



Common name

tularaemia,
hare plague
Ohara's disease
rabbit fever

Scientific name

a bacterium,
Francisella tularensis

What's Bugging Wild Critters?

Fact sheet #35:
Tularaemia

Significance

Tularaemia is widespread throughout the world in a broad range of wildlife. Within local wildlife populations, it can cause sickness and death in various species, and can pose a health risk to humans.

What? Where? How?

Originally isolated from ground squirrels in California, the bacterium is now known to occur widely in North America, Europe, and Asia. It has extremely broad habitat requirements and can survive in over 180 species of mammals, 20 species of birds, a few amphibians, and over 80 species of invertebrates.

There are two recognized subspecies of *Francisella tularensis*, one found mainly in North America and the other found in Europe, Asia, and North America.

Infections often result in tiny white spots (focal necrosis) in the liver or spleen. These are areas where local cells died and thus no longer have blood in the tissues. Other bacteria can cause the same tiny white spots; therefore, the lesion does not specifically indicate tularemia. Nevertheless, any beaver, muskrat, rabbit or hare with focal necrosis in the liver or spleen should be suspected of having *F. tularensis*.

Tularaemia in Alberta

Transmission Cycle

Bacteria are passed to other individuals by direct contact (particularly through small cuts in the skin) as well as in urine, water, contaminated food, or in the bite of a blood-sucking arthropod (e.g., mosquito, deerfly, tick). The bacteria are well adapted for survival and can live as resistant spores for long periods in the environment. In North America there are two distinct life cycles. One occurs in beaver and muskrats, and is spread in water. The other occurs in rabbits and hares, and uses ticks as a means of moving between individuals.

Once inside an animal, the bacteria can multiply rapidly and spread to various organs and lymph nodes. Often they collect in the liver and spleen where they are filtered from the blood and cause local cell damage.

Distribution in Alberta

The bacteria undoubtedly occur in many waterbodies throughout the province. Early records of outbreaks in Alberta date back to the 1940s and 50s.

Recently, outbreaks of disease most often occur in beaver and muskrat. We see recurrent mortality in Elk Island National Park and various watersheds in central Alberta but outbreaks can be separated widely over time.

We see few, if any, cases of tularemia in snowshoe hares or jack rabbits in Alberta.

Tularaemia in Alberta

(*Francisella tularensis*)

Importance for Wildlife Management

Tularaemia rarely causes clinical signs, making it impossible to identify an infected animal when it is still alive. Generally, our first clue that tularaemia is present is when someone finds a dead beaver or muskrat. Quite often this involves carcasses in a lodge or in ponds when the ice goes out in the spring.

The disease is contagious and tends to occur in situations of high density. For example, the more beavers in an area, the more habitat in which the bacteria can reproduce, and the more opportunity for the bacteria to be passed on to others. As beavers die and the population density decreases, the bacterium is less able to maintain a population and mortality decreases. Thus, it can act to reduce the number of beaver and help return the system to its natural balance. A similar situation can occur in hares and rabbits, but this is more common in eastern North America.

Epizootics (rapid, widespread outbreaks) can decimate local beaver and muskrat populations within river systems. In the past, wildlife managers introduced beaver to re-colonize an area. In extreme situations, trapper harvest quotas were



reduced following major outbreaks. However current populations are self-sustaining. And more often, mortality of beaver or muskrat is limited to a few lodges or ponds and the dead individuals are quickly replaced in the population.

Public Significance

There are few documented human cases of tularaemia in Alberta. This may reflect a low risk of exposure as well as the mild symptoms in most infected people. Human infections generally involve mild flu-like symptoms, in conjunction with swollen regional lymph nodes, particularly those in the armpits. This suggests that the bacteria enter small cuts on the hands and then move up the arms. The infection tends to run its course in less than a week and may be passed off as "flu". In a few people, the disease may become more serious; however, this is indeed rare even among people who handle beavers on a regular basis.

Although very few human cases have been reported in Alberta, people who regularly handle wildlife should be aware of the clinical signs. Prompt treatment by a physician is recommended if clinical signs consistent with possible infection occur. Be sure to tell the physician if you handled wildlife.



Tularaemia in Alberta

(*Francisella tularensis*)

Prevention/Control

In most ecosystems, tularaemia cannot be controlled. As a basic precaution, trappers and rabbit hunters should wear gloves when handling carcasses, particularly if the body cavity is opened. If you see lots of little white spots inside the animal and you don't have gloves on, wash your hands and clean the work area with mild bleach. Put gloves on before handling the carcass again!

The disease in humans is controlled readily with appropriate antibiotics early in the infection. Trappers and hunters who have chills, sweats, nausea, headaches, high temperature, vomiting and body pain should alert their physician to the fact that they handle potentially-infected wildlife.



Summary

Bacteria that cause tularaemia occur naturally throughout the world. Although the overall impact on wild populations in Alberta is minimal, localized outbreaks of mortality in beaves and muskrats is not uncommon. While infection in humans in Alberta is very rare, appropriate precautions should be taken.

Additional Information

Infectious Diseases of Wild Mammals, Third Edition. Edited by Elizabeth S. Williams and Ian K. Barker. 2001. Chapter 18 - Tularemia.

British Columbia Wildlife: http://www.env.gov.bc.ca/wld/documents/wldhealth/tularem_fs.pdf

Michigan Dept NATural Resources: http://www.michigan.gov/dnr/0,4570,7-153-10370_12150_12220-27293--,00.html

Public Health Agency of Canada: <http://www.phac-aspc.gc.ca/tularemia/tul-qa-eng.php>