



**CALIFORNIA STATE SCIENCE FAIR  
2007 PROJECT SUMMARY**

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| <b>Name(s)</b><br><b>Kalista E. De Hart</b>   | <b>Project Number</b><br><b>J0405</b> |
| <b>Project Title</b><br><b>Are You Getting the Energy You Need?</b>   |                                       |
| <b>Abstract</b><br><b>Objectives/Goals</b><br>The objective is to determine if proteins, when compared to carbohydrates and fats, will produce the most heat energy. I believe that proteins will produce the most heat energy.<br><b>Methods/Materials</b><br>I created a calorimeter using a large coffee can, a small tin can, a pencil, a cork and needle, and a can opener. Other materials used included a beaker, distilled water, a thermometer, a calibrated gram measurement scale, safety glasses, a lighter, and three food samples from each food category. Food samples were ignited and allowed to burn, heating the water in the small tin can that was resting in the coffee can. Each sample was weighed before and after burning. Water temperatures were taken prior to and after burning food samples. After analyzing the data, I then determined the increase in water temperature in Celsius times the mass of the water, in grams, which gave me the amount of energy captured by the calorimeter in calories.<br><b>Results</b><br>Results indicated proteins stored the most chemical energy when compared with carbohydrates. Each food sample for each trial in the protein category released more heat energy than each carbohydrate sample. I was unable to burn fats as all samples I attempted to burn melted. They would not ignite and sustain a flame, thus, I could not measure a change in water temperature for those items.<br><b>Conclusions/Discussion</b><br>The results of my experiment support my hypothesis that proteins produce more heat energy than carbohydrates. As stated earlier, I could not include fats in my results. This information is important in the area of chemistry as scientists and medical researchers might explore how energy keeps the brain and body working efficiently. Also, scientists involved in medical, pharmaceutical, and nutritional research could examine how cells break down and use different types of foods in our bodies. This is important in a country where weight and food issues have become a concern. |                                       |
| <b>Summary Statement</b><br>This project's focus was to use a calorimeter to determine how much food energy is stored in different types of food by determining which food source would produce the most heat energy.   |                                       |
| <b>Help Received</b><br>Science teacher, Sharon Kilkenny, provided calibrated scale and beaker, friend, Grace Kumaishi, assisted in double checking results, mother, Kathleen De Hart, assisted with board layout and discussion of science experiment.   |                                       |