



**CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY**

Name(s) John M. Shepherd	Project Number J0512
Project Title Carbohydrates vs. Fats: Which Nutrient Contains the Most Energy and Calories?	
Abstract Objectives/Goals The objective is to determine which nutrient, carbohydrates or fats, contains the most chemical energy and calories. Methods/Materials A calorimeter was constructed using a small coffee can, with the top removed and filled with water, nestled within a larger coffee can with the top and bottom removed. A rod was placed through the calorimeter to allow the small can to sit high enough to place a food item underneath it. Different small food items were weighed and then burned and the difference in temperature of the water in the small can was measured. What remained of the food item was then weighed. These steps were repeated three times for three different types of food items (marshmallows, almonds, and Chex cereal). Results The heat captured/energy stored for carbohydrates ranged from 200 calories to 780 calories (0.2 to .78 Calories), whereas the heat captured/energy stored for fats ranged from 1,000 to 2,900 calories (1.0 to 2.9 Calories). Conclusions/Discussion The results show that fats have more chemical energy stored in them than carbohydrates. More energy was released when fats were burned than when a carbohydrate was burned. Because fats are made up of fatty acids and carbohydrates are made up of glycogen, they release energy differently when burned. Carbohydrates are a quick source of energy, whereas fats are a longer lasting source of energy. I did this experiment because child obesity is at an all-time high and I wanted to understand how you find out how many Calories a food item has and what that means to your body and diet. My conclusion is also that if more kids understood how food and energy relate to your body and diet, it could help in lessening child obesity.	
Summary Statement My project is to determine which nutrient, carbohydrates or fats, contains the most chemical energy and calories by burning a food item and using a calorimeter and to see if this information might be helpful in combatting child obesity.	
Help Received My mom supervised me during the testing of this project.	