



California Science Center
CALIFORNIA STATE SCIENCE FAIR
2001 PROJECT SUMMARY

Your Name (List all student names if multiple authors.) <p style="text-align: center;">Cara L. Beasley</p>	Science Fair Use Only <h1 style="margin: 0;">S1201</h1>
Project Title (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9) <p style="text-align: center;">The Isolation and Identification of Pathogenic Bacteria from Samples of Orange Juice.</p>	Division _ Junior (6-8) <u>X</u> Senior (9-12)
Preferred Category (See page 5 for descriptions.) <p style="text-align: center;">12 - Microbiology</p>	
Abstract (Include Objective, Methods, Results, Conclusion. See samples on page 14.) <p style="text-align: center;">Use no attachments. Only text inside these boxes will be used for category assignment or given to your judges.</p> <p>Objective: The objective of this project was to isolate and identify pathogenic bacteria from samples of orange juice, and then compare the number and type of pathogenic bacteria found in the different samples.</p> <p>Materials and Methods: Orange juice samples were collected from stores and consisted of a variety of brands. Some of the juices were pasteurized, some were unpasteurized, and some were from concentrates. Each sample was then plated out on nutrient agar in order to determine whether the sample contained any bacteria. If bacteria grew on the nutrient agar, the sample was then plated out on a more selective media. This process was continued until the bacteria were identified. Gram staining was also used to split the bacteria into smaller groups, so that we could use less of the selective media, with more surety. Selective media and staining were the only methods available, and only provide a rough identification, a more positive identification could be obtained using a PCR machine and DNA tests.</p> <p>Results: The pasteurized samples were practically sterile, they had no growth although they were plated out repeatedly. The unpasteurized samples contained Listeria and possibly Salmonella. More pasteurized samples, unpasteurized samples, and the from concentrate samples will be plated out again before the State Science Fair, as this is an on going project and in order to see if the results are consistent.</p> <p>Discussion: Pasteurization is used in many food products in order to eliminate disease and spoilage causing bacteria, such as milk, cheese, and juices. Only pasteurization in juices is not as strictly regulated in juices as it is in milk and cheeses. It is known that unpasteurized apple juice is responsible for different instances of food poisoning outbreaks, but orange juice is not as often linked or considered the cause. Many people assume that orange juice is too acidic to carry pathogenic bacteria. I was curious and I decided to find out whether or not orange juice could contain pathogenic bacteria. Both my research and my results show that it is very possible for orange juice, especially unpasteurized, to contain pathogenic bacteria. Further research and testing is needed before something drastic, like requiring all orange juice to be pasteurized, is done, but I think that it is something that should be looked into.</p>	
Summary Statement (In one sentence, state what your project is about.) <p style="text-align: center;">The isolation and identification of pathogenic bacteria from samples of orange juice.</p>	
Help Received in Doing Project (e.g. Mother helped type report; Neighbor helped wire board; Used lab equipment at university X under the supervision of Dr. Y; Participant in NSF Young Scholars Program) See Display Regulation #8 on page 4. <p>Dr. Claudia Sellers advised the project, and allowed access to her lab and equipment; Dad help build board</p>	