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Manufactured Monster: Antibiotic Resistance in the Water of Colorado Springs

This project was conducted to detect tetracycline-resistant coliform (Gram-negative) bacteria throughout Colorado Springs' city water system. It's a study of the proportion of antibiotic resistant bacteria in natural and urban environments. Five samples from various points of municipal consumption and treatment, and resulting environmental effluents, were plated on selective enteric agar. Each sample was plated in multiple dilutions on both control agar, and agar containing tetracycline. Dilutions were necessary because the concentration of the bacteria in each water sample was unknown. After incubation, the resulting colonies were observed and cell numbers were calculated. These numbers were compared to determine the percentages of tetracycline resistance of the samples' coliforms. This was done using the samples' coliforms from the most reliable data in each dilution series. A higher percentage of coliforms in the samples taken from points after having been exposed to municipal populations and wastewater system was resistant to tetracycline. Environmental samples prior to exposure to the city waters showed no resistance. Samples of pre-consumption city water showed over 100% resistance to tetracycline. The reliability of this outcome, however, is in question. It can be concluded from this experiment that there is an increase in the percent of resistant Gram-negative bacteria after municipal exposure. These conclusions can demonstrate the effects of human antibiotic use on the greater environment, and the role of cities in developing antibiotic resistant organisms.