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# *Dicrocoelium dendriticum:* The Lancet Fluke of Sheep



## Introduction

Infection by parasites is a major concern of anyone who raises sheep. A group of parasites that are often overlooked are the flukes (also called flatworms or trematodes). The lancet fluke (or small liver fluke), *Dicrocoelium dendriticum*, is the only fluke of significance found in Atlantic Canada. *Dicrocoelium* is presently found throughout Europe, Asia and North America; and archaeological findings suggest that it has been in Newfoundland since at least the seventeenth century.

## Life Cycle

*Dicrocoelium* has perhaps the most complex and fascinating life cycle of any parasite found in domestic animals in Newfoundland and Labrador. The adult flatworms are found in the bile ducts of the liver of sheep, cattle, pigs, goats, rabbits, members of the deer family and rarely in humans. Adults are hermaphrodites, that is, both male and female, and so individuals can produce live eggs. The eggs pass down the bile duct, into the intestines and out into the environment in feces.

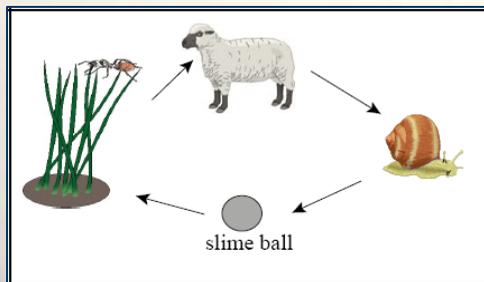


Figure 1: Lifecycle of the Lancet Fluke.

Snails eat the eggs which hatch and eventually form cercaria. The cercaria live in the snail's respiratory chamber and are released to the environment in slime balls. It normally takes three to four months for the parasite to complete the snail portion of its life cycle.

The slime balls are a favoured food of ants; and once ingested, the cercaria move to the abdomen of the ant. One or two of these cercaria move to the ant's head and establish themselves in the brain. When cercaria are present in the brain, ants which normally move into their nests with cold temperatures will move up to the tops of vegetation. The affected insects clamp their jaws unto the plant and remain paralyzed as long as the temperature stays below 20°C. The parasite normally spends one to two months inside its ant host.

The fact that infected ants tend to be at the top of vegetation increases the chances that they will be eaten by grazing sheep. Once the ants are eaten and digested, the parasite moves from the sheep's intestines up to the liver by way of the bile duct. About eleven weeks after ingestion by the sheep, *Dicrocoelium* develops into adults capable of laying eggs and starting the cycle again.

## Effects

*Dicrocoelium dendriticum* is not usually considered to cause great problems to infected sheep. However, it is possible for individual sheep to have as many as 50,000 parasites in the liver. With extreme infections of this sort, there may be distended bile ducts and liver cirrhosis leading to decreased liver function, anemia, edema and weight loss. Sheep with extremely heavy parasite loads and severe liver degeneration have been seen in Newfoundland where the presumed cause of death was *Dicrocoelium*.



Figure 2: Close-up view of flukes.

*Dicrocoelium* can also be diagnosed by finding eggs by fecal flotation. Routine flotation techniques may not show *Dicrocoelium*, and techniques intended specifically for fluke diagnosis may be required.

## Treatment and Control

Adult *Dicrocoelium* in sheep can be treated with praziquantel or benzimidazoles. Praziquantel (Droncit) is not approved for use in food animals and the cost of the drug is too high to be practical. Valbazen, a benzimidazole, has been used to treat *Dicrocoelium*; although the manufacturer makes no claim that the drug is effective for this use. Your local veterinarian can provide information concerning dosage and timing of Valbazen treatment.

Once *Dicrocoelium* infestation is established, it is quite difficult to control. Ant or snail control is not practical in most pasture situations. The possibility of eggs surviving freezing and the fact that rabbits may be infected complicates control. The best measures to avoid *Dicrocoelium* are keeping animals from areas known to have high fluke levels, pasture rotation and regular de-worming. When practical, keeping sheep off of pasture when the temperature is cold should decrease the number of infected ants consumed.

## Diagnosis

*Dicrocoelium* is usually identified at slaughter when adults are seen in the bile ducts of the liver. Unless severe liver changes have occurred, *Dicrocoelium* infestation does not render the carcass inedible.