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## Leading products for reducing the risk of engineered and exotic animal diseases

In an era of terrorism, the United States requires products that defend the nation from the intentional use of animal borne diseases (such as Rift Valley Fever, Avian Influenza, and Foot and Mouth Disease) to cause catastrophic harm, as well as from the accidental or natural introduction of exotic animal disease.

Recognizing this need, the Department of Homeland Security established in 2004 the National Center for Foreign Animal and Zoonotic Disease Defense. The FAZD Center is an integrated,

full-spectrum center charged with generating a stream of products to protect America from the exotic and engineered animal diseases that threaten public health and economic stability. These products offer the dual benefit of protecting against natural or accidental outbreaks.

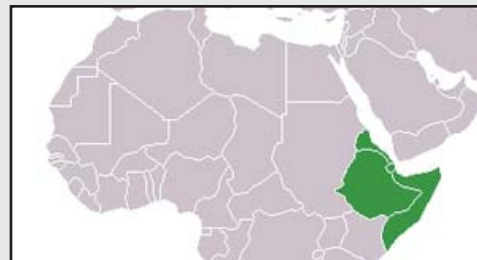
Organized by the diseases they address, here are examples of leading, cutting-edge FAZD Center products that will help members of the United States Animal Health Association reduce the risks posed by exotic animal disease.

### Rift Valley Fever

• **Vaccines** – In responding to RVF as an important emerging disease, the FAZD Center is developing candidate vaccines based on the human MP-12 vaccine that is being modified to provide the “DIVA” capacity – distinguish vaccinated from infected animals. Another modified live vaccine candidate uses a vaccinia platform with similar goals. These vaccines have performed well in laboratory challenges with small animals and large animal trials are anticipated in early 2008.

• **Diagnostics** – Companion diagnostic tests that detect the DIVA vaccinates from infected animals are also performing well in the laboratory and are ready for field testing. Important relationships with the private sector are being developed to take the products into production.

• **Models** – Quantitative epidemiologic and economic models based on experience with RVF in the Horn of Africa and on the opinions of subject matter experts have been developed and applied to an early assessment of the national economic impact of RVF as part of the Biothreat Risk Assessment



FAZD Center models of Rift Valley Fever are based on experiences in the Horn of Africa. Mosquitoes transmit RVF to humans and to sheep, goats and other livestock.

being done by the Department of Homeland Security for the White House.

## Foot and Mouth Disease

- **Vaccines and Antivirals** – The FAZD Center is collaborating with the Plum Island Animal Disease Center in the development of a next generation vaccine for FMD. A candidate component of the vaccine is a new antiviral from the FAZD Center that promotes “natural killer cells” that attack the FMD virus, providing protection within three days. The antiviral narrows the onset of immunity by three to seven days, thus severely reducing the time that animals are vulnerable to FMD infection.



- **Diagnostics** – The Center is also developing new inexpensive field (chute side) ELISA based antigen detection diagnostic tests that will support emergency responders in the event of an outbreak by providing immediate results to determine the presence of infection, thereby reducing unnecessary slaughter of healthy animals. This will also be a DIVA product to distinguish FMD vaccinates from infected animals. These tests will be complimentary to those being employed in the NAHLN laboratories. Tests are ready for evaluation at the Plum Island Animal Disease Center.

- **Models** – National epidemiologic and economic models of FMD are being employed in early evaluation of options and alternatives for prevention of and intervention following outbreaks of FMD. Specific scenarios include modeling the intensive dairy industry in Cali-

fornia and feedlots in Texas. The FAZD Center cooperates with the DOE national laboratories and USDA model developments in this area. A major new effort is underway to develop a national interstate transportation component model as a means of estimating rapid dissemination of FMD. Models will be used both for strategic planning and for informing decisions during emergency response during an outbreak. The FAZD Center is now involved in tracking and assessing the lessons learned relative to the U.S. from the FMD outbreak in the United Kingdom.



- **Public Policy** – The FAZD Center has organized stakeholder workshops on mass animal mortality that address the existing gaps,

bottlenecks and roadblocks in existing public policy that would hamper the safe and timely disposal of animal carcasses in the aftermath of pandemic (such as the 2001 FMD outbreak in the UK) or other catastrophe. These workshops brought together major stakeholders from the livestock industry: industry representatives, policymakers, scientists and regulators. Stakeholders examined current policy and suggested changes to improve response and recovery. Perhaps more importantly, they established working relationships that will prove invaluable during a crisis. Sessions have been held in Texas and California. A white paper resulting from the Texas workshop was presented to the Extension Disaster Education Network, and a state has inquired about holding a workshop of its own.

## Avian Influenza

- **Training** – The FAZD Center is using products developed under its Avian Influenza School to provide hands-on training for extension agents, veterinarians, researchers and farmers that prepares them for potential outbreaks of Avian Influenza, thus improving response and recovery rates. The training modules are being employed both in the U.S. and internationally to meet the urgent need to train early responders in industry and

government to be prepared to expediently deal with outbreaks of avian influenza. The school trains the trainers and provides training modules for use by extension agents, veterinarians, researchers and farmers – for prevention, intervention and recovery from outbreaks. Sessions have been conducted in multiple states. The training modules are also being used in a program aimed at small minority poultry operators in collaboration with multiple 1890 and 1994 minority serving institutions.