

I am the director of the Center for Food Security and Public Health. Our mission is to increase national preparedness for accidental or intentional introduction of disease agents which threaten food security or public health.

U.S. agriculture is highly vulnerable to the accidental or intentional introduction of foreign and emerging animal diseases. Many of these diseases are zoonotic (they also infect people) and can cause serious public health problems, including loss of life. Diseases that affect both animals and people are more difficult to control. In recent years, there have been numerous examples of accidental introductions of foreign animal and zoonotic diseases worldwide. Because agriculture accounts for 13% of the U.S. gross domestic product and 18% of domestic employment, an outbreak of a foreign animal or zoonotic disease could be devastating to the US economy. This makes agriculture an attractive target for terrorists.

Animal agriculture is also threatened by the potential bioterrorism agents, since nearly all of them are zoonotic. Agents against animals have been considered as a component of nearly every nation-sponsored offensive biowarfare program. The U.S. is not adequately prepared to respond to animal agricultural issues, companion animal issues, or wildlife issues in bioterrorism events. Concerns about the level of preparedness for accidental or intentional introduction of diseases have been identified by individuals at all levels of federal and state governments and by animal industry and public health officials.

Since the outbreak of foot and mouth disease in the U.K in 2000, the events of September 11, 2001, and the anthrax bioterrorism event, the U.S. Department of Agriculture (USDA), the Department of Health and Human Services (HHS), and the Department of Homeland Security (DHS) have worked to increase preparedness for disease outbreaks. Significant progress is being made. The national animal ID system is being developed, expert working groups have been convened to establish research and vaccine development priorities, a number of states have organized or are working to organize animal emergency response teams, veterinary diagnostic laboratories are networking to enhance the national capacity and to better share information, and Congress has nearly completed funding for the modernization of the National Centers for Animal Health in Ames, Iowa.

Despite the progress, the U.S. continues to have inadequate infrastructure for prevention, detection, response and recovery for foreign animal and zoonotic diseases. Homeland Security Presidential Directive 9 (HSPD 9), Defense of U.S. Agriculture and Food, issued on January 30, 2004 addressed some of the challenges and needs. However, funding to implement a number of critically important items in the Directive has not been made available.

The significant challenges that I will focus the rest of my testimony on are the vulnerabilities and needs I consider the most important for protecting public health, animal health, and U.S. agriculture from disease threats. These priorities include the rapid development of vaccines and anti-virals for high priority foreign and zoonotic diseases; correcting major deficiencies in the physical capacity for animal health research and disease diagnosis in the U.S.; and strengthening the human resources needed to prevent, prepare for, respond to, and recover from a devastating foreign animal or zoonotic disease event.

Vaccines and Anti-Virals for Foreign Animal and Zoonotic Disease Defense

In 2003, two expert panels were convened by the Federal government to assess the threat from animal pathogens that could be used by bioterrorists or agroterrorists, and to establish research and development needs to reduce the threat from these agents. The Interagency Weapons of Mass Destruction (WMD) Counter Measures Working Group - Animal Pathogens Research and Development Subgroup (2003) and a White House Office of Science and Technology Policy (OSTP) Agroterrorism Countermeasures Blue Ribbon Panel (Dec 2003), identified 10 animal diseases to be of highest priority for vaccine and anti-viral research and development: foot and mouth disease, Rift Valley fever, highly pathogenic avian influenza, Nipah/Hendra, exotic Newcastle disease, classical swine fever, African swine fever, Venezuelan and eastern equine encephalitis, and rinderpest. The expert groups recommended significant investments in vaccine and anti-viral research and development to mitigate the threat from these agents.

HSPD 9 calls for the creation of a National Veterinary Stockpile (NVS) containing significant amounts of animal vaccine, antiviral or therapeutic products to appropriately respond to the most damaging animal diseases affecting human health and the economy. The NVS should be capable of deploying vaccines within 24 hours of an outbreak. Rift Valley fever (RVF), Nipah virus, and avian influenza are especially significant threats because of their contagious nature and the fact that they can cause serious illness and death in humans. Sufficient data exists to demonstrate that safe and effective vaccines for these three diseases can be developed in a short time frame. A relatively modest investment could result in the development and production of vaccines for these three diseases for the NVS. This preventive measure would effectively reduce the serious threat these diseases pose to both public health and animal agriculture.

Animal vaccines can be developed for a small fraction of the cost of developing human vaccines, and can be approved for use much quicker and with less risk than human vaccines. Vaccinating animals for zoonotic diseases effectively protects the human population from infection, and reduces the need to vaccinate people. This results in huge cost savings and avoids the safety concerns associated with vaccinating people.

Project Bioshield calls for \$5.6 billion over a 10 year period for the development of vaccines and therapeutics for use in humans. A portion of that funding should be designated to develop vaccines and other preventatives for animal diseases with zoonotic importance. This will effectively reduce exposure of humans to these diseases, provide protection much sooner than is possible through the development of human vaccines, and reduce the need to vaccinate humans.

Physical Infrastructure for Foreign Animal and Zoonotic Disease Defense

The core of the federal government's scientists, support staff and laboratories dedicated to research and diagnosis of foreign animal diseases that threaten U.S. livestock are currently located at the Plum Island Animal Disease Center on Plum Island, NY. These facilities are operated by the Department of Homeland Security and staffed by USDA scientists responsible for research and diagnostic activities. The Plum Island Animal Disease Center does not have adequate capacity for the foreign animal disease research and diagnostic needs of the nation. This lack of capacity is recognized by the USDA, the Department of Homeland Security, the American Veterinary Medical Association (AVMA), the Association of American Veterinary Medical Colleges (AAVMC), the U.S. Animal Health Association and other groups. Planning

should begin immediately for replacement of the Plum Island Animal Disease Center facilities and funding for new facilities should be appropriated as soon as possible.

Additional biosafety level 3 agriculture (BL3 Ag) and biosafety level 4 (BL4) facilities for animal health research are urgently needed. There are no BL4 facilities for livestock disease research in the U.S. I am currently coordinating a project to develop a vaccine for the Nipah virus, a BL4 pathogen which causes serious illness and death in pigs and in people. Our collaborators in Canada are using their BL4 facility to test the vaccine in pigs because the U.S. does not have facilities for this research in food animal species.

Human Resources for Foreign Animal and Zoonotic Disease Defense

Veterinarians are an integral part of the nation's public health system. Nearly all of the biological agents that pose the highest risk to national security cause diseases that are transmitted from animals to man; veterinarians have expertise in diagnosing, preventing and controlling these types of diseases. There is a serious and acute shortage of veterinarians in rural agricultural areas, federal government agencies, and in disciplines such as public health and food safety. There is also a critical shortage of DVM, PhD research scientists and teachers to train future scientists, especially in high priority areas of veterinary infectious diseases.

The National Veterinary Medical Service Act was signed by President Bush in December 2003 in recognition of the severe shortage of food animal veterinarians in rural areas. The Act authorizes the Secretary of Agriculture to "conduct a loan repayment program regarding the provision of veterinary services in shortage situations, and for other purposes." However, there is no funding to support this Act. Approximately \$20 million per year is needed for this program.

In May 2005, U.S. Senator Wayne Allard of Colorado introduced S. 914, the Veterinary Workforce Expansion Act of 2005 (VWEA). The proposed legislation would establish a grant program to expand capacity in veterinary medical schools, and increase the number of veterinarians working in public health practice and biomedical research. The VWEA would amend the Public Health Service Act to create a competitive grant program for schools and institutions to increase both their training capacity and their ability to research high-priority diseases. Veterinary colleges are a critical national resource but are only supported by 27 states. The nation's professional veterinary education capacity has not changed appreciably in 20 years and it has been nearly 30 years since the federal government has provided general funding for veterinary medical colleges. Studies by the AAVMC have shown that approximately 350 additional students are needed each year in order to maintain the current ratio of nine incoming veterinary students per million people. The AAVMC and the AVMA are supporting this pending legislation.

Funding of the National Veterinary Medical Services Act and the Veterinary Workforce Expansion Act of 2005 is critical to developing the human resources needed for foreign animal and zoonotic disease defense.

Additional funds should be made available for advanced training of veterinarians in infectious disease related disciplines. A 2003 (AAVMC) survey found 149 vacant positions in veterinary pathology, with a projected shortage of 60 veterinary pathologists per year, and 200 vacancies

for DVMs in the USDA-Food Safety Inspection Service.

In summary, progress has been made in increasing our preparedness for agroterrorism events and incursions of foreign animal and zoonotic diseases, but much remains to be done. Vaccines and anti-virals for high priority foreign animal and zoonotic diseases should be developed as quickly as possible and placed in the National Veterinary Stockpile. Planning should begin immediately for replacement of the Plum Island Animal Disease Center facilities with the addition of BL4 facilities for domestic animal research, and funding for these facilities should be appropriated as soon as possible. In order to develop the human resources needed for foreign animal and zoonotic disease defense; funds should be appropriated for the National Veterinary Medical Services Act and the Veterinary Workforce Expansion Act of 2005.