



guardians of drinking water quality
DRINKING WATER INSPECTORATE

***Cryptosporidium* and cryptosporidiosis**

What is it?

Cryptosporidium is a protozoan parasite that infects a wide range of animals, including humans. Infection results in a diarrhoeal disease called cryptosporidiosis which is more common in young children but it can affect anyone. Most healthy people will recover within 4 – 6 weeks. However, those with a compromised immune system or with other medical conditions may be more seriously affected and cryptosporidiosis can be fatal for those receiving chemotherapy or for AIDS patients, since there is no effective treatment.

How is it spread?

The organism is transmitted through the environment in the form of oocysts with a tough outer shell originating from the excreta of infected animals. In this form, the parasite is protected from the environment and can survive for a long time.

Two species of *Cryptosporidium*, *C.parvum* and *C.hominis*, are particularly important for human health. *C.parvum* generally occurs in farmed animals and *C.hominis* appears to be specific to humans. Both cause human cryptosporidiosis but their prevalence and distribution differs.

Transmission routes are well documented and are generally by the faecal oral route, either directly or indirectly. Direct transmission can occur through person-person (anthroponotic) and animal-person (zoonotic). Indirect transmission occurs through contact with contaminated surfaces or the ingestion of contaminated food, drinking and swimming pool water.

There have been a number of drinking water related outbreaks of cryptosporidiosis, some of which have attracted considerable media attention. These outbreaks have involved between a few dozen to thousands of cases. However more common smaller community outbreaks are usually linked to swimming pools, day care nurseries or contact with farm animals.



How is drinking water protected?

Cryptosporidium poses a challenge to water treatment processes because of its small size (4-6µm) and resistance to chlorine. However, most investigations of outbreaks have shown that they happen only when some aspect of water treatment is inadequate. There is good evidence that careful design and operation of water treatment affords a very high level of protection against exposure to the parasite.

The Regulatory Position

Following a big outbreak of cryptosporidiosis in Swindon and Oxfordshire in 1989, the Government established an Expert Group on *Cryptosporidium* in Water Supplies under the chairmanship of the late Sir John Badenoch and more recently Professor Ian Bouchier. The expert group developed and published policy on reducing the risk of *Cryptosporidium* in water supplies.

In June 1999 the Government introduced regulations that required water companies to carry out risk assessments to establish where there was an ongoing risk from *Cryptosporidium* in water supplied from a treatment works. Where a risk was identified, by law, water companies had to improve treatment and monitor for the parasite on a continuous basis. However, in 2005 there were a further two large water related outbreaks of cryptosporidiosis and the learning from these resulted in the regulations being amended at the end of 2007.

Under these regulations, water companies are required to implement raw water monitoring and more comprehensive risk assessments and to design and continuously operate adequate treatment and disinfection. Failure to comply with the amended regulations has been made an offence.

Recent relevant research reports available on the DWI website

2007 DWI 70/2/199 (851)

Investigation of genetic variation within *Cryptosporidium hominis* for epidemiological purposes.

2006 DWI 70/2/201 (849)

Cryptosporidiosis: A report on the surveillance and epidemiology of *cryptosporidium* infection in England and Wales.

2005 DWI 70/2/125

Investigation of *Cryptosporidium* clinical isolates and analysis with epidemiological data.