NATURAL ATTENUATION OF CRYPTOSPORIDIUM PARVUM DURING TRANSPORT IN WATERSHEDS

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Animal operations have been implicated as one of the primary sources of the human pathogen Cryptosporidium parvum (C. parvum) in streams. Agricultural operations have been increasingly forced to implement strategies to control pathogen delivery to surface waters. Requirements for best management practices (BMPs) such as buffer strips are based on the assumption that pathogens may be readily transported to downstream water supply intakes once runoff reaches a stream. Recent evidence suggests that pathogen transport in streams is mediated by interactions with suspended and bed sediments. This implies that there may be a significant in-stream attenuation of C. parvum concentrations before agriculturally-derived waters enter downstream water supply systems. In this project, we examine the in- stream attenuation and net downstream transport of viable C. parvum oocysts in surface waters. Innovative laboratory experiments will specifically examine C. parvum association with natural sediments, deposition in streambed sediments, downstream C. parvum transport, and the effect of suspended particle interactions on C. parvum viability in streams. On the basis of these experiments, tools will be developed to predict the net attenuation of viable C. parvum oocysts between upstream agricultural discharge points and downstream surface water supplies.