United States General Accounting Office

GAO

Report to the Honorable Tom Daschle, U.S. Senate

July 2002

FOOT AND MOUTH DISEASE

To Protect U.S. Livestock, USDA Must Remain Vigilant and Resolve Outstanding Issues

GAO-02-808

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Abbreviations

APHIS	Animal and Plant Health Inspection Service
BSE	bovine spongiform encephalopathy
CCRA	Canada Customs and Revenue Agency
CFIA	Canadian Food Inspection Agency
DEFRA	Department for Environment, Food and Rural Affairs
FAS	Foreign Agricultural Service
FEMA	Federal Emergency Management Agency

FMD	foot and mouth disease
FSIS	Food Safety and Inspection Service
GAO	General Accounting Office
NAHEMS	National Animal Health Emergency Management System
OIE	Office International des Epizooties
pH	potential of hydrogen
SAGARPA	Secretaria de Agricultura, Ganaderia, Desarrollo Rural, Pesca y Alimentaction
USDA	U.S. Department of Agriculture
WTO	World Trade Organization

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United States General Accounting Office
Washington, D.C. 20548

July 26, 2002

The Honorable Tom Daschle
United States Senate

Dear Senator Daschle:

As requested, we are reporting on the United States' ability to prevent the introduction of foot and mouth disease. This report contains recommendations to the U.S. Department of Agriculture on the need to develop a process to expeditiously communicate information on foreign disease outbreaks to the Customs Service, improve some of the preventive measures used in the United States, and develop plans and timetables to address any outstanding issues that could impede a U.S. response.

As agreed with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days from the date of this letter. We will then send copies to other appropriate congressional committees; the Secretary of Agriculture; the Commissioner of Customs; and the Director, Office of Management and Budget. We will also make copies available to others upon request. In addition, the report will be available at no charge on the GAO Web site at http://www.gao.gov.

If you or your staff have any questions concerning this report, please call me at (202) 512-3841. Key contributors to this report are listed in appendix VII.

Sincerely yours,

Lawrence J. Dyckman
Director, Natural Resources
and Environment

Executive Summary

Purpose

The 2001 outbreak of foot and mouth disease (FMD) in the United Kingdom decisively illustrated the devastation that this highly contagious animal disease can cause to a nation's livestock industry and other sectors of the economy. By the time the disease was eradicated, about 8 months later, the United Kingdom had slaughtered over 4 million animals to control the disease, and sustained losses of over $5 billion in the food and agricultural sectors, as well as comparable losses to its tourism industry. Before 2001, the United Kingdom had been FMD-free for almost 34 years; following the outbreak, the country was, until recently, generally restricted from participating in the international trade of live animals, and animal and other products that could transmit the FMD virus.

The United States is an FMD-free nation and has not had an outbreak of the disease since 1929. In 2001, the U.S. livestock and poultry sector was valued at $100 billion. Because of the importance of the livestock industry to the U.S. agricultural sector and economy, protecting U.S. livestock from FMD and other animal diseases not present in the United States (foreign animal diseases) is an important responsibility for the U.S. Department of Agriculture (USDA). Senator Tom Daschle asked GAO to determine whether (1) U.S. processes to obtain and disseminate information on foreign FMD outbreaks are adequate, (2) U.S. measures for preventing FMD from entering the United States are effective and comparable with those of other selected countries, and (3) the United States could respond quickly and effectively to an outbreak of FMD, if it were to occur.

To respond to this request, GAO, among other things, visited seaports, airports, and international mail-processing facilities in New Jersey, Maryland, Texas, and Virginia. GAO also visited federal inspection stations on the U.S.-Canadian and U.S.-Mexican borders to observe inspection procedures for livestock imports and met with government officials in these countries who are responsible for protecting their nation's livestock from FMD. GAO also interviewed state veterinarians in six states that are major producers of U.S. livestock, and international passengers and U.S. veterinarians who were in the United Kingdom during the outbreak. In addition, GAO reviewed and summarized legislation, regulations, and publicly available documents on the measures used by the European Union and the United Kingdom to prevent the introduction of FMD. (See chapter 1 for a detailed description of GAO's scope and methodology.)

Background

FMD is a highly contagious viral disease of cloven-hoofed animals such as cattle, swine, and sheep. Infected animals develop a fever and blisters on their tongue, lips, and between their hooves. Many animals recover from an FMD infection, but the disease leaves them debilitated and causes severe losses in meat and milk production. FMD does not have human health implications.

Animals, people, or any materials that bring the virus into contact with susceptible animals can spread FMD. FMD is a hardy virus, and in the right environmental conditions can persist in contaminated items, such as soil and manure, for weeks or months. Only about 40 percent of countries worldwide are considered FMD-free, but all three North American countries are FMD-free.

USDA's Animal and Plant Health Inspection Service (APHIS) is responsible for protecting U.S. livestock from the introduction of foreign animal diseases such as FMD. In fulfilling its responsibilities, APHIS conducts activities to exclude animal disease, detect and eradicate it, and educate the public about it. APHIS inspectors are present at 144 U.S. ports of entry, as well as in some foreign countries, to help ensure the safety of international cargo, passengers, and mail. According to USDA, this includes all major U.S. ports.

In an effort to keep U.S. animals free of foreign animal diseases, the U.S. Customs Service (Customs) is an important federal partner, supporting USDA's activities at each of the 301 ports of entry into the United States. Customs is the first line of defense at U.S. ports against the entry of prohibited and illegal items, particularly when the port does not have APHIS personnel.

Results in Brief

The United States has adequate processes for obtaining information on foreign FMD outbreaks and providing USDA agencies and others with this information, but it does not have adequate processes for sharing this information with Customs. The United States receives information on FMD outbreaks from USDA officials stationed in foreign countries, international agricultural and animal health organizations, and foreign governments directly. In particular, USDA has animal health experts stationed in 27 countries and agriculture trade officials stationed in 129 countries. These officials collect a wide array of agricultural and animal health information about the countries and regions in which they are

stationed, which allows the United States to have access to information on foreign FMD outbreaks in a timely manner. However, USDA's processes for disseminating information on foreign FMD outbreaks are uneven. For example, after receiving official notification from the United Kingdom on February 21, 2001, about the presence of FMD in that country, USDA immediately alerted its relevant agencies in Washington, D.C., and their field locations, and during the month of March provided the public, industry, state and local governments, and private veterinarians with information and guidance about FMD prevention. But USDA has no formal process for providing Customs with information. As a result, Customs inspectors at U.S. ports of entry did not receive uniform information or guidance on FMD prevention activities after the U.K. outbreak. Customs received this information only after formally requesting it from the Administrator of APHIS—over a month after the United Kingdom's notification. During this interval, many Customs inspectors said they felt ill equipped to adequately process international cargo and passengers at U.S. ports of entry. While USDA has taken an interim step to improve notification to Customs about foreign FMD outbreaks, GAO is recommending further improvements to establish a more permanent solution and ensure that Customs has clear procedures for handling passengers and cargo from countries affected by FMD.

U.S. measures to prevent the introduction of FMD are comparable to those used by other countries and have kept the United States free of the disease for almost 75 years. Nevertheless, because of the nature of the disease and the risk inherent in the ever-increasing volume of international travel and trade, U.S. livestock remains vulnerable to the disease. USDA has a two-pronged approach to prevent FMD from reaching U.S. livestock.

- USDA tries to keep FMD as far as possible from U.S. borders by helping other countries control and eradicate the disease. For example, USDA supports programs in Colombia and Panama to create an FMD-free buffer zone between North and Central America, which are FMD-free, and South America, which is not.

- USDA has developed and implemented specific preventive measures at ports of entry to ensure that international cargo, animals, passengers, and mail do not bring the disease into the United States. For example, in response to the outbreak in the United Kingdom, USDA immediately prohibited imports of susceptible animal products from the United Kingdom, including those shipped 3 weeks prior to the date of official notification of the outbreak. This prohibition remained in effect until

USDA reassessed the United Kingdom's animal disease status and determined the products for which trade could safely resume. Similarly, at airports, USDA uses signs and inspectors, among other things, to ensure that international passengers do not inadvertently bring items into the country that could carry the FMD virus.

However, these and other efforts cannot completely eliminate the vulnerability of U.S. livestock because (1) some level of risk is inherent in international travel and trade, (2) FMD is a hardy virus that may remain viable for days or even weeks on shoes and in hay or certain meat and dairy products, and (3) the volume of legal and illegal international trade and passengers entering the United States makes it impossible for U.S. inspectors to inspect and ensure the safety of every shipment, baggage, or person entering the country. Furthermore, although the preventive measures the United States, Canada, and Mexico have implemented are similar, these other countries' implementation measures suggest opportunities for USDA to improve its preventive measures. For example, all three countries use signs at airports to alert passengers about FMD and the need to keep it out of the country. However, the Canadian and Mexican signs are much more noticeable because they are larger, bolder, and more colorful. GAO is recommending that USDA revise its signs to improve their effectiveness.

In the event of an FMD outbreak, the United States will face a number of challenges in mounting an effective and quick response, even though USDA and many states have developed and tested emergency animal disease response plans. For example, a high level of cooperation, coordination, and communication between state and federal agencies and between federal agencies is critical to an effective response. While USDA is making improvements in these areas, there is a wide variance between the states. Similarly, an effective response will require an adequate infrastructure, including a massive commitment of manpower and laboratory resources. USDA has developed agreements with other federal agencies, such as the Department of Defense and the Federal Emergency Management Agency, to leverage additional resources. However, gaps remain. For example, it is unclear how USDA will obtain the 1,200 additional veterinarians trained in responding to foreign animal diseases that it estimates the nation will need to respond to an FMD outbreak. Furthermore, several issues relating to animal identification, disposal, and indemnification have not yet been addressed. For example, the United States does not have a system to identify and track animal movements in the event of an outbreak, and it is unclear how this information would be gathered in a timely manner. USDA

currently has several efforts under way to resolve these issues. However, the effectiveness and speed of a U.S. response may be compromised if these issues are not fully addressed and resolved before an FMD outbreak occurs. GAO is recommending that USDA develop plans with interim and final milestones to ensure that these issues are addressed in a timely fashion.

Principal Findings

USDA Has Adequate Processes to Obtain Information on Foreign FMD Outbreaks but Can Improve Dissemination to Customs

USDA receives information about the incidence of foreign animal diseases, including FMD, from a variety of sources. These include USDA's network of staff stationed in foreign countries, international animal health and trade organizations, and the governments of affected nations. However, the usefulness of the information on foreign FMD outbreaks depends on a foreign country's willingness to provide accurate information in a timely fashion. For example, in 2001, Argentine officials did not acknowledge that some regions of their country had been affected with FMD, although unconfirmed reports indicated that the disease had been present for several months, according to USDA officials. USDA was unable to take official action to prohibit FMD-susceptible products from Argentina until it received an official notification of the outbreak or obtained verifiable scientific evidence that FMD was present in Argentina.

APHIS has primary responsibility for sharing information obtained about foreign FMD outbreaks with other agencies within USDA, Customs, state governments, affected industries, and the public. These entities all need current information about potential FMD outbreaks because they all play an important role in preventing or responding to an outbreak. While APHIS immediately alerts USDA agencies and others, it has no formal process or defined procedures to distribute information on foreign FMD outbreaks to Customs. For example, after the U.K. outbreak, APHIS did not inform Customs about its decisions to prohibit or restrict certain products or more vigilantly screen passengers arriving at U.S. ports of entry from the United Kingdom. Until the Acting Commissioner of Customs formally requested this information in writing from the Administrator of APHIS, Customs did not receive any official guidance on general inspection measures for passengers and products. According to a Customs memorandum and officials we spoke to, many Customs field inspectors felt ill equipped to adequately process international cargo and passengers at ports of entry

during the initial stages of the U.K. outbreak. Moreover, according to Customs officials, these inspectors are not animal disease specialists, and therefore need clear, nontechnical procedures to help them process international passengers and their luggage, especially at those ports where there is no APHIS presence. According to an APHIS official, although Customs had not been included on the FMD alert distribution list in the past, a Customs official has now been added to the list and will receive future alerts about foreign FMD outbreaks. This is a good interim step, however, GAO does not believe that it completely addresses the need for formal and well-defined communication procedures and protocols between APHIS and Customs.

U.S. Preventive Measures Are Comparable to Those of Other Countries, but Providing Complete Protection May Be Infeasible

The United States seeks to prevent an FMD outbreak by supporting various programs to control and eradicate the disease overseas and by screening livestock, animal and other products, and passengers at the nation's ports of entry. By helping other nations eradicate or control FMD outbreaks, USDA reduces the potential for the disease to reach U.S. borders. For example, in North America, U.S. efforts to eradicate and control FMD have largely focused on Mexico because of the shared border and the possible threat that the FMD virus could move overland from South America, where the disease is endemic in several countries. USDA helped Mexico eradicate FMD in 1954 and continues to help ensure that Mexico remains disease free. Similarly, USDA programs have helped create FMD-free zones in Colombia and Panama. These zones will help alert countries in both Central and North America about the potential incursion of FMD from the south. Also, when other countries have an outbreak, USDA may provide support by sending U.S. veterinarians to help control and eradicate the disease. For example, a total of about 327 U.S. animal health professionals, including over 300 veterinarians, helped eradicate the 2001 outbreak in the United Kingdom.

USDA has also identified key pathways by which the FMD virus could enter the United States and has implemented measures to prevent potentially infected animals or products from entering the country. For example, USDA allows imported livestock only from countries that are free of FMD and other diseases of concern, when they are accompanied by appropriate import permits and health certificates and may subject these animals to quarantine. Furthermore, if a country has an FMD outbreak, USDA prohibits the importation of all susceptible products shipped 3 weeks prior to the date of official notification of the outbreak. This prohibition remains in effect until USDA has reassessed the disease status of the affected

country and determined the level of trade that can resume. Moreover, USDA restricts imports of animal products from FMD-affected countries to those that have been processed in such a manner that they inactivate the virus and do not present a risk to U.S. livestock. In contrast, other products, such as hay used for feed or bedding, fresh meat, and some dairy products, are completely prohibited. Similarly, USDA has preventive measures for international passengers and their luggage, garbage from international ships and airplanes, and military personnel and equipment returning from overseas to ensure that they are not carrying the virus into the country.

USDA officials and some animal health experts believe that the United States' almost 75-year disease-free status is a measure of the success of the department's efforts to keep FMD out of the country. At the same time, these officials are also concerned that, because of the level of risk inherent in international trade and travel, no set of measures can ever completely eliminate the possibility that FMD will enter the United States. Moreover, these experts believe that U.S. vulnerability to an outbreak remains because (1) FMD is a hardy virus that can enter the country on a variety of animate and inanimate products and (2) the magnitude and volume of international passengers, mail, and products entering the United States creates an enormous inspection challenge for USDA and other federal agencies. According to USDA, it would take only one contaminated product coming into contact with one susceptible U.S. animal to start a nationwide outbreak.

Other countries face similar challenges in protecting their livestock from FMD. Canada, Mexico, and the United Kingdom generally use measures that are comparable to U.S. measures to ensure that imports of livestock and animal products, international mail, and garbage from international carriers do not present an FMD risk. However, the countries have implemented measures differently for international passengers. For example, while Canada and Mexico use disinfectant mats at ports of entry, the United States does not. According to USDA officials, the United States does not use disinfectant mats because research indicates that their use may cause the virus to spread. Also, while all three countries use signs at international airports to alert and inform passengers about the risks of FMD, the U.S. signs are not as noticeable as the signs used in Canada and Mexico. While GAO recognizes that there is a cost to developing new signs, more effective signs may help improve U.S. preventive measures for international passengers.

Despite Preparation Efforts, Serious Challenges to an Effective U.S. Response Are Yet to Be Resolved

If FMD enters the United States despite USDA's preventive measures, the nation's ability to identify, control, contain, and eradicate the disease quickly and effectively becomes paramount. Recognizing the importance of an effective response, USDA and many states have developed emergency response plans that establish a framework for the key elements necessary for a rapid and successful U.S. response and eradication program. These plans have been tested, to some extent, by federal and state agencies to determine their effectiveness. Planning and testing exercises have also identified the following challenges, which could ultimately impede an effective and timely U.S. response if they are not resolved before an FMD outbreak occurs:

- *Ensuring the rapid identification and reporting of an FMD incident.* A timely response depends on having livestock producers and private veterinarians quickly identify and report suspicious symptoms to state and federal officials. If they do not, FMD could become out of control before the federal and state governments initiate any action. Several federal and state animal health officials expressed concern about how quickly disease identification and reporting would actually occur in the United States. According to USDA officials, the U.K. outbreak helped raise general awareness among state officials, private veterinarians, and livestock producers about the risks and potential of an FMD outbreak in the United States. Consequently, in 2001, USDA and the states increased their efforts to inform the livestock industry about the risks and symptoms of FMD. The challenge to USDA will be to maintain this heightened awareness about FMD, now that the immediate risk from the United Kingdom has subsided.

- *Enhancing cooperation, coordination, and communication between federal, state, and local agencies, private veterinarians, and the industry.* Recent planning efforts and testing exercises have started the process of establishing greater coordination and improving the level of cooperation and communication between all levels. However, these efforts have also identified gaps in these areas, and according to state officials, the level of cooperation, coordination, and communication between state officials and their federal counterparts vary across states. To help address these gaps, USDA is working with other organizations, such as the National Emergency Management Association, and is providing funds to help states improve their planning for animal emergencies.

- *Developing an adequate response infrastructure to outbreaks of animal disease.* An effective response to an FMD outbreak depends on an adequate infrastructure, which should include a national emergency management control and command center, technical and other personnel, transportation and disposal equipment, and laboratory facilities and testing capacity. While details for some of these components have been developed, others are not yet fully resolved. For example, USDA, in partnership with the Federal Emergency Management Agency, has set up a mechanism that will enable it to leverage resources for many of the general logistical support activities needed to respond to an outbreak. Similarly, USDA's memorandum of understanding with the Department of Defense will help provide needed military personnel and equipment to support a response effort. However, it is not yet clear how the United States will fill the shortage of at least 1,200 specially trained veterinarians or the laboratory testing and diagnostic capacity that USDA estimates is needed to respond to an animal health emergency.

- *Establishing methods to identify and dispose of animals, and indemnify livestock producers.* The effectiveness of a U.S. response to an FMD outbreak will require an animal identification and tracking system that will allow responders to quickly identify, control, and slaughter infected and exposed animals, as well as clear animal disposal and indemnification policies. Recognizing the importance of an animal identification and tracking system, USDA began planning for it in 1999. However, until recently, the livestock industry has resisted the concept because of the costs involved and the potential for the unauthorized disclosure of proprietary information, according to USDA officials. Similarly, USDA has determined that burial, incineration, and rendering are the preferred methods for disposing of animal carcasses. However, according to federal and state officials, each of these disposal methods presents significant implementation challenges that have not yet been fully considered, such as the potential to spread the disease if on-farm disposal is not feasible, the potential to cause groundwater contamination or air pollution, high cost, and concerns about public perception. Finally, delays could occur during an FMD eradication effort, because producers—fearing that they might not be adequately compensated for the fair market value of destroyed animals, products, and materials as well as cleaning and disinfecting costs—may not cooperate with responders. To address this concern, USDA published a proposed rule on May 1, 2002, amending its FMD-related regulations

that clarify how indemnity and compensation issues will be handled during an outbreak.

Recommendations for Executive Action

GAO recommends that USDA collaborate with Customs to develop (1) a formal process to disseminate updated information on foreign FMD outbreaks to Customs inspectors at ports of entry and (2) nontechnical procedures that these inspectors can use to screen cargo and passengers from FMD-affected countries. GAO also recommends that USDA consider better signs for ports of entry to help ensure that international passengers do not inadvertently bring FMD into the United States. Finally, GAO recommends that USDA develop a plan and related milestones to address the outstanding issues that could compromise an effective and rapid U.S. response.

Agency Comments

We provided Customs and USDA with a draft of this report for review and comment. Customs had no comments on the report. USDA stated that the report was generally accurate and insightful, and provided a number of meritorious recommendations. USDA also noted that the report provided an accurate portrayal of the challenges that face the continuum of federal, state, and industry resources dedicated to safeguarding the health of U.S. agriculture. USDA agreed with the report's conclusion that because of the enormous volume of international travel and trade, there is no way to ensure zero risk of disease introduction. However, USDA also believes that the short- and long-term measures that it is taking to enhance prevention, surveillance, emergency preparedness, and coordination with other federal, state, and industry organizations is providing a much-needed boost to the United States' overall safeguarding infrastructure. At the same time, USDA agreed that it would continue to look critically at the effectiveness of its efforts and make whatever changes are warranted.

USDA's and Customs' written comments are presented in appendix V and VI, respectively. USDA's comments include additional information on the department's recent and other ongoing efforts to enhance the United States' ability to prevent and respond to an FMD outbreak in the areas of (1) resources and infrastructure, (2) prevention and control measures, and (3) communications and outreach. We have included this information and the additional technical comments that USDA provided us with throughout the report as appropriate.

Introduction

Foot and mouth disease (FMD) is one of the most devastating viral animal diseases affecting cloven-hoofed animals such as cattle and swine, and has occurred in most countries of the world at some point during the last century. Although the disease has no human-health implications, it can have enormous economic and social consequences, as recent outbreaks in the United Kingdom and Taiwan have demonstrated. These consequences occur because the international community values products from countries that are FMD-free and generally restricts international trade in FMD-susceptible products from countries affected by an outbreak. Most FMD-affected countries, therefore, take whatever measures necessary to regain their FMD-free status as quickly as possible. In the United States, the U.S. Department of Agriculture (USDA) has primary responsibility for protecting domestic livestock from animal diseases such as FMD. The U.S. Customs Service supports USDA in these efforts.

FMD Is a Highly Contagious Animal Disease

FMD—a highly contagious viral disease affecting primarily cloven-hoofed animals, such as cattle, sheep, swine, and goats—has 7 types and over 80 subtypes. Immunity to, or vaccination for, one type of the virus does not protect animals against infection from the other types. FMD-infected animals usually develop blister-like lesions in the mouth, on the tongue and lips, on the teats, or between the hooves, which causes them to salivate excessively or become lame. Other symptoms include fever, reduced feed consumption, and abortions. Cattle and pigs are very sensitive to the virus and show symptoms of the disease after a short incubation period of 3 to 5 days. The incubation period in sheep is considerably longer, about 10 to 14 days, and the clinical signs of the disease are usually mild and may be masked by other conventional conditions, thereby allowing the disease to go unnoticed. The mortality rate for nonadult animals infected with FMD varies and depends on the species and strain of the virus; in contrast, adult animals usually recover once the disease has run its course. However, because the disease leaves them severely debilitated, meat-producing animals do not normally regain their lost weight for many months, and dairy cows seldom produce milk at their former rate. The disease therefore can cause severe losses in the production of meat and milk.

The FMD virus is easily transmitted and spreads rapidly. Prior to and during the appearance of clinical signs, infected animals release the virus into the environment through respiration, milk, semen, blood, saliva, and feces. The virus may become airborne and spread quickly if pigs become infected because pigs prolifically produce and excrete large amounts of the virus into the air. Animals, people, or materials that are exposed to the

virus can also spread FMD by bringing it into contact with susceptible animals. For example, the virus can spread when susceptible animals come in contact with contaminated

- animals;
- animal products, such as meat, milk, hides, skins, and manure;
- transport vehicles and equipment;
- clothes or shoes worn by people; and
- hay, feedstuffs, or veterinary biologics.[1]

The FMD virus has a remarkable capability for remaining viable for long periods of time in a variety of animate and inanimate objects. For example, the virus can persist in the human nasal passages for up to 36 hours, manure for 1 to 24 weeks, fodder for 1 month, and on shoes for 9 to 14 weeks. The ability of the virus to persist in the environment and other products depends on the temperature and potential of hydrogen (pH) conditions.[2] Generally, the virus can survive freezing but cannot survive at temperatures above 50° Celsius (122° Farenheit) and at pH levels of less than 6, or greater than 9. Table 1 shows the various lengths of time that the FMD virus can survive in some selected products.

[1] A veterinary biologic is a product used for diagnosing, preventing, and treating an animal disease. These products include vaccines and kits for diagnosing specific animal diseases.

[2] The pH condition of a product is the measure of its degree of acidity or alkalinity; a value of 7 is considered neutral while values greater than 7 are considered alkaline and values below 7 are considered acidic. A high or low pH of a product may inactivate certain viruses, such as FMD.

Table 1: Survival Time of the FMD Virus in Selected Products and By-Products

Product or by-product	Processing or storage conditions	Virus survival time
Bacon	Salted	183 days
Bedding (straw and wood shavings)	N/A	4 weeks
Buttermilk	N/A	14 days
Ham	N/A	16 weeks
Hay	Ambient temperature	Greater than 200 days
Hides or skins	Air dried at 20° C	6 weeks
Manure	Summer/winter	1 week/24 weeks
Shoes	Summer/winter	9 weeks/14 weeks
Soil	Summer/winter	3-7 days/21 weeks
Water	Ambient temperature	14 weeks
Wool	Ambient temperature	20 days

Legend: N/A=not applicable

Source: Adapted by GAO from USDA information.

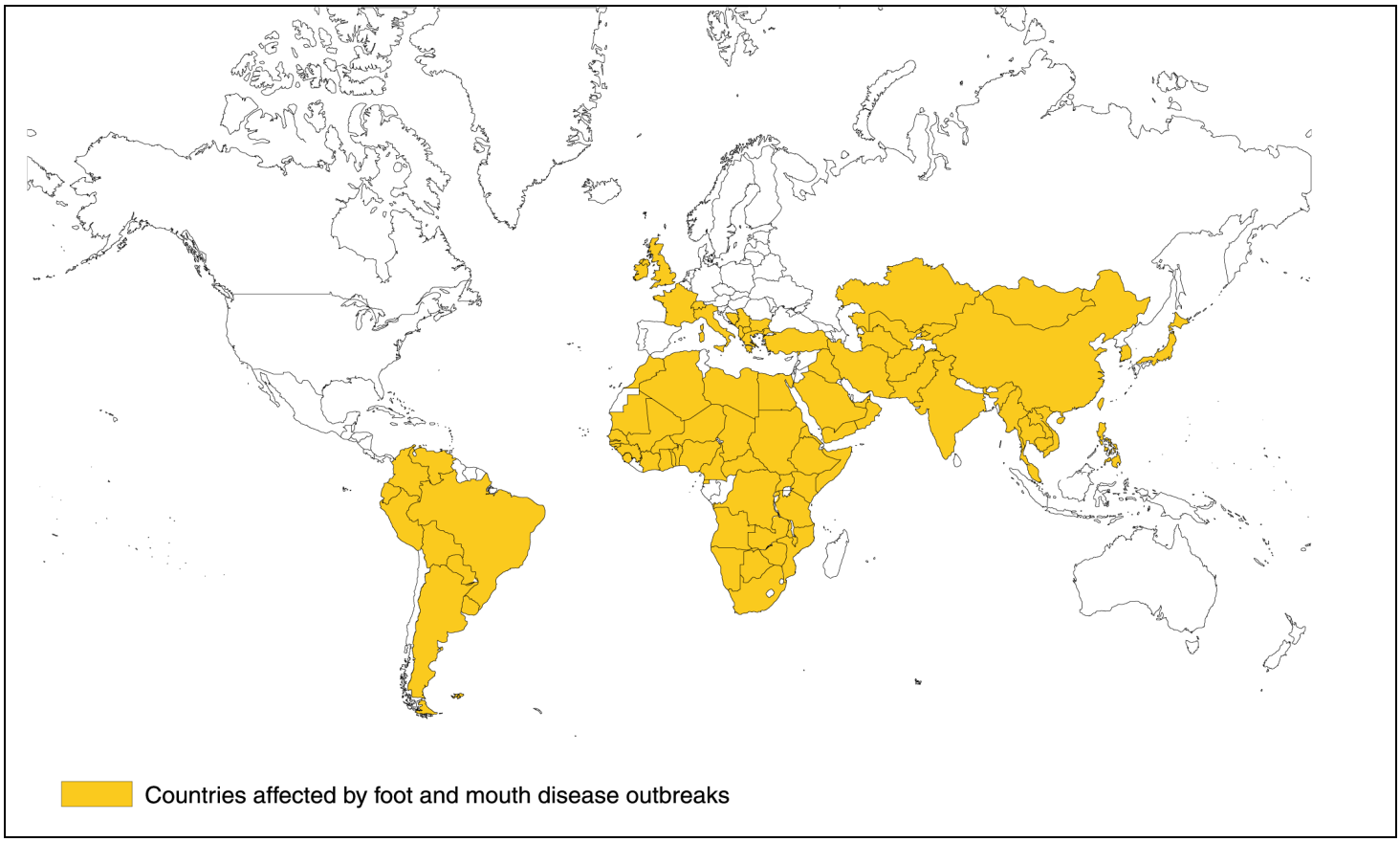
FMD can be confused with several similar but less harmful animal diseases that also produce blisters and cause animals to salivate, such as vesicular stomatitis, bovine viral diarrhea, and foot rot. Two foreign swine diseases are also clinically identical to FMD—swine vesicular disease and vesicular exanthema of swine. The only way to distinguish between FMD and these other diseases is through laboratory analyses of fluid or tissue samples. FMD is also sometimes confused with mad cow disease or bovine spongiform encephalopathy (BSE).[3] BSE is a fatal, neuro-degenerative disease found in cattle in 23 countries around the world. Cattle contract the disease through animal feed that contains protein derived from the remains of diseased animals. Scientists generally believe that an equally fatal disease in humans—known as variant Creutzfeldt-Jacob Disease—is linked to eating beef from cattle with BSE. However, unlike mad cow disease, FMD has no known human health implications.

[3] In January 2002, we issued a report on BSE entitled *Mad Cow Disease: Improvements in the Animal Feed Ban and Other Regulatory Areas Would Strengthen U.S. Prevention Efforts*, GAO-02-183 (Washington, D.C.: Jan. 25, 2002).

Incidence of FMD Worldwide Is Extensive

FMD is present in about 60 percent of the countries in the world and endemic in many countries in Africa, the Middle East, Asia, and South America. The relatively few areas that are considered free of FMD include North and Central America, Australia, New Zealand, and the Caribbean. Figure 1 shows the presence of FMD worldwide for the period 1992 through 2002.

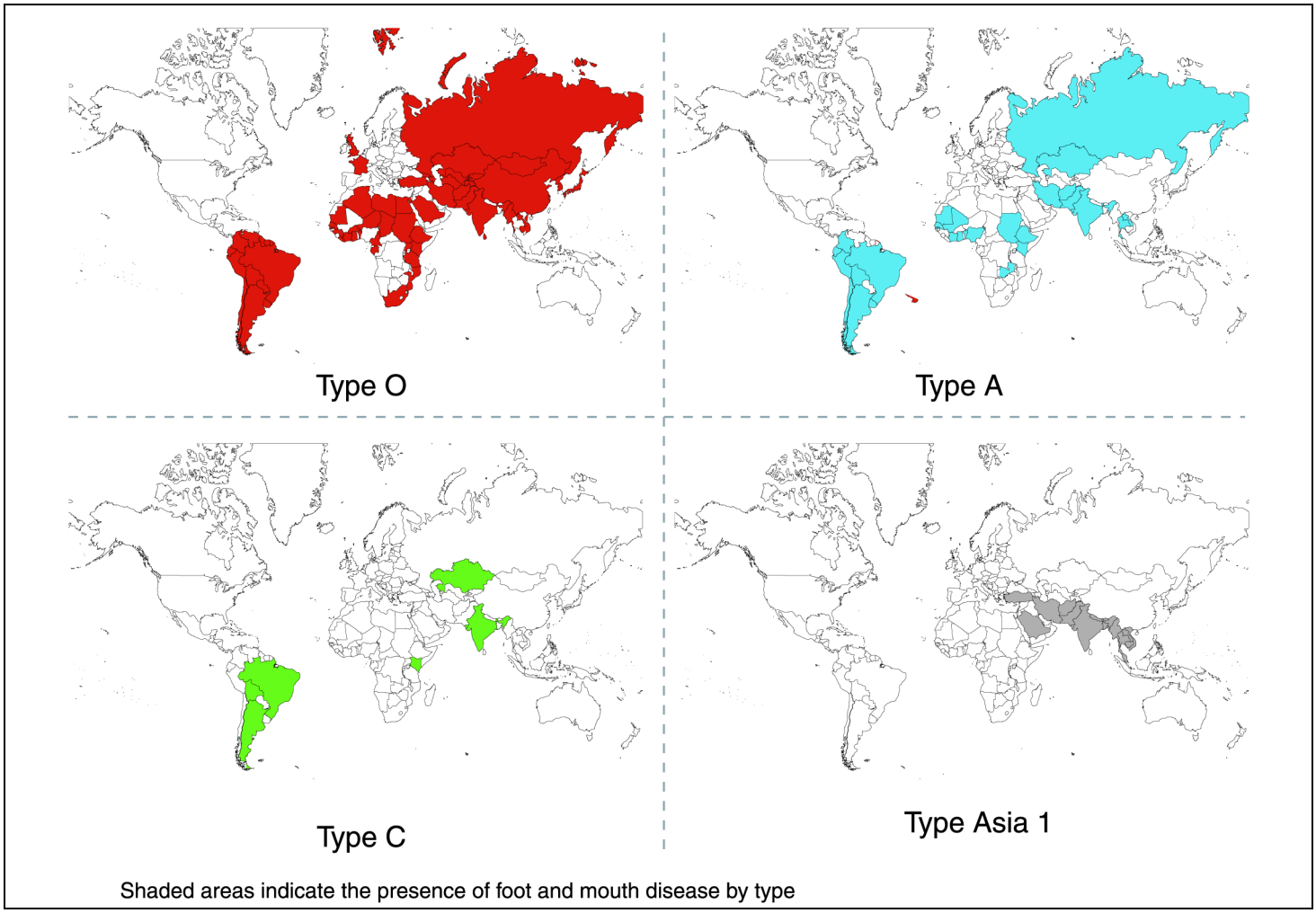
Figure 1: Worldwide Incidence of FMD, 1992 through 2002



Source: GAO's adaptation of information from the Institute for Animal Health (Pirbright Laboratory), which is designated the World Reference Laboratory for Foot and Mouth Disease by the Food and Agriculture Organization of the United Nations, and the Office International des Epizooties.

In 2000 and 2001, over 40 countries reported outbreaks of FMD, and during the first 5 months of 2002, five countries reported outbreaks. The spread of certain strains of the virus also demonstrates how quickly it is spreading throughout the world. For example, the FMD virus serotype O, known as the Pan-Asia strain, was first identified in northern India in 1990 and was subsequently found in Nepal in 1993. It then spread westward into Saudi Arabia during 1994 and, subsequently, throughout the Near East and into Europe (Thrace region of Turkey, Bulgaria, and Greece) in 1996. The Pan-Asia strain was also found in Bangladesh in 1996 and in Bhutan in 1998. In 1999 it was reported in mainland China and then detected in Taiwan. By late 1999 and in 2000, it had reached most of Southeast Asia. Most recently, the Pan-Asia strain was found in the Republic of Korea, Japan, the Primorsky Territory of the Russian Federation, and Mongolia (areas free from FMD since 1934, 1908, 1964, and 1973, respectively). The Pan-Asia strain is also responsible for the 2001 outbreak of FMD in the United Kingdom that subsequently spread to France, Ireland, and the Netherlands. Figure 2 shows the incidence of four types of FMD virus worldwide, including the type O Pan-Asia strain.

Figure 2: Worldwide Incidence of Four Types of FMD, 1990 through 2002



Source: GAO's adaptation of information from the Institute for Animal Health (Pirbright Laboratory), which is designated the World Reference Laboratory for Foot and Mouth Disease by the Food and Agriculture Organization of the United Nations, and the Office International des Epizooties.

In North America, the last outbreaks of FMD for the United States, Canada, and Mexico occurred in 1929, 1952, and 1953, respectively. The United States has worked closely with both Canada and Mexico to eradicate FMD from North America.

International Community Has Guidelines to Control and Eradicate FMD

The Office International des Epizooties (OIE)—an intergovernmental organization created in January 1924 by an international agreement signed by 28 countries—was established to guarantee the transparency of information on the animal disease status of member countries. In addition, OIE collects and analyzes veterinary scientific information and disseminates it to member countries, provides expertise and promotes international solidarity for the control of animal diseases, and guarantees the sanitary safety of world trade by developing rules for international trade in animals and animal products. In May 2001, OIE had 158 member countries.

OIE classifies member countries (or certain zones within these countries) as being FMD-free with or without vaccination if they meet certain criteria detailed in the OIE International Animal Health Code. For example, to obtain FMD-free status without vaccination, a member country should (1) have a record of prompt animal disease reporting; (2) send a declaration that it has been FMD-free and has not used vaccination for 1 year; (3) present evidence that it has an effective system of surveillance; (4) implement regulatory measures for the prevention and control of FMD; and (5) provide evidence that no vaccinated animals have been imported into the country, since such animals can become the source of future infections. Similarly, to obtain FMD-free-with-vaccination status, a country should (1) have a record for prompt animal disease reporting, (2) send a declaration that there have been no outbreaks of FMD for 2 years, (3) provide evidence that the country has effective surveillance systems and has implemented necessary regulatory measures to prevent and control FMD, (4) provide proof that routine vaccinations are carried out and that the vaccines comply with OIE standards, and (5) have an intensive and frequent system to detect any viral activity.

When FMD occurs in an FMD-free country or zone where vaccination is not practiced, the affected country must reapply after the outbreak to regain its FMD-free-without-vaccination status from OIE. OIE standards require a country to wait until 3 months after the last reported case of FMD when a "stamping out approach" (immediate slaughter of diseased and exposed animals with no vaccination) is used to eradicate the disease before the country can apply for reinstatement of its FMD-free status. As part of this process, surveillance results of laboratory-screening tests (serological surveillance results) must be provided to OIE to prove that the disease has been eradicated. If vaccination was used to control the outbreak, then the country must wait until 3 months after the last vaccinated animal is

slaughtered and serological surveillance results prove that the disease has been eradicated before reapplying for FMD-free status.

The international community generally places a high value on products from countries that are FMD-free without vaccination. Such countries can export both live animals and animal products easily to other FMD-free countries. In contrast, countries that have an FMD-free-with-vaccination status are restricted to trading animal products that can be treated to ensure that the virus is inactivated. As a result, most countries that are FMD-free without vaccination resort to a stamping out process to eradicate the disease if an outbreak occurs. The United Kingdom and Taiwan followed this process in 2001 and 1997, respectively. Similarly, if an outbreak were to occur in the United States, the current U.S. policy requires all infected and exposed animals to be immediately slaughtered and disposed of by incineration, burial, or rendering.[4]

In recent years, the international community has been encouraging the acceptance of regionalization policies for international trade. Regionalization involves declaring one or more areas of a country FMD-free while other areas are responding to an outbreak. Under a regionalization policy, in the event of an FMD outbreak in the United States, even if one state or area was infected, the nation as a whole might not lose its FMD-free status, and trade restrictions might not be enforced on all of our FMD-susceptible products.

An FMD Outbreak Can Cost Billions of Dollars

An FMD outbreak could cost the U.S. economy billions of dollars in both direct and indirect costs. Direct costs to the government would include the costs of disease control and eradication, such as the maintenance of animal movement controls, control areas, and intensified border inspections; the destruction and disposal of infected animals; vaccines; and compensation to producers for the costs of disease containment. However, government compensation programs may not cover 100 percent of producers' costs. As a result, direct costs would also occur for disinfection and for the value of any slaughtered animals not subject to government compensation. According to recent U.K. government estimates, the direct costs for control and eradication of the 2001 outbreak was about $4 billion. According to several estimates, the direct costs of controlling and eradicating a U.S.

[4] Rendering is a process that subjects animal tissue to heat or chemicals to separate the fat from the protein and mineral components.

outbreak of FMD could range up to $24 billion in current dollars, depending, among other things, on the extent of the outbreak and the control strategy employed.[5]

The value of lost export sales in the event of an FMD outbreak would represent a significant portion of the total direct costs to the U.S. economy. According to USDA officials, a single case of FMD in the United States would cause our trading partners to prohibit U.S. exports of live animals and animal products. This ban could result in losses of between $6 billion and $10 billion a year while the United States eradicated the disease and until it regained disease-free status. These losses may be mitigated to some extent by increased domestic sales of meat from disease-free portions of the United States that may otherwise have been exported. However, USDA officials believe that many people in the United States would refuse to eat meat during an FMD outbreak, thus the offset probably would be minimal.

Indirect costs of an FMD outbreak would include those costs affecting consumers, ancillary agricultural industries, and other sectors of the economy. For example, if large numbers of animals are destroyed as part of a control and eradication effort, then ancillary industries such as meat-processing facilities and feed suppliers are likely to lose revenue. Furthermore, an FMD outbreak would result in adverse effects such as unemployment, loss of income (to the extent that government compensation does not fully reimburse producers), and decreased economic activity, which could ripple through other sectors of the economy as well. For example, the loss of agricultural income could result in reduced sales of consumer goods. In the United Kingdom, according to government estimates, the 2001 outbreak resulted in losses to the tourism industry of over $5 billion that were comparable to the losses sustained by the food and agriculture sector.

In addition, not only may consumers have to pay higher prices for the remaining supply of animal products affected by an FMD outbreak, but the price of substitutes is likely to rise, as well. For example, as the price of FMD-free meat increases, some consumers are likely to buy poultry or other meat substitutes, thus causing the prices of these substitute products to rise. However, the higher prices that consumers pay for substitutes do

[5] Over 4 million animals were slaughtered during the U.K. outbreak to control the disease. According to a USDA preliminary estimate, a comparable outbreak in the United States could require the destruction of about 13 million animals.

not result in a net cost to the economy because these higher prices result in increased revenues for poultry producers and others.

Social Impacts of an Outbreak Can Be Significant

An FMD outbreak can have significant social impacts, such as enormous psychological damage, especially on families and localities directly affected by the outbreak, as the U.K. experience in 2001 illustrates. For example, in May 2001, the Welsh Institute of Rural Health found that individuals affected by the FMD outbreak experienced a range of symptoms, including tearfulness, lack of sleep, loss of appetite, increased anger, irritability, and general depression. An increase in marital discord was also noted. One general practioner reported that 50 percent of his patients affected by the FMD outbreak required antidepressant drugs. Some farming families even sent their children away from home during the outbreak rather than have them witness the slaughter and disposal of the family's livestock.

Consumer confidence in the safety of the U.K. food supply was also adversely affected by the outbreak. A survey by the United Kingdom's Institute of Grocery Distribution determined that because of the FMD and mad cow disease outbreaks, many consumers in the United Kingdom now consider meat and dairy products to be unsafe. As a result, these consumers have changed their grocery-buying habits.

An outbreak also significantly disrupts daily life. Normally busy livestock producers suddenly had almost nothing to do because their animals had been destroyed and their properties were quarantined. According to one study of the effects of FMD on farm life in the Cumbria area of the United Kingdom, most farming households had to curb their usual daily activities, and only the most essential movements on and off the farms were permitted. Lost income caused stress to families because they had to cut back on their household expenditures and some had to renegotiate loans. The study notes that the enforced isolation caused by the quarantines added to the tensions and stresses already being experienced by both adults and children.

USDA Is Responsible for Protecting U.S. Livestock From FMD and Other Animal Diseases

Within USDA, the Animal and Plant Health Inspection Service (APHIS) has the lead responsibility for protecting the nation's livestock from foreign animal diseases, which are diseases not native to the United States as well as those thought to have been eradicated. Assisting APHIS in this endeavor are USDA's Foreign Agricultural Service, the Food Safety and Inspection Service, and the Homeland Security Council.

Within APHIS, several groups share responsibility for protecting U.S. livestock from the incursion of foreign animal diseases such as FMD:

- *International Services.* Working with its counterpart organizations in foreign countries, this group seeks to reduce the international spread of animal and poultry diseases. Its goal is to protect U.S. livestock and poultry by reducing risk abroad through disease-management strategies provided to exporting countries before they send their animals and products to the United States.

- *Veterinary Services.* To protect and improve the health, quality, and marketability of our nation's animals, animal products, and veterinary biologics, this group seeks to prevent, control, and/or eliminate animal diseases, and monitor and promote animal health and productivity. This group administers laws and regulations on importing animals and animal products, including embryos and semen, to ensure that imports are free from certain disease agents. In addition, Veterinary Services provides training for state and private veterinarians on foreign animal diseases of concern and provides animal disease diagnostic and surveillance testing. Veterinary Services has primary responsibility for inspecting and ensuring the safety of live animal and animal product imports to the United States. Within Veterinary Services, the Emergency Programs unit coordinates efforts to prepare for and respond to animal disease outbreaks, including FMD, and in the fall of 2001, published a draft plan for responding to an FMD outbreak. It employs veterinarians trained to detect and respond to an FMD outbreak. Emergency Programs also provides federal and state veterinarians and others with training on foreign animal diseases.

- *Plant Protection and Quarantine.* Inspectors in this group are USDA's primary presence at 144 of the 301 ports of entry in the United States, as well as 8 foreign ports. According to USDA, inspectors are present at all major ports of entry, and staffing is based on risk assessments and supplemented with tools such as detector dogs, X-rays, and hand-held

remote-sensing equipment. USDA inspectors screen and physically inspect animal products and other cargo arriving by air, sea, or land, as well as international passengers and their luggage arriving via air, sea, or land border crossings. Most notably, the beagles in Plant Protection and Quarantine's Beagle Brigade sniff travelers' luggage for prohibited fruits, plants, and meat that could harbor harmful plant and animal pests and diseases. According to USDA, by the end of this year, it will have increased the number of dog teams to 123, which is double the level available 2 years ago.

In commenting on a draft of this report, USDA stated that by the end of this year, APHIS will also have increased the number of its safeguarding personnel to approximately 3,870—an increase of 50 percent over its fiscal year 2000 staffing levels. Moreover, USDA told us that it has hired 18 additional veterinarians who are conducting port-of-entry reviews, working with state counterparts, and providing technical guidance and training on working with and handling animal products and byproducts and international garbage that could pose a threat of foreign animal diseases.

In addition, USDA's Foreign Agricultural Service (FAS) operates programs designed to build new markets and improve the competitive position of U.S. agriculture in the global marketplace. FAS is responsible for USDA's overseas activities, such as market development, international trade agreements and negotiations, and the collection and analysis of statistics and market information. FAS supports U.S. agricultural interests through its network of agricultural counselors, attachés, and trade officers stationed in many foreign countries. FAS officials primarily deal with agricultural trade issues and meet with host government and industry officials to discuss and facilitate agricultural trade.

USDA's Food Safety and Inspection Service (FSIS) has primary responsibility for ensuring the safety of imported and domestic meat and meat products meant for human consumption. FSIS stations inspectors at ports of entry to conduct sampling and inspection functions on imported meat products. FSIS also has responsibility for approving countries that are eligible to export meat products to the United States. In fulfilling this responsibility, FSIS conducts periodic reviews of eligible countries. According to USDA, FSIS's inspection of livestock before slaughter is an important surveillance tool for detecting the presence of FMD in the United States.

Finally, USDA's Homeland Security Council is responsible for leading and coordinating USDA's activities to plan for and manage agriculture-related crises as well as emergency programs. This council serves as USDA's primary contact with the Federal Emergency Management Agency and facilitates coordination with other federal agencies, state and local governments, and private-sector organizations.

U.S. Customs Service Supports USDA's Efforts at Ports of Entry

The U.S. Customs Service (Customs) is the nation's primary enforcement agency for preventing the entry of a number of potentially harmful products into the United States, including FMD-contaminated products. In addition to their Customs responsibilities to ensure that proper duties or tariffs are paid on imported products, Customs inspectors work to enforce the regulations of about 40 federal agencies, such as those of USDA. Customs inspectors review paperwork, such as manifests and bills of lading, and physically inspect cargo and international passengers and their luggage. Customs has inspectors stationed at all 301 ports of entry throughout the United States, including international airports and seaports and land border crossings along the Canadian and Mexican borders. Customs also has inspectors at some foreign locations, such as the international airport in Toronto, Canada, where they perform preclearance inspections of passengers and their luggage prior to entry into the United States. Customs inspectors also examine international mail and packages arriving in the United States at the 14 facilities handling mail of foreign origin.

Objectives, Scope, and Methodology

Senator Tom Daschle asked us to determine whether (1) U.S. processes to obtain and disseminate information on foreign FMD outbreaks are adequate and timely, (2) U.S. measures for preventing FMD from entering the country are effective and comparable with those of other selected countries, and (3) the United States could respond quickly and effectively to an outbreak of FMD if it were to occur.

To address the first question, we obtained and reviewed relevant documents, and we interviewed USDA and Customs officials. In particular, we reviewed the adequacy and timeliness of the information obtained and disseminated by USDA after the 2001 FMD outbreak in the United Kingdom.

For the second question, we reviewed relevant legislation, regulations, and other USDA documents. We also interviewed USDA, Customs, and state officials. To observe the preventive measures for international cargo, we visited three large seaports in Elizabeth, New Jersey; Baltimore, Maryland; and Houston, Texas. To observe the preventive measures for international mail, we visited international mail-processing facilities in New Jersey and Virginia and one international express package carrier in Kentucky. To observe the preventive measures for live animals imported through U.S.-Canadian and U.S.-Mexican land ports of entry, we visited the Sarnia, Ontario, and Nuevo Laredo, Mexico, border crossings. To observe the preventive measures for international passengers, we visited Dulles International Airport, and obtained information on the preclearance procedures used to process international passengers entering the United States via Canada at the international airport in Toronto, Canada. We also gathered information on how garbage from international carriers is handled at airports and seaports. In addition, we visited two nearby county and two state fairs in Maryland and Virginia to observe how USDA's guidance for biosecurity measures to prevent the spread of disease at U.S. livestock and agricultural shows was implemented.

As a result of the heightened level of security at airports after September 11, 2001, and because our review was largely conducted after the U.K. outbreak had ended, we were unable to implement a portion of the review as originally planned. In particular, we were unable to survey passengers who were returning to the United States from the United Kingdom, during the outbreak, at the airport after they left the passenger-processing area. Instead, we surveyed by telephone 60 passengers who visited the United Kingdom during the time of the outbreak (Mar. through Sept. 2001). We asked them to recall various aspects of their return trip and the processing they underwent at U.S. airports. These results cannot be generalized and represent only the experiences of the people whom we surveyed. In addition, because we asked people to recall events after the passage of 4 to 6 months, their recollections of certain events and processes might not have been as clear as they would have been immediately upon arrival.

Furthermore, to respond to our second question, we compared the preventive measures used by Canada, Mexico, and the United Kingdom with those used by the United States. We selected Canada and Mexico for our review because the ability of the United States to protect its livestock from FMD also depends on the ability of our neighbors to prevent the disease; according to USDA officials, if any of the three countries has an FMD outbreak, the other two are also likely to have an outbreak. We

included the United Kingdom in our analysis because it is a major U.S. trading partner and because of its recent experience with FMD. To obtain information on the preventive measures used by Canada and Mexico, we visited these two countries, met with federal officials, and obtained and reviewed relevant documents. While in Canada and Mexico, we visited airports, seaports, international mail-processing facilities, and border crossings to observe the preventive measures used by these countries. To obtain information on the United Kingdom's preventive measures, we reviewed and summarized legislation and regulations for the European Union and the United Kingdom, as well as other publicly available documents. To ensure the accuracy and completeness of our information, we shared the summaries that we prepared on the preventive measures used by the three countries with officials in these countries and asked for their review and comments. The information on these foreign countries' preventive measures does not reflect our independent legal analysis.

Finally, for our third question, we reviewed federal and state emergency response plans as well as other key documents and federal legislation and regulations. We interviewed USDA officials, industry representatives, and state officials. We also interviewed a group of selected veterinarians and animal health technicians who were part of the U.S. contingent that supported the United Kingdom's response efforts in 2001 to obtain their perspectives on U.S. preparedness and observations on lessons learned from the U.K. outbreak. We interviewed the state veterinarian in six states that are major U.S. livestock producers to obtain their perspective on their state's preparedness efforts as well as the overall U.S. ability to respond to an outbreak if it were to occur. We also attended a USDA training session and a conference organized by the Western States Livestock Health Association that included information on U.S. preparedness and response to an FMD outbreak.

We provided USDA and Customs with a draft of this report for review and comment. The written comments we received from USDA are presented in appendix V, and those we received from Customs, in appendix VI. In addition, we received technical comments from USDA that we have incorporated throughout the report as appropriate.

We conducted our work from August 2001 through May 2002 in accordance with generally accepted government auditing standards.

USDA Has Adequate Processes to Obtain Information on Foreign FMD Outbreaks, but Dissemination to Customs Can Be Improved

USDA relies on a wide variety of sources to obtain information on outbreaks of FMD overseas. Its sources include APHIS and FAS staff stationed abroad, official notifications from international trade or animal health organizations, and notifications from affected countries. But USDA's dissemination of this information is more problematic because it has no formal process—detailed procedures and protocols—for sharing information on foreign FMD outbreaks with Customs, which provides the first line of defense against potentially contaminated products entering U.S. ports. USDA does, however, share the information it develops with agencies within the department, states, public and private veterinarians, industry groups, and the public through various methods, including E-mails, postings to USDA's Internet site, telephone calls, and media alerts.

USDA Obtains Information on Foreign FMD Outbreaks from Multiple Sources

USDA receives information about the incidence of foreign animal diseases, including FMD, from a variety of sources. These include USDA staff stationed in foreign countries; international organizations, such as OIE and the World Trade Organization (WTO); and the governments of affected nations.

USDA officials stationed in countries around the world provide a range of information on agricultural issues, including the disease status of foreign countries. For example, APHIS's International Services group employs over 300 foreign service officers and host country nationals in 27 countries around the world. According to APHIS officials, these foreign service staff collect agricultural information for the countries they are stationed in as well as other countries in the region. Their primary sources of information include (1) official notifications from foreign governments about changes in their country's animal or crop disease status; (2) meetings with host government, local industry, and private-sector officials; (3) local radio and television reports, as well as newspapers and magazines, which may provide early information about potential animal or crop disease problems; and (4) informal discussions at receptions or other social events hosted by the foreign government or private citizens, from which they may gather references of potential animal or crop disease problems. According to APHIS officials, any information gathered from unofficial or informal sources needs to be confirmed through other official sources before the United States can initiate any formal action, such as restricting imports.

Similarly, FAS maintains an international field structure: 63 agricultural counselor, attaché, and affiliate foreign national offices; 17 agricultural trade offices; and a number of agricultural advisers covering 129 countries

around the world. According to the FAS officials we spoke with, staff stationed overseas have no functional responsibility for tracking foreign animal diseases, such as FMD. However, during their routine activities, they may become aware of a possible outbreak, in which case they would likely relay this information to FAS headquarters, in Washington, D.C. FAS staff obtain agricultural information from several of the same sources accessed by APHIS staff, such as the local media, trade and industry reports, meetings with host government officials, and official government notifications and documents.

In addition, FSIS provides APHIS with information on the disease conditions present in foreign countries that it obtains as part of its evaluation of a country's eligibility to export meat and meat products to the United States. FSIS's technical staff review the documents provided by the foreign country as well as conduct in-country visits before deeming a country eligible to export meat and meat products to the United States for human consumption. FSIS also conducts audits in each eligible exporting country, at least annually, and shares any information obtained on diseases of concern with APHIS, according to USDA.

USDA also receives information from international organizations, such as OIE and WTO, which have reporting guidelines for member nations to follow during outbreaks of certain animal diseases. For example, both OIE and WTO require member countries affected with FMD to make an official notification as soon as the disease has been confirmed. These organizations then provide other member nations with official notification of the outbreak.

In addition to reporting to international organizations, countries affected by FMD may report the outbreak directly to their major trading partners. For example, major U.S. trading partners often notify USDA officials directly when an FMD outbreak occurs, as the United Kingdom did in early 2001. According to APHIS officials, the United Kingdom notified USDA on the same day that it confirmed the presence of FMD—February 21, 2001. In North America, Canada, Mexico, and the United States have an informal understanding that in the event of an FMD outbreak, the affected country will immediately report to the other two countries.

The usefulness of information on foreign FMD outbreaks depends on a foreign country's willingness to provide accurate information in a timely fashion. There are instances, however, when a country may fail to notify OIE, WTO, or its major trading partners of a disease outbreak in a timely

manner.[6] For example, Argentine officials did not acknowledge that some regions of their country had been affected with FMD, although unconfirmed reports indicated that the disease had been present for several months, according to USDA officials. Argentina officially notified OIE on March 13, 2001, and USDA then took action to prohibit imports of affected Argentine products. In commenting on a draft of this report, USDA stated that if it had verifiable scientific evidence that FMD existed in Argentina, it could have prohibited imports before the country notified OIE.

USDA Lacks a Formal Process to Ensure Dissemination of FMD Information to Customs

APHIS has primary responsibility for sharing information obtained about foreign FMD outbreaks with other agencies within USDA, Customs, state governments, affected industries, and the public. These entities all need information about potential FMD outbreaks because they all play an important role in preventing or responding to an outbreak. While APHIS immediately alerts USDA agencies and others, it has no formal process, including defined procedures and protocols, to distribute information on foreign FMD outbreaks to Customs. Consequently, there is no assurance that Customs inspectors at U.S. ports of entry, and in particular at the ports where APHIS does not have a presence, are adequately informed of the need to implement controls for potentially contaminated cargo, and international passengers and their luggage entering the United States.

APHIS Uses Multiple Mechanisms to Inform USDA Agencies and Others in the United States About Foreign FMD Outbreaks

APHIS uses various methods to inform its own field staff located in the United States and abroad, other USDA agencies, state governments, industry groups, the public, and the media about foreign FMD outbreaks. These methods include

- E-mails and electronic alerts,
- memos and letters,
- telephone calls,
- meetings,

[6] While OIE cannot sanction countries that do not comply with its reporting requirements, WTO can.

- press releases,
- printed media (brochures, pamphlets, and posters),
- public education and outreach,
- toll free information hotline, and
- postings to the Internet (USDA's Web page).

After the 2001 outbreak of FMD in the United Kingdom, we observed that APHIS used each of these methods to distribute information about (1) the disease, (2) the outbreak in the United Kingdom, and (3) preventing the introduction and spread of the disease in the United States. For example, APHIS field locations began receiving electronic alerts and E-mails from APHIS headquarters, on February 21, 2001, which was the same day that the United Kingdom notified APHIS about the outbreak. Similarly, by the second week of March 2001, USDA had issued several press releases, placed information on its Web site about FMD precautions, initiated an international travelers' education campaign, and established a toll-free number for public inquiries about the disease. Also, shortly after the U.K. outbreak began, APHIS distributed several types of printed media to its field offices nationwide. According to the Veterinary Services staff in the field offices we contacted, they distributed these materials to state governments, industry associations, and private veterinarians, and placed posters in public transportation terminals, such as train stations. Table 2 shows selected key actions APHIS took upon learning of the FMD outbreak in the United Kingdom.

Table 2: Key USDA Information Dissemination Actions Taken After the 2001 Outbreak of FMD in the United Kingdom

Date	Action taken/information disseminated
Feb. 21, 2001	APHIS Alert to all its Plant Protection and Quarantine Port Offices prohibiting the importation of all meat products from the United Kingdom (including England, Scotland, Wales, Northern Ireland, and the Isle of Man).
Feb. 26, 2001	APHIS Electronic Alert reminding Plant Protection and Quarantine inspectors to closely monitor international passengers, in particular those arriving from the United Kingdom, and screen for those who had been on a farm overseas and to check footwear and decontaminate if necessary.
Mar. 1, 2001	APHIS Electronic Alert to Plant Protection and Quarantine inspectors providing guidance on inspecting farm equipment and tractors as well as other vehicles imported from the United Kingdom or the Republic of Ireland.
Mar. 6, 2001	First team of U.S. veterinarians deployed to the United Kingdom to help respond to the outbreak.
Mar. 12, 2001	Beginning the week of March 12, 2001, a high-ranking APHIS official began a tour of major eastern U.S. ports, meeting with U.S. Customs and other federal inspection agencies to emphasize the need for aggressive exclusion activities.
Mar. 13, 2001	APHIS Electronic Alerts and USDA news release announcing the prohibition of imported live swine and ruminants, any fresh swine or ruminant meat (chilled or frozen), and other products of swine and ruminant from all European Union nations (does not include cooked pork products).
Mar. 13, 2001	USDA Media Advisory announcing kick off of traveler's education campaign starting March 14, 2001.
Mar. 14, 2001	USDA memo to its field veterinarians and Animal Import Centers regarding guidelines for importing pets from areas affected with FMD.
Mar. 16, 2001	USDA news release announcing the establishment of toll-free FMD call lines—domestic and international.
Mar. 20, 2001	APHIS begins regularly scheduled conference calls with the National Association of State Departments of Agriculture to discuss APHIS's FMD exclusion efforts.
Mar. 22, 2001	Specific guidance provided to the U.S. Customs Service on FMD-related inspection procedures for cargo and passengers at U.S. ports of entry.
Mar. 23, 2001	Industry Alert to livestock owners and private-practice veterinarians posted to the APHIS Web site, reminding them to report unusual animal health symptoms.
Mar. 2001	Other information issued during the month of March includes • meetings about FMD with industry, state, and local governments; • FMD-prevention information developed for airlines; • warning signs posted at airports; • public service announcements on radio and television; and • FMD information for USDA extension agents.
Apr. 9, 2001	Secretary of Agriculture authorizes an additional $32 million to increase inspection personnel.
Apr. 26, 2001	Secretary of Agriculture assures the Congress that compensation would be available to producers in the event of an FMD outbreak in the United States. USDA begins hiring 400 new inspectors and doubling the size of the canine inspection teams, and reassigns 200 current inspectors to critical ports of entry.
May 11, 2001	USDA and the Department of Defense coordinate restrictions on military exercises to ensure that FMD is kept out of the United States.
May 2001	USDA issues FMD-prevention guidelines for livestock shows agricultural fairs, and other agricultural events.

However, the effectiveness of USDA's efforts is uncertain. For example, in March 2001, APHIS issued an industry alert to airlines, suggesting that they

could assist USDA's preventive activities by making in-flight announcements on international flights to raise passengers' awareness about the dangers of FMD. APHIS also provided a brief text for the airlines to use when making these announcements. However, the passengers returning from the United Kingdom during the outbreak whom we contacted told us that not all the airlines made such announcements.

Similarly in May 2001, APHIS issued disease prevention guidelines for livestock shows and agricultural fairs, such as state and county fairs. According to APHIS officials, these guidelines are "suggestions" for fair organizers and directors, and their actual use and implementation are left to the discretion of state and local authorities. We observed that the implementation of APHIS's guidelines varied dramatically at the two county fairs and two state fairs that we visited. For example, USDA's guidelines indicate that food should not be allowed in areas where show animals are housed; however, at all four fairs, we observed that no restrictions of this kind were in effect. Moreover, some of the livestock owners and show officials that we interviewed at the fairs generally did not know about the risks associated with FMD or the need to take precautionary measures to prevent its introduction or spread. For example, one livestock producer told us that FMD was a "European problem" and that the United States did not have to worry about it.

APHIS Does Not Have a Formal Process to Provide Customs with Information on Foreign FMD Outbreaks

While APHIS uses a number of mechanisms for informing interested parties about foreign FMD outbreaks, it has no formal process to inform Customs—the first deterrent to the importation of potentially FMD-affected products—about these outbreaks. As Table 2 shows, after the U.K. outbreak, APHIS did not immediately inform Customs about its decisions to prohibit or restrict certain products or more vigilantly screen passengers arriving at U.S. ports of entry from the United Kingdom. Customs did not receive any consistent national guidance from APHIS until the Acting Commissioner of Customs formally requested this information in writing from the Administrator of APHIS, on March 16, 2001. As a result, Customs' field staff did not receive uniform official guidance on general inspection measures for passengers and products until March 27, 2001, and specific information on at-risk products to be detained at the ports until April 4, 2001—37 and 45 days, respectively, after APHIS received the United Kingdom's official notification of the outbreak. According to a Customs memorandum and officials we spoke to, field inspectors felt ill equipped to adequately process international cargo and passengers at ports of entry during the initial stages of the U.K. outbreak. For example, one Customs

supervisor told us that there was no APHIS inspector present at her port of entry and that she had no information on how to clean passengers' shoes and what kind of disinfectant to use. According to this Customs supervisor, the lack of official guidance forced her staff to rely on informal and inadequate guidance obtained from APHIS officials located at another port of entry. She added that because Customs inspectors are not animal disease specialists, they need nontechnical, clear procedures to help them process international cargo, passengers and their luggage, especially at those ports where there is no APHIS presence. The Customs' Assistant Director for Field Operations agreed that such uniform and clear guidance is needed for all Customs field inspectors.

APHIS officials acknowledged that they did not notify Customs of the U.K. outbreak. According to these officials, because Customs had not sought specific guidance from APHIS about prior FMD outbreaks in other countries, they believed that Customs knew how to handle cargo, passengers, and luggage arriving from the United Kingdom during the outbreak without specific notification and further guidance from them. As a result of the concerns raised by Customs during the U.K. outbreak, the APHIS Assistant Director for Technical Trade Services told us that in May 2002, she added an official from the Customs Office of Field Operations to the list of people to whom she sends E-mail notifications of foreign FMD outbreaks. The Customs Assistant Director for Field Operations told us that this action will help his office better inform Customs' field inspectors about future foreign FMD outbreaks.

Conclusions

Although APHIS is primarily responsible for protecting U.S. livestock from FMD, it needs Customs to help it fulfill this responsibility. Customs is especially critical to keeping FMD-contaminated products out of the United States at those ports of entry where APHIS is not present. However, Customs inspectors can help provide a concerted, coordinated, and comprehensive defense against FMD at the nation's border only if they receive current information on the countries that are affected by FMD and have clear nontechnical guidelines on how to process at-risk products and passengers. APHIS has taken the first interim step to notify Customs of future foreign FMD outbreaks, by including a Customs official on one of its electronic mailing lists. However, we believe that this does not provide a permanent solution to the lack of clear communication protocols and procedures between APHIS and Customs.

Recommendations for Executive Action

To help ensure that Customs inspectors at all U.S. ports of entry are fully informed about current foreign FMD outbreaks, we recommend that the Secretary of Agriculture direct the Administrator of APHIS to develop (1) a formal written agreement with the Commissioner of the Customs Service that will clearly delineate the process by which future information on foreign FMD outbreaks will be communicated with Customs and (2) uniform, nontechnical procedures that Customs inspectors can use to process international passengers and cargo arriving from FMD-affected countries.

U.S. Measures to Prevent FMD Are Generally Comparable to Other Countries, but Complete Protection May Be Infeasible

U.S. measures to prevent an FMD outbreak—control and eradication overseas and the port of entry screening of livestock, animal products, and passengers—have been successful since 1929. Nevertheless, the United States remains vulnerable to an FMD outbreak because of the nature of the virus, the many pathways by which it can come into the country, and the growing magnitude and volume of both legal and illegal passengers and cargo entering the country. Other countries face similar challenges in protecting their livestock from FMD and use preventive measures that are comparable to those the United States uses. However, the United States could also build on the experiences of other countries to improve its preventive measures.

USDA's Efforts to Control and Eradicate FMD in Other Countries Help Reduce the Risk to U.S. Livestock

As a first line of defense to safeguarding U.S. animal resources against the introduction of pests and diseases, USDA helps prevent, control, and eradicate agricultural health threats where they originate outside the United States. By helping other nations eradicate or control these outbreaks, USDA reduces the risk of agricultural pests and diseases reaching U.S. borders.

In North America, U.S. efforts to eradicate and control FMD have largely focused on Mexico, because of our shared border and the possible threat of the FMD virus's moving overland from South America, where the disease is endemic in some countries. USDA has staff located in Mexico working with the Mexico-United States Commission for the Prevention of Foot and Mouth Disease and Other Exotic Animal Diseases. The commission, formed in 1947 as a combined U.S.-Mexican effort to eradicate FMD from Mexico,[7] built Mexico's animal health infrastructure and successfully eradicated FMD from Mexico in 1954. Today, USDA and Mexican veterinarians work together, through the activities of the commission, to provide disease surveillance, diagnostic testing, and training for Mexico to ensure that the country remains FMD-free. According to USDA officials in Mexico, the United States initially covered about 80 percent of the costs for the joint program; however, as the Mexican government assumed greater responsibility for the program, the U.S. share has decreased to about 20 percent. In fiscal year 2001, USDA provided about $160,000 in funding for the commission's activities. According to USDA officials, this funding

[7] The commission was originally called the Mexican American Commission for the Eradication of Foot and Mouth Disease.

supports the commission's high-security laboratory in Mexico City by providing training, supplies, and equipment.

In addition, for over 30 years, the United States has held regular meetings on animal health issues with the governments of Canada and Mexico to harmonize North America's import requirements and, more recently, to coordinate preventive actions and emergency response activities in the event of an FMD outbreak. For example, in 2000, the three countries held joint exercises—known as the Tripartite Exercise 2000—to test their FMD communication and response plans, and to assess their response systems. As a result of this exercise, the three governments signed a memorandum of understanding to formally establish the North American Animal Health Committee. This committee represents animal health issues for the North American Free Trade Agreement and seeks to harmonize live animal and animal product import requirements for North America. The committee will also plan emergency response activities and perform joint test exercises to ensure that all three countries remain prepared to respond to an FMD outbreak.

The United States also supports efforts to establish FMD-control zones in Central and South America. For example, to help alert countries in Central and North America about the potential incursion of FMD from South America, USDA has established cooperative programs with Panama and Colombia. In Panama, USDA supports the U.S.-Panama Cooperative Program for the Prevention of Foot and Mouth Disease, which maintains the Darien Gap area of Panama free from FMD and other foreign animal diseases. This program conducts field surveillance at high-risk border points and annual training, analyzes technical data, and improves the infrastructure. The program also provides support for the Investigative Laboratory for Vesicular Disease, which provides bio-containment, diagnostic, and detection capabilities for vesicular and other foreign animal diseases in Central America.

Through the Colombian program, USDA helps maintain an FMD-free barrier along the Colombia-Panama border.[8] This barrier serves as the "first line of defense" for preventing the spread of FMD northward into Central America, Mexico, and the United States, which are all FMD-free. Until FMD is eradicated from South America, USDA believes that

[8] This barrier is one of two in the world; the other, in Turkey, is maintained by the European Union to protect Western Europe from FMD.

maintaining this barrier will prevent the disease's northward spread. USDA provides technical assistance and half of the funding for the program.

As part of its disease exclusion activities for the region, USDA also has cooperative agreements with all the other Central American countries to support joint monitoring and surveillance activities, including field investigations and the collection of laboratory samples for FMD and other foreign animal diseases. Through these agreements, USDA helps transfer surveillance and detection technologies to these countries.

When FMD strikes other nations—as it did recently, for example, in Argentina and the United Kingdom—the United States may assist in controlling and eradicating the disease. For example, a total of 327 U.S. animal health professionals, including over 300 veterinarians, helped eradicate the 2001 outbreak in the United Kingdom. The Americans came from USDA, other federal agencies, and state governments. Beginning in March 2001, they traveled to the United Kingdom, generally in groups that averaged about 10 per week, and assisted with the response for about a month. At the peak of the outbreak during March and April, about 100 U.S. animal health professionals were assisting in the U.K. response. The U.S. responders with whom we spoke participated in surveillance activities, such as collecting blood samples, and epidemiology tasks, such as tracking and predicting the path of new disease outbreaks. They also issued permits and licenses to move animals and products such as silage. By providing such assistance, the United States not only helps ensure that the disease is eradicated quickly, but also helps reduce the potential for FMD-infected products to arrive at U.S. ports of entry.[9]

Despite U.S. Preventive Measures at Ports of Entry, Vulnerability to FMD Remains

Preventive measures at U.S. borders provide the second line of defense against the incursion of FMD into the United States. USDA has identified several key pathways by which the FMD-virus could enter the United States. To respond to the risk posed by these pathways, USDA implemented measures designed to ensure that animals, products, passengers, and equipment arriving at U.S. borders are free of the virus and do not pose a risk to U.S. livestock. However, some level of risk is inherent

[9] According to USDA officials who helped respond to the U.K. outbreak in 2001, another benefit of sending U.S. personnel to assist with foreign disease outbreaks is the valuable training they receive by handling diseased animals and responding to various aspects of a "real life" response.

in international trade and travel, and no set of measures can ever completely eliminate the possibility that FMD will enter the country. Moreover, because FMD is a hardy virus and the level of inspection resources cannot keep pace with the increasing volume and magnitude of cargo and passengers, both legal and illegal, that continue to enter the country, the United States remains vulnerable to an outbreak.

The United States Has Implemented Preventive Measures for Key Pathways

The FMD virus could enter the United States through a number of key pathways: live animal imports, imports of animal and other products, international passengers and their luggage, garbage from international carriers, international mail, and military personnel and equipment returning from overseas. For each of these pathways, USDA has developed and implemented specific preventive measures described below.

Live animal imports. The United States allows imported livestock, such as swine, cattle, and sheep, only from preapproved countries that USDA judges to be free of FMD and other diseases of concern.[10] For example, in April 2002, USDA recognized 49 countries or geographical regions as free of FMD. (See app. I.) Generally, live animals can be imported only through designated ports of entry, the majority of which are located along U.S. borders shared with Canada and Mexico, and three others located on the east and west coasts.[11] Most live cattle imports into the United States originate from Canada and Mexico; live hog imports, from Canada; and live lamb imports, from Australia and New Zealand. Livestock exported to the United States must be accompanied by a U.S. import permit and a health certificate from an official government veterinarian in the country of origin. The health certificate states that the animals have been in the exporting country for at least 60 days prior to shipment and are free of other diseases of concern.[12] Generally, animals arriving from countries other than Canada and Mexico may be quarantined.[13] Zoological ruminants and swine from

[10] USDA performs a risk assessment to determine a country's FMD-free status using the OIE criteria described in chapter 1, and independently validates the country's disease status reports sent to the OIE. In addition, USDA reviews additional information provided by the country and conducts verification visits to the country.

[11] Twenty-six other U.S. ports of entry accept live animals on a limited basis.

[12] Because the incubation period for FMD is significantly less than 60 days, the 60-day requirement helps ensure that if animals have been exposed to the FMD virus or other serious animal health diseases, they would become symptomatic within this period of time.

FMD-affected countries are permitted into the United States but must be processed through USDA's New York Animal Import Center.

Animal and other product imports. Thousands of animal and other products that could be contaminated with the FMD virus could potentially enter the United States during the course of normal international trade. These products include animal products meant for human consumption, such as meat and dairy products; nonfood animal products, such as hides, skins, casings, and animal extracts; as well as nonanimal products, such as farm equipment, hay, and straw. USDA regulates the importation of this diverse range of products to help minimize the risk of introducing FMD into the United States.

USDA implements different import rules for FMD-free and FMD-affected countries. Generally, for countries free of FMD and other diseases of concern,[14] USDA imposes few restrictions on animal product imports. For FMD-affected countries, USDA prohibits the importation of all susceptible products shipped 3 weeks prior to the date of official notification of the outbreak. This prohibition remains in effect until USDA reassesses the disease status of the affected country and determines the level of trade that can resume. USDA allows imports of animal and other products from FMD-affected countries only if they meet certain requirements. These requirements vary for different kinds of products, as follows:

- *Animal products meant for human consumption.* Generally fresh, chilled, or frozen meat from cattle, sheep, and pigs, and fresh milk are prohibited from FMD-affected countries. However, processed meat and dairy products are allowed from FMD-affected countries if they meet certain requirements. For example, meat products can be imported from FMD-affected countries only if (1) the country and meat processing plants have been deemed eligible to export meat products to the United States by FSIS and (2) the processing plants also meet APHIS's meat-processing standards. The APHIS standards ensure that meat products from these countries are not contaminated with the FMD virus, and require that the products be processed in a manner that will

[13] The length of the quarantine depends on the type of animals imported and the kinds of diseases present in the country of origin.

[14] Unrestricted trade is generally dependent on a country's being free of other diseases of concern, such as cattle plague (rinderpest), and others. FMD is only one of the diseases of concern.

inactivate the virus. For example, they must be fully cooked, dry cured, or canned and shelf-stable, with all bones removed. Moreover, a U.S. import permit and an official veterinary health certificate from the country of origin must accompany certain meat shipments. Similarly, most dairy products from FMD-affected countries must meet APHIS's requirements to ensure that they do not pose a risk of FMD's introduction. For example, milk products that are in a concentrated liquid form and are shelf-stable without refrigeration are allowed from FMD-affected countries. Some dairy products, such as condensed milk require a U.S. import permit, while others, such as yogurt and butter are unrestricted and do not require a permit.[15]

- *Nonfood animal products.* A variety of nonfood animal products are allowed from FMD-affected countries if they have been properly treated to inactivate the virus; however, a U.S. import permit may be required. For example, tanned hides, leather, and fully finished mounted animal trophies can be imported into the United States from FMD-affected countries.

- *Other products.* USDA does not allow imports of grass, hay, or straw used for feeding, bedding, or other purposes from FMD-affected countries. However, used farm equipment is allowed with a certificate from the exporting country stating that the equipment has been steam cleaned. APHIS officials inspect farm equipment at U.S. ports of entry to ensure that it is free from dirt and soil. If dirt and soil are found, then inspectors will determine whether they can be adequately washed with detergent and disinfected at an appropriate location before granting approval for entry into the United States.

All animal and other products arriving at U.S. ports of entry, whether from FMD-free or FMD-affected countries, are subject to inspection by U.S. federal inspectors. Customs officials, who review the documents accompanying the shipments, either electronically or on paper, provide the first level of inspection for these shipments. On the basis of this review, Customs is authorized to either release the shipments into commerce or hold them for USDA inspection. USDA provides Customs with a list of products to be flagged for inspection by APHIS. APHIS inspectors ensure that all the necessary documents accompanying the shipment, such as

[15]The import permit allows USDA to evaluate the processing conditions for the product and determine whether the stated process will inactivate the FMD virus.

import permits and official health certificates, are complete and ensure that the shipments match their manifest. In some instances, APHIS inspectors will inspect the shipping containers to check their contents. After APHIS completes its inspection, the shipment may proceed to FSIS and/or the Food and Drug Administration for further inspection, depending on which agency regulates the safety of these products for human health issues, or may proceed to Customs for release into commerce.[16] According to USDA, FSIS inspectors at ports of entry visually examine all shipments of products under FSIS's jurisdiction and randomly select some for more in-depth examination.

In commenting on a draft of this report, USDA noted that it has primary inspection responsibility for agricultural cargo and manifests at those ports staffed with USDA inspectors. To ensure that these shipments continue to be referred to USDA for inspection, the department said that it is working with Customs and other federal agencies to develop an automated targeting system, which will serve as an electronic interface among federal agencies to identify and automatically segregate high-risk plant cargo and track imported animals and animal products.

International passengers. International passengers who may have been in contact with the FMD virus, either through contact with infected animals or materials such as soil and manure, or who bring potentially contaminated products into the country may also transmit the virus to the United States. USDA provides the following FMD-prevention information and types of scrutiny for international passengers in an effort to reduce the risk associated with this pathway:

- USDA requests airlines to make in-flight announcements on international flights; at ports of entry, it places warning signs and it plays prerecorded announcements about how international passengers can assist in keeping FMD out of the United States.

- International passengers must fill out a U.S. Customs declaration form that asks if they are bringing any animal or plant products into the country and if, while traveling abroad, they visited a farm or were in contact with animals. Passengers responding affirmatively to these

[16]Certain imported animal products, such as meat, are regulated by FSIS, while others, such as milk and cheese, are regulated by the Food and Drug Administration to ensure that they are safe for human consumption before they are released into U.S. commerce.

questions are sent by Customs officials to a USDA inspection area at the port of entry for further processing. USDA officials may x-ray and inspect the contents of the passengers' baggage; ask them additional questions; confiscate any prohibited items, such as meat and dairy products; and clean and disinfect their shoes.

- USDA's Beagle Brigade and inspectors generally rove the baggage claim areas at major ports of entry to help identify passengers and their luggage that may be carrying prohibited food items. USDA inspectors look not only for suspicious packages, such as bulky, misshapen, and leaking containers, but also question passengers about their travels to determine whether they present a greater risk of disease transmission. If the dogs or the inspectors identify such passengers, these passengers are referred to the USDA inspection area for further processing.

After the 2001 FMD outbreak in the United Kingdom, according to the international passengers we surveyed, some of these measures were not consistently implemented. For example, some passengers told us that the airlines they traveled on did not make any in-flight announcements about FMD. Other passengers told us that even though their Customs declaration form indicated that they had been in contact with animals or visited a farm while in the United Kingdom, they were not referred by officials to the USDA inspection area at the airport for further processing or they had to request USDA personnel at the airports to examine and disinfect the shoes that they wore while they were in FMD-affected areas in the United Kingdom.

Garbage from international carriers. Garbage from international carriers, such as airplanes and ships, can also transmit the FMD virus into the United States if the garbage contains food items contaminated with the virus. Therefore, USDA has developed guidelines to ensure that garbage from international carriers is properly handled and disposed of so that it does not present a risk to U.S. livestock. For example, USDA inspectors supervise the removal of all international garbage from airplanes and ships. This garbage must be transported in leak-proof containers and must be disposed of properly, such as by incineration or sterilization, and subsequent burial at a landfill. USDA has compliance agreements with catering firms and cleaners that outline the proper handling and approved disposal methods for international garbage. Before a compliance agreement is signed, APHIS officials will, among other things, review the application; visit the handling, processing, or disposal facilities; observe the operation of any equipment to determine its adequacy for handling

garbage; and certify and approve the garbage cookers and sterilizers to be used to process international garbage. USDA also monitors firms operating under these compliance agreements to ensure that they abide by the conditions stated in the agreement.

International mail. Prohibited animal products that could transmit the FMD virus may also be sent through international mail and courier services to U.S. residents. As a result, international mail packages entering the United States are subject to inspection by Customs and USDA officials. Customs generally reviews the declaration form on the packages and either visually inspects or x-rays them as part of its responsibility to screen international mail for illegal and prohibited items, such as contraband and drugs. At USDA's request, Customs can also screen international packages for prohibited animal products, such as meat and dairy products from FMD-affected countries. Customs sets aside packages that appear to contain such items for USDA's inspection. USDA officials will review the declaration forms and may x-ray or open these packages for physical inspection. If the item in the package is a permissible product, the officials will reseal the package and release it for delivery; otherwise it will be confiscated and destroyed.[17] In commenting on a draft of this report, USDA noted that mail from high-risk countries is more thoroughly scrutinized on the basis of pathway analysis.

Military personnel and equipment. Because U.S. military forces are deployed throughout the world, troops and military equipment returning to the United States could introduce FMD and other diseases into the country. As a result, USDA provides support for the military and helps oversee the reentry of military cargo, personnel, equipment, and personal property to reduce the risk of introducing diseases into the United States. For example, military personnel must declare all agricultural items they are bringing back to the United States and identify whether they have been on farms or in contact with animals while abroad. Their clothing and gear should also be cleaned and washed before reentering the country. Similarly, all military rolling stock, such as humvees, trucks, weapons systems, and tanks, as well as other used military gear, such as canvas tents, must be thoroughly cleaned before reentry. Pallets, wooden crates, and other military equipment must be free of soil, manure, and debris. Military equipment used to eradicate animal diseases overseas, such as FMD, is not allowed reentry. For small-scale operations, the military must

[17] Senders of packages that are confiscated and destroyed are routinely notified.

notify USDA at least 7 days in advance of arrival at a U.S. port of entry. USDA will determine if appropriate cleaning facilities are available at the first port of entry, and all items will be held at this port for inspection. If approved cleaning facilities are not available or if the equipment is contaminated to an extent that prevents cleaning, USDA will refuse to allow reentry. Large-scale operations require a 30-day notification.

United States Remains Vulnerable to FMD

The United States has not had an outbreak of FMD since 1929, and some USDA officials and animal health experts believe that this healthy condition of U.S. livestock is directly related to the effectiveness of U.S. measures to prevent the incursion of the disease. However, these and other experts agree that the nation remains vulnerable to an FMD outbreak for the following reasons:

- FMD is a highly contagious and hardy virus that remains viable for long periods of time.

- FMD can be carried and transmitted by a variety of animate and inanimate items. Although the key pathways described earlier pose varying levels of risk to U.S. livestock, according to USDA, it could take only one contaminated product to come into contact with one susceptible U.S. animal to start a nationwide outbreak.

- The magnitude and volume of international passengers, mail, and products entering the United States creates an enormous challenge for USDA and other federal inspection agencies. As a result, most inspections at ports of entry are restricted to paper reviews of manifests supported by a limited number of judgmentally selected samples for physical inspection. For example, in fiscal year 2001, over 470 million international passengers and pedestrians arrived at U.S. ports of entry; of these, USDA inspected about 102 million. According to APHIS officials, about 30 percent of the items seized from passengers at airports were prohibited animal products or by-products. Table 3 provides information on the volume/numbers of passengers, vehicles, and cargo entering the United States and the level of APHIS's inspections for fiscal year 2001. Similarly, the volume of international mail entering the United States makes it difficult for APHIS and Customs to adequately screen incoming parcels for FMD-susceptible products. For example, APHIS inspectors at the international mail facility in Elizabeth, New Jersey, told us that about 30,000 international parcels pass through their check point every day. This volume of mail

provides the inspectors approximately 3 seconds per parcel to judge whether the package might contain FMD-susceptible products. Moreover, mail is processed at the facility during the day and night to keep up with the volume of international mail arriving daily. However, APHIS inspectors are present only during the day shifts and detector dogs are available for only 1 to 2 days per week. Although Customs' inspectors screen packages for FMD-susceptible products during the time when APHIS inspectors are not available, both APHIS and Customs inspectors told us that the process is less effective than having an APHIS inspector on site. Nonetheless, according to APHIS's Assistant Director for Port Operations, even doubling or tripling the agency's inspection resources would not significantly reduce the FMD risk from overseas entries because the percentage of passengers, vehicles, and cargo receiving a physical inspection is likely to continue to be relatively low.

Table 3: Volume/Numbers of Passengers, Vehicles, and Cargo Entering the United States, Inspected by APHIS and Resulting in Seized Products, Fiscal Year 2001

Commodity/mode	Volume/number[a]	Inspected by APHIS[b]	Percentage inspected
Passengers (all modes of transport)	472,000,000	101,513,792	21.5
Ships	215,328	52,016	24.2
Aircraft	1,064,923	541,109	49.0
Cargo	14,538,271[c]	2,181,904[d]	N/A[e]
• Rail	1,534,566		
• Trucks	7,878,000		
• Ship	5,125,705		
Mail packages	N/A[f]	434,216	N/A

Legend: N/A=not applicable

[a]Source: U.S. Customs Service.

[b]Source: USDA.

[c]The number of full containers.

[d]The number of bills of lading inspected. A single bill of lading may include multiple containers.

[e]The percentage cannot be calculated because APHIS and Customs report their data in differing units of measure.

[f]The total amount of international mail that entered the United States during fiscal year 2001was not available; however, APHIS officials at the Port Elizabeth, New Jersey, facility told us that approximately 30,000 parcels go past their check point every day.

- Moreover, most U.S. preventive measures are not designed to intercept illegal entries of products or passengers that may harbor the FMD virus.

According to USDA, the volume of illegal agricultural products entering the United States is growing, and contraband meat products entering the country is the single most important risk for the introduction of FMD. In addition, illegal shipments of products from countries other than the stated point of origin and illegal immigrants also pose significant risks. USDA and Customs annually confiscate thousands of contraband and prohibited products at U.S. ports of entry. For example, in fiscal year 2001, USDA seized 313,231 shipments of prohibited meat/poultry and animal by-products. According to USDA officials, these seizures are only a small portion of the contraband entering the United States. To respond to the growing threat from illegal entries, USDA recently created the Smuggling Interdiction and Trade Compliance program. Program officials collaborate with several federal, state, and private organizations to ensure compliance with U.S. agriculture import laws at ports of entry.

U.S. Preventive Measures Are Comparable to Those Used by Other Countries

U.S. preventive measures for FMD are comparable to the measures used by Canada, Mexico, and the United Kingdom for four key pathways included in this review: livestock imports, animal product imports, international mail, and garbage from international carriers. The pathway that presented the most significant area of difference concerned the measures used to process international passengers entering these countries. (Detailed information on the preventive measures used by Canada, Mexico, and the United Kingdom are provided in appendixes II through IV of this report.)

Generally, U.S. preventive measures were similar to those used by the other three countries for the following four pathways:

- *Imported livestock.* The three countries allow imports of livestock only from approved countries that are FMD-free. Generally, these live animals must be imported through predetermined inspection ports that have adequate facilities available to quarantine the animals, if necessary. In addition, the countries require import permits and health certificates to accompany the livestock shipments unless the animals are imported directly for slaughter. Of the three countries, Mexico requires an official government veterinarian to (1) preinspect animals imported from countries other than the United States in their country of origin before they are loaded for transport to Mexico and (2) accompany the shipment and monitor the health status of the animals while they are in transit.

- *Imported animal products.* The countries generally allow animal product imports only from countries that they consider FMD-free and that meet their specific animal health and food safety standards. The countries also allow certain animal product imports from FMD-affected countries if they originate from a preapproved establishment and are processed in a manner that would inactivate the virus. For example, meat products that are fully cooked and canned and are shelf-stable can be imported from FMD-affected countries, but unprocessed products, such as fresh, chilled, or frozen meat, and untreated milk, are not allowed. In addition, all imported animal product shipments are subject to review and may be selected for physical inspection when they arrive at the port of entry in each of the countries.[18]

- *International mail.* The countries handle international mail in a similar manner, which includes a review of the documentation detailing the sender, country of origin, and contents of the package. Only packages considered suspect, for example, because they do not include required information, are from high-risk countries, or have been sent by repeat offenders, are selected and opened for further inspection. Canada uses x-ray technology to help identify packages containing prohibited items, and Mexican officials told us that all international packages arriving from FMD-affected countries are opened and inspected for prohibited items.

- *Garbage from international carriers.* The countries' federal agencies responsible for protecting animal health supervise the containment, transportation, and processing of garbage from international carriers. They generally dispose of international garbage by incineration or under certain conditions by burial at federally approved sites. For example, in Canada, international garbage can be buried at approved sites located at least half a kilometer from any premise with livestock and/or poultry and must be immediately covered by 1.8 meters (approx. 5.5 feet) of local refuse and/or other standard covering material. At the time of our review, none of the countries allowed domestic animals to be fed international garbage from airlines or ships.

[18]All imported animal product shipments receive a documentary review, which usually involves a review of the accompanying paperwork, such as import permits and health certifications. A percentage of animal product shipments is judgmentally selected for physical inspection to ensure that the products do not present any animal or public health risk. Samples may be taken for laboratory analyses as part of this inspection.

In commenting on a draft of this report, USDA noted that the United Kingdom faces greater risk than the United States because it is a member of the European Union, which includes, and provides for trade among, countries that are FMD-free as well as some that are not.

The United States differed from Canada and Mexico in the measures used to prevent FMD from entering the country via international passengers. Specifically, we noted the following three areas of difference:

- *Use of signs at ports of entry.* While Canada, Mexico, and the United States all posted special signs at ports of entry to alert international passengers to the dangers of FMD, the U.S. signs were smaller and less visible in comparison with the signs used by the other two countries. For example, the Canadian signs were over 6 feet tall and warned passengers in large, bold letters in both English and French about FMD. Similarly, in Mexico the signs were also over 6 feet tall, included pictures, and colored text in English or Spanish. In contrast, the first U.S. signs were 1-by-1 foot and included relatively small-sized text on a white background that was difficult to read and did not easily convey the importance of the message. According to USDA officials, these signs were subsequently replaced with larger signs (3-by-3 feet) that included a colored graphic and larger-sized text. While larger, we observed at one U.S. international airport that the new signs were placed at a considerable distance from arriving passengers. These signs were placed on easels on top of the baggage carousels and therefore were several feet above eye level. In contrast, we observed that the signs in Canada and Mexico were placed in more easily visible locations that were in greater proximity to the passengers. According to agriculture officials in all three countries, they are limited in their ability to place signs at ports of entry because they have to negotiate the size and placement with the port authorities. As a result, they are not always able to use the most effective signs or locations. Figures 3 and 4 show the signs that were used in the United States and Canada and Mexico.

Figure 3: U.S. FMD Signs Posted at Ports of Entry

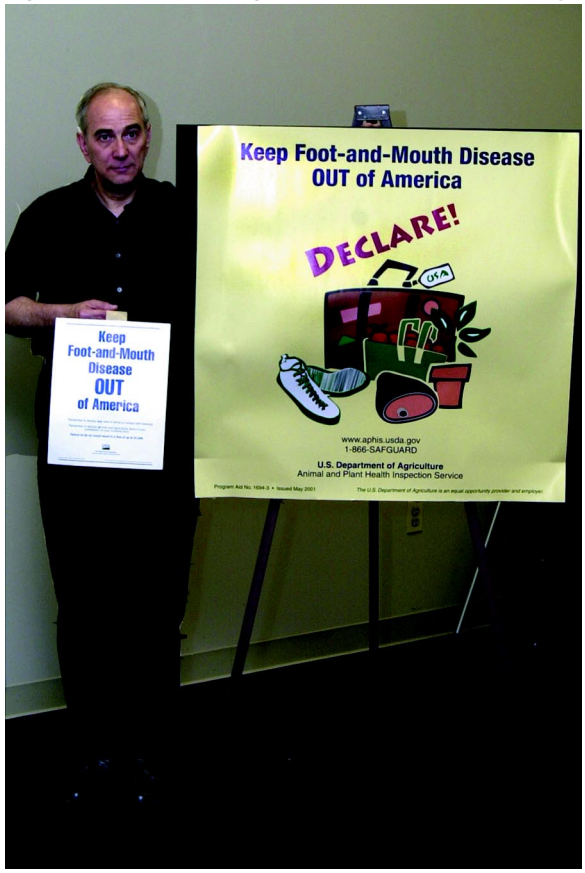


Figure 4: Canadian and Mexican FMD Signs Posted at Ports of Entry

Canada

Mexico

- *Modified declaration forms.* In 2001, both Canada and Mexico made changes to the declaration forms they use to process international passengers upon arrival. For example, after the U.K. outbreak in 2001, Canada reworded its declaration form to provide examples of food products of concern, such as dairy products. Similarly, Mexico developed a separate form that passengers coming from FMD-affected countries must complete, and it asks clear, detailed agriculture-related questions. In contrast, the United States did not make any changes to its declaration form in 2001, and some of the international passengers we contacted considered the agriculture-related question on the form ineffective and unclear. A senior APHIS official told us that USDA was aware that the question on the form was confusing and ambiguous to

travelers. This official said that most of the confusion arises because the question on the form consolidates three questions into one.

In commenting on a draft of this report, USDA stated that it has recently worked with Customs to revise the agricultural question on the Customs declaration form. The form now includes two agriculture-related questions that USDA believes will be more easily understood by travelers and will yield better information to the department to help focus its inspection efforts. The new form is currently being distributed throughout the country. Because USDA's actions address our concerns, we have deleted our recommendation on this issue from this report. (See table 4 for a comparison of the agriculture-related questions on the prior and revised U.S. declaration forms.)

Table 4: Agriculture-Related Questions on the Prior and Revised U.S. Declaration Forms

Language on prior Customs declaration form[a]	Language on revised Customs declaration form[a]
Q.11 I am (We are) bringing fruits, plants, meats, food, soil, birds, snails, other live animals, wildlife products, farm products; or, have been on a farm or ranch outside the U.S.	Q.11 I am (We are) bringing (a) fruits, plants, food, insects: (b) meats, animals, animal/wildlife products: (c) disease agents, cell cultures, snails: (d) soil or have been on a farm/ranch/pasture: Q.12 I have (We have) been in close proximity of (such as touching or handling) **livestock**:

Note: [a]Both forms require the questions to be answered with either a "yes" or "no" response.

- *Use of disinfectant mats.* As a precaution, both Canada and Mexico developed guidelines requiring all international passengers arriving at airports and seaports to walk over disinfectant mats when entering the country. However, according to USDA officials, the United States chose not to use disinfectant mats because USDA research found that the disinfectant in the mat would become ineffective after a certain number of uses and may begin to harbor the virus, thus contaminating shoes that were otherwise clean.

Conclusions

The United States has had significant success in keeping the nation's livestock FMD-free since 1929. To some extent, the success of this effort is directly related to the effectiveness of U.S. preventive measures both abroad and at the nation's borders. However, because of the extensive

presence of FMD worldwide and because the magnitude and volume of international cargo and travel continue to expand, the nation's vulnerability to an introduction of FMD remains high. The steps that other nations have taken to reduce the risk of FMD—such as signs to alert international passengers—could help improve USDA's efforts to protect U.S. livestock. While we recognize that there is an additional cost to preparing new, larger, and more noticeable signs, we believe that, given the significant economic costs of an FMD outbreak to the nation, these costs are justified if they can help improve our preventive measures.

Recommendation for Executive Action

To help improve the effectiveness of U.S. measures to prevent the introduction of FMD by international passengers, we recommend that the Secretary of Agriculture direct the Administrator, APHIS, to develop more effective signage about FMD for ports of entry.

Agency Comments

In its comments on a draft of this report, USDA stated that it is in the process of developing new signage for ports of entry that will be larger and more mobile than the ones that we observed during the course of our work.

Despite Preparation Efforts, the United States Will Face Challenges in Responding Quickly and Effectively to an FMD Outbreak

If FMD enters the United States despite USDA's preventive measures, the nation's ability to identify, control, contain, and eradicate the disease quickly and effectively becomes paramount. Recognizing the importance of an effective response and the necessity to prepare before an outbreak occurs, USDA and most states have developed emergency response plans that establish a framework for the key elements necessary for a rapid and successful U.S. response and eradication program. Many of these plans have, to some extent, been tested by federal and state agencies to determine their effectiveness. However, planning and testing exercises have also identified several challenges that could ultimately impede an effective and timely U.S. response if they are not resolved before an FMD outbreak occurs.

The Federal Government and Many States Have Developed and Tested Emergency Response Plans

Planning for a coordinated response to emergencies, including outbreaks of animal disease, is occurring at both the federal and state levels. Furthermore, both the federal government and many states have tested and revised their plans in response to the results of these tests.

Federal and State Governments Have Developed Emergency Response Plans

At the federal level, 26 federal agencies and the American Red Cross signed the federal response plan in April 1999, which is intended to guide the federal response to national emergencies and augment state response efforts. Under this plan, the Federal Emergency Management Agency (FEMA) is designated as the coordinating agency and is responsible for providing expertise in emergency communications, command and control, and public affairs. In the event of an FMD outbreak, FEMA would designate USDA as the lead agency and work closely with the department to coordinate the support of other federal agencies to respond to the outbreak. For example, under the plan, Customs would "lock down" ports of entry; the Department of Defense would provide personnel, equipment, and transport; the Environmental Protection Agency would provide technical support on the disposal of animal carcasses; the National Park Service would guide the response if wildlife become infected; and other agencies would provide additional support.

To supplement the federal response plan and provide specific guidelines for an animal disease emergency, such as implementing quarantines of

infected premises and disposing of animal carcasses, APHIS, USDA's Homeland Security Council, and FEMA are taking the lead in developing a federal plan specifically for responding to an FMD or other highly contagious outbreak of an animal disease. The draft plan calls for the involvement of more than 20 agencies and describes the authorities, policies, situations, planning assumptions, concept of operations, and federal agency resources that will provide the framework for an integrated local, state, and federal response.

At the state level, many states have developed an animal disease component for their state's emergency management plans. According to the National Animal Health Emergency Management System (NAHEMS),[19] in January 2000, only about half the states and U.S. territories had developed animal health emergency response plans. At that time, NAHEMS recommended that each state develop a plan for responding to animal health emergencies that links to their state's emergency management plan and includes information on the following key elements:

- Animal health surveillance and detection systems.
- Control and eradication procedures.
- Communication between key partners.
- Involvement of emergency management officials.
- Collaboration between state and federal emergency responders.
- Involvement of state and federal animal health officials in responding to natural disasters.

According to NAHEMS, in its 2001 annual report dated March 2002, the number of states and U.S. territories with animal disease emergency plans had increased to 46, of which 45 had included the plan as part of their state's emergency management plan, and 30 indicated that their plan included all of the elements listed above.

[19] NAHEMS is a joint federal-state-industry group whose objectives include improving the U.S. ability to respond to animal health emergencies.

Federal and State Agencies Have Tested Their Emergency Response Plans

To ensure the efficacy and completeness of their plans, the federal government and many of the states have conducted "tabletop" and functional exercises. Tabletop exercises bring together key decision makers in a relatively stress-free setting to

- discuss the contingencies and logistics of a hypothetical disease outbreak;
- evaluate plans, policies, and procedures; and
- resolve questions of coordination and responsibility.

The setting is relatively stress-free because there is no time limit to resolve the hypothetical outbreak. In contrast, functional exercises simulate an emergency in the most realistic way possible, without moving people or equipment. It is a stressful, real-time exercise in which people apply emergency response functions to a hypothetical scenario. According to one APHIS official, functional exercises are best described as "dress rehearsals" for actual emergencies.

The federal government has held both tabletop and functional exercises, as described below:

- To ensure that the federal FMD emergency response plan is comprehensive and well coordinated, USDA conducted a tabletop exercise in 2001. In this exercise, USDA developed a scenario involving a modest, limited FMD outbreak in the United States and obtained the views of 21 federal agencies and the American Red Cross on how they could support the federal response to an FMD outbreak. USDA used this information to revise its draft national FMD response plan.
- The federal government held a functional exercise in 2000—the Tripartite Exercise 2000—to test the plans, policies, and procedures that would guide the emergency response to a multifocal FMD outbreak in North America. The test focused on communication between the various entities involved in an outbreak and the use of vaccines by Canada, Mexico, and the United States. The test resulted in many recommendations to improve the three countries' abilities to (1) communicate effectively, (2) provide program support, and (3) use vaccines. According to the final report, the recommendations, if implemented, will improve North America's overall response capacity.

The three countries have established working groups tasked with responding to these recommendations.

Similarly, as of 2001, about 26 states had periodically conducted various kinds of exercises to test state responses to an FMD or other animal disease outbreak, according to NAHEMS. For example, in June 2001, the Texas Animal Health Commission, in conjunction with the Texas Division of Emergency Management within the Texas Department of Public Safety, conducted a 4-day modified functional exercise of the state's draft FMD response plan and engaged 23 federal, state, academic, and private entities in the exercise. The exercise was designed to test participants' abilities to control the simulated outbreak, find and deliver indemnity funds, and streamline the decision-making processes. Overall, the exercise determined that better communication and coordination could improve the speed and effectiveness of the state's response. It also identified areas of ambiguity in the plan that left participants without clear directions at crucial times during the exercise. According to state officials, the plan was revised as a result of the exercise, and according to the Executive Director of the Texas Animal Health Commission, more exercises are necessary to continuously improve the plan. However, the state veterinarian also said that he does not believe that adequate resources are available either at the federal or state level for such activities.

Serious Challenges to an Effective U.S. Response Are Yet to Be Resolved

As the U.K. experience has demonstrated, responding to an FMD outbreak can tax a nation's fiscal, scientific, and human resources. If a similar outbreak were to occur in the United States, the nation would face a wide spectrum of challenges that can hamper an effective and rapid response: (1) the need for rapid disease identification and reporting; (2) effective communication, coordination, and cooperation between federal, state, and local responders; (3) an adequate response infrastructure, including equipment, personnel, and laboratory capacity; and (4) clear animal identification, indemnification, and disposal policies. While USDA has made some progress in addressing some of these issues, significant work remains.

Rapid Disease Identification and Reporting

The rapid identification and reporting of an FMD incident is key to mounting a timely response. However, a timely response depends on livestock producers' and private veterinarians' quickly identifying and reporting suspicious symptoms to state and federal officials. If they do not

do so, FMD could become out of control before the federal and state governments could initiate any action. For example, within the first few days of the outbreak in the United Kingdom, before the first reports of FMD reached British officials, infected animals were criss-crossing the country in hundreds of separate movements, putting other livestock at risk. The main geographical spread of the disease occurred before any suspicion that the disease was present in the country. In contrast, in France, county officials quickly identified diseased animals from the United Kingdom, and were able to slaughter them quickly and avoid a large-scale outbreak. As a result, France sustained minimal animal losses and was declared FMD-free within months, while it took the United Kingdom almost a year to eradicate the disease and regain its FMD-free status.

Several federal and state animal health officials with whom we spoke were concerned about how quickly disease identification and reporting would actually occur in the United States. They told us that livestock producers or veterinarians may not readily identify FMD because (1) the disease presents symptoms that are similar to other less-serious diseases, (2) FMD and other foreign animal diseases are not usually included in veterinary school curricula, and (3) many veterinarians may never have seen FMD-infected animals. Furthermore, livestock producers and veterinarians may not report the disease because they are not aware of the reporting process or may not realize the criticality of prompt reporting.

According to USDA officials, the U.K. outbreak helped raise general awareness among state officials, private veterinarians, and livestock producers about the risks and potential of an FMD outbreak in the United States. An indication of this increased awareness is the doubling of foreign animal disease investigations from about 400 in 2000 to more than 800 in 2001. In addition, federal and state officials told us that the U.K. outbreak led to greater awareness of the need to have trained diagnosticians for foreign animal diseases in the field. In recent years, more field veterinarians have attended foreign animal disease training at USDA's Plum Island facility.[20]

Nevertheless, as described in chapter 2, USDA intensified its efforts to increase public and industry awareness about FMD after the U.K. outbreak

[20] Plum Island is USDA's high-security laboratory (with a biosafety level-III status) located on an island off of Long Island, New York, and is the only U.S. laboratory authorized to conduct diagnostic testing of FMD-suspected samples using live FMD virus.

in 2001. As part of these efforts, USDA also addressed industry and animal health associations, and sponsored workshops, conferences, and informational telecasts for federal, state, and local officials, and others. In addition, the state governments also supported and supplemented USDA's informational efforts. Despite USDA and state efforts to flood the livestock industry with information about the risks of FMD during 2001, the challenge to USDA will be to maintain this heightened awareness about FMD, now that the immediate risk from the U.K. outbreak has subsided.

Cooperation, Coordination, and Communication

Cooperation, coordination, and communication between federal, state, and local agencies, private veterinarians, and livestock producers are essential for an effective FMD response. Recent planning efforts and test exercises have helped start the process of establishing greater coordination and improving the level of cooperation and communication between all levels. According to a USDA official, for example, USDA's recent planning efforts to develop a national FMD response plan brought together officials from a variety of federal agencies to consider the implications of an FMD outbreak to their areas of responsibility and helped them develop ways in which they could support a federal response.

Moreover, efforts to improve communication, cooperation, and coordination are beginning to transcend state boundaries. In 2001, 26 U.S. states/territories reported to NAHEMS that they were part of a group of states that had agreed to support each other in preparing for and responding to animal health emergencies. For example, according to Midwestern state officials, they are now beginning to address regional coordination and cooperation issues. In May 2002, seven Midwestern states met in Iowa for a planning conference to discuss a coordinated response plan for the region.

While these planning and testing efforts have improved the level of communication, coordination, and cooperation, they have also identified areas that need considerable attention. For example, although the Tripartite Exercise of 2000 identified generally good communication and cooperation between government and industry participants, it also identified the need for the following actions:

- Improve the technology used to ensure an uninterrupted flow of information.

- Develop written agreements between national animal health and industry officials to ensure a continued high level of communication even when players change.

- Have federal and state counterparts work together to develop collaborative relationships that will improve communications during an actual outbreak.

We also found that cooperation and communication between federal and state officials varied by state. For example, while some state officials indicated that they had excellent working relationships with their federal counterpart located in the state, others told us that cooperation and communication were limited. According to one APHIS field veterinarian, the level of cooperation and communication depends to a large extent on the personalities of the people involved and therefore such variance is to be expected. While the development of written agreements as suggested by the Tripartite exercise report and NAHEMS could help alleviate this problem, as of 2001, only about 32 U.S. states/territories had such agreements or other documents that detailed the respective roles of federal and state officials.

To help improve cooperation, coordination, and communication, USDA officials told us that they are working with organizations such as the National Emergency Management Association to help states with their animal-emergency-planning efforts. In addition, USDA awarded 38 grants totaling $1.8 million in 2001 to state agencies, tribal nations, and emergency management organizations. According to USDA, this funding was to be used for training, equipment, and emergency-preparedness exercises.

In commenting on a draft of this report, USDA stated that in late May 2002, it announced that it would be making more than $43 million available as grants to the states for strengthening homeland security preparedness. Of this $43 million, $14 million is to help states meet the national standards of emergency preparedness established by NAHEMS. Moreover, USDA stated that it is working with FEMA to develop a framework for a comprehensive communications plan to address a foreign animal disease outbreak. The plan will help better ensure the timely dissemination of information to critical audiences, including federal agencies, states, and industries.

Adequate Response Infrastructure

An effective response to an FMD outbreak requires an effective infrastructure, including a national emergency management control and command center, technical and other personnel, transportation and disposal equipment, and laboratory facilities and testing capacity.

To ensure that a U.S. response to an FMD outbreak is properly coordinated and adequately controlled, USDA has established an Emergency Management Operations Center at its Riverdale, Maryland, location. In the event of an outbreak, USDA will activate this center to coordinate day-to-day activities during an FMD response and notify U.S. trading partners of the status of the outbreak. According to USDA's draft FMD response plan, APHIS will set up the Joint Information Center—collocated with the Emergency Management Operations Center—to serve as the primary source of public information about the response and will coordinate with other federal and state information centers.

In addition, as the U.K. outbreak illustrated, responding to an FMD outbreak requires extensive personnel resources. These include persons who can provide (1) specialized animal disease support for testing and diagnosis, epidemiology, vaccination, slaughter, and carcass disposal; (2) biohazard response support for controlling animals' movement and decontaminating infected and exposed premises, equipment, and personnel; and (3) general logistics support for sheltering and feeding responders; the transportation, movement, and positioning of equipment and supplies; and general law enforcement. During the 2001 outbreak, the U.K. government had to request specialized animal disease support from several countries, including the United States, Canada, Australia, and New Zealand; hire thousands of private contractors to provide slaughter and decontamination support; and use military personnel to provide general logistical support. According to a U.K. government working paper issued in March 2002, during the peak of the outbreak, more than 7,000 civil servants, 2,000 veterinarians, and 2,000 armed forces personnel were involved in the response—making it a bigger and more complex logistical exercise than the United Kingdom's involvement in the Gulf War.

A recent test exercise in Iowa indicates that the personnel requirements to respond to an FMD outbreak in the United States would also be enormous—approaching 50,000 people to support a response. More specifically, according to APHIS estimates, the United States would be at least 1,200 veterinarians short of the required 2,000 to 3,000 specially trained veterinarians needed to respond to an animal health emergency. APHIS officials told us that while state and private veterinarians could help

make up some of this difference, without appropriate training, their help would be of limited use.

To address the personnel challenges posed by an FMD outbreak, USDA has undertaken several efforts. By partnering with FEMA and other emergency management organizations, USDA will be able to leverage these agencies' resources to help provide many of the general logistical support activities. Similarly, USDA has established a memorandum of understanding with the Department of Defense to provide military personnel and equipment to support a response effort. In addition, APHIS has implemented an Emergency Veterinarian Officer Program to increase the number of veterinarians available to assist in an animal health emergency. The program trains federal, state, and private veterinarians to handle emergency situations. As of December 2001, APHIS had trained 276 emergency veterinarian officers, 145 of whom participated in responding to the U.K. outbreak. Moreover, USDA has trained 520 veterinarians across the country as foreign animal disease diagnosticians, and they may be called upon to provide specialized animal health support in the event of an outbreak. Finally, according to APHIS officials, USDA has informal arrangements with the United Kingdom and other countries to provide the United States with veterinary support. More formally, Australia, Canada, New Zealand, the United States, and the United Kingdom are currently drafting a memorandum of understanding that would allow the five countries to share veterinary resources in the event of an animal health emergency.

In commenting on a draft of this report, USDA also indicated that it has created a National Animal Health Reserve Corps, composed of private veterinarians from around the country who would be willing to assist APHIS veterinarians in field and laboratory operations during a foreign animal disease situation. According to USDA, to date, more than 275 private veterinarians have signed on to this corps and the department is continuing its efforts to recruit more members. This corps will supplement the personnel drawn from states, and other federal agencies and organizations.

A response infrastructure also requires a diagnostic laboratory system that is capable of handling the volume of testing and analysis necessary in the event of an outbreak. For example, from February through December 2001, the United Kingdom's Pirbright Laboratory, that country's primary reference laboratory, tested 15,000 samples for the presence of the FMD virus and performed 1 million monitoring tests to ensure that the disease

had been eradicated. Nationwide, a total of 2.75 million samples were tested as part of the response to the outbreak. Despite this level of testing, according to U.S. veterinarians returning from the United Kingdom, the United Kingdom had unmet needs for laboratory assistance.

In the United States, USDA's Plum Island facility—the primary laboratory in the United States that is authorized to test suspected FMD samples—would be quickly overwhelmed in the event of an FMD outbreak, according to many federal and state officials with whom we spoke. Recognizing this potential problem, the National Association of State Departments of Agriculture recently recommended that the United States develop a national strategy for animal health diagnostic laboratory services that would include USDA's Plum Island facility and its National Veterinary Services Laboratories at Ames, Iowa, as well as state and university laboratories. Currently, state diagnostic laboratories have no formal role in a foreign animal disease response. In addition, the Director of the Plum Island facility stated that the nation needs to look beyond Plum Island for laboratory support in the event of a large-scale FMD outbreak. He suggested that off-site noncentralized testing, using noninfectious material (tests that do not use the live virus), should be considered with backup testing support provided by Plum Island. APHIS officials told us that while the idea of a regional laboratory structure has merit, several issues would have to be addressed before such a structure could be implemented. For example, laboratory personnel would have to undergo continuous training and certification, and facilities would have to be renovated and maintained to provide state of the art capabilities. This would require a significant commitment of resources.

In commenting on a draft of this report, USDA stated that as part of its efforts to strengthen homeland security preparedness, it is providing state and university cooperators with $20.6 million to establish a network of diagnostic laboratories dispersed strategically throughout the country. This network will permit the rapid and accurate diagnosis of animal disease threats. Moreover, USDA stated that earlier this year it allocated $177 million to make improvements at key locations, including its diagnostic and research facilities in Ames, Iowa, and Plum Island, and that $15.3 million was allocated to USDA's Agricultural Research Service to improve rapid detection technology for FMD as well as other animal diseases.

Animal Identification, Disposal, and Indemnification Policies

The effectiveness of a U.S. response to an FMD outbreak will require an animal identification and tracking system to allow responders to identify, control, and slaughter infected and exposed animals as well as clear animal disposal and indemnification policies. The 2002 farm bill,[21] addresses animal disposal and indemnification issues by providing the Secretary of Agriculture with broad authority to hold, seize, treat, or destroy any animal, as well as to limit interstate livestock movement as part of USDA's efforts to prevent the spread of any livestock disease or pest. The Secretary may also take measures to detect, control, or eradicate any pest or disease of livestock, as needed. In addition, the farm bill requires the Secretary to compensate owners on the basis of the fair market value of destroyed animals and related materials. USDA is currently trying to develop specific guidance on how these authorities will be implemented.

Many epidemiologists believe that in the event of an FMD outbreak, successfully tracing affected animal movements within 24 hours is essential if the response is to be effective. However, the United States generally does not require animal identification, nor does it have a system for tracking animal movements. As a result, according to a USDA official, in the event of an FMD outbreak, USDA would likely have to rely on sales records to track animal movements, which could take days, or weeks, depending on the accuracy of record-keeping and producer/seller cooperation.

The longer it takes to identify animals and track their movements from premise to premise, the more difficult it becomes to contain the outbreak. USDA officials told us that, depending on where the outbreak is first identified, it may be relatively easy or extremely difficult to trace. For example, if only one farm were infected and animals had not recently been moved on or off the premises, no tracing of live animals would be necessary. However, if the outbreak first appeared in a major market or feedlot where hundreds of animals move in and out on almost a daily basis, tracing would be very difficult and time-consuming.

Recognizing the importance of an animal identification and tracking system, USDA began planning such a system 3 years ago, according to the Director of the National Animal Identification initiative. However, the

[21] The President signed the Farm Security and Rural Investment Act of 2002 (the 2002 farm bill) on May 13, 2002.

industry resisted the concept because of the costs involved and the potential for the unauthorized disclosure of proprietary information. The Director noted that the events of September 11, 2001, as well as technological advances appear to be reducing the level of industry opposition to a national animal identification system. For example, this official told us that the National Cattlemen's Beef Association recently indicated some support for such a system. However, the following issues will need to be resolved before a national system can be developed and implemented:

- The responsibility for funding the system.
- The type of technology that should be employed—strictly visual, electronic, or some combination.
- The amount of information that should be included on each animal's identification tag or electronic-tracking device.
- The persons able to access this information.
- The information that should be shared with other federal departments and agencies.
- At what point on the farm-to-table continuum should identification end?

In addition, during an FMD outbreak in the United States, the disposal of carcasses could become a significant challenge because of the potential number of animals that may have to be slaughtered. For example, during the U.K. outbreak, over 4 million animals, primarily sheep, were slaughtered for controlling the disease. According to USDA estimates, if the United States had an outbreak of comparable magnitude (affecting about 8 percent of the livestock population), over 13 million animals would be affected, and most of them would be cattle and hogs. Generally, disposal can occur by burial, incineration, or rendering. In the United States, according to USDA's draft FMD response plan, burial would be the preferred method of disposal when conditions make it practical. The plan states that burial is the fastest, easiest, and most economical method of disposal. When burial is not feasible, the plan recommends incineration as the alternative means of disposal even though USDA recognizes that incineration is both difficult and expensive. According to a USDA veterinarian who helped during the U.K. outbreak, a 200-meter funeral pyre was used to incinerate 400 cows or 1,200 sheep or 1,600 pigs. Such a pyre

required 1,000 railway ties, 8 tons of kindling, 400 wooden pallets, 4 tons of straw, 200 tons of coal, and 1,000 liters of diesel fuel. In addition, heavy equipment, such as bulldozers and a team of about 18 to 20 people, was needed to construct the pyre. Figures 5 and 6 show burial pits and incineration pyres used in the United Kingdom to dispose of slaughtered animals.

Figure 5: Disposal of Animal Carcasses by Burial in the United Kingdom

Source: USDA.

Figure 6: Disposal of Animal Carcasses by Incineration in the United Kingdom

Source: USDA.

According to the federal and state officials we spoke with, each of these disposal methods presents significant implementation challenges that have not yet been fully considered. For example, *burial* poses such challenges as the potential to contaminate groundwater, the need to identify burial sites and obtain appropriate federal and state permits and clearances in advance, and the potential to spread the disease if animals have to be transported to an off-farm burial site. For *incineration*, the incineration site has to be accessible to large equipment, and yet has to be sufficiently away from public view to minimize negative public reaction to the sight of large burning pyres. In addition, incineration could not only affect air quality but also may be ineffective because if not constructed properly, the pyres may not generate sufficient temperatures to completely incinerate the carcasses. According to a USDA veterinarian, in the United Kingdom the pyres generally burned for about 9 to 10 days before all of the carcasses were incinerated. Similarly, *rendering* poses challenges because transporting carcasses to rendering plants increases the risk of spreading

the disease, and additional cleaning and disinfecting procedures would be needed at the rendering facility. Some U.S. veterinarians returning from the United Kingdom told us that during the outbreak, the United Kingdom faced many of these disposal challenges and they were concerned that the United States might not have devoted enough attention to deciding how it would address these or similar disposal issues. According to APHIS officials, USDA is currently creating digital maps of the whole country to help identify appropriate burial and incineration locations. In addition, USDA is trying to determine alternative uses of carcasses, such as safely converting the meat into food, and using vaccinations to limit the number of animals slaughtered and thus requiring disposal.

Finally, clear indemnification and compensation criteria are needed to ensure producer cooperation to slaughter and dispose of infected and exposed livestock during an outbreak. During the U.K. outbreak, the government agency responsible for responding to the outbreak experienced delays in slaughtering animals because of farmers' resistance and legal challenges. According to state and livestock association officials, indemnification would be a significant issue—one that could hamper a rapid response in the United States.

USDA published a proposed rule on May 1, 2002, amending the indemnity provisions for its FMD-related regulations. This proposed rule clarifies how USDA will determine the value of animals and materials affected by an FMD outbreak and how indemnity payments will be made to claimants. USDA developed this proposed rule because it was concerned that potential delays to an FMD eradication program in the United States might occur because of producers' perceptions that they might not be adequately compensated for the fair market value of destroyed animals, products, and materials as well as cleaning and disinfecting costs. Under the proposed rule, the federal government would pay 100 percent of the costs for the purchase, destruction, and disposition of animals if they become infected with FMD, as well as for materials contaminated with FMD and the cleaning and disinfection of affected premises, according to USDA.

In commenting on a draft of this report, USDA agreed that animal identification, carcass disposal, and indemnity are all absolutely vital areas that have to be addressed before any major outbreak of disease. In this regard, USDA stated that it is working closely with the agricultural industries to provide forums for a national dialogue on the issue of a national identification plan for American livestock. The ultimate objective is to establish a national identification plan that provides the essential

elements to improve emergency response and meet future needs. USDA further stated that it is investing in other options for disposing of carcasses on a large scale. Finally, USDA stated that it has extended the comment period from July 1 to July 31, 2002, for its proposed regulations that address how decisions regarding indemnity payments will be made in the event of an FMD outbreak.

Conclusions

If an outbreak of FMD in the United States rages out of control, it could ultimately cost tens of billions of dollars and the destruction of millions of animals. To avoid such catastrophic consequences, the disease must be stamped out quickly. Although the federal government and state governments have made significant progress in developing and testing emergency response plans for an animal disease outbreak, such as FMD, significant issues remain unresolved. These unresolved issues could present major impediments to an effective and timely response if not addressed before an outbreak occurs. While USDA currently has several ongoing efforts to resolve many of these issues, the department has not established specific time frames for the completion of these efforts. We believe it is critical that adequate management attention and resources be made available to ensure that these issues are resolved expeditiously.

Recommendation for Executive Action

To ensure that the United States is well positioned to respond effectively to an animal disease outbreak such as FMD, we recommend that the Secretary of Agriculture direct the Administrator of APHIS to develop a plan, which should include interim milestones and completion dates, for addressing the various unresolved issues that could challenge an effective U.S. response.

Countries Considered FMD-Free by the United States

As of April 29, 2002, USDA considered the following countries/areas free of foot and mouth disease (FMD) and rinderpest (cattle plague):

Australia
Austria[22]
Bahama Islands[22]
Barbados
Belgium[22]
Belize (British Honduras)
Bermuda
Canada
Channel Islands[22]
Chile[22]
Costa Rica
Czech Republic[22]
Denmark[22]
Dominican Republic
El Salvador
Fiji
Finland[22]
France[22]
Germany[22]
Greenland
Guatemala
Haiti
Honduras
Hungary[22]
Iceland
Italy[22]
Jamaica
Japan[22]
Luxemborg[22]
Mexico
Netherlands[22]
New Caledonia[22]
New Zealand
Nicaragua
Northern Ireland[22]
Norway[22]
Panama
Panama Canal Zone
Papua New Guinea[22]

Poland[22]
Portugal[22]
Republic of Ireland[22]
Spain[22]
Sweden[22]
Switzerland[22]
Territory of St. Pierre and Miquelon
Tobago
Trinidad
Trust Territories of the Pacific Islands

[22] These countries are included in special categories for FMD and rinderpest because even though they have been determined to be free of these diseases, one or more of the following conditions exist: (1) they supplement their national meat supply through the importation of fresh, chilled, or frozen meat of ruminants or swine from countries/areas that are not designated as free of rinderpest or FMD; (2) they have a common land border with countries/areas that are not designated as free of rinderpest or FMD; or (3) they import ruminants or swine from countries/areas that are not designated as free of rinderpest or FMD under conditions less restrictive than would be acceptable for importation into the United States.

Measures for Preventing the Introduction of FMD into Canada

This appendix provides summary information on Canada's preventive measures to ensure that FMD does not enter the country via five key pathways included in our review: (1) the importation of live animals; (2) the importation of animal products; (3) the handling and disposal of garbage from international carriers, such as airplanes and ships; (4) international passengers; and (5) packages sent through international mail.

Background

The creation of the Canadian Food Inspection Agency (CFIA), in April 1997, consolidated the delivery of all federal food, animal, and plant health inspection programs, which were previously provided by four federal agencies, into a single food safety agency for Canada. CFIA delivers food, plant, and animal inspection programs in 18 regions across Canada. CFIA has 180 field offices, including border ports of entry, and 408 offices in nongovernment establishments, such as processing facilities. CFIA also has 13 biosecurity level-III laboratories, including 1 that handles FMD and large animals.[23] These laboratories provide scientific advice, develop new technologies, provide testing services, and conduct research.

The Health of Animals Act authorizes CFIA to prevent the introduction of diseases that may harm animals or humans. CFIA controls the importation of animals and animal products from foreign countries to reduce the risk of introducing serious animal diseases, such as FMD. The last outbreak of FMD in Canada was in 1952. CFIA has 14 inspection programs for animals, food, and plants produced in Canada and commodities and live animals imported into Canada. One of these programs is the Animal Health and Production program, which is applied at Canadian ports of entry. This program covers the issuing of import permits, quarantining of live animal imports, negotiating export health requirements with other nations' government, and establishing and ensuring compliance with Canadian import health standards. In addition, the program is responsible for implementing domestic disease control programs, foreign animal disease preparedness, and emergency response.

[23] Canada's biosecurity level-IV laboratory conducts tests on animals infected with dangerous zoonotic agents.

Controls for Live Animal Imports

Canada allows live animal imports only from countries that are FMD-free and have been preapproved by CFIA. Generally, live animals imported into Canada must be admitted through approved inspection ports of entry. For example, live animals imported into Canada by air from countries other than the United States are required to enter at airports, such as Vancouver, Halifax, Montreal, Toronto, and Calgary. CFIA generally requires that an import permit application be filed in advance of the importation of live animals from countries other than the United States. The import permit contains information on the (1) importer, who must be a Canadian resident; (2) exporter; (3) destination of the animal(s); (4) producer; (5) port of entry; (6) preapproved quarantine site, if the animal is to be quarantined; and (7) description of animals to be imported including the number, species, breed, age, color, name, individual identification, and registration numbers or numbers from the official seal on the transporting vehicle. If quarantine periods are required for the animals, CFIA preapproves the quarantine premises.

The inspection of shipments of live animals at Canadian ports of entry includes a document review and verification by Canadian Customs and CFIA, and in some cases, CFIA inspectors may off-load the animals for inspection, depending on their proposed use. As part of the physical inspection, inspectors may verify the animal identification numbers. CFIA usually requires the importer to have a license to move the imported animals to their final destination. Additionally, once animals have entered Canada, CFIA can impose post-import requirements, which may include the possible quarantine and testing or additional treatment of the animals.

All live animals, regardless of their country of origin, must meet these general import requirements. However, once these requirements are met, Canada has separate procedures for live animal imports from the United States and those from other countries.

Live Animals Imported from the United States

Generally, live animals entering Canada from the United States must conform to entry requirements that are less stringent than those for animals from other countries. Depending on an animal's state of origin and the intended use of the animal, tests for some foreign animal diseases that Canada does not have or has already eradicated, such as brucellosis, tuberculosis, anaplasmosis, and blue tongue, may be required. Some states have been preapproved by CFIA to export certain kinds of animals on the basis of the state's disease status. For example, as of April 2002, the

following seven U.S. states were qualified to export restricted feeder cattle to Canada: Hawaii, Idaho, Montana, New York, North Dakota, South Dakota, and Washington.

CFIA generally does not require an import permit for most animals imported from the United States. For example, an import permit is not required for U.S. imports of breeding cattle and bob calves for fattening. These animals are required only to have an Official Zoosanitary Export Certificate signed by an official USDA veterinarian. The certificate contains information on the (1) name and address of the consignor; (2) consignee; (3) individual identification of the animals to be exported; (4) animal's origin; (5) results of the veterinary examination of the animals; and (6) animal's residency in the United States, which must be for a minimum of 60 days. Additionally, while some animals, such as bob calves and restricted feeder cattle, are not required to be tested for diseases that Canada does not have such as, tuberculosis, brucellosis, blue tongue, and anaplasmosis, others, such as breeding cattle, must be tested.

Similarly, a CFIA import permit and individual identification are not required for animals imported from the United States for direct slaughter. U.S. livestock to be exported to Canada for direct slaughter are placed in sealed trucks or containers and transported directly to the Canadian slaughter facility. CFIA requires all live animals imported for direct slaughter from the United States to be slaughtered within 4 days of importation.

CFIA encourages U.S. exporters to fax inspection certificates ahead of time to ease the border review process.[24] Once a truckload of U.S. livestock arrives at the border, Canadian Customs performs a preclearance document review for CFIA and then sends the vehicle to the CFIA inspection area, where inspectors review the documentation to ensure that the information provided is correct. When required, CFIA unloads cattle for individual inspection. CFIA can perform inspections on the trailers if the load is small and it is safe to do so. U.S. livestock imported for direct slaughter requires only a visual inspection; however, imported breeding cattle are checked for health status, and their ear tags and tattoos are verified against the documentation provided. Every transporter is required

[24]Live animals in transit by air are off-loaded only to change planes and, if destined for the United States, are placed in sealed trucks before leaving Canada. CFIA does not allow animals to transit Canada that would normally not be allowed into the country.

to clean and disinfect the trucks, railway cars, aircraft, or shipping vessels that have been used to transport livestock immediately after they have been unloaded.

A U.S. origin health certificate issued by a USDA-authorized veterinarian must accompany swine imports from the United States. The certificate contains the name and address of both the consignor and consignee and complete identification of the animals to be exported, including certification that the (1) United States is free of hog cholera; (2) herd of origin has been free of brucellosis and pseudo rabies for the past 12 months, and that the animals exported have been tested for these two diseases; (3) animals have been isolated from other animals for at least 30 days prior to export; (4) animals have been transported in cleaned and disinfected vehicles; and (5) animals have not been fed any garbage at any time. Additionally, all swine imported from the United States must be quarantined in Canada for at least 30 days in a CFIA-approved quarantine station. Swine shipments imported directly for slaughter are required to have an import permit.

CFIA requires shipments of bovine embryos or semen from the United States to be accompanied by a U.S. origin health certificate and an import permit. The certificate contains information such as the (1) registered name and identification number of the parents, (2) species and breed, (3) name and address of the consignor, (4) address of the collection premises, (5) numbers from the official seal on the transporting vehicle, and (6) name and address of the consignee.

Live Animals Imported from Other Countries

To prevent the introduction of disease and control the importation of animals into Canada, the Minister of Agriculture designates countries or parts of countries free from specific diseases. Canada designates countries to be FMD-free after reviewing the (1) prevalence of disease in the country or part of a country, (2) time since the last outbreak of the disease, (3) surveillance programs in effect, (4) measures taken to prevent the introduction and spread of the disease, (5) natural barriers to the spread of the disease, and (6) the zoo-sanitary infrastructure. Importing countries must also be free of other Office of International des Epizooties (OIE) List A diseases in addition to FMD, such as rinderpest and classical swine fever. Importing countries that have OIE List B diseases, such as bovine spongiform encephalopathy, also known as mad cow disease; tuberculosis; and brucellosis must provide additional documentation proving that the herds being exported to Canada are free of these diseases. At the time of

our review, in addition to the United States, CFIA accepted live cattle imports only from Australia and New Zealand, and goats were permitted only from the United States.

If CFIA recognizes a country as free of FMD and other diseases of concern, the importer must apply for an import permit for live animals. CFIA generally requires that all live animals imported into the country have a unique individual identification. However, there are exceptions for animals imported for direct slaughter. Additionally, all cattle must be tested for tuberculosis, brucellosis, blue tongue, and anaplasmosis, unless the exporting country is considered free of these diseases and certifies that it is free of other diseases of concern.

CFIA has established additional requirements for importing horses into Canada from FMD-affected countries. Under CFIA supervision, horses from FMD-affected countries must be quarantined and washed with a disinfectant. In addition, their hooves and all equipment, such as saddles and tack, and all transportation vehicles must be cleaned and disinfected. Bedding and manure must be placed in bags and incinerated.

Controls for Imported Animal Products

Canada allows only imports of FMD-susceptible animal products, such as fresh meat, from countries that have been preapproved by CFIA. Some animal products may be imported from FMD-affected countries if they meet certain requirements. CFIA and the Canada Customs and Revenue Agency (CCRA) combine investigation services at ports of entry to ensure that all Canadian import requirements are met prior to releasing the products into commerce. Animal product imports from the United States are generally required only to present proof of the country of origin at the port of entry.

Countries or parts of countries officially considered FMD-free by CFIA can generally export many types of animal products to Canada. As with live animal imports, to designate a country as FMD-free, CFIA reviews information about the (1) prevalence of the disease in a country; (2) time since the last FMD outbreak; (3) surveillance programs in effect; (4) measures taken to prevent the introduction and spread of the disease; (5) natural barriers to the spread of the disease; and (6) zoo-sanitary infrastructure.

For all countries, Canada also has a country-by-country meat inspection and approval system, which includes a review of the following (1) the

country's overall system of meat inspection, (2) the establishments operating within that system, and (3) the approval of individual meat products prepared in these establishments. Moreover, CFIA reviews relevant legislation and related technical information, including the country's residue-monitoring program. If the requesting country has legislation equivalent to Canada's, a visit is made to the country to study the actual implementation of the legislation in establishments. On the basis of satisfactory findings during the visit, establishments wishing to export meat products to Canada are approved. CFIA maintains a list of the countries and establishments that have been approved to export certain types of meat products into Canada. For those countries where the meat inspection system as a whole has not been approved, importation may be limited to specific meat products.

Importations from countries that are not considered free from FMD are normally limited, to include the following: (1) commercially sterile canned cooked meat products; (2) pasteurized, canned, cured, and boneless meat products; and (3) cooked, frozen, tubed and boneless beef from specified establishments in certain countries. Milk products are allowed entry if they have been treated properly and are certified accordingly. Establishments approved for meat and meat product exports to Canada are periodically reviewed.

All commercial shipments of imported meat products are subject to monitoring and inspection at the Canadian port of entry. Once a shipment is identified as containing meat products, it must be held until the CFIA inspector reviews the information, such as the Official Meat Inspection Certificate signed by the official veterinarian of the exporting country. The Official Meat Inspection Certificate contains information on the (1) name and address of the exporter and importer; (2) certificate number, country code, and exporting establishment number; (3) establishment number and name, and country where the animals were slaughtered; (4) name of the carrier; (5) port of loading and landing; (6) departure date; (7) number and description of the meat products; and (8) numbers from the official seal on the container and the container numbers. Depending on the exporting country, additional certifications may be required. Some animal product shipments are exempt from CFIA review because they are in transit through Canada to another country. CFIA does not review these shipments, provided they remain under a Customs bond and originate in a country and are of a type that would otherwise be eligible for entry into Canada. Animal product imports from the United States are generally required only to present proof of country of origin. However, some U.S.

products, such as meat and bone meal are also required to have an import permit.

CFIA's sampling and inspection procedures for all meat packed in boxes require the shipment to be totally unloaded and staged so that all containers are visible. Inspectors visually scan the shipment to identify any evidence of damaged or stained cartons and to verify outer labels. For shipments that include suspected or unsatisfactory containers, a full inspection of affected containers is conducted. For canned meat products, random inspections are carried out by the inspector on a minimum of 40 cases, which are to be representative of the inspection lot and not include more than 5 containers from each of the cases. When there are fewer than 40 cases in an inspection lot, inspectors select the appropriate number of containers out of each case to make up the required sample. For inspection lots having fewer than 200 containers, the entire inspection lot must be examined, and the total number of containers must be recorded on the report form.

When a shipment is refused entry into Canada, the inspector must immediately hold the animal products and notify the area office by telephone. The inspector or an officer from the area office must officially notify the importer that the imported shipment is totally or partially refused and that the importer has 90 days to destroy it or remove it from Canada or it will be destroyed under direct supervision of a CFIA inspector.

Controls for International Garbage

Garbage from international airlines and ships must be disposed of and treated under the supervision of a CFIA inspector. Garbage from carriers of U.S. origin, however, is disposed of in landfills, similar to those for Canadian garbage. CFIA requires international garbage to be disposed of by incineration, heat treatment at 100° Celsius for 30 minutes, or burial at a CFIA-approved site. In addition, the transportation routes for international garbage are approved in advance along with alternative routes in case of an emergency. Transporters are responsible for maintaining their trucks in good condition and checking to ensure that there are no possible leaks.

Regarding foreign ships, CFIA monitors and inspects them to ensure that garbage on board the vehicle is stored and contained properly. Garbage can be removed only from ships at approved ports that have adequate incineration or burial sites. The ships' destinations are also recorded at the first Canadian port of entry, and CFIA inspectors may seal galleys to ensure that foreign foodstuffs do not find their way onto Canadian land. At

subsequent Canadian ports, CFIA inspectors check the galley seals. Seals may be broken under CFIA presence but must be resealed prior to departure if the ship is going to additional Canadian ports. All foodstuffs and pet animals are to remain on the ship and are allowed off only with the written permission of CFIA. If ships do not comply with these requirements, CFIA can fine and bar the vessel from entering Canadian waters.

Controls for International Passengers

CFIA inspectors work with CCRA officers and with specially trained detector dogs in all major airports to prevent the entry of prohibited plants and animal products. International passengers are required to declare all animals and animal products; the failure to declare certain animal products can result in fines. International passengers, except those arriving from the United States, are not allowed to bring meat and meat products into Canada but may bring up to 20 kilograms of cheese. Passengers not declaring prohibited items are subject to monetary penalties of up to Can. $400. At the main Canadian international airports, CFIA has approximately nine dogs trained to sniff baggage accompanying international passengers before they proceed through the federal inspection areas. The detector dog program is part of CFIA's front line of defense against pests and diseases. The dogs are trained to detect items such as prohibited fruits, plants, and meat. When the dogs are not available, CFIA inspectors walk through the baggage claim area looking for anything that might be considered suspicious.

CFIA made a number of changes to the international passenger controls as a result of the FMD outbreak in the United Kingdom and other parts of Europe. CFIA expanded its efforts to (1) use detector dogs at the airports, (2) x-ray passengers' baggage, and (3) mount a public awareness campaign. As a part of the public awareness campaign, large signs were placed around the airport terminals informing the public about FMD and precautions that should be taken to prevent its introduction into Canada. Brochures were also printed conveying similar information and handed to international passengers arriving from FMD-infected countries. In addition, CCRA officials asked specific questions about whether the passengers had been around farm animals or visited farms or if they planned to visit a farm in Canada—even if the relevant question was not marked on the declaration card. This additional questioning ceased after the United Kingdom was declared FMD-free. Moreover, all international passengers entering Canada were required to step on a disinfectant mat. Passengers who indicated that they might present an FMD risk were asked additional

questions about their activities and—as deemed necessary—their shoes were sent out for cleaning. For example, when soccer teams came to Canada from countries that had FMD, their shoes were sent for cleaning at the teams' expense. CFIA officials told us that even though the European outbreak is over, FMD still exists in many parts of the world, and they are planning to revamp their public awareness campaign and broaden the messages to cover all foreign pests and diseases.

Controls for International Mail

CCRA officers inspect all international packages arriving into Canada by mail. Although CCRA officers are the only officials authorized to open mail, when inspectors find packages that need further inspection by agencies, such as CFIA or drug enforcement, they open it and affix a seal with a code indicating which agency should perform a further inspection. Generally, each package is then x-rayed. Problem importers/exporters are identified through a computer system, and these packages are given additional scrutiny.

Recently, Canada passed new legislation making the recipient responsible for items sent through the mail, rather than the sender. As a result, recipients in Canada may be held responsible if they receive inappropriate items through the mail. For example, if personal shipments of prohibited agricultural products are sent through the mail, the recipient can be subject to monetary penalties of up to Can. $400. For commercial shipments, however, penalties for prohibited agricultural products can currently be as much as Can. $6,000. In addition, criminal penalties can also be imposed, depending on the nature of the offense.

Measures for Preventing the Introduction of FMD into Mexico

This appendix provides summary information on the preventive measures that Mexico uses to ensure that FMD does not enter the country via five key pathways included in our review: (1) the importation of live animals; (2) the importation of animal products; (3) the handling and disposal of garbage from international carriers, such as airplanes and ships; (4) international passengers; and (5) packages sent through international mail.

Background

The Mexican American Commission for the Eradication of Foot and Mouth Disease, formed in 1947, combined U.S. and Mexican efforts to eradicate FMD from Mexico.[25] The commission built Mexico's animal health infrastructure and successfully eradicated FMD from Mexico in 1954. Currently, the commission is responsible for performing a number of activities, including (1) foreign animal disease surveillance, (2) responding to reports of suspicious cases, (3) developing training on emergency plans and programs, (4) promoting public information programs, and (5) preparing and updating Mexico's emergency foreign animal disease response plans.

Mexico's Secretaria de Agricultura, Ganaderia, Desarrollo Rural, Pesca y Alimentacion (SAGARPA) covers agriculture, rural development, fish, and food issues. SAGARPA is responsible for implementing, among other things, (1) the animal health laws and regulations, (2) the zoo-sanitary rules used by inspectors at border inspections at the port of entry, and (3) the animal health measures used in response to a foreign animal disease emergency. SAGARPA has 509 inspection offices, 105 of which are at international ports of entry, such as border crossings, airports, and seaports. For 2001, SAGARPA's budget for borders, ports, and airports was about Mex. $11 million (approximately U.S. $1.1 million). All imports of live animals and agricultural products must be processed through one of SAGARPA's offices. In addition, SAGARPA officials enforce compliance with Mexico's official zoo-sanitary rules (1) at Customs offices, (2) at quarantine stations, (3) at inspection points, and (4) in other countries where treaties and accords have been approved.

SAGARPA divides Mexico into eight regions and assigns a veterinarian coordinator to each region for animal disease surveillance and for

[25] The commission is currently called the Mexico-United States Commission for the Prevention of Foot-and-Mouth and other Exotic Animal Diseases.

activating emergency operations in the event of a foreign animal disease outbreak. Additionally, to support the coordinators, Mexico established 29 animal health emergency state groups. Active throughout Mexico, these groups include over 900 government and private veterinarians trained in identifying and responding to foreign animal diseases, including FMD. Mexico also has a diagnostic biosecurity level-III laboratory capable of testing for foreign animal diseases.[26] In 2001, Mexico reported performing 220 investigations into suspicious cases that might have been FMD. All investigations resulted in negative results for the FMD virus.

Controls for Live Animal Imports

SAGARPA allows live animal imports only from preapproved countries. Live animal imports into Mexico are prohibited from countries that have the FMD virus. SAGARPA's general requirements for all live animal imports include advance notification to SAGARPA's official veterinarians at the ports of entry. The amount of time required for official advance notification depends on the animals' country of origin. Before live animals can be sent to Mexico, SAGARPA sends official veterinarians to the exporting country to ensure that the live animals to be exported are free of disease.

Once a live animal shipment arrives at the Mexican port of entry, official veterinarians review all the documents and physically inspect the animals. Importers are required to supply (1) a Mexican sanitary import permit; (2) a country of origin health certificate; (3) a dip certificate, if applicable; (4) a registration certificate, if applicable; and (5) a commercial license. The sanitary import permit certifies that the exporting country has met Mexican importation requirements. The health certificate contains information on the

- name and address of the importer,
- place of origin and destination of the animals,
- animal health production standards of the exporting country,

[26] A biosecurity level-III laboratory is one that maintains a high security level and employs extreme control measures in the handling of samples. Such laboratories install special control measures to reduce the risk of pathogens escaping into the surrounding environment by using air filters and requiring all personnel to take disinfectant showers prior to leaving the facility.

- place where the certificate was issued, and
- time period for which the certificate is effective.

All animals imported into Mexico must have individual identification marks or numbers unless they are imported for immediate slaughter. If animals are imported for direct slaughter, the only information that needs to be recorded is the number of animals and their origin. Additionally, all live animals must walk over a disinfectant mat, and depending on how tame the animals are, the hooves are scraped of dirt, and the entire animal is hosed down with disinfectant. Additionally, the trucks and containers that transported the animals are disinfected, and any bedding or waste from the animals is incinerated at the port of entry.

Generally, all live animals, regardless of their country of origin, must meet these import requirements. However once these requirements are met, Mexico has separate procedures for live animals imported from the United States and those imported from other countries.

Live Animal Imports from the United States

Generally, all live animals entering Mexico from the United States are allowed to conform to less-stringent entry requirements than animals imported from other countries. For example, animals from the United States frequently pass through Mexican land border ports on the basis of a U.S. veterinary inspection. U.S. animals that arrive in Mexico via air or sea are also allowed to enter with just a sanitary import permit when facilities for inspection are available at the port of entry within Mexico.

Before crossing the border, U.S. animals must remain on the U.S. side of the border at an authorized facility for a minimum of 24 hours. When Mexican veterinarians perform entry inspections in lieu of their U.S. counterparts, they may (1) require additional quarantine for the animals, (2) perform clinical observations and inspect the animals, (3) require animals to be disinfected and/or immunized, or (4) apply other animal health safety measures.

Live Animal Imports from Other Countries

In addition to the general requirements listed above, all live animals entering Mexico from preapproved countries must meet other import requirements. Importers of live animals from countries other than the United States are required to notify SAGARPA in advance of a shipment. As a part of the live animal importation process, SAGARPA sends two

official veterinarians to the exporting country to inspect the animals before they are sent to Mexico. These Mexican veterinarians are responsible for developing an animal health report for the animals being exported, which will document information on the health of the animals from the time the veterinarians arrive in the exporting country until the shipment of animals arrives in Mexico. As a result, before the animals are loaded onto the ship for transport to Mexico, the Mexican veterinarians will examine the paperwork and inspect each animal. One of the veterinarians will then accompany the shipment and monitor the animals for clinical signs of disease while in transit to Mexico. According to Mexican officials, because the majority of live animal imports into Mexico come from Australia, Guatemala, New Zealand, Nicaragua, and Panama, the time in transit is usually considered an adequate quarantine period for the animals. For example, the voyage from New Zealand or Australia typically lasts 28 days and serves as an adequate quarantine period for live animals. Because live animal imports from countries such as Panama or Guatemala are also transported to Mexico via ship and enter the country at maritime ports, they too are subject to the same procedures. If the veterinarian on board the ship notices any suspicious animal disease signs during the trip to Mexico, the veterinarian will notify officials in Mexico, and the shipment can be rejected en route and returned to the exporting country.

Controls for Imported Animal Products

SAGARPA and the Mexican Customs Service combine inspection services at Mexican ports of entry to ensure that all imported products comply with all Mexican import requirements before they are released into commerce. Animal products can be imported into Mexico only from countries that SAGAPRA has preapproved, using OIE criteria for determining which countries are FMD-free. SAGARPA may add additional requirements or restrictions to the OIE criteria if it deems them necessary. Mexico does allow some animal product imports from countries that have FMD, as long as SAGARPA has approved the animal-product-processing plants and the products are shipped with the required health and sanitary certificates. Some products, such as milk and dairy products, are allowed into Mexico only if they have been properly heat-treated or subjected to maturation processes that destroy the FMD virus. Other products, such as machinery, vehicles, and bullfighting equipment, must undergo disinfection procedures, determined by SAGARPA, before being allowed into the country. Products denied entry into Mexico must be immediately reexported or destroyed.

All agricultural cargo must be processed through one of SAGARPA's inspection offices located at various borders, airports, and seaports. Some imported animal products are allowed entry only at certain ports of entry that have the proper facilities to warehouse them. SAGARPA officials review the manifest of all international carriers arriving in Mexico to ensure that no food items inadvertently enter the country without inspection.

The broker initiates the importation and inspection process for animal products at the port of entry by presenting the required paperwork, including the sanitary import permit, and requesting inspection services from SAGARPA officials. The SAGARPA port veterinarian will review the paperwork as well as the health certificate accompanying the shipment. The health certificate contains information on the (1) name and address of the importer or proprietor, (2) place of origin and the specific destination of the animal products, (3) animal health production standards used by the exporting country, (4) place where the certificate was issued, and (5) time period for which the certificate is effective. If the import documents are in order and the products are from permissible countries, the container is unloaded from the vessel and transported to the official warehouse for further inspection.

SAGARPA officials inspect all containers used to ship animal products or farm machinery and equipment. Containers from countries that Mexico has deemed as high-risk for FMD must be sprayed with disinfectant on the outside. In addition to the containers they arrive in, farm machinery and other equipment from high-risk countries must be completely disinfected. Fresh, chilled, and frozen meat products are physically inspected by SAGARPA inspectors while they are stored in the refrigerated section of the Customs warehouse. The inspection consists of (1) a paperwork review, including a review of the Mexican sanitary import permit and health certificate signed by an official veterinarian of the exporting country, and (2) a visual inspection of the meat packages for the meat-processing plant's seal, lot number, and factory number to ensure that the product came from an approved plant in the country of origin. In addition, SAGARPA officials may collect product samples for laboratory analysis.[27]

[27] Mexico has a meat-product-sampling scheme, which is detailed in the country's meat inspection regulations. Normally, 15 samples are taken from a shipment of 25 tons of meat. The system is based on a judgmental sampling process; however, importers who have had problems in the past are sampled more often.

Once all the reviews and inspections are completed, SAGARPA inspectors complete the inspection report and make a final recommendation on whether the shipment should be released. Cargo cannot leave the warehouse at the port of entry without forms from SAGARPA stating that the cargo has been inspected and deemed safe to enter the country. After the main SAGARPA office issues the final certificate of importation and releases the shipment, the broker can proceed to the Mexican Customs' inspection. Mexican Customs helps SAGARPA ensure that prohibited or restricted products are not entering the country.

Controls for International Garbage

SAGARPA officials supervise the off-loading and disposal of organic waste and garbage from airplanes and ships arriving from FMD-affected countries. Generally, this garbage must be incinerated. Incinerators in two locations accept international garbage—one in Mexico City and one in Cancun. Consequently, cruise ships arriving in Mexico are allowed to dispose of garbage only in Cancun. Ships arriving at other Mexican ports must take their garbage with them.

Controls for International Passengers

In addition to the regular immigration and customs forms that all international passengers have to complete upon entry into Mexico, all passengers from FMD-affected countries must fill out a special, detailed questionnaire. This questionnaire asks passengers to help prevent the introduction of FMD by (1) declaring any animal products that they may be carrying and (2) providing information about their contact with animals in the country from which they are arriving. In addition, the form asks passengers to avoid visiting places in Mexico where they could come into contact with live animals.

At airports and marine ports of entry, international passengers from high-risk countries must walk over special mats soaked with disinfectant to disinfect their shoes. According to Mexican officials, the disinfectant mats are changed every month, and before the arrival of a high-risk flight at the airport, SAGARPA officials apply fresh disinfectant to the mat. In addition, until January 2002, the outside surface of baggage arriving from high-risk countries was sprayed with disinfectant as it was loaded onto the conveyor belt and before it entered the baggage claim area of the airport. Baggage from high-risk flights is also x-rayed and inspected for illegal products by official inspectors at the airports. All confiscated products are incinerated.

Announcements are made on the public information system at the airport in English, Spanish, and French requesting passengers to help prevent the introduction of FMD into Mexico by complying with the Mexican requirements described above. Signs in English and Spanish warning travelers about the dangers of FMD are posted throughout the airports.

Mexico also has inspection requirements for international cargo ships arriving at Mexican seaports that specifically relate to the disposal and use of food in the ship's galley that is intended for the crew. As part of this inspection process, Mexican officials (1) review the list of all the seaports that the ship has stopped at before arriving in Mexico to determine whether it docked in ports that pose a risk for FMD, (2) review the list of all food products on board the ship, (3) visually inspect the food in the galley, (4) seal the food containers in the galleys of those ships that are from high-risk countries, and (5) disinfect the stairs and main entrances of the ship. Crewmembers of ships docked at a Mexican port for more than 3 or 4 days are allowed to consume some of the products in the galley while they are docked. Crewmembers leaving the ship to go ashore must go through the same procedures as other international passengers arriving at any port of entry—complete immigration and customs forms, declare any products of animal or plant origin that they may be carrying, and walk over disinfectant mats.

Controls for International Mail

SAGARPA officials receive advance notification of all international mail deliveries to Mexican post offices that handle such mail. According to Mexican officials, SAGARPA inspectors open and inspect 100 percent of all the international packages arriving from FMD-affected countries but only randomly sample packages arriving from the United States and Canada. According to these officials, the post office facility in Mexico City receives about 500 packages per international mail delivery. Inspectors do not leave the postal facility until all of the packages that arrived on a particular day have been inspected, according to officials. Any prohibited products sent through international mail that are confiscated are incinerated.

Measures for Preventing the Introduction of FMD into the United Kingdom

This appendix provides summary information on the preventive measures used by the United Kingdom to ensure that FMD does not enter the country via five key pathways included in our review: (1) the importation of live animals; (2) the importation of animal products; (3) the handling and disposal of garbage from international carriers, such as airplanes and ships; (4) international passengers; and (5) packages sent through international mail. Because the United Kingdom is subject to the directives of the European Union Economic Community, for each pathway, this appendix summarizes (1) the preventive measures established by the European Union for trade between member states and nonmember countries and (2) any additional measures established by the United Kingdom.

Background

The United Kingdom is a member state of the European Union Economic Community[28] and is subject to the European Union's directives. One E.U. goal was to develop a common market without borders among the member states. The European Union established directives that approximated member states' laws and developed rules applicable to all member states. These directives harmonized the European Union's laws so that member states could consistently follow and apply the same rules uniformly in a common market. For example, each member state must follow guidelines governing the import of live animals and animal products to prevent the introduction of foreign animal diseases, such as FMD, into the European Union. In addition, each member state is allowed to have national provisions as needed. As a result, the United Kingdom has its own legislation governing the imports of live animals and animal products that implements the European Union's directives and covers areas that are not harmonized by these directives.

When the European Union becomes aware of an outbreak of disease in another member state or in a nonmember country that may constitute a serious threat to animal or public health, it has the power to issue a declaration making it an offense for any member state to import specific animals or animal products from the affected country or region. In the event of such an outbreak, the European Union can take emergency safeguard measures, including prohibiting the (1) export of particular species of animals or animal products from affected member states to

[28]Member states include Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Luxembourg, Netherlands, Portugal, Republic of Ireland, Spain, Sweden, and the United Kingdom.

other member states and (2) import of live animals or animal products from affected nonmember countries by member states. In certain circumstances, member states may invoke additional safeguarding procedures and take "interim safeguard and protective measures." Member states invoking such measures and procedures must inform all members of the European Union of the actions taken and the reasons for them.

The Department for Environment, Food and Rural Affairs (DEFRA) is the federal agency responsible for environmental, rural, food, and related issues. DEFRA is responsible for ensuring the health of livestock in the United Kingdom.

E.U. and U.K. Controls for Live Animal Imports

The European Union has established separate preventive measures for imports of live animals from member states and those from nonmember states. In addition, the United Kingdom has additional controls to ensure that live animal imports are disease free.

E.U. Measures for Imports of Live Animals from Member States

Live animal trade between member states requires an official veterinarian from the state of origin to inspect the animals prior to their movement and certify them as disease-free. This certification ensures that the (1) animals have originated from an FMD-free country or have been tested for diseases of concern, (2) animals have been isolated for a specified period of time, (3) country has an official disease surveillance program, and (4) animal production standards have been met. Member states must also ensure that the animals to be exported (1) come from approved holdings that undergo routine veterinary checks, (2) have official tags and identification as required by E.U. rules, and (3) are registered in such a way that the original transit holding can be traced. Although the inspections of live animals traded between member states are generally performed in the country of origin, nondiscriminatory, random spot checks in the destination member state are permitted. Official veterinarians in the destination member state are responsible for performing these checks.

E.U. Measures for Imports of Live Animals from Nonmember Countries

Member states can import live animals only from nonmember countries (or areas of nonmember countries) if the European Union has approved the country as being FMD-free. This approval is granted on a country-by-country basis after the following factors have been considered for the nonmember country:

- The general health of the livestock, wildlife, and other domestic animals, with particular attention to any exotic animal diseases and environmental health situations that may exist.

- The regularity and rapidity with which information on outbreaks of infectious or contagious animal diseases is supplied to trading partners.

- The rules for and implementation of measures to prevent and control infectious or contagious animal diseases, including those that apply to imports.

- The structure and authority of veterinary services, including laboratory services.

- Legislation covering the use of animal production substances, such as hormones.

In addition, live animals are prohibited entry into the European Union when (1) importation rules were not followed, (2) the animals appear or are found to be diseased, and (3) the animals are unfit to continue to travel. Animals denied importation must be quarantined and reexported out of the country or slaughtered.

Live animal shipments from nonmember countries must enter the European Union through approved member states' border inspection posts. A health certificate signed by an official veterinarian from the exporting country must accompany all shipments. E.U. directives have harmonized the inspections conducted at the border inspection posts to ensure the quality and equality at all member states' ports of entry. At border inspection posts, animal shipments undergo full documentary, identity, and physical checks by an official veterinarian before the shipment is allowed to enter into free circulation within the European Union. The border inspection post must ensure that only cattle and swine that show no clinical signs of specific diseases and no signs of FMD and brucellosis are allowed into the European Union. Border inspection posts are required to inform other member states' border inspection posts of any live animal shipments denied entry and the reasons for the denial.

U.K. Measures for Imports of Live Animals from Member States

Animals can be imported from member states to go directly to slaughter facilities, move through approved holding centers to slaughter facilities, or go directly to farms in the United Kingdom. An export health certificate and a license for animal movement must accompany animals arriving from member states. Veterinary inspectors have the authority to inspect animals imported into the United Kingdom from member states at their point of destination to ensure that E.U. requirements have been met. Inspectors can stop a shipment of animals while in transit if the transporter does not have the appropriate documentation. Animals imported for slaughter are required to be slaughtered immediately after they arrive at an approved facility. Breeding animals must have remained in the exporting member state for 6 months prior to transport to the United Kingdom, and slaughter animals, 3 months.

DEFRA maintains a list of registered haulers allowed to transport live animals within the United Kingdom. Haulers must maintain the following information for shipments of cattle and swine: the (1) place and date of pick-ups, including the name of the producer or business and the address of the animal-holding center; (2) species, origin, and number of animals transported; (3) the date and place of disinfection; and (4) individual animal identification numbers. Because of the recent FMD outbreak, as a temporary measure, transportation vehicles are required to have, at all times while in the United Kingdom, proof of disinfection.

In addition, operators or owners of holding centers must record and maintain information on the owner's name, the registration number of the transporter, and the license number for all imported animals. For cattle, they must also record the country of origin, date of entry into the United Kingdom, identification numbers, and the date of exit and proposed destination if the cattle are at a holding center. For swine, operators are required to record only the registration number of the holding center or the herd of origin and the proposed destination. Owners and operators of slaughter facilities are generally not required to maintain this information.

U.K. Measures for Imports of Live Animals from Nonmember Countries

The United Kingdom has adopted the European Union's directives for importing live animals and has spelled out the details for implementing these rules in legislation. Animals that have already passed through another member state's border inspection post are required to have both a border certificate of examination and the original health certificate when they arrive at the U.K. destination. The United Kingdom also has

procedures for post-import checks, which allow DEFRA veterinary inspectors to recheck any imported animals that were processed at a member state's border inspection post. These post-import checks can occur at the imported animals' destination or while they are in transit. As a result of these checks, if disease is suspected, animals may be quarantined, slaughtered, or reexported. The imports of live animals from nonmember countries are required to enter the United Kingdom through certain ports of entry such as, Heathrow, Luton, Stansted, and Prestwick.

E.U. and U.K. Controls for Imported Animal Products

The European Union has established separate preventive measures for imports of animal products from member and nonmember states. The United Kingdom has additional controls to ensure that animal product imports are disease free.

E.U. Measures for Imported Animal Products from Member States

Animal products imported by a member state from other member states must be shipped from approved and licensed facilities that meet the European Union's animal health requirements and are under the control of an official veterinarian. Each member state is responsible for ensuring that its animal products are safe and disease free. Intracommunity shipments of animal products must be accompanied by an official health certificate or commercial document that contains information on the origin and destination of the products. As a result of the European Union's common market rules, there are no routine public health checks at member states' ports of entry for shipments originating in another member state. However, E.U. rules permit random spot checks of shipments at the place of destination.

E.U. Measures for Imported Animal Products from Nonmember Countries

Member states can import animal products only from nonmember countries or parts of a nonmember country approved by the European Union. As with live animal imports, approval is considered on a country-by-country basis after the following factors have been considered:

- The general health of the livestock, wildlife, and other domestic animals, with particular attention to any exotic animal diseases and environmental health situations that may exist.
- The regularity and rapidity with which information on infectious or contagious animal disease outbreaks is supplied to trading partners.

- The rules for and implementation of measures to prevent and control infectious or contagious animal diseases, including those that apply to imports.

- The structure and authority of veterinary services, including laboratory services.

- Legislation covering the use of animal production substances, such as hormones.

Imported animal products from nonmember countries must enter member states through approved border inspection posts and be accompanied by a health certificate signed by an official veterinarian of the exporting country. Official veterinarians at the member states' border inspection post are responsible for ensuring that the following three types of checks on shipments from nonmember countries are performed and that the information provided is verified:

- A documentary check to review the veterinary documentation accompanying the shipment, the importer's advance written notice specifying the number and nature of the shipment, and the estimated time of arrival at the port of entry.

- An identity check to verify that the contents of the shipment are the same as described in the documentation. For shipments that do not arrive in containers, identity checks involve ensuring that the stamps, official marks, and health marks identifying the country and establishment of origin are present. In contrast, shipments arriving in officially sealed containers are not opened unless there is doubt about the authenticity of the seals or suspicions about tampering. In such cases, the containers will be opened and inspected to ensure that the stamps, health marks, and other marks identifying the country and establishment of origin are present on the shipment and conform to those on the certificate or document accompanying the shipment.

- A physical check of the shipment involves inspecting the contents to ensure that they do not present an animal or public health risk. During a physical check, the inspectors may take samples for laboratory analysis. Physical checks are conducted on a predetermined percentage of imported shipments of animal products from nonmember countries. The percentage varies according to the product and the country of origin. For example, veterinarians inspect 20 percent of fresh meat, fish

products, eggs, animal fats, and animal casings shipments and 50 percent of wild meat products, milk, egg products, and processed animal protein shipments.

In those cases where the checks indicate that the shipment does not meet requirements for entry into the European Union, the shipment is reexported if it does not pose any risk to public or animal health. For shipments where reexportation is not possible, the product is destroyed.

E.U. rules allow for the importation of some types of animal products, such as canned meat and some milk products, from nonmember countries that have FMD, as long as specific food-processing procedures are followed to inactivate the virus. For example, milk products imported from FMD countries must be properly heat-treated.

Imports of semen and embryos from nonmember countries are accepted by the European Union if the shipment (1) comes from an FMD-free country; (2) is accompanied by a signed health certificate attesting to the disease-free status of the animals from which the semen, ova, or embryos are derived; and (3) comes through an approved collection center. The information in the accompanying documents is checked at the member states' border inspection post to determine if the shipment meets the European Union's requirements before it is released. The European Union has additional requirements for imported germplasm; however, these are currently being updated.

U.K. Measures for Imported Animal Products from Member States

Animal products from other member states must be accompanied by all the documents required by E.U. rules and are deliverable only to the address in the United Kingdom that is identified on these documents. Official U.K. veterinarians perform nondiscriminatory veterinary checks for products imported from other member states, which may include the sampling of the product at the U.K. destination.

U.K. Measures for Imports of Animal Products from Nonmember Countries

In order to ensure that animal diseases are not imported into the United Kingdom via animal products from nonmember countries, DEFRA enforces a system of controls that relies primarily on the health certification accompanying the shipment and post-import official veterinary inspections of the shipment. Imports from nonmember countries are permitted only through about 26 approved border inspection posts in the United Kingdom.

E.U. and U.K. Controls for International Garbage

E.U. rules require that garbage from international carriers, such as airplanes and ships, be removed under official control for destruction. In the United Kingdom, international garbage is known as "catering waste" and, according to U.K. regulations, represents the most likely route by which a major foreign animal disease such as FMD could enter the country. As a result, DEFRA regulates the handling and disposal of all catering waste from international carriers that arrive in the United Kingdom. To ensure proper handling and disposal, DEFRA issues licenses, which delineate how the catering waste is to be transported, including the transportation route for the waste from the port of entry to the disposal site and how it is to be disposed of, which could either be at an approved landfill or incinerator. Livestock in the United Kingdom cannot be fed any imported catering waste.

E.U. and U.K. Controls for International Passengers

E.U. rules set limits on what products international passengers can bring from nonmember countries into member states. For example, personal imports of raw meat from any nonmember country are illegal. However, passengers are allowed to bring some animal products from nonmember countries if (1) the products are meant for human consumption, (2) the products come from an E.U.-approved country, and (3) the quantity imported does not exceed 1 kilogram (2.2 pounds) per person. Passengers traveling within the European Union are allowed to import meat, animal, and milk products up to 10 kilograms per person as long as the product originates from another member state.

The United Kingdom follows the E.U. rules for personal imports of animal products by international passengers. The United Kingdom can impose penalties of up to 2 years of imprisonment and fines for passengers found smuggling prohibited goods, such as milk and raw meat. Additional restrictions on personal imports of international travelers may be imposed as needed, owing to outbreaks of animal disease in various parts of the world.

As part of a new publicity campaign to help stop illegal products, such as meat, from entering the United Kingdom, posters were placed at various ports of entry and airports to inform travelers about prohibited items and warn them about potential penalties for illegal imports.

U.K. Controls for International Mail

We are not aware of any specific E.U. requirements for international mail. However, U.K. Customs' inspectors examine all international mail packages for prohibited and restricted items. For example, packages containing meat products may be subject to inspection and may be opened and closed by a post office official. Packages from approved nonmember countries will be allowed as long as the quantity of the product does not exceed 1 kilogram (2.2 pounds), the product is fully cooked in hermetically sealed containers, and it is intended for personal consumption only. Packages found in contravention of these regulations are liable to be seized without compensation. Meat or meat products sent to the United Kingdom via international mail from other member states are allowed if they are for personal consumption and do not exceed 10 kilograms. Additional evidence may be required to support claims that imports in excess of 10 kilograms are for personal use. Further restrictions on imported items sent through international mail may be imposed as needed, owing to outbreaks of animal disease in other countries.

Comments from the U.S. Department of Agriculture

United States Department of Agriculture

Office of the Secretary
Washington, D.C. 20250

JUL 2 2002

Dr. Lawrence J. Dyckman
Director
Natural Resources and Environment
United States General Accounting Office
Washington, D.C. 20548

Dear Dr. Dyckman:

The Department of Agriculture (USDA) has reviewed the General Accounting Office's (GAO) Draft Report, "To Protect U.S. Livestock, USDA Must Remain Vigilant and Resolve Outstanding Issues" (GAO-02-808). We found the report to be generally accurate and insightful, providing a number of meritorious recommendations. We appreciate this opportunity to comment on your findings.

Resources and Infrastructure

Since last year's foot-and-mouth disease (FMD) outbreak in the United Kingdom and the events of September 11, USDA has significantly heightened efforts to prevent foreign agricultural pests and diseases from entering the United States either intentionally or accidentally. In late May, USDA announced that more than $43 million would be made available in grants to States from the $328 million approved by President Bush and the Congress earlier this year to strengthen USDA's homeland security preparedness. These grants are an important component of the Administration's continued efforts to strengthen the Federal-State-industry infrastructure available to quickly detect and effectively respond to a potentially devastating introduction of FMD or another foreign animal disease.

Of the $43 million announced in May, $20.6 million is being provided to State and university cooperators to be used to establish a network of diagnostic laboratories dispersed strategically throughout the Nation to permit rapid and accurate diagnosis of animal disease threats; $4.5 million will be used to strengthen State-level surveillance for animal disease; and $4.3 million will be used to assist States to improve their capability to detect plant pests and diseases. In addition, $14 million is being used to help States meet the national standards of emergency preparedness established by the National Animal Health Emergency Management System (NAHEMS). [Last year USDA provided the States $2 million to work toward meeting NAHEMS standards; these funds were drawn from fiscal year (FY) 2001 supplemental appropriations bill, which provided USDA with $5 million out of a requested $35 million; the balance of the $5 million was used for other emergency preparedness needs.]

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We are also working in closely with the Federal Emergency Management Agency (FEMA) to develop a comprehensive operational plan under which FEMA would coordinate Federal assets and resources to assist USDA in the event of an outbreak. Additionally, we are working within the Department to ensure that the Forest Service and other agencies could provide logistical and operational support in the event of an outbreak.

This latest infusion of resources follows other allocations announced earlier this year, including $177 million to make improvements at key USDA locations, including diagnostic and research facilities in Ames, Iowa, and Plum Island, New York. We also devoted an additional $35 million to strengthen the Agricultural Quarantine Inspection program by expediting work with the U.S. Customs Service on an automated inspection targeting system, purchasing 100 rapid pathogen identification devices, and hiring additional inspection personnel. USDA also provided $16.5 million for the Food Safety and Inspection Service to increase monitoring, provide training to inspectors, expand technical capabilities, and hire additional inspectors for imported meat and poultry. Finally, $15.3 million was provided for the Agricultural Research Service to improve rapid detection technologies for FMD as well as other animal diseases.

This year, the Animal and Plant Health Inspection Service (APHIS) has established two new Senior Executive Service positions to head Emergency Programs (animal health) and Port Operations, and both of these positions will be filled by the end of the year. In addition, by the end of the year, APHIS will have increased its safeguarding personnel to approximately 3,870, a 50 percent increase over FY 2000 staffing levels, and we will have doubled the number of dog teams to 123 from the level of 2 years ago. We have also hired 18 additional veterinarians who are conducting port reviews, working closely with State counterparts, and providing technical guidance and training on working with and handling animal products, animal by-products, and international garbage that could pose a threat of foreign animal diseases. The President's FY 2003 budget requests about $150 million in additional funding for USDA for additional homeland security protections. If this request is granted by Congress, it would bring the resources dedicated to protecting agricultural health to the highest levels ever.

With regard to concerns about the availability of sufficient personnel to work on a massive eradication effort if one were required, we wish to point out that we have created a National Animal Health Reserve Corps, composed of private veterinarians from around the United States who would be willing to assist APHIS veterinarians in field and laboratory operations during a foreign animal disease situation. To date, more than 275 private veterinarians have signed on to this Corps, and we are continuing to recruit more members. This Corps supplements the force of personnel drawn from the States, the Department of Defense, FEMA, and other organizations in the event of an animal disease catastrophe. We are also working with Canada, New Zealand, Australia, and the United Kingdom on the creation of an international veterinary reserve, which could supplement resources available domestically in the event of a major emergency.

Prevention and Control Measures:

We wish to note that, although the report seems to characterize the United States' regulatory processes as similar to those of the United Kingdom, belonging to European Union (EU) presents the United Kingdom with greater risk than that faced by the United States, because the EU includes, and provides for trade among, countries that are FMD-free and some that are not.

APHIS is continually assessing emerging animal health conditions around the world and ensuring that our requirements effectively address the risks associated not only with FMD but also bovine spongiform encephalopathy and a host of other diseases of concern.

We wish to note that the report understated the number of ports at which USDA has a presence. In fact, USDA has a presence at all major U.S. ports, with staffing based on risk assessments and supplemented with tools ranging from detector dogs to x-rays to hand-held remote sensing/diagnostic equipment. In those ports staffed by USDA, we have the primary inspection responsibility for agricultural cargo and manifests. To ensure that these shipments continue to be referred to USDA for inspection, we are working with Customs and other Federal agencies on the aforementioned automated targeting system, which will serve as an electronic interface among several Federal agencies to identify and automatically segregate high-risk plant cargo and track imported animals and animal products.

In addition, Customs and APHIS inspectors work together at international mail facilities, examining package declaration forms, visually inspecting or x-raying package contents to determine those items requiring closer inspection, which may include opening such mail. Mail from high-risk countries is more thoroughly scrutinized, and this is based upon pathway analyses, which can help determine the potential for the introduction of a foreign animal disease.

With regard to the concerns cited about work needed in the areas of animal identification, carcass disposal, and indemnity, we would agree that these are all absolutely vital areas to have addressed prior to any major outbreak of disease. In this regard, we are working closely with the agricultural industries to provide forums for national dialogue on the issue of a national identification plan for American livestock. The ultimate objective is to establish a national identification plan that provides the essential elements to improve emergency response and meet future needs. We are also investing other options available for disposing of carcasses on a large scale. Further, on May 1, 2002, we published in the *Federal Register* proposed regulations to address the payment of indemnity in the event of an FMD outbreak. Under this rule, the Federal Government would pay 100 percent of the costs for purchase, destruction, and disposition of animals should they become infected with FMD as well as for materials contaminated with FMD and cleaning and disinfection of affected premises. We recently extended the comment period on this proposal to July 31, 2002.

Communications and Outreach

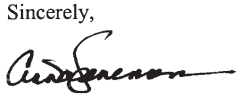
Immediately upon the detection of FMD in the United Kingdom, USDA implemented an aggressive educational campaign to increase awareness of FMD on the part of international travelers, farmers, and the general public. Among other things, additional advisory signs were posted in airports, public service announcements were broadcast, an information hotline and comprehensive Web site were established, and a suggested in-flight announcement was provided to international carriers. Our outreach effort continues, and APHIS is in the process of developing new signage at ports of entry that will be larger and more mobile than the ones observed by the GAO auditors. In addition, we are very pleased to note that we have worked with Customs to modify the Customs declaration form so that its questions will be understood more easily by travelers and yield better information to help us focus our efforts. The new forms are now being distributed around the country.

We are also working in conjunction with FEMA to develop a framework for a comprehensive communications plan to address a foreign animal disease outbreak. The plan will help better ensure timely dissemination of accurate information to critical audiences, including Customs and other Federal agencies, States, and industry.

Conclusion

In short, we appreciate the opportunity to review GAO's report and believe the final product is overall an accurate portrayal of the challenges facing the continuum of Federal, State, and industry resources dedicated to safeguarding U.S. agricultural health. As the report acknowledges, with the enormous volume of international travel and trade, there is no way to ensure zero risk of disease introduction. However, we believe that the short- and long-term measures we are taking to enhance prevention, surveillance, emergency preparedness, and coordination with other Federal, State, and industry organizations are providing a much-needed boost to our overall safeguarding infrastructure. We will continue to look critically at the effectiveness of our efforts and to make whatever changes are warranted to ensure that the American food supply continues to be the safest, most abundant, and most affordable food supply in the world.

Sincerely,



Ann M. Veneman
Secretary

Comments from the U.S. Customs Service

U.S. Customs Service

Memorandum

DATE: July 2, 2002

FILE: AUD-1-OP CN

MEMORANDUM FOR LAWRENCE J. DYCKMAN
GENERAL ACCOUNTING OFFICE

FROM: Director,
Office of Planning

SUBJECT: Comments on Draft Audit Report Entitled Foot and Mouth Disease: To Protect U.S. Agriculture, USDA Must Remain Vigilant and Resolve Outstanding Issues

Thank you for providing us with a copy of your draft report entitled "Foot and Mouth Disease: To Protect U.S. Agriculture, USDA Must Remain Vigilant and Resolve Outstanding Issues" and the chance to discuss the issues in this report.

We have reviewed this report and have no comments to make at this time on the substance of the report.

We did not identify any information that would warrant protection under the Freedom of Information Act.

Thank you for the opportunity to review the draft report. If you have any questions regarding this report, please contact Ms. Cecelia Neglia at (202) 927-9369.

William F. Riley

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GAO Contacts and Staff Acknowledgments

GAO Contacts

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Acknowledgments

In addition to the persons named above, Erin Barlow, Clifford Diehl, and Eugene Wisnoski made key contributions to this report. Important contributions were also made by William Chatlos, Oliver Easterwood, Judy Pagano, and Carol Hernstadt Shulman.

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