R: A Language and Environment for Statistical Computing," R Foundation for Statistical Computing.
- Ramsdell, J.V., Jr., Rishel, J.P. (2007). *Tornado Climatology of the Contiguous United States (NUREG/CR-4461, Revision 2; PNNL-15112, Revision 1)*. Division of Risk Assessment and Special Projects, U.S. NRC.

- Randolph, T.F., Morrison, J.A., and Poulton, C. (2005). "Evaluating Equity Impacts of Animal Disease Control: The Case of Foot and Mouth Disease in Zimbabwe " *Review of Agricultural Economics*. 27, 465-472.
- Reed, S. E. (1975). "An investigation of the possible transmission of Rhinovirus colds through indirect contact," *J Hyg (Lond)*. 75, 249-258.
- Reeves, A. (2011). "Using data from the individual animal level to inform unit-level disease state parameters for NAADSM," <http://www.naadsm.org/techpapers>.
- Rego, A., Roley, L. (1999). "In-use barrier integrity of gloves: Latex and nitrile superior to vinyl," *American Journal of Infection Control* 27, 405-410.
- Reimer, J.J. (2006). "Vertical integration in the pork industry," *American Journal of Agricultural Economics*. 88 (1), 234, 0002-9092.
- Reynes, J. M., Counor, D., Ong, S., Faure, C., Seng, V., Molia, S., Walston, J., Georges-Courbot, M.C., Deubel, V., and Sarthou, J. (2005). "Nipah Virus in Lyle's Flying Foxes, Cambodia," *Emerging Infectious Disease*, 11, 1042-1047,
- Rich, K. (2005). "Spatial Models of Animal Disease Control in South America: The Case of Foot-and-Mouth Disease," *PhD Dissertation*. University of Illinois at Urbana-Champaign.
- Rich, Karl and Alex Winter-Nelson (2007). "An Integrated Epidemiological-Economic Analysis of Foot and Mouth Disease: Applications to the Southern Cone of South America," *American Journal of Agricultural Economics*. 682-697.
- Rich, K.M., Winter-Nelson, A., and Miller, G.Y. (2005). "Enhancing economic models for the analysis of animal disease," *Rev. sci. tech. Off. int. Epiz*. 24 (3), 847-856.
- Richard A, Pledger (1960). "Effect of neutral red on plaque formation by foot-and-mouth disease virus," *Virology*, 10(1), 50-56, <http://www.sciencedirect.com/science/article/pii/0042682260900052>.
- Richmond, J. Y. (1971). "Mouse Resistance Against Foot-and-Mouth Disease Virus Induced by Injections of Pyran," *Infect Immun*. 3, 249-253.
- Rife, Daran L., Pinto, James O., Monaghan, Andrew J., Davis, Christopher A. and Hannan, John R. (2010). "Global Distribution and Characteristics of Diurnally Varying Low-Level Jets," *Journal of Climate*. 23 (19), 5041-5064, DOI: 10.1175/2010jcli3514.1, 0894-8755 1520-0442.
- Riley County (2009). *Solid Waste Management Plan*,
- Robinson, S. E. and Christley, R. M. (2007). "Exploring the role of auction markets in cattle movements within Great Britain," *Preventive Veterinary Medicine*. 2007/05/08, 81 (1-3), 21-37, DOI: 10.1016/j.prevetmed.2007.04.011, 0167-5877 (Print), 0167-5877 (Linking), Retrieved: Sep 14.

- Rockx, Barry, et al. (2011 Aug). "Clinical Outcome of Henipavirus Infection in Hamsters Is Determined by the Route and Dose of Infection," *Journal of Virology*. Vol. 85 (No. 15), 7658-7671, Received 8 March 2011/Accepted 10 May 2011.
- Rockx, Barry, Bossart, Katharine N., Feldmann, Friederike, Geisbert, Joan B., Hickey, Andrew C., Brining, Douglas, Callison, Julie, Safronetz, David, Marzi, Andrea, Kercher, Lisa, Long, Dan, Broder, Christopher C., Feldmann, Heinz and Geisbert, Thomas W. (2010). "A Novel Model of Lethal Hendra Virus Infection in African Green Monkeys and the Effectiveness of Ribavirin Treatment," *J. Virol.*, 84(19), 9831-9839, <http://jvi.asm.org/cgi/content/abstract/84/19/9831>.
- Roth, James A. and Spickler, Anna Rivid (2008). *Emerging and Exotic Diseases of Animals*, Iowa State University.
- Round, J. I. (1983). "Nonsurvey Techniques: A Critical Review of the Theory and the Evidence," *International Regional Science Review* 8 (3), 189-212.
- Rusin, P., Maxwell, S. and Gerba, C. (2002). "Comparative surface-to-hand and fingertip-to-mouth transfer efficiency of gram-positive bacteria, gram-negative bacteria, and phage," *Journal of Applied Microbiology*. 2002/09/18, 93 (4), 585-592, DOI: 1734 [pii], 1364-5072 (Print) 1364-5072 (Linking), <http://www.ncbi.nlm.nih.gov/pubmed/12234341>.
- Rutala, William A., Weber, David J. (2008). *Guideline for Disinfection and Sterilization in Healthcare Facilities, 2008*. DHHS/CDC.
- Sahini, M., et.al. (2001). "Nipah virus infection among abattoir workers in Malaysia, 1998-1999," *International Journal of Epidemiology*. 2001:30, 1017-1020.
- Sandia National Laboratories (2009, December 17). "NBAF Threat and Risk Assessment," pp. 82.
- Sandia National Laboratories (2009, June). "Design Basis Threat."
- Sanson, R.L. (2000). "A re-analysis of the start of the United Kingdom 1967-8 foot-and-mouth disease epidemic to calculate transmission probabilities," *9th Symposium of the International Society for Veterinary Epidemiology and Economics.*, Retrieved: Augus 6-11, 2000.
- Sattar, S. A., Jacobsen, H., Springthorpe, V. S., Cusack, T. M. and Rubino, J. R. (1993). "Chemical disinfection to interrupt transfer of rhinovirus type 14 from environmental surfaces to hands," *Applied and Environmental Microbiology*. 1993/05/01, 59 (5), 1579-1585, 0099-2240 (Print) 0099-2240 (Linking), Retrieved: May, <http://www.ncbi.nlm.nih.gov/pubmed/8390817>.
- Schijven, Jack, et al. (2005). "Quantitative Risk Assessment of FMD Virus Transmission via Water," *Risk Analysis*. Vol 25 No. 1, 13-21.
- Schlenker, W. and S. B. Villas-Boas (2009). "Consumer and Market Response to Mad-Cow Disease," *American Journal of Agricultural Economics*. 91 (4), 1140-1152.
- Schuenemann, K.C., Cassano, J.J. and Finnis, J. (2009). "Synoptic Forcing of Precipitation over Greenland: Climatology for 1961-99," *Journal of Hydrometeorology*. 10 (60-78).

- Scudamore, J.M. (2007). "Consumer attitudes to vaccination of food-producing animals," *Rev. sci. tech. Off. int. Epiz.* 26 (2), 451-459.
- Sellers, R.F., Parker, J. (1969, May 17). "Airborne excretion of foot-and-mouth disease virus," *The Journal of Hygiene.* 67, 671-677, Cambridge University Press, Retrieved: February 12, 2010, <http://www.jstor.org/pss/3861463>.
- Sellers, R.F., Donaldson, A.I., and Herniman, K.A.J. (1970, May 22). "Inhalation, persistence and dispersal of foot-and-mouth disease virus by man," *The Journal of Hygiene.* 68, 565-573, Cambridge University Press, Retrieved: January 27, 2010, <http://www.jstor.org/pss/3861566>.
- Sellers, R.F. (1971, June). "Quantitative aspects of the spread of foot and mouth disease," *The Veterinary Bulletin.* 41 (6), 431-439.
- SES, Inc. Multi-State Partnership for Security in Agriculture. (2009, December). "Animal Stop Movement Order Functional and Full-Scale Exercise After-Action Report and Improvement Plan.."
- SES Inc. (2011). "Interview with Pottawatomie County Producer 3," In Deimeke B (ed.).
- Sharma, et al. (1981). "Foot-and-mouth disease in sheep: Pattern of virus excretion and distribution in the experimentally infected animals," *Indian J. Anim. Sci.* 51 (January), (1): 61-66.
- Shields, D.A., and Mathews, K.H. (2003, June). "Interstate Livestock Movements," *Electronic Outlook Report from the Economic Research Service.* LDP-M-108-01, USDA, Retrieved: March 15, 2010, <http://www.ers.usda.gov/publications/ldp/jun03/ldpm10801/ldpm10801.pdf>.
- Snowden, W.A. (1966). "Growth of foot-and-mouth disease virus in monolayer cultures of calf thyroid cells," *Nature.* 210, 1079-1080.
- Sorensen, J. H. (2003). "Modelling the Atmospheric Spread of Foot-and-Mouth Disease," *Danish Meteorological Institute.* 26.
- Sorensen, J. H., Mackay, D. K., Jensen, C. O. and Donaldson, A. I. (2000). "An integrated model to predict the atmospheric spread of foot-and-mouth disease virus," *Epidemiology and infection.* 2000/09/12, 124 (3), 577-590, 0950-2688 (Print), 0950-2688 (Linking), Retrieved: Jun.
- Spurgin, Anthony J. (2009). *Human Reliability Assessment Theory and Practice*, CRC Press.
- Suarez, D.L., Spackman, E., Senne, D.A., Bulage, L., Welsch, A.C., & Froberg, K. (2003 abstract accessed online 19 December 2011). "The Effect of Various Disinfectant on Detection of Avian Influenza Virus by Real Time RT-PCR," *Avian Diseases.* Vol. 47 (No. s3), pp. 1091-1095, <http://www.aaapjournals.info/doi/abs/10.1637/0005-2086-47.s3.1091?journalCode=avdi>.
- Sullivan, Robert, et al. (1971 July). "Inactivation of Thirty Viruses by Gamma Radiation," *Applied Microbiology.* Vol 22 No. 1, 61-65.

- Sutmoller, P., and Vose, D.J. (1997). "Contamination of animal products: the minimum pathogen dose required to initiate infection," *Rev. Sce Tech Off. int. Epiz.* 16 (1).
- Sutmoller, P. and McVicar, J. W. (1972). "Foot-and-Mouth Disease: Changes in Serum-Neutralizing Activity of Immunized Cattle Shortly After Virus Exposure," *Infection and Immunity*, 6(5), 718-722,
- Sutmoller, P. and McVicar, J. W. (1972). "Three variants of foot-and-mouth disease virus type O: exposure of cattle," *Am J Vet Res.* 1972/08/01, 33 (8), 1641-1647, 0002-9645 (Print), 0002-9645 (Linking), Retrieved: Aug, <http://www.ncbi.nlm.nih.gov/pubmed/4340054>.
- Sutmoller, P. and McVicar, J. W. (1976). "Pathogenesis of foot-and-mouth disease: the lung as an additional portal of entry of the virus," *J Hyg (Lond)*. 1976/10/01, 77 (2), 235-243, 0022-1724 (Print), 0022-1724 (Linking), Retrieved: Oct, <http://www.ncbi.nlm.nih.gov/pubmed/185288>.
- Sutmoller, P., McVicar, J. W. and Cottral, G. E. (1968). "The epizootiological importance of foot-and-mouth disease carriers. I. Experimentally produced foot-and-mouth disease carriers in susceptible and immune cattle," *Arch Gesamte Virusforsch.* 1968/01/01, 23 (3), 227-235, 0003-9012 (Print), 0003-9012 (Linking), <http://www.ncbi.nlm.nih.gov/pubmed/5680590>.
- Sykes, R.I., Parker, S.F., Henn, D.S. and Chowdhury, B. (2008). *SCIPUFF Version 2.4 Technical Documentation*. Sage Management Enterprise LLC.
- Tammero, Lance, Gansemer, Jim, Holmstrom, Lindsey, Hullinger, Pam, Melius, Carl and Robertson, Alex (2010). "The Multiscale Epidemiological Simulation and Analysis (MESA) Model: Parameterization of MESA for FMD," LLNL-TM-432205.
- Taul, T. (2011). Interview with the Kansas Artificial Breeding Service Unit (KABSU) Manager, In Wilson A (ed.), SES, Inc.
- Taylor, G. R. and Butler, M. (1982). "A comparison of the virucidal properties of chlorine, chlorine dioxide, bromine chloride and iodine," *The Journal of Hygiene*, 89(2), 321-328,
- Taylor, N.M., et al., (2004). "Risk of foot-and-mouth disease associated with proximity in space and time to infected premises and the implications for control policy during the 2001 epidemic in Cumbria," *Vet Rec*, 154, 617-626,
- Taylor, Scott (2011). "Interview with Nebraska Game and Parks Commission's Wildlife Division."
- Team RDC (2011). "R: A Language and Environment for Statistical Computing," R Foundation for Statistical Computing, Vienna, Austria.
- Terpstra, C. (1972). "Pathogenesis of foot-and-mouth disease in experimentally infected pigs," *Bull Off Int Epizoot* 77, 859-874.
- Teunis, P.F., A.H. Havelaar (2000). "The Beta Poisson dose-response model is not a single-hit model.," *Risk Anal* (20), 513-520.

- Thilmany, D., Umberger, W., and Ziehl, A. (2004). "Consumer Response to Beef due to the December 2003 BSE Incident in the U.S.," Colorado State University DARE Extension publication AMR 04-01.
- Tildesley, M. J., Savill, N. J., Shaw, D. J., Deardon, R., Brooks, S. P., Woolhouse, M. E., Grenfell, B. T. and Keeling, M. J. (2006). "Optimal reactive vaccination strategies for a foot-and-mouth outbreak in the UK," *Nature*. 2006/03/03, 440 (7080), 83-86, DOI: nature04324 [pii], 10.1038/nature04324, 1476-4687 (Electronic), 0028-0836 (Linking), Retrieved: Mar 2, <http://www.ncbi.nlm.nih.gov/pubmed/16511494>.
- Tonsor, G. T., Mintert, J. R., & Schroeder, T. C. (2010). "US Meat Demand: Household Dynamics and Media Information Impacts," *Journal of Agricultural and Resource Economics*. 35.
- Torres-Velez, F. J., Shieh, W. J., Rollin, P. E., Morken, T., Brown, C., Ksiazek, T. G. and Zaki, S. R. (2008). "Histopathologic and Immunohistochemical Characterization of Nipah Virus Infection in the Guinea Pig," *Veterinary Pathology Online*, 45(4), 576-585, <http://vet.sagepub.com/content/45/4/576.abstract>.
- Townsend, E., Halvorson, D.A., Nagaraja, K.V., & Shaw, D.P. (1999, 2000 abstract accessed online 20 December 2011). "Susceptibility of an Avian Pneumovirus isolated from Minnesota Turkeys to Physical and Chemical Agent," *Avian Diseases*. Vol. 44, pp. 336-342, <http://www.jstor.org/pss/1592548>.
- Tozer, P., Marsh, T.L., and Perevodchikov, E.V., (2010). "Domestic and Trade Impacts of Foot and Mouth Disease on the Australian Beef Industry," Contributed paper 2010 Meeting of the Australian Agricultural and Resource Economics Society, http://www.impact.wsu.edu/MarshFiles/Tozer%20Manuscript_170310.pdf.
- Twomey, T., France, L. L., Hassard, S., Burrage, T. G., Newman, J. F. E. and Brown, F. (1995). "Characterization of an acid-resistant mutant of foot-and-mouth disease virus," *Virology*, 206(1), 69-75, <http://www.sciencedirect.com/science/article/pii/S0042682295800204>.
- U.S. GAO. "U.S. GAO - Biological Research: Observations on DHS's Analyses Concerning Whether FMD Research Can Be Done as Safely on the Mainland as on Plum Island." from <http://www.gao.gov/products/GAO-09-747>.
- United Kingdom, Department for Environment, Food and Rural Affairs (UK DEFRA) "Family Food – Data Sets," Retrieved: 8/23/2010, <http://www.defra.gov.uk/evidence/statistics/foodfarm/food/familyfood/documents/index.htm>.
- United States Post Office (2009). *USNaviguide (Free USPS Lookup and Boundary map)*. Vol. 2011, <http://www.usnaviguide.com/>.
- University of Georgia College of Veterinary Medicine (2007). "Southeastern Cooperative Wildlife Disease Study," Vol 2011, <http://128.192.20.53/nfsms/index.jsp>.
- USACE (U.S. Army Corps of Engineers) (2001, April). "Earthquake Effects on the Dam," *Heartland Engineers Fact Sheet*. USACE Kansas City District.

- USAHA (2008). "Foreign Animal Diseases (The Gray Book)," <http://www.usaha.org/pubs/fad.pdf>.
- USDA (2007). "National Veterinary Stockpile Countermeasures Working Group Report Foot-and-Mouth Disease ", USDA Agricultural Research Service.
- USDA (2009). "2007 Census of Agriculture: Summary and State Data In Agriculture."
- USDA Research Education and Economics (2002). *ARS Facilities Design Standards*. 242.241-ARS.
- USDA (2011). "NAHEMS Guidelines: Vaccination for contagious diseases. Appendix A: foot-and-mouth disease."
- USDA-APHIS (2009). "Beef 2007-08, Part II: Reference of Beef Cow-calf Management Practices in the United States, 2007–08," (Table D.8.a), 84,
http://www.aphis.usda.gov/animal_health/nahms/beefcowcalf/downloads/beef0708/Beef0708_dr_PartII.pdf.
- USDHHS/CDC *National Health and Nutrition Examination Survey, 1999-2002*.
- USDHHS/CDCP (2007). "Biosafety in Microbiological and Biomedical Laboratories, 5th Edition," Retrieved: May 28, 2010,
http://www.cdc.gov/biosafety/publications/bmbl5/BMML5_introduction.pdf.
- USGS (2011). "USGS Surface-Water Monthly Statistics for the Nation," *USGS Water Resources*.
http://waterdata.usgs.gov/nwis/monthly/?referred_module=sw&site-no=06887000&por_06887000-6+92416,00060,6,1950.
- Vande Woude, George F., Polatnick, Jerome and Ascione, Richard (1970). "Foot-and-Mouth Disease Virus-Induced Alterations of Baby Hamster Kidney Cell Macromolecular Biosynthesis: Inhibition of Ribonucleic Acid Methylation and Stimulation of Ribonucleic Acid Synthesis," *Journal of Virology*, 5(4), 458-463,
- Vogelmann, J. E., Howard, S. M., Yang, L., Larson, C. R., Wylie, B. K. and Van Driel, J. N. (2001). "Completion of the 1990's National Land Cover Data Set for the conterminous United States," *Photogrammetric Engineering and Remote Sensing*. 67, 650-662.
- Walker, J.S., et al. (1984). "The thermal death time curve for foot-and-mouth disease virus contained in primarily infected milk," *Journal of Biological Standardization*. 12, 185-189.
- Wang, Wenli, Winters, Philip J. (2004). "Statistically Significant Efficiency Testing of HEPA Filters," *Journal of the IEST*. 2004 Edition, 101-106.
- Ward, M. P., Laffan, S. W. and Highfield, L. D. (2011). "Disease spread models in wild and feral animal populations: application of artificial life models," *Rev Sci Tech*. 2011/10/04, 30 (2), 437-446, 0253-1933 (Print), 0253-1933 (Linking), Retrieved: Aug,
<http://www.ncbi.nlm.nih.gov/pubmed/21961216>.

- WasteCare Corporation (2011). *Trash Compactors and Waste Disposal*.
http://www.wastecare.com/Products-Services/Compactors/Compactors_About.htm.
- Weingartl, Hana, Czub, Stefanie, Copps, John, Berhane, Yohannes, Middleton, Deborah, Marszal, Peter, Gren, Jason, Smith, Greg, Ganske, Shelley, Manning, Lisa and Czub, Markus (2005). "Invasion of the Central Nervous System in a Porcine Host by Nipah Virus," *J. Virol.* 79 (12), 7528-7534,
<http://jvi.asm.org/cgi/content/abstract/79/12/7528>.
- Weingartl, Hana M., Berhane, Yohannes, Caswell, Jeff L., Loosmore, Sheena, Audonnet, Jean-Christophe, Roth, James A. and Czub, Markus (2006). "Recombinant Nipah Virus Vaccines Protect Pigs against Challenge," *J. Virol.* 80 (16), 7929-7938,
<http://jvi.asm.org/cgi/content/abstract/80/16/7929>.
- Westcott, P.C., Young, E.C., and Price, J.P. (2002). "The 2002 Farm Act: Provisions and Implications for Commodity Markets," *USDA, Economic Research Service*. AIB778,
<http://www.ers.usda.gov/Publications/AIB778/>.
- Williams, Tara (2010, April 22). "Health Cert - Swine & Cattle Imports 2009," Personal correspondence, Veterinary Division, North Carolina Department of Agriculture and Consumer Services.
- Williamson, Mm, Hooper, Pt, Selleck, Pw, Gleeson, Lj, Daniels, Pw, Westbury, Ha and Murray, Pk (1998). "Transmission studies of Hendra virus (equine morbilli-virus) in fruit bats, horses and cats," *Australian Veterinary Journal.* 76 (12), 813-818, 1751-0813,
<http://onlinelibrary.wiley.com/doi/10.1111/j.1751-0813.1998.tb12335.x/abstract>.
- Williamson, M. M., Hooper, P. T., Selleck, P. W., Westbury, H. A. and Slocombe, R. F. (2000). "Experimental Hendra Virus Infection in Pregnant Guinea-pigs and Fruit Bats (*Pteropus poliocephalus*)," *Journal of Comparative Pathology.* 122 (2-3), 201-207, 0021-9975,
<http://www.sciencedirect.com/science/article/pii/S002199759990364X>.
- Winther, B., McCue, K., Ashe, K., Rubino, J.R. and Hendley, J.O. (2007). "Environmental contamination with rhinovirus and transfer to fingers of healthy individuals by daily life activity," *Journal of Medical Virology.* 79 (10), 1606-1610, 1096-9071.
- Wong, K.T., et al. (2009). "Human Hendra virus infection causes acute and relapsing encephalitis," *Neuropathology and Applied Neurobiology* 35, 296-305.
- Wood, J., et al. (2004). "Destruction Efficiency of Microbiological Organisms in Medical Waste Incinerators: A Review of Available Data," Proceedings, 23rd Annual International Conference on Incineration & Thermal Treatment Technologies (Phoenix, AZ, May 10-14,), Air & Waste Management Association, Pittsburgh, PA, 011.
- World Health Organization (2010, March 10). "Nipah Virus Fact Sheet N262,"
<http://www.who.int/mediacentre/factsheets/fs262/en/print.html>.
- Wright, C. F., Gloster, J., Mazelet, L., Paton, D. J. and Ryan, E. D. (2010). "Short-lived carriage of foot-and-mouth disease virus in human nasal cavities after exposure to infected animals," *The Veterinary Record,* 167(24), 928-931, <http://www.ncbi.nlm.nih.gov/pubmed/21262692>.

- Yu, C.-Y., Hsu, Y.-W., Chen, C.-Y. (2008). "Determination of hand surface area as a percentage of body surface area by 3D anthropometry," *Burns* 34, 1183-1189.
- Yu, C.-Y., Tu, H.-H. (2009). "Foot surface area database and estimation formula," *Applied Ergonomics*. 40, 767-774.
- Yu, C.-Y., Lin, C.-H., Yang, Y.-H. (2010). "Human body surface area database and estimation formula," *Burns* 36, 616-629.
- Zhao, Z., Whal, T., and Marsh, T. (2006). "Invasive Species Management: Foot-and-Mouth Disease in the U.S. Beef Industry," *Agricultural and Resource Economics Review*. 35 (1), 98-115, <http://purl.umn.edu/10174>.
- Zhu, Zhongyu, Bossart, Katharine N., Bishop, Kimberly A., Crameri, Gary, Dimitrov, Antony S., McEachern, Jennifer A., Feng, Yang, Middleton, Deborah, Wang, Lin-Fa, Broder, Christopher C. and Dimitrov, Dimiter S. (2008). "Exceptionally Potent Cross-Reactive Neutralization of Nipah and Hendra Viruses by a Human Monoclonal Antibody," *Journal of Infectious Diseases*. 197 (6), 846-853, <http://jid.oxfordjournals.org/content/197/6/846.abstract>.
- Zohrabian, A.M., et al. (2004). "West Nile Virus Economic Impact, Louisiana, 2002," *Emerging Infectious Diseases*. 10, 1736-1744.
- Zollinger, B. (2004). "Kansas Department of Wildlife and Parks Survey of Landowners on Opinions About Deer Populations in Kansas."
- Zollinger, B., and Wheeler, B. (2007, January). "Public Opinion Survey of Deer Management in Kansas," The Docking Institute of Public Affairs. Fort Hays State University.
- Zollinger, B. (2010, March 3). "Addendum to the 2008 Kansas Department of Wildlife and Parks Survey of Land Operators on Opinion About Deer Populations in Kansas," The Docking Institute of Public Affairs.
- Zoni, R., Zanelli, R., Riboldi, E., Bigliardi, L. and Sansebastiano, G. (2007). "Investigation of virucidal activity of chlorine dioxide, experimental data on feline calicivirus, HAV and Coxsackie B5," *J. Prev. Med. Hyg*, 48(3), 91-95,

