CALIFORNIA SCIENCE & ENGINEERING FAIR
2019 PROJECT SUMMARY

Name(s)

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Project Number

J1503

Project Title

Bacteria Invade Your Veggies

Abstract

Objectives

The purpose of this study is to find how many bacteria are present on a variety of fresh store-bought vegetables and mushrooms and to determine if disease causing organisms might be present.

Methods

Eight different fresh vegetables and mushrooms were purchased from the grocery store. The serial dilution method was used to determine the number of bacteria per gram of each sample. Coliform counts were used as an indicator of disease causing potential.

Results

Counts of total bacteria per gram of sample and coliform bacteria per gram of sample were done on unwashed vegetables and mushrooms. The lowest counts of bacteria were found on cauliflower (about 13000 per gram). The coliform count of the cauliflower was 2.1% of the total bacteria. The highest bacterial count was from enoki mushroom (about 2 billion per gram). The coliform count for the enoki mushrooms were 31.8% of the total bacteria. Bacteria counts for other samples tested were between these numbers.

Conclusions

There was a large range in the number of bacteria on the vegetables - from tens of thousands to billions per gram of sample. Some reasons for this big range were due to the cleanliness of the vegetables. In other cases, the higher bacteria numbers seemed to be due to greater vegetable surface area per gram. Coliforms were found on every sample tested. Coliforms are a group of bacteria that serve to indicate the presence of disease causing microbes. One encouraging result was that no E. coli were found on any vegetables tested. Some strains of E. coli have been linked to widespread illness caused by vegetables.

Summary Statement

A variety of fresh vegetables were tested and found to have large numbers of bacteria, as well as coliforms, which may indicate the presence of disease causing organisms.

Help Received

My brother helped me to understand serial dilutions and my Dad helped to use research materials safely.