



**CALIFORNIA STATE SCIENCE FAIR  
2008 PROJECT SUMMARY**

<b>Name(s)</b> <b>Erik L. Kreeger</b>	<b>Project Number</b> <b>S1410</b>
<b>Project Title</b> <b>The Leafy Truth: A Study of Farming Methods and Bacteria Levels</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The goal of the project was to determine if organic lettuce had higher levels of gram-negative bacteria than conventionally grown bacteria. The hypothesis is if the produce was grown organically, then it will have higher levels of gram negative bacteria. <b>Methods/Materials</b> Two heads of conventionally grown lettuce and two heads of organically grown lettuce were bought at the supermarket. They were cultured on 9 MacConkey agar plates, four conventional samples and five organic samples, for four days. After four days, the cultured bacteria were counted. The data was logged in a journal and graphed in Excel. The experiment was repeated using twelve organically and twelve conventionally grown spinach samples which had only been dipped in water and minimally processed and shipped up from Arizona in a cooler. <b>Results</b> For the store bought lettuce experiment, the organically grown lettuce samples had an average of 24% more gram negative bacteria than conventionally grown lettuce. For the farm direct spinach experiment, the organically grown spinach had an average of 6% more gram negative bacteria. <b>Conclusions/Discussion</b> The hypotheses were shown to be correct. Organically grown bacteria did have more gram negative bacteria than conventionally grown lettuce. One factor that may contribute to organically grown lettuce having more gram negative bacteria is because organic farms use fertilizers with feces. However, the margin between the sample averages in the second experiment (the farm direct) suggests that the difference in bacteria may not be as big as originally thought.	
<b>Summary Statement</b> The goal of my project was to determine whether organically grown lettuce had more gram negative produce than conventionally grown produce.	
<b>Help Received</b> Mr. S. Komar supplied me with the spinach from Arizona. Ms. Kiest helped me revise my project write-ups and helped me refine my project idea.	