



**CALIFORNIA STATE SCIENCE FAIR  
2002 PROJECT SUMMARY**

<b>Name(s)</b> <b>Andrew Botts; Michael Botts</b>	<b>Project Number</b> <b>S0504</b>
<b>Project Title</b> <b>Coke Decay</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> The objective is to determine which Coca-Cola soft drink has the most damaging effects on healthy human teeth.</p> <p><b>Methods/Materials</b> Four healthy, third molars (wisdom teeth) extracted from a human mouth, ranging in size from 1.7cm X 1.0cm to 1.4cm X 0.6cm. Teeth were assigned letters, A, B, C and D to avoid confusion. Soft drinks were given letters as well, Tooth A corresponded with liquid A. The teeth were emersed in 65cc of their corresponding liquids. Everyday between January 7 and January 22 the teeth were evaluated for changes in their characteristics and the liquid was changed. Teeth never sat longer than 17 hours between changes and evaluations. At every changing of the liquid, the temprature of each liquid was taken and not allowed to vary more than five degrees. At every evaluation, any changes in the characteristics of the teeth were noted in the journal.</p> <p><b>Results</b> Tooth A immersed in Coca-Cola had the worst decay, it was stained black and had several deep fissures on its chewing surface and had malleable root chambers. Tooth C had the second worse level of decay, it suffered full loss of its enamel and its entire level of dentin was exposed. Tooth B had the third worse decay, it didn't suffer full loss of its enamel, though it was stained black and had malleable root chambers.</p> <p><b>Conclusions/Discussion</b> The Conclusion is that those soft drinks that have a high level of carbonation are the most damaging. Carbonation contains carbonic acid, the more carbonation, the more acid is present in the drink. Other teeth-damaging ingredients are sugar and caffeine, which are both present in Coca-Cola. Sprite is caffeine free but contains high amounts of sugar. Diet-Coke has no sugar but does posses caffeine.</p>	
<b>Summary Statement</b> Which Coca-Cola brand soft drink causes the most damage to helathy human teeth.	
<b>Help Received</b> Staff at Sunnymead Dental Group supplied pictures and information.	