



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

Name(s) Karel Hage; Timothy N. Tran	Project Number J1311
Project Title Isolation of Staphylococcus aureus from Raw and Pasteurized Milk	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Our objective was to determine if Staphylococcus aureus (<i>S. aureus</i>) could be isolated from raw and pasteurized milk. Our hypothesis was that the raw milk would contain Staphylococcus aureus whereas the pasteurized milk would not.</p> <p>Methods/Materials : First primary isolation of all milk samples was performed by inoculating thioglycolate broth with 1 ml of milk (raw or Pasteurized) and incubated. Next, secondary isolation was performed by inoculating mannitol salt agar (MSA) and columbia colistin-nalidixic acid agar (CAN) with inoculum from thioglycolate broth and incubate. Finally, tertiary isolation was performed by inoculating 5% Sheep blood agar (SBA) with suspected colony from MSA or CAN and incubated. All samples were incubated at 37 deg. C for 24 hours aerobically.</p> <p>We then Gram-stained to determine whether the subcultured bacteria were Gram-positive or Gram-negative. Gram-positive cocci bacteria were found in the raw milk samples. Slide coagulase, Tube coagulase, and latex agglutination (BBL# Staphyloslide# Latex Test) tests were used to determine if the organism was <i>S. aureus</i>. API staph test strip was run to confirm these tests. Gram-positive rods were found in the pasteurized milk samples. API 50 CH test with API 50 CHB medium was used to identify the organism.</p> <p>Results</p> <ul style="list-style-type: none">· All brands of raw milk tested contained <i>S. aureus</i>. The <i>S. aureus</i> colonies were found to be resistant to penicillin, and one brand, Claravale Farms, was resistant to ampicillin.· No <i>S. aureus</i> was found in the pasteurized milk samples.· The pasteurized milk samples that were tested contained two different <i>Bacillus</i> species: <i>Bacillus subtilis</i> and <i>Bacillus licheniformis</i> which are environmental microbes. <p>Conclusions/Discussion Through our research, we concluded that pasteurization of milk does not make it totally free from bacteria as both raw and pasteurized milk contained bacteria. Raw milk contained <i>S. aureus</i>, which causes food born illnesses.</p>	
Summary Statement This study was carried out to investigate whether different brands of raw and pasteurized milk contained Staphylococcus aureus bacteria that are harmful to humans.	
Help Received Used lab and equipment at SJSU under supervision of Dr. Bill Murray, Professor of Biology at San Jose State University; Mentoring by SJSU undergraduates Miss Daphne Fong, Miss Vasu Rangaswamy, Miss Kathy Tran; Mynra Hage for backboard help.	