Name(s)

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Project Number

J0208

Project Title

How Poop Can Power the Planet: Microbial Fuel Cells

Abstract

Objectives

The purpose of this study was to find which less conventional, yet prevalent, organic waste fuels would produce the most electricity in a standard two chamber microbial fuel cell. It was hypothesized that out of sewer sludge, horse manure, and compost, sewer sludge would produce the most electricity in a microbial fuel cell left running for 72 hours.

Methods

This experiment involved getting sewer sludge from the Contra Costa County Sanitary District, horse manure from a local farm, and home grown compost. These were then utilized in three microbial fuel cells which were constructed by the scientist.

Results

The results were that sewer sludge produced the most electricity in the fuel cell, with a high of 282 millivolts, and horse manure produced the second highest amount, with an average of 122.7 millivolts. Compost generated no electricity.

Conclusions

It was found that sewer sludge is the best type of fuel to use as it produced the most electricity, likely because it contains a larger amount of anaerobic bacteria. Sewer sludge can be found anywhere in the world, and can help power villages in developing countries.

Summary Statement

I built three microbial fuel cells to see whether different types of prevalent, yet not typically used wastes would be an effective fuel to generate electricity.

Help Received

I constructed the fuel cells and did research on my own, but did so under the supervision of a qualified nurse, Gena Howarter, and my father.