

***Echinococcus granulosus* in wolves in Idaho**

January 13, 2010

What is *Echinococcus granulosus*?

Echinococcus granulosus is a tapeworm (cestode). It has a two host life cycle - canids (dogs, wolves, coyotes, foxes) are the definitive host for adult worms and ungulates (deer, elk, moose, domestic sheep, domestic cattle) are the intermediate host for larval worms.

How is *Echinococcus granulosus* spread?

Adult worms are small, 3-5 mm long, and live in the small intestine of canids. Adult worms lay eggs that are passed in the feces. Eggs are ingested by ungulates, hatch in the rumen and migrate to the thoracic or abdominal cavity and form sac like structures called hydatid cysts. The hydatid cysts can contain 100's of immature tapeworms. If a canid consumes a hydatid cyst, the larval tapeworms develop into adult worms in the small intestine of the canid.

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

Echinococcus granulosus has a worldwide distribution. There are two recognized biotypes of the parasite – the northern or sylvatic biotype that circulates between canids (wolf, dog) and cervids (moose, caribou, reindeer, deer and elk) and is present above 45° latitude.

The domestic biotype, comprised of at least nine different strains, circulates between dogs and domestic ungulates, especially sheep. It is endemic in most sheep raising areas of the world.

The immature form of the parasite, 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.

Hydatid cysts were found in a mountain goat in 2006 and in mule deer and elk in 2007 in central Idaho.

Adult tapeworms were found in 39 of 63 (62%) wolves collected in 2006-2008 from central Idaho. Similar prevalence is reported for wolves in Montana. The prevalence of *Echinococcus* in coyotes, foxes and domestic dogs in Idaho 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 for lice (Ivermectin and pyrethrin), roundworms (Ivermectin), and tapeworms (Praziquantel).

How is *Echinococcus granulosus* diagnosed in animals?

Fecal flotation to find the eggs. The eggs are indistinguishable from those of other similar tapeworms. In deer, elk and sheep, the hydatid cysts are variable sized, fluid filled sacs, and generally found or felt in the lungs.

Is *Echinococcus granulosus* a reportable disease in Idaho?

Echinococcus granulosus was a reportable animal disease in Idaho in 2006, but is not currently on the list of reportable diseases. The WHL notified IDFG HQ personnel and ISDA personnel when the parasite was initially found and on each subsequent diagnosis. The parasite was also reported to the Idaho Department of Health and Welfare.

Echinococcus granulosus is not a reportable human disease in Idaho.

Can humans get infected with *Echinococcus granulosus*?

Echinococcus granulosus is a well documented 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.

In humans, the parasite forms hydatid cysts, generally in the liver and lungs. The symptoms of the disease in humans depend on where the cyst is located and its size. It is readily treated with drugs or surgery. In Idaho, at least three reports of human infections with *E. granulosus* are known. All occurred prior to wolf introduction and likely originated from the domestic strain of the parasite.

Most human cases occur in indigenous people with close contact with infected dogs. Where the parasite is found in wolves and cervids, 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 most agencies including the Idaho Department of Fish and Game.

Can the parasite be treated in wolves or other animals?

Control of parasite infections in wild animals is difficult to unfeasible.

Regular deworming of dogs, especially dogs that roam or could consume parts of deer, elk or sheep is recommended.

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

The potential for human exposure to eggs of *E. granulosus* in the feces of infected wolves 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 per the IDFG Game Care Brochure (2002).

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 parasite in humans.

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