



# CALIFORNIA STATE SCIENCE FAIR 2014 PROJECT SUMMARY

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| <b>Name(s)</b><br><b>Charles M. Pasternak</b>  | <b>Project Number</b><br><b>J1514</b> |
| <b>Project Title</b><br><b>The Dirty Secret about Grocery Store Misters</b>  |                                       |
| <p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b><br/>Multi-state outbreaks of E. coli have been reported over the past few years due to consuming raw or unwashed vegetables. The objective of this study was to determine if the water from grocery store misters could possibly be a contributing factor in contaminating our vegetables with E. coli and other total coliform bacteria. I will compare the test results from the grocery store water misters to raw water from Lake Cachuma in Santa Barbara before it is treated at Cater Treatment Plant.</p> <p><b>Methods/Materials</b><br/>The IDEXX Quanti-Tray/2000 and Colilert-18 system was used to detect 1 to 2,419 colony forming units of E. coli and total coliform per 100 mL samples of water from 9 grocery store misters. The controls were Santa Barbara City tap water, positive E. coli and negative pseudomonas. After an 18-hour incubation period, MPN determination is made by counting the Quanti-Tray's 49 large and 48 small wells that have turned yellow for total coliform and then the result is taken from the Quanti-Tray/2000 MPN Table. The yellow wells that fluoresce under UV light are positive for E. coli.</p> <p><b>Results</b><br/>The results of the current study suggest, after testing nine grocery stores, four of the stores' misters tested positive for total coliform. The Most Probable Number of coliform was Market A at 2419.2, Market C at 214.2, Market D at 307.6 and Market J 21.1. None of the water samples contained E. coli. The raw untreated water from Lake Cachuma had significantly less coliform at 30 MPN and tested positive for E. coli at 4 MPN.</p> <p><b>Conclusions/Discussion</b><br/>Testing the water from grocery store misters supported the objective of discovering a high rate of total coliform in four out of the nine stores' water misters. This may have been attributed to improper cleaning of supply lines, contamination of hands or sneezing on the misters. Raising public awareness that grocery store misters may be an attributing factor to bacteria on our food is of concern. Ongoing future studies is suggested.</p> |                                       |
| <b>Summary Statement</b><br>I tested water from grocery store misters to determine if our raw vegetables are being contaminated with total coliform and E. coli  |                                       |
| <b>Help Received</b><br>Gaylen Fair, Laboratory Analyst from City of Santa Barbara Public Works Department and mother provided transportation  |                                       |