

Q Fever

What is Q Fever?

Q Fever is a disease caused by a rickettsia called *Coxiella burnettii*. Rickettsiae are very small bacteria, not much larger than viruses. *C. burnettii* can infect a variety of wild and domestic animals, but human infections are most commonly associated with sheep, goats and cattle. Q fever is a significant cause of illness in biomedical research facilities housing ruminants, especially sheep or goats.

What kind of germ is Q Fever?

C. burnettii is extremely common among wild and domestic animals. While any animal species can be infected, domestic ruminants are the greatest hazard. Usually, infected animals do not become visibly ill, although if the infected animal is pregnant, abortion sometimes results. Occasionally an "abortion storm" or series of abortions occurs when Q Fever passes through a previously uninfected flock. There are two ways which Q Fever is spread; aerosols of body fluids and the bites of ticks. Infected ruminants often shed *C. burnettii* in their milk and in the amniotic fluid that they discharge when they give birth. Other animals or humans can be infected by inhaling aerosols from the amniotic fluid or from unpasteurized infected milk. The amniotic fluid of infected animals carries a very high number of organisms and is particularly dangerous.

How can Q Fever be Diagnosed?

The other route of transmission occurs among wild animals. The disease may be spread between infected rabbits, rodents, and other wild animals by the bites of ticks. Humans are not usually infected by tick bites, although it is possible. Infected humans develop a flu-like illness which can be mild or severe in different individuals. Many humans have mild infections and recover without ever realizing that they have had Q Fever. A substantial portion of rural workers and those that work with ruminants have already had the disease, developed antibody, and are immune to further infection. Disease is most likely to be seen in urban workers who are working with ruminants for the first time.

How is Q Fever treated?

Q fever is easily treated with appropriate antibiotics, so it's very important that a correct diagnosis be made if the illness might be Q fever.

Are there any long-term effects of Q Fever?

While most human cases are mild and flu-like, the disease can be a serious one. Clinical signs begin from two weeks to one month after exposure. Signs include fever, sweating, muscular aches and pains, and headache. In rare cases the organism can invade the heart and cause serious injury.

How can humans get Q Fever?

Human infection most commonly results from exposure to the amniotic fluid of infected ruminants, especially sheep. The organism spreads by aerosols, so direct contact with the fluid is not necessary - you only need to be in the same air space with the infectious material. The highest risk is seen in those that work with pregnant animals or newborn lambs, especially if the workers have had relatively little exposure to ruminants in the past.

The organism is very stable in the environment. Workers washing clothing or drapes contaminated with amniotic fluid are at risk, even if they have no contact with the animals themselves.

Workers dealing with wildlife in field conditions could also be infected by the bites of ticks, although humans are seldom infected in this way.

Prevention

Since Q fever is widespread in nature, any animal flock or herd of ruminants should be considered potentially infected. It is not generally possible to develop "Q fever free" herds or flocks. Prevention of illness rests on two principles:

- Awareness: Those who work with ruminants should know the risks and know the signs of illness.
- Containment: Those who do not work with ruminants should be isolated from the amniotic fluids of ruminants.

If you work with ruminants, especially pregnant ones or neonates, and if you develop signs which might be caused by Q fever, you should report the illness to your supervisor and to employee health services. Q fever is easily treated if it is correctly diagnosed.

Ruminants, especially sheep used for biomedical research, should not be used in or transported through areas in use by workers that are not occupationally exposed to sheep. Sheep should be housed in traditional open barns, or in dedicated vivarium facilities with 100% non-recirculated air supplies. Sheep should not be transported through or used in indoor area of multipurpose buildings. An exception can be made for wethers who have been sheared and bathed - such animals are very unlikely to be shedding the Q-fever organism, since shearing and bathing will have removed any remnant of amniotic fluid from their coat.