Haemophilus somnus Disease in Cattle

E.J. Richey

Extension veterinarian
College of Veterinarian Medicine
Cooperative Extension Service
Institute of Food and Agricultural Sciences
University of Florida, Gainesville, 32611.

Haemophilus somnus is a common disease-causing bacteria that spreads throughout cattle herds in a very elusive manner. Usually a major problem has already developed before the disease is detected.

Historically, the major H. somnus problem was considered to be a nervous system problem, but as the investigations of the disease progressed, many different problems became recognized. It was found that the organism had the capacity to attack many different organs in the body. Because of this, the diseases caused by this bacteria are now referred to as the "Haemophilus somnus complex." In most cases, the organism blocks the minute blood vessels (capillaries) and interrupts the blood flow to the organs or parts of the organs. This interrupted blood flow results in tissue death, thus causing clinical symptoms of the disease.

In general, the Haemophilus somnus complex is clinically manifested in the reproductive and urinary tract form, the respiratory form, the septicemic form, and a "catch-all" miscellaneous form.

Reproductive and Urinary Tract Form

If H. somnus attacks the reproductive tracts of pregnant cows, the infection may result in the death of the fetus, at any age, with subsequent abortion and infection of the uterus. A long-term uterine infection will usually result in an extension of the infection into the vagina and a repeat-breeders syndrome. Because H. somnus has been found in the urinary tract and prepuce of bulls, it has been surmised that the organism is transmitted from the cow to the bull during mating. The organism is shed in uterine/vaginal discharges and urine of these infected animals. Susceptible cattle, in close proximity to the infected animals are routinely exposed to the organism by sniffing the discharges or being splattered by the urine.
Subsequently, the exposed susceptible cattle become infected, usually resulting in the respiratory form of *H. somnus* disease.

**Respiratory Form**

The organism has the ability to attack both the upper and lower respiratory tract. In calves, one of the typical forms of the disease attacking the upper respiratory tract is "calf diphtheria." The surface tissue of the larynx (voice-box), affected by the interruption in blood supply, begins to die and slough. The calf exhibits difficulty in swallowing, bawling, and breathing; everything hurts! As the disease progresses, the wind-pipe or trachea may also become infected.

If the *H. somnus* organism reaches and attacks the lungs, severe pneumonia can result. The pneumonia caused by *H. somnus* can result in rapid death of the animal before any clinical signs have been detected. Quite often *H. somnus* is the primary cause of the pneumonia but can be quickly over-grown by opportunist organisms like *Pasteurella multocida* and *Pasteurella haemolytica*. In either case, the pneumonia caused by *H. somnus* must be treated immediately or death usually occurs. If either the reproductive-urinary tract form or the respiratory form of *H. somnus* disease gains access to the blood stream, the organism can spread to all parts of the body. The diseases originating from the circulating infected blood are referred to as the "septicemic" form of *H. somnus*.

**Septicemic Form of *H. somnus***

What type of clinical signs are manifested during the septicemic form of *H. somnus* disease depends upon where the organism becomes attached, colonizes, and blocks the blood flow by forming a blood clot. How severe the clinical disease depends upon how much tissue dies as a result of the blood flow blockage. If the blockage occurs in the brain or spinal cord, the disease can be manifested as nervous disorders. Since the blood clot blocks the blood vessel (thromboembolic) and affects the covering of the spinal cord (meninges) and the brain (encephalon) this particular disease form is known as "Thromboembolic meningoencephalitis" (TME or TEME). Affected animals may begin to have an altered gait, walk in circles, knuckle over at the fetlocks, and eventually begin to "head-press," appear blind, and have convulsions. Eventually, the affected animals become comatose; they are called "sleeper calves". Needless to say, unless treated at an extremely early stage, this form of *H. somnus* septicemia results in death. If the blood flow blockage occurs in the heart muscle, a heart attack may occur. In many cases of *H. somnus* septicemic disease, death is the result of severe myocardial (muscle of the heart) damage. If the blockage of the blood occurs in the skeletal muscles, lameness and stiffness is seen.
Unfortunately, opportunistic organisms can easily set up housekeeping in the damaged tissue. Blackleg diseases are common sequela to *H. somnus* infections in the skeletal muscles. If the blockage occurs in the gastrointestinal tract, blackleg organisms that affect the gut will begin to proliferate, and the animal may die of toxins produced by them (enterotoxemia). If the blockage occurs in the liver, red-water disease (another Blackleg disease organism) may be a sequel to the damage. In all three cases, death is usually attributed to a blackleg disease rather than *H. somnus*.

The septicemic form of the disease may also affect the animal's joints, resulting in chronic arthritis, swollen joints, and chronic lameness. Over the last few years, the septicemic form of *H. somnus* disease has occurred less frequently. This reduction is thought to be due to early recognition of the disease and early treatment by producers. Producers are becoming better informed.

**Miscellaneous Forms**

*H. somnus* diseases have also occurred in the ears and eyes of cattle. The ear form is characterized by a large amount of thin, yellowish discharge flowing from the ear canal. The eye form is seen as an infection of the conjunctiva, the white part of the eye. As with any conjunctivitis, there is reddening of the eye, excessive tears that overflow and drain, and squinting.

Unfortunately, unless treated early, any form of *H. somnus* disease can cause another form of the disease (Figure 1). Regardless of how the disease was introduced into the herd, the infection has a tendency to reach the uterus. Because of this, the infected reproductive tract is thought to be the reservoir of the disease.

![Diagram](https://via.placeholder.com/150)

Figure 1. Unless treated early, any form of *H. somnus* disease can cause another form of the disease.

**Treatment**
As stated before, early treatment is necessary to stop the disease progress; if clinical signs are missed and treatment is delayed, survival of the severely sick animals is questionable. The *H. somnus* organism is susceptible to several different antibacterial agents; primarily the new generation antibiotics such as enrofloxacin (Baytril®), ceftiofur hydrochloride (Excenel™), ceftiofur sodium (Naxel), tilmicosin (Micotil®) and florfenicol (Nuflor®) are effective. However, we still use many of the old generation antibacterial agents such as tetracycline, penicillin, and sulfa groups. The antibiotics are just halting the growth of the organism. It is the body defenses that actually kill it. Therefore, stopping treatment too early may allow the *H. somnus* organism to begin growing again and the animal will relapse with the disease.

**Prevention**

Disease caused by *H. somnus* can be prevented by the appropriate use of vaccines on the market. Appropriate use means: two doses administered at least 21 days apart, with the second dose given at least 30 days before the anticipated challenge. An annual booster is required to keep the resistance level high. In the case of an "out break," we generally reduce the challenge by use of antibacterial drugs while the resistance is raised by vaccination (see diagram below). In this case we would use repeated doses of antibiotics or antibacterial drugs to reduce the challenge and allow time for the vaccinations (two doses) to raise the resistance.

![Figure 2. Use vaccines to raise the resistance and medications to reduce the challenge.](image)

As you can see, *Haemophilus somnus* is another disease organism that has the ability to cause many different diseases. Prevention is the best way to control the diseases.

**Footnotes**

2. E.J. Richey, Extension Veterinarian, College of Veterinary Medicine, Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, 32611.

The Institute of Food and Agricultural Sciences (IFAS) is an Equal Opportunity Institution authorized to provide research, educational information and other services only to individuals and institutions that function with non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, marital status, national origin, political opinions or affiliations. For more information on obtaining other extension publications, contact your county Cooperative Extension service.


Copyright Information
This document is copyrighted by the University of Florida, Institute of Food and Agricultural Sciences (UF/IFAS) for the people of the State of Florida. UF/IFAS retains all rights under all conventions, but permits free reproduction by all agents and offices of the Cooperative Extension Service and the people of the State of Florida. Permission is granted to others to use these materials in part or in full for educational purposes, provided that full credit is given to the UF/IFAS, citing the publication, its source, and date of publication.