



Notes for Water Watchers

Kansas Department of Health and Environment

February, 1994 (Revised October, 1997)

What are Cryptosporidium and Giardia?

This *Notes for Water Watchers* is intended to highlight the relationship between land use activities and the resulting water quality conditions. By recognizing these relationships, nonpoint source (NPS) pollution control planners will be able to prepare more effective NPS pollution control plans and more clearly describe the benefits resulting from plan implementation.

Cryptosporidium and Giardia

Cryptosporidium and Giardia are parasites that exist in rivers and lakes. These parasites can cause intestinal illnesses.

Cryptosporidium is a parasitic protozoan having a complicated life cycle. At some stage of its life, it exists alongside the cells that line the intestines of animals and humans. While in the human or animal host, cryptosporidium produces an oocyst, which then forms a dormant protective cyst in the intestines. The cyst is a microscopic particle that can easily be carried by water. The oocyst is discharged from the host to the environment in feces. Giardia also form protective cysts that allow the parasite to survive in the environment until ingested by a host.

In May, 1993, an epidemic of intestinal illnesses occurred in the Milwaukee, Wisconsin area. This epidemic was caused by cryptosporidium and has brought nationwide attention to cryptosporidium and giardia in water supplies. Studies have shown out of 107 untreated surface water samples collected in six western states, 77 were positive for cryptosporidium oocysts.

Cryptosporidium was recently tested for and found in the Kansas River and Milford and Tuttle Creek Reservoirs by Kansas State University microbiologists.

The symptoms of cryptosporidiosis that can occur in humans include diarrhea, abdominal pain, nausea, vomiting, and low-grade fever. These symptoms can come and go, but usually last less than 30 days. However, immunodeficient patients are more susceptible to cryptosporidiosis, and problems with the immune system can cause death. These include AIDS patients, cancer patients undergoing chemotherapy, those suffering from viral illnesses such as chicken pox or measles, and malnourished children. Severe dehydration due to cryptosporidiosis can also cause death. Giardiasis symptoms include gastrointestinal disturbances, flatulence, diarrhea, and discomfort.

A properly designed, operated, and maintained drinking water treatment system is essential for the protection of water consumers from cryptosporidium and giardia infections. In addition, point and NPS pollution control measures in watersheds supplying public water supplies are also necessary to assure that cryptosporidium and giardia densities in the watershed are as low as possible. Livestock and sanitary sewage from households and business establishments using on-site treatment systems are typical NPS sources of cryptosporidium and giardia. Whenever possible, these activities should be minimized in watersheds of public drinking water supplies.

Where these sources are present, very reliable wastewater treatment systems are needed to reduce the risk of contamination of the water supply. Reliability includes proper treatment system design, as well as proper operation and maintenance. At the minimum, sanitary wastewater from households and business establishments with on-site wastewater treatment systems must be treated by a treatment system meeting either minimum local or state standards. In addition, new sources should be located so there is a buffer area between the wastewater treatment system and the water supply lake or streams flowing into the lake.

Confined livestock operations should use a properly designed, operated, and maintained runoff contaminant system. Manure should be applied to fields in a manner that will not result in direct runoff into waterways. Grazing livestock should not have direct access to the water supply lake and have limited access to water courses in the watershed.

For additional information, please contact KDHE, Bureau of Water - Nonpoint Source Section, Forbes Field, Bldg. 283, Topeka, KS 66620-0001; (785) 296-4195.



Publication costs are financed in part through EPA Section 319 Nonpoint Source Pollution Control Grant #C9007405-01-0. Printed on recycled paper.