



***Echinococcus granulosus* in Idaho**

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What is *Echinococcus granulosus*?

Echinococcus granulosus is a parasitic tapeworm (cestode) that requires 2 hosts to complete its life cycle. Ungulates (deer, elk, moose, domestic sheep, and domestic cattle) are intermediate hosts for larval tapeworms which form hydatid cysts in the body cavity. Canids (dogs, wolves, coyotes, foxes) are definitive hosts where larval tapeworms mature and live in the small intestine. Definitive hosts are exposed to larval tapeworms when ingesting infected ungulates. Adult tapeworms, 3-5 mm long, produce eggs which are expelled from canids in feces. Intermediate hosts ingest the eggs while grazing, where the eggs hatch and develop into larvae.

Can humans get infected with *Echinococcus granulosus*?

Yes, it is a known zoonotic disease of humans with a worldwide distribution. Humans can be infected by ingesting eggs from canid feces, usually from a domestic dog. The hydatid cyst is not infectious to humans. There are several treatments for the disease in humans.

In humans, hydatid cysts usually develop in the liver or lungs. Symptoms depend on cyst location and size. The disease is readily treated with drugs or surgery. In Idaho, at least three reports of human infections with *E. granulosus* are known; the earliest dating back to 1938. Throughout the world, most human cases occur in indigenous people with close contact with infected dogs.

Where the parasite is found in wolves and wild ungulates, most wildlife management and public health agencies acknowledge the presence of the parasite, but consider the public health significance to be low. Appropriate use of gloves when handling dog or wolf feces and when skinning and field dressing wolves, coyotes and foxes is recommended by human health and wildlife agencies.

How do I prevent getting infected with this parasite if I am a hunter, trapper or outdoor enthusiast?

The potential for human exposure to *E. granulosus* eggs in wolf feces or fecal contaminated hides is relatively low. Wolf hunters are encouraged to wear latex or rubber gloves when field dressing and skinning wolves in line with the recommendations for handling carcasses of other wildlife as outlined in the IDFG Game Care Brochure (2002). Additionally, wild game meat should always be cooked thoroughly.

Regular deworming of domestic dogs and good hygienic practices (wearing rubber or latex gloves when handling feces and washing hands after handling feces) by humans in contact with dogs and dog feces are the best methods of control and prevention of the tapeworm in humans.

Do not feed uncooked meat or organs of deer, elk, moose or sheep to dogs.

Where is *Echinococcus granulosus* found? Is it found in Idaho?

The tapeworm has a worldwide distribution with 2 recognized "biotypes" – the 'northern' biotype that circulates between canids (wolf, dog) and wild ungulates (moose, caribou, reindeer, deer and elk) is primarily found in northern latitudes above the 45th parallel. In Idaho, above the 45th parallel corresponds with McCall north. The 'southern' biotype circulates between dogs and domestic ungulates, especially sheep. It is endemic in most sheep raising areas of the world.

Hydatid cysts were found in domestic sheep from Idaho that were sent to California for slaughter in the late 1960's and early 1970's.

In Idaho, hydatid cysts were found in a mountain goat in 2006 and in mule deer and elk in subsequent years in several areas of central Idaho. Adult tapeworms were found in 39 of 63 (62%) wolves collected in 2006-2008 from Idaho. Similar prevalence occurs in Montana. Tests for the tapeworm have not been conducted in coyotes and foxes, and the prevalence rate is unknown.

Were wolves examined and treated for *Echinococcus granulosus* before they were released in Idaho?

All wolves captured in Canada for relocation to Yellowstone National Park and central Idaho were sampled for disease (blood, feces and external parasites) and treated twice for lice (Ivermectin and pyrethrin), roundworms (Ivermectin), and tapeworms (Praziquantel).

What is the significance of *Echinococcus granulosus* to wildlife and livestock?

Normally, *Echinococcus granulosus* is not harmful to canids or felids. Heavy infections may be associated with diarrhea or poor body condition. In ungulates, the presence of large numbers of hydatid cysts can lead to respiratory difficulty. The presence of hydatid cysts in livestock at slaughter is generally not of concern, and if present, is trimmed from the edible product.

Where can I go to learn more about this parasite?

http://www.avma.org/public_health/zoonotic_risks/hunters_precautions.asp

<http://www.dpd.cdc.gov/DPDx/html/Echinococcosis.htm>

<http://emedicine.medscape.com/article/216432-overview>

http://www.wildlifeneews.alaska.gov/index.cfm?adfg=wildlife_news.view_article&articles_id=400&issue_id=66