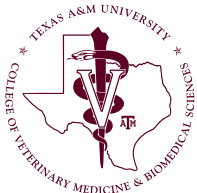


# GENERAL BIOSECURITY



for **Livestock** and  
**Poultry Producers**



**FAZD CENTER**

NATIONAL CENTER FOR FOREIGN ANIMAL  
AND ZOOLOGIC DISEASE DEFENSE



# General Biosecurity for Livestock and Poultry Producers

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# Foreword

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This biosecurity manual is a compiled review of the literature for use by anyone involved in animal agriculture. It is intended to help producers develop or enhance biosecurity practices for preventing the introduction and spread of animal diseases. The general section is followed by a list of diseases that are of primary concern.

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# General Biosecurity Practices for Livestock and Poultry Operations

The animal agriculture industry in the United States has a significant economic impact on the country, so biosecurity is important to everybody. Biosecurity can be defined as those management practices that prevent infectious diseases from being introduced into or spread among a herd or flock. In order to achieve high health status within your herd or flock, biosecurity practices should be evaluated routinely. This publication

- discusses the importance of biosecurity
- defines the types of diseases and their epidemiology
- summarizes the role of immunity in preventing disease
- outlines general and specific biosecurity practices that can be implemented

## Phases of Biosecurity

Biosecurity has four sequential phases: mitigation, preparedness, response and recovery.

*Mitigation* means making something less dangerous or harmful. One can think of mitigation as a type of prevention. Mitigation practices help secure facilities/premises against infectious diseases.

*Preparedness* includes planning, training for and implementing mitigation practices to ensure their usefulness. There are many ways to protect a premises, but they may not all be useful or cost-effective. For this reason, producers should analyze the weaknesses and strengths of their operations to determine the most effective ways of protecting them.

The *response* phase involves reacting to and handling a disease outbreak efficiently and effectively. The first 24 hours of a disease outbreak are crucial. Immediately report any abnormal health issues (massive die-offs, unusual symptoms including but not limited to blisters on the nose, mouth and teats, etc.) to a veterinarian or to state/federal animal health regulatory officials. The more rapidly a diagnosis is made and quarantine zones are established, the more likely it is that the spread of the disease to other animals and premises can be controlled.

Neither state nor federal animal health regulatory agencies charge producers or local veterinarians to investigate a possible disease outbreak. When these agencies respond, the officials involved will be responsible for determining quarantine areas, collecting and submitting appropriate samples for testing, and determining the appropriate fate of the diseased animals.

The *recovery* phase occurs when premises and facilities are restored to an acceptable operational level. Once a disease outbreak has been either eradicated or brought under control, the recovery phase begins. Recovery practices might include covering pits, sampling ground water and disinfecting premises. Authorities determine what needs to be done before facilities are repopulated to ensure that there is no recurrence of the disease.

The biosecurity practices in each phase rely on one another. After recovery, the process cycles back to mitigation so that areas that might need some attention can be improved. This constant cycle helps ensure that infectious diseases are prevented, controlled or eradicated.



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## Types of Diseases

Before discussing why biosecurity practices are important in disease prevention, the different classes of diseases should be identified. Diseases are defined as either foreign, emerging or endemic. They can also be labeled as zoonotic.

A “foreign animal disease” (FAD) is one that is not currently found in the U.S. Federal and state animal health regulatory agencies are carefully monitoring these diseases to ensure that if they occur, they will be promptly identified, controlled and eradicated. FADs have the potential to cause devastating social and economic effects.

Emerging/endemic diseases are either new to the U.S. or new forms of old diseases that are becoming more prevalent. The emergence of an animal disease may be related to animal movement in commerce, mutation of disease-causing agents, or changes in environmental conditions.

Once a disease is identified as either foreign or emerging/endemic, it can be further classified by its zoonotic potential. A zoonotic disease is one that is shared between animals and people. Several foreign and endemic animal diseases are considered to be zoonotic and can be a potential threat to human health. For this reason, the Department of State Health Services is ready to be called into action to help control disease transmission to people.

Foreign, emerging and endemic diseases are infectious. An infectious disease, as the name implies, is caused by a pathogen that can invade (infect) and then multiply in a susceptible animal. Infectious disease pathogens include bacteria, protozoa, viruses, fungi and rickettsiae (e.g., anaplasmosis in cattle). These organisms enter the body of a susceptible animal (one with the potential to become infected) and cause

an illness in that animal. Examples of noninfectious disorders are those caused by toxins (chemical poisoning) or by the malfunctioning of the body (as in nutritional disorders).

## Epidemiology of Diseases

### *Disease transmission*

Epidemiology is the study of the way disease is distributed in populations and the factors that influence or determine the distribution. There are two primary means of disease transmission—direct and indirect.

Direct transmission occurs when a susceptible animal comes in direct or close contact with an infected, contagious animal and is exposed to its respiratory air droplets; saliva; nasal, ocular or genital mucus; fetal fluids; feces or urine; milk; skin; or blood. Prenatal and venereal routes also are direct means of disease transmission.

Indirect transmission occurs when animals come in contact with infected or contaminated inanimate vehicles, environmental fomites and animate vectors. Inanimate vehicles that carry disease agents include needles, balling guns, dehorners, trucks, trailers, tires, shovels, wheelbarrows, etc. Environmental fomites are contaminated soil, food, water and other objects. People are animate vectors when they carry pathogens on their clothing, shoes and hands between animals and operations. Other animate vectors are arthropods (ticks, flies, mosquitoes, fleas) that transmit a pathogen from an infected animal to a susceptible animal.

There are two types of vector transmission—biological and mechanical. A biological vector is an organism that is needed for the life cycle of the pathogen. Arthropods can be biological vectors



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when a disease agent multiplies or develops in the arthropods before infecting susceptible animals. Most biological vectors are considered to be persistently infected. A mechanical vector carries the pathogen but the pathogen is not altered while on the vector. Arthropods, wild and domestic animals and people can be mechanical vectors.

With direct and indirect transmission, there are five primary routes by which pathogens can enter susceptible animals— aerosol inhalation, skin contact, oral, reproductive and blood.

Aerosol inhalation occurs when pathogens are carried in tiny moisture droplets in the air. The moisture droplets come from respiration, sneezing or coughing. Because the concentration of aerosol pathogens decreases with distance from an infected animal, susceptible animals should be kept apart from infected animals.

The oral entry route is illustrated by susceptible animals consuming disease-causing pathogens in contaminated fomites (soil, food, water) or licking or chewing on contaminated objects in the environment. Nursing animals that drink the milk of infected dams may be infected in this way. Because manure and urine play a major role in contaminating the environment, it is important to routinely dispose of manure, disinfect feed and water troughs, and remove objects that animals might chew or lick.

With the skin contact route, the pathogen infects the skin or enters through breaks in the skin and then causes a systemic infection in the body.

The reproductive route is a type of direct contact because it occurs during mating (venereal) or *in utero* (transplacental). When a disease enters by the reproductive route it infects the genital organs of adults and the fetuses and placentas of pregnant dams.

A disease enters by the blood route when an animal is bitten by an infected vector (arthropod) or infected by a contaminated vehicle (needle, nose tongs, ear notcher, dehorner, balling gun).

### ***Immunity***

Immunity determines how animals are protected from contracting a disease. Immunity is an animal's ability to resist a particular disease by preventing the pathogen from developing or by counteracting the effects of its products (toxins). Animals immune to a specific pathogen have chemical substances called antibodies that attack and destroy the pathogen before it causes illness. Antibodies are specific for the pathogen they protect against. There are three types of immunity: natural, active and passive.

Natural immunity exists without exposure to a disease agent. The body has many defenses, including the skin and nasal passages, to keep disease pathogens out. There are also cells in the body that attack foreign organisms that could cause disease.

Active immunity is acquired through vaccination or when the body battles an infection. A vaccine stimulates the production of antibodies without the animal actually acquiring the disease. Active immunity decreases over time and boosters are needed to maintain it.

Passive immunity is acquired when antibodies are passed from one animal to another. This occurs when antibodies are transferred *in utero* from the dam to the fetus, or when a newborn animal drinks colostrum. Since antibodies are large molecules, their ability to cross the placenta varies with species. In fact, some types of placentas are impenetrable to antibodies. In those species, newborns must receive colostrum (about 10 percent of their body weight) within 24 hours of birth to acquire

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the antibodies. After 24 hours, an animal's simple stomach matures and antibody molecules are too large to be absorbed across the epithelium.

### ***Vaccinations***

Vaccines are preparations of either killed pathogens or modified living organisms. Modified live vaccines are disease pathogens that have been altered so they stimulate immunity but do not cause disease. When an animal is vaccinated the body makes antibodies to combat the introduced foreign material. If exposed to the disease later, the body recognizes the disease agent and rapidly produces more antibodies, to supplement those it already has, to combat the disease.

Vaccines are effective in preventing certain diseases in livestock and poultry. However, it is important to remember that vaccines are not 100 percent effective. By law, all vaccines must come with instructions on their proper usage. Some vaccines require only a one-time injection, while most require that the first injection be followed by a second one 3 to 6 weeks later and that the animal have an annual booster after that. Without annual boosters the animal loses its immunity to the disease and again becomes susceptible. For best protection, animals must be vaccinated before, not after, they are exposed to a particular disease. A veterinarian should be consulted about the proper timing of vaccinations as part of an overall herd/flock health management plan.

### ***Vaccine failures***

Vaccines are fragile and must be handled according to the manufacturer's label directions. Otherwise, they lose their effectiveness and do not provide any immunity to the animals. When handling

and working with vaccines follow these guidelines:

- Before vaccinating animals, consult a veterinarian and **read the label and/or package insert.**
- Note the expiration date and the instructions for storing the vaccine properly. Vaccines are fragile. Handle them with care.
- Most vaccines must be refrigerated during storage and use to remain effective. Keep refrigerator temperature at 36 to 46 °F.
- Even if vaccines or other medicines do not require refrigeration, store them out of direct sunlight in a controlled environment.
- Give the right vaccine to the right species of animal. If the label indicates it is for use in cattle, do not use it in swine. This is an off-label use and it is illegal.
- Give the proper dosage, in the recommended area on the animal, using the recommended technique (IM or SQ).
- Once a vial is open, do not insert a used needle back into the bottle. Always enter the bottle with a clean needle or a transfer needle.
- Use a clean needle for each animal. This prevents disease transmission among a herd.
- When finished vaccinating for the day, properly dispose of the remaining vaccine. It does not keep well once the vial seal has been punctured. Once a vaccine vial is opened, the expiration date is void.
- Do not use chemical sterilants to disinfect syringes for modified live vaccines.
- Properly dispose of used needles in a puncture-proof (sharps) container.
- Give boosters when a label requires it.

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## General Biosecurity Practices

Not all biosecurity practices will be feasible (or necessary) for everyone to implement. Producers must assess their risks when deciding which biosecurity practices to adopt. Below are some general practices that cover all commodities in the animal industry.

### *Disease risk assessment*

- Prioritize diseases that are the greatest risk to the operation.
- Determine the cost/benefit ratio of biosecurity for your operation.
- Identify how the transmission or introduction of disease on your premises could occur.
- Consult with a veterinarian to implement vaccination and other herd/flock health management strategies.

### *Visitors*

- Designate one area on your premises where visitors enter and congregate without coming into contact with animals, equipment or barns.
- Limit the number of people who enter your premises and keep a log of all people who come and go, including consultants, salesmen, deliverymen, maintenance workers and veterinarians.
- Require that oilfield, power, pipeline and seismic crew vehicles be cleaned and disinfected before entering or leaving your property.
- Know where people have recently been before you allow them on your premises.
- Ask visitors to log any animal contact they have had in the last 48 hours.
- Keep feed and other products away from visitors and monitor it closely.

- Require proper identification of all visitors.
- If foreign visitors are expected, determine how many days they have been in the U.S. and ensure that they have had no animal contact. Require that they have been in the U.S. for at least 5 days.
- Provide tire disinfectant baths or sprays for visiting vehicles.
- Provide disposable boots or disinfectant footbaths for visitors at entry.
- Never allow visitors unlimited access to your premises and facilities.
- Do not allow people who own other animals to come into physical contact with your animals.

### *Owner practices*

- Keep a clean pair of shoes to wear only around your animals on one premises. If you have multiple premises, have shoes that stay at each one. If you have only one pair, thoroughly clean/disinfect those shoes before traveling to another premises. Insist that all personnel who work with you adopt the same practice.
- Carry disposable boots if you visit other premises and dispose of them before leaving that site.
- Wash your hands for at least 20 seconds with soap and water before touching any animals. If you do not have access to soap and water, use a gel that is at least 60 percent alcohol.
- If you have been off-site, change clothes (including footwear) before visiting your own animals.
- Provide disinfectant footbaths and tire baths for your employees to walk and drive through.
- Spray a disinfectant on your tires before leaving or re-entering your premises.

- Wash out and disinfect trailers before returning to your premises.
- Always clean and disinfect any vehicles that you use to transport or haul animals, especially those that transport market animals to processing facilities.
- Disinfect reusable equipment (tattooers, nose tongs, hoof tools, implant guns, ear notchers, side cutters, etc.) between animals.
- Clean and disinfect all feed delivery equipment between deliveries and between farms.
- Don't place feed on the ground. Use hay troughs, racks or feed bunks/troughs.
- Test bulk feed (corn and whole cottonseed) for mycotoxins.

### ***Security***

- Keep doors and gates locked at all times.
- Post "No Trespassing" signs around your premises and "Do Not Enter" signs outside all buildings. Replace/repair signs as needed.
- Conduct random security checks of your premises. Look for signs of unauthorized activity or entry.
- Around barns, houses and facilities, remove shrubs and other objects where people or unwanted animals could easily hide. You want things to be out in the open and not concealed.
- Keep areas around and inside buildings well lit. Install backup lighting to use in the event of an emergency.
- Install alarms, motion detector lights, cameras and other security equipment to ensure the safety of the premises.
- Maintain good perimeter fences. Remember that "Good Fences Make Good Neighbors."
- Have an outer perimeter fence and an additional fence 15 to 20 feet inside boundaries. This helps control aerosol transmission between pastures.
- Secure hazardous materials (pesticides and fertilizers), feed and nutrients.
- Secure water sources, such as wells, and identify alternative sources in the event you need a backup.
- Maintain an accurate and up-to-date inventory of anhydrous ammonia, ammonium nitrate, bulk urea, pesticides, herbicides and other hazardous materials.
- Secure storage areas for hazardous chemicals and drugs according to state and national codes. Lock the chemical containers in these storage areas even if they are empty.
- Install locks on all doors, including the ones that secure the water supply, chemicals, equipment and other supplies. A deadbolt lock with a minimum 1.5-inch throw is recommended.
- Inventory farm vehicles and equipment regularly.
- Lock all vehicles left outside.
- Ask feed suppliers about their sources, the precautions they take to ensure feed is not contaminated, and how they manage pests.
- Clean all feed storage facilities (silos, bins, etc.) before restocking them with feed.
- Clean and disinfect all feed delivery equipment between deliveries and between farms.
- Require all suppliers of feed and other products to have procedures for preventing contamination and controlling pests.

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## ***Livestock and poultry***

- Vaccinate animals regularly to increase protective immunity.
- Maintain a tracking system with current records of all your animals.
- Isolate new animals from the rest of your herd or flock for at least 2 weeks (preferably 8 weeks or 60 days for swine operations). During this time, watch them closely for symptoms of illness, unusual maggots, abnormal behavior, etc. Test the animals for known diseases of concern. Avoid contact between these animals and the primary herd/flock.
- Look for unusual signs in your herd/flock, such as odd behavior; sudden and unexplained deaths; large numbers of sick animals; unusual ticks or maggots; blisters around an animal's nose, teats, mouth or hooves; difficulty rising and walking; partial to complete drop in milk production; or a large number of dead insects, rodents or wildlife. Contact your veterinarian immediately if any of these occur.
- When possible, exclude wildlife (especially feral swine) from the premises.
- Identify animals clearly.
- Develop a carcass disposal plan that designates approved burial sites and has recommended transportation routes as well as composting and incineration plans.
- Remove animals that are “reservoirs” for certain diseases such as Johne's disease from your herd/flock. These animals continue to shed the pathogen and infect other animals on your premises.
- Clean and disinfect any feed or water source that becomes contaminated with feces or urine.

## ***Transporting livestock and poultry***

- Use a disinfectant to kill viruses and bacteria. A common disinfectant is bleach. A mixture of one part bleach to 32 parts water ( $\frac{1}{2}$  cup bleach to 1 gallon water) is sufficient. A pump-up sprayer is ideal for applying disinfectant in most situations. Mix a new batch every few days.
- Instruct people cleaning and disinfecting trailers to wear clean, waterproof clothing and boots.
- Sweep out trailers to remove loose dirt, hay and grain, cobwebs, trash or debris. If mats are in the trailer, remove them and sweep under them as well.
- Remove mud and manure by scraping or scrubbing both the interior and exterior of the trailer, truck and equipment, before disinfecting.
- Remove all feeders, panels and grooming or cleaning equipment so the trailer can be cleaned thoroughly.
- Soak and wash vehicles and equipment using water and detergent or disinfectant. Use a brush or pressure washer if necessary to remove all debris.
- When washing the outsides of vehicles and trailers, start at the top and front and work from top to bottom and front to back. This helps wash pathogens out of the vehicle.
- Wash the wheels, wheel arches, mudguards and undercarriages of vehicles and trailers.
- When washing the insides of vehicles and trailers, start with the ceiling and work down the walls and to the floor. Begin at the front of the trailer and work toward the back.
- Clean and disinfect tail gates, lifts and ramps.



- Wash and disinfect mats in trailers and vehicles, as well as foot pedals in vehicles.
- Leave disinfectants on surfaces for 20 to 30 minutes, or as directed on the product label, to kill all pathogens.
- Rinse vehicles, trailers and equipment thoroughly to remove detergents and debris. Allow everything to dry completely.

### ***Vectors***

- Control pests (rodents, ticks, insects and birds) and limit their access to feedstuffs.

### ***Employees***

- Train employees to report sick animals, suspicious activity or people, and unusual events.
- Keep keys in a safe place and have employees check them in and out as needed.
- After foreign travel, employees should not return to work for 3 days.
- Insist that employees who have animals at home follow proper biosecurity procedures.
- Conduct safety and security meetings with all people who work or live on the premises.

### ***General***

- Get to know your neighbors and set up a crime watch program.
- Don't advertise when you will be away from your premises.
- Communicate with local law enforcement agencies and request that they randomly drive by your premises and look for unusual behavior.
- Create an emergency contact list that includes names and phone numbers of people in the community. Post copies of this list near telephones and

on bulletin boards. Have employees put these numbers into their cell phones.

- Make sure critical information is readily accessible to any first responders who might be called to the scene. Such information could include maps of the premises, types and locations of chemicals, an inventory of animals, etc.
- USDA recommends having a facility map that includes emergency contacts and other information that could be critical for first responders, including:
  - The name, address and phone number(s) of the owner.
  - The relationship of the farm to adjacent fields and structures.
  - A site map with buildings/structures labeled and numbered, including houses, barns, greenhouses, nurseries, shops, outbuildings, silos, grain bins, and chemical and fertilizer storage/pits (indicate sizes and locations of entrances).
  - Transportation routes, including access roads, highways, crossroads, etc.
  - Storage areas for machinery, equipment and airplanes.
  - Fences and gates (indicate dimensions).
  - Well and/or municipal water supply, hydrants, ponds, streams, rivers, lakes and wetlands.
  - Electric, gas and phone lines and shutoff locations.
  - Septic tanks, wastewater systems and cisterns.
  - Drainage ditches, culverts and surface drains.
  - Fields/pastures.
  - Fuel storage tanks.
  - Areas where animals and/or crops of concern are located. Include the average number of animals housed in these locations.

# Identification of Various Diseases

Diseases are categorized as foreign, emerging or endemic diseases. Discuss with your veterinarian the diseases in this list, and find out the risk of having these diseases in your operation.

## **Foreign Animal Diseases**

### **African Swine Fever**

Species: Swine

Disease-causing organism: Virus

Mode of transmission: Oral, vector and inhalation

Symptoms: Fever, lesions, vomiting, bleeding from nose and rectum, abortions and death

Vaccine: No

Treatment: No

Zoonotic: No

<http://aevm.tamu.edu>

### **Avian Influenza (High Path)**

Species: Poultry

Disease-causing organism: Virus

Mode of transmission: Oral and inhalation

Symptoms: Cyanosis and edema of head, comb and wattle; greenish diarrhea; and discoloration of shanks and feet due to hemorrhages

Vaccine: Yes, requires approval of USDA

Treatment: No

Zoonotic: Possibly

<http://aevm.tamu.edu>

### **Bovine Spongiform Encephalopathy (BSE)**

Species: Cattle

Disease-causing organism: Prion

Mode of transmission: Oral

Symptoms: Incoordination, abnormal posture and change in temperament

Vaccine: No

Treatment: No

Zoonotic: Associated with new variant—

Creutzfeldt-Jakob Disease

<http://aevm.tamu.edu>

### **Classical Swine Fever**

Species: Swine

Disease-causing organism: Virus

Mode of transmission: Oral and inhalation

Symptoms: Fever, diarrhea, convulsions, generalized vasculitis, anorexia and death

Vaccine: Yes, emergency vaccination

Treatment: No

Zoonotic: No

<http://aevm.tamu.edu>

### **Exotic Newcastle Disease**

Species: Poultry

Disease-causing organism: Virus

Mode of transmission: Oral and inhalation

Symptoms: Coughing, tremors, paralyzed wings and watery, greenish diarrhea

Vaccine: Yes

Treatment: No

Zoonotic: Yes

<http://aevm.tamu.edu>

### **Foot and Mouth Disease**

Species: Cattle, goats, sheep and swine

Disease-causing organism: Virus

Mode of transmission: Oral and inhalation

Symptoms: Blisters or erosions on mouth, lips, tongue, hooves and teat

Vaccine: Yes, emergency vaccination

Treatment: No

Zoonotic: No

<http://aevm.tamu.edu>



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**Rift Valley Fever**

Species: Cattle, goats and sheep  
Disease-causing organism: Virus  
Mode of transmission: Vector  
(mosquitoes)  
Symptoms: Fever, anorexia, evident abdominal pain, jaundice, nasal discharge, excessive salivation, abortions and diarrhea  
Vaccine: No  
Treatment: No  
Zoonotic: Yes  
<http://aevm.tamu.edu>

**Swine Vesicular Disease**

Species: Swine  
Disease-causing organism: Virus  
Mode of transmission: Oral and inhalation  
Symptoms: Vesicles on feet, snout and in the mouth—similar to FMD  
Vaccine: No  
Treatment: No  
Zoonotic: No  
<http://aevm.tamu.edu>

**Venezuelan Equine Encephalomyelitis (VEE)**

Species: Horses  
Disease-causing organism: Virus  
Mode of transmission: Vector  
(mosquitoes)  
Symptoms: Stiffness, tremors, seizures, paralysis, colic and diarrhea  
Vaccine: Yes  
Treatment: Yes  
Zoonotic: Yes  
<http://www.merckvetmanual.com>

**Emerging/Endemic Diseases****Anthrax**

Species: Cattle, horses, sheep, goats and swine  
Disease-causing organism: Bacterium  
Mode of transmission: Oral, inhalation and vector  
Symptoms: Staggering, trembling, collapse, terminal convulsions, bloody discharges from orifices and death  
Vaccine: Yes  
Treatment: Yes  
Zoonotic: Yes  
<http://aevm.tamu.edu>

**Botulism**

Species: Horses, cattle, sheep, goats, swine and poultry  
Disease-causing organism: Bacterial toxin  
Mode of transmission: Oral  
Symptoms: Paralysis, weakness and tremors  
Vaccine: Yes  
Treatment: Yes  
Zoonotic: Yes  
<http://aevm.tamu.edu>

**Bovine Brucellosis**

Species: Cattle  
Disease-causing organism: Bacterium  
Mode of transmission: Oral and reproductive  
Symptoms: Abortions, still births and weak calves  
Vaccine: Yes  
Treatment: No  
Zoonotic: Yes  
<http://aevm.tamu.edu>

**Bovine Coronavirus Enteritis**

Species: Cattle  
Disease-causing organism: Virus  
Mode of transmission: Oral  
Symptoms: Dark green to black mucoid diarrhea  
Vaccine: No

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Treatment: Yes

Zoonotic: No

<http://www.merckvetmanual.com>

### **Bovine Leukosis**

Species: Cattle

Disease-causing organism: Virus

Mode of transmission: Vector, vehicle,  
reproductive and oral (milk)

Symptoms: Enlarged lymph nodes

Vaccine: No

Treatment: No

Zoonotic: No

<http://www.merckvetmanual.com>

### **Bovine Neosporosis**

Species: Cattle

Disease-causing organism: Protozoan

Mode of transmission: Oral and  
reproductive

Symptoms: Abortions

Vaccine: Yes

Treatment: No

Zoonotic: No

<http://www.merckvetmanual.com>

### **Bovine Trichomoniasis**

Species: Cattle

Disease-causing organism: Protozoan

Mode of transmission: Reproductive

Symptoms: Infertility and abortions

Vaccine: Yes

Treatment: No

Zoonotic: No

<http://aevm.tamu.edu>

### **Bovine Tuberculosis**

Species: Cattle

Disease-causing organism: Bacterium

Mode of transmission: Inhalation

Symptoms: Lesions in organs and body  
cavities and chronic emaciation

Vaccine: No

Treatment: No

Zoonotic: Rarely

<http://aevm.tamu.edu>

### **Bovine Vibriosis**

Species: Cattle

Disease-causing organism: Bacterium

Mode of transmission: Reproductive

Symptoms: Abortions and infertility

Vaccine: Yes

Treatment: Yes

Zoonotic: No

<http://aevm.tamu.edu>

### **Bovine Viral Diarrhea (BVD)**

Species: Cattle

Disease-causing organism: Virus

Mode of transmission: Oral and  
reproductive

Symptoms: Severe diarrhea, fever and  
abortions

Vaccine: Yes

Treatment: Yes

Zoonotic: No

<http://www.merckvetmanual.com>

### **Caseous Lymphadenitis**

Species: Sheep and goats

Disease-causing organism: Bacterium

Mode of transmission: Gains entry  
through break in skin

Symptoms: Swelling of superficial lymph  
nodes

Vaccine: Yes

Treatment: Yes

Zoonotic: No

<http://www.merckvetmanual.com>

### **Chlamydia (Enzootic Abortion of Ewes)**

Species: Sheep

Disease-causing organism: Bacterium

Mode of transmission: Vector, vaginal and  
uterine secretions

Symptoms: Abortions, stillbirths, weak  
kids and lambs, neonatal pneumonia

Vaccine: Yes

Treatment: Yes

Zoonotic: Yes

<http://www.merckvetmanual.com>

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**Circovirus Disease**

Species: Swine  
Disease-causing organism: Virus  
Mode of transmission: Oral, inhalation and reproductive  
Symptoms: Stillbirths, mummies, anorexia, agalactia and chronic pneumonia  
Vaccine: Yes  
Treatment: No  
Zoonotic: No  
<http://www.merckvetmanual.com>

**Coccidiosis**

Species: Poultry, sheep and goats  
Disease-causing organism: Protozoa  
Mode of transmission: Oral  
Symptoms: Diarrhea  
Vaccine: Yes  
Treatment: Yes  
Zoonotic: No  
<http://www.merckvetmanual.com>

**Contagious Mastitis**

Species: Dairy cattle  
Disease-causing organism: Bacteria  
Mode of transmission: Fomite, direct contact and vector  
Symptoms: Swollen, hot, hard udder and thick milk, possibly with clumps and blood  
Vaccine: No  
Treatment: Yes  
Zoonotic: Yes  
<http://www.merckvetmanual.com>

**Cryptosporidiosis**

Species: Cattle  
Disease-causing organism: Protozoan  
Mode of transmission: Oral  
Symptoms: Diarrhea  
Vaccine: No  
Treatment: Yes  
Zoonotic: Yes  
<http://www.merckvetmanual.com>

**Eastern Equine Encephalomyelitis (EEE)**

Species: Horses  
Disease-causing organism: Virus  
Mode of transmission: Vector (mosquitoes)  
Symptoms: Stiffness, tremors, seizures, paralysis, colic and diarrhea  
Vaccine: Yes  
Treatment: Yes  
Zoonotic: Yes  
<http://aevm.tamu.edu>

**Equine Infectious Anemia**

Species: Horses  
Disease-causing organism: Virus  
Mode of transmission: Vector (horsefly) and vehicle (needle)  
Symptoms: Anemia, depression, weight loss and dependent edema  
Vaccine: No  
Treatment: No  
Zoonotic: No  
<http://aevm.tamu.edu>

**Equine Influenza**

Species: Horses  
Disease-causing organism: Virus  
Mode of transmission: Inhalation  
Symptoms: Fever, cough, nasal discharge and enlarged lymph nodes  
Vaccine: Yes  
Treatment: Yes  
Zoonotic: No  
<http://aevm.tamu.edu>

**Equine Rhinopneumonitis**

Species: Horses  
Disease-causing organism: Virus  
Mode of transmission: Inhalation  
Symptoms: Abortions, purulent nasal discharge, pneumonia and cough  
Vaccine: Yes  
Treatment: Yes  
Zoonotic: No  
<http://aevm.tamu.edu>

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**Equine Rotavirus A Enteritis**

Species: Horses  
Disease-causing organism: Virus  
Mode of transmission: Oral  
Symptoms: Diarrhea, anorexia and depression  
Vaccine: Yes  
Treatment: Yes  
Zoonotic: Yes  
<http://www.merckvetmanual.com>

**Equine Viral Arteritis**

Species: Horses  
Disease-causing organism: Virus  
Mode of transmission: Inhalation and reproductive  
Symptoms: Serious nasal discharge and cough  
Vaccine: Yes  
Treatment: Yes  
Zoonotic: No  
<http://aevm.tamu.edu>

**Fowl Campylobacter Enteritis**

Species: Poultry  
Disease-causing organism: Bacterium  
Mode of transmission: Oral  
Symptoms: Diarrhea  
Vaccine: No  
Treatment: Yes  
Zoonotic: Yes  
<http://www.merckvetmanual.com>

**Fowl Cholera**

Species: Poultry  
Disease-causing organism: Bacterium  
Mode of transmission: Oral  
Symptoms: Fever, septicemia, depression, anorexia, diarrhea, increased respiration and death  
Vaccine: Yes  
Treatment: Yes  
Zoonotic: No  
<http://www.merckvetmanual.com>

**Fowl Colibacillosis**

Species: Poultry  
Disease-causing organism: Bacterium  
Mode of transmission: Oral  
Symptoms: Diarrhea  
Vaccine: No  
Treatment: Yes  
Zoonotic: Yes  
<http://www.merckvetmanual.com>

**Fowl Listeriosis**

Species: Poultry  
Disease-causing organism: Bacterium  
Mode of transmission: Oral and vector  
Symptoms: Depression, listlessness, peracute death, diarrhea and paralysis  
Vaccine: No  
Treatment: Yes  
Zoonotic: Yes  
<http://www.merckvetmanual.com>

**Fowl Necrotic Enteritis**

Species: Poultry  
Disease-causing organism: Bacterium  
Mode of transmission: Oral  
Symptoms: Bloody diarrhea  
Vaccine: No  
Treatment: Yes  
Zoonotic: No  
<http://www.merckvetmanual.com>

**Fowl Pox**

Species: Poultry  
Disease-causing organism: Virus  
Mode of transmission: Vector and inhalation  
Symptoms: Lesions on non-feathered regions, decreased egg production and asphyxia  
Vaccine: Yes  
Treatment: Yes  
Zoonotic: No  
<http://www.merckvetmanual.com>

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**Fowl *Staphylococcus aureus* Disease**

Species: Poultry  
Disease-causing organism: Bacterium  
Mode of transmission: Oral  
Symptoms: Lameness and infections of the navel and yolk sac  
Vaccine: No  
Treatment: Yes  
Zoonotic: Yes  
<http://www.merckvetmanual.com>

**Fowl Typhoid**

Species: Poultry  
Disease-causing organism: Bacterium  
Mode of transmission: Oral and reproductive  
Symptoms: Diarrhea, pale birds, whitish fecal paste, dehydration and death  
Vaccine: No  
Treatment: Yes  
Zoonotic: No  
<http://www.merckvetmanual.com>

**Gangrenous Dermatitis**

Species: Poultry  
Disease-causing organism: Bacteria  
Mode of transmission: Oral and skin contact  
Symptoms: Sudden death, depression, feather loss, necrotic skin over breast, abdomen wing tips or thighs and lethargy  
Vaccine: No  
Treatment: Yes  
Zoonotic: No  
<http://www.merckvetmanual.com>

**Infectious Bovine Rhinotracheitis (IBR)**

Species: Cattle  
Disease-causing organism: Virus  
Mode of transmission: Inhalation and reproductive  
Symptoms: Abortions, cough, eye infection and genital infections  
Vaccine: Yes  
Treatment: Yes

Zoonotic: No  
<http://www.merckvetmanual.com>

**Infectious Bursal Disease (IBV)**

Species: Poultry  
Disease-causing organism: Virus  
Mode of transmission: Oral and inhalation  
Symptoms: Decreased egg production, wrinkled or misshapen eggs, cough, sneezing and facial swelling  
Vaccine: Yes  
Treatment: No  
Zoonotic: No  
<http://www.merckvetmanual.com>

**Infectious Laryngotracheitis**

Species: Poultry  
Disease-causing organism: Virus  
Mode of transmission: Inhalation and oral  
Symptoms: Coughing, rattling, extension of neck, and sometimes a bloodstained mouth and beak  
Vaccine: Yes  
Treatment: No  
Zoonotic: No  
<http://www.merckvetmanual.com>

**Leptospirosis**

Species: Cattle, swine, sheep, goats and horses  
Disease-causing organism: Bacteria  
Mode of transmission: Skin contact, oral, reproductive and inhalation  
Symptoms: Abortions, stillbirths, weakness, fever, anorexia, decrease in performance, jaundice and anemia  
Vaccine: Yes  
Treatment: Yes  
Zoonotic: Yes  
<http://www.merckvetmanual.com>

**Marek's Disease**

Species: Poultry  
Disease-causing organism: Virus  
Mode of transmission: Oral (sheds in

feather follicles)  
Symptoms: Depression, unilateral leg paresis, enlarged feather follicles and distorted pupils  
Vaccine: Yes  
Treatment: No  
Zoonotic: No  
<http://www.merckvetmanual.com>

### **Mycoplasmosis**

Species: Poultry  
Disease-causing organism: Bacterium  
Mode of transmission: Inhalation and fomite  
Symptoms: Coughing, sneezing, nasal discharge, frothiness around the eyes and difficulty breathing  
Vaccine: Yes with permission  
Treatment: Yes  
Zoonotic: No  
<http://www.merckvetmanual.com>

### **Ovine Brucellosis**

Species: Sheep and goats  
Disease-causing organism: Bacterium  
Mode of transmission: Oral and reproductive  
Symptoms: Late pregnancy abortion, retained placenta, mastitis, lameness and impaired fertility in rams  
Vaccine: No  
Treatment: No  
Zoonotic: Yes  
<http://aevm.tamu.edu>

### **Parainfluenza-3 Virus (PI<sub>3</sub>) Pneumonitis**

Species: Cattle  
Disease-causing organism: Virus  
Mode of transmission: Inhalation  
Symptoms: Cough, nasal discharge and increased respiratory rate  
Vaccine: Yes  
Treatment: Yes  
Zoonotic: No  
<http://www.merckvetmanual.com>

### **Paratuberculosis (Johne's Disease)**

Species: Cattle, sheep and goats  
Disease-causing organism: Bacterium  
Mode of transmission: Oral  
Symptoms: Diarrhea, weight loss and swelling under jaw ("bottle jaw") in cattle and poor fleece quality in sheep (can be confused with parasitism)  
Vaccine: No  
Treatment: No  
Zoonotic: Unknown  
<http://aevm.tamu.edu>

### **Porcine Reproductive and Respiratory Syndrome**

Species: Swine  
Disease-causing organism: Virus  
Mode of transmission: Oral, inhalation and reproductive  
Symptoms: Stillbirths, mummies, anorexia, agalactia and chronic pneumonia  
Vaccine: Yes  
Treatment: No  
Zoonotic: No  
<http://www.merckvetmanual.com>

### **Potomac Horse Fever**

Species: Horses  
Disease-causing organism: Bacterium  
Mode of transmission: Oral  
Symptoms: Mild colic, fever and diarrhea  
Vaccine: Yes  
Treatment: Yes  
Zoonotic: No  
<http://aevm.tamu.edu>

### **Q Fever**

Species: Cattle, sheep and goats  
Disease-causing organism: Rickettsial bacterium  
Mode of transmission: Inhalation, reproductive and skin contact  
Symptoms: Abortions  
Vaccine: No  
Treatment: Yes  
Zoonotic: Yes  
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**Rabies**

Species: Cattle, horses, sheep, goats and swine  
Disease-causing organism: Virus  
Mode of transmission: Skin contact (bite)  
Symptoms: Anorexia, apprehension, nervousness, altered temperament, hyperexcitability and death  
Vaccine: Yes  
Treatment: No  
Zoonotic: Yes  
<http://aevm.tamu.edu>

**Salmonellosis**

Species: Cattle, poultry, sheep, goats, swine and horses  
Disease-causing organism: Bacteria  
Mode of transmission: Oral  
Symptoms: Diarrhea  
Vaccine: Yes  
Treatment: Yes  
Zoonotic: Yes  
<http://www.merckvetmanual.com>

**Salmonella pullorum Disease**

Species: Poultry  
Disease-causing organism: Bacterium  
Mode of transmission: Through the egg, oral  
Symptoms: Huddle near heat source, anorexic, weak, diarrhea, and progeny have unabsorbed yolk sacs  
Vaccine: No  
Treatment: No  
Zoonotic: Yes  
<http://www.merckvetmanual.com>

**Scrapie**

Species: Sheep and goats  
Disease-causing organism: Prion  
Mode of transmission: Reproductive and oral  
Symptoms: Convulsions, abnormal posture, increased nervousness and excitability, change in temperament and rubbed raw areas of fleece

Vaccine: No  
Treatment: No  
Zoonotic: Unknown  
<http://aevm.tamu.edu>

**Soremouth (Contagious Ecthyma)**

Species: Sheep and goats  
Disease-causing organism: Poxvirus  
Mode of transmission: Skin contact  
Symptoms: Crusting lesions around mouth and nose  
Vaccine: Yes  
Treatment: No  
Zoonotic: Yes  
<http://www.merckvetmanual.com>

**Strangles**

Species: Horses  
Disease-causing organism: Bacteria  
Mode of transmission: Oral and inhalation  
Symptoms: Abscessed lymph nodes  
Vaccine: Yes  
Treatment: Yes  
Zoonotic: No  
<http://aevm.tamu.edu>

**Swine Brucellosis**

Species: Swine  
Disease-causing organism: Bacterium  
Mode of transmission: Oral and reproductive  
Symptoms: Abortions, stillbirths and weak pigs  
Vaccine: No  
Treatment: No  
Zoonotic: Yes  
<http://aevm.tamu.edu>

**Swine Pseudorabies**

Species: Swine  
Disease-causing organism: Virus  
Mode of transmission: Oral and inhalation  
Symptoms: Anorexia, high piglet mortality, abortion, stillbirth and even



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occasional death losses in breeding and finishing hogs  
Vaccine: Yes  
Treatment: No  
Zoonotic: No  
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### **Swine Streptococcal Infections**

Species: Swine  
Disease-causing organism: Bacteria  
Mode of transmission: Oral  
Symptoms: Fever, meningitis, incoordination, unusual stances, wasting, cyanosis, abortions and vaginitis  
Vaccine: Yes  
Treatment: Yes  
Zoonotic: Yes  
<http://aevm.tamu.edu>

### **Swine Vesicular Exanthema**

Species: Swine  
Disease-causing organism: Virus  
Mode of transmission: Oral and inhalation  
Symptoms: Fever; blisters on the snout, oral mucous, soles of the feet, the coronary band and between the toes—similar to FMD and SVD  
Vaccine: No  
Treatment: No  
Zoonotic: No  
<http://www.merckvetmanual.com>

### **Tetanus**

Species: Horses, cattle, sheep, goats and swine  
Disease-causing organism: Bacterial toxin  
Mode of transmission: Skin contact and oral  
Symptoms: Colic and vague stiffness  
Vaccine: Yes  
Treatment: Yes  
Zoonotic: Yes  
<http://aevm.tamu.edu>

### **Vesicular Stomatitis**

Species: Cattle, sheep, goats, swine and horses  
Disease-causing organism: Virus  
Mode of transmission: Oral, inhalation and vector  
Symptoms: Blisters and erosions in mouth, tongue, palate and lips  
Vaccine: Yes, but not in U.S.  
Treatment: No  
Zoonotic: Yes  
<http://aevm.tamu.edu>

### **Western Equine Encephalomyelitis (WEE)**

Species: Horses  
Disease-causing organism: Virus  
Mode of transmission: Vector (mosquitoes)  
Symptoms: Stiffness, tremors, seizures, paralysis, colic and diarrhea  
Vaccine: Yes  
Treatment: Yes  
Zoonotic: Yes  
<http://aevm.tamu.edu>

### **West Nile Encephalitis**

Species: Horses  
Disease-causing organism: Virus  
Mode of transmission: Vector (mosquitoes)  
Symptoms: Stumbling, fever, partial paralysis and depression  
Vaccine: Yes  
Treatment: Yes  
Zoonotic: Yes  
<http://aevm.tamu.edu>



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