Biosecurity: Preparing the U.S. for Emerging Biological Threats Through Workforce Development

Background

The United States remains relatively unprepared to protect its citizens and agricultural industry from known biological agents that may be introduced into the U.S. with relative ease via various means and routes. The deadly consequences of West Nile virus, Zika, chikungunya, porcine epidemic diarrhea virus and Ebola reinforce the need for a strategic plan to identify and control similar threats before they are introduced. Management in crisis is difficult, inefficient and often costly, thereby creating the need for sustained training and workforce development to rapidly identify or use surveillance, respond to, and control an agent as soon as possible after introduction to enable recovery.

Description

The Biosecurity Research Institute, also known as BRI at Kansas State University's Pat Roberts Hall is a unique facility eager to train multidisciplinary professionals involved in responding to high-consequence biological pathogens that may threaten our nation's livestock, crops and people. Training materials will be tailored to meet the needs of personnel ranging from technical staff, first responders, law enforcement (including Customs and Border Protection agents), physicians, veterinarians, epidemiologists, and researchers in academic and private industry environments.

In the late 1990s, K-State made a programmatic commitment to the area of security and agricultural food safety. As a land-grant institution, K-State made food animal health and welfare and **protecting the global food system** a priority. The state of Kansas made a strong investment in K-State's research priorities by funding the construction of the BRI. The Department of Homeland Security has acknowledged K-State's leadership within this area with ongoing construction of the National Bio and Agro-defense Facility, or NBAF, adjacent to the BRI.

The BRI is one of fewer than six high containment facilities in the United States that can conduct research on livestock experimentally infected with a broad range of highly pathogenic organisms. The BRI is the designated facility at K-State for work on organisms classified by the U.S government as select agents, or SAs. One of the defining factors for SA designation is that these agents have the potential for weaponization. As such they are of high priority and require highly specialized facilities and highly trained and approved personnel to ensure constant accountability, safety and security.

Risk analysis is a key factor in the decision for which pathogens currently provide the greatest risk of introduction into the U.S. The U.S. Department of Agriculture APHIS recently released its "Emerging Animal Disease Preparedness and Response Plan," which is utilized to help identify emerging pathogens of concern. K-State has the capabilities to identify pathways of introduction and the risk associated with those pathways and can focus training efforts towards those areas of greatest risk. Based on the data, estimates of commercial impact on our agricultural industry could be made.

Over 10,000 square feet is dedicated to education, including an integrated classroom and laboratory space, to make students' learning expeditious and efficient. A tiered classroom seating 25 people is adjoined to a fully-equipped biocontainment laboratory. The laboratory provides hands-on training activities in a pathogen-free training area. Students gain foundational skills in a realistic work environment without the risk of biosafety concerns or biocontainment breaches. The BRI also includes world-class high-definition video capture and streaming technology allowing the training suite and research areas to serve as filming studios for distance-education courses that are taught online.

Relevance

The mission of the BRI is "Leading through research and education to protect agriculture and the public from biological threats." This mission is epitomized by the BRI's unique integration of interdisciplinary work on pathogens that contaminate food and infect livestock, people, and plants. Recent management of a DHS-funded Fellowship Program in TransBoundary Animal Diseases based at the BRI provides expertise with DHS workforce development plans for staffing NBAF.

Improving the nation's long-term capacity to anticipate and respond to biosecurity threats through sustained workforce expansion and the development of teaching materials that could be made broadly available represent essential first steps toward preparing the U.S. for emerging biological threats.

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