



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

Name(s) Michele L. Trichler	Project Number S0524
Project Title Fuel for the Future?	
Abstract Objectives/Goals The objective of my project is to determine how efficient certain biofuels are in comparison to diesel fuel and to determine whether using new or used oil in the making of the biofuels altered their efficiency. Methods/Materials Five oils were made into biofuels by the addition of sodium methoxide. Three of the oils; canola oil, soybean oil, and olive oil were new oils and two of the oils; fryer grease and grease trap waste, were used oils. After the addition of sodium methoxide, two layers were formed in the resultant solution; glycerin and the biofuel. The biofuel, the top layer, was removed and isolated. The biofuels, as well as diesel and methanol, were then tested three times in a homemade bomb calorimeter. The heat gain was measured in the water in order to determine energy emissions. Methanol, the standard, was used to compensate in the calculations for all of the heat loss experienced in the experiment. Results The soybean biofuel and diesel had the same average energy emitted per gram per second, while canola, which emitted the second highest energy per gram per second, was a third less efficient. However, in regards to emitting the most energy per gram, the soybean biofuel was again the most efficient, which was followed closely by olive and then canola biofuel. Diesel had a very low emission rate per gram. Throughout all the tests fryer grease biofuel constantly preformed the worst, while grease trap waste did not convert to a fuel at all. Conclusions/Discussion Biofuels, if manufactured correctly have the potential to have a comparable energy output to fossil fuels.	
Summary Statement My project is comparing the efficiency of homemade biofuels in relation to diesel.	
Help Received Neighbor helped orgainze ideas and obtain used oils; Mother and Father help to time and record data; Used lab equipment at university of california under the supervision of Lauren Aubin; Mr. Bausback, my chemistry teacher, helped me in my board layout and requirements; Mother helped take pictures	