

Zoonotic diseases: an overview



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Zoonotic diseases are animal diseases that can be transmitted to humans. Transmission can be by ingestion, inhalation, bites, scratches, contact with contaminated products, and vector-borne. There are over 200 zoonotic diseases that can possibly threaten your health and involve several different causative agents, such as bacteria, parasites, viruses, and others. I am only going to inform you of just a hand full that is caused by bacteria and contaminates cattle. Once the cattle on large commercial farms become infected it can be a challenge to get rid of and contain.

SALMONELLOSIS

Bovine salmonellosis is when cattle ingest feed and water infected with the bacteria *Salmonella* spp and is found worldwide. *Salmonella* can be spread by any infected animal, shedding it by their feces. Salmonellosis can cause bacteremia, septicemia, and endotoxemic infection in cattle. A cow can be asymptomatic, making it hard to tell whether they are infected. Transmission is from fecal to oral, from saliva and nasal secretions to shared waters, and then to milk if cow is nursing. Aerosol transmission is also possible if there

are overcrowded facilities. The clinical signs are fever, diarrhea, depression, lethargy, dehydration, anorexia, decreased milk production, and increased salivation. Treatment for cattle is supportive care, including fluids, antibiotics, and NSAIDs (McGuirk & Peek, 2003).

Salmonellosis in humans causes an infection in the lining of the small intestine called salmonella enterocolitis. The most common type of enterocolitis is food poisoning from eating contaminated meat and drinking contaminated water and milk. Fruit and vegetables also can be contaminated by infected water (Kahn, 2010, p. 179). “ Approximately 40, 000 people develop salmonella infection in the United States each year” (Adam, Inc, 2010, para. 2). The symptoms in humans are abdominal pain, chills, diarrhea, fever, muscle pain, nausea, and vomiting. These symptoms could last from 2 days to 2 weeks depending on how healthy the patient is. People can also be asymptomatic, carrying the bacteria in their system for a year or more. Children and infants are mostly at risk from meningitis and septicemia which can end in death. There is a good prognosis with a treatment of fluid replacement for dehydration, acetaminophen or ibuprofen for fever and aches, and a basic diet binding foods to make stools firmer (Adam, Inc, 2010, para. 3, 5,&6).

For the best prevention of this disease washing your hands after handling contaminated food. Making sure your food is properly stored and cooked thoroughly is very important (Adam, Inc, 2010, para. 9).

BRUCELLOSIS

Brucellosis, also known as the bang disease and the contagious abortion, that infects cattle is caused by a common bacteria called *Brucella abortus*. Transmission occurs from ingesting contaminated unpasteurized dairy products and any contact with infected mucous membranes and broken skin (Kahn, 2010, p. 1238). Also contact with fetal membranes can cause possible infection. *Brucella* spreads fast causing 30% to 80% abortions through cattle herds. If the cattle are unvaccinated or previously unexposed, they are more at risk of becoming infected. Even though *B. abortus* is found worldwide there are some countries that have eradicated the disease. United States is all most rid of *B. abortus* in cattle, but it still can be found in the wildlife, such as bison and buffalo (Iowa State University, 2009, p. 1).

A main sign is usually abortion or stillbirth in pregnant cattle. Other clinical signs are decreased milk production and shedding of bacteria in milk and uterine discharge. Bulls have complications with reproductive organs, such as testicular abscesses and both sexes may have problems with infertility. Also hygromas, swelling of the leg joints and arthritis can develop (Iowa State University, 2009, p. 1 & 2).

There is no treatment for brucellosis, so the basic procedure of eradicating the disease is to systematically test the cattle and the infected are killed. The uninfected are vaccinated (Iowa State University, 2009, p. 4).

Brucellosis in humans is also known as undulant fever, Malta fever, or Mediterranean fever and may only get infected if one is in direct contact with cattle. People become infected by ingesting contaminated unpasteurized milk

and cheese. The most common way today to become infected is to be in contact with placental tissues and vaginal secretions. Human symptoms are fever, aches, weight loss, chills, depression, weakness, testicular complications in men, and abortion in pregnant women. Treatment is antibiotics and acetaminophen or ibuprofen (Brucellosis, n. d.). If left untreated, there is a 5% chance brucellosis can be fatal (Kahn, 2010, p. 2755).

In most cases, infection will happen with people working around cattle; so, it is very important to wear protective clothing when handling cattle and wash hands and equipment before and after working with the cattle. Also, do not drink unpasteurized milk and be careful about what cheese you consume to lower your risk of getting infected.

TUBERCULOSIS

Bovine tuberculosis is caused by a bacteria called *Mycobacterium bovis* and infects a lot of different variety of mammals, but cattle are the main host. It used be found world wide but now there are control programs in place that have been successful in eradicating tuberculosis from many countries and a majority of the United States. Transmission is by ingestion of contaminated milk, by aerosol inhalation, and by openings in the skin. The bacteria, *M. bovis*, can be shed in secretions, feces, urine, and milk. Cattle can asymptomatic and shedding later during infection (Iowa State University, 2009). Clinical signs are emaciation, lethargy, weaknes, anorexia, and a erratic fever. Over time a cough, lesions, and enlarged lymph nodes can develop. This disease rapidly spreads and symptom come on fast. Being that

there is no treatment available, the infected are killed to prevent the spreading of tuberculosis (Kahn, 2010, p. 622).

In humans, the tuberculosis infection may spread from lungs to the other organs. Symptoms are coughing blood, fatigue, fever, excessive sweating, weight loss, chest pain, and difficulty breathing. Older people, infants, and people with weak immune system are more at risk of being infected.

Prognosis is good if caught early and treated as soon as possible. Treatment involves taking a lot of different medications at different times because the bacteria can become unaffected by prescribed drugs. If left untreated or even taking too long to treat, there can be permanent lung and vision damage; or even death (ADAM, Inc, 2010, para. 2, 3, & 5).

Prevention is a skin testing for the public who are more exposed than others and if test comes back positive, treat it quickly (ADAM, Inc, 2010, para. 10).

ANTHRAX

Anthrax causative agent is *Bacillus anthracis* and is most common in herbivores. It is transmitted by ingesting or inhalation of spores and improperly handling contaminated carcass. These spores can survive up to 100 years in the soil. Transmission can also occur through wounds and bites from insects. Incubation period can usually range between 1 to 14 days. The clinical signs are sudden and before a diagnosis can be done the animal is already dead. Before death occurs the noticeable signs are staggering, trembling, convulsions, collapse, respiratory and cardiac distress, and fever. After death, there is rapid decomposition with blood oozing from the orifices of the body (Kahn, 2010, p. 544). This disease is very easy to spread and

necropsy should not be performed. There is treatment of antibiotics if caught early and for asymptomatic animals (Kahn, 2010, p. 545).

This disease is controlled by vaccines giving to livestock and to ones who are in high risk occupations. To prevent further contamination any carcasses that may be suspected of being infected should be buried deep or cremated (Kahn, 2010, p. 545).

In humans, there is cutaneous anthrax (infection of the skin), gastrointestinal anthrax (infection of the gastrointestinal tract), or inhalation anthrax (infection of the lungs). The three major ways that humans become infected are through cuts or scrapes, from spores entering the lungs, or from eating contaminated meat. The symptoms may be blisters or ulcers on the skin, fever, headache, cough, chest pain, shock, anemia, bloody diarrhea, or vomiting. Treatment is antibiotics, but cutaneous anthrax is more likely to improve. Humans with inhalation or gastrointestinal are prognosis is not good. It may be fatal (ADAM, Inc, 2009).

CONCLUSION

As was said before, there are many different zoonotic disease that can threaten human health. Even though there may be a vaccine, a treatment, or they may say that the disease is eradicated, there are no sure guarantees that you are not at risk. All the different types of zoonotic diseases, such as bacteria, viral, fungal, prion, parasites, protozoa, or even by insect, are living organisms that may find a way to resist preventive measures.

The best prevention is always going to be basically the same. Wearing the proper protective clothing and cleaning equipment and anything on one's

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self in contact with animal before and after contact is very important when working with animals. This prevents the spreading of organisms from traveling with to the animal. Always wash hands when handling and preparing any type of raw meat or eggs. Also, cooking any product coming from a animal throughly lowers the risk of infection.

Good husbandry for our domestic animals helps lower the risk of them becoming sick. Factors such as proper cover, comfortable bedding, well ventilated housing, and the correct type and amount of feed helps keep the animals stress level down. When an animal is stressed, it lowers there immune system making it evening harder to fight any infecting organism. Good preventive medicine, such as vaccines, deworming schedules, systematic testing, and keeping up with health check-ups, is still essential because it makes owner aware of what is going on with their animals.