



**CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY**

Name(s) Emmelyn S. Hsieh	Project Number S0509
Project Title Comparisons of D-Glucose and D-Fructose Levels in Consumer Products	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals This project is investigating the correlation between fructose and glucose levels and the listed carbohydrate levels in various consumer products. The experiment was constructed to measure the levels of fructose and glucose in frequently consumed products, and was aimed at discovering the true carbohydrate levels in products claiming to be "sugar free" or to withhold "zero calories". This project was ultimately designed to give the population an idea of how daily diets should be regulated and to help people realize the ways they are impacting their body and health through their eating habits.</p> <p>Methods/Materials Several samples of consumer products such as juices and energy drinks were analyzed with tandem gas chromatography-mass spectrometry (GC/MS). Assays were conducted for samples with and without prior hydrolysis treatment. Assuming that all glucose and fructose in the samples originated from sucrose and/or high fructose corn syrup, the hydrolysis reaction promoted dissociation of the disaccharides and/or oligosaccharides into the two monosaccharides of interest, allowing quantification of all available glucose and fructose in the sample. A linear standard curve was prepared and utilized to determine the quantity of glucose and fructose based on the GC/MS intensity ratio of the monosaccharide and its respective internal standard.</p> <p>Results This report presents the glucose and fructose concentration of various consumer products. When the hydrolysis step was omitted prior to analysis, the sugar levels were in the range of the listed values in the nutrition label of each product. All samples showed significantly higher fructose and glucose content when all sucrose was completely hydrolyzed prior to analysis.</p>	
Summary Statement This project is investigating the correlation between fructose and glucose levels and the listed carbohydrate levels in various consumer products using hydrolysis treatment and GC/MS analysis..	
Help Received Used lab equipment at LA Biomed under the supervision of Dr. Catherine Mao, Dr. Mary Beth Patterson, and Paulin Wahjudi.	