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The Effectiveness of Carbon Water Filters on Escherichia Coli and Pharmaceuticals

The purpose was to test if common methods of water filtration are effective against pharmaceuticals and members of the total coliforms groups. If common household filters are applied to waters containing pharmaceuticals and total coliforms, then the maximum water effluent (zero) according to clean water standards will be exceeded, except the pharmaceuticals, which do not have a standard. Testing the effectiveness of point-of-use water filters in removing bacterial and pharmaceutical contaminants requires several steps. To test filters against bacteria, spiked bacterial samples were created using serial dilution. Contaminated water was pumped through a faucet. 100-milliliter grab samples were collected at the end of ten seconds three times with each of the three filters. A similar process was repeated using 9.5 and 40 liters, taking grab samples at specific times. For the pharmaceutical test, a concentrated aspirin solution was tested using 7.5 liters using "Filter A." Results were compared to the controls to analyze the effectiveness of removing contaminants. The data collected did support the original hypothesis. On average, "Filter A" had approximately 3.03 E. coli per 100 milliliters. "Filter B" 71.7 and "Filter C" 20.08. "Filter A" allowed pharmaceuticals into the effluent at levels comparable to the control after 7.5 liters. The data collected lead us to believe that although these filters were overall ineffective according to the EPA/NSF standards, the amount of bacteria was reduced considerably when compared to the controls. Point-of-use filters could reduce the level of bacterial contaminants in water reducing the likelihood of getting sick.