



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

Name(s) Meghana Khurana	Project Number J2012
Project Title Milk Matters! Organic vs. Conventional Milk: Comparison of Milk Spoilage (pH) and Bacterial Growth	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals To determine if organic or conventional milk lasts longer by studying pH, color, odor and Bacterial growth for 3 weeks in refrigerator and room temperatures. I believe organic milk will last longer than conventional milk. I also think conventional milk will be more susceptible to bacterial growth than organic milk.</p> <p>Methods/Materials Two organic brands of milk, Heritage & Horizon and 2 conventional brands, Alta Dena & Albertsons, were tested. Both full fat & low fat versions were tested for each brand for a total of 8 milk types. For each milk type, I made 6 milk samples in Ziploc cups and inoculated 6 corresponding agar petri dishes from the samples. 3 sets of milk cups & petri dishes were kept in room temp. and 3 sets were kept in the refrigerator. Everyday, for 3 weeks, readings were taken for milk pH, odor, appearance (from Ziploc cups) and bacterial growth in the petri dishes. Altogether there were 48 milk samples & 48 petri dishes.</p> <p>Results At room temperature, organic milks lasted longer than conventional ones. In the refrigerator, organic and conventional milk lasted almost equally long. Horizon, Albertsons and Heritage were very comparable. Alta Dena spoiled earlier. Milk fat did not make matter. Bacterial growth: Alta Dena low fat had the most bacterial growth right away. Horizon and Heritage samples grew bacteria after a delayed period slowly, but once they started appearing, they grew rapidly. Albertsons milk showed significantly fewer colonies.</p> <p>Conclusions/Discussion 1. At higher temperatures ultra-pasteurized milk lasts longer. 2. When refrigerated, life of milk is very comparable between conventional and organic brands contrary to my hypothesis. Organic milk does not always last longer. 3. I expected all conventional milk to have more bacterial growth than organic milk. My prediction was wrong. Albertsons brand had the least growth of bacteria in the agar plates. Alta Dena had the most. Both are conventional brands making me wonder why one conventional brand had the most resistance to bacterial growth.</p>	
Summary Statement Comparison of organic and conventional milk: Study of pH, odor, appearance and bacterial growth in milk samples in refrigerator and room temperatures over 3 weeks	
Help Received Teacher provided pH Vernier equipment, mother helped with readings a little bit on some days as readings sometime took 4 to 5 hours a day, sister helped make labels	