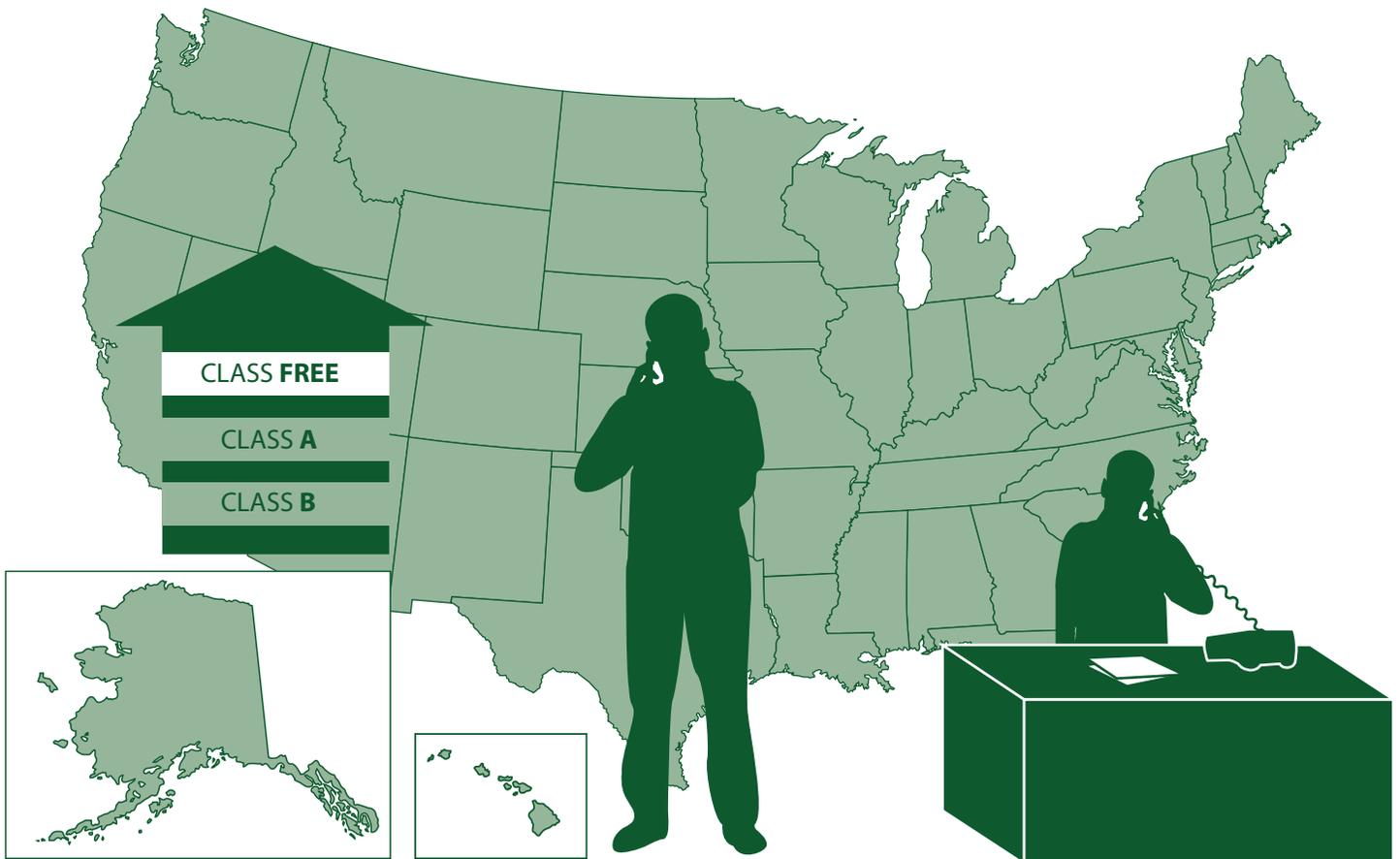


MODULE 3: OVERVIEW OF FOREIGN ANIMAL, USDA PROGRAM, AND REPORTABLE DISEASES



NATIONAL VETERINARY ACCREDITATION PROGRAM

United States Department of Agriculture • Animal and Plant Health Inspection Service • Veterinary Services

Approved as one unit of supplemental training for participants in USDA's National Veterinary Accreditation Program



Overview of Foreign Animal, USDA Program, and Reportable Diseases

This informational module has been approved expressly to serve as one unit of supplemental training for participants in USDA's National Veterinary Accreditation Program. The module is intended to familiarize accredited veterinarians with animal health regulatory concepts and activities. Information in the module does not supersede the regulations. For the most up-to-date regulations and standards, please refer to the Code of Federal Regulations or contact your local VS Area Office.

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Overview of Foreign Animal, USDA Program, and Reportable Diseases

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Overview of Foreign Animal, USDA Program, and Reportable Diseases

Introduction

Welcome to the Overview of Foreign Animal, USDA Program, and Reportable Diseases module. As an accredited veterinarian, awareness and understanding of these diseases is important to the health and well-being of animals and the public.

Upon completion, you should be able to:

- Define foreign animal, USDA program and reportable diseases
- Describe the safeguards that help prevent FADs from entering the U.S.
- Outline the steps in a foreign animal disease investigation
- List the USDA programs for controlling or eradicating diseases in various species of livestock and poultry
- Recognize the additional training opportunities available to accredited veterinarians
- Report foreign animal and reportable diseases
- Locate additional resources and learning opportunities

Completion of this module is expected to take 60 minutes, but will vary with your familiarity of the topics presented.

Foreign Animal, USDA Program, and Reportable Diseases

There are state, national and international reportable diseases, some of which are foreign animal diseases while others are USDA Program Diseases. Reportable diseases may also be zoonotic. To understand the differences and similarities, each is defined below.

Foreign Animal Diseases (FADs)

FADs include diseases or pests of terrestrial or aquatic animals not known to exist in the United States or its territories that may involve livestock, poultry, wildlife, or other animals. (Source: USDA-APHIS-VS) These diseases are sometimes called transboundary animal diseases.

Transboundary animal diseases are defined as those that are of significant economic, trade and/or food security importance for a considerable number of countries; which can easily spread to other countries and reach epidemic proportions; and where control/management including exclusion, requires cooperation between several countries. (Source: United Nations Food and Agricultural Organization)

USDA Program Diseases

Programs have been established jointly among federal-state-industry stakeholders to control and/or eradicate specific diseases or pests of livestock and poultry. Diseases may be designated as USDA Program Diseases because they are serious zoonotic diseases, are economically important, or are of concern to the livestock, poultry, or aquaculture industries. Some examples include bovine tuberculosis, trichinosis in swine, chronic wasting disease in cervids, and equine infectious anemia. More details will be provided under the USDA Program Disease section of this module.

Reportable Diseases

- All foreign animal diseases must be reported to Federal and State Animal Health Officials
- USDA Program Diseases must immediately be reported to Federal and State Animal Health Officials



- States may have additional diseases of interest that they monitor, and thus are reportable at the state level
- Zoonotic diseases may need to be reported to the State Health or Public Health department as well as the Centers for Disease Control and Prevention (CDC)
- Bioterrorism disease agents may be reportable to Federal and/or State Animal Health Officials

There are resources available to learn more about the various diseases cited as examples in this module and they are provided at the end of each section.

Next we will review the consequences of the accidental or intentional introduction of foreign animal, USDA program and reportable diseases.

Consequences of FAD, USDA Program and Reportable Diseases

Animal Health and Well-Being

- Some FADs, such as African horse sickness, peste des petits ruminants, or Nairobi sheep disease, are highly fatal. Others, such as epizootic lymphangitis and foot-and-mouth disease, kill few animals but cause considerable disease, discomfort, and production losses.
- Scrapie, a USDA Program Disease affecting sheep and goats, causes severe neurological disease leading to discomfort and death for all animals affected. As a result of the USDA National Scrapie Eradication Program, the prevalence of scrapie in the U.S. decreased by over 85% between 2003 and the end of September 2011. According to current projections, the U.S. should be at or near zero prevalence by 2017.

Human Health

- In 2003, Monkeypox virus, a zoonotic FAD, entered the U.S. in a shipment of exotic animals, spread to pet prairie dogs, and subsequently infected humans. Monkeypox virus can be fatal to humans, but fortunately no one died in this outbreak. People infected with the virus only developed a mild, self-limiting flu-like illness and a vesicular rash.
- In 1947, more than 6,000 cases of human brucellosis (4.4 cases/100,000 population) were reported in the U.S. As a result of the USDA brucellosis eradication program, fewer than 0.5 cases per 100,000 people are now seen each year (mostly *B. melitensis*).

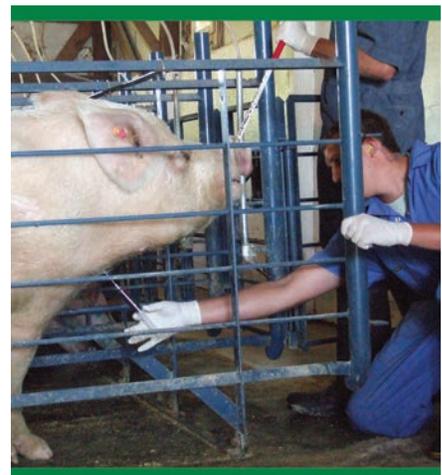
Sources: USDA-APHIS Facts about Brucellosis, June 2000 available at http://www.aphis.usda.gov/animal_health/animal_diseases/brucellosis/downloads/bruc-facts.pdf and the CDC, October 2005 available at http://www.cdc.gov/ncidod/dbmd/diseaseinfo/brucellosis_t.htm



The Economy

- Should a FAD, USDA Program or reportable disease be detected in the U.S., the economic impact will likely be felt by a variety of groups including producers (loss of markets, animals), affiliated industries (meat and milk processors, trucking companies may not have as much product to haul due to control efforts), and non-affiliated industries (tourism, sporting events often halt due to control efforts). Depending on the disease, consumer buying patterns may change, thus potentially negatively impacting domestic and international markets.
- Before eradicating pseudorabies from the U.S., the annual cost to pork producers cost was approximately \$21 million dollars to control disease outbreaks, conduct diagnostic serology, and vaccinate for prevention and control.

Source: USDA-APHIS Pseudorabies (Aujeszky's Disease) and Its Eradication, October 2008, accessed at: http://www.aphis.usda.gov/publications/animal_health/content/printable_version/pseudo_rabies_report.pdf



International Trade

When internationally important diseases are reported in a country, other nations may quickly ban the importation of susceptible species and related animal products from that country.

- In 2003, bovine spongiform encephalopathy was detected in a single imported cow in the state of Washington. As a result, many U.S. trading partners including Japan, South Korea, Russia, and Mexico suspended imports of U.S. beef and beef products.
- Many USDA Program Diseases can cause international trade barriers. Eliminating these diseases could introduce new markets for U.S. livestock and poultry and ease testing and trade restrictions.

Rapid Detection and Reporting is Essential

One reason to detect FADs or USDA Program Diseases quickly is to minimize the costs associated with control, eradication, and trade losses. A second reason is to prevent disease establishment in animal reservoirs (including wildlife) or arthropod vector populations. If an FAD is not recognized quickly and eradicated, its presence could be permanent.



This danger is particularly serious when the disease can enter wildlife and/or insect vectors. In 1998, West Nile virus was considered to be exotic to the Americas. In 1999, the first cases and fatalities in humans, wild birds, and domestic animals (horses) were recognized in New York. Animal and public health officials hoped to eradicate the virus by conducting surveillance in wild birds and by controlling the mosquito vectors. Since that time, West Nile virus has established itself in wild bird and mosquito populations across North America and has spread into parts of South America. It has become an endemic disease.

OIE-Listed Diseases

Another important group of diseases all accredited veterinarians should be aware of are the OIE-listed diseases. Most of the important FADs and many of the USDA Program Diseases can be found on a list maintained by the World Organization for Animal Health. This organization, formerly known as the Office International des Epizooties, still uses the acronym OIE. The OIE sets standards for animal diseases affecting international trade. It also collects and disseminates information about disease outbreaks. Most nations, including the U.S., are OIE members. OIE member countries submit routine reports on the disease status on the OIE listed diseases. If a country is recognized as free of an OIE listed disease, any change in the disease status in that country must be reported immediately.

In the past, OIE-listed diseases were traditionally divided into two lists (A and B), with List A containing the most important diseases in terms of their impact on international trade. In 2004, OIE members approved the creation of a single list of diseases notifiable to the OIE. The list is modified annually in January. It currently contains more than one hundred diseases that affect cattle, sheep, goats, pigs, horses, camels, birds, rabbits, fish, amphibians, mollusks, crustaceans, and/or bees.

OIE-listed diseases are very important, as their presence in a country can prevent or restrict the export of susceptible animals and animal products.

OIE-listed Diseases

<http://www.oie.int/animal-health-in-the-world/oie-listed-diseases-2011/>

Important Emerging Diseases

Some diseases, particularly emerging diseases such as Hendra or Menangle virus infections, may not (yet) be found on the OIE list. Do not assume that an FAD is not important just because it is not OIE-listed.

The remainder of this module provides more detail on the information accredited veterinarians need to recognize and report FADs, USDA Program and Reportable Diseases with links to additional resources.

1986	First case of BSE <i>United Kingdom</i>
1993	Hantavirus (Sin Nombre Virus) <i>United States</i>
1994	Hendra virus <i>Australia</i>
1997	First human cases of avian influenza H5N1 <i>Hong Kong</i> Menangle virus <i>Australia</i>
1998	Nipah virus <i>Malaysia</i>
1999	West Nile Virus <i>United States</i>
2003	Monkeypox, First case of BSE <i>United States</i>
2009	Human H1N1 pandemic <i>United States, many countries worldwide</i>

Knowledge Review #1

Match the appropriate description with the terms presented in this module.

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| A. Foreign animal, USDA Program, zoonotic, or a disease of interest | 1. Foreign animal disease |
| B. Internationally reportable diseases that can impact the import and export of animals and animal products | 2. Reportable disease |
| C. Diseases or pests of terrestrial or aquatic animals not known to exist in the United States | 3. USDA Program disease |
| D. Serious zoonotic diseases, are economically important, or are of concern to the livestock, poultry, or aquaculture industries | 4. OIE-listed diseases |

Answers are found in the appendix.

Foreign Animal Diseases

Some FADs, such as Nairobi sheep disease, have never occurred in the U.S. Other FADs such as foot-and-mouth disease, classical swine fever (hog cholera), bovine babesiosis (cattle tick fever), and screwworms were once endemic* in the U.S. but have now been eradicated through prompt reporting, surveillance, and control efforts. Another FAD, rinderpest, was declared eradicated from the world by the OIE in May 2011. This was the second disease, after smallpox, to be eradicated from the globe through human efforts.

*Endemic means that a disease is constantly present in a population. The amount of disease is relatively stable and predictable. Source: Thrusfield, *Veterinary Epidemiology* 3rd ed., 2007.

Accredited veterinarians need to familiarize themselves with FADs to be able to promptly recognize and report suspicions to animal health authorities. This action can prevent severe losses to animal health, public health (if zoonotic), and impacts on the economy and international trade.

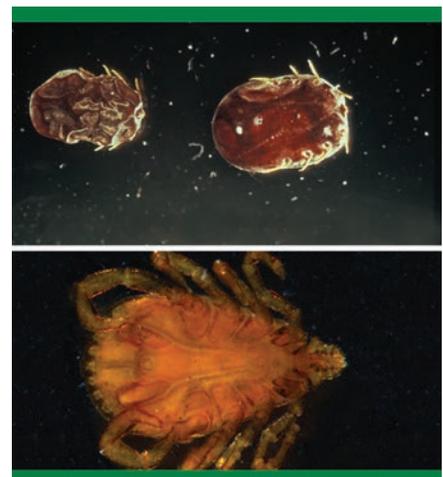
FADs of Livestock, Poultry and Horses

Category II accredited veterinarians treating livestock, poultry, and horses need to acquaint themselves with the diseases that are OIE-listed. Many of these diseases are foreign to the U.S., but some, such as anthrax, rabies, and certain strains of bluetongue, are endemic.

Accredited veterinarians should be aware of exotic arthropods that could enter the U.S. In addition to the harm they cause directly, these arthropods can carry the agents of FADs.

NVAP Module 5: Vesicular Diseases and *NVAP Module 18: Avian Influenza (AI) and Exotic Newcastle Disease (END)* provide much more information on FADs that have been or could be encountered on livestock or poultry operations.

Please see “FADs of Interest to Category II Veterinarians” in the appendix.



FADs of Companion Animals

Companion animals can be hosts for important arthropods not found in the U.S. such as the tropical bont tick, *Amblyomma variegatum*, that carries the rickettsia that causes heartwater disease. FADs such as screwworm infestations, Rift Valley fever, glanders or velogenic Newcastle disease can affect companion animals and possibly spread to livestock or poultry. Awareness of susceptible species and clinical signs of FADs in companion animals is an important responsibility of accredited veterinarians.

Also important to note is the potential for companion animals serving as a fomite. Their footpads and fur or feathers can harbor certain viruses. Companion animal movement between farms with susceptible species could result in disease spread if conditions are favorable.

NVAP Module 6: Exotic Avian Diseases and *NVAP Module 7: Foreign Animal Disease Detection in Category I Animals* provides more information on 12 FADs that have been or could be encountered in companion animals.

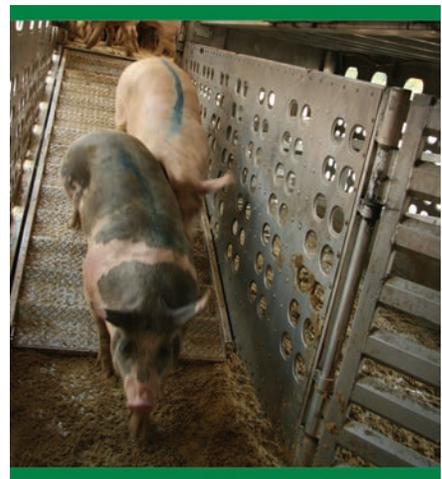
Please see “FADs of Interest to Category I Veterinarians” in the appendix.

Introduction of FADs

FADs can enter the U.S. by a variety of routes:

In Imported Animals or Animal Products

- Many infectious diseases can be carried by asymptomatic animals; as a result, pre-export, import and/or post-entry quarantines may be required by receiving countries.
- Some pathogenic organisms may also remain viable in animal products for a period of time. Diseases like foot-and-mouth disease, classical swine fever, swine vesicular disease, and African swine fever virus can survive in meat products, even in partially cured products like sausage. The Swine Health Protection Act regulates producers and premises that are feeding meat containing waste (garbage) to swine.
 - The Swine Health Protection Act requires any producer who utilizes waste feeding practices to obtain a permit and requires those producers to follow strict cooking and biosecurity (to prevent recontamination of cooked product) standards. The standards are described in the Code of Federal Regulations Parts 166 and 167. Additional information on the swine health protection act can be found at: http://www.aphis.usda.gov/animal_health/animal_dis_spec/swine/.



Carried by Unsuspecting Travelers

- Upon entry into the U.S., travelers are required by the Department of Homeland Security to declare if they have been on a farm/ranch/pasture or touched/handled livestock. Travelers could bring FADs into the U.S. if they carry contaminated fomites or are incubating a zoonotic disease. A fomite could be as simple as a shoe that had been worn while walking through a farm or pasture.
- Travelers entering the U.S. from foreign countries as well as from Hawaii, Puerto Rico, and the U.S. Virgin Islands are also required to declare any meats, animals, and animal products (among other items) that they intend to bring into the U.S. (Source: USDA) The U.S. Department of Homeland Security (DHS) Customs and Border Protection (CBP) is responsible for examining those items.
- Since it is impossible to screen every traveler, their clothing/footwear, or vehicle for contaminated or prohibited items as well as relying on people’s honesty in completing the declarations form, the risk of FAD introduction exists.

More information on bringing agricultural products into the U.S. is available at:
http://www.cbp.gov/xp/cgov/travel/clearing/agri_prod_inus.xml

Import Inspection

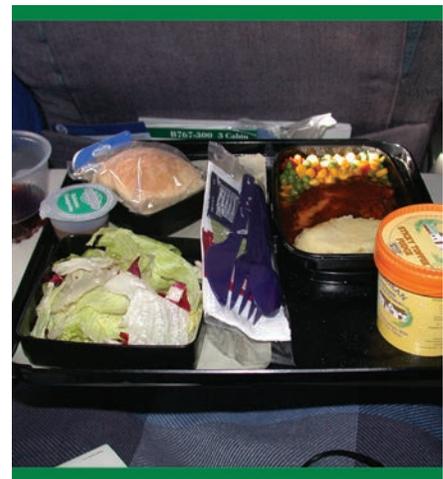
In 2003, in accordance with the Homeland Security Act of 2002, a Memorandum of Agreement was signed between DHS and USDA, transferring certain agricultural import and entry inspection functions from USDA to DHS.

- The DHS employs approximately 58,500 CBP personnel to monitor cargo and vehicles at our borders and ports. Millions of trucks, rail cars, and ship containers enter the U.S. annually. A wide variety of infectious items, from animal products to arthropod vectors or contaminated fomites, might cross the border within these shipments.
- USDA maintains a border and air/seaport inspection force of approximately 150 inspectors, who monitor the entry or transit movement of APHIS-regulated animals into or through the U.S. Other commodities such as animal products may receive a deferred inspection or be required to undergo other mitigation at or after entry.
- It is impossible to inspect each container or vehicle given the volume of products and traffic crossing the border. In reality, less than 2% of transboundary movement is actually inspected. Thus the risk of FAD introduction exists and vigilance is essential.
- Given the prevalence of some FADs in countries where our military serve, pre-clearance inspections/examinations of returning military cargo and passengers are performed by military personnel trained as Customs and Border Clearance Agents. (Source: U.S. Transportation Command (USTRANSCOM))



International Travel Waste Handling

- Meals, drinks, and other trash generated during journeys from other countries to the U.S. must be off-loaded at the point of arrival and handled in ways that will not introduce an FAD. The USDA-APHIS Plant Protection and Quarantine (PPQ) and DHS CBP are responsible for monitoring garbage unloading from vessels and airplanes that arrive at approved U.S. ports.
 - Plant Protection and Quarantine (PPQ) safeguards U.S. agriculture and natural resources from animal and plant pests and noxious weeds. More information about the USDA PPQ is available at: http://www.aphis.usda.gov/plant_health/
- All regulated garbage must be placed in sealed, leakproof containers and transported to an APHIS approved facility, where it is incinerated to ash, sterilized, or ground and discharged into an approved sewage system. If you notice unapproved handling of international garbage, contact your VS Area Office.



In (or on) Insect Vectors and Wild Animals

- Infectious agents carried by insect vectors or in wild animals can pass freely across national borders. Agents that can be carried in migratory birds, which travel long distances and may pass through several countries each year, are of particular concern. Wild animals may also carry arthropod vectors, such as ticks, that are infected with FAD agents.

Introduced Intentionally by Terrorists

- The intentional introduction of an FAD is also a possibility. Some agents introduced to affect humans could also infect animals. It is possible that zoonotic FADs could be seen by the veterinary profession before physicians.
- Agroterrorists may intentionally introduce an FAD agent that causes harm to animal health yet has no effect on humans, with the goal of causing economic and trade disruption as well as fear. The intentional introduction of foot-and-mouth disease is one such devastating animal disease that could cripple the U.S. economy.

Knowledge Review #2

Select the various ways FADs could be introduced to the U.S. Select ALL that apply.

- A. Insects
- B. Imported animals
- C. Travelers with contaminated boots
- D. Imported animal products
- E. Garbage from international flights

Answers are found in the appendix.

Keeping FADs out of the U.S.

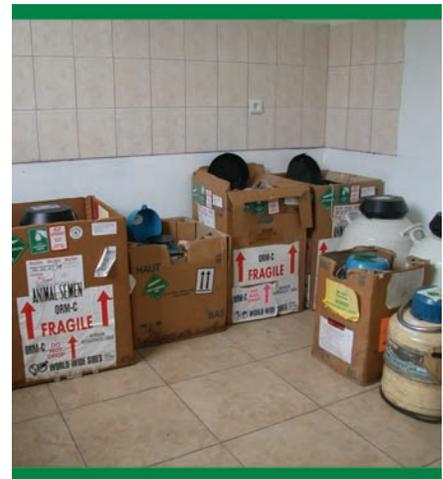
The USDA's Animal and Plant Health Inspection Service's (APHIS) Veterinary Services (VS) coordinates the protection of agriculture in the United States. APHIS works to keep FADs out of the U.S. through:

- Import regulations of animals and animal products, quarantines, and testing
- Surveillance of domestic animals and some wildlife species within the U.S.
- Inspections and investigations of livestock by APHIS field personnel
- FAD testing by the National Animal Health Laboratory Network (NAHLN)
- Coordination of responses to animal disease outbreaks
- Public outreach and other informational efforts

Import Regulations

Import regulations are the first defense against an FAD; they help ensure that infectious animals and animal products do not enter the country without adequate mitigation. APHIS-VS regulates the importation of livestock, poultry, some species of fish, a few species of tortoises, and many animal products. Other agencies, such as the U.S. Fish and Wildlife Service and the U.S. Centers for Disease Control and Prevention (CDC), are involved in regulating the entry of some species of fish, reptiles, primates, endangered species and some pets (dogs).

Before animals (which includes semen, embryos, and hatching eggs) and animal products (e.g., meat, table eggs, etc.) are allowed into the U.S., many must be tested for disease. The testing requirements depend on the species of animal or type of product, the disease status of its country of origin, and the purpose of the shipment. For specific requirements, visit the USDA-APHIS National Center for Import and Export website. http://www.aphis.usda.gov/import_export/animals/animal_import/animal_imports.shtml



The USDA receives important information about the disease status of other countries from its trading partners and the OIE, and modifies its import rules and surveillance based on this information. Certain animals and animal products from countries known to have FADs or other diseases of concern may be banned from import or may be required to undergo a variety of other risk mitigations prior to, at, or after entry to the U.S.

Import Quarantines and Testing

Livestock and poultry must be imported through a port designated in Title 9 of the CFR for the importation of animals. Most livestock and poultry entering the U.S. are inspected by a USDA Port Veterinarian. If the animal(s) must be quarantined, they must enter the U.S. through USDA Import Centers which are located in Miami, Florida or Newburg, New York. Another option is privately-owned quarantine facilities that have been approved by USDA. Animals may be quarantined at these facilities for 3-60 days, depending on the species, country of origin, and purpose of importation.

Although some pre-export testing may be done in the country of origin, APHIS also tests quarantined animals for selected FADs or other diseases of concern. When all required tests are negative and the quarantine period has passed with no signs of disease, the animal is released to its owner. Some post-entry quarantine measures may also

be stipulated for certain animals, such as horses from contagious equine metritis-affected countries, or some zoo animals regulated by APHIS.

Some pet animals regulated by APHIS, such as dogs returning from countries affected with screwworm, are inspected at ports of entry, but they are not usually quarantined. Pet birds returning to the U.S. from countries other than Canada are required to be tested at the time of inspection and must undergo a 30-day home quarantine; or if returning from a country affected with high pathogenicity avian influenza, must be quarantined for 30 days at a USDA facility. U.S.-origin pet birds returning from Canada must be inspected, but are not tested or quarantined at or after arrival in the U.S. Other 'pets' (poultry, ruminants, etc.) are required to meet APHIS' importation requirements applicable to livestock populations of the species involved.

Hawaii is free of rabies and may or may not quarantine animals, depending on the state of origin and the rabies titer of the animal. Individual states also have entry requirements that must be met by importers for livestock, birds, dogs, cats, and other animals, including pets. Customs and Border Protection, U.S. Fish and Wildlife Service inspectors or other federal officials may confiscate illegally imported animals at U.S. borders, euthanize or quarantine them until further resolution is possible.

For a listing of the designated ports of entry for animals, visit the NCIE website: http://www.aphis.usda.gov/import_export/animals/animal_import/animal_imports_portlist.shtml

Knowledge Review #3

Which safeguards help prevent FADs from entering in the U.S.? Select ALL that apply.

- A. Prohibiting certain animal products from countries with FADs
- B. Import inspections
- C. Import regulations
- D. Import quarantines and testing

Answers are found in the appendix.

Role of Accredited Veterinarians in FAD Surveillance

Accredited veterinarians are essential to the prompt recognition and reporting of suspicious clinical signs. Sometimes a disease raises suspicion immediately because the morbidity or mortality rate is unexpectedly high, or because the clinical signs are unusual. But FADs do not always look strange.

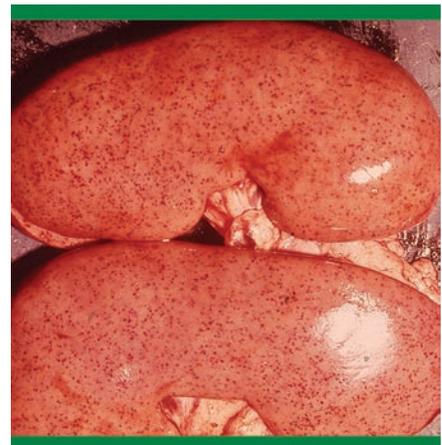
Many FADs can look like endemic diseases. The differential diagnosis for classical swine fever in pigs for example can include salmonellosis, erysipelas, acute pasteurellosis, streptococcosis, leptospirosis, and porcine respiratory and reproductive syndrome.

Reasons to suspect an FAD:

- There is a history of possible contact with people or livestock returning from abroad
- The syndrome does not follow the usual clinical pattern or respond to treatment as expected

Reporting Suspicions

Reducing the impact of an FAD on U.S. animal and public health and the economy requires ***early detection, prompt reporting, and rapid response***. Should an FAD be introduced, there are specific steps to follow to report and control the outbreak.



If you suspect an FAD, immediately contact your State Animal Health Official (SAHO) and the APHIS Area Veterinarian-in-Charge (AVIC). Accredited veterinarians should NOT attempt to diagnose a foreign animal disease or submit samples to a diagnostic laboratory as this could lead to additional spread if not handled appropriately.

A list of SAHOs and AVICs can be found at the following website links:

SAHOs: <http://www.usaha.org/StateAnimalHealthOfficials.aspx>

AVICs: http://www.aphis.usda.gov/animal_health/area_offices/

FAD Surveillance and Investigations

Accredited veterinarians are an integral part of the FAD surveillance team, as are producers, extension personnel, veterinary diagnostic laboratories, the USDA Food Safety Inspection Service, and the CDC. APHIS and state animal health agencies also conduct surveillance of U.S. animals to ensure that important FADs, such as classical swine fever, have not been introduced into domestic livestock populations.

A cooperative surveillance effort between APHIS and the States is the National Animal Health Laboratory Network (NAHLN). Scattered throughout the U.S. are diagnostic labs with veterinary pathologists trained to recognize FADs, as well as proficiency-trained personnel and the reagents to conduct animal disease testing. The role of NAHLN with FAD testing will be described later in this section.

FAD Investigations

Several hundred foreign animal disease investigations occur every year in the United States. Most people do not hear about all the investigations that occur because the majority are negative. Understanding the various steps in an FAD investigation is important to alleviate the concerns about reporting and ‘what happens next’ when you call in your suspicions to the AVIC and SAHO.

Step 1: Suspicious signs identified and reported to the AVIC and SAHO.

- This initiates the FAD investigation.

Step 2: The AVIC and/or the SAHO assigns a Foreign Animal Disease Diagnostician (FADD) to investigate the case who will:

- Visit the premises
- Examine the affected animals
- Conduct a thorough epidemiological investigation
- Communicate with the National Veterinary Services Laboratories (NVSL) to discuss sample collection, preparation, handling and destination lab
- Collect diagnostic samples and conduct any necropsies
- Help the producer establish biosecurity measures that will prevent the disease from spreading

If surveillance shows a possible FAD introduction, or upon request from the AVIC or SAHO, a Foreign Animal Disease Diagnostician (FADD) becomes involved in the investigation. FADDs are federal, state, or university affiliated veterinarians trained by APHIS at the Foreign Animal Disease Diagnostic Laboratory in Plum Island, NY to recognize and respond to foreign animal diseases. As of October 2011, there were approximately 500 FADDs that are trained to respond to suspected foreign animal disease outbreaks, assess the situation, and take appropriate samples for testing.

Step 3: Control measures may be implemented.

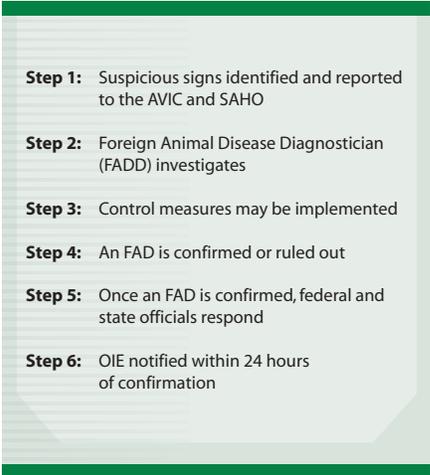
If an FAD appears to be likely, animal health officials may implement a premises quarantine and/or restricted movement controls before the final laboratory confirmation is available. Planning for the response may also begin.

Step 4: An FAD is confirmed or ruled out.

If an FAD is confirmed, federal and state officials will implement a full-scale response plan. If not, quarantines and restricted movement orders will be lifted. Further diagnostics become the responsibility of the animal owner.

Step 5: Once an FAD is confirmed, federal and state officials respond.

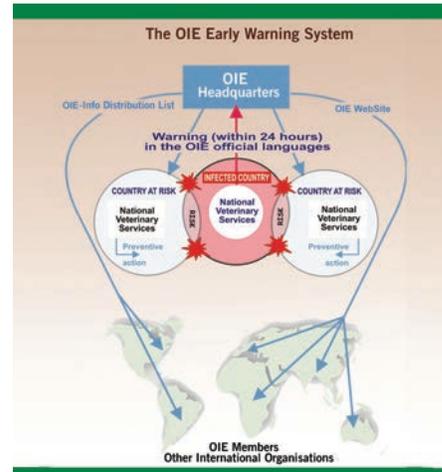
The USDA-APHIS-VS works with the SAHO in the state where the animal(s) is located to coordinate the response to the diagnosed FAD. Other federal and state agencies may also participate in the response.

- 
- Step 1:** Suspicious signs identified and reported to the AVIC and SAHO
 - Step 2:** Foreign Animal Disease Diagnostician (FADD) investigates
 - Step 3:** Control measures may be implemented
 - Step 4:** An FAD is confirmed or ruled out
 - Step 5:** Once an FAD is confirmed, federal and state officials respond
 - Step 6:** OIE notified within 24 hours of confirmation

Step 6: The U.S. must notify the OIE of any non-endemic listed diseases within 24 hours of a confirmed diagnosis. The OIE will immediately disseminate the information to its member nations, which may ban the importation of U.S. animals or animal products. U.S. authorities also call neighboring countries and major trading partners.

OIE Early Warning System

- Step 1: The OIE has established a warning system that allows member countries to take action should there be an occurrence of an FAD.
- Step 2: The infected country is required to inform the OIE Central Bureau in France.
- Step 3: The OIE Central Bureau then warns other countries which are considered at risk. Both of these steps must occur within the first 24 hours.
- Step 4: Each country considered at risk will take the appropriate preventative actions.
- Step 5: The OIE will then disseminate the information to all other OIE member nations.
- Step 6: The infected country is required to submit weekly update reports on the outbreak status until the outbreak has been resolved.



FAD Testing

National Veterinary Services Laboratories (NVSL)

The USDA-APHIS National Veterinary Services Laboratories (NVSL) perform or officially confirm the results of all diagnostic testing and studies related to FAD investigations in the United States. The NVSL is composed of 4 testing laboratories, three of which are located in Ames, Iowa. The fourth laboratory is the Foreign Animal Disease Diagnostic Laboratory which is located on Plum Island, New York.



The combined NVSL have expertise in all of the diagnostic tests for significant animal diseases found in the Americas. All vesicular disease* samples and other highly contagious diseases are sent to Plum Island, NY. Potential foreign animal diseases of equine or poultry origin, as well as transmissible spongiform encephalopathies**, are sent to the laboratories in Ames, IA.



For more information about NVSL, please visit: http://www.aphis.usda.gov/animal_health/lab_info_services/about_nvsl.shtml

*Vesicular diseases are a group of viral infections with very similar clinical signs. These diseases are characterized by vesicles and erosions, typically on and around the mouth, feet, and mammary glands. Vesicular diseases include foot-and-mouth disease, vesicular stomatitis, swine vesicular disease, and vesicular exanthema.

**Transmissible spongiform encephalopathies (TSEs) are a group of fatal, neurodegenerative diseases. The exact nature of the agent underlying TSEs is still under investigation. However, the most widely accepted theory is that the disease is caused by an infectious protein, or prion. Bovine spongiform encephalopathy, scrapie, and chronic wasting disease (CWD) are examples.

National Animal Health Laboratory Network (NAHLN)

If an FAD is confirmed, NVSL may be assisted by state and university laboratories that are part of the National Animal Health Laboratory Network (NAHLN). During an FAD outbreak, these laboratories help NVSL test suspect herds, determine the extent of the outbreak, and conduct follow-up surveillance to determine when the area is disease-free. They also perform routine targeted surveillance testing and response testing for FADs.

For more information about NAHLN, visit: http://www.aphis.usda.gov/animal_health/nahln/

Coordination of Responses to Animal Disease Emergencies

Should an FAD be diagnosed, a coordinated effort between the federal government, the states, Tribal Nations, and industry will be necessary to control and eradicate it. The USDA-APHIS-VS National Center for Animal Health Emergency Management (NCAHEM) develops guidelines for emergency response, coordinates investigations, manages the National Animal Health Emergency Response Corp (NAHERC), supports business continuity efforts, identifies interagency resources and deployment, and manages the National Veterinary Stockpile (NVS) of critical veterinary countermeasures.

NCAHEM receives assistance from federal and state field veterinarians, animal health technicians, and disease specialists, as well as more than 62,000 accredited veterinarians. For more information, visit: http://www.aphis.usda.gov/animal_health/emergency_management/

FAD Response

During the outbreak, disease control and eradication personnel work from a set of operational guidelines APHIS has developed for responding to FADs. The Foreign Animal Disease Preparedness and Response Plan (FAD PRoP) documents are in various stages of development and available at the websites listed below. An Incident Command is established in the area of the outbreak, and response teams are dispatched to perform each activity needed to bring it under control. The response activities in an FAD outbreak may involve:

- Quarantines and movement restrictions
- Surveillance to show containment, control, identify new cases
- Epidemiologic investigations
- Indemnity for animals that must be depopulated
- Depopulation (or rarely, treatment) of affected and exposed animals
- Carcass disposal
- Cleaning and disinfection of affected premises
- Vaccination
- Vector controls
- Management of wildlife
- Public education

The FAD PRoP website contains draft Guidelines, SOPs, and disease specific response plans: <https://fadprep.lmi.org> (username and password can be requested)



Completed FAD PRoP Guidelines and Industry Manuals are also available here: <http://www.cfsph.iastate.edu/Emergency-Response/fad-prep.php>

VS may need temporary personnel to assist during an FAD outbreak. *NVAP Module 19: Animal Health Emergency Response* provides details about various government, state, and private organizations that utilize private practitioners and animal health technicians to respond to an outbreak. A brief list is provided here with links for more information.

- The USDA's National Animal Health Emergency Response Corps (NAHERC)
 - www.aphis.usda.gov/animal_health/emergency_management/naherc.shtml
- National Veterinary Response Team (NVRT)
 - <http://www.phe.gov/Preparedness/responders/ndms/teams/Pages/nvrt.aspx>
- Veterinary Medical Assistance Teams (VMATs)
 - <http://www.avma.org/vmat/>
- State emergency response teams
 - Contact your state Veterinary Medical Association or Department of Agriculture for more information
- Private organizations
 - Numerous organizations involved

Recovery from FADs

The OIE's Terrestrial Animal Health Code and Aquatic Animal Health Code set the standards that determine when a country will be classified as disease-free. OIE standards must be satisfied before international trade resumes.

During recovery, surveillance is conducted to ensure that the disease has been eradicated. Quarantines and movement controls are lifted.

The ultimate costs of an outbreak for a country, its producers, and affiliated industries can be high. These costs may include:

- Direct costs of eradication
- Trade restrictions that prevent the sale of healthy animals or animal products
- Lost value of animal products in domestic markets
- Losses to affiliated industries such as meat packers and shipping companies
- Possible losses to other industries such as tourism

It is **imperative** for accredited veterinarians to remain **alert** for possible FADs, **report** suspicious cases, and **work** with animal owners on prevention strategies.

Knowledge Review #4

Order the steps (1, 2, 3) of a FAD investigation in the proper order.

- A. Implementation of control measures
- B. Federal and State officials respond to confirmed FAD
- C. Calling the SAHO and AVIC to report suspicious signs
- D. FADD assigned to investigate the case
- E. FAD is confirmed or ruled out
- F. OIE is notified within 24 hours of FAD confirmation

Answers are found in the appendix.

Remain Educated about FADs

During the last several decades, many familiar diseases, such as screwworm myiasis, classical swine fever and bovine babesiosis, have been eradicated from the United States. Veterinarians who were once aware of these diseases have retired, and today's accredited veterinarian may only have limited training in emerging and exotic diseases. To be vigilant for FAD detection, first you must be aware of the clinical signs and the species affected. Know what to look for, and then include it on your differential list.

Many animal diseases foreign to the U.S. occur in other countries. Remaining educated and current on the nature and location of these diseases can help raise your awareness level. Information about FADs and updates of outbreaks worldwide are available and maintained by a variety of sources including:

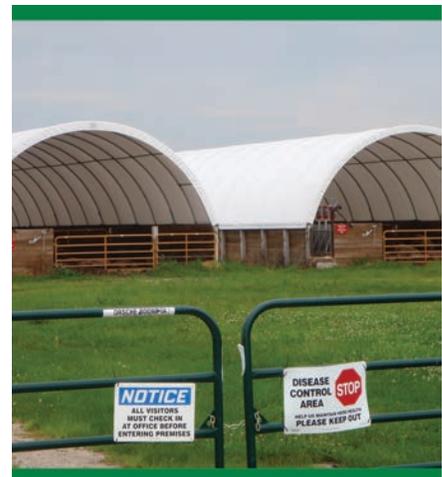
- USDA-APHIS National Veterinary Accreditation Program – APHIS-Approved Supplemental Training modules
http://www.aphis.usda.gov/animal_health/vet_accreditation/
- USDA-APHIS www.aphis.usda.gov
The APHIS website posts information about disease outbreaks and has detailed information about many foreign animal diseases and all USDA Program Diseases.
- APHIS National Center for Animal Health Emergency Management
www.aphis.usda.gov/animal_health/emergency_management/
The National Center for Animal Health Emergency Management conducts FAD training courses and also has a variety of educational videotapes, as well as a lending library of more than 5,000 color slides with photographs of foreign animal diseases. Contact your VS Area Office for more information.

- World Organization for Animal Health www.oie.int
The World Organization for Animal Health, formerly known as the Office International des Epizooties (OIE), has disease outbreak information for all member countries and disease factsheets.
- The U.S. Animal Health Association (USAHA) www.usaha.org
The USAHA provides disease outbreak information and *The Grey Book* can be accessed through their website. *The Grey Book* has detailed foreign animal disease information and various clinical sign photos.
- Center for Food Security and Public Health (CFSPH) www.cfsph.iastate.edu/diseaseinfo/
The CFSPH at Iowa State University, College of Veterinary Medicine has disease fact sheets, annotated clinical images and PowerPoint presentations for self-study of foreign animal, USDA program, and reportable diseases. The *Emerging and Exotic Diseases of Animals* course for veterinarians provides information about various diseases from a systematic approach.
- Veterinary Information Network (VIN) www.vin.com
The VIN offers multiple educational opportunities including Remembering the Zebras course for veterinarians which includes information about various FADs.
- Program for Monitoring Emerging Diseases (ProMED Mail) <http://www.promedmail.org/>
ProMED Mail provides free daily alerts to email subscribers about outbreaks of infectious diseases affecting animals and humans globally. It is an official program of the International Society for Infectious Diseases.
- Continuing Education (CE) opportunities at state and national meetings

Recommending Prevention Practices

Disease transmission can be interrupted by controlling exposure through proper disease prevention practices or biosecurity measures. The following should be recommended to producers to limit the opportunity for disease entry:

- Consider a closed herd or flock if practical
- Quarantine new additions and returning animals
- Buy semen and embryos from sources with a good disease control program
- Buy feed from reputable sources
- Isolate sick animals
- Report unusual illnesses or unexpected deaths
- Control rodents (trap, reduce access to food sources)
- Keep wildlife out of animal areas
- Develop an insect control program
- Practice good hygiene and sanitation, especially when moving between groups of animals
- Avoid sharing equipment and tools with other farms
- Wash and disinfect equipment and vehicles contaminated with animal excrement
- Wear protective clothing, and clean/disinfect or change footwear when entering the farm
- Prohibit entry to animal areas except to essential personnel
- Keep a record of visitors
- Provide protective clothing and footwear for visitors (e.g., service providers)



The links below provide additional information:

Biosecurity for Birds, USDA-APHIS

http://www.aphis.usda.gov/animal_health/birdbiosecurity/

National Biosecurity Resource Center, Purdue University

<http://www.biosecuritycenter.org/>

Biosecurity information is also available from various industry groups and state agriculture websites.

Next we will review the various USDA Program Diseases. Links for more information about each is provided, including specific biosecurity recommendations to prevent or control disease.

USDA Program Diseases

The USDA established Program Diseases jointly with states and industry to control and/or eradicate specific diseases or pests of livestock and poultry. Programs vary from those focused on eradication, to herd/flock certification, to surveillance, to disease control (a component of all).

Eradication

- The goal of the bovine and cervid **brucellosis**, bovine **tuberculosis**, and **scrapie** programs is to eradicate these diseases from the U.S.
- The **swine brucellosis** and **pseudorabies** programs have resulted in eradication of these diseases from the U.S. commercial swine population. The programs are now being modified to focus on surveillance activities that increase disease detection methods.

Certification

- The **Chronic Wasting Disease Herd Certification Program** for farmed cervids, **Scrapie Flock Certification Program** for sheep and goats, and **Trichinae Herd Certification Program** for swine recognize and certify herds that are at a low risk of disease. Herd or flock certification can be used to meet international or interstate movement requirements, improve marketability and/or can be a component of an eradication program.

Surveillance

- Surveillance is an important component of current USDA programs for rapid detection and also to promote trade by ensuring freedom from disease. Some programs, such as the Swine Pseudorabies Surveillance Program and the Cattle Fever Tick Eradication Program may continue surveillance for diseases, or their vectors, that have been eradicated from the U.S. but could be re-introduced from neighboring countries.

The Cattle Fever Tick Eradication Program conducts surveillance for *Rhipicephalus (Boophilus) annulatus* and *Rhipicephalus (Boophilus) microplus*. These tick species transmit the parasites *Babesia bovis* and *Babesia bigemina*, which cause bovine babesiosis. A permanent 500-mile quarantine buffer zone along the Texas-Mexico border was established in 1938 to effectively contain, monitor for and eliminate any fever tick incursions originating from Mexico on stray and smuggled livestock and free-ranging native and exotic ungulates.



Control

- Strictly speaking, all of the federal disease programs can be considered control programs. However, some programs have as their goal the prevention of transmission from infected animals.
- The **Equine Infectious Anemia Program**, for example, regulates the disposition of infected horses but is not an eradication or certification program.

Disease control and eradication measures include quarantines to stop the movement of possibly infected or exposed animals; testing and examination to detect infection; destruction of infected (sometimes exposed) animals to prevent further disease spread; treatment to eliminate parasites; vaccination in some cases; and cleaning and disinfection of contaminated premises.

Source: USDA-APHIS Status of Current Eradication Programs accessed at:
http://www.aphis.usda.gov/animal_health/animal_dis_spec/downloads/eradication_status.pdf.

Regulations for Program Diseases

Eradication, certification, and control programs are governed by:

- The Code of Federal Regulations, Title 9 Animals and Animal Products available at: http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?sid=cfbf7821c592bb4b69ecd9d4afc29678&c=ecfr&tpl=/ecfrbrowse/Title09/9tab_02.tpl –AND–
- Uniform Methods and Rules (UMR) –OR–
- Program Standards for each Program Disease

The Uniform Methods and Rules (UMR) or Program Standards contain details regarding control procedures, testing, marketing animals, and surveillance. For example, the UMR for the Cooperative State-Federal Brucellosis Eradication Program contains “minimum standards for certifying herds, classifying States and areas, and detecting, controlling, and eradicating brucellosis, as well as minimum brucellosis requirements for the intrastate and interstate movement of cattle and bison.”

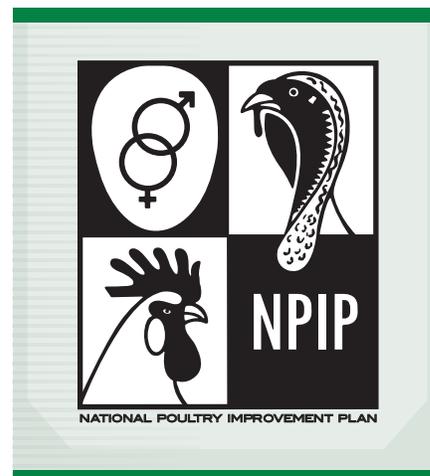


Source: USDA-APHIS Brucellosis Eradication: Uniform Methods and Rules, October 1, 2003 http://www.aphis.usda.gov/animal_health/animal_diseases/brucellosis/downloads/umr_bovine_bruc.pdf

Other USDA Animal Health Programs

Other USDA animal health programs are broader in their scope. For instance, the National Poultry Improvement Plan (NPIP) and the National Aquatic Animal Health Plan (NAAHP) address a variety of diseases affecting poultry or aquatic animals. The NPIP and NAAHP do not have specific Uniform Methods and Rules or Program Standards as found in other USDA Program Diseases. Rather they provide recommendations to States, Tribal Nations, industry and other stakeholders to prevent, control, and manage pathogens of concern to their respective industries.

NVAP Module 17: National Poultry Improvement Plan provides much more detail about this animal health program. Likewise, the USDA website provides additional information: http://www.aphis.usda.gov/animal_health/animal_dis_spec/poultry/



NVAP Module 14: Aquatic Animal Diseases and Related Regulatory Activities provides much more detail about this animal health program. The NAAHP, finalized October 2008, can be viewed at: http://www.aphis.usda.gov/animal_health/animal_dis_spec/aquaculture/downloads/naahp.pdf

USDA Program Diseases by Species

The following section provides a review of USDA Program Diseases. Listed here by species are the various programs that will be reviewed. Complete details about each program are beyond the scope of this overview module. Links for more information are provided after each program summary and in the appendix; see “Additional Resources for USDA Program Diseases”.

Bovine Programs

Bovine Brucellosis Eradication
Voluntary Bovine Johne’s Disease Control Program
Bovine Tuberculosis Eradication

Cervid Programs

Brucellosis Eradication
Chronic Wasting Disease Herd Certification Program

Equine Programs

Equine Infectious Anemia
Equine Viral Arteritis

Sheep & Goat Programs

National Scrapie Eradication Program
Voluntary Scrapie Flock Certification Program

Swine Programs

Swine Brucellosis Eradication
Pseudorabies Surveillance
Trichinae Herd Certification Program

Bovine Brucellosis Eradication

Introduction

Bovine brucellosis, caused by *Brucella abortus*, is a serious disease of livestock that has significant animal health, public health and national and international trade consequences. Brucellosis mainly affects domestic cattle, bison, and swine; however goats, sheep and horses are also susceptible. In its principle hosts, brucellosis infection causes loss of young through spontaneous abortions or birth of weak offspring, decreased milk production, and occasional sterility in cattle. There is no economically feasible treatment for brucellosis in livestock.

Humans may become infected by contact with infected animal tissues or ingestion of dairy foods made using unpasteurized milk from infected animals. In humans, brucellosis initially causes flu-like symptoms and may develop into a variety of chronic conditions, including arthritis. Humans can be treated for brucellosis with an extensive course of antibiotics.

A cooperative state-federal brucellosis program was established in 1934. This program, which has evolved through the years to meet the needs of disease eradication efforts and the cattle industry, has nearly eradicated bovine brucellosis from U.S. domestic animals. Brucellosis vaccination is still used as part of the brucellosis program activities in some states, although it is declining in the U.S. overall. The national brucellosis vaccination policy recommends judicious and appropriate use of vaccination in herds at risk of exposure in high-risk areas.

State Classification

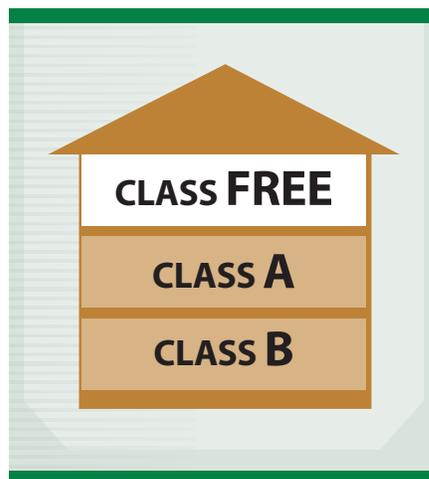
The bovine brucellosis program currently classifies states into Class Free (no infections), Class A (herd infection rate not exceeding 0.250%), and Class B (herd infection rate not exceeding 1.500%). States can be divided into areas, with each area reflecting a different class based on the herd infection rate. In July 2009, all fifty States achieved brucellosis Class-Free state status.

In 2009, APHIS proposed a new approach that will transition the bovine Brucellosis program from the current state-based classification system to an approach where any restrictions will be based on the risk of transmission of brucellosis from a specific area rather than the entire State. A national surveillance system that includes a risk-based disease management area approach will facilitate this transition.

Surveillance

In recent years, most brucellosis-affected herds have been identified through Market Cattle Identification (MCI) surveillance activities. Slaughter surveillance and first-point testing (testing at markets and points of concentration) have proven successful in finding suspect and reactor animals, leading to the disclosure of brucellosis-affected herds. Requirements for testing prior to inter or intrastate movement, sale or exhibition, or State-specific area testing requirements have also been instrumental in finding brucellosis-affected herds.

In 2011, amendments were made to the State-Federal Cooperative Brucellosis Program, reflecting a national slaughter surveillance plan that demonstrates the disease-free status of the U.S. domestic cattle and bison herd. The new national



bovine brucellosis slaughter surveillance plan provides for testing of samples collected from test-eligible animals at slaughter and provides a 95 percent confidence that brucellosis would be detected in as few as one infected animal per one million animals.

Suspected cases of bovine brucellosis must be reported to the appropriate animal health authorities by veterinarians, laboratories, and producers.

Brucellosis Program Changes

In October 2009, APHIS published a concept paper entitled “A New Direction for the Bovine Brucellosis Program” in the Federal Register that outlined proposed changes to the Brucellosis Program. These potential changes represent a new approach to managing bovine brucellosis in the United States that will:

- Effectively demonstrate the disease-free status of the United States through a national status-based program supported by a national surveillance strategy,
- Enhance efforts to mitigate disease transmission from wildlife,
- Enhance disease response and control measures,
- Implement a risk-based disease management area concept, and
- Modernize the regulatory framework to allow for disease risks to be quickly addressed.

Because both the bovine brucellosis and bovine tuberculosis programs are undergoing similar changes, APHIS will develop a single rule for both the Brucellosis and TB programs that ensures consistency and flexibility while reducing administrative burdens.

For more information, visit the USDA website:

http://www.aphis.usda.gov/animal_health/animal_diseases/brucellosis/

Bovine Brucellosis UMR, October 1, 2003 available at:

http://www.aphis.usda.gov/animal_health/animal_diseases/brucellosis/downloads/umr_bovine_bruc.pdf

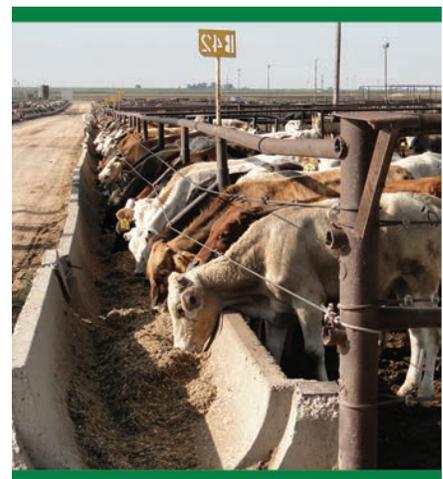
Bovine Tuberculosis Eradication

Introduction

Bovine tuberculosis (TB) is caused by *Mycobacterium bovis*, a rod-shaped, acid fast bacterium. This organism can infect all warm-blooded animals, including humans. The cooperative State-Federal Tuberculosis Eradication Program began in 1917.

Bovine TB has nearly been eradicated from U.S. livestock, and the prevalence rate in cattle herds is now less than 0.001%; however, sporadic cases continue to occur. Barriers to complete eradication include the presence of the disease in wildlife, imported cattle, and captive cervid herds.

Bovine TB is now rare in humans as a result of the eradication program, milk pasteurization, and advances in sanitation and hygiene, and the development of effective human treatments.



State Classification

The tuberculosis eradication program has historically classified states into status levels based upon the number of TB-affected herds in the State. A State’s bovine TB status is a primary determinant of the requirements for interstate movement of livestock, with more restrictions placed on animals from States in lower status levels of the program. A zone with a different status can also be formed within a State on a case-by-case basis. This is commonly referred to as “split-State status.”

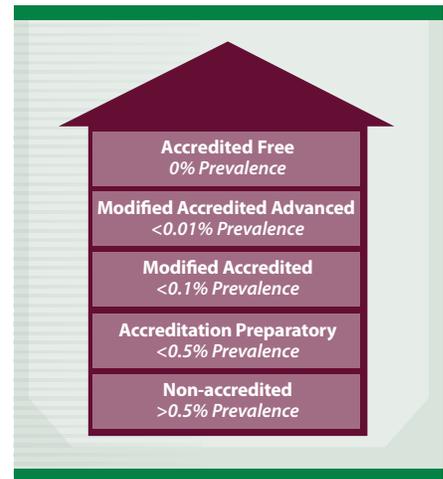
- **Accredited Free** states – 0% prevalence of TB affected cattle and bison herds.
- **Modified Accredited Advanced** states – prevalence of infected cattle and bison herds is <0.01%
- **Modified Accredited** states – prevalence of infected cattle and bison herds is < 0.1%
- **Accredited Preparatory** states – prevalence of infected cattle and bison herds is <0.5%

- **Non-accredited** states – do not meet the provisions of the tuberculosis UMR or have a herd prevalence rate of 0.5% or greater.
- States may have different statuses levels for bovines and captive cervids.

In 2009, APHIS proposed a new approach that will transition the bovine TB program from the current state-based classification system to an approach where any restrictions will be based on the risk of transmission of TB from a specific area rather than the entire State.

Surveillance

Surveillance for TB consists of slaughter surveillance in cattle and bison and live-animal testing in cattle, bison, and captive cervids. Tuberculin tests must be done by an accredited veterinarian (caudal fold test only), designated accredited veterinarian, or state or APHIS veterinarian.



A designated accredited veterinarian is a specially trained accredited veterinarian who has been approved to perform additional tuberculosis tests such as the single cervical test (cervids) or the bovine interferon gamma assay. Designated accredited veterinarians may also be approved for other TB program activities.

Testing

- The caudal-fold test (CFT) is the official tuberculin test used in cattle, bison, or goats for routine testing. As of October 2011, any accredited veterinarian is allowed to do this test.
- The single cervical tuberculin (SCT) test is used in captive cervids. Practitioners must become designated accredited veterinarians to perform this test.

The tuberculin test is read by **observing AND palpating** the injection site 72 hours +/- 6, after injection. Observation without palpation is cause for removal of veterinary accreditation. Animals must be officially identified at the time of the test.

Tuberculosis Program Changes

In October 2009, APHIS published a concept paper entitled “A New Approach for Managing Bovine Tuberculosis” in the *Federal Register* that outlined proposed changes to the TB program. These potential changes represent a new approach to managing bovine TB in the United States that will:

- Mitigate the introduction of TB into the U.S. national herd,
- Enhance TB surveillance,
- Increase options for managing TB-affected animals and herds,
- Modernize the regulatory framework, and
- Transition the TB program from a State classification system to a science-based zoning approach.

Because both the bovine TB and brucellosis programs are undergoing similar changes, APHIS will develop a single rule for both the TB and brucellosis programs that ensures consistency and flexibility while reducing administrative burdens.

For more information, visit the USDA website:

http://www.aphis.usda.gov/animal_health/animal_diseases/tuberculosis/

Bovine Tuberculosis Eradication UMR January 1, 2005

http://www.aphis.usda.gov/animal_health/animal_diseases/tuberculosis/downloads/tb-umr.pdf

Voluntary Bovine Johne’s Disease Control Program

Introduction

Johne’s disease (paratuberculosis) is a disease of ruminants caused by *Mycobacterium avium* subsp. *paratuberculosis*. Animals are usually infected when they are young. Many become chronic subclinical carriers and may shed the

organism, but only a few carriers develop overt clinical signs, usually after an incubation period of years. Clinical cases are progressive and eventually fatal, with wasting and diarrhea as the most prominent signs. If Johne's disease remains uncontrolled in a herd, more animals start to become ill, and clinical signs develop at an earlier age.

Interstate movement of cattle, sheep, goats, and other domestic animals that test Johne's positive using an official test is regulated under 9CFR part 80. In general, the animals must bear an official eartag and be shipped with an owner-shipper certificate to a recognized slaughter establishment or approved livestock facility that will sell the animal to such an establishment.

Voluntary Program

The three elements of the **voluntary Johne's disease program** consist of:

- Producer education about disease costs and management strategies
- Assistance to producers in establishing good management strategies
- Herd testing and classification to demonstrate the level of risk of Johne's disease

For more information, visit the USDA website:

http://www.aphis.usda.gov/animal_health/animal_diseases/johnes/index.shtml

Uniform Program Standards for the Voluntary Bovine Johne's Disease Control Program, September 1, 2010:

http://www.aphis.usda.gov/animal_health/animal_diseases/johnes/downloads/johnes-ups.pdf

Brucellosis in Cervidae

Brucellosis in cervids is caused by *Brucella* species (*abortus and suis*). As of November 2011, there is no federal cervid brucellosis eradication program, but several States have developed State administered cervid brucellosis programs. Many of the State's cervid brucellosis programs include a brucellosis herd certification program for captive cervid herds. Under this herd certification program, cervid herds can be recognized as certified brucellosis-free (movement testing is not required) or brucellosis-monitored. In addition, many of the State cervid brucellosis programs utilize the disease control and eradication standards described in the *Brucellosis In Cervidae Uniform Methods and Rules, September 30, 2003*. These program standards reflect such activities as testing before interstate movement or at slaughter, and quarantining and further testing or depopulation of brucellosis-affected herds.

As APHIS works to develop the single comprehensive rule for both the bovine Brucellosis and bovine TB programs, cervids will be included.

Activities for cervids will reflect surveillance, interstate movement and herd certification standards.

Brucellosis in Cervidae UMR, September 30, 2003

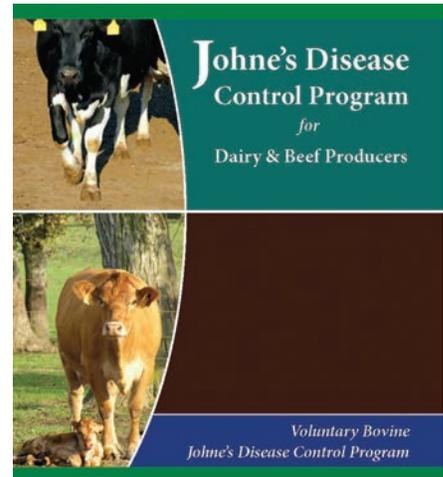
http://www.aphis.usda.gov/animal_health/animal_diseases/brucellosis/downloads/bcervumr.pdf

Chronic Wasting Disease Herd Certification Program

Introduction

Chronic wasting disease (CWD) is prion disease of cervids in North America resulting in degenerative neurological illness. It has been reported in wild deer, elk, and moose populations, and in captive cervid herds in North America. As of 2011, CWD has been identified in free ranging cervids in 15 U.S. states and two Canadian provinces (Alberta and Saskatchewan).

Since 2003, APHIS has cooperated with state agencies in CWD surveillance and prevention and control programs in both farmed and free-ranging cervid populations. This has included testing affected and exposed animals, paying



indemnity, based on availability of federal funding, for appraisal, depopulation, and disposal, and developing herd plans.

Herd Certification

The APHIS Herd Certification Program (HCP) is planned as a joint Federal-State-Industry program for farmed cervids. The initial rule was published in 2006 but not implemented. An amended final rule is expected to be published and enacted in 2012. The program, when implemented, will incorporate existing state programs that meet or exceed the national program standards and includes:

- Fencing requirements
- Official identification of individual animals
- Regular herd inventories of animals
- CWD tests conducted on all mortalities of animals >12 months that die for any reason
- Restrictions on herd additions
- Interstate movement requirements

After 5 years of successful surveillance with no evidence of CWD, a herd can be certified as low risk for CWD. Interstate movement of animals will depend on participation in the program

For more information, visit the USDA website:

http://www.aphis.usda.gov/animal_health/animal_diseases/cwd/

Herd Certification Program July 21, 2006 (final rule in Federal Register, never implemented)

<http://edocket.access.gpo.gov/2006/pdf/06-6367.pdf>

Equine Infectious Anemia

Introduction

Equine infectious anemia (EIA) is an insect-transmitted retroviral infection of equids. All equids, including those that are asymptomatic, become carriers and are infectious for life. The control of EIA is mainly carried out by the individual states and the USDA has disease control regulations that regulate infected horses. The EIA UMR provides recommendations to assist states in standardizing control programs and movement requirements.

Testing

Most states have an import testing requirement. These requirements may vary from state to state. Always check the import state(s) testing requirements prior to interstate travel. It is also advisable for equine owners to confirm testing requirements prior to movement because some exhibitions/competitions may require EIA testing prior to entry. Only accredited veterinarians or state or federal animal health officials or military veterinarians can submit blood samples for EIA testing.

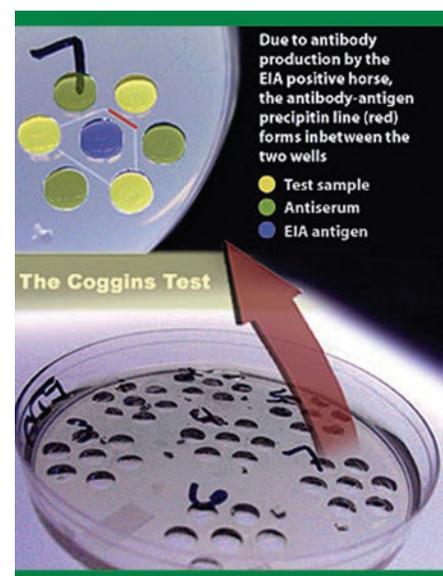
The most widely-accepted laboratory test for EIA diagnosis is the agar gel immunodiffusion (AGID) or Coggins test. This test identifies infected animals by detecting antibodies to the EIA virus. ELISA tests are also used to screen animals. Because false positives are more common in this assay, the serum from a reactor is retested in the Coggins test before any regulatory action is taken.

For more information, visit the USDA website:

http://www.aphis.usda.gov/animal_health/animal_diseases/eia/

Equine Infectious Anemia, UMR January 10, 2007

http://www.aphis.usda.gov/vs/nahss/equine/eia/eia_umr_jan_10_2007.pdf



Equine Viral Arteritis

Introduction

Equine viral arteritis (EVA) is an acute, contagious viral disease of horses and other equids caused by equine arteritis virus. Infection results in abortions and occasional disease and death in young foals. EVA decreases the commercial value of carrier stallions and reduces export markets for infected animals and their semen. Most nations do not allow carrier stallions or semen from these animals to enter the country.

Voluntary Control Program

The control of EVA is influenced by differences in virus transmission between stallions, which become asymptomatic chronic carriers and shed the virus in semen for years, and mares and immature horses, which are infectious only during the acute stage. In acutely ill animals, the virus is transmitted by both respiratory and venereal routes. EVA control includes:

- Isolation of acutely infected horses while they are shedding the virus.
- Vaccination of uninfected stallions each year before breeding.
- Testing of seropositive stallions that do not have an EVA vaccination certificate.
- Selective breeding of stallions that shed EVA (carriers) as approved by the State Animal Health Official.

For more information, visit the USDA website:

http://www.aphis.usda.gov/animal_health/animal_diseases/eva/

Equine Viral Arteritis, UMR April 19, 2004

http://www.aphis.usda.gov/animal_health/animal_diseases/eva/downloads/eva-umr.pdf

National Scrapie Eradication Program

Introduction

Scrapie is a fatal, degenerative TSE* affecting the central nervous system of sheep and goats. It is characterized by a long incubation period. Clinical signs include incoordination, behavioral changes, other neurological signs, and in some cases, intense pruritus; any of which may be accompanied by loss of condition. Scrapie is relatively rare in the U.S. but the economic impact is significant.

*Transmissible spongiform encephalopathies (TSEs) are a group of fatal, neurodegenerative diseases. The exact nature of the agent underlying TSEs is still under investigation. However, the most widely accepted theory is that the disease is caused by an infectious protein, or prion. Bovine spongiform encephalopathy, scrapie, and chronic wasting disease (CWD) are examples.



Eradication Program

Scrapie was first reported in the United States in 1947. In 1952, The National Scrapie Eradication Program (NSEP) was established. The NSEP is a mandatory program that applies to all sheep and goat producers in the United States.

The NSEP was revised in 2001 to accelerate the eradication of scrapie from the United States. The revised program requires the official identification of most sexually intact sheep and goats in commerce; additionally, it identifies scrapie-infected animals through surveillance of mature cull sheep and goats at slaughter as well as suspects reported by veterinarians and producers.

NVAP Module 11: Sheep and Goats: Scrapie and Health Certificates provides more details about NSEP.

For more information, visit the USDA website:

http://www.aphis.usda.gov/animal_health/animal_diseases/scrapie/

Scrapie Eradication UMR June 1, 2005

http://www.aphis.usda.gov/animal_health/animal_diseases/scrapie/downloads/umr_scrapie.pdf

Voluntary Scrapie Flock Certification Program

The Scrapie Flock Certification Program (SFCP) was added in 1992 and is a voluntary certification program within the NSEP. The SFCP identifies scrapie-free flocks by monitoring them over a 5-7 year period. Participation in the SFCP has multiple benefits for participants. Because the U.S. has not yet eradicated scrapie, producers who wish to export sheep and goats to most countries, including Canada, must participate in the SFCP. Enrollment also increases the marketability of the flock in domestic markets. Finally, animals from export certified flocks are valuable breeding stock for other flocks.

For more information, visit the USDA website:

http://www.aphis.usda.gov/animal_health/animal_diseases/scrapie/free-certi.shtml

SFCP Program Standards, June 30, 2007

http://www.aphis.usda.gov/animal_health/animal_diseases/scrapie/downloads/sfcp.pdf

Update to page 17, July 9, 2009

http://www.aphis.usda.gov/animal_health/animal_diseases/scrapie/downloads/sfcp_standards_page_17.pdf

Swine Brucellosis Eradication Program

Introduction

Swine brucellosis is caused by *Brucella suis*. Reproductive signs are most common, but lameness can also be seen. Cattle are also occasionally infected with *B. suis*. Pigs can be infected with *Brucella abortus* or *B. melitensis*, but this is rare.

Brucella suis (as well as other *Brucella* species) is zoonotic; human infections are usually the result of occupational exposure to infected pigs. In 1961, concerns over human brucellosis in swine abattoir workers prompted the establishment of the swine brucellosis program.

In 1997, APHIS began the Brucellosis Emergency Action Plan (EAP). As a result of the EAP, brucellosis surveillance and the management of new cases are conducted as emergencies. As of November 2011, all States' commercial swine herds are swine brucellosis free (stage III – eradicated, but States continue to conduct surveillance). Swine brucellosis continues to exist in feral swine and herds allowing exposure to feral swine.

Surveillance

APHIS is revising their surveillance methods, moving from an eradication phase to a targeted surveillance approach that allows for rapid detection. Breeding pigs are tested for brucellosis before they are sold, when they pass through markets, and at slaughter.

For more information, visit the USDA website:

http://www.aphis.usda.gov/animal_health/animal_dis_spec/swine/

Swine Brucellosis Eradication Program UMR April 1998

http://www.aphis.usda.gov/animal_health/animal_dis_spec/swine/downloads/sbruumr.pdf

Pseudorabies Surveillance

Introduction

Pseudorabies (PRV or Aujeszky's disease) is caused by a contagious herpesvirus (pseudorabies virus). Infection with the virulent strain that emerged in 1962 causes neurologic signs in nursing piglets and respiratory disease in older pigs. Pregnant animals may abort, resorb their fetuses, or give birth to mummified or stillborn fetuses. Young pigs often die, but older pigs typically survive. PRV can infect other species including cattle, dogs, cats, and sheep but does not infect humans or horses. PRV may cause an intense pruritus in those species; death often occurs in a few days.



The Pseudorabies Eradication Program was established in 1989 due to the severe outbreaks caused by the virulent virus. This Industry-State-Federal cooperative program effectively eliminated the virus from commercial swine in 2004 and all States commercial swine are PRV Free. This program has moved to post-eradication surveillance as outlined in the PRV Surveillance Plan.

PRV still exists in feral swine. Sporadic cases are occasionally identified in swine herds with exposure to feral swine.

Surveillance

Targeted surveillance is utilized for PRV because it increases the odds of rapidly finding disease and helps protect and ensure the commercial swine industry is disease free. The surveillance plan has three goals:

- Rapid detection
- Demonstration of freedom
- Monitoring risk of PRV introduction

To support these goals, samples may be collected from diagnostic laboratories, premises with feral swine exposure, premises with increased risk from feral swine, markets and buying stations, and various slaughter establishments including sow-boar and market swine.

For more information, visit the USDA website:

http://www.aphis.usda.gov/animal_health/animal_dis_spec/swine/

Pseudorabies Surveillance Plan, April 16, 2008

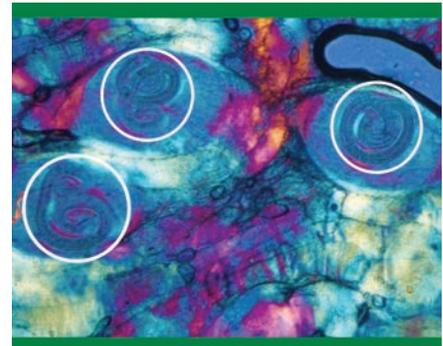
http://www.aphis.usda.gov/vs/nahss/swine/prv/prv_surveillance_plan_final_draft_04_16_08.pdf

Trichinae Herd Certification Program

Introduction

The Trichinae Herd Certification Program was initiated to minimize the risk of human trichinellosis and to facilitate exports of fresh pork from the U.S. Trichinellosis is caused by eating meat contaminated with the parasitic nematode *Trichinella*. *T. spiralis* is the species found in pigs.

If an animal or person is infected by large numbers of *Trichinella*, the clinical signs may include diarrhea, anorexia, fever, weakness, and myositis. Trichinellosis is a concern mainly in humans. Most infections in domestic animals are asymptomatic or undiagnosed.



Trichinae Herd Certification Program

The Trichinae Herd Certification Program is a voluntary pre-harvest pork safety program. It is designed to certify herds which, due to their management practices, have little risk of being infected with *T. spiralis*. Qualified Accredited Veterinarians conduct audits to record risk factor interventions on the farm. After at least two audits, pigs and pork products from the farm can be sold as “trichinae certified.”

Qualified Accredited Veterinarians

Accredited veterinarians can become auditors in the Trichinae Certification program after training in good management practices by APHIS or its designee(s). Qualified accredited veterinarian status must be renewed every 2 years. Only qualified accredited veterinarians or qualified APHIS veterinarians can conduct audits for enrolled herds.

For more information, visit the USDA website:

http://www.aphis.usda.gov/animal_health/animal_dis_spec/swine/

Trichinae Herd Certification Program Standards (2001): <http://www.aphis.usda.gov/vs/trichinae/>

Knowledge Review #5

Match the USDA Program Disease with the corresponding animal species regulated by USDA as reviewed in this module. More than one animal species may be regulated by the various programs.

- | | |
|-----------------------------|--------------------------|
| A. Brucellosis | 1. Bovine |
| B. Pseudorabies | 2. Cervid |
| C. Tuberculosis | 3. Equine |
| D. Viral arteritis | 4. Sheep and Goat |
| E. Scrapie | 5. Swine |
| F. Infectious anemia | |

Answers are found in the appendix.

Knowledge Review #6

Accredited veterinarians can obtain additional training and perform enhanced responsibilities on behalf of USDA-APHIS. Select the Program Diseases presented here that offer these additional opportunities.

Select ALL that apply.

- A.** Brucellosis eradication
- B.** Pseudorabies surveillance
- C.** Bovine tuberculosis eradication
- D.** Equine viral arteritis
- E.** Scrapie eradication
- F.** Equine infectious anemia
- G.** Trichinae herd certification

Answers are found in the appendix.

USDA Program Diseases and Interstate Movement

Testing requirements for program diseases usually depend on the disease prevalence in the originating and destination state. Animals from herds that are certified free of a particular disease may be exempt from some testing. The interstate movement of animals is regulated by federal laws and/or by rules set by the state the animal is entering. Most interstate movement regulations apply to livestock and poultry. Always check with the destination State Animal Health Official (SAHO) for current testing requirements, as regulations may change without notice.

Many USDA Program Diseases are also reportable diseases, which is the topic of the last section of this module.

Reportable Diseases

As a review from the introduction, reportable diseases vary by the type of disease (foreign animal, USDA Program, zoonotic) and the level of authority they are reported to (state, federal, international). Diseases are also reportable under different time frames, depending on the need for control measures. If a unique disease situation presents itself, call the office of your SAHO, State Public Health Veterinarian, or APHIS AVIC and ask about its reportability to be certain the disease is handled appropriately.

SAHOs: <http://www.usaha.org/StateAnimalHealthOfficials.aspx>

State Public Health Veterinarians: <http://www.nasphv.org/Documents/StatePublicHealthVeterinariansByState.pdf>

AVICs: http://www.aphis.usda.gov/animal_health/area_offices/

State Reportable Diseases

States are responsible for establishing which diseases and the timeframe in which they must be reported. While FADs and serious human zoonoses appear on the list in every state, other diseases are reportable according to the state's control programs and concerns. As a federally accredited veterinarian, it is your responsibility to be aware of the reporting requirements in your state. In many cases, these lists can be accessed online at the state's agriculture department or legislative documents (State Codes) website.

Tip: An Internet search that includes the state's name, the term "reportable disease" and the names of one or two FADs (e.g., classical swine fever and African horse sickness) will often take you directly to your state's list.

Animal diseases should be reported to the office of the SAHO. If it is zoonotic, it should also be reported to the state's Department of Health; not all states have a designated State Public Health Veterinarian so communicate with an appropriate official. Ensure you follow the required reporting time frame.

Federally Reportable Diseases

Animal diseases of federal importance should be reported to the APHIS AVIC or designee. Those include:

- All foreign animal diseases
- Certain USDA Program Diseases
- Some bioterrorism disease agents

Ensure you follow the required reporting time frame. In some cases, the diagnostic laboratory will report the findings directly to the AVIC and SAHO. However, it is your responsibility as the accredited veterinarian to ensure the appropriate authorities were notified. Two phone calls are better than none.

Animal diseases with zoonotic potential may also need to be reported to the CDC. These are referred to as "notifiable" diseases and your State Department of Health can provide the CDC with the information needed. This may occur immediately or as periodic reports from each state.

Internationally Reportable Diseases

Confirmed foreign animal diseases must be reported by the U.S. Chief Veterinary Officer to the World Organization for Animal Health (OIE) within 24 hours of a confirmed diagnosis. Within this timeframe, our trading partner countries will also be notified.

Bovine Spongiform Encephalopathy (BSE) is an example of an internationally reportable disease. After the initial detection of BSE in an imported cow in 2003, and because of the public health significance of the disease, BSE Enhanced Surveillance was initiated from 2004 to 2006. More than 750,000 cattle were tested and two additional atypical BSE cases were detected. In 2006, the BSE Ongoing Surveillance Plan was implemented and tests approximately 40,000 cattle per year, focusing on animals at higher risk for BSE. The program exceeds OIE testing standards. Samples are collected from various streams but on-farm mortalities with histories of CNS signs provide particularly valuable samples. Accredited veterinarians play a critical role in collecting and submitting samples and should work with their AVIC to ensure that necessary protocols are followed. For more information about BSE Surveillance, visit: http://www.aphis.usda.gov/newsroom/hot_issues/bse/

To prepare its annual report to the OIE, APHIS uses information entered into the National Animal Health Reporting System (NAHRS). NAHRS records data on OIE-listed diseases in livestock including cattle, goats, sheep, swine, and horses, as well as poultry and aquatic animals. Data are supplied monthly on a voluntary basis by State Animal Health Officials, based on the information reported by private practitioners, laboratories, and others. NAHRS data is available to all stakeholders involved in public, animal and environmental health. If you are interested in the status



of reportable diseases in the U.S., reports are available on the NAHRS website at: http://www.aphis.usda.gov/animal_health/nahrs/

The Importance of Prompt Reporting

The importance of prompt reporting cannot be overemphasized. Prompt reporting of diseases can:

- Prevent the spread of foreign animal, USDA Program or zoonotic diseases
- Reduce the risk that an FAD will become established in wildlife or arthropod reservoirs
- Prevent the spread of important contagious domestic diseases
- Prevent human disease
- Reduce the economic costs of an outbreak

When in doubt about a disease's significance or likelihood of being an FAD, USDA Program, or reportable disease, immediately call the State Animal Health Official and APHIS AVIC.

Knowledge Review #7

Based on clinical signs in a foal, you are suspicious of tularemia (*Francisella tularensis*). From your training, you recall this disease affects a wide number of species including humans, it is a CDC Category A bioterrorism agent, has zoonotic potential, and is not common in your area. Who should you report your suspicions to? Select ALL that apply.

- A.** Your local diagnostic laboratory
- B.** Your SAHO
- C.** The APHIS AVIC
- D.** The State Public Health Veterinarian
- E.** The neighbors, they should protect themselves

Answers are found in the appendix.

Summary

Now that you have completed this module, you should be able to:

- Define a foreign animal, USDA Program and reportable disease
- Describe the safeguards that help prevent FADs from entering the U.S.
- Outline the steps in a foreign animal disease investigation
- List the USDA programs for controlling or eradicating diseases in various species of livestock and poultry
- Report foreign animal and reportable diseases
- Locate additional resources and learning opportunities
- Recognize the additional opportunities available to accredited veterinarians

A list of all the websites in the order referred to in this module is also provided in the appendix; see “Web Resources for Module 3”.

Acknowledgments

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Photo and Illustration Credits

- Page 1:** This is a collage of four images of animals (from top left) a horse and foal, a pig, a cow, and a chicken that are all susceptible to FADs and are regulated under various USDA Program Diseases. *Photo sources: Horse: Megan Smith, Iowa State University; Pig: Pam Zaabel, Iowa State University; Cow: Danelle Bickett-Weddle, Iowa State University; Chicken: USDA*
- Page 2:** **(Top)** This photo depicts the vesicular lesions on the hand of a person exposed to Monkeypox virus during the 2003 outbreak. *Photo source: Medscape at <http://emedicine.medscape.com/article/1134714-overview>*
(Bottom) As part of the pseudorabies eradication program, accredited veterinarians were integral in collecting blood samples to conduct diagnostic serology. *Photo source: Alex Ramirez, Veterinary Diagnostic and Production Animal Medicine, Iowa State University*
- Page 3:** **(Top)** This graphic illustrates the U.S. trade suspension that occurred as a result of a BSE positive cow in the state of Washington in December 2003. *Graphic illustration by: Clint May, Iowa State University*
(Bottom) This graphic lists the years various diseases emerged and in what part of the world. *Graphic illustration by: Katlyn Harvey, Iowa State University*
- Page 4:** **(Top)** This photo shows a close-up of a vesicle on the dental pad in a sheep's mouth due to foot-and-mouth disease. *Photo source: USDA*
(Bottom) These ticks can carry bovine babesiosis and are part of the cattle fever tick eradication program. Top: *Rhipicephalus (Boophilus) annulatus*; Bottom: *Rhipicephalus (Boophilus) microplus*- ventral view. *Photo source: Armed Forces Institute of Pathology (top); J. Ostojic, Iowa State University College of Veterinary Medicine (bottom)*
- Page 5:** **(Top)** These companion animals are susceptible to various FADs, like the two dogs laying in the grass (top) and the rabbits in a cage (bottom). *Photo source: Danelle Bickett-Weddle, Iowa State University (top) Ken Sturgis (bottom)*
(Bottom) This photo depicts pigs unloading off a livestock trailer. *Photo source: Katlyn Harvey, Iowa State University*
- Page 6:** **(Top)** This photo shows a cargo ship with product for import or export. *Photo source: Ratre Platt, Iowa State University*
(Bottom) This is a photo of a meal that is served on an airline. Foreign animal diseases and pests could be carried into the U.S. from other countries in various food products, as pictured here, so the garbage generated on flights must be properly handled at approved airports to eliminate this risk. *Photo source: Danelle Bickett-Weddle, Iowa State University*
- Page 7:** Frozen semen, as pictured here in liquid nitrogen tanks in numerous boxes, is regulated as an animal when it comes to U.S. import requirements. *Photo source: Danelle Bickett-Weddle, Iowa State University*
- Page 8:** **(Top)** This image shows a swine kidney with petechial hemorrhages, which could be a lesion found in several diseases, both foreign animal and endemic diseases. *Photo source: USDA*
(Bottom) These photos show a veterinarian in the field telephoning a State Animal Health Official (SAHO) to report suspicious findings. Remember that both the SAHO and the APHIS Area Veterinarian-in-Charge (AVIC) need to be contacted when suspecting an FAD. *Photo source: Clint May, Iowa State University*
- Page 9:** This graphic lists the six steps in an FAD investigation. *Graphic illustration by: Katlyn Harvey, Iowa State University*
- Page 10:** **(Top)** This graphic depicts the various steps of the OIE Early Warning System. *Graphic illustration source: OIE http://www.oie.int/fileadmin/Home/eng/Animal_Health_in_the_World/img/A_Early_Warning_2009_mar.jpg*
(Middle) This is a photo of the National Veterinary Services Laboratories in Ames, IA. *Photo source: Jim Fosse, USDA*
(Middle) This photo shows one of the NVSL, specifically the Plum Island Animal Disease Center in New York, the location where vesicular and other highly contagious diseases are tested. *Photo source: USDA*
(Bottom) This map depicts the various locations of the NAHLN in the U.S. *Photo source: USDA*

- Page 11:** This photo includes the USDA FAD PReP FMD Response Plan, otherwise known as The Red Book, which defines the various response efforts to contain, control, and eradicate FMD, as well as supporting documents, FAD PReP/NAHEMS Guidelines for Cleaning and Disinfection and Surveillance, Epidemiology and Tracing. *Photo source: Katlyn Harvey, Iowa State University*
- Page 13:** These signs hung on gates outside two hoop buildings housing hogs are designed to prohibit entry to animal areas except to essential personnel. *Photo source: Alex Ramirez, Veterinary Diagnostic and Production Animal Medicine, Iowa State University*
- Page 14:** A photo of the sign designating the 500-mile quarantine buffer zone along the Texas-Mexico border to contain, monitor for, and eliminate any cattle fever tick incursions. *Photo source: Renee Dewell, Iowa State University*
- Page 15:** **(Top)** This is a photo of the Code of Federal Regulations, Title 9. *Photo source: Katlyn Harvey, Iowa State University*
(Bottom) This is an illustration of the NPIP logo. *Photo source: USDA*
- Page 16:** This graphic illustrates the various state classifications for bovine brucellosis. *Graphic illustration by: Clint May, Iowa State University*
- Page 17:** Imported cattle at a feedlot. *Photo source: Danelle Bickett-Weddle, Iowa State University*
- Page 18:** This graphic illustrates the various state classifications and herd prevalence limits for bovine tuberculosis. *Graphic illustration by: Clint May, Iowa State University*
- Page 19:** **(Top)** Johne's Disease Control Program educational pamphlet. *Source: www.johnesdisease.org/*
(Bottom) These elk represent a cervid that is susceptible to brucellosis. *Photo source Keith Weller, USDA.*
- Page 20:** The Coggins Agar Gel Immunodiffusion (AGID) test, shown in this image, and several Competitive Enzyme-Linked Immunosorbent Assays (cELISA) are the accepted tests for diagnosing Equine Infectious Anemia (EIA). *Photo source: Danelle Bickett-Weddle, Iowa State University. Graphic illustration by: Clint May, Iowa State University*
- Page 21:** This sheep has wool missing on its side due to the intense pruritis causing her to rub it off. *Photo source: Iowa State University*
- Page 22:** This pig is exhibiting respiratory signs and producing excessive foam from the mouth due to PRV. *Photo source: University of Georgia, Athens*
- Page 23:** White circles mark *Trichinella spiralis* in muscle. *Photo source: University of Georgia, Athens*
- Page 24:** This graphic illustrates an example state-specific Certificate of Veterinary Inspection. *Photo source: Iowa Department of Agriculture and Land Stewardship*
- Page 25:** **(Top)** This graphic illustrates that the reporting of certain diseases varies by state and you should contact your State Animal Health Official (SAHO) or State Department of Health to find out more. *Graphic illustration by: Clint May, Iowa State University*
(Bottom) This graphic illustrates the logo of the World Organization for Animal Health (OIE). *Graphic illustration by: OIE*

Knowledge Review Answers

Knowledge Review #1

Match the appropriate description with the terms presented in this module.

- | | |
|-----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| A. Foreign animal, USDA Program, zoonotic, or a disease of interest | 1. Foreign animal disease |
| B. Internationally reportable diseases that can impact the import and export of animals and animal products | 2. Reportable disease |
| C. Diseases or pests of terrestrial or aquatic animals not known to exist in the United States | 3. USDA Program disease |
| D. Serious zoonotic diseases, are economically important, or are of concern to the livestock, poultry, or aquaculture industries | 4. OIE-listed diseases |

Answers are found in the appendix.

The correct answers are **A – 2. Reportable disease, B – 4. OIE-listed diseases, C – 1. Foreign animal disease, D – 3. USDA Program disease.**

Knowledge Review #2

Select the various ways FADs could be introduced to the U.S. Select ALL that apply.

- A.** Insects
- B.** Imported animals
- C.** Travelers with contaminated boots
- D.** Imported animal products
- E.** Garbage from international flights

The correct answers are all of the above.

Knowledge Review #3

Which safeguards help prevent FADs from entering in the U.S.? Select ALL that apply.

- A.** Prohibiting certain animal products from countries with FADs
- B.** Import inspections
- C.** Import regulations
- D.** Import quarantines and testing

The correct answers are all of the above.

Knowledge Review #4

Order the steps (1, 2, 3) of a FAD investigation in the proper order.

- A. Implementation of control measures
- B. Federal and State officials respond to confirmed FAD
- C. Calling the SAHO and AVIC to report suspicious signs
- D. FADD assigned to investigate the case
- E. FAD is confirmed or ruled out
- F. OIE is notified within 24 hours of FAD confirmation

The correct order of steps would be C, D, A, E, B, F.

Knowledge Review #5

Match the USDA Program Disease with the corresponding animal species regulated by USDA as reviewed in this module. More than one animal species may be regulated by the various programs.

- | | |
|----------------------|-------------------|
| A. Brucellosis | 1. Bovine |
| B. Pseudorabies | 2. Cervid |
| C. Tuberculosis | 3. Equine |
| D. Viral arteritis | 4. Sheep and Goat |
| E. Scrapie | 5. Swine |
| F. Infectious anemia | |

The correct answers are A, Brucellosis – 1. Bovine, 2. Cervid, 3. Equine, 4. Sheep and Goat, 5. Swine; B, Pseudorabies – 5. Swine; C, Tuberculosis – 1. Bovine, 2. Cervid; D, Viral arteritis – 3. Equine; E, Scrapie – 4. Sheep and Goat; F, Infectious anemia – 3. Equine.

Knowledge Review #6

Accredited veterinarians can obtain additional training and perform enhanced responsibilities on behalf of USDA-APHIS. Select the Program Diseases presented here that offer these additional opportunities.

Select ALL that apply.

- A. Brucellosis eradication
- B. Pseudorabies surveillance
- C. Bovine tuberculosis eradication
- D. Equine viral arteritis
- E. Scrapie eradication
- F. Equine infectious anemia
- G. Trichinae herd certification

The correct answers are C) bovine tuberculosis – designated accredited veterinarian and G) trichinae – qualified accredited veterinarians.

Knowledge Review #7

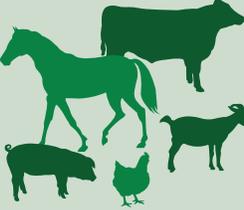
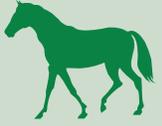
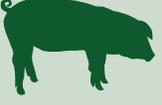
Based on clinical signs in a foal, you are suspicious of tularemia (*Fransicella tularensis*). From your training, you recall this disease affects a wide number of species including humans, it is a CDC Category A bioterrorism agent, has zoonotic potential, and is not common in your area. Who should you report your suspicions to? Select ALL that apply.

- A. Your local diagnostic laboratory
- B. Your SAHO
- C. The APHIS AVIC
- D. The State Public Health Veterinarian
- E. The neighbors, they should protect themselves

The correct answers are B, C and D. Answer A is incorrect – before submitting samples to a diagnostic lab, you should call the State and Federal officials in case special handling or a designated lab needs to be used. Answer E is incorrect; no need to cause alarm until the authorities are involved and a diagnosis is made.

Foreign Animal Diseases of Interest to Category II Veterinarians

This list includes diseases from the OIE-Listed Diseases that are not currently found in the U.S. (as of November 2011) and other diseases listed as devastating terrestrial animal diseases.

 <p>Multiple Species Diseases</p>	<ul style="list-style-type: none"> • Akabane disease • Crimean Congo hemorrhagic fever • Echinococcosis/hydatidosis • Foot and mouth disease • Heartwater • Melioidosis • Japanese encephalitis • New world screwworm (<i>Cochliomyia hominivorax</i>) 	<ul style="list-style-type: none"> • Old world screwworm (<i>Chrysomya bezziana</i>) • Rift Valley fever • Rinderpest • Surra • Trypanosomiasis • Vesicular stomatitis
 <p>Cattle Diseases</p>	<ul style="list-style-type: none"> • Bovine babesiosis • Bovine ephemeral fever • Bovine spongiform encephalopathy • Contagious bovine pleuropneumonia 	<ul style="list-style-type: none"> • Hemorrhagic septicemia (in cattle) • Lumpy skin disease • Theileriosis (East Coast fever)
 <p>Sheep & Goat Diseases</p>	<ul style="list-style-type: none"> • Contagious agalactia (nonpathogenic strains are found in the U.S.) • Contagious caprine pleuropneumonia • Maedi-visna 	<ul style="list-style-type: none"> • Nairobi sheep disease • Peste des petits ruminants • Sheep pox and goat pox
 <p>Equine Diseases</p>	<ul style="list-style-type: none"> • African horse sickness • Contagious equine metritis • Dourine • Epizootic lymphangitis 	<ul style="list-style-type: none"> • Equine piroplasmosis • Glanders • Hendra virus • Venezuelan equine encephalomyelitis
 <p>Swine Diseases</p>	<ul style="list-style-type: none"> • African swine fever • Classical swine fever • Menangle virus infection • Nipah virus infection 	<ul style="list-style-type: none"> • Reston ebolavirus infection • Swine vesicular disease • Teschovirus encephalomyelitis • Vesicular exanthema
 <p>Avian Diseases</p>	<ul style="list-style-type: none"> • Duck virus hepatitis (one less virulent form occurs in the U.S.) • Fowl typhoid and pullorum disease • High pathogenicity avian influenza 	<ul style="list-style-type: none"> • Newcastle disease (velogenic)
 <p>Lagomorph Diseases</p>	<ul style="list-style-type: none"> • Myxomatosis • Rabbit hemorrhagic disease • Venezuelan equine encephalomyelitis 	 <p>Fish Diseases</p> <ul style="list-style-type: none"> • Epizootic hematopoietic necrosis • Epizootic ulcerative syndrome • Gyrodactylosis (<i>Gyrodactylus salaris</i>) • Red sea bream iridoviral disease

This information was developed by staff veterinarians at the CFSPH and approved by APHIS for use as training materials for the USDA APHIS National Veterinary Accreditation Program.



Foreign Animal Diseases of Interest to Category II Veterinarians (cont'd)

 <p>Cat Diseases</p>	<ul style="list-style-type: none"> • Bovine spongiform encephalopathy* • Glanders • Hendra virus infection (experimental) • High pathogenicity avian influenza (H5N1) • Melioidosis • Nipah virus infection • Rift Valley fever • Screwworms • Surra • Trypanosomiasis
 <p>Dog Diseases</p>	<ul style="list-style-type: none"> • Epizootic lymphangitis • Glanders • High pathogenicity avian influenza (H5N1) • Louping ill • Melioidosis • Nipah virus infection • Rift Valley fever • Screwworms • Surra • Trypanosomiasis • Venezuelan equine encephalomyelitis
 <p>Ferret Diseases</p>	<ul style="list-style-type: none"> • High pathogenicity avian influenza (H5N1) (experimental) • Screwworms
 <p>Guinea Pig, Hamster, Prairie Dogs or other Pet Rodents Diseases**</p>	<ul style="list-style-type: none"> • Glanders (experimental) • Melioidosis (experimental) • Monkeypox • Screwworms • Trypanosomiasis (experimental)
 <p>Reptile Diseases</p>	<ul style="list-style-type: none"> • Melioidosis

*In cats, the BSE agent causes feline spongiform encephalopathy.

**Mice and rats have been experimentally infected with numerous foreign animal disease agents, in addition to the diseases listed here.

Foreign Animal Diseases of Interest to Category I Veterinarians

This list includes diseases from the OIE-Listed Diseases that are not currently found in the U.S. (as of November 2011) and other diseases listed as devastating terrestrial animal diseases.

 <p>Cat Diseases</p>	<ul style="list-style-type: none"> • Bovine spongiform encephalopathy* • Glanders • Hendra virus infection (experimental) • High pathogenicity avian influenza (H5N1) • Melioidosis 	<ul style="list-style-type: none"> • Nipah virus infection • Rift Valley fever • Screwworms • Surra • Trypanosomiasis
 <p>Dog Diseases</p>	<ul style="list-style-type: none"> • Epizootic lymphangitis • Glanders • High pathogenicity avian influenza (H5N1) • Louping ill • Melioidosis 	<ul style="list-style-type: none"> • Nipah virus infection • Rift Valley fever • Screwworms • Surra • Trypanosomiasis • Venezuelan equine encephalomyelitis
 <p>Rabbit Diseases</p>	<ul style="list-style-type: none"> • High pathogenicity avian influenza (H5N1) (experimental) • Melioidosis (experimental) • Rabbit hemorrhagic disease • Screwworms 	<ul style="list-style-type: none"> • Trypanosomiasis (experimental) • Venezuelan equine encephalomyelitis
 <p>Ferret Diseases</p>	<ul style="list-style-type: none"> • High pathogenicity avian influenza (H5N1) (experimental) • Screwworms 	
 <p>Guinea Pig, Hamster, Prairie Dogs or other Pet Rodents Diseases**</p>	<ul style="list-style-type: none"> • Glanders (experimental) • Melioidosis (experimental) • Monkeypox • Screwworms • Trypanosomiasis (experimental) 	
 <p>Reptile Diseases</p>	<ul style="list-style-type: none"> • Melioidosis 	

*In cats, the BSE agent causes feline spongiform encephalopathy.

**Mice and rats have been experimentally infected with numerous foreign animal disease agents, in addition to the diseases listed here.

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Additional Resources for USDA Program Diseases

For complete UMR or Program Standard details about each of the USDA Program Diseases, or more disease information on the USDA website, please visit the following websites.

Bovine Brucellosis Eradication:

USDA disease information: http://www.aphis.usda.gov/animal_health/animal_diseases/brucellosis/

UMR October 1, 2003 http://www.aphis.usda.gov/animal_health/animal_diseases/brucellosis/downloads/umr_bovine_bruc.pdf

Voluntary Bovine Johne's Disease Control Program:

USDA disease information: http://www.aphis.usda.gov/animal_health/animal_diseases/johnes/index.shtml

Uniform Program Standards September 1, 2010

http://www.aphis.usda.gov/animal_health/animal_diseases/johnes/downloads/johnes-ups.pdf

Bovine Tuberculosis Eradication:

USDA disease information: http://www.aphis.usda.gov/animal_health/animal_diseases/tuberculosis/

UMR January 1, 2005 http://www.aphis.usda.gov/animal_health/animal_diseases/tuberculosis/downloads/tb-umr.pdf

Brucellosis in Cervidae:

UMR September 30, 2003 http://www.aphis.usda.gov/animal_health/animal_diseases/brucellosis/downloads/bcervumr.pdf

Chronic Wasting Disease Herd Certification Program:

USDA disease information: http://www.aphis.usda.gov/animal_health/animal_diseases/cwd/

Herd Certification Program July 21, 2006 (final rule in Federal Register, never implemented)

<http://edocket.access.gpo.gov/2006/pdf/06-6367.pdf>

Equine Infectious Anemia:

USDA disease information: http://www.aphis.usda.gov/animal_health/animal_diseases/eia/

UMR January 10, 2007 http://www.aphis.usda.gov/vs/nahss/equine/eia/eia_umr_jan_10_2007.pdf

Equine Viral Arteritis:

USDA disease information: http://www.aphis.usda.gov/animal_health/animal_diseases/eva/

UMR April 19, 2004 http://www.aphis.usda.gov/animal_health/animal_diseases/eva/downloads/eva-umr.pdf

National Scrapie Eradication Program:

USDA disease information: http://www.aphis.usda.gov/animal_health/animal_diseases/scrapie/

UMR June 1, 2005 http://www.aphis.usda.gov/animal_health/animal_diseases/scrapie/downloads/umr_scrapie.pdf

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Additional Resources for USDA Program Diseases

Voluntary Scrapie Flock Certification Program Standards:

June 30, 2007 http://www.aphis.usda.gov/animal_health/animal_diseases/scrapie/downloads/sfcp.pdf

July 9, 2009 (update to page 17)

http://www.aphis.usda.gov/animal_health/animal_diseases/scrapie/downloads/sfcp_standards_page_17.pdf

Swine Brucellosis Eradication Program:

USDA disease information: http://www.aphis.usda.gov/animal_health/animal_dis_spec/swine/

UMR April 1998 http://www.aphis.usda.gov/animal_health/animal_dis_spec/swine/downloads/sbruumr.pdf

Pseudorabies Surveillance:

USDA disease information: http://www.aphis.usda.gov/animal_health/animal_dis_spec/swine/

Pseudorabies Surveillance Plan, April 16, 2008

http://www.aphis.usda.gov/vs/nahss/swine/prv/prv_surveillance_plan_final_draft_04_16_08.pdf

Trichinae Herd Certification Program:

USDA disease information: http://www.aphis.usda.gov/animal_health/animal_dis_spec/swine/

Program Standards (2001): <http://www.aphis.usda.gov/vs/trichinae/>

Web Resources for Module 3: Overview of FAD, USDA Program, Reportable Diseases

OIE-listed Diseases <http://www.oie.int/animal-health-in-the-world/oie-listed-diseases-2011/>

Customs and Border Protection, agricultural product imports: http://www.cbp.gov/xp/cgov/travel/clearing/agri_prod_inus.xml

National Center for Import and Export website
http://www.aphis.usda.gov/import_export/animals/animal_import/animal_imports.shtml

Designated ports of entry for animals
http://www.aphis.usda.gov/import_export/animals/animal_import/animal_imports_portlist.shtml

National Veterinary Services Laboratories (NVSL) http://www.aphis.usda.gov/animal_health/lab_info_services/about_nvsl.shtml

National Animal Health Laboratory Network (NAHLN) http://www.aphis.usda.gov/animal_health/nahln/

National Center for Animal Health Emergency Management (NCAHEM)
http://www.aphis.usda.gov/animal_health/emergency_management/

USDA-APHIS National Veterinary Accreditation Program http://www.aphis.usda.gov/animal_health/vet_accreditation/

USDA APHIS www.aphis.usda.gov

World Organization for Animal Health (OIE) www.oie.int

U.S. Animal Health Association (USAHA) www.usaha.org

Center for Food Security and Public Health (CFSPH) www.cfsph.iastate.edu/diseaseinfo/

Veterinary Information Network (VIN) www.vin.com

Biosecurity for Birds, USDA-APHIS http://www.aphis.usda.gov/animal_health/birdbiosecurity/

National Biosecurity Resource Center, Purdue University <http://www.biosecuritycenter.org/>

Infection Control Resources, Center for Food Security and Public Health, Iowa State University
http://www.cfsph.iastate.edu/Infection_Control/index.php

SAHOs: <http://www.usaha.org/StateAnimalHealthOfficials.aspx>

State Public Health Veterinarians: <http://www.nasphv.org/Documents/StatePublicHealthVeterinariansByState.pdf>

AVICs: http://www.aphis.usda.gov/animal_health/area_offices/

FAD PReP website: <https://fadprep.lmi.org>

National Animal Health Emergency Response Corps (NAHERC)
www.aphis.usda.gov/animal_health/emergency_management/naherc.shtml

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Web Resources for Module 3: Overview of FAD, USDA Program, Reportable Diseases

National Veterinary Response Team (NVRT) <http://www.phe.gov/Preparedness/responders/ndms/teams/Pages/nvrt.aspx>

Veterinary Medical Assistance Teams (VMATs) <http://www.avma.org/vmat/>

USDA-APHIS Status of Current Eradication Programs accessed at:
http://www.aphis.usda.gov/animal_health/animal_dis_spec/downloads/eradication_status.pdf

Code of Federal Regulations: <http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&tpl=%2Findex.tpl>

National Poultry Improvement Plan (NPIP) http://www.aphis.usda.gov/animal_health/animal_dis_spec/poultry/

National Aquatic Animal Health Plan (NAAHP)
http://www.aphis.usda.gov/animal_health/animal_dis_spec/aquaculture/downloads/naahp.pdf

Bovine Brucellosis Eradication:

USDA disease information: http://www.aphis.usda.gov/animal_health/animal_diseases/brucellosis/

UMR October 1, 2003 http://www.aphis.usda.gov/animal_health/animal_diseases/brucellosis/downloads/umr_bovine_bruc.pdf

Voluntary Bovine Johnes Disease Control Program:

USDA disease information: http://www.aphis.usda.gov/animal_health/animal_diseases/johnes/index.shtml

Uniform Program Standards September 1, 2010
http://www.aphis.usda.gov/animal_health/animal_diseases/johnes/downloads/johnes-ups.pdf

Bovine Tuberculosis Eradication:

USDA disease information: http://www.aphis.usda.gov/animal_health/animal_diseases/tuberculosis/

UMR January 1, 2005 http://www.aphis.usda.gov/animal_health/animal_diseases/tuberculosis/downloads/tb-umr.pdf

Brucellosis in Cervidae:

UMR September 30, 2003 http://www.aphis.usda.gov/animal_health/animal_diseases/brucellosis/downloads/bcervumr.pdf

Chronic Wasting Disease Herd Certification Program:

USDA disease information: http://www.aphis.usda.gov/animal_health/animal_diseases/cwd/

Herd Certification Program July 21, 2006 (final rule in Federal Register, never implemented)
<http://edocket.access.gpo.gov/2006/pdf/06-6367.pdf>

Equine Infectious Anemia:

USDA disease information: http://www.aphis.usda.gov/animal_health/animal_diseases/eia/

UMR January 10, 2007 http://www.aphis.usda.gov/vs/nahss/equine/eia/eia_umr_jan_10_2007.pdf

Equine Viral Arteritis:

USDA disease information: http://www.aphis.usda.gov/animal_health/animal_diseases/eva/

UMR April 19, 2004 http://www.aphis.usda.gov/animal_health/animal_diseases/eva/downloads/eva-umr.pdf

Scrapie Eradication:

USDA disease information: http://www.aphis.usda.gov/animal_health/animal_diseases/scrapie/

UMR June 1, 2005 http://www.aphis.usda.gov/animal_health/animal_diseases/scrapie/downloads/umr_scrapie.pdf

Voluntary Scrapie Flock Certification Program Standards:

June 30, 2007 http://www.aphis.usda.gov/animal_health/animal_diseases/scrapie/downloads/sfcp.pdf

July 9, 2009 (update to page 17)

http://www.aphis.usda.gov/animal_health/animal_diseases/scrapie/downloads/sfcp_standards_page_17.pdf

Swine Brucellosis Eradication Program:

USDA disease information: http://www.aphis.usda.gov/animal_health/animal_dis_spec/swine/

UMR April 1998 http://www.aphis.usda.gov/animal_health/animal_dis_spec/swine/downloads/sbruumr.pdf

Pseudorabies Eradication:

USDA disease information: http://www.aphis.usda.gov/animal_health/animal_dis_spec/swine/

Pseudorabies Surveillance Plan, April 16, 2008

http://www.aphis.usda.gov/vs/nahss/swine/prv/prv_surveillance_plan_final_draft_04_16_08.pdf

Trichinae Herd Certification Program:

USDA disease information: http://www.aphis.usda.gov/animal_health/animal_dis_spec/swine/

Program Standards (date unknown): <http://www.aphis.usda.gov/vs/trichinae/>

National Animal Health Reporting System (NAHRS) http://www.aphis.usda.gov/animal_health/nahrs/