

Agricultural Security and Emergency Preparedness: Protecting One of America's Critical Infrastructures

**Stephen M. Apatow, President, Humanitarian Resource Institute
Director of Infrastructure Analysis, International Research and Development.**

December 2001

Humanitarian Resource Institute
P.O. Box 21372, Carson City, Nevada 89721
Telephone: Eastern U.S. (203) 668-0282
Telephone: Western U.S. (775) 884-4680
Internet: <http://www.humanitarian.net>
Email: info@humanitarian.net

Introduction

The threat of biological weapons and potential for terrorists to disrupt economies and societies by introducing pathogens into the food supply and livestock is now being taken seriously by government agencies. The U.S. Department of Agriculture (USDA) has in place an overall biosecurity system designed to prevent the harmful introduction of plant and animal pathogens into America's system of agriculture and food production. Biosecurity and biocontainment are words describing programs for infectious disease control that (1) reduce/prevent the introduction of new diseases onto an operation from outside sources and (2) reduce/prevent the movement of infectious diseases on the operation.¹ Since September 11, all USDA inspectors have been placed on heightened alert at ports of entry and in meat and poultry slaughter and processing plants, and security has been increased at appropriate USDA facilities.

The strength and value of the U.S. food and agricultural system makes it a potential terrorist target.^{2 3} The agricultural sector accounts for some 13% of U.S. gross national product⁴ with one eighth of all American jobs connected to agriculture, either directly or indirectly.

¹ USDA: APHIS: VS, CEAH, National Animal Health Monitoring System, Includes the following publications: Introduction to Infectious Disease Control on Farms (Biosecurity), Biosecurity on Dairies, Biosecurity of Dairy Farm Feedstuffs. Available at <http://www.aphis.usda.gov/vs/ceah/cahm/General.htm>.

² Anne Kohnen. "Responding to the Threat of Agroterrorism: Specific Recommendations for the United States Department of Agriculture." BCSIA Discussion Paper 2000-29, ESDP Discussion Paper ESDP 2000-04, John F. Kennedy School of Government, Harvard University, October 2000. Available at <http://ksgnotes1.harvard.edu/BCSIA/Library.nsf/pubs/ESDP4Kohnen>.

³ Jason Pate and Gavin Cameron. "Covert Biological Weapons Attacks against Agricultural Targets: Assessing the Impact the Impact against U.S. Agriculture." BCSIA Discussion Paper 2001-9, ESDP Discussion Paper ESDP-2001-05, John F. Kennedy School of Government, Harvard University, August 2001. Available at <http://ksgnotes1.harvard.edu/BCSIA/Library.nsf/pubs/ESDP01Cameron>.

⁴ Statement by Floyd P. Horn, Ph.D., Administrator, Agricultural Research Service U.S. Department of Agriculture Before the United States Senate Emerging Threats and Capabilities Subcommittee of the Armed Services Committee, October 27, 1999. Available at http://www.senate.gov/~armed_services/statemnt/1999/991027fh.pdf.

From the farm to the table, USDA has in place biosecurity measures designed to protect against all animal and plant pathogens. USDA is also closely coordinating with other federal agencies such as the Food and Drug Administration, the Centers for Disease Control, the U.S. Customs Service, and law enforcement agencies on biosecurity issues. Communications, training and outreach continues with state and local agriculture agencies, as well as appropriate industry representatives.^{5 6 7}

According to a report by the Animal and Plant Health Inspection Service (APHIS), a division within the USDA, at the 2001 American Veterinary Medical Association Convention, there are approximately 150 foreign animal diseases APHIS is concerned with keeping out of the United States. On an average day, 1.3 million people enter the country, along with 38,000 animals. In fiscal year 2000, 14 million animals were imported, mostly from Mexico and Canada.⁸

Biosecurity Incidents: A Reference Point for Strategic Planning

The World Organization for Animal Health or Office International des Epizooties (OIE) is an intergovernmental organization with 155 member countries that is the international body responsible for setting animal health standards on which international trade restrictions are based. Transmissible diseases under the OIE Classifications have the potential for very serious and rapid spread, serious socio-economic or public health consequences and are of major importance in the international trade of animals and

⁵ 2. U.S. Department of Agriculture, Agricultural Biosecurity Questions and Answers. Available at <http://www.usda.gov/special/biosecurity/anthraxq&a.htm>.

⁶ National Emergency Response to a Highly Contagious Animal Disease, U.S. Department of Agriculture, Animal and Plant Health Inspection Service. Available at <http://www.aphis.usda.gov/oa/pubs/fco412.pdf>.

⁷ National Association of State Departments of Agriculture FMD Resource Page. Available at <http://www.nasda-hq.org/FMD/index.htm>.

animal products. The diseases posing the most significant threats to the United States agricultural market are classified as List A diseases.⁹ An outbreak of a List A disease is internationally recognized as grounds for an export embargo.¹⁰

In 1997, an outbreak of Classical Swine Fever in the Netherlands left \$2.3 billion (USD) in economic damages and 8 million hogs destroyed. Also in 1997, an outbreak of Foot and Mouth Disease (FMD) spread rapidly in Taiwan causing some 8 million hogs to be destroyed and \$8 billion (USD) in economic losses.¹¹ In the spring of 1999, dioxin (cancer-causing lipid-soluble polychlorinated/brominated dibenzo-p-dioxins) was introduced into the Belgian food supply, including exports, via contaminated animal fat used in animal feeds supplied to Belgian, French and Dutch farms. Hens, pigs and cattle ate the contaminated feed and high levels of dioxin were found in meat products as well as eggs. Within two to three weeks following the first announcement of contamination, at least 30 countries temporarily banned imports of Belgian agriculture products. Some countries banned imports from France, the Netherlands and Germany as well. The United States and Singapore went one step further and temporarily banned all European poultry and pork.^{12 13}

⁸ 2001 Convention News. American Veterinary Medical Association, Wednesday, July 18, 2001. Available at <http://www.avma.org/conv/cv2001/news/wednesday2.asp>.

⁹ Diseases of the OIE Classification for List A and list B, Office International des Epizooties. Available at http://www.oie.int/eng/maladies/en_classification.htm.

¹⁰ World Trade Organization, Sanitary and Phytosanitary Measures. Available at http://www.wto.org/english/tratop_e/sps_e/sps_e.htm.

¹¹ Jay Lemmermen, Animal Agriculture Coalition, Testimony before the United States Committee on Agriculture, Nutrition and Forestry, March 27, 2001. Available at http://www.senate.gov/~agriculture/Hearings/Hearings_2001/March_27__2001/0327lem.htm.

¹² Corie Lok and Douglas Powell, The Belgian Dioxin Crisis of the Summer of 1999: A case study in crisis communications and management, Department of Food Science, University of Guelph, Ontario, February 1, 2000. Available at <http://www.plant.uoguelph.ca/safefood/crisis/belgian-dioxin-crisis-feb01-00.htm>.

¹³ American Board of Veterinary Toxicology (ABVT). Available at <http://www.abvt.org>.

Crop Disease Incidents include Fusarium head blight, or scab of wheat and barley, has been the plant disease with arguably the greatest impact on U.S. agriculture and society. The disease has reached epidemic proportions in the United States causing yield losses and price discounts resulting from reduced seed quality. Over 2.6 billion dollars have been lost to US agriculture during wheat scab epidemics in the 1990s.¹⁴ This figure is on the same order of magnitude as the 1997 Red River Valley spring floods. Losses in terms of bushels of wheat were the greatest of any outbreak in U.S. history and about 10 million acres were affected to some extent.¹⁵ In 1996, Karnal blight was discovered in wheat seeds grown in Arizona. In response to this outbreak approximately 50 countries including China adopted phytosanitary trade restrictions¹⁶ against the United States.

The importance of good crop biosecurity requires appropriate research for fingerprinting high priority pathogens, detecting deliberate releases, developing rapid genetic-based diagnostic assays, epidemiological and risk prediction, and other scientific and technical approaches to reduce this risk.¹⁷

Beginning in late February 2001, an outbreak of Foot and Mouth Disease (FMD), one of the world's most economically devastating livestock diseases spread throughout the UK with a smaller number of cases reported in France, the Netherlands and Ireland.

¹⁴ Fusarium head blight in the U.S., USDA-ARS Cereal Disease Laboratory, University of Minnesota. Available at http://www.crl.umn.edu/scab/fhb_us.html.

¹⁵ Edward Lotterman, Scab: The Ninth District's agricultural plague of the '90s, Fedgazette, November 1998. Available at <http://minneapolisfed.org/pubs/fedgaz/98-10/scab.html>.

¹⁶ World Trade Organization, Sanitary and Phytosanitary Measures. Available at http://www.wto.org/english/tratop_e/sps_e/sps_e.htm.

¹⁷ N. W. Schaad, J. J. Shaw, A. Vidaver, J. Leach, and B.J. Erlick, USDA ARS-Foreign Disease-Weed Science Unit, Ft. Detrick, MD 21702; 2Inst. Molecular Biology and Medicine, University of Scranton, Scranton, PA; University of Nebraska, Lincoln, NE 68583; Kansas State University, Manhattan, KS 66506; USDA ARS Special Interagency Programs, Beltsville, MD 20705. Available at <http://www.apsnet.org/online/feature/BioSecurity/Top.html>.

To date, upwards of 2,030 cases have been recorded with 3,975,000 animals slaughtered on 9,493 premises.¹⁸

The speed and extent of the Pan-Asian strain of type O FMD was considered unprecedented. The spread of the FMD Virus within newly infected countries was mainly attributed to the movement of subclinically infected animals, principally of sheep, and via contact with contaminated vehicles used for the transportation of these animals.¹⁹

In March, the Federation of Veterinarians of Europe (FVE) and the Union of European Veterinary Practitioners (UEVP) representing all the veterinarians of Europe shared the concern of the general public over the death and destruction of large numbers of animals, many of which were not infected with the disease. A key issue in this discussion related to several factors, among which was the non-vaccination and “stamping out” policy adopted in the 1990’s to eradicate the disease and to open new export markets.²⁰ These challenges led to a call for the Paris-based Office International des Epizooties (OIE) to ensure the protective capacity of new vaccines and standardized tests which can differentiate between antibodies produced by vaccine and those produced by disease.^{21 22} In response to appeals by the international community, a number of

¹⁸ DEFRA: UK Statistics on foot and mouth disease Number of affected premises at 17:00 06 December.

¹⁹ OIE/FAO International Scientific Conference on foot and mouth disease 17-18 April 2001, p. 3. Available at ftp://ftp.oie.int/FMD20010417-18/OIEFAO_conf.pdf.

²⁰ Federation of Veterinarians of Europe (FVE) Statement on Foot and Mouth Disease. 3 April.2001. Available at http://www.fve.org/news/pdf/01_042.htm.

²¹ Stephen M. Apatow, Foot & Mouth Disease - EU: Use of Vaccination(02), ProMED Mail. Available at <http://www.humanitarian.net/eidnet/fmd/fmdresearch.html>.

²² Stephen M. Apatow, Perspective: Ring Vaccination - Common Sense ?. Available at <http://www.humanitarian.net/eidnet/fmd/vaccination.html>.

proposed changes to International Regulations were outlined by the OIE / FAO International Scientific Conference on Foot and Mouth Disease on April 17-18, 2001.²³

The economic impact to the U.K. is estimated at approximately \$20 billion (USD) that includes not only eradication and indemnity expenses, but also lost trade and tourism revenue.²⁴

In October 1999, seven people died along with scores of birds in States of New York, New Jersey, and Connecticut in an outbreak of a viral encephalitis never before diagnosed in the Western Hemisphere. The virus, which was confirmed in mid-October as being the West Nile Virus endemic to the Middle East, Africa, and Southeast Asia, was also attributed as the cause of death of several horses on Long Island, NY.²⁵ Since the initial index case, the West Nile Virus has spread to approximately 288 U.S. counties in 27 states, the District of Columbia and Canada.²⁶ In 2001, WNV reached the Mississippi Valley (extreme western portions of Kentucky, Tennessee and Mississippi, into central Louisiana) leading experts to anticipate the continued spread to Mexico, Central America, and the Pacific coast during this next year.

According to the Centers for Disease Control, 48 human cases of WNV encephalitis or meningitis in 9 states (five patients died), 416 cases (413 confirmed, 3 probable) of clinical West Nile Virus (WNV) infection in horses from 19 states with a

²³ OIE/FAO International Scientific Conference on foot and mouth disease 17-18 April 2001. Available at ftp://ftp.oie.int/FMD20010417-18/OIEFAO_conf.pdf.

²⁴ Ty Vannieuwenhoven , 2001 Convention News. American Veterinary Medical Association. Wednesday, July 18, 2001. Available at <http://www.avma.org/conv/cv2001/news/wednesday2.asp>.

²⁵ Centers for Disease Control and Prevention. Update: West Nile-like viral encephalitis—New York, 1999. MMWR Morb Mortal Wkly Rep 1999;48:890-2.

²⁶ Florida Division of Animal Industry, Office of the State Veterinarian, West Nile Virus Disease Bulletin, ProMED-mail post No. 20011212.3003, 12-DEC-2001. Available in Pro-MED Mail archives at <http://www.promedmail.org>.

total of 756 WNV positive mosquito pools reported in 15 states.^{27 28} The rapid spread has been attributed to the introduction of the infectious agent to the ecosystem where mosquitoes are the principal vectors, and birds of several species, chiefly migrants, appear to be the major introductory or amplifying hosts.²⁹ The 2001 Surveillance Activity includes the Centers for Disease Control and Prevention working with the U.S. Geological Survey, U.S. Department of Agriculture Animal and Plant Health Inspection Service, state wildlife agencies, and state and local health and vector control agencies to track the occurrence of West Nile Virus (WNV). Public health organizations in the lower 48 States and localities are actively participating in this program.³⁰

United States Risk Factors & Analysis

The United States has commercialized and economized agricultural production generating an inexpensive source of food, but these practices have increased the risk of catastrophic disease and pest outbreaks.³¹ According to the 2000 research statistics, United States agricultural sales were valued at \$196.8 billion. California was the leading agricultural state with sales valued at \$23 billion; Texas was second with \$13.7 billion; followed by Iowa at \$11.9 billion; Nebraska (\$9.8 billion), and Kansas (\$9.2 billion). The top 5 states accounted for 34 percent of the U.S. total. However, 25 states had agricultural

²⁷ CDC. Weekly update: West Nile virus activity -- United States, November 14-20, 2001. MMWR Morb Mortal Wkly Rep 2001; 50(47); 1061-2 (30 Nov). Available at <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5047a5.htm>.

²⁸ Florida State Division of Animal Industry, West Nile Virus Information, 26 Nov 2001. Available at <http://doacs.state.fl.us/ai/westnile.htm>.

²⁹ Migratory Birds and Spread of West Nile Virus in the Western Hemisphere. J. H. Rappole, S. R. Derrickson, and Z. Hubalek. Emerging Infectious Diseases, 6(4): 319-328 2000.

³⁰ Center for Integration of Natural Disaster Information (CINDI), U.S. Department of the Interior, U.S. Geological Survey. Available at <http://cindi.usgs.gov>.

³¹ The following statistics were obtained from the United States Department of Agriculture web site. Available at: <http://www.usda.gov>.

sales valued at more than \$3 billion; 19 states had more than \$4 billion and 9 had \$6 billion.³²

Major crop production zones in concentrated geographic regions provide an increased vulnerability to a major attack. For example, within the United States, 92.2 percent of grapes, 47 percent of tomatoes, 77.8 percent of lettuce, 100 percent of almonds and 75.5 percent of strawberries were grown in California;³³ 41 percent of tobacco, 39 percent of sweetpotatoes in North Carolina;³⁴ 83 percent of red raspberries, 77.3 percent of hops and 55 percent of apples in Washington;³⁵ 42 percent of peanuts in Georgia;³⁶ 47.7 percent of rice in Arkansas;³⁷ 76.5 percent of citrus in Florida.³⁸

The concentration of animals on individual farms can also magnify the impact of an agroterrorist attack. Large poultry farms may have hundreds of thousands of birds and feedlots can have thousands of cattle. Some animals, such as pigs and poultry, are often raised intensively and in close quarters. In such cases, even where a disease does not compel that an entire farm be slaughtered, the spread of the disease in such confined conditions may be rapid and extensive. In the United States, the numbers of farms have decreased, with the numbers of animals per operation increasing. Today, the most

³² United States Fact Sheet, USDA Economic Research Service. Available at <http://www.ers.usda.gov/statefacts/US.HTM>.

³³ California Agricultural Statistics Service. Telephone conversation with Jim Tippett, State Statistician for the California Department of Agriculture. Available at <http://www.nass.usda.gov/ca/rlsetoc.htm>.

³⁴ North Carolina Department of Agriculture. Telephone conversation with Tom Sabel, Statistician for the North Carolina Department of Agriculture. Available at http://www.ncagr.com/stats/nc_rank/ncrallyr.htm.

³⁵ USDA-NASS, Washingtons Rank in the Nations Agriculture. Available at: <http://www.nass.usda.gov/wa/annual01/warank01.pdf>.

³⁶ USDA-NASS, 2001 Georgia Agricultural Facts, p. 7. Available at <http://www.nass.usda.gov/ga/pubs/agfacts/genrlsec.pdf>.

³⁷ USDA-NASS, Arkansas Commodity Cash Receipts and Rank. Available at <http://www.nass.usda.gov/ar/econcomm.PDF>.

³⁸ USDA-NASS, State Statistical Report 1999-00, Florida Agricultural Statistics Service. Conversation with Bob Terry, Statistician for the Florida Department of Agriculture. Available at http://www.nass.usda.gov/fl/citrus/cs99/99cs_5_7.htm#principal.

successful swine farms each have 10,000 hogs or more. Similarly, beef cattle are fattened in a dwindling number of large feedlots - many of these hold 150,000-300,000 animals at a given time. Broiler production in the U.S. is very high and has increased from 1.6 billion birds in 1960 to 7.0 billion birds today. These chickens are usually grown in floor pens with 10,000 to 20,000 birds per pen.³⁹

On every farm, biosecurity through facility management techniques are crucial to decrease the risk of disease or pest introduction.⁴⁰

Disease Detection and Response

The mission of the USDA Animal and Plant Health Inspection Service (APHIS) is to protect America's animal and plant resources by, safeguarding resources from exotic invasive pests and diseases, monitoring and managing agricultural pests and diseases existing in the United States, resolving and managing trade issues related to animal or plant health, and ensuring the humane care and treatment of animals.⁴¹

Rapid surveillance and detection of Foreign Animal Diseases (FAD's) is crucial to minimizing the scope of a natural outbreak or a deliberate terrorist incident in the United States. If an outbreak of Foot and Mouth Disease (FMD) was detected, the time required to diagnose and initiate the appropriate measures would be crucial to determining the outbreak's ultimate effect. Successful eradication of the disease would require the commitment of government, livestock industries, farmer's organizations and

³⁹ Corrie Brown, "Agricultural terrorism: A Cause for Concern," *The Monitor*, Vol. 5, No. 1-2, Winter-Spring 1999, p. 7. Available at http://www.uga.edu/~cits/publications/monitor_win_sp_1999.pdf.

⁴⁰ USDA:APHIS:VS, CEAH, National Animal Health Monitoring System, Includes the following publications: Introduction to Infectious Disease Control on Farms (Biosecurity), Biosecurity on Dairies, Biosecurity of Dairy Farm Feedstuffs. Available at <http://www.aphis.usda.gov/vs/ceah/cahm/General.htm>.

⁴¹ Mission, Animal and Plant Health Inspection Service, U.S. Department of Agriculture. Available at <http://www.aphis.usda.gov/oa/mission.html>.

the general public. Research has suggested that a one-week delay could increase the proportion of infected premises from 18% to more than 90%.⁴² In November 2000, Canada, the U.S. and Mexico participated in Tripartite Exercise 2000, a simulated outbreak of FMD for the purpose of testing emergency disease response plans.⁴³ This exercise demonstrated the scope of serious challenges that would be associated with a FMD outbreak in the United States. This includes the need for close coordination and support of the Canadian and Mexican governments in the event a Foreign Animal Disease outbreak occurs first in their geographic region of North America.

Surveillance is the first line of defense against disease outbreak and U.S. Agriculture relies on ground surveillance by plant pathologists and field veterinarians. The Animal and Plant Health Inspection Agency maintains a cadre of field veterinarians to monitor animal disease and trains these employees in the recognition of exotic diseases. However, due to budgetary cutbacks over the last decade, the number of field veterinarians has decreased considerably and many have not received specific training in the recognition of foreign diseases.⁴⁴ Since the last outbreak of FMD was in 1929, few livestock producers or animal health workers have direct experience in the recognition and handling of the disease.⁴⁵

Intensive educational initiatives are needed to provide training for veterinarians that have had limited exposure to the recognition of Foreign and Exotic Animal Diseases.

⁴² The Potential Impact of Foot-and-Mouth Disease in California, 1999 University of California Agricultural Issues Center Report. Available at <http://aic.ucdavis.edu/pub/fmd.html>.

⁴³ Tripartite Exercise 2000, United States Foreign Animal Disease Response Simulation Exercise Final Reports and Summaries, Humanitarian Resource Institute. Available at <http://www.humanitarian.net/eidnet/fmd/tripartite2000.html>.

⁴⁴ Corrie Brown, "Agricultural terrorism: A Cause for Concern," *The Monitor*, Vol. 5, No. 1-2, Winter-Spring 1999. Available at http://www.uga.edu/~cits/publications/monitor_win_sp_1999.pdf.

The deliberate introduction of a FAD in multiple locations and/or with multiple pathogens could potentially overwhelm the current emergency response system. This potential challenge requires contingency plans which provide a surge capacity for the national animal health system. In the event of an emergency, local accredited veterinarians are likely to be the first responders and resources for ground surveillance, disease detection and response.⁴⁶ Foreign Animal Disease training through programs such as Plum Islands FAD Training Course⁴⁷ is considered to be a crucial need for both the curricula in schools and colleges of veterinary medicine as well as continuing education programs.

Zoonotics: Bridging Human and Veterinary Medicine

During the initial outbreak of West Nile Virus in 1999, a veterinarian named Dr. Tracey McNamara, head of the department of pathology for the Wildlife Conservation Society was credited with the initial diagnosis. Had it not been for the expertise of a veterinary professional linking a rash of mysterious bird deaths to a human encephalitis outbreak, it is unknown how long the foreign disease would have gone unrecognized. The eventual isolation and identification of the virus was the result of extensive and ongoing networking among numerous state and federal public health and animal health agencies, including the Centers for Disease Control and Prevention and the USDA:APHIS.⁴⁸

⁴⁵ Foot and Mouth Disease - Sources of Outbreaks and Hazard Categorization of Modes of Virus Transmission, USDA:APHIS:VS, Centers for Epidemiology and Animal Health, December 1994.

⁴⁶ National Emergency Response to a Highly Contagious Animal Disease, USDA APHIS Executive Summary. Available at <http://www.aphis.usda.gov/oa/pubs/fco412.pdf>.

⁴⁷ USDA:APHIS, Lessons Offered at Plum Island. Available at http://www.aphis.usda.gov/lpa/inside_aphis/features7.html.

⁴⁸ Veterinarians key to discovering outbreak of exotic encephalitis, Journal of the American Veterinary Medical Association, October 21, 1999. Available at <http://www.avma.org/onlnews/javma/newsextra/encephalitis.asp>.

Today, potential zoonotic agents relating to the threat of bioterrorism include Anthrax, Plague, Q fever and Tularemia. The Centers for Disease Control and Prevention and the US Department of Agriculture are urging veterinarians to continue watching for signs of anthrax in animals. The potential for anthrax being spread in ways other than through the mail has veterinarians on heightened alert. Animals often serve as sentinels of disease.⁴⁹

The challenge of emerging infectious diseases requires immediate access to linked human and animal disease databases for both medical and veterinary professionals on the front lines.⁵⁰

Economic Cost of Biosecurity

The effects of an agroterrorist attack of a Foreign Animal Disease such as Foot and Mouth Disease would extend beyond the agricultural sector with economic losses split into four categories. These would include:

- (1) The expenditures in extra resources used as a consequence of the disease, whether they are private (drugs, veterinary services, etc.) or public (quarantine enforcement, depopulation, etc.).
- (2) The direct effects of the disease on the production system (lost production, animal deaths, lower prices, etc.)

⁴⁹ Veterinarians Advised to Watch for Anthrax in Animals, AVMA, November 29, 2001. Available at http://www.avma.org/press/pi_vetsanthrax.asp.

⁵⁰ Foreign Animal and Zoonotic Disease Center, Humanitarian Resource Institute Biodefense Reference Library. Available at <http://www.humanitarian.net/biodefense/fazdc>.

(3) The indirect and induced effects of the disease on the entire economy (lost employment, disruption to other industries linked directly or indirectly to the dairy and livestock industries in the infected area, etc

(4) Losses caused by trade restrictions.⁵¹

Under provisions of Title 9 (Code of Federal Regulations), Part 53, the U.S. Department of Agriculture has the authority to pay up to 100% of the expenses of the purchase, destruction and disposition of animals and materials required to be destroyed because they were contaminated by or exposed to FMD. The USDA also pays for cleaning and disinfection of infected premises.⁵²

Under current regulations, indemnity payments cover only the direct costs of animals and materials destroyed. It has been well documented, however, that the economic losses may exceed by several times the costs covered by the indemnity payments, as a result of trade disruptions. Consequential losses may be incurred not only by livestock producers but also by all industries linked directly and indirectly.⁵³

The equine industry is a key example of an agricultural sector that would be directly impacted by an FMD outbreak. This industry directly produces goods and services of \$25.3 billion and has a total impact of \$112.1 billion on U.S. gross domestic product. Racing, showing and recreation each contribute more than 25% to the total

⁵¹ Javier M. Ekboir, Appendix C, The Potential Impact of Foot and Mouth Disease in California, 1999 University of California Agricultural Issues Center Report, p. 1. Available at: http://aic.ucdavis.edu/pub/Ekboir_appendixC.pdf

⁵² 1999 CFR, Title 9--Animals and Animal Products, Chapter I--Animal and Plant Health Inspection Service, Department of Agriculture, Part 53--Foot-and-Mouth Disease, Pleuropneumonia, Rinderpest, and certain other Communicable Diseases of Livestock or Poultry. Available at http://www.access.gpo.gov/nara/cfr/waisidx_99/9cfr53_99.html.

⁵³ Javier M. Ekboir, Chapter 6, The Potential Impact of Foot and Mouth Disease in California, 1999 University of California Agricultural Issues Center Report, p. 7. Available at: http://aic.ucdavis.edu/pub/Ekboir_Ch6.pdf.

value of goods and services produced by the industry. The industry's contribution to the U.S. GDP is greater than the motion picture services, railroad transportation, furniture and fixtures manufacturing and tobacco product manufacturing industries. It is only slightly smaller than the apparel and other textile products manufacturing industry.⁵⁴

It is crucial that contingency plans include other measures such as those used to provide relief from natural disasters—low cost loans, tax relief, special unemployment payments, etc. The impact of an agroterrorist attack would be felt nationwide and therefore warrants a solid federal, state, interstate and local strategy for countering the social and economic impact.

Conclusion

Agriculture represents one of America's critical infrastructures that require a domestic preparedness program to protect an industry worth hundreds of billions of dollars that directly or indirectly employs millions of people.

The challenge of domestic preparedness encompasses an immediate need for a heightened state of awareness of the present threat facing the agricultural sector as a potential terrorist target in conjunction with a unified collaborative strategic plan and commitment of government, livestock industries, farmer's organizations and the general public to protect the U.S. Agricultural System.

⁵⁴ American Horse Council, Statistics. Available at <http://www.horsecouncil.org/ahcstats.html>.