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NEW FOOT-AND-MOUTH DISEASE VACCINE GETS LICENSED FOR USE ON CATTLE

First FMD Vaccine That Can Be Manufactured on the U.S. Mainland

PLUM ISLAND, NY—The U.S. Department of Homeland Security (DHS) announced today that the world’s first molecular foot-and-mouth (FMD) vaccine has been granted conditional license for use in cattle by the U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service’s Center for Veterinary Biologics (CVB). Developed at DHS’s Science and Technology Directorate (S&T) Plum Island Animal Disease Center (PIADC), this is the first licensed FMD vaccine that can be manufactured on the U.S. mainland.

“The important capability of this vaccine compared with other foot-and-mouth disease vaccines that have been developed in the past is that it can be manufactured on the mainland in the United States because it does not contain live FMD virus,” said PIADC Director Dr. Larry Barrett.

This molecular-based FMD vaccine was developed by scientists with the USDA Agricultural Research Service and DHS at PIADC and is the result of a seven-year collaboration with industry partners GenVec Inc., a biopharmaceutical company based in Gaithersburg, Md., and Antelope Valley Biologics, a Benchmark Biolabs affiliate based in Lincoln, Neb.

“This vaccine represents one of the most significant developments in foot-and-mouth disease vaccines in the last 50 years,” said Dr. Luis Rodriguez, Research Leader, PIADC, Agricultural Research Service, USDA. “The new molecular vaccine provides important options to FMD control in the United States, including less dependence on foreign sources for vaccine manufacturing and a wider range of tests that can readily distinguish vaccinated animals from those that have been infected with the disease.”

Additionally, the vaccine does not require expensive, high-containment facilities because it does not use the infectious materials of the live FMD virus. DHS PIADC is working with the animal health vaccine manufacturer Merial to evaluate the production process.

The award-winning discovery research conducted by Dr. Marvin Grubman, USDA Agricultural Research Service at PIADC, led to this new vaccine that contains only virus coat particles, called empty viral capsids, which lack the infectious viral nucleic acids.

“The absence of specific viral components provides multiple opportunities to develop better diagnostic tests that differentiate between vaccinated and infected animals,” said Grubman. “Having this capability is critical to demonstrating freedom of infection and return to trade after a foot-and-mouth disease outbreak.”

Dr. John Neilan, with the DHS Targeted Advanced Development Branch at PIADC, developed a way to address the immune response to the vaccine, achieving the efficacy required for a USDA license.

With the licensing of this vaccine, it may be added to the North American Vaccine Bank at PIADC. While this vaccine protects against one strain of FMD, there are seven major serotypes and many sub-types of FMD. Vaccines for other strains of FMD and other transboundary animal diseases of livestock are being developed at PIADC using this and other molecular technologies.

“Development of this vaccine technology took several years, and everyone at Plum Island Animal Disease Center is proud to see result of the hard work that began with the initial discovery by Agricultural Research Service scientists followed later by the Department of Homeland Security scientists taking it through the licensing process,” said Barrett.

“Effective FMD vaccines can help alleviate the burden that these diseases pose to animal health and human wellbeing particularly in parts of the world facing food insecurity and population increases over the next decades,” Rodriguez added.

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About Plum Island Animal Disease Center

Plum Island Animal Disease Center is a U.S. Department of Homeland Security Science & Technology Directorate laboratory that is managed in collaboration with the U.S. Department of Agriculture (USDA Agricultural Research Service and USDA Animal and Plant Health Inspection Service) to support inter-related programs in the protection of U.S. livestock from the accidental or intentional introduction of foreign animal disease that can seriously threaten livestock industries, food safety and our economy.

About Foot- and-Mouth Disease

Foot-and-mouth disease (FMD) is a highly contagious disease of domestic and wild cloven-hoofed animals including cattle, swine, sheep, goats, deer and buffalo. The disease causes vesicular lesions on the tongue, feet and teats but causes low mortality except in young animals; however, infection has a severe adverse impact on animal production and productivity. FMD is a reportable disease and countries in which the disease is present cannot trade susceptible animals or their products with FMD-free countries. Therefore, FMD has a significant economic impact on affected countries, especially those that have investment in export of agricultural products. FMD is composed of seven serotypes and multiple subtypes within each serotype. Humans do not get FMD, but they can act as mechanical carriers for the virus. FMD is considered a foreign animal disease to the U.S. because it does not occur in this country. The last outbreak in the U.S. was 1929. However, FMD is globally recognized as being a “transboundary” disease with regional and global impact because of its relationship to the development of international trade in animals and animal products and the movement of people worldwide.