



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Sarah Levi; Amanda Radner	Project Number J2014
Project Title How Do Different Methods of Washing Affect Bacteria on Lettuce?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Our goal was to determine how common methods of washing affect bacterial counts on organic and conventionally grown Romaine lettuce given concerns about bacteria on produce causing illness. We hypothesized that triple washed non-organic lettuce would have the most bacteria because it had been stored in a closed bag. We thought that organic lettuce washed with produce cleaner would have the least bacteria because we suspected that organic lettuce was cleaner to begin with, and we thought that produce cleaner combined with a thorough washing would kill the most bacteria.</p> <p>Methods/Materials Organic Romaine lettuce was rinsed with room temperature water for one minute. Organic Romaine lettuce was washed with room temperature water mixed with widely available commercial produce cleaner for one minute. Unwashed conventional lettuce was rinsed for one minute with room temperature water, and unwashed conventional lettuce was washed with room temperature water mixed with produce cleaner for one minute. Commercially triple washed organic and conventional lettuce was used as packaged. Five leaves of each lettuce sample were swabbed using a sterile cotton swab. The swabs were streaked on nutrient agar plates and then placed upside-down for five days in a warm, dark location (100 F, 37 C). Bacterial counts were obtained daily.</p> <p>Results Within the conventional lettuce groups lettuce washed with produce cleaner had the least bacteria and hand washed lettuce had the most bacteria at 24 hours. However, organic commercially triple washed, packaged lettuce had the least bacteria of all groups at 24 hours. Organic hand washed lettuce had the most bacteria of all groups at 24 hours.</p> <p>Conclusions/Discussion Our hypothesis was incorrect. Organic lettuce washed with produce cleaner did not have the least bacteria. Organic lettuce which is commercially triple washed receives a thorough washing prior to purchase. Likewise, commercially triple washed conventional lettuce did not have the highest bacterial counts. Lettuce that was hand washed without produce cleaner, in both groups had the most bacteria. We believe that the act of hand washing added bacteria to the lettuce, and produce cleaner is partially successful in removing bacteria.</p>	
Summary Statement Our project demonstrates that simple hand washing of lettuce leads to the highest bacterial counts, and these results are important for food safety.	
Help Received Physician parent showed us how to safely swab agar plates and count colonies. Used incubator at local hospital. Parents drove us to stores and hospital.	