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**BIOTERRORISM**

**A Threat to Agriculture and  
the Food Supply**

Statement for the Record by  
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## Why GAO Did This Study

When the President created the Department of Homeland Security, he included U.S. agriculture and food industries in the list of critical infrastructures needing protection. The Secretaries of Agriculture and of Health and Human Services have publicly declared that the U.S. food supply is susceptible to deliberate contamination. GAO was asked to provide an overview of the potential vulnerabilities of the food supply and agriculture sector to deliberate contamination and to summarize four recent GAO reports that identified problems with federal oversight that could leave the nation's agriculture and food supply vulnerable to deliberate contamination.

## What GAO Recommends

The four GAO reports included recommendations to (1) the U.S. Department of Agriculture and the Food and Drug Administration (FDA) to strengthen import checks for detecting mad cow and foot-and-mouth diseases and to address security matters at food processors; (2) FDA to strengthen enforcement of the feed ban; and (3) the Department of Homeland Security to correct security deficiencies at Plum Island. The agencies generally agreed with GAO's recommendations and have taken, or are in the process of taking, actions to address the problems GAO found.

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# BIOTERRORISM

## A Threat to Agriculture and the Food Supply

### What GAO Found

Bioterrorism attacks could be directed at many different targets in the farm-to-table food continuum, including crops, livestock, food products in the processing and distribution chain, wholesale and retail facilities, storage facilities, transportation, and food and agriculture research laboratories. Experts believe that terrorists would attack livestock and crops if their primary intent was to cause severe economic dislocation. The U.S. agriculture sector accounts for about 13 percent of the gross domestic product and 18 percent of domestic employment. Terrorists may decide to contaminate finished food products if harm to humans was their motive.

Four recent GAO reports found gaps in federal controls for protecting agriculture and the food supply. Thus, the United States would be vulnerable to deliberate efforts to undermine its agriculture industries, deliberate tampering of food during production, and the release of deadly animal diseases, some of which also affect humans. GAO found, for example, border inspectors were not provided guidance on foot-and-mouth disease prevention activities in response to the 2001 European outbreak, inspection resources could not handle the magnitude of international passengers and cargo, and new technology used to scan shipments at a bulk mail facility was operating only part-time and in only that facility. Such careful controls over imported foods can help to prevent pathogens from contaminating U.S. cattle with devastating diseases that have struck many other countries. GAO also found that federal overseers did not have clear authority to impose requirements on food processors to ensure security at those facilities. Finally, GAO found security problems at Plum Island—a large government-operated animal disease research facility. GAO found that scientists from other countries, facility workers, and students had access to areas containing high-risk pathogens without having completed background checks and the required escorts.

Following are the four reports discussed in this testimony:

- *Foot and Mouth Disease: To Protect U.S. Livestock, USDA Must Remain Vigilant and Resolve Outstanding Issues*, U.S. General Accounting Office, GAO-02-808 (Washington, D.C.: July 26, 2002).
- *Mad Cow Disease: Improvements in the Animal Feed Ban and Other Regulatory Areas Would Strengthen U.S. Prevention Efforts*, U.S. General Accounting Office, GAO-02-183 (Washington, D.C.: January 25, 2002).
- *Food-Processing Security: Voluntary Efforts Are Under Way, but Federal Agencies Cannot Fully Assess Their Implementation*, U.S. General Accounting Office, GAO-03-342 (Washington, D.C.: February 14, 2003).
- *Combating Bioterrorism: Actions Needed to Improve Security at Plum Island Animal Disease Center*, U.S. General Accounting Office, GAO-03-847 (Washington, D.C.: September 19, 2003).

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Madam Chairman and Members of the Committee:

I appreciate the opportunity to submit this statement for the record on the results of our work on potential threats, vulnerabilities, and risks faced by the nation's agriculture sector and its food supply. As you know, protecting the nation's agriculture industries and food supply has taken on increased sense of urgency in the wake of the terrorist attacks of September 11, 2001. And there is now broad consensus that American farms, food, and agriculture systems, which account for about 13 percent of the nation's gross domestic product, are vulnerable to potential attack and deliberate contamination.

In his October 2001 executive order establishing the Office of Homeland Security, the President added agriculture and food industries to the list of critical infrastructure sectors needing protection—acknowledging that the agriculture sector and the food supply are indeed vulnerable to bioterrorism. Both the Secretaries of Agriculture and of Health and Human Services have also publicly recognized that the U.S. food supply is susceptible to deliberate contamination. Within this backdrop, federal and state government agencies; industry; and academic institutions have taken steps, such as, assessing the potential threats, risks, and vulnerabilities and developing plans to rapidly detect and respond to any attack on the nation's agriculture sector and food supply.

This statement (1) provides a brief overview of the potential vulnerabilities of the food supply and agriculture sector to deliberate contamination and (2) summarizes four recent GAO reports identifying a range of problems with federal oversight that could leave the nation's agriculture sector and food supply vulnerable to intentional contamination. Included in this discussion are our 2002 reports on federal efforts to prevent devastating animal diseases—foot-and-mouth and bovine spongiform encephalopathy (BSE), also known as mad cow—from entering the United States, and our 2003 reports on security at food-processing facilities and at the Plum Island Animal Disease Center. Plum Island studies serious animal diseases, including some that can cause illness and death in humans. The four reports are discussed in greater detail in appendix I, which also provides the link to each report on GAO's Web page.

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## Summary

The U.S. agriculture and food sectors have features that make them vulnerable to bioterrorism attacks. These attacks could be directed at many different targets in the farm-to-table food continuum—including crops, livestock, food products in the processing and distribution chain,

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wholesale and retail facilities, storage facilities, transportation, and food and agriculture research laboratories. Indeed, chemicals and infectious pathogens could be intentionally introduced at various points in that continuum. Most experts believe that terrorists would choose to attack livestock and crops if their primary intent was to cause severe economic dislocation. Such an attack would cause severe disruption—the U.S. agriculture sector accounts for about 13 percent of the U.S. gross domestic product and 18 percent of domestic employment. On the other hand, terrorists would choose to contaminate finished food products if harm to humans was their motive.

Four recently issued GAO reports found gaps in federal controls for protecting agriculture and the food supply. As a result of those gaps, the United States would be vulnerable to deliberate efforts to undermine its agriculture industries, intentional tampering of food during production, and the release of deadly animal diseases, some of which also affect humans. We found, among other things, that the volume of imported items entering the United States made it impossible for border inspectors to physically inspect every incoming cargo container or each and every international passenger's luggage—key pathways through which foot-and-mouth disease could enter the country. We also found that new equipment used to scan shipments at one large import bulk mail facility was operating only part-time and in only that bulk mail facility. We also reported that discrepancies in the accuracy of documents provided by the importer posed a risk that BSE-contaminated food might not be flagged for further inspection. Those careful controls over imported foods help prevent pathogens from contaminating American cattle with devastating diseases that have struck many other countries. In addition, we found that federal overseers did not have clear authority to impose requirements on food processors to ensure security at those facilities. And finally, we found security problems at Plum Island. For example, several scientists from other countries, facility workers, and students had access to areas containing high-risk pathogens, even though their background checks were incomplete and they did not have the required escorts.

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## Overview of the Vulnerability of the U.S. Agriculture Sector and Food Supply to Intentional Contamination

Our current agriculture and food sectors have features that make them vulnerable to terrorist attacks. These include the high concentration of our livestock industry and the centralized nature of our food-processing industry. As a result, chemicals and infectious pathogens can be intentionally added at various points along the farm-to-table food continuum. Whether terrorists target food products or animals and crops for deliberate contamination, serious public health and economic consequences are at stake. The mere threat of such an attack would seriously undermine consumer confidence in the safety of our food supply and destabilize export markets.

The U.S. agriculture sector and food supply have been largely secure from deliberate contamination, except for a few such incidents. In 1984, for example, in what federal agencies describe as the first recorded event of bioterrorism in the United States, a cult group poisoned salad bars at several Oregon restaurants with *Salmonella* bacteria. As a result, 750 people became ill. A recent, deliberate food contamination also highlights how easily someone intent on causing harm can do so. In January 2003, the Centers for Disease Control and Prevention reported that 92 persons became ill after purchasing ground beef from a Michigan supermarket that was intentionally contaminated with nicotine. An employee of the supermarket that sold the contaminated meat has been indicted for intentionally poisoning 200 pounds of meat sold in his supermarket.

Naturally occurring outbreaks of diseases affecting livestock, as well as accidental contamination of food, further illustrate the potentially horrific effects of a deliberate and carefully choreographed event. For example, the United Kingdom has estimated that its outbreak of foot-and-mouth disease resulted in over \$10 billion (U.S.) in losses to tourism and the food and agriculture sectors and the slaughter of over 4 million animals. Estimates of direct costs for a similar outbreak in the United States run as high as \$24 billion with the destruction of about 13 million animals. Terrorists seeking ways to harm the United States could deliberately introduce foreign animal diseases into the country. In addition, according to a recent media report, the USDA calculated that a foot-and-mouth disease outbreak could spread to 25 states in as little as 5 days. Furthermore, according to the media report, a simulation exercise by the National Defense University in June 2002 predicted that a foot-and-mouth disease outbreak could spread to more than one-third of the nation's cattle herds. As that exercise demonstrated, diseases affecting livestock could have significant impacts on the U.S. economy and consumer confidence in the food supply.

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With regard to food, one large-scale U.S. foodborne illness outbreak in 1994 sickened 224,000 people nationwide with *Salmonella enteritidis* from eating a national brand of ice cream. That outbreak, though not deliberate in nature, is estimated to have cost about \$18.1 million in medical care and time lost from work. Widely publicized illness outbreaks in 2002 resulted in illnesses, deaths, and costly food recalls. One involved ground beef produced by a plant in Colorado that caused at least 46 people in 16 states to become ill from *E. coli O157:H7*. The plant conducted a recall to remove about 18 million pounds of potentially contaminated beef that had entered commerce. The other outbreak involved fresh and frozen ready-to-eat turkey and chicken products. Those products, manufactured in a Pennsylvania plant, carried *Listeria monocytogenes*, caused 46 illnesses in eight states, as well as seven deaths and three stillbirths or miscarriages. The plant recalled approximately 27.4 million pounds of potentially contaminated poultry products that had entered commerce. However, most foodborne illnesses are not reported and the vast majority of foodborne outbreaks are never traced to a specific food source.

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## Recent GAO Reports Identified Weaknesses in U.S. Systems for Protecting Livestock and the Food Supply and Preventing the Release of Animal Diseases that Present Human Health Risks

We recognize that the U.S. Department of Agriculture (USDA) and the Food and Drug Administration (FDA)—the federal agencies with primary responsibility for safeguarding our agriculture and food sectors—have stepped up their prevention and response efforts. In addition, we recognize the concerted efforts to better safeguard U.S. borders that have been taken over by the Department of Homeland Security, which also recently took over the operation of the Plum Island Animal Research Facility from USDA. Nevertheless, serious questions remain about whether the agriculture sector and the food supply are sufficiently prepared for deliberate acts of terrorism. Over the last 10 years, GAO has issued many reports that, in aggregate, portray a national food safety system that is fragmented and problem-laden. It is that system, however, on which the nation must depend to prevent, prepare against, and respond to bioterrorism events against our food supply.

Four recently issued GAO reports, in particular, identified weaknesses in federal systems for protecting U.S. livestock against devastating animal diseases and ensuring security at food-processing facilities and at Plum Island—the nation’s principal diagnostics laboratory for foreign animal diseases, including some that can transfer to humans. The information from these four reports will not provide a comprehensive presentation of potential risks; there are certainly other potential targets in the farm-to-table food continuum, including the food transportation sector, that we have not yet examined for vulnerability to intentional contamination.

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These reports do, nonetheless, highlight weaknesses in U.S. systems for protecting critical agriculture and food safety sectors.

Two reports we issued in 2002—on foot-and-mouth disease and on mad cow disease—examined, among other things, U.S. measures for preventing those diseases from entering the United States.<sup>1</sup> We found that, because of the sheer magnitude of international passengers and cargo that enter this country on a daily basis and the inspection resources that are available, completely preventing the entry of those diseases may be infeasible. Foot-and-mouth disease can be carried on the shoes of international passengers and the packages they carry, in international mail, and in garbage from international carriers. We found that USDA did not provide timely guidance to border inspectors for screening cargo and international passengers after foot-and-mouth disease struck Europe in 2001. We also reported that only one international bulk mail facility used new scanning equipment to help inspectors more accurately identify products potentially carrying animal diseases that could contaminate U.S. cattle.

Our 2003 report on food-processing security noted that experts from government and academia agreed that terrorists could use food products as a vehicle for introducing harmful chemical or biological agents into the food supply.<sup>2</sup> We found that USDA and FDA had each, independently, published comprehensive security guidelines for processors to help them prevent or mitigate the risk of deliberate contamination at their facilities. Additionally, we reported that USDA and FDA did not have clear authority to require processors to take safety measures, such as installing fences, alarms, or outside lighting. These measures could improve security in the event of deliberate contamination. In addition, the field personnel at the two agencies did not have adequate training on security matters, which would hamper their ability to conduct informed discussion with processing plant personnel.

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<sup>1</sup>*Foot and Mouth Disease: To Protect U.S. Livestock, USDA Must Remain Vigilant and Resolve Outstanding Issues*, U.S. General Accounting Office, [GAO-02-808](#) (Washington, D.C.: July 26, 2002) and *Mad Cow Disease: Improvements in the Animal Feed Ban and Other Regulatory Areas Would Strengthen U.S. Prevention Efforts*, U.S. General Accounting Office, [GAO-02-183](#) (Washington, D.C.: January 25, 2002).

<sup>2</sup>*Food-Processing Security: Voluntary Efforts Are Under Way, but Federal Agencies Cannot Fully Assess Their Implementation*, U.S. General Accounting Office, [GAO-03-342](#) (Washington, D.C.: February 14, 2003).

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In September 2003, we also reported fundamental concerns with security at the Plum Island Animal Disease Center that leave the facility vulnerable to security breaches.<sup>3</sup> We found that alarms and door sensors for the biocontainment area were not fully operational; outdoor lighting was not adequate to support security cameras; and certain assets, including the foot-and-mouth disease vaccine bank, were not adequately protected. Controls over access to the pathogens were also inadequate—scientists from other countries were given access to the biocontainment area without escorts while their background checks were incomplete; no background checks were done on students attending classes in the biocontainment area; and the cleaning crew were among the unauthorized staff entering the biocontainment area unescorted. Controlling access to pathogens is critical because a tiny quantity of pathogen could be removed without being detected and developed into a weapon. Lastly, we found that the security guards protecting the Island had been operating without authority to carry firearms or to make arrests; the facility’s written plans for responding to a terrorist incident exceeded the capability of its security system and the emergency response plans were not adequately coordinated with state and local emergency and law enforcement responders. Our report noted that the Department of Homeland Security officials agreed with our identification of these problems and stated that they had initiated actions to address our concerns.

The four reports made recommendations to USDA, FDA, and the Department of Homeland Security for correcting the problems we found, and the agencies generally agreed with our recommendations. Appendix I discusses the four reports, our recommendations, and the agencies’ positions in greater detail.

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<sup>3</sup>*Combating Bioterrorism: Actions Needed to Improve Security at Plum Island Animal Disease Center*, U.S. General Accounting Office, [GAO-03-847](#) (Washington, D.C.: September 19, 2003).



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## Contacts and Acknowledgments

For future contacts regarding this statement, please contact Lawrence J. Dyckman at 202-512-3841. Individuals making key contributions to this statement included Maria Cristina Gobin, Erin Lansburgh, Charles Adams, and Clifford Diehl. This statement will also be available on the GAO Web site at <http://www.gao.gov>.

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# Appendix I: Recent GAO Reports Highlight Gaps in Federal Efforts to Protect Agriculture and the Food Supply

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Four recently issued GAO reports identified weaknesses in federal systems for protecting U.S. livestock against devastating animal diseases and ensuring security at food-processing facilities and at Plum Island—the nation’s principal diagnostics laboratory for animal diseases. The following reports highlight weaknesses in U.S. systems for protecting critical agriculture and food safety sectors:

- *Foot and Mouth Disease: To Protect U.S. Livestock, USDA Must Remain Vigilant and Resolve Outstanding Issues*, U.S. General Accounting Office, [GAO-02-808](#) (Washington, D.C.: July 26, 2002).

Because the livestock industry is a key element of the U.S. agricultural sector and economy, protecting U.S. livestock from foot-and-mouth disease is an important federal responsibility. The 2001 outbreak of this disease in the United Kingdom clearly illustrated the destruction that this highly contagious animal disease can cause to a nation’s livestock industry and other sectors of the economy. Foot-and-mouth disease 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 over the past century. The last foot-and-mouth disease outbreak in the United States was in 1929.<sup>1</sup> According to federal officials, even a single case of the disease would cause our trading partners to prohibit U.S. exports of live animals and animal products and could result in losses of between \$6 billion and \$10 billion a year while the country eradicated the disease and until it regained disease-free status.

As part of our study, we examined whether U.S. measures for preventing foot-and-mouth disease from entering the United States were effective and whether the United States could respond quickly and effectively to an outbreak of the disease if it were to occur.

We found that, because of the sheer magnitude of international passengers and cargo that enter this country on a daily basis, completely preventing the entry of foot-and-mouth disease may be infeasible. The volume of incoming items make it impossible for border inspectors to physically inspect every incoming cargo container or each international passenger’s

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<sup>1</sup>The foot-and-mouth virus is relatively hardy and can survive in certain environments for considerable periods of time. For example, it can live in salted bacon for up to 183 days or in air-dried animal hides or skins for 6 weeks. Should a person step in manure from an infected animal, the virus can live on the shoes for up to 9 weeks in summer conditions or up to 14 weeks in winter.

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luggage. The U.S. Department of Agriculture (USDA) has identified key pathways through which this highly contagious disease might enter the United States, such as on imported live animals or animal products; on the shoes of, or in packages carried by, international passengers; in international mail; and in garbage from international carriers. We also reported that, after the foot-and-mouth disease outbreak in the United Kingdom in 2001, USDA did not inform Customs of its decision to prohibit or restrict certain products or more vigilantly screen passengers arriving at U.S. ports of entry from the United Kingdom. USDA did not provide such official guidance until the Acting Commissioner of Customs formally requested such information more than a month after the outbreak began in the United Kingdom. USDA and the Department of Homeland Security (DHS) are working to increase defenses against diseases entering through those pathways.

We further reported that, should preventive measures fail, and the United States experience an outbreak, the country would face challenges in responding quickly and effectively. While considerable planning and testing of emergency response plans had occurred, we noted several factors that could limit a rapid response to a foot-and-mouth disease outbreak, including (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.

Our report recommended that USDA develop a formal mechanism to notify Customs as outbreaks of foot-and-mouth disease spread in other countries and develop uniform, nontechnical procedures that Customs inspectors could use to process international passengers and cargo arriving from disease-affected countries. USDA agreed with our recommendations. It said it would work with DHS to ensure that formal protocols are established for the seamless communication of animal disease risk information for border inspection.

- *Mad Cow Disease: Improvements in the Animal Feed Ban and Other Regulatory Areas Would Strengthen U.S. Prevention Efforts*, U.S. General Accounting Office, [GAO-02-183](#) (Washington, D.C.: January 25, 2002).

Mad cow disease—or BSE—is an always fatal, neuro-degenerative disease that had been found in cattle in 23 countries around the world at the time we issued this report. Cattle contract the disease through feed that contains protein derived from the remains of diseased animals. Scientists

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generally believe an equally fatal disease in humans—known as variant Creutzfeldt-Jacob Disease—is linked to eating beef from cattle infected with BSE; over 100 people have died from the human variant. During long incubation periods—2 to 8 years in cattle and possibly up to 30 years in humans—the disease is undetectable.

As part of our study, we assessed the effectiveness of federal actions to prevent the emergence and spread of BSE and ensure compliance with the animal feed ban.

We found, among other things, that federal actions could not sufficiently ensure that all BSE-infected animals or products would be kept out of the United States or that if BSE were found, it would be detected promptly and not spread to other cattle through animal feed or enter the human food supply. The United States had imported about 125 million pounds of beef (0.35 percent of total imported) and about 1,000 cattle (0.003 percent of total imported) from countries that later discovered BSE—during the period when BSE would have been incubating. We reported that USDA's and the Food and Drug Administration's (FDA) import inspection capacity had not kept pace with the growth of imports. We also found that the one international bulk mail facility that used the newest technology in scanning equipment that would help inspectors more accurately identify products that could carry BSE was not being used during periods of operation when inspectors were not on duty. We further reported that Customs found discrepancies with the accuracy of importer-provided information and, as a result, BSE-risk imports may go undetected.

We also reported that FDA's enforcement of the feed ban, which was put in place to prevent the spread of BSE if it were found in U.S. cattle, was limited and that FDA inspection data were flawed. FDA had not identified and inspected all firms subject to the ban and had not acted promptly to compel firms to keep prohibited proteins out of cattle feed and to label animal feed that cannot be fed to cattle. FDA's data on inspections of feed facilities were so severely flawed that the agency could not know the full extent of industry compliance.

We noted that, if BSE were found in the United States, the economic impact on the \$56 billion beef industry could be devastating—consumers might refuse to buy domestic beef; beef exports could decline dramatically; and sales in related industries, such as hamburger chains and soup and frozen dinner manufacturers, could be similarly affected.

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We recommended that USDA and FDA, among other things, develop a coordinated strategy to identify resources needed to increase inspections of imported goods and that FDA strengthen enforcement of the feed ban and its management of inspection data. USDA and FDA agreed with these recommendations. Additional funds were requested and approved to strengthen border inspections. FDA has increased the number of feed-ban compliance inspections, and implemented a new feed-ban inspection data system.

- *Food-Processing Security: Voluntary Efforts Are Under Way, but Federal Agencies Cannot Fully Assess Their Implementation*, U.S. General Accounting Office, [GAO-03-342](#) (Washington, D.C.: February 14, 2003).

The food-processing sector is generally described as the middle segment of the farm-to-table continuum—it extends from the time livestock and crops leave the farm for slaughter and processing until food products reach retail establishments and the consumer. Experts from government and academia agreed that terrorists could use food products as a vehicle for introducing harmful chemical or biological agents into the food supply. In June 2002, the National Academies had also reported that terrorists could use toxic chemicals or infectious agents to contaminate food production facilities and that FDA should act promptly to extend the use of its Hazard Analysis and Critical Control Point methods for ensuring food safety to deal with the risk of deliberate contamination.<sup>2</sup> The Centers for Disease Control and Prevention had also reported on the need for vigilance in protecting food and water supplies. Within this context, in 2002 we examined federal efforts to enhance security at food-processing facilities.

We reported that the two agencies with primary responsibility for ensuring for food safety—USDA and FDA—had each, independently, published comprehensive security guidelines for food processors to help them identify measures to prevent or mitigate the risk of deliberate contamination at their production facilities. Both agencies encouraged processors to review their current operations and to adopt those measures that they believed would be best suited for their facilities. FDA’s guidance contains over 100 suggested security measures and USDA’s some 68 such items. Among other things, the guidelines included recommendations for

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<sup>2</sup>USDA requires meat and poultry plants to use a Hazard Analysis and Critical Control Point system and FDA requires that system for juices, fish, and shellfish.

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improving personnel security by conducting screening and background checks and controlling entry into the facilities; securing hazardous materials by controlling access to storage areas; improving outside security by monitoring all access to the establishment; installing lighting; ensuring that in-house laboratories have comprehensive and validated security and disposal procedures in place; and that parking areas are a safe distance from the facility.

However, we also reported that USDA and FDA had determined that their existing statutes did not provide them with absolutely clear authority to impose security requirements at food-processing facilities. For example, neither agency had authority to require processors to implement measures to enhance security outside the food-processing environment, such as installing fences, alarms, or outside lighting. Nor did the agencies believe they had authority to require food processors to conduct employee background checks. Because of these uncertainties about their authority, the security guidelines they gave food processors are voluntary. Since the guidelines were voluntary, USDA and FDA have not been enforcing, monitoring, or documenting their implementation. We also found that most of USDA's and FDA's field staff had not received training on security matters. And, although the field staff were instructed to be vigilant and on "heightened alert," they were also told not to document or report their observations regarding security at the plants because the information could be obtained under a Freedom of Information Act request.

We also reported on recent congressional efforts to protect the nation's drinking water from terrorist acts that may offer a model for FDA and USDA to help them monitor security measures at food-processing facilities and to identify any gaps that may exist. Specifically, the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 requires community water systems to assess their vulnerability to terrorist attacks and develop emergency plans to prepare and respond to such events. They are also required to submit copies of their plans to the Environmental Protection Agency. The act specifically exempts these assessments from the Freedom of Information Act.

We concluded that FDA and USDA could not assess the industry's efforts to prevent or reduce their vulnerability to deliberate contamination. Lacking such baseline information, they could not be prepared to advise food processors on any additional actions needed. We also concluded that the lack of security training for field personnel hampered their ability to conduct informed discussion with facility personnel.

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We recommended that FDA and USDA study their agencies' existing statutes and identify what additional authorities they may need relating to security measures. On the basis of the results of these studies, the agencies should seek additional authority from the Congress. While USDA agreed with our recommendation, FDA took no position. We also recommended that both agencies provide training for all field personnel to enhance their awareness and ability to discuss security measures with plant personnel. USDA and FDA agreed with the need for additional training.

- *Combating Bioterrorism: Actions Needed to Improve Security at Plum Island Animal Disease Center*, U.S. General Accounting Office, [GAO-03-847](#) (Washington, D.C.: September 19, 2003).

USDA scientists at the Plum Island Animal Disease Center are responsible for developing strategies for protecting the nation against animal diseases that could be accidentally or deliberately introduced in to the country. These scientists—often with the assistance of scientists from other countries—identify the pathogens that cause animal diseases in foreign countries and then work to develop vaccines against them. Some pathogens maintained at USDA's Plum Island laboratory, such as foot-and-mouth disease, are highly contagious to livestock and could cause catastrophic economic losses if they were released outside the facility. Questions about the security of Plum Island arose after the September 2001 terrorist attacks and when employees of the contractor hired to operate and maintain the Plum Island facilities went on strike in August 2002. About 10 months later, in June 2003, DHS became responsible for Plum Island while the USDA staff are continuing their research programs.

In September 2003, we reported that our review of security at Plum Island identified fundamental concerns that leave the facility vulnerable to security breaches. We found that immediately after the September 2001 terrorist attacks, USDA began a concerted effort to assess security at many of its laboratories, including Plum Island. Using a risk management approach, USDA identified certain pathogens as the primary asset requiring protection, the potential threats to this asset, and the associated risk. USDA also began to upgrade security at Plum Island. For example, USDA hired armed guards to patrol the island and installed fingerprint recognition locks on freezers containing pathogens.

Despite these improvements, we identified shortcomings in Plum Island's security arrangements. We found that Plum Island's physical security was incomplete and limited. For example, the alarms and door sensors that

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were recommended for the biocontainment area were not fully operational; outdoor lighting was not adequate to support security cameras; and physical security was not sufficient for certain assets, including the foot-and-mouth disease vaccine bank. DHS officials said the alarms and door sensors will be in place by December 2003 and they were evaluating other physical security matters.

Furthermore, we found that Plum Island officials had not adequately controlled access to the pathogens. Eight scientists from other countries were given access to the biocontainment area without escorts while their background checks were incomplete; no background checks were done on students who regularly attended classes within the biocontainment area; and individuals entering the biocontainment area to perform nonlaboratory functions, such as cleaning, were not always escorted. Controlling access to the pathogens is particularly important because no security device is currently capable of detecting a microgram of pathogenic material. Therefore, a scientist could remove a tiny quantity of pathogen without being detected and potentially develop it into a weapon. Many facilities take measures to minimize this risk. For example, at the U.S. Army Medical Research Institute of Infectious Diseases, background checks must be updated regularly to evaluate the continued suitability and reliability of employees working with pathogens. According to DHS officials, they are taking action to revise policies for access to the biocontainment area.

We also found limitations in Plum Island's incident response capability. For example, the guard force had been operating without authority to carry firearms or to make arrests. Plum Island's incident response plan does not address what to do if an incident, such as a terrorist attack, exceeds the capability of the security system, and officials have not tested the facility's response capability to ensure its effectiveness. DHS officials told us they have started to take actions to fully address these incident response issues and are obtaining assistance from the Federal Protective Service.

Because of the strike that occurred in August 2002 and the hostility surrounding it, the risk that someone may try to steal pathogens has increased. One striker was convicted of tampering with the island's water distribution and treatment system as he walked off the job the day the strike began, and USDA officials suspect that this individual did not act alone. The intelligence community considers disgruntled employees as posing a security risk. Although USDA did consider the possibility that it could have a disgruntled worker, it did not reevaluate the level of risk, the



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assets requiring protection, or its incident response plans for Plum Island in light of specific events related to the strike. Furthermore, USDA did not discuss the defined threat with the intelligence community and local law enforcement officials to ensure that threats particular to Plum Island and its vicinity were taken into consideration.

We concluded that further actions are needed to provide reasonable assurance that pathogens cannot be removed from the facility and exploited for use in bioterrorism. Particularly, it is important to better secure the foot-and-mouth disease vaccine bank to ensure its availability for combating an outbreak. The lack of comprehensive policies and procedures for limiting access to pathogens unnecessarily elevates the risk of pathogen theft. Moreover, because physical security measures alone are not adequate to secure pathogens, all laboratories containing these materials face the challenge of developing other approaches to mitigate the risk of theft. By consulting with other laboratories to discover methods they are using to mitigate the risk to pathogens, Plum Island officials can learn more about safeguards being employed elsewhere.

We recommended that DHS (1) correct physical security deficiencies at Plum Island; (2) limit access to pathogens and identify ways to mitigate the inherent difficulty of securing pathogens; (3) enhance Plum Island's incident response capability; and (4) reconsider the risks and threats to Plum Island and revise the security and incident response plans as needed. DHS has agreed with the report and has started to implement these recommendations.

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