

Bovine tuberculosis

(*Mycobacterium bovis*)

in Alberta

MJ Pybus Fish & Wildlife Alberta SRD



Common name

bovine tuberculosis,
bovine TB,
mycobacteriosis

Scientific name

a bacterium,
Mycobacterium bovis

What's Bugging Wild Critters?

Fact sheet #2:
Bovine tuberculosis

Significance

Bovine tuberculosis is a federal reportable disease with serious implications for agricultural economics and human health. Infection can occur in some wildlife species, primarily as spillover from infected cattle. However, under specific conditions, the bacterium can maintain a population in wildlife alone.

What? Where? How?

Species of *Mycobacterium* occur worldwide in a variety of wild and domestic species. Bovine TB is a federal reportable disease in Canada and, as such, the federal agriculture department is committed to eradication of TB in domestic livestock and captive wildlife. Sporadic cases continue to occur in cattle, farmed bison, and farmed cervids, and are dealt with by a "scorched earth" program of depopulation and compensation to the owner. In North America, bovine TB also persists in free-ranging bison in Wood Buffalo National Park (WBNP), free-ranging white-tailed deer in parts of Michigan, and free-ranging elk in and around Riding Mountain National Park.

The bacteria generally are associated with accumulations of thick yellow pus, either in the lungs or lymph nodes. In the lungs, this may cause difficult breathing, coughing, and runny discharge from the nose or mouth. Internally, small round tubercles ("pearls") may be found in the lungs, liver, kidneys, or lymph nodes, or on the lining of the ribcage.

Transmission Cycle

The optimal habitat for TB bacteria is in the lungs of a mammal. Additional habitat is provided in the gut and lymph tissues. The specific site used by the bacteria in each individual depends on how the bacteria enter the body. If they are inhaled, chances are the bacteria will enter the lungs. If they are ingested, the bacteria usually enter the lymph nodes either at the back of the throat or along the intestine. Regardless of how they get in, the bacteria are detected and engulfed by cells of the immune system (macrophages). However, TB bacteria have evolved means of survival within the macrophages and use them as a perfect place to reproduce. As the population expands, more and more bacteria are shed in the exhaled breath or in faeces. Outside the mammal, the bacteria survive best when environmental conditions are cold and damp; but are killed relatively quickly by direct sunlight and dry conditions.

Distribution in Alberta

Bovine TB was first identified in bison in northern Alberta (WBNP) in 1959 or 1960. The bacterium undoubtedly entered the northern ecosystem in plains bison shipped from central Alberta in the 1920s. Recent data indicate an infection rate of 51% of the remaining bison in the park. In the early 1990s, bovine TB was identified in farmed elk in Alberta. The federal "scorched earth" program was implemented immediately and the last case detected in farmed elk was in 1993. In the summer of 2001, bovine TB was identified in a farmed herd of bison in central Alberta; however, infection was limited to a single individual recently imported from eastern Canada. The

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Pub.No:
I/155
ISSN:
1710-4327
ISBN Print:
0-7785-3549-5
ISBN Online:
0-7785-3550-9

province is TB-free in the domestic cattle herd. Except for a few cases within WBNP, bovine TB has never been found in free-ranging elk, moose, or deer in Alberta.

who handle and consume bison killed in areas adjacent to WBNP.

Importance for Wildlife Management

The presence of infected bison in northeastern Alberta is considered a growing risk for wild wood bison in the Northwest Territories and northwestern Alberta. As such, programs for the conservation of wood bison are severely affected. It makes no sense to put time, dollars and endangered wood bison into a program that simply provides additional habitat for bovine TB. In addition, there is concern for spread of the bacterium to an increasing population of farmed bison and cattle in the Peace River/Fort Vermilion area, and subsequent implications for the bacterium entering the domestic cattle and bison populations. If such transmission occurred it would jeopardize the national TB-free status and result in significant impacts on international trade in cattle and bison.

Public Significance

Although bovine TB does not readily transfer to humans, infected bison are a human health risk. The number of documented human cases in northeastern Alberta is low; however, there is risk to First Nations people and other hunters

Prevention/Control

Current control options are extremely limited. Around the world, where bovine TB exists in wildlife species, there are two basic options: live with the disease and the associated agricultural and human health risks or eradicate it. There are no suitable or effective medications/vaccinations available for wildlife. In addition, the logistics of treating free-ranging wildlife are prohibitive. Thus, eradication programs are faced with the reality of using depopulation (killing of infected and potentially infected animals) as the only practical and effective means of limiting the bacterial populations.

The best prevention/control of human infections is to arm yourself with appropriate information. If you hunt bison in northeastern Alberta, learn what the disease looks like. Wear plastic gloves and stay upwind when handling potentially infected wildlife. Wash your hands, knives, and clothes in warm soapy water. Contact a Fish and Wildlife office if you have concerns about a specific bison. Cook the meat well. Freezing, smoking, or drying will not necessarily kill the bacteria. Contact a physician if you suspect you may have been infected. Effective treatment in humans is readily available.



Summary

Bovine tuberculosis remains a significant concern for hunters, wildlife managers, farmers, agricultural managers, public health officials, and First Nations people within Alberta. In many cases, the concern is modified by the knowledge that adequate surveillance is in place to assure us that bovine TB is not present in farmed and wild populations other than the bison in the north. A federal-provincial multi-stakeholder discussion is necessary to resolve the problems in northern bison.

Additional Information

Infectious Diseases of Wild Mammals, Third Edition. Edited by Elizabeth S. Williams and Ian K. Barker. 2001. Chapter 21 - Mycobacterial diseases.

Alberta Agriculture, Food & Rural Development: <http://www1.agric.gov.ab.ca/app21/rtw/selcat.jsp>

Canadian Food Inspection Agency: <http://www.inspection.gc.ca/english/anima/heasan/disemala/tuber/tbwtbse.shtml>

University of Northern BC: http://www.unbc.ca/nlui/wildlife_diseases_bc/tuberculosis.htm

Northwest Territories RWED: <http://www.nwtwildlife.rwed.gov.nt.ca/Publications/diseasepamphletweb/tuberculosis.htm>

For more information on wildlife diseases in Alberta: <http://www3.gov.ab.ca/srd/fw/diseases/Index.html>