



**CALIFORNIA STATE SCIENCE FAIR  
2006 PROJECT SUMMARY**

<b>Name(s)</b> <b>Ken L.M. Lozano</b>	<b>Project Number</b> <b>S1612</b>
<b>Project Title</b> <b>Determination of Energy Content of Selected Herbs and Spices Classified According to TCD Energy Nature</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> To determine if there is a relationship between the food energy content of selected herbs and spices categorized according to the Traditional Chinese Dietotherapy (TCD) energy nature of foods.</p> <p><b>Methods/Materials</b> The materials and equipment used are as follows: Hot (green pepper and cinnamon bark), Warm (garlic and ginger), Cold (peppermint and marjoram), distilled water, double-wall calorimeter, improvised calorimeter, alcohol burner, thermometer, balance, ring stand, graduated cylinder, burette clamp, glass rod, beakers, watch glass, wash bottle, microwave, knife, chopping board, plates, paper towels, and aluminum foil boxes. The major steps are Preparation of the apparatus and food samples; Burning of the food samples; Observation of the change in water temperature and mass of food samples; Recording of results; and Computation of the energy content values of food samples. One experimental run per type of calorimeter using two different food samples per energy nature and three trials per food samples were conducted. The temperature and mass changes were recorded and were used in computing the energy content values per gram of food sample (in J/g).</p> <p><b>Results</b> The computed energy content values for all the food samples showed that energy was released from the burning food sample and absorbed by water in the calorimeter. Analysis of these computed values showed a wide numerical range for all spices and herbs tested in both the improvised and laboratory calorimeters. Furthermore, the computed numerical averages of the three trials per food sample showed that a higher energy content in the warm (garlic and ginger) and cold (marjoram and peppermint) samples were obtained in the laboratory calorimeter compared to the improvised calorimeter.</p> <p><b>Conclusions/Discussion</b> The computed energy content values per gram of selected herbs and spices showed that there is no apparent relationship between the energy content and the TCD energy nature classification of foods. The samples classified as high energy nature (hot) did not exhibit the highest computed energy content compared to the other samples classified as warm or cold. Further studies can be done to see if the energy content is more closely related to the chemical nature of food components and if the TCD energy nature is determined by the food interaction in the body of a person.</p>	
<b>Summary Statement</b> This project deals with the determination of a relationship between the energy content of selected herbs and spices and the energy nature categories of Traditional Chinese Dietotherapy (TCD).	
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