

## **Zoonotic Diseases in Cattle**

*Tom McBride*

*Adams County Extension*

Zoonotic diseases are diseases that can be transmitted from animals to humans and from humans to animals. Zoonotic diseases may be acquired or spread in a variety of ways: through the air (aerosol), by direct contact, by contact with an inanimate object that harbors the disease (fomite transmission), by oral ingestion and by insect transmission. There are fifteen cattle diseases with zoonotic potential in the United States, some of which are more common than others. They include anthrax, brucellosis, cryptosporidiosis, dermatophilosis, *Escherichia coli*, giardiasis, leptospirosis, listeriosis, pseudocowpox, Q fever, rabies, ringworm, salmonellosis, tuberculosis and vesicular stomatitis.

### **ANTHRAX**

Anthrax is a bacterial disease caused by *Bacillus anthracis*, which forms spores that survive for years in the environment. Cattle, sheep and goats are at the highest risk of developing anthrax, but other farm animals as well as wildlife and humans, can contract the disease. Most animals are infected by oral ingestion of soil contaminated with anthrax spores. People develop anthrax when the organism enters a wound in the skin, is inhaled in contaminated dust or is eaten in undercooked meat from infected animals. Biting flies can transmit the bacterium which results in redness and swelling at the bite site. The most common clinical sign in animals is sudden death. Blood may be seen oozing from the mouth, nose and anus of animals that died of anthrax. A vaccine for livestock is available in areas where anthrax is a common livestock disease. Animals suspected of dying from anthrax should be examined by a veterinarian immediately.

### **BRUCELLSIS**

Brucellosis is caused by the bacterium *Brucella*, which can affect a wide variety of animals including cattle, pigs, sheep, goats, horses and dogs. *Brucella* organisms can be present in birthing tissues or fluids (aborted fetuses, fetal fluids, placenta and vaginal discharges) and also in milk, urine, blood and semen. Transmission among cattle is through ingestion of birthing fluids and milk and in utero. The most common clinical sign in cattle is late-term abortion but many infected cattle do not show any clinical signs. Most infections in humans are associated with drinking or eating unpasteurized milk products. Handling infected aborted fetuses or afterbirth is another common means of human infection, as the organism can enter through cuts in the skin and the mucous membranes of the eye and mouth. Common symptoms in humans are undulating fever, weakness, headache, joint pain and night sweats.

### **CRYPTOSPORIDIOSIS**

Cryptosporidium is a protozoal parasite that causes diarrhea. Most animals can be infected with Cryptosporidium but clinical signs are most commonly observed in calves less than 1 month old. Infected animals shed the organism in their feces, contaminating the environment. Cryptosporidium can then be ingested from infected food or water. Humans are infected by consuming food or water contaminated with the organism or by failing to wash their hands after exposure to infective feces or animals. Most people who are infected do not become sick. For those individuals that show clinical signs, explosive diarrhea and abdominal pain are common.

### **DERMATOPHILOSIS**

Dermatophilosis is a bacterial skin disease caused by *Dermatophilus congolensis*, and is also known as rain rot, lumpy wool and strawberry foot rot. It most commonly affects cattle, sheep, goats and horses.

### **ESCHERICHIA COLI**

*Escherichia coli* (E. Coli) are bacteria normally found in the intestines of people and animals. However, some strains cause a severe, often bloody, diarrhea in humans. Animals are the carriers of the bacteria and humans become infected by ingesting contaminated food or water, especially undercooked ground beef, unpasteurized juice and milk, and vegetables. Humans may also become infected after handling or being exposed to feces of a carrier animal. Person to person transmission can occur by lack of good hand washing following diaper changes.

### **GIARDIASIS**

*Giardia lamblia* is an intestinal protozoal parasite that may or may not cause disease in cattle. *Giardia* is present in soil, food and water that have been contaminated by infected feces. Humans become infected by ingestion of contaminated food or water.

### **LEPTOSPIROSIS**

Leptospirosis is a bacterial disease caused by *Leptospira interrogans* that can occur in a large number of animals including cattle, sheep, goats, pigs, horses and dogs. Leptospirosis is spread through the urine of infected animals and can survive in water and soil for months. The most common clinical signs in cattle are abortion and weak newborn calves. Cattle, and especially rodents, may show no signs of illness but carry and pass the organism in their urine.

### **LISTERIOSIS**

Listeriosis is caused by the bacterium *Listeria monocytogenes*. Cattle, sheep and goats are commonly affected. Common signs of infection in livestock are circling, lack of coordination and the inability to chew and swallow. Pregnant animals may abort. The organism lives in decaying vegetation and low lying wet areas. Consumption of spoiled or improperly ensiled feed

is often associated with outbreaks in animals. Feeding good quality corn silage will decrease the risk of listeriosis in animals. Moldy silage that has been exposed to air and leftover silage from feed bunks should be discarded.

### **PSEUDOCOWPOX**

Pseudocowpox is a virus that causes small raised sores and scabs on the teats and udders of cattle. The virus is spread from cow to cow by milkers and milking equipment and causes small raised sores that later scab. Humans acquire pseudocowpox by direct contact with infected cows and can develop painful scabby sores on the hand and arms.

### **Q FEVER**

Q fever is caused by the bacterium *Coxiella burnetii* and causes abortions in cattle, sheep and goats. Animals acquire Q fever through contact with reproductive fluids and milk from infected animals. Humans are usually infected when they are assisting the birthing process and are exposed to reproductive fluids.

### **RABIES**

Rabies is a deadly viral infection affecting all mammals including humans. Rabies is spread in the saliva of a rabid animal, typically through bite wounds. Cattle may show changes in behavior, excessive vocalization, have difficulty swallowing, drool and/or become paralyzed. People contract rabies through exposure to infected saliva in open wounds or mucous membranes (eyes, nose and mouth).

### **RINGWORM**

Ringworm is a skin infection caused by fungi of the *Trichophyton* or *Microspora* species. Animals get ringworm by direct contact with an infected animal or by being in an infected environment, such as a barn. Ringworm is characterized by hairless, crusty, circular areas on the skin.

### **SALMONELLOSIS**

Salmonella are bacteria that are shed in the feces of infected animals. Many animals are susceptible to Salmonella, including cattle. Infection occurs as a result of the ingestion of contaminated feed, water or grass. The bacterium can live for months to years in the environment, especially in wet and warm conditions.

### **TUBERCULOSIS**

Bovine tuberculosis is caused by the bacterium *Mycobacterium bovis* which is shed in respiratory secretions, feces and milk of infected animals. Cattle are infected by inhaling or ingesting the bacterium. Weight loss, weakness, low grade fever and coughing are common clinical signs of infection in cattle.

## **VESICULAR STOMATITIS**

Vesicular stomatitis is a viral disease producing blister like sores on the mouth and feet of infected animals. The disease is transmitted by flies or direct contact. People acquire the virus by direct contact with infected animals.

## **SUMMARY**

There are numerous zoonotic diseases that can be transferred from cattle to humans. These diseases cause mild to severe symptoms and are a definite concern for farmers and their families. While some of the diseases are rare, their potential for devastating outcomes make it necessary to take precautions for these diseases seriously. Luckily, many of the precautions taken to prevent these diseases are the same:

- Washing hands with soap after handling animals is the most important precaution. Soap should be readily available in the barn and lavatory areas.
- Unpasteurized milk and milk products should be avoided. This is especially true for children, the elderly and pregnant women.
- All meat should be cooked to appropriate temperatures. Ground beef should be cooked until reaching an internal temperature of 165°F and the juices run clear.
- Raw meat and eggs should be handled as if they contain infectious organisms.
- All surfaces and utensils used to prepare raw foods should be thoroughly washed with hot water and soap. Utensils used on raw goods should not be used later in the cooking or serving process.

If you suspect any of these diseases on your farm or you have questions about them, contact your veterinarian. If you suspect that you, one of your farm employees or anyone in your family has any of these diseases, contact your physician immediately.