This presentation is titled “Animal Disease Emergencies – Local Response Preparedness and Planning” and is designed for a Local Government Official audience.

Note to presenter: The following presentation provides an overview of animal disease emergency preparedness, response and recovery measures. Additional PowerPoints on specific components (e.g., state response plan, specific disease information) are available for inclusion into this presentation, depending on time allotted and interest of the audience. Please delete this slide prior to presentation!

Animal agriculture is an essential component of the U.S. and Iowa’s economy. The impact of an animal disease emergency or outbreak in livestock could be devastating. Response to such a situation will require interaction between local, state and often federal agencies and personnel. Preparedness efforts are essential for the prevention and control of such an event in Iowa and are necessary to protect animal health, our economy and even human health. During this presentation we will discuss the importance of agriculture to the U.S. and Iowa’s economy, what animal emergency diseases are, the impact they can have, the steps involved in detection and response, including the State and Federal agencies involved. Additionally, we will discuss the importance of preparing at the local level and how you can prepare.

Animal disease emergencies involve any number of disease pathogens that may affect large numbers of livestock, resulting in severe economic consequences, including high death rates, high levels of illness, and loss of production. The occurrence of any of these diseases may have trade implications, including embargos and import restrictions. Human health can also be impacted by animal health emergencies. Some of the diseases are zoonotic (spread from animals to humans) and the loss of animals and livelihood can have severe mental health impacts for those raising or working with the animals. Disease listed as important concerns or emergencies are often referred to as FADs (foreign animal diseases) or high consequence pathogens.
United States agriculture is very vulnerable to the intentional or accidental introduction of disease agents (foot-and-mouth disease or FMD), as well as emerging (Nipah virus in pigs and people) or re-emerging diseases (such as exotic Newcastle disease in poultry). Today we will talk more about those vulnerabilities and ways to minimize the United States’ risk of a devastating disease entering our country. Introduction of these disease agents can occur in any number of ways from natural spread, emergence of diseases to new areas, accidental introduction or even the intentional use of agents in a terrorist type attack. Natural introduction can occur sporadically in given (endemic) areas like anthrax in cattle in the Dakotas. Emerging diseases are those that are expanding in distribution or found in new locations (e.g., Nipah virus, Exotic Newcastle disease). The accidental introduction of disease pathogens may occur through the transport of animals, animal products or persons coming from countries where the disease occurs, via contaminated clothing, shoes or other objects. These are often referred to as foreign animal diseases, as their presence in the U.S. is limited or non-existent. Disease pathogens of livestock may also be introduced intentionally. Defined as agroterrorism, this involves the use of biological agents or their toxins to adversely impact the agriculture industry, the economy, or the consuming public. Regardless of how a disease pathogen may be introduced, the detection, response and control measures needed are essentially the same, but may vary in scale (local vs. state vs. national), depending on the disease in question.

High consequence animal diseases lists are maintained at the international, national, and state levels. Most of the listed disease agents have been successfully eradicated or controlled in the U.S. but still occur in other countries. While this is good for our livestock industry, it also means that the introduction of any of these agents can have severe consequences since our animals have no natural immunity to the disease. These diseases are listed based on the impact they may have (e.g., highly contagious (spread quickly), severe animal health, economic or public health consequences, great importance in international trade).

The detection of any of the listed high consequence livestock pathogens must be reported to the World Organization for Animal Health (called the OIE – Office International des Epizooties) within 24 hours. This international organization monitors the disease status of animal diseases of severe economic or public health consequences. The OIE immediately informs all other countries at risk, i.e. those countries receiving exports from the affected country. The result is often the swift implementation of a trade embargo by many countries against the affected animal species or their products. This was seen with the discovery of “mad cow” case (BSE, bovine spongiform encephalopathy) in the State of Washington. Once the infected cow was discovered, live cattle exports ceased to many countries. Borders did not reopen until an international investigation team deemed the disease investigation was handled appropriately and the disease had been eradicated. In the case of foot and mouth disease (FMD), trade could not resume until 3-months after the slaughter of the last positive animal, given ongoing testing and surveillance had occurred throughout the disease monitoring process.
Animal Disease Emergency Indicators

- Increased illness, death rates, abortions
- Significant drop in production
- Ulcers or blisters on or around the animal’s mouth or feet
- Sudden lameness
- Any nervous system signs
- Pox or lumpy skin conditions
- Severe respiratory conditions
- Any unusual or unexplained illness

The report of an ill or suspicious animal usually occurs at the producer level. The producer should call their local veterinarian upon seeing any unusual or unexplained illness. Although many high consequence diseases can have signs similar to commonly seen diseases, some indicators to be alert for include any increases in illness, deaths or abortion, any significant drops in production, ulcers or blisters on or around the mouth or feet, sudden lameness, any neurological signs, any pox or lumpy skin condition, and any severe respiratory conditions.

Important of Agriculture

When we look at the economics of livestock at the national level, we see it is of major value. From pigs and poultry to cattle and sheep, animal agriculture generates income for producers and the economy while supplying safe food to our tables. The economic importance and estimated numbers of livestock and poultry in our nation and Iowa are listed here. (2005 for U.S. and 2006 for Iowa). Data from http://www.usda.gov/nass/pubs/stathigh/2005/lvstkindex.htm and http://www.agriculture.state.ia.us/quickFacts2.htm

Iowa Agriculture, 2006

Here in Iowa, agriculture and livestock are major components of our economy with 88,600 farms, supporting over 63,000 jobs in the state. In 2006, Iowa led the nation in the production of pork, corn, soybeans and eggs and was second nationally in red meat production (6.5 billion pounds) and agricultural exports ($4.02 billion). Total cash receipts for farm commodities in Iowa in 2006 were almost $15 billion dollars, third in the nation. [Source: State of Iowa, Department of Agriculture and Land Stewardship, Quick Facts about Iowa Agriculture, 2005 Livestock Summary. www.agriculture.state.ia.us/2006AgStats/06_76.pdf, www.agriculture.state.ia.us/quickFacts.htm and www.agriculture.state.ia.us/quickFacts2.htm. Accessed 01/02/08.]

Food Production Changes

- Number of farms decreasing
- Animal numbers rising on some farms
- Opportunities
  - Increasing intensity/specialization
  - Efficient food source: U.S. and world
- Challenges
  - Disease control and eradication
  - Devastating economic effects

Despite the large numbers of animals in Iowa, each year the Census of Agriculture reports fewer farms. The changes in animal production (e.g., higher densities) and species specialization has allowed livestock farmers to efficiently provide food for America and the world, but presents opportunities and challenges that were not a part of raising animals only a few decades ago. The introduction of a disease into a facility can spread rapidly based on the high concentration of animals. This highlights the need to prevent disease introduction to continue to ensure the animal’s well-being and a safe food source.
### Impact of Animal Disease

- **Animal Health**
  - Death, illness, loss of production
- **Economics**
  - Loss or disruption of trade
  - Loss of consumer confidence
  - Movement restrictions
- **Human Health**
  - Zoonoses
  - Mental health

The effect of an animal disease emergency can impact animal health, economics and possibly even human health. The impact could be felt, in the case of a foreign animal disease discovery, in as quickly as 24 hrs. Exportation of livestock could be halted. Allied and reliant industries, such as restaurants, grocery retailers, food processors and distributors, and transporters have direct and indirect ties to agriculture and would be impacted significantly. Costs would also be generated due to the needed measures for eradication and control of the disease (e.g., disease surveillance, diagnostic testing, tracing of exposed animals and their movement, implementing and maintaining quarantines, depopulation costs, indemnity paid to the farmer), … the list and impact could be extensive. Some losses due to a foreign animal disease may take years to fully realize.

### Vulnerabilities

- High density husbandry
- Mixing at auction markets or transport by vehicles
  - Over 5 million cattle each year
- Poor traceability of animals
- No immunity to foreign animal diseases
- Centralized feed supply and distribution

What makes U.S. and Iowa agriculture vulnerable? Animals are raised in high concentrations (cattle feedlots, swine confinement units, poultry barns) which can lead to the rapid spread of a FAD. Animals are often transported great distances, sometimes over 1,000 miles, and mixed at auction markets. Auction markets allow for mixing of animals from around the state or neighboring states, presenting the opportunity for the exchange of infectious diseases such as FMD or hog cholera, and exposing others in a crowded setting. The U.S. is currently very inefficient in our ability to trace animal movement, making the tracking of disease outbreaks difficult. The USDA National Animal Identification System (NAIS) has progressed to get animal owners to register their location or premises. However, it is voluntary and the second step, animal identification, is not as advanced. Most severe, highly contagious diseases of livestock have been eradicated from the U.S., and vaccines are not used for these diseases, livestock have no immunity to FADs. Another concern is our centralized feed supply and distribution; feed can be an ideal vehicle in which to distribute an agent or compound. One feed manufacturer can supply hundreds or thousands of farms, unknowingly distributing an infectious disease agent throughout the country.

### Vulnerabilities

- Diseases are widespread in other countries
- Expanded international trade and travel
- Border penetration: people, wild birds, mammals
- Inadequate on-farm biosecurity
- Inadequate foreign animal disease awareness

We are a global society and our international trade and travel has greatly expanded in the last quarter century. With the widespread distribution of infectious disease agents in other countries, we are very vulnerable to the accidental or intentional introduction of these pathogens. Our mobile society leaves our borders open for trade, making us vulnerable to agents or contaminated equipment being smuggled in if inspections are not thorough. Another concern is the lack of biosecurity for our animals and plants, which will be further discussed. Finally, there is also a great need to improve foreign animal disease (FAD) awareness and education among veterinarians and producers. We all must be able to recognize the signs and know how to report them in order to decrease our vulnerability to disease spread. Today’s presentation is designed to give you some of those tools.

### Prepare

State and Federal Agencies

So, how do we prepare for an animal disease emergency? Preparedness involves advance planning. This starts with identification of stakeholders and agencies involved or needed for a response. It is important to know members of your community and understand the roles and responsibilities they may have or may contribute to in the event of an emergency at the local, State and Federal level. Familiarity should be established before the disaster strikes. We will discuss the State and Federal agencies involved in preventing and responding to animal disease emergencies, and the plans and programs that are in place for such an event.
In the event of an animal disease emergency, the primary agency involved in the detection and response to an animal disease emergency in Iowa is the Iowa Department of Agriculture and Land Stewardship (IDALS). Directed by the State Veterinarian, Dr. David Schmitt, the agency is responsible for animal health and disease control issues as well as determining actions and the scope of the response, overseeing field operations, animal movement and tracking, and more. Working under the State Veterinarians are six District veterinarians. These individuals are all Foreign Animal Disease Diagnosticians, or FADDs. This means that they have been specially trained to conduct investigations and collect samples for situations involving high consequence diseases, or foreign animal diseases (FAD). In Iowa, 25-50 suspected FAD are investigated each year.

This map shows the areas covered by the six District veterinarians for the state of Iowa. All of these veterinarians are FADDs. They run surveillance and prevention programs in the state for diseases such as brucellosis, tuberculosis, pseudorabies, and avian influenza.

The Center for Agriculture Security is also part of IDALS. The Center trains and coordinates the Iowa Veterinary Rapid Response Team (IVRRT). This cadre of over 330 veterinary and animal health professionals is trained and ready to respond to an animal disease emergency in their community, county or in the state. These individuals are activated and directed by the State Veterinarian and the Iowa Secretary of Agriculture to assist in surveillance, euthanasia, diagnostics, premise cleaning and disinfection operations. They can also assist counties with animal sheltering issues during other types of disasters.

Other state agencies may be involved in an animal disease emergency response and provide assistance and/or resources to IDALS. The Iowa Homeland Security and Emergency Management Division (HSEMD) would manage the needed resources for the emergency. In the event of depopulation on a farm(s), the Iowa Department of Natural Resources (DNR) would assist in animal disposal and environmental issues. An online livestock burial map database to determine safe and secure locations for burial of carcasses has been developed by the DNR. We will talk about this a bit later in the presentation. Some FADs can affect human health, including personnel on the farm. In these instances, the Iowa Department of Public Health would also be involved in an animal disease emergency. They may also be involved in assisting and addressing the mental health issues that could occur during or after an emergency response.

Additional State agencies may be involved depending on the degree and nature of the animal disease emergency. These include the Iowa Department of Public Safety, Iowa Department of Transportation, Iowa National Guard. Additionally, support may come from Iowa State University Extension Service and Iowa State University College of Veterinary Medicine.
There is a State plan developed for the occurrence of an animal disease emergency. It describes the roles, responsibilities and actions needed for a variety of emergencies or disaster events. The Iowa Emergency Response Plan is part of the Iowa Comprehensive Plan, outlined in the Iowa Code, Section 605, Chapter 9 and Essential Support Function #11: The Agriculture and Natural Resources Plan, and Annex W: Infectious Animal Disease addresses the specifics for an animal disease emergency.

Annex W addresses Iowa’s ability to respond and eliminate infectious animal diseases which are a threat to the agriculture industry of the state. It is designed to provide the Governor, the Iowa Secretary of Agriculture, and other key state government decision-makers with a prudent and well-reasoned course of action aimed at controlling and eradicating a serious infectious animal disease outbreak. This function is not activated for all animal disease outbreaks that occur in Iowa or that otherwise pose a threat to Iowa. Many such outbreaks are handled routinely by private practice veterinarians and/or the veterinarians employed by the State Veterinarian.

Annex W also addresses the significant functional interdependencies of the various State agencies, such as direction, control and coordination, law enforcement, logistics, public information, public works and engineering, resource management, human services and in the event of an intentional event, terrorism incident response.

The Iowa Code, Section 163, grants IDALs broad powers to “control an infectious disease affecting animals within the state. Actions needed may include, control and eradication of animal disease, quarantine of diseased animals or premises, regulation or prohibition of animal movement in, out and within the state, entry to any premises where animals/carcasses are or have been in the past, condemnation and depopulation of animals and/or disinfection of farm operations. Iowa Code Chapter 163: Infectious and Contagious Diseases Among Animals at http://www.legis.state.ia.us/IACODE/2001/V.html.

If a major animal disease is reported in Iowa, movement restrictions could be put in place to minimize spread until more information is known. The State Veterinarian, under the authority of the Iowa Secretary of Agriculture, may implement embargos, voluntary hold orders, or quarantines, depending on the needed response. Animals or their products may not be allowed to go to market or for further processing. People movement may also be limited initially until more is known about the disease and how it is spread. The only ones allowed on/off operations could be essential personnel or state authorities. Deliveries may be halted as well depending on the disease concern and how rapidly it can spread.
Animal Disease Emergencies – Local Preparedness and Response

Local Government Officials

The Iowa Department of Agriculture and Land Stewardship has been working with the U.S. Department of Agriculture on the formation of the National Animal Identification System (NAIS). This national program is being developed to identify animals and track them as they move from one location to another. The database created will allow a rapid traceback in the event of a disease of concern. When fully operational, the NAIS will be capable of tracking an animal or group of animals back to the original premises within 48 hours. The first step in the process is to identify and register premises that house animals. Premise Identification Numbers (PINs) are necessary for any location involved in livestock commerce or the movement of animals or poultry. Allied agricultural operations and non-producer participants can also be assigned PINs. The PIN process begins with the completion of a Premises Identification Number Application.

Federal Agencies

There are a number of federal agencies involved in the surveillance, detection and response of animal disease emergencies at the national level. The lead federal agency for safeguarding American livestock and poultry health and for responding to a animal disease emergency is the U.S. Department of Agriculture, Animal and Plant Health Inspection Service (USDA-APHIS). There are several divisions of the agency which handle various aspects of surveillance, detection, diagnostics and response. The Veterinary Services division (VS) works to prevent, control and/or eliminating animal diseases, and monitoring and promoting animal health and productivity. The Emergency Management and Diagnostics Division prepares and trains personnel for response to animal health emergencies and oversees the National Veterinary Diagnostic Laboratories.

USDA Personnel in Iowa

There are several USDA personnel based in Iowa and responsible for federal activities in the State. All are trained FADDs.

USDA-APHIS-VS Diagnostic Laboratories

Just as the state has District Veterinarians, on the Federal side, there are 9 regionally located Veterinary Medical Officers, or VMOs. These veterinarians are all FADDs and work to implement and monitor federal animal health surveillance and control programs. Some of these individuals have dual duties as State district veterinarians as well.

Four USDA-APHIS laboratories comprise the National Veterinary Services Laboratories (NVSL) and provide services for the diagnosis of domestic or foreign animal diseases, import/export testing of animals, training, and testing for eradication or control programs. All suspected foreign animal disease (FAD) outbreaks must be investigated within 24 hours of notification. When a large-scale animal-disease outbreak occurs, tracking its progress and performing diagnostic tests on thousands of diagnostic samples is a big challenge. To get the job done, it is very important that all the parties involved—Federal agencies and laboratories managed by State governments and universities—communicate and collaborate effectively. The National Animal Health Laboratory Network (NAHLN) now forms part of a nationwide strategy to coordinate the work of all organizations providing animal disease surveillance and testing services. (Photo: National Animal Health Laboratory Network (NAHLN).

The USDA also manages the National Animal Identification System (NAIS), a voluntary national program created to identify and track the movement of livestock. This will aid in determining animals in contact with or commingled with diseased or exposed animals during an outbreak investigation. Although most animal industries use some type of identification system for animal identification, the current systems are not consistent from state-to-state. In the event of a disease outbreak, the process of tracing an animal’s movement using the current forms of identification can be a time consuming event, especially if the animal has moved across state lines. Additionally, the maintenance of this information improves the ability to notify states and producers in the event of an animal health emergency. Once the program is fully implemented, a goal of NAIS is to be able to traceback or traceforward exposed animals in 48 hours or less. The first component of the program is premises identification, followed by animal identification and lastly, reporting animal movement.

The Department of Homeland Security (DHS), through USDA-APHIS, has the difficult job of protecting our borders and keeping foreign animal and plant pests out of our country. Agriculture border controls were maintained by the USDA-APHIS-Plant Protection and Quarantine, prior to March 1, 2003, when responsibilities were transferred to the Department of Homeland Security (DHS), Customs and Border Protection (CBP). DHS CBP is responsible for monitoring 317 ports of entry into the US and are constantly on the lookout for imported animal and plant material. Under the CBP are the Customs Service, the Border Patrol, Immigration and Naturalization Service, and Agricultural Inspections; more than 40,000 employees working to safeguard our borders and ports. About 3,000 USDA-APHIS agriculture inspectors search baggage at airports and cargo at major ports of entry to ensure compliance with animal and plant import restrictions. In 2004, DHS CBP agriculture specialists inspected nearly 1 million conveyances; 83 million passengers/pedestrians and conducted nearly 3.6 million cargo inspections. An additional part of the CBP is the Beagle Brigade, a team of 141 detector dogs used to sniff out luggage, packages, mail and any other items brought in the U.S. Over 2 million interceptions of prohibited agricultural products made each year, detector dogs make 75,000 of them. This photo depicts a beagle sniffing baggage at an airport; the vest he is wearing says “Protecting American Agriculture”. (Photos by Danelle-Bickett Weddle, ISU)

There are also Federal and Regional veterinary medical assistance teams. National Veterinary Response Teams (NVRT) and Veterinary Medical Assistance Teams (VMATS) are groups of veterinarians and animal health professionals capability of setting up a full field hospital, and can provide medical care for pets, search and rescue dogs, livestock, wildlife and even zoo animals if the need arises. The USDA manages The National Animal Health Emergency Response Corps (NAHERC), a roster of private and state veterinarians and veterinary technicians that can be activated quickly to serve as temporary Federal personnel to help meet emergency staffing needs for the response and control of animal disease outbreaks. (Photo: VMAT members examining a dog. www.fema.gov/storm/charley/photos/h_c_s2_10.jpg)

The Homeland Security Act of 2002, led to the release of Homeland Security Presidential Directive #9: Management of Domestic Incidents in January 2004. This measure established objectives for a national effort to develop a comprehensive all-hazards approach to domestic incident management. This national policy is aimed at defending the nation’s agriculture and food system against terrorist attacks, major disasters and other emergencies. HSPD-9 also suggested the development of a national veterinary stockpile with treatment, vaccinations and other support materials that would be needed in an animal disease emergency.
The National Veterinary Stockpile (NVS) was established following release of Homeland Security Directive #9 on January 30, 2004. The NVS, much like the human version – Strategic National Stockpile, contains critical veterinary supplies in the event of an animal disease emergency. Items include vaccines, antiviral medications and other drugs needed for treating ill animals. It also includes PPE kits – Personal Protective Equipment – to ensure those working with animals have the proper gear so they aren’t exposed to disease agents. The shipment must be requested by the State; the State must then be prepared to receive, stage, store, and manage the inventory. It will be sent within 24 hours of request and is designed to support the response efforts for 40 days. A practice deployment and inventory management scenario was performed in Iowa in 2007.

A number of other Federal agencies may play a role in an animal health emergency depending on the response and personnel needed. The Department of Justice would coordinate law enforcement activities related to terrorist threats and incidents. The Department of Homeland Security (DHS): Coordinates Federal operations within the United States to prepare for, respond to, and recover from terrorist attacks, major disasters, and other emergencies. The Department of State (DOS): Coordinates international response activities relating to domestic incidents, and for the protection of U.S. citizens and U.S. interests overseas. The Department of Defense (DOD): Authorizes Defense Support of Civil Authorities for domestic incidents. Other Federal departments or agencies may play primary, coordinating, and/or support roles based on their authorities and resources and the nature of the incident.

The National Response Framework (NRF), successor to the National Response Plan (NRP), was released by the Department of Homeland Security in January 2008 and became effective March 22, 2008. This 90 page document specifies how Federal Government resources work with State, local, and tribal governments and the private sector to respond to emergency situations, especially when federal assistance is needed.

A basic premise of the National Response Framework is that all incidents are handled at the lowest jurisdictional level possible -- the emphasis is on local response. For animal disease emergencies, local responders such as veterinary and animal health professionals as well as police, fire, public health, medical or emergency management professionals may be called upon to assist in the response. Additionally, the private sector is a key partner, particularly for critical infrastructure protection and restoration of the community.
Fifteen Emergency Support Functions (ESF) are included in the NRF. These documents describe the grouping of Federal resources and capabilities into functional areas needed in a national response (e.g., Transportation, Firefighting, Agriculture and Natural Resources). Each ESF lists the primary and support agencies involved in various emergency response situations, as well as the Federal resources, policies, concepts of operation, responsibilities and capabilities for a national response. ESF outlines how the Federal government will provide assistance to State, local and tribal governments. For animal disease emergency response, ESF 11: Agriculture and Natural Resource is followed. Depending on the scale of the incident, the response may also involve ESF 8: Public Health and Medical Services and ESF 13: Public Safety and Security. (Slide graphics used with permission from Dr. Dahna Batts, CDC, Clinician Outreach and Communication Activity (COCA). October 2007. www.bt.cdc.gov/coca/ppt/coca_Brief_052207_Final.ppt#264,11,Slide11; Updated ESF info from www.fema.gov/pdf/emergency/nrf/nrf-est-all.pdf.)

**Local Roles and Responsibilities**

- Chief Elected or Appointed Official
  - Ensure public safety and welfare
  - Provide strategic guidance and resources within jurisdictions, among adjacent jurisdictions, with private sector
- Emergency Manager
  - Oversees emergency programs and activities
  - Coordinate jurisdiction capabilities
- Department and Agency Heads
  - Perform emergency management functions
  - Local emergency plans, provide response resources

**Chief Elected or Appointed Official.** A mayor, city manager, or county manager, as a jurisdiction’s chief executive officer, is responsible for ensuring the public safety and welfare of the people of that jurisdiction. Specifically, this official provides strategic guidance and resources during preparedness, response, and recovery efforts. Emergency management, including preparation and training for effective response, is a core obligation of local leaders. Significant incidents require a coordinated response across agencies and jurisdictions, political boundaries, sectors of society, organizations, etc. These incidents will require that publicly elected and appointed officials, as well as business owners and community leaders, make difficult decisions for the benefit of the community.

**Emergency Manager.** The local emergency manager has the day-to-day authority and responsibility for overseeing emergency management programs and activities. He or she works with chief elected and appointed officials to ensure that there are unified objectives with regard to the jurisdiction’s emergency plans and activities. This role entails coordinating all aspects of a jurisdiction’s capabilities. The emergency manager coordinates all components of the local emergency management program, to include assessing the availability and readiness of local resources most likely required during an incident and identifying and correcting any shortfalls.

**Department and Agency Heads.** The local emergency manager is assisted by, and coordinates the efforts of, employees in departments and agencies that perform emergency management functions. Department and agency heads collaborate with the emergency manager during development of local emergency plans and provide key response resources. Participation in the planning process ensures that specific capabilities (e.g., firefighting, law enforcement, emergency medical services, public works, environmental and natural resources agencies) are integrated into a workable plan to safeguard the community. These department and agency heads and their staffs develop, plan, and train on internal policies and procedures to meet response and recovery needs safely. They should also participate in interagency training and exercises to develop and maintain the necessary capabilities. (Source: http://www.fema.gov/pdf/emergency/nrf/nrf-core.pdf)

Prevention includes measures that prevent the emergency from happening, reduce the chance of the emergency happening, or reduce the damage of unavoidable emergencies. Awareness and management of disease risk is an important component for Iowa livestock operations so that an animal disease emergency can be prevented. Whether it is part of everyday operations or in the event of an outbreak, awareness of common biosecurity, or biological risk management, protocols is essential to those interacting with animal facilities. Specific prevention steps exist for certain diseases, and control practices relate to how the disease is actually spread. Recommended prevention practices for the five routes of transmission will be further explained.
Disease agents can be spread from animal to animal, or animal to human (known as zoonotic disease), through five main routes – aerosol, direct contact, fomite, oral and vector borne. Zoonotic diseases involve the transmission of disease pathogens from animals to humans. The disease agents enter into a person goes through the same five routes of transmission as in animals – aerosol, oral, etc. It should be noted that many infectious agents can be transmitted by more than one route of infection. (Photo courtesy of DB Weddle, DVM, Iowa State University)

NOTE TO PRESENTER: This would be the place to distribute the Transmission Routes Handout so participants can learn the definition of each of the routes of transmission. For brevity, here are quick explanations: aerosol – breathing in contaminated particles; direct contact – disease agent entering through blood, breeding, mucous membranes like eyes/gums/open wounds; fomite – contaminated inanimate object carries disease agents and enters animal directly or orally (example – needles, buckets, boots); oral – consumption of contaminated feed, water; vector-borne – insects acquire disease agent from one animal/human and spread to another animal/human

It is important to remember that disease transmission can occur without animals exhibiting obvious clinical signs of disease. That is why daily disease prevention and awareness of how diseases are transmitted are essential when developing a strategy to minimize the risk of disease for a facility or operation. (Photo source: DB Weddle, DVM, Iowa State University)

The response needed for an animal disease emergency will depend on a number of factors, such as the particular disease, how easily it is spread, the number of animals or locations affected. However, almost all disease outbreaks involving livestock or poultry will involve the State Veterinarian and usually the Federal Government (USDA APHIS) to some extent. Those outbreaks that involve a foreign animal disease (one that is not found in the U.S.) will have international trade issues.
Upon suspecting a disease of high consequence, the local veterinarian is required to contact the State veterinarian or the Federal AVIC. At this point a FADD (foreign animal disease diagnostician) is sent out to investigate. A FADD, is a state or federal veterinarian who is specially trained to conduct investigations of high consequence animal diseases. Each year in the U.S. over 500 FADD investigations are conducted; most of which are found to be negative for high consequence animal diseases. Here in Iowa, about 25-50 investigations are conducted each year. The FADD will investigate within 24 hours of the local veterinarians initial call. The FADD will assess the situation and examine the animal(s). Working in close collaboration with the State Veterinarian and the Federal AVIC, the FADD will obtain the appropriate samples and forward them to the appropriate National laboratory for testing.

Depending on the level of suspicion of an FAD, the sample may be shipped overnight or hand carried to the laboratory. While the sample is being processed, the affected farm may be placed under a hold order to prevent the movement of animals off of or onto the premises. The level of response needed will vary on a number of factors. The disease suspected or confirmed, the number of animals or premises affected, the animal health and public health impact from the disease, the economic or trade implications of the disease. Actions taken will be made by the State Veterinarian (or in the case of a national emergency – in conjunction with the Federal AVIC). Some diseases may potentially bring a Presidential or a USDA declaration of emergency.

Animal disease diagnostic testing in Iowa is done routinely by the Iowa State University College of Veterinary Medicine Diagnostic Laboratory as well as other private laboratory facilities or those in the National Animal Health Laboratory Network. In the event of suspicion of a high consequence disease pathogen, samples would be sent to one of two National Animal Disease Diagnostic Laboratories. The FADDL (Foreign Animal Disease Diagnostic Laboratory) in Plum Island, NY, conducts testing of sample from cattle, sheep, goats and swine. The National Veterinary Services Laboratory in Ames, Iowa, conducts testing on poultry, equine and fish disease agents.

There are various disease prevention and control methods that must be applied during and after an animal health event and these will be discussed next.

If a major animal disease is reported in Iowa, movement restrictions could be put in place to minimize spread until more information is known. The State Veterinarian, under the authority of the Iowa Secretary of Agriculture, may implement embargos, voluntary hold orders, or quarantines, depending on the needed response. Animals or their products may not be allowed to go to market or for further processing. People movement may also be limited initially until more is known about the disease and how it is spread. The only ones allowed on/off operations could be essential personnel or state authorities. Deliveries may be halted as well depending on the disease in question.
Once an Infected Premise (IP) with a high consequence animal disease is identified, the area surrounding that farm will be quarantined (Infected zone ~ approximately 6.2 miles in diameter). Neighboring farms, Contiguous Premises, may also be quarantined as would any farms that had received animals from the IP or were sources of animals to the IP (until surveillance is conducted). For some severely contagious diseases, such as foot-and-mouth disease, movement of animals and possibly traffic will be stopped. This will involve the implementation of various road block and entry and exit points in the Infected Zone. Depending on the location and number of roadways feeding into the area, this may be a high resource (personnel) demanding function. (Graphic by Andrew Kingsbury, CFSPH, ISU)

Single Premises Response

- One location
- FADD investigates
- Diagnosis
- Quarantine premises
- Most coordination at State level
- Treat or depopulate
- Federal authorities manage international issues

Single premises responses consist of one location where the FADD is called out to investigate the clinical signs or cause of death in animals. Once a diagnosis of a foreign animal disease is received, the State Veterinarian will put a quarantine on that premises. If the history and clinical signs are cause for concern, the FADD can discuss their findings with the State Veterinarian first and the quarantine can actually be put in place prior to definitive diagnosis as a safety measure. A single premises FAD will most likely be handled by State. They will decide to treat the animals or depopulate (euthanize and dispose of carcasses) depending on the disease diagnosis. The Federal authorities will handle the issues related to international concerns as a result of the disease diagnosis (OIE communication, embargos from other countries).

Multiple Premises, Confined Area Response

- Everything for single premise
- Increased quarantine Area
- REGIONAL Involvement
  - State, federal and industry agricultural authorities handle situation with or without State Declared Emergency
- USDA Secretary of Agriculture may issue Declaration of Emergency

Once you have considered the incident management of one location and some of the logistics and personnel issues, consider a multiple premises response. Although limited in geographic area, the control area needed would still be large and require increased resources. At this level, the Region gets very involved and there may or may not be a State Declaration of Emergency.

Multiple Premises, Multi-State Response

- Everything previous plus
- National movement controls
- State level emergency declared
- U.S. Secretary of Agriculture requests assistance from DHS
- National Response Framework and ESF 11 activated
- APHIS is lead agency

This is the worst case scenario. All of the previous response type actions are in place and now a State level emergency is declared. The U.S. Secretary of Agriculture will request assistance from Department of Homeland Security (DHS), thus turning on the National Response Framework, specifically ESF 11. APHIS will be the lead Agency and will support the States in their response efforts.

Prevention: On the Farm

- Restrict access to farm
- Clean vehicles only
- Record ALL traffic, visitors
- Monitor animals frequently
- Contact your herd veterinarian

Producers should implement and follow strict, complete biosecurity protocols as their best means of prevention. This should include steps such as restricting access to only personnel necessary for the function of the farm. All traffic (vehicle, people and animals) should be CLEAN, closely monitored and recorded in a log book. Animals should be closely and frequently monitored for signs of illness or unusual behavior. If identified, the herd veterinarian should be contacted immediately. Signs should be posted at the farm entrance restricting access, such as the one pictured here (graphic design by Clint May, CFSPH). Note to presenter: Do Not Enter Sign is available in your resources.
When on the farm during an animal disease event, personal protective equipment such as gloves, coveralls, and boots should be worn at all times. These materials should be disinfected or removed and properly disposed of following the procedure to prevent cross contamination between different areas of the farm and farm-to-farm. Additionally, hands should be washed with soap and water after contacting animals to prevent spread of disease to animals or humans if the disease is zoonotic. Depending on the specific disease, protective eyewear and a mask or respirator may also be necessary. State and Public Health Officials will provide guidance regarding proper protection to those working with animals. Vaccination or treatment of animals is very disease specific, and dependent upon the availability of a safe, effective product. Again, State Animal Health Officials will provide guidance to those working with livestock producers and veterinarians as to the best approach in an animal health event.

In order to control disease, proper cleaning and disinfection of all vehicles on and off the farm, plus animal housing areas may be necessary. An essential step is cleaning - removing all organic matter (manure, feed, dirt, etc.) prior to application of any disinfectants. Most disinfectants are inactivated by organic material. Additionally, this debris can allow microorganisms “hiding” from the action of disinfectants. Always read the label instructions to determine to concentration needed. More is not always better. Another often overlooked step is to allow for proper contact time after application of the disinfection solution. The chemicals need time to do their job. In the event of a disease outbreak, the best prevention: on the farm control method will be determined by animal health officials. Photo courtesy of: Danielle Bickett-Weddle, DVM, ISU

Control of a diagnosed foreign animal disease on a livestock operation usually involves depopulation of all animals on the farm. This decision will be made by the State or Federal Veterinarian. Many different humane options exist for euthanizing animals and the method is determined by species. If animals are euthanized, then a disposal plan should be in place. (The photo shows carbon dioxide foam used to humanely euthanize floor reared poultry.)

Burial on-site and composting are the current options the Iowa Department of Natural Resources (IDNR) has in their plan for livestock disposal. Protocols have been developed to ensure proper composting or burial. One big advantage of these methods is that animal carcasses are not moved off the premises thereby decreasing the risk of disease spread. Rendering may be a consideration depending on proximity to one of five rendering businesses in Iowa. Landfill of dead animals raises biosecurity concerns depending on the disease and where the quarantine zone is located. Open burning of carcasses is not allowed in Iowa; incineration methods may be allowed. In some cases alkaline hydrolysis may also be used.

The Iowa Department of Natural Resources has developed Carcass Disposal Maps using GIS technology. These maps are on line and interactive. Site considerations for livestock burial include proximity to water tables, habitation and the possibility of disease transmission. A 3 tiered approach is used for the maps with red indicating burial restricted zones, multiple colors are cautionary and green are no known restrictions.
This is a sample livestock burial map from the Iowa DNR website. Red – restricted zones, Multiple colors – cautionary zones, Green – No known restrictions.

Several of the high consequence diseases are zoonotic (diseases of animals transmissible to humans). For example, Newcastle disease virus in chickens has lead to conjunctivitis ("pink eye") in poultry workers and responders. Swine vesicular disease virus can cause mild blister formation on the hands or other exposed areas of the skin. Avian influenza, as we are all aware of, can lead to severe respiratory disease or pneumonia. Anthrax, which does occur in parts of the United States, can cause skin lesions, respiratory disease and if untreated, death. Therefore, response workers should take personal protective precautions if called to assist at sites of a zoonotic disease.

Safety is also a concern when assisting with a response to an animal disease emergency. Physical stress and injuries may occur from interactions with animals or heavy equipment used on the site. Inclement weather conditions as well as wet disinfection and decontamination areas can lead to slips, trips or falls. Mental health issues are also a concern. Not only for the producer, who may lose the entire herd/flock and possibly their livelihood, but also the responders working with or euthanizing the animals. Depending on weather conditions, environmental stress such as heat, cold, rain, snow, etc. can contribute to the physical and psychological stress.

Next we will overview the coordination mechanisms of any animal disease emergencies. These include NIMS, the National Incident Management System and ICS, the Incident Command Structure.
In February 2003, Homeland Security Presidential Directive–5 (HSPD-5) was created to “enhance the ability of the United States to manage domestic incidents by establishing a single, comprehensive national incident management system”. This led to the creation of NIMS, the National Incident Management System, a nationwide template that standardized incident management processes, protocols and procedures for all responders whether governmental, private-sector or non-governmental organizations (NGO). NIMS also mandates the use of the Incident Command System, which we will talk about later.

NIMS consists of a core set of principles, terminology and organizational processes that establish standardization of the management of an incident. The system is flexible and adaptable and can be used regardless of the cause, size, location or complexity of the hazard. This allows Government and private entities to work together.

NIMS aligns command and control, organizational structure, terminology, communication protocols, resources and resource typing to enable synchronization of efforts in response to an incident at all levels of government. Resources, knowledge, and abilities from the various Federal Departments and Agencies are outlined in the National Response Framework.

The Incident Command System (ICS) is mandated by NIMS. It is a standardized on-scene emergency management tool that allows responders to coordinate their efforts. ICS has an integrated organizational structure with which incorporates the needed officials and responders from Federal, State, local and tribal agencies as well as the private sector and non-governmental organizations. The system allows function without hindering jurisdictional boundaries.

ICS is adjustable depending on the complexity or demands of the incident. The organization structure can be adapted for a variety of situations, including single jurisdiction/single agency events, single jurisdiction with multi-agency involvement, and multi-jurisdictional or multi-agency operations. The structure of the ICS is a modular format. It is a top down structure with five key functional areas. The Command Post, the Operations, Planning, Logistics and Finance/Administration functions.
Command Post (CP)

- On-scene command and management
- Incident Commander in charge of all functions
  - By legal, agency, or delegated authority
- A Safety Officer, Information Officer, and Liaison Officer may be appointed

The Command Post (CP) is the on-scene management site. It is lead by an Incident Commander, who by legal, agency or delegated authority is in charge of all functions of the situation. The Incident Commander may appoint assistants to help in managing specific areas of the incident. These include the Safety Officer, the Information Officer and the Liaison Officer. The Safety officer is responsible for oversight and verification of safe practices and procedures at the incident site.

Unified Command

- Multi jurisdictional authorities or agencies
- Manage under appropriate law, ordinance or agreement
- Goals
  - Develop objectives for incident
  - Improve information flow and interaction among all agencies involved
  - Reduce or eliminate duplicate efforts

The term Unified Command is used when there is more than one agency with incident jurisdiction or when incidents cross political jurisdictions. Normally, individual agency responsibilities and authority are legally confined to a single jurisdiction. The goals of Unified Command are to develop objective for the entire incident, improve information flow and interaction among all agencies involved in incident response, develop single collective approach to incident response, optimize efforts of all agencies to perform their respective missions by reducing or eliminating duplicate efforts or missions.

Area Command

- Management of multiple incidents being handled by separate Incident Command Posts
- Management of very large or complex incident with multiple incident management teams

Area Command involves the management of multiple incidents, which are handled by separate Incident Command Posts (ICP) or when very large or complex incidents require multiple task teams. Area Command may be established at an emergency operations center (EOC) facility or at some location other than an ICP. For animal disease emergencies, the State Veterinarian and the Federal Area-Veterinarian-in-Charge (AVIC), or their Federal or State representative, serve as the Area Commanders in each State in the ICS system. As such, they are responsible for all animal health emergency response activities within their Area (State). They also share responsibility for establishing one or more Incident Management Teams in their Area and for ensuring that these teams are trained and capable of meeting or helping to meet the response management needs of the State and the Nation.

In analyzing the complexity of an incident, the Emergency Incident Management and Typing System may be useful. It can help characterize a situation and identify safety issues and key areas of complexity. Incident complexity is categorized in a range of Type 5 Incident (comparatively short time and minor levels of resources) to a Type 1 Incident (need for significant human and material resources and committed for a longer time period).

This slide shows the organization of a larger scale incident. Area command is established to oversee the management of the various Incident Command Posts (ICP). The ICPs are the field locations at which the primary tactical-level, on-scene incident command functions are performed. The EOC (local, state, national) is a physical location at which the coordination of information and resources to support local incident management activities normally takes place.
This is a more detailed view of the various sections in an Animal Health Incident Command. Operations (field) organization is grouped by task (e.g., diagnostics, epidemiology, surveillance, euthanasia, cleaning and disinfection).

It is important to remember that each incident will be LOCAL. Therefore local planning is needed to best prepare for an event. Although State and Federal agencies will respond, once the situation is controlled, the long term recovery process is locally based.

The final step in an animal disease emergency is recovery – what can be done to restore livestock production, continue with business, and ensure Iowa’s agriculture industry rebuilds.

Recovery involves restoring confidence that the situation is contained and the danger is over. A great deal of time, money, and effort is required to recover from an agricultural incident. Once the animals are disposed of, then the site(s) must be cleaned and disinfected. Following an animal disease emergency, Federal and State governments would work together on a possible compensation plan (indemnity) for producers for some or all of the loss of value of animals destroyed, dependent upon availability of State or Federal indemnity funds. Typically a farm will not be allowed to restock for a set period of time, dependant on the disease (e.g., for avian influenza the wait time is a minimum of 30 days). Finally, business continuity is an important consideration in recovery efforts. Recovery is smoother if a business or county has a continuity plan to implement. These plans are developed to keep people safe and employed during a disaster and to keep the business running during and after a disaster, which history tells us requires planning. More details related to business continuity are discussed next.

Prior to a disaster, some of the thoughts business owners may have had include “It will never happen to me,” “If disaster strikes, it won’t be that bad,” “I have insurance” and “The government will take care of me if a disaster occurs.” As we know, disasters can and do happen and the only thing we can predict is that disasters are unpredictable. The definition of disaster contains words like catastrophe, calamity, great loss and destruction, an uncontrolled crisis. That alone means it will be bad and preparation and planning is imperative for businesses to survive. Insurance and the government are not always going to be able to assist in the capacity that is needed. Take responsibility for the success of your business by establishing a business continuity plan. (Photo source: http://www.cherokeeia.com/images/photos/larrabee_feed_mill.jpg)
Local support may include:
- Road barricades
- Quarantine enforcement
- Checkpoint personnel
- Decon stations and personnel
- Transportation
- Additional communications capacity
- GPS equipment
- Base of operations
- Training/orientation facility
- Staging area for equipment
- Food, lodging
- Supplies, resources as needed for task management

In order to get through the YOYO phase, planning is imperative. Planning is a way to protect your family and/or employees, your pets and/or livestock, your property/business, and allow critical community resources to more readily help those who have special needs or are most severely impacted. This allows you to be part of the solution rather than part of the problem.

FEMA has outlined the important components of a business continuity plan. The planning team should go through each component and address the issues. Source: Emergency Management Guide for Business and Industry: A step-by-step approach to emergency planning.

**Direction and control** – this part of the plan outlines who is in charge and what system they will use to help manage the resources and make decisions. Depending on the size of the business, this can be simple or more sophisticated. This should include the plan to be followed, the duties of personnel, and what information needs to be gathered to make decisions.

**Communications** – this part of the plan outlines how employees and others will be educated and trained about the plan, how each employee will know what their role is in the plan, and how employees will be notified of a disaster. Communications should also be prepared to discuss expectations.

**Life safety** – this is directly related to communication and identifies someone in charge of safety. This person must be prepared to communicate about the safety of employees regarding the disease outbreak. Employees and their families will need to know what the risks are to them and their pets. Protecting the health and safety of all people and animals is a first priority. Photo depicts training people about avian influenza – what it is, how birds are affected, how people can protect themselves. (Source: DB Weddle, DVM, Iowa State University)

**Property protection** – this part should address biosecurity, specifically, what will be the process for restricting movement on and off a property?

**Community involvement** – it is important to be involved with the planning for response in the community. If your business is going to be impacted by an outbreak, participating as a responder to aid in the response and recovery helps get business back together as quickly as possible. Plan ahead and have employees participate in the responder training. How could your business make adjustments to help in the response since you are not functioning in a normal manner? For example, if you run a warehouse with agricultural products and there is a stop movement order placed on trucks, you could offer to serve as a location for supplies or stockpiled goods. Get to know local and state officials that will be making decisions about movement and restoration of business. Discuss your business capabilities with them so they understand what role or risk you pose to the disaster.

**Administration and logistics** – ensure you have complete and accurate records for review by officials or the insurance company if needed. Other things to think about before an event include the overall plan, training and exercising, pre-
approved purchase requisitions for emergencies, stockpiling key supplies, and how you will access back-up power and maintain communications. **During and after** and event make sure you keep telephone logs, detailed record of events, record any injuries, be able to account for personnel, notify family, prepare press releases, and pre-approved purchase requisitions are still needed. The final part of the plan relates to recovery and restoration and will be discussed next.

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**Business Continuity Plan**

- Recovery and restoration
  - Planning considerations
  - Continuity of management
  - Insurance
  - Employee support
  - Resuming operations

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**Planning Pays Off**

- No or poor plan can result in losses
- In the event of a major disaster
  - 43% never reopen
  - 16.5% reopen but close in 2 years
  - ~60% attrition due to a disaster
- For every $1 spent on planning, $7 saved from disaster loss (FEMA)

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**Animal Disease Emergency Example**

Foot and Mouth Disease

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To demonstrate the impact an animal disease can have, and highlight the need for a prompt response to control the spread, we will discuss Foot and Mouth Disease and its implications should it be accidentally or intentionally introduced into the U.S.
Foot and mouth disease is a highly contagious viral disease that affects cloven-hoofed (two-toed) animals. [This includes cattle, pigs, sheep, goats, deer but NOT horses]. Foot and mouth disease is considered one of the most important livestock disease in the world. It is highly contagious, causing fever and blister formation in the mouth, on the tongue or muzzle, the feet or teats of affected animals. These result in great production losses, as animals have excessive salivation, difficulty walking and eating; death may occur in young animals. Sheep and goats that have the virus often have very mild signs of disease and cases may be missed if not examined closely. The FMD virus is found in the saliva and lesions of affected animals. It is spread rapidly between animals by contact, respiratory aerosol, or by objects (feed, coveralls, shoes, instruments, etc) contaminated with saliva or lesion fluids. Any case of FMD discovered in the U.S. (or in any country) must be reported to the World Organization for Animal Health (formerly the Office International des Épizooties (OIE) created in 1924) within 24 hours. The OIE then reports the outbreak to other nations, often this results in embargos or bans on animals or animal products from the affected country. The photos depict excessive salivation (cow-top) and ruptured vesicles on leg and coronary band (pig-bottom) due to FMD.

Foot and Mouth Disease (FMD) once occurred in the U.S., but was eradicated in 1929. No new cases have occurred since that time. However, the disease does still occur in other areas of the world, including parts of Asia, Africa and South America. With the ease of world trade in animals and animal products, the threat of the introduction of FMD into the U.S. is a real one. Photo: The map shows outbreaks of FMD worldwide from January-March 2008. Map from the World Organization for Animal Health (called the OIE- Office of International Epizootics), accessed 27 March 2008.

FMD is an economical devastating disease, as seen by the effects during and following an FMD outbreak in the U.K. in 2001. Estimates put overall economic losses over £10 billion due to the total economic strain placed on the agriculture and food industry (£3.1 billion), compensation to farmers (£1.1 billion), tourism (£4.5 to £5.3 billion by 2005) and sports (£750 million). While it is known that 6 million animals were slaughtered in the U.K. to control this disease, resulting in them reaching FMD free status in less than one year, the true costs will likely never be known. The public witnessed something few had ever seen. Mass slaughter was called into question, as were animal welfare and animal rights. Pollution from pyres of burning carcasses was intense in some areas and also impacted public health.

Conclusion
Throughout this presentation, we hope you have learned that threats to agriculture and livestock need to be taken very seriously. A local plan needs to be established for proper response and coordination in large events. Adequate resources and expertise will be needed to determine the extent of the attack, prevent disease spread and the losses that accompany it, prevent any public health implications.

In the event of an animal disease emergency, it is important for producers and the community to understand what steps government agencies will take to respond to or resolve the situation. It is equally as important for government agencies and local response groups to understand what industry resources are available to assist in the response and recovery process and how to work together to ensure consumer confidence in our food product and food safety systems. Today’s presentation emphasized the importance of early detection and response, which is critical to limiting the overall impact of the emergency. Veterinarians, and producers should know what signs to look for and who to call for assistance.

As local government officials, you should (may be required to) be trained in NIMS and ICS. Hopefully this presentation has increased your awareness of the State and Federal agencies involved in an animal disease emergency response, as well as the necessary steps that must be taken to control an outbreak. Get involved and encourage other members of your community to be involved with local response plan development. Work with State officials to improve your communities level of preparedness. Encourage members of your community to maintain vigilance and prevention practices for animal diseases.

A handout with the phone numbers of the State Veterinarian for Iowa, State Public Health Veterinarian, APHIS Area-Veterinarian-in-Charge and County Emergency Managers is provided. It is important to keep this list close at hand. If in doubt it is better to call and let the officials decide if your situation needs further investigation. The faster an outbreak can be identified, the faster it can be contained and controlled.