CALIFORNIA SCIENCE & ENGINEERING FAIR
2019 PROJECT SUMMARY

Name(s)

Brianna Julio

Project Number

J1607

Project Title

Where Are the Most Antibiotic Resistant Bacteria?

Abstract

Objectives

My goal was to find out if there were more antibiotic-resistant bacteria inside the home or outside the home. I hypothesized that I would find more resistant bacteria inside the home versus outside.

Methods

I collected bacteria from three different surfaces inside and outside the home. One type of bacteria from each surface was tested with three antibiotics (kanamycin, streptomycin, and ampicillin) to determine the extent of resistance. This was done by soaking sterile disks with each antibiotic and then placing the disc on a plate that had been spread with the bacteria. After three to four days, any growth inside the zone of clearance would be scored as antibiotic resistant.

Results

I found that the most antibiotic resistant bacteria were present outside. The number of times the outside bacteria was resistant to antibiotics was eight, and the number of times the inside bacteria was resistant to antibiotics was four. From these results, I was able to answer the question whether there were more resistant bacteria inside or outside.

Conclusions

My results did not support my hypothesis, but instead suggest that there is more resistant bacteria outside than inside the home. It is possible that the bacteria outside are more diverse due to the large pool of bacteria outside. The chances of finding one resistant are therefore increased. These results show that where people are more exposed to outside environments, they need to be aware of how much resistant bacteria are present.

Summary Statement

By using three different antibiotics, I found there were more resistant bacteria outside the home than inside.

Help Received

Dr. Steve Julio, Professor of Biology at Westmont College, helped me obtain the resources and materials I needed, and helped me organize the data.