

# Crypto Mania

By Jeff Swanson

SUPERMAN was THE “Man of Steel”, but there was one thing that brought him to his knees...Krypton! Would Crypto have had the same affect?...Cryptosporidium that is! I remember that he could eat bombs, be pelted by bullets, and consume other poisonous substances that seemed to barely faze him. As a matter of fact, he may have been the only superhuman that could not be effected by our little microbiological menace. However, we normal humans can become sick, and even die from a good dose of Cryptosporidiosis.

The main reason for bringing up the subject of Cryptosporidium has mainly to do with our new regulations – both the Long Term 1 Enhanced Surface Water Rule (LT1ESWTR) and soon to follow - the Long Term 2 Enhanced Surface Water Rule (LT2ESWTR). We have always been concerned with Giardia but now a 2-log removal / inactivation of Cryptosporidium is a requirement as well. According to an EPA fact sheet: “Existing drinking water regulations require public water systems (systems) that use surface water sources and provide filtration to achieve at least a 99 percent (2-log) removal of *Cryptosporidium*. New data on *Cryptosporidium* infectivity, occurrence, and treatment indicate that current treatment requirements are adequate for the majority of systems, but there is a subset of systems with higher vulnerability to *Cryptosporidium* where additional treatment is necessary. This vulnerable subset includes those filtered systems with the highest source water *Cryptosporidium* levels, along with unfiltered systems (systems that use surface water sources and do not provide filtration).” - Stay tuned for more on the LT2ESWTR, but for now, let’s explore the wonderful world of Cryptosporidium.

In 1993, Cryptosporidium caused over 400,000 people in Milwaukee, WI to experience intestinal illness. More than 4,000 were hospitalized and at least 50 deaths were attributed to the cryptosporidiosis outbreak. Physical removal (filtration) is critical to the control of Cryptosporidium because it is highly resistant to standard disinfection practices. Cryptosporidiosis, the infection caused by Cryptosporidium, may manifest itself as a severe infection that can last

several weeks and may cause the death of individuals with compromised immune systems. When someone is infected with Cryptosporidium, they may contract cryptosporidiosis, a disease which can cause diarrhea, stomach cramps, nausea, loss of appetite, and a mild fever. Cryptosporidium is a protozoan parasite found in humans, other mammals, birds, fish, and reptiles. In the infected animal, the parasite multiplies in the gastrointestinal tract. The animal then excretes oocysts of the parasite in its feces. These oocysts are tiny spore-like organisms 4 to 6 microns in diameter (too small to be seen without a microscope), which carry within them the infective sporozoites. It is common in the environment and widely found in surface water supplies and wastewater discharges. Cryptosporidium has become recognized as one of the most common causes of waterborne disease (drinking and recreational) in humans in the United States. An incident such as a rainstorm that flushes many oocysts into the source water or causes a sanitary sewer overflow combined with a water treatment plant upset could allow a large pulse of oocysts to move past the multiple barriers of a water treatment plant.

**How do you get Cryptosporidiosis?** You get cryptosporidiosis by swallowing oocysts, which are either present in contaminated water or in feces of infected humans or animals. Getting this illness may not be as difficult to do as it might sound. Water may look crystal clear and still be contaminated. When hiking or camping, no surface water should be considered safe or consumed without boiling or filtering. Person-to-person transfer of oocysts from feces may also occur more easily than you might think. For example, a parent may change a child’s diaper and then prepare a meal for the family. The parent may spread the oocysts to all members of the family if he/she doesn’t wash thoroughly, and this may make the family sick. Cryptosporidiosis may be a concern at day care centers because children can spread the disease to each other. A child may spread feces (by hand or by leakage out of a diaper) onto playing surfaces, toys, furniture, or food. The oocysts can survive on these surfaces and may infect other kids.

**Why haven’t I heard of Cryptosporidium?** Just like with Giardia, most people have associated Crypto. with animals. Many people in the past associated Giardia with beavers, (Gee Wally!),

because they lived in the surface waters such as creeks, rivers, and ponds. *Cryptosporidium* has probably been causing illness in people for a very long time, but physicians didn't think to look for this organism since it was thought to affect only animals. Even today, physicians do not routinely look for *Cryptosporidium*, and cryptosporidiosis may instead be incorrectly diagnosed as giardiasis or a viral infection due to the similarity of symptoms.

**What are the symptoms of the disease?** In most people, cryptosporidiosis causes diarrhea and stomach cramps. A person may also have vomiting, weakness, fever, gas and weight loss. Stools are frequently watery, slightly yellowish, and foul-smelling. Some people, however, may get this disease and exhibit not symptoms. After a person becomes infected with *Cryptosporidium*, it usually takes approximately 5 to 14 days for symptoms to develop. Symptoms may last anywhere from 2 days to 30 days, but generally last 2 weeks. Many features of cryptosporidiosis are not understood very well, for example, it is not known if you can get cryptosporidiosis more than once. Some researchers believe that once you get it, you are susceptible to getting the disease over and over again because you never completely get rid of it from your body. Other researchers think that once you get this disease that you are immune from getting it again.

#### **Who is most likely to get Cryptosporidiosis?**

- People who care for small children, such as family members, day care operators, or babysitters.
- People who have contact with farm animals—especially young farm animals, such as calves, lambs, piglets, foals, etc.
- People who drink water from unfiltered surface sources, such as lakes, rivers, and streams.
- Health care workers who may have contact with feces of infected patients.
- Foreign travelers, especially those traveling to countries with poor sanitation.

**What is the best treatment?** There is currently no effective treatment for cryptosporidiosis. Most healthy people, however, will get over the infection without medical treatment. If you think that you

have the disease, you should visit a physician since you may have other pathogens in addition to *Cryptosporidium* that are treatable. It is not uncommon to be exposed to more than one intestinal pathogen at a time because several are quite commonly found in feces and in fecally-contaminated water. Also consider that if you are infected, you could potentially infect those around you. If you are infected, drink plenty of fluids. You may wish to eat a bland diet of bananas, toast, soup broth, soda crackers, etc.

**How can you prevent the disease?** For families, day care operators, and baby sitters: Wash hands frequently, change diapers away from food preparation areas, and pay careful attention to infant and young children and their interactions and hygiene.

For backpackers, hikers, and campers: Avoid drinking surface water that has not been boiled or filtered. If just hiking for a day, it may be better to bring potable water with you. If you must drink surface water, bring it to a boil and then allow it to cool at atmospheric temperature until it reaches a drinkable temperature. This should keep the temperature elevated for a long enough time period to kill any *Cryptosporidium* oocysts in that water. (Water should be kept above 70C (158F) for at least 15 minutes.) Remember that with increased elevation, water will boil at a lower temperature. (For reference, water boils at 200F at 6,700 ft. and 187F at 14,500 ft.) Another option is to take advantage of some of the newer filtering devices on the market. Please keep in mind that *Cryptosporidium* is much larger than bacteria and viruses and the same filter that can remove *Giardia* and *Cryptosporidium* may not be removing the other microbial organisms. Also remember that iodine and chlorine will not kill *Cryptosporidium*.

For travelers: Get information from various U.S. Embassies or local health officials. Read guidebooks that will give important local information. If in doubt, boil or filter the water. In some countries, the bottled water may not be as trustworthy as thought. Check for bottles are sealed properly. Be careful in swimming pools, restaurants, and other tourists' attractions. Consider the water quality when brushing your teeth. It is also important to avoid raw produce, such as lettuce, tomatoes, apples, etc.

Now that you know a few more tidbits about Cryptosporidium, go out and enjoy! I hope that you haven't read this shortly before your next meal....or how about that nice lettuce salad that you're considering? It is green - isn't it Superman?