



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

Name(s) Argen Youssefian	Project Number J1337
Project Title How Do Additives Affect the Growth of Microorganisms?	
Abstract Objectives/Goals The aim of this project was to determine which of the chosen additives has the greatest inhibition effect on bacterial growth. The hypothesis was that vinegar will be the most effective additive comparing with sugar, salt and oil because vinegar is 4 to 6% acetic acid and most bacteria have difficulty growing in acidic conditions. Methods/Materials 4 chicken cubes 1000ml hot water One measuring cup One large glass jar 18 glass jars with lid Salt Sugar Vinegar Vegetable oil Teaspoon Masking tape Pen Paper 18 nutrient agar plates Dissolved 2 chicken broth cubes in 500ml hot water. Divided the solution in 9 jars. Added one teaspoon of salt, vinegar, sugar and oil to the first four jars. Then added 2 teaspoon of salt, vinegar, sugar and oil to the next four jars. The 9th jar had no additive. The plates were kept at room temperature and checked daily for their appearance and smell for one week. Samples were also taken from each jar after 1st,3rd,5th and 7th day and inoculated on agar plates to count the number of bacteria present in each jar. The experiment was repeated one more time for a total of 2 repeated trials. Results It was found that every additive used in this project had some bacterial growth inhibition in comparison with the control jar, but the most effective additive was vegetable oil. It was also found that the bacterial inhibition was dose related. As the concentration of each additive was increased, the number of bacteria in	
Summary Statement Would the chosen additives inhibit the bacterial growth?	
Help Received Mother helped me with the experimental set up and the board.	