



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2018 PROJECT SUMMARY

<b>Name(s)</b> <b>Priyanka K. Soe</b>	<b>Project Number</b> <b>J2018</b>
<b>Project Title</b> <b>Comparing Levels of Coliform Bacteria in Raw, Pasteurized, and UHT Milk Products</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> According to statistics from 2009 - 2014, the average person who drinks raw milk is 840 times more likely to contract a foodborne illness than one who drinks pasteurized milk. In my project I tested coliform levels in raw milk, pasteurized milk (heating milk to 63°C for 30 minutes), and Ultra Heat Treatment (UHT) milk (heating milk to 135°C for 1-2 seconds). I believed that the UHT milk and the pasteurized milk would contain safe levels of coliforms while the raw milk results might vary, and the raw milk might not contain safe levels of coliforms.</p> <p><b>Methods/Materials</b> I performed two trials to test 10 of milk products and used a total of 33 plates. I inoculated each plate with 2 mL of milk into the Coliscan Easygel. I used Coliscan Easygel media, sterile serological pipets, an incubator at 37°C, safety goggles, a metric (mm) ruler, a colony counter, Parafilm, a magnifying glass, disposable gloves, and a lab coat.</p> <p><b>Results</b> I tested one brand of raw milk twice, two types of raw kefir (whole and skim), four brands of pasteurized milk, and three brands of UHT milk. In my first trial, I found an average of 16 coliform colonies in the raw milk, but in my second trial, the test plates for raw milk contained coliform colonies too numerous to count. I also found E. coli colonies in the raw milk during my second trial. For the raw kefir, I was unable to count the exact number of colonies because the plate contained lawns of coliforms. I also documented E. coli in the raw kefir plates, and in the skim raw kefir plates. All the plates inoculated with either pasteurized milk or UHT milk were completely sterile.</p> <p><b>Conclusions/Discussion</b> I thought I might encounter bacteria in the pasteurized and UHT milk products, but these milk products were completely sterile. The raw kefir contained many colonies, which was expected, since it contains beneficial bacteria, but some E. coli was also found, which surprised me. My hypothesis, stating that the raw milk results would vary most, was supported. I found several coliform colonies during my first test of raw milk, but the number still met California state regulations. However, during my second test of raw milk, I found numerous coliform colonies in the raw milk products as well as some E. coli colonies. This supports my hypothesis that the raw milk would not meet the California state standards for raw milk. 2321 characters</p>	
<b>Summary Statement</b> I compared numbers of coliform colonies in various milk products while checking to see if the raw milk passed California state standards.	
<b>Help Received</b> I would like to thank my mother for driving me to various grocery stores to purchase the milk products for my project. Thanks to my science teacher for her guidance, supervision, safety, and providing materials and equipment. I preformed all my procedures and analyzed the results by myself.	