



# Leptospirosis in Cattle, Pigs, Sheep, Goats, Horses and Humans

Updated July 2008

AG0455

ISSN 1329-8062

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Leptospirosis is the general term applied to diseases of animals and humans caused by numerous distinct serovars of a spiral-shaped bacterium known as *Leptospira interrogans*. Many such serovars are harboured by a wide range of animals, and all of them are capable of causing illness in humans. *Leptospira* serovars **pomona** and **hardjo** are particularly important in livestock, however the number of other serovars of concern, detected in domestic animals and in humans, is growing. Leptospirosis is a cause of economic losses in farm animals. Many infected animals do not show signs of clinical disease.

Leptospirosis is spread by the urine of infected animals. Moisture is an important factor of the survival of the bacteria in the environment.

## Symptoms and recognition of leptospirosis

### Cattle

Redwater in cattle, and particularly in calves, strongly suggests infection with *Leptospira pomona*. Calves as young as two or three weeks of age can become affected.

Symptoms develop suddenly and include deep red urine, decreased activity, rapid breathing, anaemia and pale, slightly yellow membranes lining the mouth and vagina. Young unweaned calves may be “off-colour” at one feed and dead before the next. Not all severely affected animals die, however, and the symptoms of redwater may pass after a few days.

A peculiar type of mastitis is another distinctive form of leptospirosis. There is a sudden onset of slackness of the whole udder and abnormal milk in all four quarters. It may affect many cows in a herd at one time. *Leptospira hardjo* is a frequent cause, with the milk being yellowish, and sometimes of uneven consistency. *Leptospira pomona* may also produce a similar condition but the milk may be brownish, or contain a little blood.

With *Leptospira pomona* infection redwater occasionally accompanies this unusual mastitis condition, and may produce severe sickness. Otherwise there is little general sickness. Milk returns to its normal appearance after a few days, but sometimes the cow fails to reach her expected level of production for that season.

Cows may abort in late pregnancy due to either *Leptospira pomona* or *Leptospira hardjo*. Abortion may occur without, or some weeks after, other symptoms of leptospirosis.

Leptospirosis may also add indirectly to other problems in cattle, such as decreased milk production, increased susceptibility to the usual forms of mastitis, and poorer fertility. It can also be responsible for losses of condition as a result of persistent kidney damage.

### Pigs

Leptospirosis in pigs, usually a chronic infection, is sometimes important as a cause of abortions, still-births and poor survival of newborn piglets. There may be some cases of animals failing to thrive because of persistent kidney damage. *Leptospira pomona* is most important; *Leptospira tarassovi* may also cause similar symptoms, while *Leptospira icterohaemorrhagiae* may cause acute septicemic outbreaks in piglets, with high mortality rates.

### Sheep and goats

Leptospirosis is rare in sheep and goats, but redwater resulting from infection with *Leptospira pomona* can occur. In most cases animals develop acute septicemia and are found dead. In *Leptospira hardjo* infections, abortion may be the only sign, but milk drop syndrome similar to one observed in cattle can be seen in lactating ewes.

### Horses

Horses may be infected with *Leptospira pomona*, leading to severe sickness, redwater in foals, and abortion. There may also be a connection between *Leptospira pomona* infection and a persistent eye condition called periodic ophthalmia or moon blindness.

## Nature and transmission of leptospirosis

Exposure of livestock to leptospira organisms is much wider than the occurrence of the disease would suggest. Livestock pick up infection by contact with pasture or water contaminated by the urine of infected livestock or wild animals. In warm, moist conditions the organisms may survive in the environment and cause infection for several weeks, so that under suitable conditions, many livestock are almost continually exposed for long periods.

The organism enters the body through intact membranes such as the eyes, nose or mouth or through broken skin. Many animals suffer only mild or unapparent signs on their first infection. Recovered animals become resistant to further infection by similar leptospiral organism but for periods of up to several months, they may pass leptospiral organisms in their urine, adding to the reservoir of environmental infection.

Many factors affect the complex pattern of exposure and resistance, producing widely varying levels of infection and symptoms.

The unusual mastitis (discussed earlier) is still not well understood. Udder reaction and damage associated with it, however, produce positive reactions on the rapid mastitis test. It is suspected that leptospiral mastitis paves the way for more familiar mastitis infections. However, milk is unfavourable for survival of leptospiral organisms, so milk, unlike urine, is not important in contaminating the environment.

Abortion during later stages of pregnancy is caused by leptospiral organisms multiplying after first entering the body. When they reach the placenta and the unborn calf they multiply further in that site, to cause sufficient damage for abortion to follow. Thus, one may see the unusual mastitis or redwater some weeks before the cow aborts. On the other hand, the initial infection may produce such mild results that nothing unusual is seen before the abortion.

## Diagnosis of leptospirosis

The sudden appearance of acute sickness associated with redwater in calves, and perhaps older cattle, is sufficient to provide a strong suspicion of *Leptospira pomona* infection, although other causes of redwater, such as rape and kale poisoning, post parturient hemoglobinuria, bacillary hemoglobinuria, must be taken into account. The sudden appearance of a slack udder with abnormal milk in all four quarters suggests *Leptospira hardjo* infection.

Laboratory examination of urine and other specimens may be made to confirm the infection. Infected animals produce antibodies to the leptospira organisms and these antibodies can be detected by testing blood samples. Sometimes, positive results on the first test can only be interpreted as evidence that cattle were exposed to infection sometime in the past. However, if rising antibody levels are found on further tests, they indicate recent infection.

When the first suggestion of leptospirosis in cattle or pigs is abortion late in pregnancy, without laboratory assistance there is no way of confirming infection.

An interesting point here is that as leptospiral abortion usually occurs quite some weeks after infection, antibody levels could be falling rather than rising at that time. Similar considerations apply to the testing of sows following loss of their piglets from abortion, stillbirth or lack of vitality after birth.

## Treatment and control of leptospirosis

Treatment of cattle severely affected with leptospirosis, in particular calves with redwater, requires veterinary consultation.

Prevention of leptospirosis through management alone is not reliable. However, avoiding paddocks receiving drainage directly from the milking yards, or poorly drained areas for young calves,

should reduce the risk of *Leptospira pomona* infection. Another step to reducing *Leptospira pomona* infection in cattle is to keep them away from pigs, and drainage from piggeries.

## Vaccination

Immunisation is by far the most practical method of controlling leptospirosis. Veterinary consultation is desirable at the start of a vaccination program. When first starting a vaccination program, two shots must be given, four to six weeks apart. Immunity to infection will be present approximately two weeks after the second injection. This immunity will need to be annually, usually six to eight weeks prior to calving so the new born calf is protected until it is old enough to be vaccinated and actively develop its own immunity.

Calves are vaccinated at four to six months of age, and again about four to six weeks later. Heifer replacements should receive a booster shot prior to joining and then prior to calving (in line with the rest of the herd). Cattle vaccines are now available which provide combined protection against the clostridial diseases and leptospirosis. Vaccination of purchased cattle must not be overlooked.

Control of *Leptospira pomona* infection in pigs also requires a vaccination program, the details of which are supplied by vaccine manufacturers. Vaccines are also available to counter *Leptospira tarassovi*.

## Human illness

Leptospirosis in humans is an occupational hazard of farmers, butchers or veterinarians and others in close contact with animals. People can become infected through bare feet, by handling aborted calves or piglets without gloves, by droplets sprayed from urinating animals which reach the eye or nasal passages, or through poor attention to personal hygiene, including washing the hands after handling animals.

Human leptospirosis resulting from contact with livestock can cause severe illness. Influenza-like symptoms of fever for some seven to 10 days, muscular pain, headache, intolerance of light, vomiting, and abdominal pain can occur. Pulmonary haemorrhage is increasingly recognised as a major and often lethal manifestation of infection. *Leptospira hardjo* is the organism particularly important in this regard. When any connection between human illness and leptospirosis is suspected, your doctor should be given any information available on the leptospirosis situation on the farm concerned.

Leptospirosis is also emerging as a growing medical hazard in humans around the world, associated with recreational exposures like travel in tropical countries with significant rainfall.

*This Information Note was originally developed by the Bureau of Animal Health and was previously published in May 1998.*

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