Richard C. Knudsen
Centers for Disease Control and Prevention, Atlanta, Georgia

The objective of a biosafety program is to protect personnel and the environment from exposure to an infectious agent. It is not often that we have a concrete example of "protecting the environment" so aptly presented to us by the multimedia press. If you watch TV, read a daily newspaper or weekly news magazine, you should be well aware that Foot-and-Mouth Disease (FMD) is wreaking havoc in Great Britain and Western Europe. FMD is a disease of cloven-footed animals, which includes livestock such as cattle, swine, sheep, and goats. Livestock and their fields, pastures, feedlots, barns, farms etc., as well as the surrounding air, constitute the "environment." FMD is caused by a tiny virus, Foot and Mouth Disease Virus (FMDV; see cover illustration). FMDV can survive in the environment for days or weeks where it can continue to serve as a source of infection. Since FMDV does not infect humans and most adult animals usually recover, what's the big deal with this virus?

Cattle, swine, sheep, and other livestock animals are economic powerhouses for the domestic economy and international markets in many nations in the world. There is a huge international business in exporting/importing meat, milk, and cheese products, animal hides, and many other animal products throughout the world. It has been estimated that the annual export market for animal products for the U.S. is $60 billion. If one animal on a single farm on the U.S. mainland is diagnosed with FMDV, the country's exports of animal products could be shut down for 6 months or more.

Add on the many costs of control and eradication of the disease, compensation costs for farmers etc. and we can see that the disease can have a tremendous domestic and international economic impact. For example, the 1997 outbreak in Taiwan may have cost as much as $5 billion.

The United States has not had an outbreak since 1929, but in the last 12 months outbreaks have occurred in at least 23 nations in the world, not including those in Western Europe. These nations include Brazil, Colombia, Japan, and Russia. The United States could be next on the list.

A worst case scenario would be an FMD outbreak in the U.S. traced to the virus escaping from a U.S. laboratory. To minimize this possibility laboratory work with FMDV is confined to the United States Department of Agriculture's Plum Island Animal Disease Center (PIADC), located off the eastern tip of Long Island, New York. The isolated island location, enhanced BSL-3 facilities, and tight security restrictions on personnel minimizes any possibility of aerosol or other transmission to mainland animals. PIADC is an ideal example of a laboratory designed and operated for protecting the environment against the escape of an infectious disease.

To learn more about this economically devastating disease read the article "Foot-and-Mouth Disease: A Brief Review of the Etiologic Agent and the Disease Which It Causes" in this issue's Special Features section.