| Title: ***Cryptosporidium* in Water Supplies** | |
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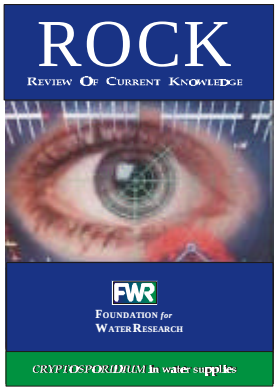
This report is the fifth in a series of FWR Reviews of Current Knowledge (**ROCKs)**. Each review focuses on a topical issue in the water environment area and provides concise, readable, scientific and technical information on the subject. They are intended to facilitate a wider understanding of the issues involved and to promote informed opinion about them.

This **ROCK** addresses *Cryptosporidium* in Water Supplies. *Cryptosporidium* is a waterborne parasite found widely distributed around the world including Europe. When ingested it can cause an unpleasant illness referred to as cryptosporidiosis. Infections are transmitted by tiny pore- or egg-like cells called oocysts. *Cryptosporidium* oocysts are small, roughly spherical in shape and about 4 to 6 ìm in diameter; a ìm is a micrometre, one millionth of a metre.




The symptoms of cryptosporidiosis are diarrhoea (circa 92% of patients), mild abdominal pain (circa 45% of patients), nausea and vomiting (circa 51% of patients), mild fever (circa 63% of patients) and fatigue. No drug has been shown to be effective against *Cryptosporidium* infection and recovery from the illness is dependent on the body's immune system. As a consequence cryptosporidiosis can be very serious in people whose immune system is weakened or less effective such as the very young, the elderly, AIDS sufferers and those on immuno-suppressant drugs.

The oocysts of *Cryptosporidium* are passed in huge quantities in the faeces of infected people and animals (which is why oocysts are found in sewage effluent and sewage sludge). When animal slurry is spread on farmland oocysts may well be present, and as a consequence runoff from rain can carry oocysts into streams, rivers, lakes and reservoirs. It has been reported that most waterborne outbreaks of cryptosporidiosis occur during and after heavy rainfall.

Cryptosporidiosis is routinely observed in the population. Since the causal agent was identified in 1976 there have been a number of outbreaks of cryptosporidiosis caused by poor hygiene, contact with farm animals, contaminated drinking water and contaminated swimming pools. *Cryptosporidium* is resistant to the normal methods used to disinfect drinking water such as chemical dosing with chlorine, chloramines, chlorine dioxide and/or ozone. Fortunately a well-operated water treatment plant using conventional coagulation and filtration can reduce oocysts by as much as 99% or even 99.8%. However, sudden changes in flow rates dislodge some of the solids retained within the filters, including oocysts so the careful operation of the filters is of great importance. This fact is recognised in the UK by the adoption of treatment regulations, which stipulate that there should be less than 1 oocyst in 10 litres with a sample flow-rate of at least 40

litres per hour taken over a day. The **ROCK** explains that this regulation is not a health standard but an operational standard to ensure that the processes for physical removal of particles (including oocysts) are working efficiently at the supplier's treatment works.

Although *Cryptosporidium* is frequently waterborne in natural waters and infections have occurred from drinking contaminated water supplies most outbreaks of cryptosporidiosis in the UK appear to be associated with swimming pools (an 'outbreak' of cryptosporidiosis or intestinal disease is defined as a level of disease above the normal background level). In the period January 1999 to December 2000 there was a total of 18 outbreaks of cryptosporidiosis of which 2 were attributed to public water supplies, 1 to a private water supply, 1 uncertain and 14 were attributed to swimming pools. The total number of people infected in these outbreaks was 667, of whom 405 were infected by the public water supply, whereas the total number of individual cases notified to the Communicable Disease Surveillance Centre for the same period in England & Wales was 10,037.

In the year 2000 the total number of reported cases of cryptosporidiosis in England & Wales was 5279 out of total population of 52.94 million of whom 51.2 million are connected to the public water supply. However, drinking the public water supply did not cause most of these cases. Therefore the risk of infection by *Cryptosporidium* in the UK is low, and the risk of infection from the drinking water supply is increasingly lower still.

The review has a bibliography and a list of 50 individual references. The total length is 26 pages (A5 size).

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