

Leptospirosis in Cattle

Leptospirosis, commonly referred to as “Lepto,” is caused by the spiral-shaped bacteria *Leptospira*, which has more than 400 subclassifications called “serovars.” Some examples of different serovars include *hardjo*, *pomona*, *canicola*, *icterohaemorrhagiae*, and *grippityphosa*, all of which are included in the commonly used “five-way Lepto” vaccines.

Serovars are typically associated with one or more maintenance hosts that serve as reservoirs of infection. In other words, maintenance hosts carry the bacteria and expose other susceptible animals. Maintenance hosts can be wildlife species or domestic animals, including livestock (see table below). An animal may be infected by serovars maintained by its own species (maintenance host infection or host-adapted infection) or serovars maintained by other species (incidental infection or nonhost-adapted infection).

Leptospirosis is also a zoonotic disease. Zoonotic diseases are infectious diseases that can be passed among animals (wild or domesticated) and humans. Therefore, people should take extra precautions to protect themselves when handling animals suspected of having a Lepto infection.

<i>Leptospira</i> serovar	Maintenance host
<i>hardjo-ovis</i>	cattle
<i>pomona</i>	pigs, skunks
<i>canicola</i>	dogs
<i>icterohaemorrhagiae</i>	rats, other rodents
<i>grippityphosa</i>	raccoons, skunks, opossums
<i>bratislava</i>	pigs, horses



Clinical Signs

The clinical signs of Lepto depend on the herd’s degree of resistance or immunity, the infecting serovar, and the age of the animal infected. In herds with adequate resistance, ideally developed through a good vaccination program or in some cases natural exposure, cattle may be infected with the organism but not show signs of disease. However, in herds with low resistance, animals infected with the organism may show mild to severe signs of disease. Disease usually takes one of two forms: chronic (long lasting) or acute (short lasting), often depending on whether animals are infected with host-adapted or nonhost-adapted serovars, respectively.

- *Leptospira hardjo-ovis* is the only **host-adapted** Lepto serovar in cattle and can infect animals at any age, including young calves. Because cattle are the maintenance host for *hardjo-ovis*, infection with this serovar will often produce a carrier state in the kidneys associated with long-term urinary shedding. In addition, infections with *hardjo-ovis* can persist in the reproductive tract. The infertility that can result from persistent

reproductive tract infections is perhaps the most economically damaging aspect of leptospirosis in the United States. Low antibody titers are typically associated with *hardjo-ovis* infections, making detection and diagnosis difficult.

- **Nonhost-adapted** Lepto serovars include *Leptospira pomona*, *icterohaemorrhagiae*, *canicola*, and *grippityphosa*. Because cattle are incidental hosts for these Lepto serovars, the clinical signs are typically very different than infection with *hardjo-ovis*. When leptospirosis associated with nonhost-adapted Lepto serovars occurs in calves, the result is high fever, anemia, red urine, jaundice, and sometimes death in three to five days. In older cattle, the initial symptoms such as fever and lethargy are often milder and usually go unnoticed. In addition, older animals usually do not die from leptospirosis. Lactating cows produce less milk, and, for a week or more, the milk they produce is thick and yellow. However, unlike many other udder infections, leptospirosis does not usually cause any firmness of the udder. Leptospirosis with nonhost-adapted Lepto serovars also affects pregnant cows causing embryonic death, abortions, stillbirths, retained placenta, and the birth of weak calves. Abortions usually occur three to ten weeks after infection. The more severe clinical signs and higher antibody titers that are usually associated with nonhost-adapted Lepto serovars make diagnosis easier.

Transmission

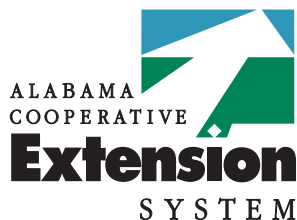
Leptospirosis is transmitted either directly between animals or indirectly through the environment. The *Leptospira* organism is most commonly shed in the urine of an infected animal and can be shed through aborted fetuses as well, thus infecting animals directly

or contaminating the environment. The source of infection can therefore be an infected animal or water/feed that has been contaminated with infected urine. The organisms gain entry to the body through the membranes of the eyes, nose, mouth, and even the skin, especially if it is injured or water softened. Infected animals also commonly shed the bacteria in placental fluids and milk. In addition, some *Leptospira* serovars can be transmitted venereally through sexual contact.

Leptospira organisms can survive in the environment for weeks to months depending on environmental conditions, and some organisms have been shown to survive in stagnant, standing water or in wet soil for longer than six months if the temperature is favorable (between 50 degrees and 93 degrees F). Moisture and warm temperatures are conducive to *Leptospira* survival, while dry, freezing, and extremely high temperatures often kill the bacteria.

Treatment and Prevention

Because of the presence of *Leptospira* carrier states in both cattle and wildlife, avoiding all exposure to leptospirosis is not possible for most beef cattle operations. Your veterinarian may prescribe antibiotic therapy for animals with leptospirosis, when necessary. However, attempting to prevent leptospirosis through regular herd vaccination is the best approach. At a minimum, annual vaccination of bulls, cows, and replacement heifers at least six to eight weeks before the breeding season with a five-way Lepto vaccine is recommended after initial primary and booster vaccinations, according to label directions. Because all Lepto vaccines are killed, or inactivated, it is critical that animals receive the initial primary and booster vaccinations according to label directions, which include the proper time interval between the initial and booster vaccinations (usually about four weeks).



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