



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

Name(s) Michael P. Hartman	Project Number J1313
Project Title Which Ground Beef Has the Least Bacteria?	
Abstract Objectives/Goals The objective was to determine whether freshly-ground or pre-packaged beef has the least bacteria. My hypothesis was that freshly-ground beef has less bacteria than pre-packaged ground beef. Methods/Materials Samples of freshly-ground beef and pre-packaged beef were purchased from three different stores. One-tenth of a gram of each sample was placed in Thio broth, from which serial dilutions were made. Samples from each dilution were inoculated onto two sets of blood and McConkey agars and incubated for 24 hours. Colonies were then counted. Results Colonies were counted for each set of cultures at each dilution and the absolute number of bacteria were calculated. Freshly-ground beef had less bacteria than pre-packaged beef. Surprisingly there was one brand of pre-packaged beef that had minimal growth on all plates tested. It was later discovered that this brand was irradiated prior to shipping. Conclusions/Discussion Freshly-ground beef had less bacteria than pre-packaged beef, unless the pre-packaged beef had been irradiated. Based upon my results, the FDA should require that all ground beef be irradiated, in order to minimize the number of cases of bacteria-related foodborne illness.	
Summary Statement Freshly-ground beef has less bacteria than pre-packaged beef, unless the pre-packaged beef has been irradiated.	
Help Received Mother proofread written report. Seton Hospital Micro lab staff instructed me on dilution and inoculation techniques, with use of lab and supplies.	