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Report to the Chairman, Subcommittee on Oversight of Government Management, the Federal Workforce, and the District of Columbia, Committee on Homeland Security and Governmental Affairs, U.S. Senate

August 2011

HOMELAND SECURITY

Actions Needed to Improve Response to Potential Terrorist Attacks and Natural Disasters Affecting Food and Agriculture

GAO-11-652

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Highlights

Highlights of GAO-11-652, a report to the Chairman, Subcommittee on Oversight of Government Management, the Federal Workforce, and the District of Columbia, Committee on Homeland Security and Governmental Affairs, U.S. Senate

Why GAO Did This Study

The President issued Homeland Security Presidential Directive (HSPD) -9 in 2004 to establish a national policy to defend the food and agriculture systems against terrorist attacks, major disasters, and other emergencies. HSPD-9 assigns various emergency response and recovery responsibilities to the Departments of Agriculture (USDA), Health and Human Services (HHS), Homeland Security (DHS), and others. In addition, Emergency Support Function (ESF) -11 addresses the federal food and agriculture response during emergencies and is coordinated by USDA. GAO was asked to evaluate (1) the extent to which there is oversight of federal agencies' overall progress in implementing HSPD-9; (2) the steps USDA has taken to implement its HSPD-9 responsibilities for response and recovery and challenges, if any; and (3) the circumstances under which USDA has coordinated an ESF-11 response and challenges it faces, if any. GAO reviewed key documents; surveyed states; and interviewed agency, state, and industry officials.

What GAO Recommends

GAO's nine recommendations include that (1) DHS resume efforts to coordinate agencies' HSPD-9 implementation efforts, (2) USDA develop a department-wide strategy for implementing its HSPD-9 responsibilities, and (3) USDA ensure that after-action reports are completed. USDA, HHS, and DHS generally agreed with GAO's recommendations. The National Security Staff stated they agree that a review of HSPD-9 is appropriate and will look for an opportunity to do so.

View GAO-11-652 or key components.
For more information, contact Lisa Shames at (202) 512-3841or shamesl@gao.gov.

What GAO Found

There is no centralized coordination to oversee the federal government's overall progress implementing the nation's food and agriculture defense policy—HSPD-9. At one time, the White House Homeland Security Council and DHS took steps to gather and coordinate information about agencies' efforts to implement HSPD-9, but no agency currently does so. Officials from the National Security Staff—which now supports the Homeland Security Council—told GAO that they will be looking for an opportunity to conduct an interagency review of HSPD-9, and DHS officials stated that Homeland Security Council leadership is important to ensure the success of their coordination efforts. Federal standards for internal control call for agencies to employ such activities as top-level review to help ensure that management's directives are carried out and to determine if agencies are effectively and efficiently using resources. Because there is no centralized coordination to oversee agencies' overall HSPD-9 efforts, the nation may not be assured that these crosscutting agency efforts are effective at reducing the vulnerability to, and impact of, major emergencies.

USDA agencies have taken steps to implement the department's HSPD-9 response and recovery responsibilities. However, various challenges remain, such as critical research gaps, which could impede recovery from high-consequence plant diseases that could devastate the nation's production of economically important crops. Also, USDA does not have a department-wide strategy for setting its priorities and allocating resources for implementing its numerous HSPD-9 responsibilities. Without such a strategy, USDA cannot be assured that its agencies are making progress to align with departmental priorities and that its HSPD-9 responsibilities are met.

Since 2007, USDA has coordinated the federal ESF-11 response for about 28 natural disasters, including hurricanes and floods. Although USDA and state officials GAO met with identified factors that contributed to the success of USDA's response—such as having a single USDA coordinator to facilitate communication during ESF-11 emergencies—they also identified some challenges. For example, federal agencies' responsibilities for disposing of animal carcasses following an emergency are unclear, which delayed previous disposal efforts and could pose a public health risk. Also, USDA has not consistently prepared after-action reports that summarize what went well and what needed improvement during an emergency response. Without preparing such reports for all ESF-11 responses, USDA managers may not have the necessary information to help ensure that past mistakes are not repeated.

Livestock Stranded, Killed, and Buried as a Result of Natural Disasters

Sources: Clean Harbors (photo on left); USDA (photos in middle and on right).

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Abbreviations

APHIS	Animal and Plant Health Inspection Service
ARS	Agricultural Research Service
CDC	Centers for Disease Control and Prevention
DHS	Department of Homeland Security
EPA	Environmental Protection Agency
ESF	Emergency Support Function
FDA	Food and Drug Administration
FEMA	Federal Emergency Management Agency
FSIS	Food Safety and Inspection Service
HHS	Department of Health and Human Services
HSPD	Homeland Security Presidential Directive
NPDRS	National Plant Disease Recovery System
NVS	National Veterinary Stockpile
OHSEC	Office of Homeland Security and Emergency Coordination
USDA	U.S. Department of Agriculture

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United States Government Accountability Office
Washington, DC 20548

August 19, 2011

The Honorable Daniel K. Akaka
Chairman
Subcommittee on Oversight of Government
Management, the Federal Workforce,
and the District of Columbia
Committee on Homeland Security
and Governmental Affairs
United States Senate

Dear Mr. Chairman:

Agriculture is critical to public health and the nation's economy. It annually produces $300 billion worth of food and other farm products, provides a major foundation for prosperity in rural areas, and is estimated to be responsible for 1 out of every 12 U.S. jobs. As a result, any natural or deliberate disruption of the agriculture or food production systems—including natural disasters, disease outbreaks, and food contamination—can present a serious threat to the national economy and human health and can halt or slow trade. For example, initial estimates found that Hurricane Katrina caused $882 million in total crop, livestock, and aquaculture losses in the Southeast and interrupted the flow of poultry, milk, and other agricultural products to markets. The food and agriculture systems are also vulnerable to terrorist attacks, such as the intentional introduction of a foreign animal or plant disease or the intentional contamination of food products. While the U.S. food and agriculture systems have yet to experience such an attack, the congressionally established bipartisan Commission on the Prevention of Weapons of Mass Destruction Proliferation and Terrorism reported in 2010 that the nation is seriously lacking in its capability to rapidly respond to a natural or intentional biological threat and gave the nation a failing grade in this area.[1]

Recognizing the vulnerability of the U.S. food and agriculture systems, the President issued Homeland Security Presidential Directive (HSPD) -9

[1]Former Senator Bob Graham and Former Senator Jim Talent, Commission on the Prevention of Weapons of Mass Destruction Proliferation and Terrorism, *Prevention of WMD Proliferation and Terrorism Report Card* (Washington, D.C.: Jan. 26, 2010).

in January 2004 to establish a national policy to defend the food and agriculture systems against terrorist attacks, major disasters, and other emergencies. HSPD-9 assigns federal agencies responsibilities to enhance the nation's preparedness for food and agriculture emergencies. For example, HSPD-9 assigns the U.S. Department of Agriculture (USDA) responsibility for four efforts related to emergency response and recovery, including as co-lead with the U.S. Department of Health and Human Services (HHS) on enhancing recovery efforts. See appendix I for detailed information on agencies' roles and responsibilities under HSPD-9.

Separately, in 2004, the Department of Homeland Security (DHS) created the National Response Plan—which in 2008 was replaced by the National Response Framework. The framework outlines how the nation will collectively respond to any emergency, natural or man-made, regardless of its cause or size. Specifically, according to this document, during an emergency, state and local governments typically take the lead in response efforts, and the federal government can provide assistance if states become overwhelmed or require additional capabilities. The framework includes 15 emergency support functions (ESF) for a federal response to an emergency, as well as federal support to states during an emergency (see app. II for a list of all 15 ESFs). DHS activates individual ESFs when a threat or emergency necessitates a specific type of coordinated federal response. For example, during Tropical Storm Fay in 2008, DHS activated multiple ESFs, including ESF-5 to support evacuations, ESF-8 to assess the health care infrastructure, and ESF-12 to monitor fuel and traffic. ESF-11 specifically addresses the federal food and agriculture response during emergencies, and USDA is designated as the coordinator.

In 2005, we reported that the United States faces several complex challenges—including the inability to deploy vaccines within 24 hours of a disease outbreak—that limit its ability to quickly and effectively respond to a widespread attack on agriculture.[2] In addition, for more than a decade, we have reported on the fragmented nature of federal food safety oversight and have found that it results in inconsistent oversight, ineffective coordination, and inefficient use of resources. In 2007, we

[2]See GAO, *Homeland Security: Much Is Being Done to Protect Agriculture from a Terrorist Attack, but Important Challenges Remain*, GAO-05-214 (Washington, D.C.: Mar. 8, 2005).

added food safety to our list of high-risk areas that warrant attention by Congress and the executive branch. Our biennial reviews of high-risk issues in 2009 and 2011 concluded that fragmentation of federal food safety oversight continues to be a problem.[3] We have made several recommendations on this issue, including recommending that agencies develop a government-wide performance plan for food safety that includes results-oriented goals and performance measures, as well as information about strategies and resources.[4]

This report responds to your request for a review of the nation's food and agriculture defense policy and ESF-11. Our objectives were to (1) evaluate the extent to which there is oversight of federal agencies' overall progress in implementing the nation's food and agriculture defense policy; (2) evaluate the steps USDA has taken to implement its response and recovery responsibilities outlined in this policy, and identify challenges, if any, that the department faces in implementing these responsibilities; and (3) identify the circumstances under which USDA has coordinated the federal food and agriculture response for an emergency for which ESF-11 was activated and challenges, if any, that the parties involved experienced.

To evaluate the extent to which there is oversight of federal agencies' overall progress in implementing HSPD-9, we reviewed presidential directives and compared federal efforts with those outlined in the *Standards for Internal Control in the Federal Government*.[5] We also interviewed officials from USDA, DHS, HHS, and the Environmental Protection Agency (EPA)—because these agencies have the most

[3]See: GAO, *High-Risk Series: An Update*, GAO-07-310 (Washington, D.C.: Jan. 31, 2007); GAO, *High-Risk Series: An Update*, GAO-09-271 (Washington, D.C.: Jan. 22, 2009); GAO, *High-Risk Series: An Update*, GAO-11-278 (Washington, D.C.: Feb. 16, 2011). See also: GAO, *Federal Food Safety Oversight: Food Safety Working Group Is a Positive First Step but Governmentwide Planning Is Needed to Address Fragmentation*, GAO-11-289 (Washington, D.C.: Mar. 18, 2011).

[4]See: GAO-11-289; GAO, *Oversight of Food Safety Activities: Federal Agencies Should Pursue Opportunities to Reduce Overlap and Better Leverage Resources*, GAO-05-213 (Washington, D.C.: Mar. 30, 2005); GAO, *Food Safety and Security: Fundamental Changes Needed to Ensure Safe Food*, GAO-02-47T (Washington, D.C.: Oct. 10, 2001).

[5]GAO, *Standards for Internal Control in the Federal Government*, GAO/AIMD-00-21.3.1 (Washington, D.C.: Nov. 1, 1999).

responsibilities under HSPD-9—and analyzed progress reports these agencies provided to the Homeland Security Council.

To evaluate the steps USDA has taken to implement its response and recovery responsibilities outlined in HSPD-9 and identify whether it encountered any implementation challenges, we reviewed relevant laws, regulations, and presidential directives, as well as federal guidance, planning, and implementation documents. We interviewed officials from various USDA agencies responsible for implementing the department's response and recovery responsibilities, and we interviewed relevant officials from DHS, HHS, and EPA regarding USDA's interagency coordination efforts. Moreover, we conducted a survey of animal health officials from all 50 states and 5 U.S. territories. The survey gathered information about states' and U.S. territories' experiences working with USDA regarding the National Veterinary Stockpile (NVS), the nation's repository of resources for responding to outbreaks of the most damaging animal diseases. We received responses from 52 of 55 animal health officials surveyed, for an overall response rate of 95 percent. We also conducted interviews in person or via telephone with agriculture officials from a nonprobability sample of three states about their experiences working with USDA—Iowa, Mississippi, and Texas—selected, in part, because USDA officials told us that these states used resources from the NVS for animal-related emergencies. In addition, we conducted interviews with representatives of industry associations for the top five U.S. agricultural commodities—cattle and calves, corn, soybeans, dairy products, and broiler chickens—about the impact of USDA's food and agriculture emergency response and recovery efforts on industry.

To identify the circumstances under which USDA has coordinated the federal food and agriculture response during an emergency for which ESF-11 was activated, and if the parties involved experienced any challenges, we reviewed relevant agency documents, including ESF-11 and key documents from ESF-11 activations. We also interviewed relevant officials from USDA and DHS. Moreover, we conducted interviews in person or via telephone with agriculture officials from Iowa, Massachusetts, Mississippi, and Texas—selected largely because (1) these states have experienced at least one emergency for which ESF-11 was activated, (2) USDA conducted on-the-ground activities in these states in response to these emergencies, and (3) of their geographic locations—about their experience working with USDA and DHS during previous ESF-11 emergencies. We also requested and reviewed information from USDA and DHS related to the number of times ESF-11 has been activated and found that the data are not sufficiently reliable for

reporting purposes. We are making a recommendation regarding this finding. Additional details about the objectives, scope, and methodology of our review are presented in appendix III.

We conducted this performance audit from June 2010 to August 2011, in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

Four federal agencies have most of the responsibility under the response and recovery category of HSPD-9: USDA, DHS, HHS, and EPA. Each of these four agencies also conducts additional activities to support and protect the food and agriculture systems as follows:

- USDA's Office of Homeland Security and Emergency Coordination (OHSEC) coordinates USDA's disaster management and emergency planning response activities and has responsibility for coordinating the department's HSPD-9 responsibilities. In addition, USDA's Animal and Plant Health Inspection Service (APHIS) is responsible for issuing orders and regulations to prevent the introduction or dissemination of animal and plant pests and diseases. USDA's Food Safety and Inspection Service (FSIS) is responsible for the safety of meat, poultry, and processed egg products. Moreover, USDA's Agricultural Research Service (ARS) is the department's chief research agency, conducting research on agricultural problems of high national priority. Additionally, USDA's Natural Resources Conservation Service administers a number of programs that encourage conservation, development, and productive use of the nation's land.

- DHS is responsible for coordinating the overall national effort to protect the nation's critical infrastructure—including agriculture—from terrorist attacks, major disasters, and other large-scale emergencies. DHS's Federal Emergency Management Agency's (FEMA) mission is to provide response to emergencies and major disasters, such as those arising from terrorist attacks and natural disasters, including managing the response, coordinating federal response resources, and aiding recovery. FEMA coordinates response support across the federal government by activating one or more ESFs. In addition, DHS's Office of Health Affairs provides medical, public health, and

scientific expertise to prepare for, respond to, and recover from all hazards impacting the nation's health security. The Office of Health Affairs has been delegated responsibility for coordinating the department's HSPD-9 responsibilities.

- In the event of an outbreak of a zoonotic disease—a disease that can be transmitted between humans and animals and could possibly kill both, such as highly pathogenic avian influenza—HHS's Centers for Disease Control and Prevention (CDC) would become involved to help control the spread of the disease and minimize the impact of the outbreak. CDC also manages the Strategic National Stockpile, which contains such medical supplies as antibiotics and life-support medications to address public health emergencies affecting humans. Another HHS agency, the Food and Drug Administration (FDA), is responsible for ensuring the safety of most other food that does not fall under USDA's jurisdiction, such as whole shell eggs, seafood, milk, grain products, and fruits and vegetables. FDA also approves human drugs, biologics (which include vaccines, blood and blood components, and tissues), and medical devices used in the Strategic National Stockpile and new animal drugs for treating disease in animals, including food-producing animals.

- EPA's mission is to protect human health and the environment. Specifically for protecting the food and agriculture sector under HSPD-9, EPA provides technical assistance and guidance on decontamination and disposal to the public and private sectors and authorizes the use of pesticides to prevent or mitigate crop and livestock pathogens and other pests and bio-agents that can be a threat to crop and food production. In addition, EPA is responsible for working with DHS, HHS, and USDA for developing and disseminating decontamination and disposal standards and model plans to be used during food and agriculture emergencies.

In addition, the White House Homeland Security Council was established by executive order in 2001 to ensure coordination of the homeland security-related activities of executive departments and agencies, as well as effective development and implementation of homeland security policies, such as HSPD-9. The Homeland Security Council advises the President and includes the Vice President and heads of some executive

branch agencies.[6] In May 2009, the President merged the Homeland Security Council with the National Security Council, a council that advises the President on national security and foreign policy matters. The White House National Security Staff now supports both councils. The Homeland Security Council was maintained as the principal venue for interagency deliberations on issues that affect homeland security.

USDA coordinates a federal food and agriculture response, among other things, when ESF-11 is activated. ESF-11 defines specific areas of federal response, including

- providing nutrition assistance,
- responding to animal and plant diseases and pests,
- ensuring the safety and security of the commercial food supply,
- providing for the safety and well-being of household pets during an emergency response or evacuation, and
- protecting natural and cultural resources and historical properties.[7]

During an emergency, USDA may assist with response efforts through its normal day-to-day or statutory responsibilities. FEMA also has the authority to ask USDA, through a mission assignment, to conduct work outside of its general statutory authorities. A mission assignment is a reimbursable work order to other federal agencies to complete a specific task.

[6]Members include the President and Vice President; the Attorney General; Secretaries of Defense, Health and Human Services, Transportation, Treasury; the Directors of FEMA, the Federal Bureau of Investigation, and Central Intelligence; the Assistant to the President for Homeland Security; and others the President may designate. Other heads of agencies—including the Secretary of Agriculture and the Administrator of the EPA—may also be invited to attend meetings. The establishment of the Homeland Security Council was codified in statute with the enactment of the Homeland Security Act of 2002. See Pub. L. No. 107-296 § 901, 116 Stat. 2135, 2258.

[7]We did not review aspects of ESF-11 pertaining to the protection of natural and cultural resources and historic properties because our review focuses on emergencies affecting food and agriculture.

No Centralized Coordination Exists to Oversee Federal Agencies' Overall Progress in Implementing the Nation's Food and Agriculture Defense Policy

There is no centralized coordination to oversee the federal government's overall progress in implementing responsibilities outlined in the nation's food and agriculture defense policy—HSPD-9. Because the responsibilities outlined in HSPD-9 cut across several different agencies, centralized oversight is important to ensure that agencies' efforts are coordinated to avoid fragmentation, efficiently use scarce funds, and promote the overall effectiveness of the federal government. Moreover, in our past work, we have offered approaches for better overseeing crosscutting programs, including improved coordination to ensure that program efforts are mutually reinforcing. Previously, the Homeland Security Council conducted some coordinated activities to oversee federal agencies' HSPD-9 implementation by gathering information from agencies about their progress, and DHS's Office of Health Affairs supported these activities by coordinating agencies' reporting of HSPD-9 implementation progress. However, the Homeland Security Council and DHS's efforts are no longer ongoing. Officials from EPA noted that although the Homeland Security Council's and DHS's oversight roles have not been consistent for the past few years, EPA and other agencies have used multi-agency working groups to coordinate food and agriculture emergency activities.[8] It is unclear why the Homeland Security Council no longer gathers such information, but DHS noted that interest from agencies and the Homeland Security Council has decreased, and they no longer coordinate agencies' reporting of their HSPD-9 implementation progress.

From 2007 to early 2009, the Homeland Security Council gathered status updates from agencies, which were a list of efforts agencies had undertaken to fulfill their HSPD-9 responsibilities. USDA, DHS, EPA, and HHS officials told us that the Homeland Security Council's efforts were valuable. For example, EPA officials told us it was valuable to interact with other agencies regarding HSPD-9 efforts, and HHS officials found the Homeland Security Council's consolidation of information across multiple agencies to be useful. However, USDA and DHS officials told us that the Homeland Security Council stopped requesting this information some time in late 2008 or early 2009. An official from the National Security Staff—which now supports the Homeland Security Council—

[8]In 2005, we reported that, since the terrorist attacks of 2001, agencies had formed numerous working groups to protect agriculture. For example, DHS created a Food and Agriculture Sector Coordinating Council to help the federal government and industry share ideas about how to mitigate the risk of an attack on agriculture. See GAO-05-214.

confirmed that the National Security Staff is not currently conducting an interagency review of HSPD-9 but will be looking for an opportunity to do so.

In addition, in 2008 the Homeland Security Council tasked DHS with creating an online forum intended to enable agencies to share information that coordinated their HSPD-9 efforts.[9] According to DHS officials, the forum was intended to replace the status updates that agencies were providing to the Homeland Security Council and would allow Homeland Security Council and department officials to efficiently view agencies' implementation progress in a consistent manner. DHS officials told us that agencies' initial participation in the development of the online forum was strong, but participation declined after the Homeland Security Council's leadership on HSPD-9 implementation diminished in 2009. These DHS officials also noted that the Homeland Security Council's support of the online forum was beneficial and encouraged other agencies to participate. USDA officials told us that the online forum would be useful if agencies were given resources to contribute and maintain information included in the forum. EPA and HHS officials, however, told us that they did not find the forum to be useful and were concerned about how DHS would use the information shared through the forum. According to DHS officials, DHS has the authority to coordinate HSPD-9 implementation, as HSPD-9 states that the Secretary of Homeland Security will "lead, integrate, and coordinate implementation efforts among Federal departments and agencies." DHS officials told us that in 2009 during the change of presidential administrations, the department "paused" the interagency working group involved with developing the forum. According to these DHS officials, although the department continues to use the forum internally to monitor DHS's HSPD-9 progress, agencies have not contributed information to the forum since that time.

Under the federal standards for internal control, federal agencies are to employ internal control activities, such as top-level review, to help ensure that management's directives are carried out and to determine if agencies are effectively and efficiently using resources.[10] Because there is currently no centralized coordination to oversee agencies' HSPD-9 implementation progress, it is unclear how effectively or efficiently

[9]DHS refers to this online forum as the "Defense of Food and Agriculture Dashboard."

[10]GAO/AIMD-00-21.3.1.

agencies are using resources in implementing the nation's food and agriculture defense policy. As a result, the nation may not be assured that crosscutting agency efforts to protect agriculture and the food supply are well-designed and effectively implemented in order to reduce vulnerability to, and the impact of, terrorist attacks, major disasters, and other emergencies.

USDA Agencies Have Taken Steps to Implement the Department's Response and Recovery Responsibilities, but Challenges Remain

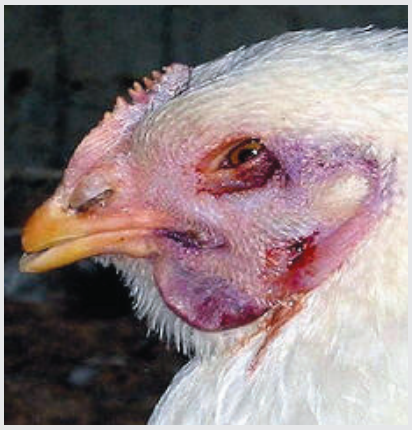
USDA agencies have taken steps to implement the four HSPD-9 response and recovery efforts for which USDA has the lead responsibility, but various challenges remain. First, APHIS has developed the NVS but experiences complex implementation challenges. Second, ARS has taken steps to develop the National Plant Disease Recovery System (NPDRS), but implementation challenges remain. Third, various USDA agencies have taken steps to enhance food and agriculture recovery efforts, but critical challenges may affect recovery from animal disease outbreaks or food contaminations. Fourth, USDA submitted a required report on tools to help agriculture producers in the event of a terrorist attack to the Homeland Security Council but has not taken steps to address the report's recommendations. We also found that a common challenge affecting all four of these efforts is that USDA does not have a department-wide strategy for implementing HSPD-9.

APHIS Developed the NVS to Respond to Outbreaks of Certain Animal Diseases but Experiences Complex Implementation Challenges

In 2006, APHIS began operating its NVS to respond to the 17 most damaging animal diseases, such as highly pathogenic avian influenza (see app. IV for a list of the 17 diseases). Under HSPD-9, the Secretary of Agriculture is responsible for developing a stockpile containing sufficient resources to respond to the most damaging animal diseases affecting human health and the economy and deploying them within 24 hours of an outbreak. This responsibility grew out of a national concern that terrorists could simultaneously release animal diseases of catastrophic proportions that would quickly deplete state[11] and industry resources and overwhelm the private sector. USDA assigned this responsibility to APHIS because of its mission to safeguard the health of the nation's animals against the introduction, reemergence, or spread of animal diseases. From 2006 through 2010, APHIS allocated

[11]According to the NVS Business Plan, APHIS uses the term "State" for brevity to denote all jurisdictions, including tribes and territories, that may request NVS assistance.

Highly Pathogenic Avian Influenza



Source: USDA.

Highly pathogenic avian influenza viruses are associated with high morbidity and mortality in poultry and are considered foreign animal diseases because they rarely occur in the United States. Clinical signs in chickens include sudden death, lack of energy and appetite, decreased egg production, swelling of the head and eyelids (as depicted in photo above), nasal discharge, among others. Although primarily an avian disease, the H5N1 strain of the virus can infect humans and have severe economic consequences. For example, since 2003 highly pathogenic avian influenza killed millions of wild and domestic birds worldwide and infected over 550 people, more than half of whom died. Spread of this virus has taken a major economic toll, costing East Asian economies an estimated $10 billion. According to the World Health Organization, controlling the virus in animals is the principal way to reduce opportunities for human infection and, therefore, reduce opportunities for a pandemic to emerge.

approximately $33 million to develop the NVS and acquire critical resources to combat animal disease threats, including: vaccines, diagnostic test kits, personal protective equipment, animal handling equipment, antiviral medication, and contracts for commercial support services—which are response companies that can quickly provide trained personnel with equipment to support states. According to the NVS business plan, deploying these resources within 24 hours after an outbreak would benefit states only if they knew how to request, manage, and use them. In light of this, APHIS has taken several steps to help prepare states to request and use NVS resources. For example, APHIS developed guidance and hired a full-time liaison to, among other things, help states develop a plan to manage these resources.

Although APHIS has taken important steps to develop the NVS, complex implementation challenges remain. For example, according to USDA management officials, although the NVS has acquired various resources to respond to each of the 17 most damaging animal disease threats, resource gaps exist for some of the diseases for a variety of reasons. Some vaccines and diagnostic test kits, for example, have not yet been developed for certain diseases or may be too costly for the NVS to purchase. In addition, APHIS officials told us that although they have the capability to deploy certain resources within 24 hours—as required by HSPD-9—it will take longer to deliver certain vaccines to states. We previously reported that because vaccines are not stored in a ready-to-use state, their delivery will take additional time.[12] Our analysis of NVS documents indicates that manufacturers must first prepare such vaccines for use—a process that could take an additional 7 to 14 days, depending upon the vaccine. According to the NVS business plan, purchasing and maintaining vaccines with methods that minimize the costs of storage, maintenance, and expiration—such as by not storing them in a ready-to-use state—is imperative to using existing funds wisely. In addition, more than half of state and U.S. territory animal health officials responding to our survey reported that they are concerned the NVS may not be able to deploy its vaccines within 24 hours of an outbreak (see app. V for the complete survey). In fact, state and U.S. territory animal health officials reported more concerns about NVS vaccines than any other resource available from the NVS.

[12]See GAO-05-214.

Another challenge is that the states may not be adequately prepared to receive and use NVS resources. Specifically, about three-quarters of state and territory animal health officials who responded to our survey reported that they have taken steps to create an NVS plan. About one-third of all the states and territories responding to our survey reported completing such a plan. According to NVS guidance, states need a plan to manage the distribution of NVS resources to ensure responders get what they need. Moreover, some of the states that lack such a plan have major cattle, hog, or poultry production. State and territory animal health officials who responded to our survey generally reported they have not completed a NVS plan because they lack sufficient personnel or financial resources. In addition, only 38 percent of state and territory animal health officials who responded to our survey reported that their state or U.S. territory has identified a physical location to manage the NVS resources APHIS would deploy in response to a disease outbreak. According to NVS guidance, it is "absolutely critical" that states identify locations from which they will manage NVS resources in advance of an outbreak; otherwise, states will not be able to adequately support responders. NVS officials are aware of states' progress in creating NVS plans and are developing a 5-year training and exercise strategy to help overcome this problem. According to APHIS officials, this strategy is designed to enhance the preparedness of federal, state, tribe, territory, and local governments to logistically respond to damaging animal disease outbreaks, which will improve the NVS program's ability to accomplish its mission and meet its goals.

Further, more than half of state and territory animal health officials reported concerns that APHIS has not shared sufficient information regarding the type or amount of NVS resources available. Without such information, states may be less able to adequately plan for using NVS resources or determine whether the resources would be sufficient or appropriate to meet their needs during an emergency. For example, one official reported that planning efforts are "futile" unless states know what is available from the NVS. APHIS officials told us they did not share this information in the past for security reasons but that they are now developing a mechanism to securely share information about the type, but not the amount, of resources available in the NVS with states and territories. APHIS officials told us they will continue to not share information regarding the quantity of resources available for security reasons.

Moreover, APHIS and CDC have taken some steps to help the NVS leverage the mechanisms and infrastructure of CDC's Strategic National

Stockpile. HSPD-9 states that the "NVS shall leverage where appropriate the mechanisms and infrastructure that have been developed for the management, storage, and distribution of the Strategic National Stockpile." According to APHIS and CDC officials, the two agencies have collaborated since the inception of the NVS. For example, CDC officials told us that they provided the NVS technical assistance and shared lessons learned, operational plans, and guidance documents. In addition, in February 2011, APHIS and CDC officials met to discuss collaboration between the two stockpiles, including the possibility of sharing resources, such as transportation, warehousing, and state and local resources used for the receipt and distribution of Strategic National Stockpile assets. However, according to CDC officials, no additional opportunities for resource sharing have been identified to date. Furthermore, CDC officials told us that it is inappropriate, and may be too costly, for the NVS to further leverage the Strategic National Stockpile because of differences in their missions. Specifically, they told us that the mission of the Strategic National Stockpile is to save human life and requires a 12-hour response time or quicker, whereas the mission of the NVS is to minimize the economic impact of an animal disease outbreak and allows a longer 24-hour response time.

Despite these steps to collaborate, there appears to be some confusion about the details of each stockpile's mission and infrastructure that may be impeding the agencies' efforts to further leverage the stockpiles. For example, according to APHIS officials, opportunities exist for the NVS to use the same state inventory management system developed by the Strategic National Stockpile so that states do not have to understand and maintain multiple systems to manage resources they would receive from either stockpile during an emergency. According to an APHIS official responsible for state coordination, managing separate systems is neither cost effective nor efficient. Having two separate systems requires additional costs for maintenance, training, and technical support. However, according to CDC officials, the Strategic National Stockpile does not currently provide an inventory management system for state use. Instead, states use their own systems to meet their particular needs for managing Strategic National Stockpile provided inventory. Moreover, CDC officials told us there is no need to share inventory management systems, because as they understood it, the NVS does not send any resources to states; instead, CDC officials said the NVS sends commercial support services directly to farms to respond to disease outbreaks. This is counter to NVS planning guidance, which asserts that states must have an inventory management system in place to manage the "massive resources" they will receive from the NVS and that their

system should be operational before the first shipment of resources arrives. When commenting on a draft of this report, however, HHS officials stated that the agency is in the process of developing an inventory management system for state and federal use during an emergency. HHS officials also told us that this system could potentially prove useful to state officials who might receive or manage resources from the NVS and that CDC has offered to provide NVS access to the system after it is developed.

In addition, APHIS and CDC officials disagree about whether additional resources from the Strategic National Stockpile can be leveraged. Specifically, APHIS officials told us that opportunities exist to leverage antiviral medication contained in the Strategic National Stockpile. For example, a senior NVS official told us that both stockpiles would use the same antiviral medication to protect humans during an emergency and should explore opportunities to leverage similar resources. In fact, this official told us that if the NVS's existing inventory of antiviral medication expires or is depleted, additional supplies are available from the Strategic National Stockpile. CDC officials told us, however, that the vast majority of the antiviral medications contained in the Strategic National Stockpile are pre-allocated for states and that it is inappropriate for the NVS to leverage antiviral medications from the Strategic National Stockpile. CDC officials also told us that the NVS could easily purchase the antiviral medication on the commercial market at a lower cost than the comprehensive cost of developing an interagency agreement. However, according to HHS's pandemic influenza plan, demand for antivirals during an influenza pandemic is likely to "far outstrip" supplies available in stockpiles or through usual channels of distribution. This was observed during the 2009 H1N1 influenza pandemic when the Strategic National Stockpile had to release antiviral medications for young children in response to state and local shortages. Supply and demand imbalances are not limited to influenzas. For example, this imbalance was recently observed following the March 2011 earthquake and tsunami in Japan that resulted in the release of radiation from damaged nuclear reactors. Specifically, FDA reported increased demand for potassium iodide—the only FDA-approved medication available to treat contamination with radioactive iodine—and media reported that manufacturers struggled to keep up with the sudden increase in demand, and, in some cases, supply of the product ran out. We have previously reported on challenges associated with leveraging CDC's Strategic National Stockpile capabilities and infrastructure for the NVS. Specifically, in 2007 we reported that NVS officials told us that in order to prevent duplication of efforts and limit costs, the best strategy for the NVS to acquire antiviral medication to

protect responders from highly pathogenic avian influenza would be to gain access to antiviral medication in the Strategic National Stockpile.[13] Four years later, APHIS and CDC officials continue to disagree on this issue.

APHIS and CDC officials have collaborated since the inception of the NVS, but as we discussed, confusion and disagreement may be impeding efforts to further identify leveraging opportunities. With no formal agreement regarding if and when it is appropriate for the NVS to leverage the mechanisms and infrastructure developed for the Strategic National Stockpile, USDA and HHS may miss opportunities to more effectively utilize federal and state resources.

ARS Has Taken Steps to Develop a NPDRS, but Implementation Challenges Remain

USDA's ARS has taken steps to develop the NPDRS, which is a system intended to help the nation recover from high-consequence plant disease outbreaks—outbreaks that could devastate the nation's production of economically important crops. Under HSPD-9, the Secretary of Agriculture is responsible for developing a NPDRS capable of, among other things, responding to high-consequence plant diseases within a single growing season by using resistant seed varieties and disease control measures, such as pesticides. From 2005 through 2010, ARS allocated approximately $10.6 million to the development of the NPDRS. According to the 2010 NPDRS draft strategic plan, which officials expect to finalize in summer 2011, ARS's principal method for fulfilling this responsibility is to develop an estimated 30 to 50 recovery plans for select high-consequence plant diseases that may enter the United States. Thus, from 2005 through 2010, ARS allocated about $1.1 million (10.8 percent) of NPDRS funds to develop recovery plans and assigned responsibility for developing the plans to its Office of Pest Management Policy—which integrates USDA's activities related to pest management, among other things. As of May 2011, ARS's Office of Pest Management Policy has completed 13 plans (see app. VI for a description of the plant diseases with completed recovery plans), all of which address the use of disease control measures and resistant seed varieties. According to NPDRS documents, each recovery plan is intended to provide a brief primer on the plant disease and identify research gaps and priorities, among other

Stem Rust of Wheat

Source: Agricultural Research Service, USDA.

According to the NPDRS recovery plan for stem rust of wheat, the disease occurs wherever wheat is grown and has been one of the most devastating plant diseases worldwide. In 1999, a new strain of the disease was reported in Uganda. The new strain is able to cause disease on previously resistant wheat cultivars, and USDA is concerned that it will be introduced into the United States—thereby threatening wheat and barley production. Although stem rust has been effectively controlled in the United States for the past 50 years, previous outbreaks have been costly to producers. For example, according to the NPDRS recovery plan, total production losses due to stem rust in Minnesota, North Dakota, and South Dakota in 1935, 1953, and 1954 were estimated at over 250 million bushels, which represents nearly $3.7 billion (adjusted to 2009 dollars).

[13]GAO, *Avian Influenza: USDA Has Taken Important Steps to Prepare for Outbreaks, but Better Planning Could Improve Response*, GAO-07-652 (Washington, D.C.: June 11, 2007).

things. For example, the NPDRS recovery plan for stem rust of wheat—one of the most devastating plant diseases worldwide, which threatens wheat and barley production—states that current understanding of the disease is based largely on 50-year-old data that must be reexamined and identifies 13 specific areas that require updated research. According to ARS officials, updated research is needed to improve understanding of stem rust in the context of contemporary cropping practices, wheat varieties, and diseases.

In addition to developing recovery plans, ARS uses NPDRS funds for research purposes. ARS officials told us that the NPDRS program provides a flexible source of funding to help ARS initiate research on new, emerging plant disease problems as they arise. Thus, from 2005 through 2010, ARS allocated over $7 million of NPDRS funds to conduct research on the two plant diseases that, according to ARS officials, currently pose the greatest threat to the U.S. food and agriculture systems: soybean rust[14] and stem rust of wheat. According to a senior ARS official, these research funds were used to implement national USDA action plans and conduct research that addressed the highest priority needs included in the NPDRS recovery plans for these two high-consequence plant disease threats.

Despite these efforts, important challenges related to the NPDRS remain. For example, although the Office of Pest Management Policy spent resources developing recovery plans that identified critical research gaps, ARS officials told us the agency lacks resources and a process to fill these gaps. According to ARS officials, they rely on a variety of entities—including ARS, other federal agencies, state governments, land grant universities, and the private sector—to conduct research on high-consequence plant diseases that may fill research gaps identified in the recovery plans. However, ARS does not have a systematic process for tracking research conducted or under way that may fill the gaps identified in the NPDRS recovery plans. Without a documented, systematic process to monitor the extent to which research gaps are filled, USDA may not have critical information needed to help the nation recover from high-consequence plant disease outbreaks. Moreover, NPDRS guidance

[14]For more information on soybean rust, see GAO, *Agriculture Production: USDA Needs to Build on 2005 Experience to Minimize the Effects of Asian Soybean Rust in the Future*, GAO-06-337 (Washington, D.C.: Feb. 24, 2006).

states that recovery plans provide an opportunity to indicate where research dollars need to be concentrated in the future.

ARS also has not effectively communicated the NPDRS to key stakeholders that need to know about these plant disease recovery plans. The NPDRS draft strategic plan states that recovery from high-consequence plant diseases will require coordination between USDA and states. Moreover, according to USDA officials, several key officials should be aware of NPDRS recovery plans, including state plant regulatory officials and APHIS state plant health directors. However, of the five state plant regulatory officials, the five APHIS state plant health directors, and the two APHIS senior regional plant health officials we met with to discuss the NPDRS, all had limited or no knowledge about NPDRS recovery plans. ARS officials told us that they share information about the recovery plans with federal and state plant health officials through a variety of venues, including their public Web site. An ARS official responsible for developing NPDRS recovery plans acknowledged, however, that ARS needs to conduct additional outreach to and collaborate with states, including state department of agriculture officials. In addition, HHS officials told us that recovery from high-consequence plant diseases should also involve FDA because plants are a source of food and animal feed. Because recovery from high-consequence plant diseases will require effective coordination with state and federal plant health officials, without such efforts, USDA may miss opportunities to enhance the effectiveness of NPDRS recovery plans and ensure states have the information they need to facilitate recovery from high-consequence plant diseases.

USDA Agencies Have Taken Steps to Enhance Recovery, but Challenges Could Affect Recovery from Animal Disease Outbreaks or Food Contaminations

Various agencies within USDA have taken steps in response to HSPD-9 to enhance recovery from food and agriculture emergencies. According to HSPD-9, the Secretary of Agriculture—along with the Secretary of HHS—is responsible for enhancing recovery efforts that “rapidly remove and effectively dispose of contaminated food and agriculture products or infected plants and animals, and decontaminate premises.” The following includes steps USDA agencies have taken, in coordination with other agencies, to fulfill this responsibility:

- Several USDA agencies—including APHIS, FSIS, and ARS—and FDA participated in a 2005 EPA-led effort that produced guidance on federal roles and responsibilities for disposing of contaminated animals, crops, and food products and decontaminating affected areas in order to prevent the spread of disease.

- FSIS, in conjunction with FDA and EPA, prepared guidelines for the disposal and decontamination of intentionally adulterated food products.

- APHIS is co-leading an interagency working group for the White House National Science and Technology Council[15] Committee on Homeland and National Security that, among other things, identifies research gaps for depopulating—or slaughtering—and disposing and decontaminating of diseased animals. In the event of a foreign animal disease outbreak, depopulation, disposal, and decontamination services are an essential part of the response and recovery effort because USDA's traditional strategy to eradicate a foreign animal disease is to depopulate all susceptible animals.

- USDA's Rural Development—an agency whose mission is to improve the economy and quality of life in rural America—is participating in a federal multiagency effort to draft a recovery framework that will outline federal activities to support community recovery by, for example, identifying resources, capabilities, and best practices for recovering from a disaster.

- APHIS is partnering with universities, states, and industry to develop continuity of business plans for some animal disease emergencies. The purpose of these plans is to (1) help ensure that certain live animals and food products can be safely moved through an affected area to market, (2) maintain industry viability, and (3) ensure a steady supply and source of food to consumers.

Although HHS has co-lead on this HSPD-9 responsibility to enhance recovery, and FDA has responsibility for ensuring the safety of roughly 80 percent of the food supply, HHS officials informed us that FDA has a "small role in recovery efforts" in agriculture or food emergencies.

[15]The National Science and Technology Council is the principal means within the executive branch to coordinate science and technology policy across the federal government.

According to FDA officials, in addition to the two efforts noted above, FDA took other steps to enhance recovery efforts; however, they noted that these efforts were not taken in direct response to HSPD-9. For example, in response to the draft of the National Disaster Recovery Framework, HHS set up a HHS Recovery Working Group, of which FDA is a member, to discuss specific actions that would take place in a recovery effort.

However, federal, state, and industry officials we spoke with also identified challenges related to these efforts that could affect the nation's ability to recover from a catastrophic animal disease outbreak, including the following challenges with depopulation of livestock, carcass disposal, and decontamination:

Depopulation of livestock. According to APHIS and industry officials, there may not be sufficient workforce capacity to depopulate animals quickly in the event of a catastrophic disease outbreak. For example, APHIS officials told us that it could take as long as 80 days to depopulate a single feedlot—a concentrated feeding area for cattle that typically contains about 100,000 animals. Agencies' concerns regarding the enormity of the workforce response and the coordination required to manage a large-scale outbreak has surfaced in our prior work.[16]

Carcass disposal. Carcass disposal can present multiple challenges during a catastrophic disease outbreak, according to federal, state, and industry officials. Specifically, a highly contagious animal disease such as foot-and-mouth disease can result in the depopulation of millions of animals in order to control the spread of the disease. According to USDA guidance, effective disposal of animal carcasses and materials is a key component of a successful foot-and-mouth disease response. In the event of an outbreak, foot-and-mouth disease-susceptible animals should be disposed of within 24 hours. In addition, it must be done in a manner that does not allow the virus to spread and minimizes negative environmental effects, among other things. Although burial has traditionally been the preferred method for disposal, USDA officials told us that this may not be feasible on a large scale because, among other things, the operation is labor intensive. A joint federal, state, and industry exercise testing capabilities to control a widespread foot-and-mouth

Foot-and-Mouth Disease

Source: USDA.

Foot-and-mouth disease 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 a foot-and-mouth disease infection, but the disease leaves them debilitated and causes losses in meat and milk production. Foot-and-mouth disease does not have human health implications. It can be spread by animals, people, or materials that bring the virus into physical contact with susceptible animals. The disease is also considered a potential agent for agroterrorism. There has not been a foot-and-mouth disease outbreak in the United States since 1929; however, the disease is considered widespread in parts of Africa, Asia, Europe, and South America. According to USDA, a 2001 outbreak of foot-and-mouth disease in the United Kingdom resulted in the slaughter and disposal (pictured above) of millions of animals and economic losses conservatively estimated at $14.7 billion. Moreover, South Korea has recently been battling a major outbreak of foot-and-mouth disease, which from November 2010 through January 2011 has resulted in the culling of 2.2 million livestock and the vaccinating of 12 million more, an effort which has cost around $1.6 billion.

[16]GAO, *Veterinarian Workforce: Actions Are Needed to Ensure Sufficient Capacity for Protecting Public and Animal Health,* GAO-09-178 (Washington, D.C.: Feb. 4, 2009).

disease outbreak supports this concern. During the exercise, it was determined that burying 70,000 cattle carcasses within 4 days was not possible. In addition, carcass burial may be limited by topography, soil type, soil depth to bedrock, and environmental regulations at all levels of government. Multiple methods of disposal will likely be needed to handle the large quantity of materials in need of disposal. Incineration, composting, and rendering may be viable alternatives. Rendering is a process by which carcasses are converted into products that are safe to use in animal feeds, and it is regulated by the states and FDA. According to USDA officials, the public health consequences of carcass burial on a large scale are unacceptable, as recent foot-and-mouth disease outbreaks in Japan, Korea, and the United Kingdom have shown. For example, the media reported groundwater contaminations in Korea near some burial sites of animal carcasses—including near several schools—making the water unfit for human use. News reports stated that, under the pressure to respond to the outbreak, authorities may have failed to take the necessary precautions for safe burial, such as lining the pits with two layers of plastic sheeting, and other reports noted that some animals were buried alive as the supply of euthanasia drugs ran low.

According to APHIS officials, one way to mitigate the depopulation and disposal resource concerns is to move away from the traditional strategy of eradicating certain diseases through depopulation and disposal. Officials said that this may be possible by increasing the use of vaccines for at-risk animals, which could minimize the number of animals that need to be depopulated. This would also reduce the need for disposal. USDA and DHS are conducting research to develop more effective vaccines that could be used against foot-and-mouth disease. In addition, USDA's November 2010 draft foot-and-mouth disease response plan includes options that take this vaccine policy approach into consideration.

A potential new challenge with carcass disposal is that disposal roles and responsibilities may be unclear if the carcasses are contaminated with a foreign animal disease. USDA officials told us that although APHIS traditionally has authority under the Animal Heath Protection Act for carcass disposal when the carcasses are contaminated with a foreign animal disease,[17] the recently enacted FDA Food Safety Modernization

[17]Animal Health Protection Act, Pub. L. No. 107-171, tit. X, subtit. E, 116 Stat. 494 (codified as amended at 7 U.S.C. §§ 8301-8317).

Act designates EPA as the lead agency, in coordination with USDA, HHS, and DHS, for developing and exercising decontamination and disposal standards and model plans to be used during food and agriculture emergencies, including a foreign animal disease outbreak.[18] According to USDA officials, this issue could lead to confusion in the event of an outbreak. EPA officials told us that they are working with other agencies to discuss if and how the FDA Food Safety Modernization Act changes their understanding of the roles and responsibilities for carcass disposal.

Decontamination. According to APHIS officials and subject matter experts, research gaps remain in the ability to decontaminate areas infected with disease, such as feedlots and poultry houses. For example, testing of disinfectants is generally done at room temperature and on hard, nonporous surfaces such as stainless steel, and not on porous surfaces commonly found on farms. APHIS officials said, however, that it is also necessary to test on more porous surfaces that may be found on farms—such as wood and soil—and at different temperatures. APHIS is working with Canadian officials to test at temperatures below freezing, and a White House interagency working group, which the agency leads, has drafted a research plan to address this and other gaps in decontamination and disposal. However, USDA officials told us that funding to support research is lacking. According to EPA officials, EPA has also done some limited testing on decontamination measures for foreign animal diseases. For example, EPA confirmed that a number of disinfectants assumed to be effective for highly pathogenic avian influenza were, in fact, ineffective.

Recovery challenges are not limited to controlling animal diseases. There is also the difficulty in tracing recalled food products through the distribution chain during a food recall. As we have previously reported, the food distribution chain can be complex, involving multiple levels of processors, distributors, and retailers before the food reaches consumers.[19] In the event of an emergency, it can be difficult to trace both the source of contamination and the ultimate destination of the contaminated product.

[18]FDA Food Safety Modernization Act, Pub. L. No. 111-353, § 208, 124 Stat. 3885, 3944.

[19]GAO, *Food Safety: USDA and FDA Need to Better Ensure Prompt and Complete Recalls of Potentially Unsafe Food,* GAO-05-51 (Washington D.C.: Oct. 6, 2004).

This point was well-illustrated in a 2007 outbreak of botulism—a serious illness caused by botulinum toxin that can lead to paralysis and potentially death in humans. Botulinum toxin found in canned hot dog chili sauce resulted in at least eight severe illnesses and spurred a massive recall of tens of millions of cans of food across 49 states, causing retailers and officials to scramble to locate and remove potentially contaminated items. Because there was potentially dual jurisdiction over the food products, FSIS and FDA were both involved in the recall. According to a report from the DHS National Center for Food Protection and Defense, information on the recall changed, and the number of recalled items expanded, creating confusion for affected organizations and consumers and delaying recovery efforts. Moreover, a former state-level food and drug director who headed recall efforts in one state that conducted almost 16,000 site visits to remove contaminated products from shelves told us that states received very little information from FSIS and FDA about the distribution chain during the recall, and the lists of recalled products that the two agencies issued were inconsistent. According to this former state official, this inconsistency delayed state efforts and caused some retailers to continue selling contaminated products as many as four days after the recall was announced, potentially endangering human lives.

FSIS officials also told us that some parties affected by the recall—including schools and senior centers—were confused by the large number of telephone calls they received from different agencies alerting them about the recall, as it was unclear who was in charge. FSIS officials told us that the agencies involved have since resolved these coordination problems. A former state-level food and drug director involved in the recall told us, however, that a lack of coordination may affect future recalls unless resolved. According to HHS officials, FDA has since updated its recall procedures and directives to improve communications between states and FDA officials. The former state official believes that the passage of the FDA Food Safety Modernization Act will provide the framework and process for sharing information with states to ensure that this will not happen in the future and, according to this official, it is critical for federal and state agencies to work together on these types of recalls. However, the act gives mandatory recall authority to FDA but not USDA, which could add to fragmentation in future recalls. As we previously mentioned, food safety has been on our list of high-risk areas since 2007 because the fragmented federal oversight of food safety has caused

Food Recalls

Source: USDA.

This nation enjoys a plentiful and varied food supply that is generally considered to be safe. However, the Centers for Disease Control and Prevention estimates that each year roughly 1 in 6 Americans gets sick, 128,000 are hospitalized, and 3,000 die of foodborne diseases. To protect consumers from unsafe food, the U.S. Department of Agriculture's Food Safety and Inspection Service (FSIS) and the Department of Health and Human Service's Food and Drug Administration have recall programs. For example, in 2010, FSIS initiated recalls of over 34.5 million pounds of food, including over 6 million pounds of *Salmonella*-contaminated frozen chicken meals and over 7 million pounds of *E.coli*-contaminated beef products. The total figure does not include currently open recall cases. In some instances, companies were alerted to the contaminated food when officials found patterns of illnesses linked to the products. In other instances, consumers called the company to complain about foreign material—such as pieces of plastic—in the food products. FSIS also identifies problems with products in other ways, such as through regulatory testing, plant or third-party testing, and routine inspection verification activities (see photo above).

inconsistent oversight, ineffective coordination, and inefficient use of resources.[20]

USDA Submitted a Required Report to the Homeland Security Council but Has Not Taken Steps to Implement Its Recommendations

USDA submitted a July 2004 report to the Homeland Security Council that recommended steps the department could take to help the food and agriculture sector protect itself from financial risks resulting from terrorism, but the department has not taken steps to address any of the report's recommendations. Under HSPD-9, the Secretary of Agriculture was responsible for studying and making recommendations to the Homeland Security Council for the use of existing, and the creation of new, financial risk management tools encouraging self-protection for food and agriculture enterprises vulnerable to losses due to terrorism. To fulfill this responsibility, USDA's Risk Management Agency—whose goal is to help agriculture producers manage their business risks—hired a contractor to investigate and develop solutions for the financial risks associated with potential acts of terrorism affecting agriculture. The resulting report made 19 recommendations to USDA—such as appointing an individual to coordinate risk management policy development and implementation for nonfarm agricultural businesses—and found "serious gaps" in the tools and strategies that some agriculture businesses have in place to financially protect themselves against losses resulting from a terrorist attack. According to USDA's OHSEC officials, the department has not taken steps to address the report's recommendations because the Homeland Security Council provided no further direction to USDA as to how to proceed with implementation.

Officials from USDA's Office of the General Counsel told us that numerous USDA disaster and financial assistance programs may be available to help producers recover from a terrorist attack. Before providing such assistance, however, USDA must first determine which specific programs the department is permitted to use given the particular circumstances of the emergency. To make this determination, USDA would review its statutory authorities for each disaster or assistance program and assess whether the circumstances meet each program's eligibility criteria. Officials from USDA's Office of the General Counsel noted that the department would follow this same process regardless of

[20]See GAO-11-278.

the underlying cause of the emergency—whether a natural event or terrorist attack.

USDA Does Not Have a Department-Wide Strategy for Implementing Its HSPD-9 Responsibilities

Despite agencies' efforts to implement USDA's HSPD-9 response and recovery responsibilities, USDA does not have a department-wide strategy for implementing these responsibilities. We previously reported that developing a strategy to accomplish national security goals and desired outcomes helps agencies manage their programs more effectively and is an essential mechanism to guide progress in achieving desired results.[21] Moreover, we have reported that effective strategies help set priorities and allocate resources, including staffing, to inform decision making and help ensure accountability.[22] Such priority setting and resource allocation is especially important in a fiscally constrained environment. However, USDA officials told us that the department did not develop a department-wide strategy for implementing its HSPD-9 responsibilities. Instead, according to a senior official from OHSEC—the USDA office responsible for coordinating HSPD-9 implementation—USDA assigned HSPD-9 implementation responsibilities to its agencies based on their statutory authority and expertise and allowed individual agencies to determine their implementation and budget priorities. In addition, senior OHSEC officials told us that although OHSEC does not specifically oversee agencies' HSPD-9 efforts, it holds monthly meetings where agencies have the opportunity to share information about homeland-security activities generally. OHSEC officials also noted that because food and agriculture defense has not been a primary focus for the National Security Staff over the past few years, OHSEC has been less focused on HSPD-9 oversight and has prioritized other, more recently directed activities, such as a 2007 executive order that promotes education, training, and experience of current and future professionals in national security positions. According to OHSEC officials, USDA would benefit from strategic direction from the National Security Staff with

[21]See GAO, *Combating Terrorism: Evaluation of Selected Characteristics in National Strategies Related to Terrorism*, GAO-04-408T (Washington, D.C.: Feb. 3, 2004); GAO, *Aviation Security: A National Strategy and Other Actions Would Strengthen TSA's Efforts to Secure Commercial Airport Perimeters and Access Controls*, GAO-09-399 (Washington, D.C.: Sept. 30, 2009); GAO, *Rebuilding Iraq: More Comprehensive National Strategy Needed to Help Achieve U.S. Goals*, GAO-06-788 (Washington, D.C.: July 11, 2006).

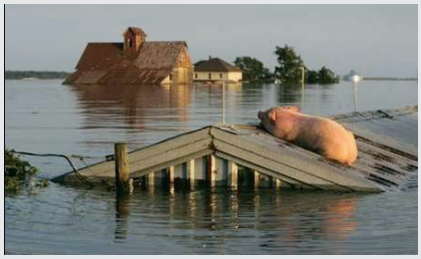
[22]GAO-09-399.

respect to HSPD-9 to help prioritize specific activities and funding decisions, given this time of limited resources. OHSEC officials and senior APHIS officials responsible for emergency planning and coordination told us that USDA would also benefit from strategic planning, but they noted that the department lacks dedicated resources for conducting such planning and has not determined the resources that would be needed to carry out such an effort. Because USDA has not developed a department-wide strategy, it may lack assurance that its agencies' efforts align with departmental priorities and have effectively allocated resources, and the department cannot be assured that it is fulfilling its HSPD-9 responsibilities.

USDA Has Coordinated the Federal Food and Agriculture Response for Various Natural Disasters, but USDA, FEMA, and State Officials Identified Several Challenges

USDA has coordinated the federal food and agriculture capabilities that were needed during numerous recent natural disasters. USDA, FEMA, and state officials involved in these emergencies identified some factors that contributed to the success of these efforts, as well as challenges they experienced. We also found additional management issues related to these ESF-11 coordination efforts.

ESF-11 Activation in Iowa for Flooding



Source: Clean Harbors.

In June 2008, tens of thousands of acres of crop land and swine facilities in Iowa were flooded by heavy rains. Although more than 17,000 swine in the affected area were relocated prior to the flooding, about 4,000 were left behind and became stranded or drowned when levees failed. Under ESF-11, FEMA asked APHIS personnel to assist with trapping, euthanizing, and disposing of the swine and other livestock carcasses, many of which were found beached on the levee or floating in flood waters (as depicted in photos above). USDA's contractor used flat-bottomed airboats to corral carcasses and transport them to dry land, where they could then be moved to an approved landfill. Despite the hot, humid weather, workers wore full personal protective equipment because many of the carcasses were badly decomposed, and the water was assumed to be contaminated with chemicals and sewage. More than 3,000 swine carcasses were removed in the cleanup efforts.

According to information provided by USDA's ESF-11 national coordinator, from 2007 through May 2011, USDA coordinated the ESF-11 response for about 28 natural disasters, including hurricanes, floods, winter storms, and other weather-related emergencies (see app. VII for a list of the 28 emergencies for which ESF-11 was activated). In the event of an emergency, FEMA may activate ESF-11 to coordinate the federal response to address issues that affect agriculture and the food supply, among other things. More specifically, FEMA may issue mission assignments to USDA to undertake three types of activities that are otherwise outside USDA's statutory authority: (1) federal operations support, such as providing personnel to help coordinate state and federal response efforts at regional and national coordinating centers; (2) technical assistance to states by sharing subject matter expertise, for example, on the cleanup of tree debris contaminated with an invasive beetle; and (3) direct federal assistance to help states, such as disposing of animal carcasses that may pose a threat to public health.

USDA, FEMA, and state officials involved in ESF-11 activations identified factors that have contributed to the success of these efforts. For example, USDA, FEMA, and state agriculture officials we interviewed told us that having a single USDA point of contact at the regional level to coordinate with FEMA staff on a state's behalf helped ensure more effective and streamlined communication during emergencies. In addition, USDA officials involved in previous emergencies noted that effective working relationships, both between USDA and FEMA and among federal and state officials, contributed to the success of several ESF-11 activations. Following an ice storm in New England, for example, effective working relationships between USDA and FEMA staff helped facilitate the disposal of tree debris contaminated with Asian long-horned beetles. Iowa officials involved with an ESF-11 response to flooding that affected swine farms told us that having the ESF structure in place was beneficial because it provided a logical and consistent framework for emergency response across states.

ESF-11 Activation in Massachusetts for Ice Storms

Source: Agricultural Research Service, USDA.

In summer 2008, USDA began an eradication program in Massachusetts to quarantine and remove trees infested with the Asian long-horned beetle (pictured above)—an invasive pest that grows and reproduces within trees (such as maple, birch, willow, elm, and ash) and eventually kills the trees. According to USDA, the beetle has the potential to damage such industries as lumber, maple syrup, nursery, and tourism, accumulating over $41 billion in losses. However, in December 2008, New England— including part of the quarantine zone established in Massachusetts for the Asian long-horned beetle— was impacted by a severe winter ice storm, resulting in a significant amount of tree debris (as depicted in photo below). FEMA activated ESF-11 to provide updates on the removal of tree debris, some of which was contaminated with the Asian long-horned beetle. FEMA also gave an ESF-11 mission assignment to USDA to provide technical assistance by helping to produce outreach and awareness materials for distribution to the public to ensure that the beetle outbreak would not spread.

Source: Massachusetts Department of Conservation and Recreation.

However, USDA, FEMA, and state officials involved in ESF-11 activations also identified challenges they experienced, including the following:

Lack of clarity on the type of support provided under ESF-11. USDA, FEMA, and state officials told us that lack of clarity over the type of support that ESF-11 provides has compromised response efforts in Massachusetts, Texas, and Mississippi. For example, FEMA and USDA negotiated for several weeks in the aftermath of a major ice storm affecting New England about what types of activities FEMA could fund through a mission assignment that were not under USDA's statutory authority. Specifically, USDA—through APHIS's mission to control plant pests—had been working in Massachusetts to quarantine an Asian long-horned beetle infestation prior to the storm. However, according to USDA officials involved with the response efforts, the ice storm significantly increased the quantity of tree debris that was part of the quarantine. Quarantined wood could not be sold as firewood, a measure meant to avoid spreading the beetle to other parts of the country. USDA was overwhelmed, and in need of assistance to maintain the quarantine, but USDA officials told us that FEMA could not provide reimbursement to USDA for program activities that were already receiving resources through USDA's nondisaster emergency response funds. FEMA ultimately issued an ESF-11 mission assignment for technical assistance to USDA almost 4 weeks after the ice storm. This provided USDA with additional funds to produce outreach and awareness materials for distribution to the public and to mobilize emergency response personnel to oversee debris removal activities associated with the ice storm. We have previously reported that, in preparing for a disaster, legal authorities and roles and responsibilities must be clearly defined, effectively communicated, and well understood in order to facilitate rapid and effective decision making.[23]

In another example, Texas state officials told us that, after Hurricane Ike in 2008, FEMA did not issue a mission assignment to USDA to provide assistance to round up and relocate roaming cattle because it disagreed with Texas state public safety officials' contention that these cattle were a public safety hazard. Thousands of cattle were stranded on roadways and needed to be moved, identified, and returned to their owners. Officials

[23]GAO, *Catastrophic Disasters: Enhanced Leadership, Capabilities, and Accountability Controls Will Improve the Effectiveness of the Nation's Preparedness, Response, and Recovery System*, GAO-06-618 (Washington, D.C.: Sept. 6, 2006).

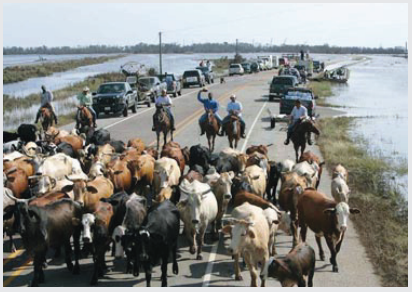
said that one car accident occurred when a vehicle struck a cow wandering on the road. Moreover, according to Texas state officials, many cattle later died from saline toxicity because of the lack of fresh drinking water, thereby adding to the number of carcasses that needed to be disposed of. Ultimately, an association of cattle ranchers helped to corral some of the roaming cattle, and FEMA asked USDA to provide feed to cattle that were stranded on the roads. According to Texas officials, the ESF-11 request process was "overly exhaustive" and potentially cost more time and effort than the benefits of receiving the animal feed. A USDA official expressed regret that USDA was unable to do more to assist the live cattle because providing such assistance was not expensive. According to this official, USDA was not able to provide more assistance because FEMA declared the live cattle to be private property and thus they could not receive assistance under ESF-11. Texas state officials told us that this experience raises questions about the extent to which FEMA will provide assistance for other agriculture-related issues that may arise during emergencies. For example, they questioned whether FEMA would provide generators or fuel to poultry farmers if they were to lose power from strong storms. A power loss could cause poultry houses to overheat, killing thousands of birds. Texas state officials said that they recognize that FEMA does not generally provide assistance to industry, but they also pointed out that agriculture is recognized as critical infrastructure by DHS and affects public safety, animal welfare, and the nation's food supply. According to Texas state officials, this lack of clarity on what type of support ESF-11 provides prevents states from being able to plan accordingly.

A senior official from Mississippi expressed similar concerns related to federal assistance for dairy farms that lose power following a natural disaster. Following Hurricane Katrina in 2005, dairy farmers were unable to milk their cows because they did not have generators or sufficient fuel to power their generators, which were needed to operate milking equipment. USDA officials told us that if dairy cows are not milked within a certain time frame, the cows will become diseased and will need to be slaughtered after several days. According to the Mississippi state official, the state requested generators from FEMA; however, FEMA denied their request because Stafford Act funds—assistance available when the President declares a major disaster—could not be used to purchase equipment for private businesses. State and federal officials told us that, consequently, many farmers sold their cows below market value, causing approximately 50 percent of dairy farms to go out of business. The Mississippi state official added that the dairy industry supplies important food for human nutrition and health and should be considered "public

infrastructure" and thus eligible for Stafford Act funding during emergencies.

Lack of clarity on carcass disposal responsibilities when ESFs are activated. As we previously mentioned, disposal of livestock carcasses infected with animal diseases can impede recovery efforts, but clarity regarding agencies' roles and responsibilities for animal carcass disposal presents additional challenges when ESFs are activated and multiple agencies are involved. Specifically, federal agencies' responsibilities for disposing of animal carcasses following an emergency are not always clear, which has at times impeded an effective ESF-11 response. When ESFs are activated for an emergency, FEMA is responsible for determining which federal agency should conduct carcass disposal as part of response efforts. According to FEMA officials, the disposal of animal carcasses is generally the responsibility of ESF-3, which addresses public works and engineering and is coordinated by the U.S. Army Corps of Engineers. ESF-3 defines livestock or poultry carcasses and plant materials as debris. FEMA officials also told us that, through ESF-11, USDA would coordinate the disposal of diseased animal carcasses or carcasses with chemical, biological, radiological, and nuclear contamination. For the ESF-11 emergencies that we reviewed that involved animal carcasses, FEMA assigned two different USDA agencies—the Natural Resources Conservation Service and APHIS's NVS—with this responsibility. APHIS traditionally disposes of livestock infected with a foreign animal disease through its authority under the Animal Health Protection Act, but none of the animals in the emergencies we reviewed were infected with a foreign animal disease; they had died from drowning or were otherwise impacted by natural disasters. Federal and state officials told us that disposal responsibilities are further complicated by a lack of agreement as to whether carcasses resulting from a natural disaster are considered to be a public health threat. The USDA ESF-11 national coordinator told us that USDA could be asked to conduct carcass disposal when HHS or a state declares the carcasses to be a public health concern; otherwise, the U.S. Army Corps of Engineers is generally responsible. A CDC Web page currently states that animals killed in a natural disaster pose a low risk to human health if proper precautions are taken. Such precautions include practicing proper hand washing and removing animal carcasses to avoid attracting rats. However, according to USDA officials, other federal officials believe that decaying animal carcasses do pose a public health threat, attracting vectors such as rodents and insects, which can carry disease to humans.

ESF-11 Activation in Texas for Hurricane Ike



Source: Texas Parks and Wildlife Department, Photographer Earl Nottingham.

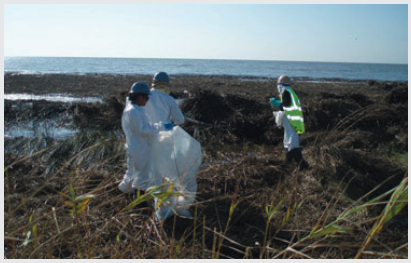
Hurricane Ike hit the Gulf Coast of Texas in September 2008, with a storm surge several miles inland that displaced thousands of livestock, including cattle and horses. Under ESF-11, USDA provided feed for living cattle that were stranded on roads—which was some of the only dry land available for the cattle to roam. In addition, USDA's Natural Resources Conservation Service removed and disposed of livestock carcasses, some of which ended up in residential and public areas, including the grounds of a hospital. USDA officials estimated they retrieved more than 1,300 cattle, horse, and goat carcasses. According to Texas state officials, carcass disposal was complicated because of the difficulty identifying cattle so their owners could be indemnified by the federal government for their losses. Cattle are normally identified by an ear tag or branding. This was difficult, however, because, in some cases, the ear tags were missing or brands could not be read because the cattle carcasses were piled up, missing limbs, and were decaying from sitting in extreme heat (see photo below).

Source: USDA.

The resulting lack of clarity has delayed response efforts during previous emergencies for which ESF-11 was activated. For example, Texas agriculture officials involved with response to Hurricane Ike in 2008 told us that valuable time was lost as federal officials debated whether the U.S. Army Corps of Engineers or USDA should assist with disposal. Ultimately, FEMA asked USDA's Natural Resources Conservation Service to conduct the carcass disposal; however, according to officials from the Natural Resources Conservation Service, they did not receive this mission assignment until several days after the hurricane struck Texas—after the carcasses had already begun to decompose. Officials from the Natural Resources Conservation Service told us that they were frustrated with the time it took FEMA to determine who would conduct carcass disposal efforts, as this delayed their ability to seek and obtain a contractor to conduct the disposal. The cumulative delay impeded recovery. According to Texas state officials, the surge of water from the hurricane washed cattle, horses, and poultry 15 to 20 miles inland, leaving dead livestock in backyards, in front of hospitals, and on roads and highways. Texas state officials told us that because the temperatures were over 100 degrees, the carcasses quickly filled with gas and exploded, becoming "soupy" after a few days, further complicating disposal efforts. It also created a negative public perception of the federal government's disposal efforts. In light of this, Texas state officials told us that, although they would like to continue partnering with the federal government during major emergencies, they have concerns about how disposal would be handled in a future emergency. Moreover, Texas officials stated that they will maintain some level of involvement and responsibility to respond to small, yet high-profile, disposal issues that affect public perception and attract the attention of media and local officials.

ESF-11 Activation in Mississippi for Hurricane Gustav

On September 1, 2008, Hurricane Gustav made landfall in the United States, and federal emergency declarations were made for multiple states, including Mississippi, where the storm washed approximately 2,000 animal carcasses on the beachfront and along the Jordan River. The carcasses were primarily nutria—an invasive semiaquatic rodent (pictured above)—but also included birds, hogs, and a canine. Within several days, residents began complaining of foul odor resulting from the decomposing carcasses, and Mississippi requested federal assistance to help remove them. According to an APHIS after-action report, since biological, physical, and chemical hazards were involved in the carcass removal operations, personnel wore personal protective equipment (pictured below) and worked in inhospitable conditions including 90-degree heat among hundreds of venomous and nonvenomous snakes. Personnel used pitchforks and shovels to place the carcasses in polyethylene barrel liners, sealed the liner openings with duct tape, and then carried them to a polyethylene-lined dumpster for transport to landfills.



Source: Mississippi Department of Agriculture and Commerce (both photos).

Similarly, following Hurricane Gustav in 2008, hundreds of nutria—a large type of rodent—were washed onto Mississippi beaches. According to USDA officials involved with coordinating the emergency, negotiations among federal representatives about who was responsible for disposal delayed and complicated the response. A Mississippi state official told us that the impact of the carcasses was limited, however, because another hurricane hit the area several days later, and the related storm surge carried the remaining carcasses out to sea. We have previously reported that a lack of clarity in leadership roles and responsibilities can result in disjointed federal emergency response efforts among collaborating agencies and confusion about what resources would be provided within specific time frames.[24] To address such a lack of clarity in leadership roles among collaborating agencies, we have reported that a practice to enhance and sustain collaboration is for agencies to work together to define and agree on their respective roles and responsibilities, including how the collaborative effort will be led.[25]

Pet sheltering reimbursement challenges. One of USDA's responsibilities under ESF-11 is to provide for the safety and well-being of household pets during an emergency. However, coordinating this activity can be problematic for USDA because, according to a USDA official, activities to shelter animals that do not meet FEMA's definition of a household pet are not eligible for FEMA or Stafford Act funding. Pet sheltering is an important part of emergency response because some people refuse to evacuate their homes in an emergency if they cannot take their pets with them. In its disaster assistance policy, FEMA defines a household pet as a domesticated animal, such as a dog, cat, bird, rabbit, rodent, or turtle kept in the home, and not intended for commercial purposes. FEMA also reimburses costs for evacuations and sheltering of service animals, such as guide dogs for individuals with impaired vision or hearing. However, according to Mississippi and Texas state officials, evacuees often bring to the shelters numerous animals that are not listed in FEMA's definition, including horses, goats, and potbellied pigs. State officials told us that states and volunteer organizations often still accept all animals brought to shelters, but because FEMA does not provide reimbursement for the care of animals not included in their definition of household pets, states and

[24]See GAO-06-618.

[25]GAO, *Results-Oriented Government: Practices That Can Help Enhance and Sustain Collaboration among Federal Agencies*, GAO-06-15 (Washington, D.C.: Oct. 21, 2005).

volunteer organizations have to absorb the costs for these animals. A Mississippi state official told us that they are not able to estimate the additional costs associated with animals outside of FEMA's definition, largely because they do not track costs by animal.

We also identified additional challenges related to USDA's management of ESF-11, including the following:

Unreliable tracking of emergencies for which ESF-11 was activated. USDA and FEMA data are not sufficiently reliable for reporting the number of times ESF-11 has been activated. Under government auditing standards, management information is to be complete, accurate, and consistent to support performance and decision making.[26] However, USDA and FEMA data on emergencies for which ESF-11 was activated were incomplete, inaccurate, and inconsistent, changing throughout the course of our review. Specifically, USDA officials provided us with three different sets of documents that could be used to track such emergencies: (1) by mission assignments issued by FEMA, (2) by funding received from FEMA per mission assignment, and (3) by USDA after-action reports—documents that summarize information on what went well and what needed improvement during an emergency response to improve future responses. Our review of these documents found that the information on the number of emergencies varied, raising questions about the accuracy of the information they provided us. When we asked USDA about these differences, a senior official stated that the inconsistencies are, in part, a result of changes in management. USDA ultimately provided us with a list of about 28 ESF-11 activations, which is the number we are reporting to provide some context on the number of times these activations have occurred. In addition, FEMA separately provided us with a list of ESF-11 activations that included some emergencies that did not appear in any of the USDA lists we received. According to DHS officials, managing a list of ESF-11 activations is USDA's responsibility as the coordinator of ESF-11. FEMA officials also told us that the system they used to generate the list they provided to us is not intended to track ESF-11 emergencies and that ESF information is not a standard field on FEMA system's search page. Without an accurate count of ESF-11 activations over time, USDA

[26]GAO, *Government Auditing Standards (July 2007 Revision)*, GAO-07-731G (Washington, D.C.: July 2007).

managers may not have the information necessary to request and allocate resources, including staff, for ESF-11 activities.

Lack of efforts to comprehensively identify and address lessons learned. USDA's after-action reporting process is inconsistent and does not include key parties involved in ESF-11 emergency response. USDA policy is to prepare after-action reports following the response to an ESF-11 activation. However, USDA does not always complete these reports after every emergency. USDA completed 14 after-action reports—including one that covered the 2008 hurricane season—for various emergencies even though USDA officials reported to us that ESF-11 has been activated for about 28 emergencies.[27] In addition, the after-action reports that USDA did complete have not always contained the perspectives of key parties involved in the response, such as FEMA officials, relevant USDA officials involved in the emergency at the state level, and state officials. For example, an after-action report prepared for the 2008 hurricane season did not include the perspectives of state officials and, therefore, did not capture the carcass disposal problems that Texas and Mississippi experienced after Hurricanes Ike and Gustav, respectively. Several state and USDA officials that were involved with past emergencies for which ESF-11 was activated told us that they had not been formally asked to provide input on lessons learned, and several state officials also stated that they had not received a copy of a completed after-action report from USDA.

Moreover, our analysis of USDA's after-action reports from 2007 through 2011 found common challenges, including challenges involving communication, technology, and the need for additional training. USDA officials responsible for ESF-11 coordination told us that they address critical issues identified in the after-action reports immediately and that other issues are addressed informally at national conferences. However, these officials also told us that it could be beneficial to have a more structured and consistent way of addressing challenges that arose in past emergencies.

Without a more consistent and comprehensive after-action reporting process, USDA managers may not have the necessary information to

[27]Three of these 28 emergencies occurred in spring 2011 and, therefore, would not have developed after-action reports at the time we completed our audit work.

identify gaps or challenges and address them through corrective actions to help ensure that past mistakes are not repeated. In addition, by not sharing after-action reports with key parties, those parties also may not have information needed to improve coordination and performance in future emergencies for which ESF-11 is activated. In February 2006, a White House report on Hurricane Katrina stated that "too often, after-action reports for exercises and real-world incidents highlight the same problems that do not get fixed."[28] According to the report, all departments and agencies should translate findings of homeland security gaps and vulnerabilities into concrete programs for corrective action that are fully implemented in a timely fashion.

Conclusions

The nation is vulnerable to both intentional and natural threats that could imperil its food and agriculture systems. Since the terrorist attacks of September 11, 2001, the federal government has taken many steps to address this vulnerability, including developing a national policy to defend the food and agriculture systems against terrorist attacks, major disasters, and other emergencies (HSPD-9), as well as strategically organizing resources and capabilities to ensure a more efficient response to such emergencies (ESF-11). However, the Commission on the Prevention of Weapons of Mass Destruction Proliferation and Terrorism gave the nation a failing grade for its capabilities to rapidly respond to and recover from a biological attack. Moreover, natural disasters and diseases also can pose a significant threat to the food and agriculture systems, as demonstrated by Hurricane Katrina, highly pathogenic avian influenza, and food recalls, such as botulinum toxin found in canned hot dog chili sauce in 2007.

Despite these threats, there is currently no centralized coordination to oversee the federal government's overall progress in defending the food and agriculture systems. DHS is responsible for coordinating agencies' overall HSPD-9 implementation efforts but has not done so since 2009. Similarly, the Homeland Security Council has in the past gathered status updates on agency efforts to fulfill its HSPD-9 responsibilities, but the National Security Staff—which now supports the Homeland Security Council—is no longer doing so, and it is not conducting any other interagency process to coordinate HSPD-9 implementation efforts.

[28]The White House, *The Federal Response to Hurricane Katrina: Lessons Learned* (Washington, D.C.: Feb. 26, 2006).

Without coordinated activities to oversee agencies' HSPD-9 implementation efforts, federal decision makers may lack critical information they need to assess how well the nation is prepared for major emergencies and how efficiently agencies are using federal resources to prepare. Moreover, without encouragement from the National Security Staff that agencies should contribute to DHS's coordination efforts, successful coordination efforts to oversee agencies' progress may be limited.

As a leader of our nation's food and agriculture system, USDA has invested considerable time and resources to protect animals, plants, and food. Specifically, APHIS and CDC have taken some steps to leverage the mechanisms and infrastructure of HHS's Strategic National Stockpile, as directed by HSPD-9, but confusion and disagreement may be impeding efforts to further identify leveraging opportunities. Unless the departments formally determine whether such opportunities exist, they cannot be assured that they are taking advantage of all opportunities to make efficient use of federal resources.

In addition, USDA faces two important implementation challenges that could impact its ability to recover from a high-consequence plant disease outbreak. First, ARS has no documented, systematic process for tracking research gaps identified in the NPDRS recovery plans and for monitoring whether these gaps have been filled. Without such a process, USDA may lack critical information needed to help the nation recover from a high-consequence plant disease. Second, key state and federal plant health officials lack awareness of NPDRS recovery plans, potentially leaving them without the necessary information to facilitate recovery from high-consequence plant diseases.

More broadly, USDA does not have a department-wide strategy for setting priorities and allocating resources, including staffing, for implementing its numerous HSPD-9 responsibilities. Instead, USDA assigned HSPD-9 implementation responsibilities to its agencies and allowed them to determine their implementation and budget priorities. Without such a strategy, USDA lacks assurance that its agencies are making progress to align with departmental priorities, that its efforts are adequately staffed, and that it is fulfilling its HSPD-9 responsibilities. Setting priorities is especially critical in a fiscally constrained environment.

USDA has also faced challenges to effective coordination of ESF-11 responses to various natural disasters affecting food and agriculture, as it did after two hurricanes in 2008 when the federal government lost

valuable time as FEMA decided which agency should take the lead in disposing of animal carcasses. Although FEMA would be responsible for determining which agency is responsible for carcass disposal if ESF-11 were activated, it has not clarified the roles and responsibilities that key agencies will have for the disposal of animal carcasses during emergencies for which ESF-11 is activated. Absent such clarification, agencies may not be adequately prepared to quickly respond, and decomposing animal carcasses may threaten public safety and health.

In addition, USDA has not consistently prepared after-action reports for all emergencies involving ESF-11 activations and has not always incorporated the perspectives of key parties involved in each activation or shared the completed reports with them. These reports are important for addressing identified gaps or challenges through corrective actions to help ensure that past mistakes are not repeated. For example, consistently completed after-action reports that include the perspectives of key parties involved in each activation may help to bring issues, such as challenges with pet sheltering, to the attention of USDA managers. Without a more consistent and comprehensive after-action reporting process that includes completing a report for all ESF-11 activations, incorporating the perspectives of key parties, and providing completed reports to key parties, USDA managers may not have the necessary information to identify gaps or challenges and address them through corrective actions to help ensure that past mistakes are not repeated. Key parties may also not have all of the information they need to improve coordination and performance in future emergencies for which ESF-11 is activated. Moreover, USDA did not provide a complete and accurate count of ESF-11 activations over time. Government auditing standards call for management information to be complete, accurate, and consistent to support performance and decision making. However, without an accurate count of ESF-11 activations over time, USDA managers may not have the information and sufficiently reliable data necessary to request and allocate resources, such as staff, for ESF-11 activities.

Recommendations for Executive Action

We are making the following nine recommendations:

To help ensure that the federal government is effectively implementing the nation's food and agriculture defense policy, we recommend that:

- the Secretary of Homeland Security resume DHS's efforts to coordinate agencies' overall HSPD-9 implementation efforts.

- the Homeland Security Council direct the National Security Staff to establish an interagency process that would provide oversight of agencies' implementation of HSPD-9.

- the Homeland Security Council direct the National Security Staff to encourage agencies to participate in and contribute information to DHS's efforts to coordinate agencies' implementation of HSPD-9.

To ensure the most effective use of resources and to resolve any confusion, we recommend that:

- the Secretaries of Agriculture and Health and Human Services jointly determine on a periodic basis if there are appropriate opportunities for the NVS to leverage Strategic National Stockpile mechanisms or infrastructure as directed by HSPD-9. If such opportunities exist, the two agencies should formally agree upon a process for the NVS to use the identified mechanisms and infrastructure.

To help ensure that the nation is adequately prepared to recover from high-consequence plant diseases, we recommend that:

- the Secretary of Agriculture direct the Administrator of ARS, in coordination with relevant USDA agencies, to develop and implement a documented, systematic process to track research gaps identified in the NPDRS recovery plans and monitor progress in filling these gaps.

- the Secretary of Agriculture direct the Administrator of ARS, in coordination with relevant USDA agencies, to develop and implement a mechanism to ensure NPDRS recovery plans are shared with key state and federal plant health officials.

To ensure that USDA is fulfilling its responsibilities to protect the nation's food and agriculture systems, we recommend that:

- the Secretary of Agriculture develop a department-wide strategy for implementing its HSPD-9 responsibilities. Such a strategy would include an overarching framework for setting priorities, as well as allocating resources.

To expedite response and recovery from major emergencies, we recommend that:

- the Secretary of Homeland Security direct the Administrator of FEMA, in coordination with key agencies to provide guidance that clarifies the roles and responsibilities agencies will have regarding the disposal of animal carcasses in emergencies for which ESF-11 is activated.

To improve USDA's performance as ESF-11 coordinator and to address issues experienced by key parties, such as challenges with pet sheltering, we recommend that:

- the Secretary of Agriculture develop a process for ensuring that (1) following all ESF-11 activations, after-action reports are consistently completed and shared with key parties involved in each activation; (2) the perspectives of key parties are incorporated in these reports; (3) any identified gaps or challenges are addressed through corrective actions; and (4) the completed after-action reports are used to provide a complete, accurate, and consistent count of ESF-11 activations over time, in turn producing sufficiently reliable data on ESF-11 activations.

Agency Comments and Our Evaluation

We provided the Departments of Agriculture, Health and Human Services, and Homeland Security; the Environmental Protection Agency; and the National Security Staff a draft of this report for their review and comment. USDA, HHS, and DHS generally concurred with the recommendations and provided written comments on the draft, which are summarized below and presented in their entirety in appendixes VIII, IX, and X, respectively, of this report. In addition, in an e-mail received July 22, 2011, the National Security Staff's Deputy Legal Advisor stated that the National Security Staff agrees that a review of HSPD-9 is appropriate and that they will look for an opportunity to do so. USDA, HHS, DHS, EPA, and the National Security Staff provided technical comments, which we incorporated as appropriate.

USDA agreed with the report's five recommendations to the department. In commenting on our recommendation that USDA and HHS jointly determine if there are opportunities for the NVS to leverage Strategic National Stockpile mechanisms or infrastructure, USDA officials confirmed that they have collaborated with CDC officials since the inception of the NVS in 2006 and noted that they met with CDC officials in February 2011 to discuss the possibility of resource sharing. We modified our report to include information about this February 2011 meeting. USDA also stated in its written comments that the agency will continue to work with CDC to explore leveraging opportunities between the two agencies and will document the process for using CDC's resources or the findings

if there are no such opportunities, as appropriate. In response to our recommendation that USDA develop and implement a mechanism to ensure NPDRS recovery plans are shared with key state and federal plant health officials, USDA commented that it will expand the department's efforts to share NPDRS recovery plans more broadly. As our report states, USDA and state plant health officials we met with all had limited or no knowledge about NPDRS recovery plans, even though ARS officials were sharing plans through a variety of venues. In commenting on our recommendation that USDA take steps to enhance its after-action reporting process, USDA officials stated that they have been meeting regularly to discuss any identified gaps or challenges and plans for executing appropriate corrective actions; however, they also stated that they will seek even broader input to the after-action reports and that they will e-mail the after-action reports directly to ESF-11 stakeholders. Moreover, officials commented that the after-action reporting processes allow for the compilation of complete, accurate, consistent, and reliable data on ESF-11 activations. We agree that this could be a sufficiently reliable source of data; however, as our report states, USDA provided us with three different sets of documents that could be used to track ESF-11 emergencies, which showed inconsistent information on the number of such emergencies and raised questions about the accuracy of the information USDA officials provided to us. We continue to believe that if USDA consistently completes after-action reports, the agency can provide a complete, accurate, and consistent count of ESF-11 activations over time.

HHS agreed with the report's recommendation that USDA and HHS jointly determine if there are opportunities for the NVS to leverage Strategic National Stockpile mechanisms or infrastructure. In commenting on our report, HHS stated that, to date, it has not identified opportunities for resource sharing but that if an opportunity arises in the future, as determined by HHS and USDA, HHS will work to ensure that the appropriate interagency agreements are in place. We view this as a positive step, but we continue to believe that the departments have not yet arrived at a joint determination about what resources are appropriate for the NVS to leverage. Also in its comments, HHS stated that the specific areas cited in the report where leveraging can occur are incorrect. As stated in our report, the two examples we provide are from the perspective of APHIS officials, further demonstrating that there is not yet a joint determination about what resources are appropriate to leverage. As a result, we modified our report to clarify that, at this time, there appears to be some confusion about the details of the NVS's and Strategic National Stockpile's mission and infrastructure that may be

impeding the agencies' efforts to further leverage the stockpiles. In addition, we modified the recommendation to clarify that it is intended to resolve any confusion between USDA and HHS and that they should jointly determine on a periodic basis whether there are opportunities for the NVS to leverage Strategic National Stockpile resources.

DHS agreed with the report's recommendations that DHS resume the department's efforts to coordinate agencies' overall HSPD-9 implementation efforts and that DHS provide guidance that clarifies the roles and responsibilities agencies will have regarding the disposal of animal carcasses in emergencies for which ESF-11 is activated. In commenting on our recommendations, DHS stated that it was pleased with GAO's characterization of DHS's role in protecting the nation's food and agriculture systems and responding to terrorist attacks and major disasters. DHS also commented that it will continue to support the coordination of overall HSPD-9 implementation efforts. Moreover, DHS stated that FEMA will work with and provide guidance to federal partners clarifying roles and responsibilities for animal carcass disposal and noted that, to fulfill this recommendation, its federal partners will need to review their authorities and determine their agencies' specific responsibilities during ESF-11 activations.

As agreed with your office, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies to the appropriate congressional committees; the Secretaries of Agriculture, Health and Human Services, and Homeland Security; the Administrator of the Environmental Protection Agency; the Executive Secretary for the National Security Staff; and other interested parties. In addition, this report will be available at no charge on the GAO Web site at http://www.gao.gov.

If you or your staff members have any questions about this report, please contact me at (202) 512-3841 or shamesl@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix XI.

Sincerely yours,

Lisa Shames
Director, Natural Resources
and Environment

Appendix I: Federal Agencies Roles and Responsibilities for Food and Agriculture Defense as Defined by HSPD-9

Agency responsibilities	Department of Homeland Security	Department of Agriculture	Department of Health and Human Services	Environmental Protection Agency	Department of the Interior	Department of Justice	Department of Education	Central Intelligence Agency	White House Office of Science and Technology Policy	Other
Awareness and Warning										
Develop surveillance and monitoring systems for animal, plant, and wildlife disease, as well as food, public health, and water quality for early detection and awareness of disease, pest, or poisonous agents		●	●	●	●					●
Develop systems to track specific animals and plants, as well as specific commodities and food		●	●	●	●					●
Develop nationwide laboratory networks for food, veterinary, plant health, and water quality that are interconnected and standardized		●	●	●	●					●
Develop and enhance intelligence operations and analysis capabilities for agriculture, food, and water sectors	●	○	○	○		●		●		
Develop new biological threat awareness capacity to enhance detection and characterization of an attack	●	○	○	○						○
Vulnerability Assessments										
Expand and continue vulnerability assessments of the agriculture and food sectors	●	●	●							
Mitigation Strategies										
Prioritize, develop, and implement mitigation strategies to protect vulnerable critical production nodes from the introduction of diseases, pests, or poisonous agents	●	○	○	○		●		○		○
Expand development of common screening procedures for agriculture and food items entering the United States and maximize effective domestic inspection activities for food items within the United States	●	●	●							
Response and Recovery										
Develop a National Veterinary Stockpile containing sufficient amounts of animal vaccine, antiviral, or therapeutic products to respond to the most damaging animal diseases affecting human health and the economy	○	●	○	○						
Develop a National Plant Disease Recovery System capable of responding to a high-consequence plant disease with pest control measures and the use of resistant seed varieties	○	●	○	○						
Enhance recovery systems to stabilize agriculture production, the food supply, and the economy, including disposal and decontamination procedures	○	●	●	○						

	Department of Homeland Security	Department of Agriculture	Department of Health and Human Services	Environmental Protection Agency	Department of the Interior	Department of Justice	Department of Education	Central Intelligence Agency	White House Office of Science and Technology Policy	Other
Response and Recovery (continued)										
Study and make recommendations to the Homeland Security Council for the use of financial risk management tools for self-protection of food and agriculture enterprises vulnerable to losses due to terrorism		●								
Ensure adequate federal, state, and local response capabilities to respond quickly and effectively to a terrorist attack, major disease outbreak, or other disaster affecting the national agriculture or food infrastructure	●	○	○	○		○				
Develop a coordinated agriculture and food-specific standardized response plan to be integrated into the National Response Plan[a]	●	○	○	○		○				
Outreach and Professional Development										
Establish an effective information sharing and analysis mechanism for agriculture and food in cooperation with appropriate private sector entities	●	○	○							○
Develop and promote higher education programs for the protection of animal, plant, and public health	○	●	●				○			
Develop and promote higher education programs to address protection of the food supply	○	●	●				○			
Establish opportunities for professional development and specialized training in agriculture and food protection	●	●	●							
Research and Development										
Accelerate and expand development of countermeasures against the intentional introduction or natural occurrence of catastrophic animal, plant, and zoonotic diseases	●	●	●	●					○	●
Develop a plan to provide safe, secure, and state-of-the-art agriculture biocontainment laboratories to research and develop diagnostic capabilities for foreign animal and zoonotic diseases	●	●								
Establish university-based centers of excellence in agriculture and food security	●	○	○							
Budget										
Submit an integrated budget plan for defense of the U.S. food system	●	●	●							

● Primary Responsibility for Task Execution ○ Support Task Execution

Source: GAO analysis of HSPD-9.

[a]The National Response Plan was replaced by the National Response Framework in 2008.

Appendix II: The 15 Emergency Support Functions (ESF), ESF Coordinators, and ESF Responsibilities

ESF-1: Transportation

Coordinator: Department of Transportation

- Aviation/airspace management and control
- Transportation safety
- Restoration and recovery of transportation infrastructure
- Movement restrictions
- Damage and impact assessment

ESF-2: Communications

Coordinator: Department of Homeland Security

- Coordination with telecommunications and information technology industries
- Restoration and repair of telecommunications infrastructure
- Protection, restoration, and sustainment of national cyber and information technology resources
- Oversight of communications within the federal incident management and response structures

ESF-3: Public Works and Engineering

Coordinator: Department of Defense (U.S. Army Corps of Engineers)

- Infrastructure protection and emergency repair
- Infrastructure restoration
- Engineering services and construction management
- Emergency contracting support for lifesaving and life-sustaining services

ESF-4: Firefighting

Coordinator: Department of Agriculture (U.S. Forest Service)

- Coordination of federal firefighting activities
- Support to wildland, rural, and urban firefighting operations

ESF-5: Emergency Management

Coordinator: Department of Homeland Security (Federal Emergency Management Agency)

- Coordination of incident management and response efforts
- Issuance of mission assignments
- Resource and human capital
- Incident action planning
- Financial management

ESF-6: Mass Care, Emergency Assistance, Housing, and Human Services

Coordinator: Department of Homeland Security (Federal Emergency Management Agency)

- Mass care
- Emergency assistance
- Disaster housing
- Human services

ESF-7: Logistics Management and Resource Support

Coordinator: General Services Administration and Department of Homeland Security (Federal Emergency Management Agency)

- Comprehensive, national incident logistics planning, management, and sustainment capability
- Resource support (facility space, office equipment and supplies, contracting services, etc.)

ESF-8: Public Health and Medical Services

Coordinator: Department of Health and Human Services

- Public health
- Medical
- Mental health services
- Mass fatality management

ESF-9: Search and Rescue

Coordinator: Department of Homeland Security (Federal Emergency Management Agency)

- Lifesaving assistance
- Search and rescue operations

ESF-10: Oil and Hazardous Materials Response

Coordinator: Environmental Protection Agency

- Oil and hazardous materials (chemical, biological, radiological, etc.) response
- Environmental short- and long-term cleanup

ESF-11: Agriculture and Natural Resources

Coordinator: Department of Agriculture

- Nutrition assistance
- Animal and plant disease and pest response
- Food safety and security
- Natural and cultural resources and historic properties protection
- Safety and well-being of household pets

ESF-12: Energy

Coordinator: Department of Energy

- Energy infrastructure assessment, repair, and restoration
- Energy industry utilities coordination
- Energy forecast

ESF-13: Public Safety and Security

Coordinator: Department of Justice

- Facility and resource security
- Security planning and technical resource assistance
- Public safety and security support
- Support to access, traffic, and crowd control

ESF-14: Long-Term Community Recovery

Coordinator: Department of Homeland Security (Federal Emergency Management Agency)

- Social and economic community impact assessment
- Long-term community recovery assistance to states, tribes, local governments, and the private sector
- Analysis and review of mitigation program implementation

ESF-15: External Affairs

Coordinator: Department of Homeland Security

- Emergency public information and protective action guidance
- Media and community relations
- Congressional and international affairs
- Tribal and insular affairs

Source: National Response Framework, 2008.

Appendix III: Objectives, Scope, and Methodology

Our objectives were to (1) evaluate the extent to which there is oversight of federal agencies' overall progress in implementing the nation's food and agriculture defense policy; (2) evaluate the steps the U.S. Department of Agriculture (USDA) has taken to implement its response and recovery responsibilities outlined in this policy, and identify challenges, if any, that the department faces in implementing these responsibilities; and (3) identify the circumstances under which USDA has coordinated the federal food and agriculture response during an emergency for which ESF-11 was activated, and challenges, if any, that the parties involved experienced.

For our first objective regarding oversight of federal agencies' overall progress in implementing Homeland Security Presidential Directive (HSPD) -9, we reviewed presidential directives, including HSPDs 1, 5, 7, 8, and 9, which define agency roles in homeland security and food and agriculture defense. In addition, we compared federal efforts with those outlined in the *Standards for Internal Control in the Federal Government*.[1] We interviewed officials from USDA, the Department of Homeland Security (DHS), the Department of Health and Human Services (HHS), and the Environmental Protection Agency (EPA)—chosen because they have the most HSPD-9 responsibilities—and received written responses from each of the four agencies about how they view federal oversight and coordination. We also analyzed status reports these agencies provided to the Homeland Security Council between 2007 and early 2009. We also met with an official from the National Security Staff—which now supports the Homeland Security Council—to discuss any current efforts they are coordinating to oversee agencies' HSPD-9 implementation progress.

For our second objective regarding the steps USDA has taken to implement its HSPD-9 response and recovery responsibilities, we reviewed relevant laws, regulations, and presidential directives, including the Animal Health Protection Act, FDA Food Safety Modernization Act, Public Health Security and Bioterrorism Preparedness and Response Act of 2002, the *Biennial Review and Republication of the Select Agent and Toxin List*, and HSPD-9 and HSPD-1. We also reviewed federal guidance, planning, and implementation documents, including the Federal Food and Agriculture Decontamination and Disposal Roles and Responsibilities document, DHS's National Response Framework, DHS's

[1]See GAO/AIMD-00-21.3.1.

and the Department of Housing and Urban Development's draft National Disaster Recovery Framework, various National Animal Health Emergency Management System guidelines, USDA agencies' and offices' strategic plans, various federal departments' HSPD-9 implementation progress reports, various USDA financial disaster assistance programs, and the National Veterinary Stockpile's (NVS) service contracts for transportation and commercial support services. In addition, we reviewed and analyzed various documents including: USDA's Risk Management Agency's report on Managing the Financial Risks of Terrorist Acts against Agriculture, National Plant Disease Recovery System (NPDRS) recovery plans, NVS state planning documents, and the NVS's contracts for vaccines. To determine how USDA agencies allocated and obligated funds to develop the NVS and NPDRS, we requested and reviewed budget data provided by the Animal and Plant Health Inspection Service (APHIS) and the Agricultural Research Service (ARS).

For our second objective, we also interviewed officials from USDA agencies responsible for implementing the department's response and recovery responsibilities, and we interviewed relevant officials from DHS and HHS regarding USDA's interagency coordination efforts and received written responses from DHS, HHS, and EPA about how they view interagency coordination (see table 1 for a complete list of agencies and offices we interviewed). To inform this objective, we also interviewed USDA officials from the department's two regional offices in North Carolina and Colorado and, while in these two states, we also spoke with state-level agriculture and emergency management officials. In addition, we conducted interviews with officials representing industry associations for the top five U.S. agricultural commodities, as determined by cash receipt data available from USDA's Economic Research Service—cattle and calves, corn, soybeans, dairy products, and broiler chickens—about the impact of USDA's agriculture and food emergency response and recovery efforts on industry. We also met with officials from various relevant professional associations to learn more about USDA's HSPD-9 implementation efforts and any challenges or gaps related to these efforts (see table 2 for a complete list of organizations we interviewed). In addition, we met with officials from two DHS Centers of Excellence regarding food recalls and animal diseases, as well as veterinary specialists from a land grant university whom we selected for their technical expertise and previous experience working with USDA on emergency response and recovery issues. We also attended exercises, including a joint state-federal exercise on plant disease and a national-

level exercise, and we reviewed lessons learned from previous key exercises.

Moreover, for our second objective, we conducted a survey of animal health officials from all 50 states and five U.S. territories. The survey gathered information about states' and U.S. territories' perspectives regarding the NVS. The five territories we surveyed were: American Samoa, the Commonwealth of the Northern Mariana Islands, the Commonwealth of Puerto Rico, Guam, and the Virgin Islands. We did not survey the District of Columbia because, according to the District of Columbia's lead veterinary medical officer, livestock are not permitted in the District, and federal agencies are responsible for responding to and recovering from any foreign animal disease outbreak that affects the National Zoological Park or the National Aquarium in the District of Columbia. We received responses from 52 of 55 animal health officials surveyed, for an overall response rate of 95 percent. More specifically, we received completed surveys from 49 of the 50 states and from three of the five territories. We did not receive survey responses from one state, Georgia, and two territories, Guam and the Commonwealth of the Northern Mariana Islands. Because we surveyed the universe of state and U.S. territory animal health officials from all 50 states and five territories, our survey was not a sample survey and, therefore, had no sampling errors. However, the practical difficulties of conducting any survey may introduce other types of errors, commonly referred to as nonsampling errors. For example, difficulties in interpreting a particular question, sources of information available to respondents, or entering data into a database or analyzing them can introduce unwanted variability into the survey results. We took steps in developing the questionnaire, collecting the data, and analyzing them to minimize such nonsampling errors. For example, a social science survey methodologist helped design the questionnaire in collaboration with GAO staff that had subject-matter expertise. The questionnaire was also reviewed by an independent GAO survey specialist. The survey asked a combination of questions that allowed for open-ended and close-ended responses. We pretested the content and format of the questionnaire with four animal health officials—selected to represent both large and small agriculture producing states, as well as states with a variety of experience working with the NVS—to ensure that (1) the survey questions were clear, (2) the terms we used were precise, (3) the questionnaire did not place an undue burden on the respondents, and (4) the questions were unbiased. We received input on the survey and made changes to the content and format of the final questionnaire based on our pretest results. Since there were relatively few changes based on the pretests and we were conducting surveys with

the universe of respondents—all state and U.S. territory animal health officials—we did not find it necessary to conduct additional pretests.

Following this work on developing a questionnaire to collect data in a standardized and structured manner, we sent the questionnaire by e-mail on November 16, 2010, in an attached Microsoft Word form that respondents could return electronically after marking checkboxes or entering narrative responses into open-answer boxes. Follow-up e-mail messages or telephone calls were placed to respondents when answers were unclear or questions were unanswered. We analyzed the frequency and distribution of marked checkbox responses. We also conducted a content analysis on the open-ended narrative responses for trends and recurring themes. Data analysis was conducted by a GAO data analyst working directly with GAO staff with subject-matter expertise. A second, independent, analyst checked all of the computer programs for accuracy.

For our third objective regarding the circumstances under which USDA has coordinated the federal food and agriculture response during an emergency for which ESF-11 was activated, we reviewed DHS's National Response Framework, including ESF-11, ESF-3, and ESF-6; the Stafford Act; and FEMA's Disaster Assistance Policy. We also reviewed and analyzed ESF-11-related mission assignments given to USDA by FEMA and after-action reports created by USDA for emergencies for which ESF-11 was activated. In addition, we interviewed relevant officials from USDA—including from APHIS's office of Animal Care, the Food and Nutrition Service, and the Food Safety Inspection Service—and FEMA about coordination with each other and with states and regarding challenges related to ESF-11. We also requested and reviewed documents provided by both USDA and FEMA with the number of times ESF-11 has been activated since 2007. We compared the ESF-11 activations from USDA's and FEMA's lists to determine the extent to which the same events appeared in all data sets. As we are reporting, we found that the data are not sufficiently reliable for reporting purposes. USDA ultimately provided us with a list of about 28 ESF-11 activations, which is the number we are reporting to provide some context on the number of times these activations have occurred. We are making a recommendation regarding this finding. We did not review aspects of ESF-11 pertaining to the protection of natural and cultural resources and historic properties because our review focuses on emergencies affecting agriculture and food.

For our third objective, we also conducted interviews in person or via telephone with federal and state agriculture and emergency management

officials from a nonprobability sample of four states—Iowa, Massachusetts, Mississippi, and Texas—about their experience working with USDA and FEMA. We used a multistep process to select these four states:

- First, we listed the states and territories that have experienced past emergencies for which ESF-11 was activated, which were determined by reviewing USDA-provided after-action reports.
- Second, we narrowed that list down to states in which USDA conducted on-the-ground activities, which again was determined by reviewing USDA-provided after-action reports.
- Third, we divided the remaining states into two groups: those in USDA's Eastern Region and those in USDA's Western Region to ensure that the selected states represented both regions.
- Fourth, we identified the reason for each ESF-11 activation—information that we obtained by reviewing USDA-provided after-action reports—to ensure that the states we selected experienced different types of emergencies.
- Finally, we considered the states that have used available resources from the NVS, based on information provided by APHIS officials.

Within each state, we interviewed relevant federal and state officials involved with the ESF-11 activations, such as state plant and animal officials, emergency management officials, USDA state and regional officials, and FEMA regional officials (see tables 1-3 for a complete list of departments, agencies, and organizations we interviewed). To maximize our resources and because HSPD-9 states that the Secretary of Agriculture shall work with state governments, among others, to develop the NVS and NPDRS, we also interviewed some of these federal and state officials regarding issues related to our second objective.

We conducted this performance audit from June 2010 to August 2011, in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Table 1: Departments, Agencies, and Offices Interviewed

Department	Component/agency
U.S. Department of Agriculture	Agricultural Research Service
	• Office of Pest Management Policy
	Animal and Plant Health Inspection Service (APHIS), Animal Care
	• APHIS Animal Care Eastern Regional Office
	• APHIS Animal Care Western Regional Office
	Animal and Plant Health Inspection Service, Emergency Management Leadership Council
	Animal and Plant Health Inspection Service, ESF-11 Coordinators
	• ESF-11 National Coordinator
	• ESF-11 Eastern Region Coordinator
	• ESF-11 Western Region Coordinator
	• ESF-11 Coordinator for FEMA Region I
	• ESF-11 Coordinator for FEMA Region IV
	• ESF-11 Coordinator for FEMA Region VI
	• ESF-11 Coordinator for FEMA Region VII
	Animal and Plant Health Inspection Service, Plant Protection and Quarantine (PPQ)
	• APHIS PPQ Eastern Regional Office
	• APHIS PPQ Western Regional Office
	• APHIS PPQ state office in Colorado
	• APHIS PPQ state office in Iowa
	• APHIS PPQ state office in Massachusetts
	• APHIS PPQ state office in Mississippi
	• APHIS PPQ state office in North Carolina
	• APHIS PPQ state office in Texas
	Animal and Plant Health Inspection Service, National Veterinary Stockpile
	Animal and Plant Health Inspection Service, Veterinary Services (VS)
	• APHIS VS Eastern Regional Office
	• APHIS VS Western Regional Office
	• APHIS VS state office in Colorado
	• APHIS VS state office in Iowa
	• APHIS VS state office in Mississippi

Department	Component/agency
	• APHIS VS state office in North Carolina
	• APHIS VS state office in Texas
	Animal and Plant Health Inspection Service, Veterinary Services, National Veterinary Services Laboratories
	Departmental Management, Office of Homeland Security and Emergency Coordination
	Farm Service Agency
	Food and Nutrition Service
	• Food and Nutrition Service North East regional office
	Food Safety and Inspection Service
	• Food Safety Inspection Service district office in North Carolina
	• Food Safety Inspection Service district office in Colorado
	• Office of Program Evaluation, Enforcement, and Review
	• Office of Data Integration and Food Protection
	• Office of Field Operations
	National Institute of Food and Agriculture
	Natural Resources Conservation Service
	Office of the General Counsel
	Risk Management Agency
Department of Health and Human Services	Centers for Disease Control and Prevention, Strategic National Stockpile
	Food and Drug Administration
Environmental Protection Agency	Office of Homeland Security
	Office of Solid Waste and Emergency Management
	Office of Chemical Safety and Pollution Prevention
	Office of Research and Development
Department of Homeland Security	Federal Emergency Management Agency
	• FEMA Region I
	• FEMA Region VI
	• Grant Programs Division
	• Recovery Directorate
	• Response Directorate
	Office of Health Affairs
	Office of General Counsel

Source: GAO.

Table 2: Organizations Interviewed

American Association of Swine Veterinarians
American Phytopathological Society
American Soybean Association
DHS Center of Excellence, National Center for Food Protection and Defense
DHS Center of Excellence, Foreign Animal and Zoonotic Disease Defense
Iowa Pork Producers Association
Iowa State University, Center for Food Security and Public Health
National Association of State Departments of Agriculture
National Cattlemen's Beef Association
National Chicken Council
National Corn Growers Association
National Milk Producers Federation
National Plant Board
National Pork Board

Source: GAO.

Table 3: State Agencies Interviewed

State	Department/agency
Colorado	Department of Agriculture
Iowa	Department of Agriculture and Land Stewardship
	Department of Inspections and Appeals
	Department of Public Defense
Massachusetts	Department of Agricultural Resources
	Department of Conservation and Recreation
Mississippi	Board of Animal Health
	Department of Agriculture and Commerce
North Carolina	Department of Agriculture and Consumer Services
	Department of Crime Control and Public Safety
Texas	Animal Health Commission
	Department of Agriculture
	Department of Public Safety

Source: GAO.

Appendix IV: Seventeen Most Damaging Animal Diseases Identified for USDA's National Veterinary Stockpile

Animal disease	Animals affected	Route of transmission	Risk to human health
Highly pathogenic avian influenza	Chicken, turkey, wild birds, water fowl	Body fluids; aerosols; fomites	Yes, may be lethal
Foot-and-mouth disease	All cloven hoofed animals including cattle, sheep, goats, pigs	Aerosol; direct contact; ingestion; fomites	No
Rift Valley fever	Cattle, sheep, goats, dogs, cats, camels, monkeys	Insect vectors (mosquitoes); direct contact with blood or tissue	Yes, may be lethal
Exotic Newcastle disease	Poultry, other avian species	Direct contact with body fluids; aerosols; feces or respiratory droplets	Yes, minor effects
Nipah virus and Hendra virus	For Nipah virus: pigs, horses, cats, dogs. For Hendra virus: horses, cats, guinea pigs	For Nipah virus: close direct contact with contaminated tissue or body fluids. For Hendra virus: direct contact; oranasal; ingestion of contaminated material; fruit bats	Yes, may be lethal
Classical swine fever	Domestic pigs	Ingestion (uncooked garbage); fomites; aerosol; direct contact	No
African swine fever	Domestic and wild pigs; wart hogs	Direct contact with body fluids, especially blood; fomites; tick vectors	No
Bovine spongiform encephalopathy	Cattle	Ingestion of infected cattle products (meat, bone-meal, nervous tissue)	Suspected
Rinderpest	Cattle, sheep, goats	Direct or close contact with body fluids	No
Japanese encephalitis	Horses, pigs	Mosquitoes	Yes, may be lethal
African horse sickness	Horses, zebras, donkeys, mules, camels	*Culicoides* midges, mechanically by other insects	No
Venezuelan equine encephalitis	All equine, bats, birds, rodents	Mosquito (vectors) infected with virus	Yes, may be lethal
Contagious bovine pleuropneumonia	Cattle	Close contact with respiratory droplets and other body fluids	No
Ehrlichia ruminantium (Heartwater)	Cattle, sheep, goats, wild ruminants	Ticks	No
Eastern equine encephalitis	Horses	Vectors infected with virus	Yes, may be lethal
Coxiella burnetii	Cattle, sheep, goats, dogs, cats, rodents, rabbits	Arthropods: ticks; inhalation; infected animal body fluids (urine, milk, blood, birthing)	Yes, may be lethal
Akabane virus	Cattle, sheep, goats	Unknown, thought to be various species of mosquitoes	No

Sources: GAO analysis of materials obtained from NVS, Iowa State University's Center for Food Security and Public Health, and federal regulations.

Note: These diseases are also select agents. Select agents are biological agents and toxins (1) that have the potential to pose a severe threat to public health and safety, to animal or plant health, or to animal or plant products, and (2) whose possession, use, and transfer are regulated by select agent rules (7 C.F.R. pt. 331, 9 C.F.R. pt. 121, and 42 C.F.R. pt. 73). The CDC and USDA maintain a list of select agents and toxins. Congress passed several laws—including the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Bioterrorism Act) [1]—that strengthened the oversight and use of select agents.

[1]Pub. L. No. 107-188, 116 Stat. 594, 637-662 (June 12, 2002).

Appendix V: Survey of State and U.S. Territory Animal Health Officials

United States Government Accountability Office

Survey of Animal Health Officials regarding the National Veterinary Stockpile

Introduction

The U.S. Government Accountability Office (GAO) is an independent, non-partisan legislative branch agency that assists the Congress in evaluating how the federal government spends taxpayer dollars. GAO supports the Congress in meeting its constitutional responsibilities and to help improve the performance and ensure the accountability of the federal government for the benefit of the American people.

In response to a congressional request, we are evaluating federal agriculture and food response and recovery efforts, including the National Veterinary Stockpile (NVS). The NVS is the nation's repository of veterinary countermeasures, including supplies, equipment, field tests, vaccines, and commercial support services. It exists to provide States and Territories the resources they need to respond to catastrophic animal disease outbreaks that terrorists or nature may create.

The goal of this survey is to gain your perspective regarding the NVS. You were selected for this survey because you were identified as the key contact in your State (including the District of Columbia) or U.S. Territory for the NVS.

Deadline

To assist us, we ask that you complete and return this survey by **December 3, 2010.**

Instructions for Completing This Survey

You can answer most of the questions easily by checking boxes. A few questions request narrative answers. Please note that the space provided will expand to accommodate your answer. You may write additional comments at the end of the survey. Before you start answering the questions, simply save this file to your computer hard drive, fill it out, resave the file, and then attach it to your return e-mail to GAO. The return e-mail address is SahoSurvey@gao.gov.

- Please **use your mouse** to navigate throughout the survey by clicking on the field or check box you wish to fill in. **Do not use the "Tab" or "Enter" keys** as doing so may cause formatting problems.
- To select or deselect a check box, simply click or double click on the box.

Contact Information

Thanks in advance for taking the time to complete this survey. If you have any questions about the survey, please contact either:

Bill Colwell, *GAO Analyst*
Phone:
E-mail:

or

Amanda Krause, *GAO Analyst-in-Charge*
Phone:
E-mail:

Thank you for your help.

Contact Information

1. Several people may participate in the completion of this survey, but we ask that you provide contact information for the person coordinating the completion of the survey in case we need to follow-up with additional questions.

   Name: _____
   Title: _____
   Agency: _____
   State or Territory: _____
   Phone #: (___) ___-____
   E-mail: _____

2. **How long have you been in this position?** *(Round up to the nearest year.)*

   1-25 years = range
   6.1 years = average

3. **Are you the State Animal Health Official for your State or the equivalent for your Territory?** *(Mark ☒ only one response.)*

   38 Yes
   14 No

Section A. Working with USDA Regarding the NVS

4. **Did USDA work with your State or Territory to develop the NVS before it became operational in 2006?** *(Mark ☒ only one response.)*

   11 Yes
   36 No
   5 Missing / No Response

5. **Did USDA work with your State or Territory regarding the NVS after it became operational in 2006?** *(Mark ☒ only one response.)*

   40 Yes
   11 No
   1 Missing / No Response

6. **When working with USDA regarding the NVS, what aspects were positive?** *(Note: If your State or Territory has not worked with USDA regarding the NVS, enter 'Not Applicable.')*

   40 respondents made a comment to this question

7. **When working with USDA regarding the NVS, what aspects could be improved?** *(Note: If your State or Territory has not worked with USDA regarding the NVS, enter 'Not Applicable.')*

   30 respondents made a comment to this question

8. In which of the following venues, if any, did USDA share information with your State or Territory regarding the NVS? *(Mark ☒ only one response for each row.)*

Venue	Yes – USDA shared information in this venue	No – USDA did not share information in this venue	State or Territory did not participate in this venue	Missing / No response
a. Conferences	*44*	*4*	*2*	*2*
b. Webinars	*30*	*9*	*8*	*5*
c. Training	*27*	*10*	*12*	*3*
d. Exercises	*33*	*5*	*12*	*2*
e. Individual meetings or phone calls between USDA and your State or Territory	*34*	*7*	*9*	*2*
f. Group meetings or phone calls with USDA and other States or Territories	*39*	*5*	*6*	*2*

9. In what other venues, if any, did USDA share information with your State or Territory regarding the NVS?

31 respondents made a comment to this question

10. If USDA shared information with your State or Territory regarding the NVS, what information did it share?

43 respondents made a comment to this question

11. In which of the following venues, if any, did USDA solicit input from your State or Territory regarding the NVS? *(Mark ☒ only one response for each row.)*

Venue	Yes – USDA solicited input in this venue	No – USDA did not solicit input in this venue	State or Territory did not participate in this venue	Missing / No response
a. Conferences	*32*	*13*	*4*	*3*
b. Webinars	*23*	*15*	*9*	*5*
c. Training	*25*	*15*	*9*	*3*
d. Exercises	*25*	*12*	*12*	*3*
e. Individual meetings or phone calls between USDA and your State or Territory	*28*	*13*	*10*	*1*
f. Group meetings or phone calls with USDA and other States or Territories	*31*	*12*	*8*	*1*

12. In what other venues, if any, did USDA solicit input from your State or Territory regarding the NVS?

16 respondents made a comment to this question

13. If USDA solicited input from your State or Territory regarding the NVS, what issues did it ask about?

29 respondents made a comment to this question

Section B. NVS-Specific Plans

14. Has your State or Territory taken any steps to create a written NVS-specific plan? *(Mark ☒ only one response.)*

40 Yes
12 No

15. Does your State or Territory have a written NVS-specific plan? *(Mark ☒ only one response.)*

17 Yes ➔ *Please attach a copy of this plan to your e-mail* ➔ **SKIP TO QUESTION #17**
35 No

16. What barriers or challenges exist, if any, that prevent your State or Territory from having a written NVS-specific plan?

27 respondents made a comment to this question

Section C. Receiving NVS Resources

17. Has your State or Territory identified specific facility locations to receive NVS resources? *(Mark ☒ only one response.)*

20 Yes
31 No ➔ **SKIP TO QUESTION #20**
1 Don't know ➔ **SKIP TO QUESTION #20**

18. Are these specific facility locations to receive NVS resources identified in your State's or Territory's written NVS-specific plan? *(Mark ☒ only one response.)*

13 Yes
1 No
6 Not applicable since State or Territory does not have a written NVS-specific plan

19. Has your State or Territory identified a facility location(s) capable of holding temperature-sensitive NVS resources such as antiviral medications, vaccines, or diagnostic test kits? *(Mark ☒ only one response.)*

17 Yes
2 No
1 Don't know

20. How clear or unclear is the process for requesting NVS resources? *(Mark ☒ only one response.)*

26 Very clear
20 Somewhat clear
2 Somewhat unclear
1 Very unclear

3 Don't know

Section D. Concerns about NVS Resources

21. Does your State or Territory have any of the following concerns about NVS personal protective equipment (PPE)? *(Mark ☒ only one response for each row.)*

Concern	No	Yes	If yes, please note any specific concerns	Missing / No response
a. Sufficiency of the amount of PPE contained in the NVS	*40*	*12* →		*0*
b. Appropriateness of NVS PPE to respond to the most damaging animal diseases	*40*	*11* →		*1*
c. Capability of the NVS to deploy PPE within 24 hours of an outbreak	*35*	*15* →		*2*

22. What other concerns, if any, does your State or Territory have regarding NVS PPE?

17 respondents made a comment to this question

23. Does your State or Territory have any of the following concerns about NVS diagnostic test kits? *(Mark ☒ only one response for each row.)*

Concern	No	Yes	If yes, please note any specific concerns	Missing / No response
a. Sufficiency of the amount of diagnostic test kits contained in the NVS	*32*	*16* →		*4*
b. Appropriateness of NVS diagnostic test kits to respond to the most damaging animal diseases	*32*	*16* →		*4*
c. Capability of the NVS to deploy diagnostic test kits within 24 hours of an outbreak	*34*	*14* →		*4*

24. What other concerns, if any, does your State or Territory have regarding NVS diagnostic test kits?

25 respondents made a comment to this question

25. Does your State or Territory have any of the following concerns about NVS antiviral medication? *(Mark ☒ only one response for each row.)*

Concern	No	Yes	If yes, please note any specific concerns	Missing / No response
a. Sufficiency of the amount of antiviral medication contained in the NVS	*32*	*17* →		*3*
b. Appropriateness of NVS antiviral medication to respond to the most damaging animal diseases	*34*	*16* →		*2*
c. Capability of the NVS to deploy antiviral medication within 24 hours of an outbreak	*30*	*17* →		*5*

26. What other concerns, if any, does your State or Territory have regarding NVS antiviral medication?

26 respondents made a comment to this question

27. Does your State or Territory have any of the following concerns about NVS vaccines? *(Mark ☒ only one response for each row.)*

Concern	No	Yes	If yes, please note any specific concerns	Missing / No response
a. Sufficiency of the amount of vaccines contained in the NVS	*20*	*30* →		*2*
b. Appropriateness of NVS vaccines to respond to the most damaging animal diseases	*24*	*26* →		*2*
c. Capability of the NVS to deploy vaccines within 24 hours of an outbreak	*24*	*26* →		*2*

28. What other concerns, if any, does your State or Territory have regarding NVS vaccines?

26 respondents made a comment to this question

29. Does your State or Territory have any of the following concerns about NVS animal-handling equipment? *(Mark ☒ only one response for each row.)*

Concern	No	Yes	If yes, please note any specific concerns	Missing / No response
a. Sufficiency of the amount of animal-handling equipment contained in the NVS	*23*	*26* →		*3*
b. Appropriateness of NVS animal-handling equipment to respond to the most damaging animal diseases	*29*	*19* →		*4*
c. Capability of the NVS to deploy animal-handling equipment within 24 hours of an outbreak	*27*	*22* →		*3*

30. What other concerns, if any, does your State or Territory have regarding NVS animal-handling equipment?

20 respondents made a comment to this question

31. Does your State or Territory have any of the following concerns about NVS depopulation, disposal and decontamination (3D) commercial support services? *(Mark ☒ only one response for each row.)*

Concern	No	Yes	If yes, please note any specific concerns	Missing / No response
a. Sufficiency of the amount of 3D commercial support services available from the NVS	*28*	*23* ➔		*1*
b. Appropriateness of NVS 3D commercial support services to respond to the most damaging animal diseases	*28*	*22* ➔		*2*
c. Capability of the NVS to deploy 3D commercial support services within 24 hours of an outbreak	*27*	*21* ➔		*4*

32. What other concerns, if any, does your State or Territory have regarding NVS 3D commercial support services?

22 respondents made a comment to this question

33. Does your State or Territory have any concerns regarding any other specific NVS resource(s)?

10 respondents made a comment to this question

Section E. Use of NVS Resources

34. Has your State or Territory requested any NVS resources since 2006 to respond to an incident? *(Mark ☒ only one response.)*

3 Yes
49 No

35. Has your State or Territory received any NVS resources since 2006 to respond to an incident? *(Mark ☒ only one response.)*

3 Yes
49 No➔ **SKIP TO QUESTION #40**

36. Overall, how satisfied or dissatisfied were you with the assistance you received from the NVS? *(Mark ☒ only one response.)*

2 Very satisfied
1 Somewhat satisfied
0 Neither satisfied nor dissatisfied
0 Somewhat dissatisfied
0 Very dissatisfied

37. Why did you rate your level of satisfaction with the NVS assistance you received at this level?

3 respondents made a comment to this question

38. What improvements, if any, could be made in the assistance provided by the NVS?

3 respondents made a comment to this question

39. Did USDA solicit feedback from your State or Territory about the NVS assistance you received? *(Mark ☒ only one response.)*

2 Yes
1 No
0 Don't know

Section F. Additional Information

40. Please provide any additional comments you would like to share regarding the NVS.

26 respondents made a comment to this question

Appendix VI: Thirteen High-Consequence Plant Diseases with Completed Recovery Plans for USDA's NPDRS

Plant disease	Plants affected	Route of transmission	Impact
Citrus variegated chlorosis	Sweet oranges and other citrus species	Budding using infected budwood sources, natural root grafts, vectored by xylem-feeding insects	The potential economic impact is high because the disease lowers yields, makes fruit unmarketable, and there is a likely loss of domestic and international export markets by embargo.
Downy mildews of corn	Corn, sugarcane, some sorghum cultivars, and many weedy grass species	Spores produced by nearby infected hosts or soil borne over-wintering spores, spread by wind and rain	On sweet corn, losses of 100% have been reported in the Philippines. It was estimated that the national yield loss in the Philippines in the 1974-1975 growing season was $23 million.
Huanglongbing of citrus	All citrus plants, including sweet oranges, tangelos, and mandarins	Grafting with diseased budwood, vectored by citrus psyllids	Severe yield losses result from infections of citrus trees, which usually die in 3 to 8 years. Infected trees produce fruit that is bitter and generally unsuitable for sale as fresh fruit or for juice.
Late wilt of corn	Corn	Spread primarily through movement of infested soil, crop residue, or seeds	Corn yield losses approached 40% in Egypt before the introduction of resistant varieties. All areas in the United States could be seriously impacted by the disease, in part, because of favorable environmental conditions.
Laurel wilt of redbay	Trees in the laurel family	Vectored by beetles	The disease poses the greatest threat to the commercial avocado industry. Other economic impact may include decreased property values and lost revenue to nurseries.
Plum pox	Plums, peaches, nectarines, apricots, and almonds	Graft transmission, vectored by aphids	The disease can cause significant economic loss due to a reduction in fruit quality and yield and due to premature tree death. In 1999, the yearly value of production of peaches, nectarines, plums, apricots, and almonds nationally was approximately $1.8 billion.
Potato wart	Potatoes	Infected seed potatoes, movement of fungal spores in soil or water, infested manure from animals that have fed on infected tubers	The economic impact is not from direct disease losses but from loss of international trade markets, long-term quarantines, and regulatory restrictions placed on infested areas and the buffer zones surrounding infested land.
Ralstonia bacterial wilt of potato and geraniums	Various row crops including pepper, tobacco, tomato, and potato, as well as some ornamentals such as geraniums	Primarily a soilborne and waterborne pathogen	The disease is one of the most damaging pathogens on potato worldwide and has been estimated to affect 3.75 million acres in approximately 80 countries with global damage estimates exceeding $950 million per year.

Plant disease	Plants affected	Route of transmission	Impact
Rathayibacter poisoning	Forage grasses, often resulting in fatal poisoning of grazing animals	Transferred from infested soils into plants by plant parasitic nematodes	Thousands of sheep and cattle, as well as some horses, died from ailments attributed to the disease in Australia, where loss of production and cost of control has been in the millions of dollars.
Red leaf blotch of soybean	Soybeans	Rain splashes the fungus from soil onto leaf surfaces, where germination and infection occur	Yield losses of up to 50% were reported in Zambia and Zimbabwe. The disease could threaten soybean production anywhere in the United States.
Scots pine blister rust	Eurasian pine trees	Spread by windborne spores, may also be carried on plant material	The greatest economic impacts may be to nurseries and Christmas tree plantations that grow Scots pine. Movement restrictions and eradication of infected material could cause enormous economic losses amounting to millions of dollars.
Stem rust of wheat	Wheat and barley	Rain splash and wind-dispersal	The disease has been one of the most important diseases of cereal crops since the emergence of western civilization. Regional epidemics have occurred numerous times in the United States, with losses of over 50% recorded in Minnesota and North Dakota in 1935.
Phytophthora kernoviae	Forest trees and shrubs such as beech and rhododendron	Dispersed by splashes, through contaminated runoff water, in infested soil, and through long-distance dispersal on logs, wood products, and ornamental nursery stock	The potential for the disease to become established in U.S. hardwood forests is considered high, as is the likelihood of it causing extensive mortality, therefore, the potential economic and ecological impact to U.S. natural resources due to pathogen establishment is potentially very high.

Source: GAO analysis of NPDRS recovery plans.

Appendix VII: USDA List of 28 ESF-11 Activations between 2007 and 2011

Year	Emergency	States and U.S. territories affected
2007	Tornado	Kansas
2007	Wildfires	California
2007	Tropical Storm Erin	Texas
2007	Severe winter storms	Colorado, Kansas, Nebraska
2007	Hurricane Dean	Louisiana, Texas
2008	Severe storms and flooding	Indiana, Iowa
2008	Hurricane Omar	U.S. Virgin Islands
2008	Hurricane Dolly	Texas
2008	Hurricane Gustav	Alabama, Louisiana, Mississippi, Texas
2008	Hurricane Ike	Texas
2008	Hurricane Fay	Florida
2008	Tropical Storm Hanna	North Carolina
2008-2009	Severe winter storms	Massachusetts
2009	Earthquake and tsunami	American Samoa
2009	Flooding	Washington
2009	Severe storm and flooding	North Dakota
2009	56th Presidential Inauguration[a]	Washington, D.C.
2010	Flooding	North Dakota
2010	Hurricane Alex	Texas
2010	Hurricane Earl	Massachusetts, New York, North Carolina
2010	Severe flooding	Massachusetts
2010	Haiti earthquake	Florida[b]
2011	Severe storms	Connecticut
2011	Severe storms and flooding	Arizona
2011	Honshu tsunami	California, Washington
2011	Severe storms, tornados, and flooding	Missouri
2011	Flooding	Louisiana
2011	Flooding	South Dakota

Source: USDA.

[a]According to USDA officials, ESF-11 was activated as a precautionary measure to feed and shelter individuals in the event that an improvised explosive devise was detonated.

[b]ESF-11 was activated to assist states with planning efforts to address agriculture concerns with U.S. citizens returning to the United States from Haiti.

Appendix VIII: Comments from the U.S. Department of Agriculture

United States Department of Agriculture

Office of Homeland Security and Emergency Coordination

1400 Independence Avenue SW

Washington, DC 20250

TO: Lisa Shames
Director
Natural Resources and Environment

FROM: Todd H. Repass, Jr. JUL 28 2011
Director
Office of Homeland Security
and Emergency Coordination

SUBJECT: U.S. Department of Agriculture Response

The United States Department of Agriculture (USDA) appreciates the opportunity to respond to the Government Accountability Office's (GAO) Draft Report titled *Homeland Security: Actions Needed to Improve Response to Potential Terrorist Attacks and Natural Disasters Affecting Food and Agriculture* (GAO-11-652).

USDA concurs with the Recommendations in this report. However as outlined below, USDA concurs, with discussion, on two of the five recommendations.

GAO Recommendation

To ensure the most effective use of resources, we recommend the Secretaries of Agriculture and Health and Human Services jointly determine if there are opportunities, where appropriate, for the National Veterinary Stockpile (NVS) to leverage Strategic National Stockpile mechanisms or infrastructure as directed by HSPD-9. If such opportunities exist, the two Agencies should formally agree upon a process for the NVS to use the identified mechanisms and infrastructure.

USDA Response

USDA agrees with this recommendation. The Centers for Disease Control and Prevention (CDC's) Strategic National Stockpile (SNS) and USDA's Animal and Plant Health Inspection Service's (APHIS) National Veterinary Stockpile (NVS) have collaborated since the NVS began operations in 2006. The SNS has provided technical assistance and shared lessons learned, planning documents, and numerous guidance documents that were subsequently utilized by the NVS. The SNS and the NVS met as recently as February 2011, and in this meeting the SNS shared information with the NVS on current capabilities as well as challenges/lessons learned. APHIS and CDC will continue to explore opportunities for which the NVS may leverage Strategic National Stockpile mechanisms or infrastructure as directed in HSPD-9. If there are any opportunities, the NVS will develop a document that describes the process on how the NVS will use the mechanisms or infrastructure. If not, NVS will document the findings as appropriate.

GAO Recommendation

Develop and implement a documented, systematic process to track research gaps identified in the NPDRS recovery plans and monitor progress in fillings these gaps.

USDA Response

USDA concurs with this recommendation.

GAO Recommendation

Develop and implement a mechanism to ensure NPDRS recovery plans are shared with key state and federal plant health officials.

USDA Response

USDA concurs with this recommendation and will expand its efforts to share recovery plans more broadly. Currently, the Department conducts outreach with the American Phytopathological Society (APS), which has over 3,000 professional plant pathologists as members representing about 90 percent of all plant pathologists in the United States. NPDRS recovery plans are posted in the APS newsletter and on the NPDRS webpage. Federal plant health officials are notified of recently developed plans on a regular basis through an email network as well as the NPDRS webpage. Officials also meet with state and federal experts on an annual basis in a NPDRS workshop where current activities and problems are reviewed and discussed, and future activities are planned.

GAO Recommendation

To ensure that USDA is fulfilling its responsibilities to protect the nation's food and agriculture systems, we recommend that the Secretary of Agriculture develop a department-wide strategy for implementing HSPD-9 responsibilities. Such a strategy would include an overarching framework for setting priorities, as well as allocating resources.

USDA Response

USDA concurs with this recommendation.

U.S. Department of Agriculture Response
Page 3

GAO Recommendation

To improve USDA's performance as ESF-11 coordinator and to address issues experienced by key parties, such as pet sheltering, we recommend that the Secretary of Agriculture develop a process for ensuring that: (1) following all ESF-11 activations, after-action reports are consistently completed and shared with key parties involved in each activation; (2) the perspectives of key parties are incorporated in these reports; (3) any identified gaps and/or challenges are addressed through corrective actions; and (4) the completed after-action reports are used to provide a complete, accurate, and consistent count of ESF-11 activations over time, in turn producing sufficiently reliable data on ESF-11 activations.

USDA Response

USDA agrees with this recommendation. Since 2008, the APHIS ESF-11 coordinator has developed a consistent approach for developing After Action Reports (AAR). The AARs are modeled after the Department of Homeland Security Federal Emergency Management Agency's AARs, which include identifying successes and areas needing improvement. These ESF #11 AARs are posted on the ESF #11 Web site, http://www.aphis.usda.gov/emergency_response/esf_11/esf11_resources.shtml, and are available for key parties to review. In the future, APHIS plans to e-mail the AARs directly to ESF #11 stakeholders.

The AAR process includes the perspectives of key parties that participate in ESF #11 responses. The ESF #11coordinator will seek even broader input to incorporate the perspectives of all key parties that participate in ESF #11 responses. Since 2008, APHIS and the other ESF #11 partner Agencies have been meeting regularly to discuss any identified gaps or challenges and to plan and execute appropriate corrective actions. Lastly, existing ESF #11 reporting processes and AAR reporting processes allow for the compilation of complete, accurate, consistent, and reliable data on ESF-11 activations.

USDA again thanks GAO for its review of actions needed to improve responses to potential terrorist attacks and natural disasters affecting food and agriculture. If there are any additional questions, please questions Jennifer Wendel at (202) 205-4441.

Appendix IX: Comments from the Department of Health and Human Services

DEPARTMENT OF HEALTH & HUMAN SERVICES — OFFICE OF THE SECRETARY

Assistant Secretary for Legislation
Washington, DC 20201

JUL 07 2011

Lisa Shames, Director
Natural Resources and Environment
U.S. Government Accountability Office
441 G Street N.W.
Washington, DC 20548

Dear Ms. Shames:

Attached are comments on the U.S. Government Accountability Office's (GAO) draft report entitled, "HOMELAND SECURITY: Actions Needed to Improve Response to Potential Terrorist Attacks and Natural Disasters Affecting Food and Agriculture" (GAO 11-652).

The Department appreciates the opportunity to review this report prior to publication.

Sincerely,

Jim R. Esquea
Assistant Secretary for Legislation

Attachment

GENERAL COMMENTS OF THE DEPARTMENT OF HEALTH AND HUMAN SERVICES (HHS) ON THE GOVERNMENT ACCOUNTABILITY OFFICE'S (GAO) DRAFT REPORT ENTITLED, "HOMELAND SECURITY: ACTIONS NEEDED TO IMPROVE RESPONSE TO POTENTIAL TERRORIST ATTACKS AND NATURAL DISASTERS AFFECTING FOOD AND AGRICULTURE," (GAO-11-652)

The Department appreciates the opportunity to review and comment on this draft report.

GAO Recommendation for HHS:

To ensure the most effective use of resources, we recommend the Secretaries of Agriculture and Health and Human Services jointly determine if there are opportunities, where appropriate, for the NVS to leverage Strategic National Stockpile mechanisms or infrastructure as directed by HSPD-9. If such opportunities exist, the two agencies should formally agree upon a process for the NVS to use the identified mechanisms and infrastructure.

HHS Response:

The Department concurs with the recommendation that HHS, in collaboration with USDA, should determine whether opportunities exist for NVS to leverage SNS mechanisms or infrastructure as directed by HSPD-9. In February 2011, both CDC/DSNS and USDA/NVS examined possible resource sharing in the areas of transportation, warehousing, and state and local resources used for the receipt and distribution of SNS assets. However, no real opportunities for resource sharing have been identified to date. If an opportunity arises in the future, as determined by HHS and USDA, HHS will work to ensure that the appropriate agreements are in place to fully comply with rules and regulations governing interagency agreements.

The specific areas the report cites where leveraging can occur are incorrect. The SNS does not currently provide an inventory management system for state or local use. Most states have adopted various commercial inventory management systems to meet their particular needs for managing SNS provided inventory. The vast majority of the influenza antiviral medications contained in the SNS are pre-allocated for states on a pro-rata basis based on human population. NVS maintains its own stock of anti-virals that it believes is sufficient for NVS purposes.

Appendix X: Comments from the Department of Homeland Security

U.S. Department of Homeland Security
Washington, DC 20528

Homeland Security

July 18, 2011

Lisa Shames
Director, Natural Resources and Environment
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Re: Draft Report GAO-11-652, "HOMELAND SECURITY: Actions Needed to Improve Response to Potential Terrorist Attacks and Natural Disasters Affecting Food and Agriculture"

Dear Ms. Shames:

Thank you for the opportunity to review and comment on this draft report. The U.S. Department of Homeland Security (DHS) appreciates the U.S. Government Accountability Office's (GAO's) work in planning and conducting its review and issuing this report.

The Department is pleased to note the report's positive acknowledgement of its role and that of the Federal Emergency Management Agency (FEMA), related to protecting the nation's critical infrastructure – including U.S. food and agriculture systems – and responding to terrorist attacks, major disasters, and other large-scale emergencies, as appropriate. The Department remains committed to continuing its work with interagency partners, such as the U.S. Department of Agriculture (USDA) and the U.S. Environmental Protection Agency (EPA) to ensure effective implementation of Homeland Security Presidential Directive (HSPD)-9.

The draft report contained two recommendations directed at DHS, with which DHS concurs. Specifically, to help ensure that the federal government is effectively implementing the nation's food and agriculture defense policy, GAO recommended that the Secretary of Homeland Security:

Recommendation 1: Resume the Department of Homeland Security's efforts to coordinate agencies' overall HSPD-9 implementation efforts.

Response: Concur. DHS will work to coordinate overall HSPD-9 implementation efforts. Within DHS, several components have expertise to contribute to improving the response to terrorist attacks and natural disasters affecting food and agriculture. For example, the DHS Office of Health Affairs (OHA) has a mechanism in place to coordinate HSPD-9 progress with the Defense of Food and Agriculture Dashboard. The Dashboard has always been available to the interagency to use at their discretion. In 2008, OHA established, in coordination with the inter-agency, the Defense of Food and Agriculture Dashboard which is hosted on the Office of Management and Budget's MAX collaboration portal. DHS

coordinated HSPD-9 progress from the EPA, U.S. Department of Health and Human Services (HHS), and the USDA and reported this information publicly to the Federal community on the Dashboard. DHS maintains its departmental progress of HSPD-9 on the Dashboard and actively engages the interagency community on HSPD-9 activities by establishing several working groups with HHS and USDA to effectively coordinate and collaborative on food and agriculture defense activities. OHA, and other DHS components, will continue to support interagency coordination activities of HSPD-9 implementation efforts.

To expedite response and recovery from major emergencies, GAO also recommended that the Secretary of Homeland Security direct the Administrator of the Federal Emergency Management Agency, in coordination with key agencies, to:

Recommendation 2: Provide guidance that clarifies the roles and responsibilities agencies will have regarding the disposal of animal carcasses in emergencies for which ESF-11 is activated.

Response: Concur. FEMA serves as one of the support agencies and will continue to work with and provide guidance to our federal partners to better define the roles and responsibilities regarding the disposal of animal carcasses. However, clarifying roles and responsibilities will necessitate our federal partners to review their authorities and determine their agency's specific responsibility for the action during Emergency Support Function (ESF)-11 activations.

Again, thank you for the opportunity to review and comment on this draft report. Technical comments on the report have been provided under separate cover. We look forward to working with you on future Homeland Security engagements.

Sincerely,

Jim H. Crumpacker
Director
Departmental GAO/OIG Liaison Office

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Appendix XI: GAO Contact and Staff Acknowledgments

GAO Contact

Lisa Shames, (202) 512-3841, or shamesl@gao.gov

Staff Acknowledgments

In addition to the individual named above, Mary Denigan-Macauley, Assistant Director; Kevin Bray; William Colwell; Bridget Grimes; Amanda Krause; and Terry Richardson made key contributions to this report.

Other important contributors included Nancy Crothers, Joyce Evans, Diana Goody, Emily Hanawalt, Joshua Hurd, Jan Montgomery, Jeremy Sebest, Benjamin Shouse, and Cynthia S. Taylor.

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