

Prevention of Meningeal Worm Infection

SCWDS Briefs, April 1999, 15.1

White-tailed deer are the normal host for the meningeal worm (*Parelaphostrongylus tenuis*). Adult worms reside in the meninges of the brain of white-tailed deer and produce eggs that are carried to the lungs via blood circulation. In the lungs the eggs hatch and produce larvae that enter airways and migrate to the larynx where they are swallowed and passed in the feces of deer. The larvae then penetrate and grow within required intermediate hosts, i.e., terrestrial slugs and snails. The life cycle is completed when deer accidentally ingest infected mollusks while browsing.

Infection typically causes no clinical disease in white-tailed deer, but when infected snails and slugs are ingested by other cervids or ungulates, severe neurologic disease can develop due to aberrant parasite migration in the spinal cord and brain. Clinical signs of meningeal worm infection (parelaphostrongylosis) in these abnormal hosts are variable and include weakness, lameness, circling, blindness, head tilt, paralysis, abnormal behavior, and sometimes death. Species known to be susceptible include other native and exotic cervids (black-tailed deer, mule deer, elk, caribou, moose, fallow deer, axis deer), domestic livestock (goats and sheep especially), llamas, and exotic antelope species (blackbuck, sable antelope, and others). All exotic ungulates should be regarded as potentially susceptible.

There currently is no single effective method of preventing meningeal worm infection in ungulates that share range with infected white-tailed deer. Eliminating white-tailed deer via lethal methods is not a practical or effective method of control in most situations. Limiting deer access to pastures can reduce the potential for environmental fecal contamination, but it is important to remember that the mollusk inter-mediate hosts actually harbor the infective larval stages for up to a year. Deer-proof fencing is one option for small-scale operations, and it is sometimes possible to make pastures less appealing by limiting trees and cover favorable to deer. Furthermore, feeding livestock and captive exotic species in an enclosed building will limit attraction of deer to available feed.

Reducing exposure to infected slugs and snails is important in preventing meningeal worm infection. Susceptible animals should not be allowed access to pastures that contain thick vegetation or moist shaded areas favorable to the snail and slug intermediate hosts. Feeding animals in elevated bunks rather than directly on the ground is also advisable. A variety of techniques has been suggested to control slugs and snails in pastures, including: destruction of slug and snail habitat; erection of physical barriers around the perimeter of the pasture; trapping mollusks with home-made or commercial traps; application of commercial molluscides; and even manually collecting slugs and snails. More information on methodology is available at the following website: [www.ipm.ucdavis.edu/PMG/PESTNOTES/pn028.html].

A final potential method for prevention of meningeal worm infection in susceptible animals is prophylactic treatment with anthelmintics or deworming drugs. At the present time, no studies have been performed that demonstrate complete prevention of infection with these agents. Despite this fact, some veterinarians currently prescribe daily oral administration of

pyrantel tartrate or subcutaneous injections of ivermectin every 3 weeks during the spring, summer, and fall as a preventive. More research needs to be performed to identify effective deworming programs, and producers or owners interested in these methods are encouraged to contact their veterinarian for specific advice and recommendations. (Prepared by Todd Cornish and Cariann Turberville)