



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

Name(s) Joshua M. Zenker	Project Number S0532
Project Title From the Fryer to the Fuel Tank	
Abstract Objectives/Goals My goal was to create and test a vegetable based fuel that both performs well and burns cleanly compared to modern energy sources. Methods/Materials I produced bio-fuel from vegetable oil in order to compare its performance to other common fuels. I measured the length of burn and the output of joules for kerosene, lighter fluid, gasoline and petroleum diesel and compared their results with that of bio-fuel. I did this by burning the fuel under a constant amount of water on a ringstand apparatus, under a fume hood, then measuring the difference in the temperature with a Texas Instruments graphing calculator with a thermometer attachment. Then, putting those numbers into formulas that allow me to find the heat calculated in joules. These numbers also gave me the information necessary to determine the total burn time and other information for each fuel. Results I did discover that bio-fuel is very competitive with today's modern energy sources. Although the fuel did take a long time to get started it did eventually show that it was a competitive source of energy. All fuels, with the exception of motor oil, at least doubled the water sample's temperature. With bio-fuel there was no residue left behind after the burn. The bio-fuel burned an average 241 seconds per trial and produced 288.6 joules of heat. Diesel, gasoline, and lighter fluid left a significant amount of soot. Thicker fuels like kerosene and diesel and especially motor oil had to us the wicking effect to warm the fuel before it burned. Conclusions/Discussion I discovered that biodiesel did compete with the fuel sources that were tested. This means that a much cleaner fuel that is also efficient can be used more widely in the near future. Some of the fuels were tested in a manner that is inconsistent with how they are normally used, but I believe that my results indicate that bio-fuel burns efficiently.	
Summary Statement The purpose of my project was to create and test a vegetable based fuel and compare it with modern energy sources.	
Help Received Mother helped with arts and crafts (that gene skips a generation) Guy Row as a mento and lended his expertise in chemistry.	