Heartwater

Etiology
Heartwater is a tick-borne disease caused by infection with *Ehrlichia* (formerly *Cowdria*) *ruminantium*, a rickettsia (tribe *Ehrlichia*, family *Rickettsiaceae*). Strains of *E. ruminantium* vary in their pathogenicity. At least one strain seems to be nonpathogenic for cattle; however, all strains appear to be pathogenic for sheep and goats.

Species affected
Cattle, sheep, goats, and wild buffalo are severely affected, although in some indigenous African breeds of sheep and goats, the symptoms are mild. *E. ruminantium* can also infect white-tailed deer, ferrets and certain species of mice.

Geographic distribution
Heartwater is endemic in most of Africa south of the Saharan Desert, Madagascar, and a few islands in the Caribbean.

Transmission
Heartwater can be transmitted by at least 12 species of *Amblyomma* ticks (*vector*). Cows may transmit the infection to their calf through colostrum (*oral*).

Incubation period
The incubation period is usually two weeks, but can be as long as one month.

Clinical signs
**Ferrets:** Experimentally infected ferrets developed a fever, nervousness and uncoordinated movements.

**Cattle, sheep, goats:** There are four forms of the disease, however the acute form is the most common. The signs include sudden fever (up to 107°F), anorexia, listlessness and rapid respiration. This is followed by nervous signs, particularly chewing movements, protrusion of the tongue, twitching of the eyelids and circling, often with a high-stepping gait. Animals with the acute form usually die within a week after the onset of the disease.

Zoonotic potential
*Ehrlichia ruminantium* does not appear to affect humans.

Diagnosis
Before collecting or sending any samples from animals with a suspected foreign animal disease, the proper authorities should be contacted. Samples should only be sent under secure conditions and to authorized laboratories to prevent the spread of disease.

Prevention and control
Control of this disease relies mainly on control of the tick vector with acaricides and prevention of tick infestation from infected animals. Transfer of blood between animals must also be avoided.

Notification of authorities
Suspected cases of heartwater should be reported to state or federal authorities immediately. Federal: Area Veterinarian in Charge (AVIC) http://www.aphis.usda.gov/vs/area_offices.htm State Animal Health Official http://www.aphis.usda.gov/vs/sregs/official.html

For more information
- Center for Food Security and Public Health (CFSPH), Iowa State University
  http://www.cfsph.iastate.edu/DiseaseInfo/
  http://www.merckvetmanual.com/mvm/index.jsp?cfile=htm/bc/55100.htm&word=heartwater
- USAHA Foreign Animal Diseases Book
  http://www.vet.uga.edu/vpp/gray_book/FAD/
- World Organization for Animal Health (OIE)
  http://www.oie.int

This information was developed by staff veterinarians at the CFSPH for use as training materials for the USDA APHIS National Veterinary Accreditation Program.