



CALIFORNIA STATE SCIENCE FAIR

2006 PROJECT SUMMARY

Name(s) George J. Saba	Project Number J1328
Project Title You Dropped It, Now What Do You Do? The Effectiveness of Common Cleaning Methods on the Reduction of E. coli	
Objectives/Goals Who hasn't dropped food or seen a baby lose its pacifier and wondered "Now what do I do? Is there any way to save the food or the pacifier?" Since studies have disproved the "Five-Second Rule," I wanted to test the effectiveness of the different ways people use to "clean off" dropped objects. I hypothesized that these commonly used cleaning methods would reduce bacteria on contaminated objects. Testing this hypothesis could help us decide what to do when we have dropped something and still want to consume or reuse it.	Abstract I tested two experimental objects (M&Ms and pacifiers) for the presence of E. coli (control). I chose E. coli because it is frequently found inside and outside of our homes. I dropped each experimental object on a Petri dish containing E. coli for five seconds and tested to confirm contamination (control variable). Next, I exposed each object to E. coli for five seconds. I cleaned the M&M by: blowing on it or wiping it on a tee-shirt. I cleaned the pacifier by: blowing on it; wiping it on a tee-shirt; pouring water on it; wiping it with saliva; or spraying it with antibacterial hand sanitizer (experimental variables). Then, I exposed each object to a Levine agar Petri dish for five seconds. I streaked the dish and placed it in an incubator at 37.5° C for 48 hours. Bacteria were quantified using a grid. I tested each variable five times and repeated the entire experiment for accuracy.
Results Blowing on both objects reduced 0% of the E. coli. To my surprise, wiping both objects on tee-shirts reduced bacteria by only 50%, and wiping the pacifier with saliva reduced it less than 50%. Pouring water on the pacifier reduced 25% of the E. coli. Only the antibacterial hand sanitizer reduced 100% of the bacteria.	
Conclusions/Discussion My hypothesis, that all methods tested would reduce E. coli, was only partially correct. Once food or a pacifier is dropped on the ground, we should assume it is contaminated, even if retrieved in less than five seconds. Because blowing or wiping did not reduce all of the bacteria, I recommend that we should not eat dropped food. Unless a dropped pacifier can be treated with antibacterial hand sanitizer, my data suggests that we should not put it back in a baby's mouth. In future research, I would explore combining methods, such as wiping and pouring water, to see if their effectiveness is increased.	
Summary Statement I tested five methods that people commonly use to clean off dropped objects in order to determine their effectiveness in reducing bacteria.	
Help Received My Mother supervised my experiment, and my Father helped edit my written report.	