



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Ashley S. Ogasawara	Project Number J1925
Project Title Energy to Burn! Sugary vs. Healthy: Which Type of Cereal Oxidizes the Highest Amount of Caloric Chemical Energy?	
Abstract Objectives/Goals My project compared five sugary breakfast cereals to five healthy breakfast cereals to determine the amount of caloric chemical energy stored in each cereal. My hypothesis was that Apple Jacks cereal would oxidize the highest amount of caloric chemical energy because it has the largest amount of sugars per serving. Methods/Materials I constructed a homemade Calorimeter to capture caloric chemical energy by measuring the increase of temperature of distilled water after the heat captured in the cereal is released by the chemical reaction of oxidation. Once the raw data of milliliters of water, temperature of water in °C, and weight of cereal in grams was recorded before and after oxidation for ten trials per cereal, the calculations of energy released per cereal/per unit weight were averaged. Results Honey Nut Cheerios released the highest amount of caloric chemical energy with an average of 1,388 calories per gram. Conclusions/Discussion Sugary cereals and healthy cereals oxidized relatively similar total amounts of caloric chemical energy per gram. The data suggests that the healthy cereals in my experiment contained high amounts of processed sugars or simple carbohydrates which are easily oxidized by cells in the body. Yet, the cereal which contained the highest amount of caloric chemical energy is high in starch and glycogen, which are easily digestible forms of complex carbohydrates. Glucose is the major energy source needed by the cells in the body to maintain and perform optimal cellular functions.	
Summary Statement Many students consume cereal to sustain optimal physical and intellectual energy levels at school, but which type of cereal, sugary or healthy, supplies the cells in the body with the highest amount of caloric chemical energy to burn?	
Help Received Mother helped take photos, obtain food science/chemistry books, and purchased cereals; Father helped construct display board and purchased project materials; Dr. Andrew Olson of Stanford University advised me concerning project design; The experts at Science Buddies answered my math questions.	