

# Effectiveness of Home Cleaning Solutions on Bacteria Growth

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## Introduction

The purpose of this experiment was to test the effectiveness of various home cleaning solutions on bacteria growth. The cleaning solutions that we decided to use included: Lysol, Seventh Generation, a 1:1 vinegar water solution, and water, as the control. All of these home cleaning solutions are known for being effective in eliminating bacteria growth on various surfaces. We evaluated the effectiveness of each cleaning solution on 20 surfaces throughout the ASU polytechnic campus.

**Null Hypothesis** - There will be no significant statistical difference in the amount of bacteria grown between the four different home cleaners.

**Alternate Hypothesis** - There will be a significant statistical difference in the amount of bacteria grown between the four different home cleaners.

## Materials and Methods

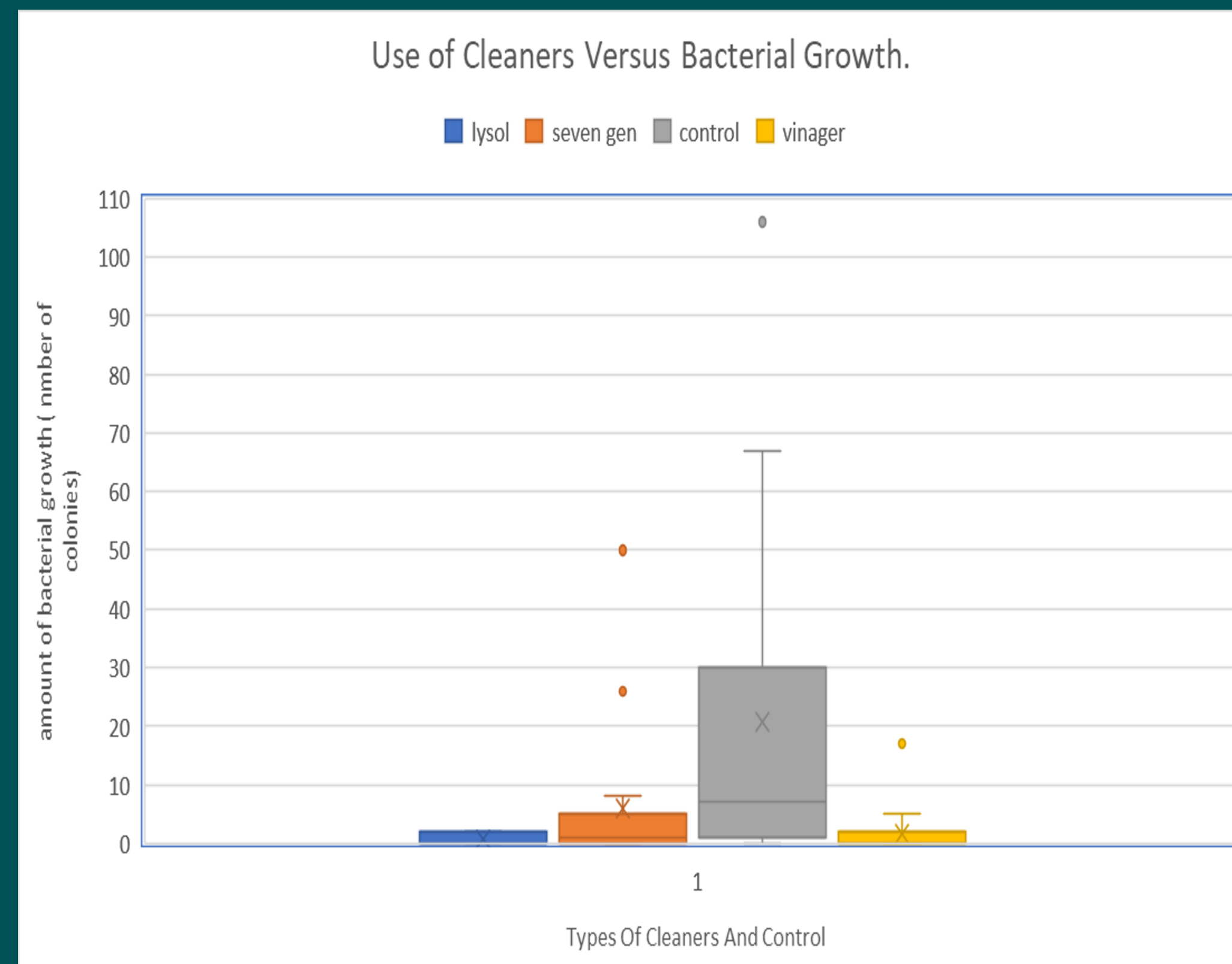
Sterile techniques were used to swab different surfaces around the ASU campus. Each surface was treated with a home disinfectant: Lysol, Seventh Generation, a 1:1 parts distilled white vinegar to water, or no treatment (to act as a control) before swabbing. The contents of the swab were transferred to a section of a nutrient agar petri dish. The plates were incubated for a week before counting the bacterial growth on each section.



Figure 1:  
Bacteria growth from the door handles at the ASU Polytechnic Santan Building



Figure 2:  
Bacteria growth from the outside tables at the ASU Polytechnic Student Union.



## Literature Cited

Maria Bautista. (2022). *Student Led Undergraduate Research Project Information*. Mesa, AZ; ASU.

## Results

T-test Values		Average	
Lysol VS Control	0.002159	control	0.684211
seven gen vs control	0.022725	seventh gen	5.894737
vinager vs control	0.003293	lysol	20.68421
lysol vs seven gen	0.036089	vinegar	1.578947
lysol vs vinager	0.170786		
seventh gen vs vinegar	0.075947		

Table 1: Table showing the average and T-test values for each treatment.

## Conclusions

The results indicate that Lysol was the most effective home disinfectant at killing bacteria growth. The T value for Lysol compared to the control was 0.0021. When all the cleaning agents were compared to the control they all presented as statistically significant (p-values were less than 0.1). The results also indicated that there was no statistically significant difference between vinegar and Lysol at killing bacteria growth (p-values were 0.170786 thus being over the limit of 0.1). There is room for more investigation when it comes to comparing Lysol and vinegar, as well as more research into the safety of home cleaning agents such as Lysol when looking at the Environmental Working Group standards. Overall the results supported the alternative hypothesis.