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# Microbial Abundance and the Pattern of Escherichia coli Antibiotic Sensitivity and Resistance in Deer Creek and the Potential Impact of a Veterinarian Hospital's Input


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# Microbial Abundance and the Pattern of *Escherichia coli* Antibiotic Sensitivity and Resistance in Deer Creek and the Potential Impact of a Veterinarian Hospital's Input

Sarah Boxer and Dr. Timothy Gsell

## Abstract

The gram-negative bacteria, *E. coli*, is an indicator of fecal input for both point and non-point source origin. The veterinarian hospital located on Deer Creek may contribute to high antibiotic levels, which are known to select for resistant strains of bacteria living in impacted waters. The water running north of the veterinarian hospital was considered potentially antibiotic influenced as it was downstream of the site. The origin of the stream and sites upstream from the hospital were considered influent water. Sediments were also collected from these sites to determine if more long term resident *E. coli* were present with elevated antibiotic resistance in stretches of the creek influenced by potential fecal input from the Veterinary Hospital. The antibiotics used in the experiment were chosen as they are specific to *E. coli* which are often associated with mammalian gut pathogens. The antibiotics; penicillin, tetracycline, gentamicin, amoxicillin, streptomycin and amoxicillin-clavulanate were tested using the Kirby Bauer method. The most extreme antibiotic sensitivity and resistance was present within water collected from the veterinarian hospital site. In water samples, the largest yield of bacteria were present at the site downstream from the hospital, indicating a potential impact on *E. coli* isolates antibiotic sensitivity/resistance patterns. Sediments from a neighborhood along the creek upstream of the Hospital contained the greatest amount of *E. coli* and other coliform bacteria. This indicated other potential sources of contamination could include homes and their septic systems in that part of the creek. Future studies will focus on these sites.