

## Intel ISEF OFFICIAL ABSTRACT and CERTIFICATION

Effect of Calcium on the Concentration of Ascorbic Acid in Orange Juice

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Introduction  
Purpose  
Hypothesis

Vitamin C has been the wonder vitamin ever since the Nobel Prize winning chemist, Luis Pauling, published, Vitamin C and the Common Cold. Doctors have recommended Vitamin C to combat nearly everything from cancer to bee stings. However, studies have shown that calcium reduces Vitamin C in the body. While grocery shopping, it was noticed that there were only a few brands of orange juice labeled "Calcium-Fortified." The question that came to mind was, "Will the addition of calcium to orange juice change the concentration of Vitamin C in the orange juice? The purpose of the study was to determine if added calcium decreases the concentrations of ascorbic acid. The hypothesis was that it would.

Method

A 10% pure ascorbic acid solution (control) and a 0.1% concentration of 2, 6 dichloroindophenol indicator were prepared. Calcium-Fortified and regular orange juice samples (liquid and frozen) were filtered to remove the pulp. The control and several brands of orange juice were tested for the presence of ascorbic acid using both the "Dropping Pipette Method" and the "Burette Method" of titration with the indicator. A reading was taken when the color of the indicator changed from blue to clear. The concentration of the ascorbic acid was then determine for each sample and trial.

Results  
Conclusion  
Application

The results rejected the hypothesis. The highest concentration of ascorbic acid was in the Tropicana Calcium-Fortified juice, while the lowest was in the regular Tropicana juice. However, a conclusion cannot be definitely stated, since pH readings indicated that the Tropicana Calcium-Fortified juice had the least acidic reading as oppose to the regular Tropicana juice. Further tests will be considered. If ascorbic acid is actually reduced with the addition of calcium, consumers need to be aware that while the supplement of calcium is beneficial, they may not be getting the amount of Vitamin C listed on the Nutritional label.

Answer  
Questions  
That Apply

- As a part of this research project, the student directly handled, manipulated, or interacted with (check ALL that apply): ☐ human subjects ☐ potentially hazardous biological agents  
☐ vertebrate animals ☐ microorganisms ☐ rDNA ☐ tissue
- Student independently performed all procedures as outlined in this abstract. ☒ Yes ☐ No
- A Regulated Research Institution was a work site for some or all of this project. ☐ Yes ☒ No
- This project is a continuation. ☐ Yes ☒ No
- My display board includes photographs/visual depictions of humans (other than myself): ☐ Yes ☒ No

*I/We hereby certify that the above statements are correct and the information provided in the Abstract is the result of one year's research.  
I/We also attest that the above properly reflects my/our own work.*

*Edward Jones*

Finalist or Team Leader Signature

1/10/07

Date

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*This embossed seal attests that this project is in compliance with all federal and state laws and regulations and that all appropriate reviews and approvals have been obtained including the final clearance by the Intel ISEF Scientific Review Committee.*

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Date AFTER Actual End Date