Pennsylvania Game Commission Wildlife Disease Reference Library

Deer Liver Flukes

Other Names: Fasciolodiasis, giant liver fluke, large American liver fluke

Cause

Fascioloides magna is a parasitic flatworm found within the livers of infected deer and other ruminants. Adult liver flukes are flat, oval, purple-gray in color, and up to 8 cm (3.15 in) long and 3 cm (1.2 in) wide.

Significance

Deer liver flukes rarely cause clinical illness in free-ranging deer, and do not seem to have a major impact on wild deer populations. These flukes present more of a problem when they infect domestic cattle and sheep. Infected cattle often do not show clinical signs, but may have decreased milk production, unthrifty offspring, and infection may result in liver condemnation at the slaughterhouse. Sheep are much more severely affected by deer liver flukes and often die from extensive liver damage. This parasite does not infect humans and meat from infected deer is safe for consumption.

Species Affected

In North America the primary hosts for *F. magna* are white-tailed deer and caribou. These flukes can also infect mule deer, elk, moose, bison, and other wild ruminants. Domestic cattle, sheep, pigs, horses, and llamas can also become infected with deer liver flukes.

Photo courtesy of the Michigan Department of Natural Resources

Distribution

The deer liver fluke is found primarily in 5 regions in North America: the Great Lakes region; the Gulf coast, lower Mississippi, and southern Atlantic

seaboard; the northern Pacific coast; the Rocky Mountain trench; and northern Quebec and Labrador. *F. magna* was introduced into Italy in 1865, and has since been reported in Germany, Poland, the former Czechoslovakia, Austria, and Hungary. It is not thought to occur in Pennsylvania.

Transmission / Life Cycle

Adult flukes live in fibrous capsules within the liver and release eggs which are swept into the intestines and shed in feces. The eggs hatch in water and a free-swimming immature form known as a miracidium emerges. They then penetrate snails (intermediate hosts) where they continue to develop and multiply. Several immature free-swimming cercaria emerge from each infected snail and cling to vegetation in a protective form called a cyst. Encysted cercaria, known as metacercaria, infect new hosts when they are ingested along with vegetation and then migrate through the intestinal wall to the liver, where they become encased in fibrous cysts and develop into adults. The entire life cycle can be completed within 5 months under favorable conditions.

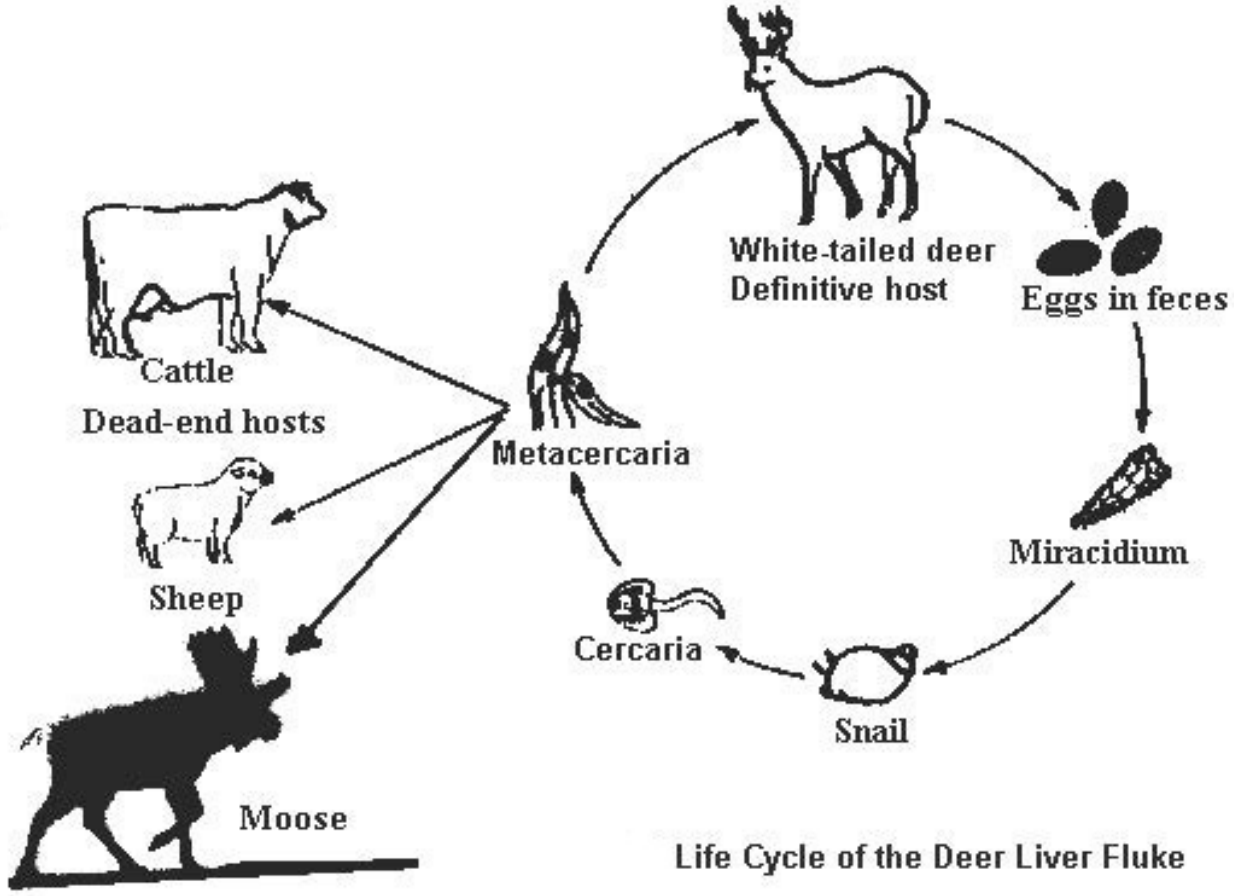

Image courtesy of fws.gov

There are three different categories of mammalian hosts for deer liver flukes: definitive hosts, dead-end hosts, and aberrant hosts. The flukes can complete their life-cycle within definitive hosts which include white-tailed deer, elk, caribou, mule deer, and fallow deer. In dead-end hosts immature flukes reach the liver but rarely mature and produce eggs. Dead-end hosts include moose, Sika deer, cattle, bison, horses, llamas,

and pigs. Flukes cannot complete their migration within aberrant hosts which include bighorn sheep, roe deer, and domestic sheep and goats.

Clinical Signs

Most deer infected with liver flukes do not show clinical signs. In definitive and dead-end hosts the flukes become encapsulated within the liver, which prevents further fluke migration and liver damage. When definitive and dead-end hosts are parasitized by a large number of flukes, they may become emaciated, suffer severe liver damage, and sometimes die. In aberrant hosts, such as bighorn sheep and domestic sheep, immature flukes continue to wander throughout the liver, which can cause extensive liver damage. Clinical signs in aberrant hosts include lethargy, loss of appetite, depression, weight loss, and death. In aberrant hosts that have died of deer liver fluke parasitism, necropsy may reveal a swollen, necrotic, hemorrhagic liver with many fluke migration pathways.

Diagnosis

A diagnosis can be made at necropsy by identifying *F. magna* within the liver of an infected animal. Deer liver fluke infections can also be diagnosed by identifying fluke eggs within the feces.

Treatment

Drugs are available for the treatment of captive and domestic animals, but they are rarely used in wild free-ranging animals. However, medicated baits have been distributed in a wildlife refuge in Texas to decrease the prevalence of liver flukes in wild white-tailed deer.

Management/Prevention

F. magna can be introduced to new areas when infected animals are translocated, so it is important to treat deer with anti-fluke medications before translocation. Susceptible domestic animals should not be permitted to graze where infected snails are common, and they should not share pastures with potentially infected deer.

Suggested Reading

Michigan Department of Natural Resources. Wildlife Disease. Deer Liver Fluke. < http://www.michigan.gov/dnr/1,1607,7-153-10370_12150_12220-26639--,00.html>.

Pybus, M. J. 2001. Liver Flukes. Pages 121-149 *in* W. M. Samuel, M. J. Pybus, and A. A. Kocan, editors. Parasitic Diseases of Wild Mammals. Iowa State University Press, Ames, Iowa, USA.