



**CALIFORNIA STATE SCIENCE FAIR  
2009 PROJECT SUMMARY**

<b>Name(s)</b> <b>Beth A. Rosenberg</b>	<b>Project Number</b> <b>J2228</b>
<b>Project Title</b> <b>Cardboard: It's Just Not for Breakfast Anymore</b>	
<b>Objectives/Goals</b> I wondered how a food's Calories compares to the Calories of its food container, such as Fritos vs. the Fritos bag. I also wondered if the Calories per serving on the foods' Nutritional Facts Label were accurate.  I hypothesize that food has more Calories than its container, and the Nutritional Facts Labels are accurate.	
<b>Abstract</b> <b>Methods/Materials</b> I built a homemade calorimeter to measure the heat released from the food and container samples when burned. The heat released was captured by a can filled with a measured amount of water located above the burning object. I weighed a small piece of the food and its container before and after I separately burned them. I also measured the water temperature before and after the burning. Using these measurements, I calculated the object's calories. I tested each item (food and containers) at least three times.	
<b>Results</b> Food vs. Container: 7 of the 8 containers tested had at least 32% more Calories than the food it contained. 5 containers had over 60% more Calories.  Accuracy of the Nutritional Facts Labels: All of the Nutritional Facts Labels listed at least 36% more Calories per serving than the food I tested.	
<b>Conclusions/Discussion</b> My hypothesis about food Calories vs. container Calories was incorrect. My calorimeter gave very consistent data results for each of the 8 food items and 8 food containers I tested. Only one food item had slightly more Calories than its container, Fiber One Cereal which is high in dietary fiber (cellulose), just like its cardboard box (this must explain why Fiber One tastes like cardboard). My research indicates that we may someday be able to convert food containers into animal feed and bio-fuel.  While my hypothesis about the Nutritional Facts Label accuracy appears incorrect, my calorimeter allowed for too much heat loss which gave me inaccurate (too low) food Calorie readings. Therefore, I believe my test results were inconclusive to either prove or disprove my hypothesis.	
<b>Summary Statement</b> I compared the Calories in food to the Calories in its food container and I tested the accuracy of the Calories per serving noted on the Nutritional Facts Labels.	
<b>Help Received</b> Dad helped me with graphs, charts, spreadsheets and making sure I didn't burn down the house. Mom helped me with the display board and proofreading everything.	