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Leishmaniasis

in Montana Bears

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What is Trichinosis?

Trichinosis is a parasitic disease of humans and other mammals which results from ingestion of larvae of the muscleworm (*Trichinella spp.*) in infected animal tissue. The nematode responsible for this infection was first discovered in the muscles of a human patient in 1835. The mode of infection was studied extensively during the latter part of the 19th century and was found to consist of a unique life cycle in which all stages of the parasite occur in a single host.

How is Trichinosis acquired?

Trichinosis in wild animals has been studied extensively; at least 22 species of carnivorous mammals and a few predatory birds have been implicated in the transmission of the infection in North America. Predation and scavenging are thought to be the two principal mechanisms by which the infection is acquired. Carcasses of infected carnivores are the major source of exposure for wildlife and humans. In Montana, bears are implicated as the greatest potential source of infection since many are consumed by hunters each year. More than 10 % of human trichinosis cases in the United States are traced to infected bear meat.

How prevalent is Trichinosis in Montana Bears?

Extensive testing of black and grizzly bears during cooperative studies by MSU and MDFWP has been conducted during the past 30 years. Over 500 black bears and 300 grizzly bears were tested. Sixty-four percent of the grizzly bears and 15 percent of the black bears have tested positive for trichinosis. The older a bear is the more likely that it will have been infected. Most bears over 15 years of age are infected.

photos by W.J. McRae

There is also a gradient of prevalence in Montana bears with high infection rates in the northwest and lower infection rates in the southcentral portions. Counties with high prevalence include Flathead, Lincoln and Sanders counties in northwestern Montana.

BEAR INFECTION RATES in Montana

Adult worms in the intestine during the early stages of the disease produce symptoms resembling food poisoning, i.e., severe diarrhea. As larvae enter the circulation and migrate through skeletal muscles and other tissues, elevated body temperature, toxemia, focal hemorrhages and eosinophilia become evident. Ten to 30 days after exposure severe muscle pain, stiffness of the neck, swelling around the eyes and inflammation occur. There is currently no effective treatment for the intramuscular stage of the disease. In bears, a response similar to larval migration in the tissues occurs, but acute disease has not been observed in experimentally infected animals.

What are the symptoms for Trichinosis in humans?

LIFE CYCLE of *TRICHINELLA SPIRALIS*

INFECTED BY
IMPROPERLY
COOKED MEAT

develop to
adult worms

ADULTS IN
SMALL INTESTINE

Female deposits
larvae in tissues of
intestine...

When infected muscle
is eaten, larvae excyst
in intestine and...

LARVAE carried by
blood to skeletal
muscle...

INFECTED
MEAT

and
encyst...

Eradication of *Trichinella* in wildlife is unlikely because scavenging and predation are the principal mechanisms of transmission. For bears these are natural and essential feeding strategies. Many other carnivores including mountain lion, wolverine, pine marten, lynx, bobcat, fisher, otter, coyote, weasel, badger, and fox also act as a reservoir for *Trichinella* larvae.

Can *Trichinella* be
controlled in Bears?

What can I do to prevent getting Trichinosis?

If you hunt and eat bear meat some simple precautions will prevent infection. Thorough cooking of the meat at temperatures exceeding 165° F. will kill the larvae. However, freezing will not kill the organism. Curing by itself will also not kill larvae but curing along with smoking seems to kill the parasite.

Meat samples from hunter killed bears can be tested at the MSU Veterinary Molecular Biology Laboratory. Samples can be submitted for free testing through MDFWP offices and personnel or can be mailed to:

D. E. WORLEY
VET. MOLECULAR BIOLOGY
MONTANA STATE UNIVERSITY
BOZEMAN, MT 59717

To submit a sample cut a 4-5 inch portion from the tongue. If tongue isn't available cut a golfball-sized piece of muscle from the head or leg. Place the sample in a plastic bag labeled with the date of kill, location of kill, sex of bear, and your address and phone number. You will be notified of the results within 2-4 days. Special mail kits for submitting samples are available at Montana Dept. of Fish, Wildlife & Parks Regional offices.