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## “French Heartworm” Infection of Dogs & Foxes in Newfoundland

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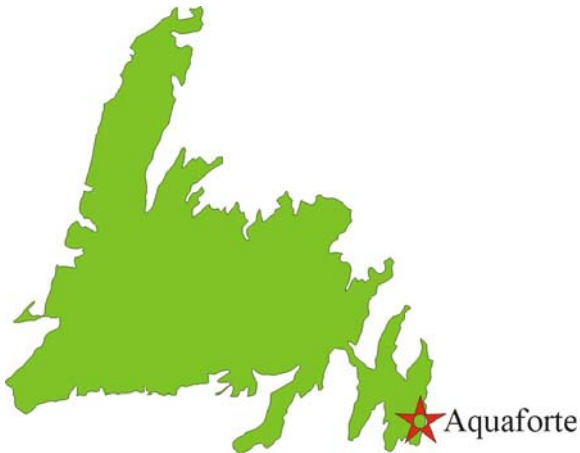


## Wildlife Diseases FACTSHEET

# “French Heartworm” Infection of Dogs & Foxes in Newfoundland

### Introduction

**French Heartworm** is the common name for a parasitic disease affecting foxes, dogs, and other members of the dog family. Caused by the nematode (worm) *Angiostrongylus vasorum*, this disease was first thought to exist in France in the mid 1800's. It is now considered to exist generally in Europe but has not been reported in North America other than on the Island of Newfoundland, with the exception of infected animals imported from Europe but diagnosed in North America. The first case recorded in Newfoundland was in Aquaforte (Avalon Peninsula) in 1973.

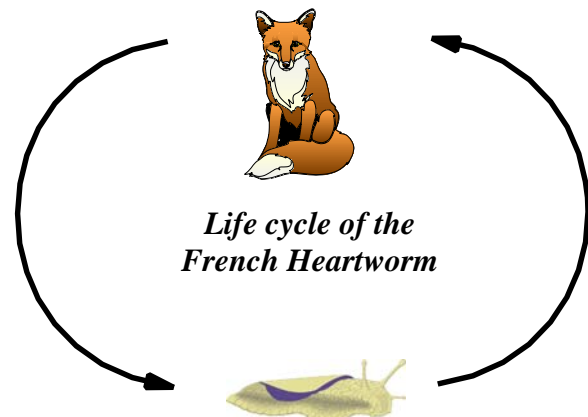


First recorded case of *A. vasorum*

When and how it might have come over from Europe is unknown; however, red foxes could easily have been imported to the Island of Newfoundland for hunting purposes numerous times over the last hundreds of years giving many opportunities to mix with local wild foxes. As well, the disease could have come in through infected dogs, snails, or slugs. Why this would not also have happened at other sites on the eastern coast of North America as well is unknown.

### Life Cycle

The worm goes through different stages of development from an egg through a number of larvae and finally to the adult form. To complete this life cycle, the worm must live in two different animals or hosts. One host is the fox (or dog), and the second is a slug (or snail). These hosts are called either the final host, if they contain the adult or egg-laying part of the worm's cycle, or the intermediate host, if they contain the immature (larval) stages of the worm.



The example will be used of the fox as final host and the slug as intermediate host remembering that this could also include dogs and snails. To become infected, the fox eats a slug. The worm is released from the slug during the digestion process and penetrates the wall of the fox's stomach or intestine. From there, they migrate to the right side (ventricle) of the heart, arriving within approximately 10 days. In the heart (and associated large blood vessels), the worm becomes an adult and the female starts to shed eggs. The blood vessels transport these eggs to the lungs where they hatch. The fox coughs up the hatched immature larvae which are then swallowed

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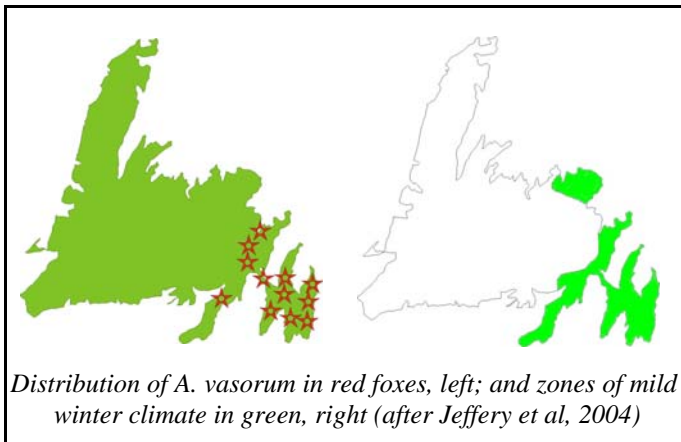
and pass through the intestines and out of the body through the feces.

Once into the environment, the contaminated feces are fed on by other snails, which then become infected. The parasite develops within the snail and is now ready to infect another fox.

The occurrence of the disease would depend upon the level of the disease in foxes, the fox population in the area, the level of the disease in slugs/snails, and of course the numbers of slugs/snails in the area. Factors contributing to an increase in one of these would increase the ability for the disease to spread. As slugs/snails do well where there are mild winters and high air humidity, many parts of this province could support large populations of these animals.

Recent research has shown the distribution of this parasite on the Island of Newfoundland.

It is suggested that the final distribution of the parasite on the island may be limited by climate. Those areas, shown in the map, where winter temperatures generally stay above  $-4^{\circ}\text{C}$  may be the most hospitable to this parasite.



## The Disease

In affected dogs, disease will depend upon the severity of the infection and the dog's own ability to defend itself against infection (such as breed variation, age, other existing disease conditions). Signs of illness are usually chronic, often seen months or years after infection by such general problems as decreasing tolerance to exercise, laboured breathing, coughing, loss of appetite, and weight loss. More rapid changes can occur if worms directly or indirectly go to other parts of the body including the kidneys and brain.

In infected areas, dogs kept together (such as in kennels, or packs of hunting dogs) have a greater chance of spreading the disease amongst themselves.

## Prevention and Control

Other than the precautionary measures generally used for sanitary purposes (regularly washing out kennels, control of slugs and snails), or the avoidance of potentially affected wild areas, there is no specific preventative measure for this disease. Dogs that are dewormed on a regular basis would have some protection against this disease if the dewormer used had activity against this parasite. Foxes kept on farms would not be at risk from the disease unless they came into the farm infected or were kept where infected slugs and snails could live.

Dogs can be examined for this disease quite easily through the laboratory analysis of fresh feces. Though a single sample with no evidence of worms does not guarantee freedom from infection (as the worms are not shed on a continual basis), a series of tests will be able to indicate whether the animal is infected or not. Treatment is possible, however, care is taken to assure that the killing of the parasite does not cause further problems as they are cleared out of the body.

Questions on this and other diseases of dogs can be addressed to your local veterinary clinic. Questions on diseases of foxes and other wildlife can be addressed to the Animal Health Division or the Wildlife Division (Department of Environment and Conservation).

## References:

1. Helminths of some mammals from Newfoundland. F.R. Smith & W. Threlfall. *Am. Midl. Nat.* 90: 215-218 (1973).
2. *Angiostrongylus vasorum* and *Crenosoma vulpis* in red foxes (*Vulpes vulpes*) in Newfoundland, Canada. R.A. Jeffery et al. *Can. J. Zool.* 82: 66-74 (2004).

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