



**CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY**

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Project Title
Cost Efficiency: Alternative Fuels and Their Financial Counterparts

Abstract

Objectives/Goals
The question to be answered is which common gasoline alternative fuel is the most efficient in cost and caloric content including wood, vegetable oil, animal fats, and natural gas.

Methods/Materials
Calorimeter-homemade apparatus
20 cm cubed balsa wood, 20 cm cubed redwood chips, 20 ml cane sugar, 20 ml lard oil, 20 ml soybean oil, 20 ml canola oil, 20 ml paraffin, thermometer, 9-volt, batteries, snap connectors, rubber insulated wire
Procedure:
Place fuel in central chamber of calorimeter
Place water in external chamber of calorimeter
Be sure that the central chamber is sealed off
Make sure that the battery coil is hot
Wait ten minutes for each fuel to burn
Record change in temperature
Repeat twice with each fuel

Results
Fuels Starting Temperature(Celsius) Caloric Content 1 degree/ml water Cost Amount
Canola Oil 20 degrees 88 degrees .68 \$0.11 20 ml Soybean Oil 20 degrees 75 degrees .55 \$0.12 20 ml Lard Oil 20 degrees 68 degrees .48 \$0.06 20 ml Sugar 20 degrees 48 degrees .28 \$0.16 20 grams Paraffin 20 degrees 84 degrees .64 \$0.18 20 ml Balsa wood 20 degrees 31 degrees .11 \$0.08 20 cm cubed Redwood Chips 20 degrees 42 degrees .22 \$0.13 20 cm cubed

Conclusions/Discussion
This experiment proved that animal fats and plant oils could very potentially replace gasoline and other fossil fuels as the powerhouse energy sources of the century. The most efficient oils were canola oil and soybean oil being the most efficient. This experiment showed that there are many alternative fuels that can be more environmentally friendly, safe, and much more cost efficient, while being renewable as well as plentiful. This experiment also showed that these new and used oils can be used to blend biodiesels, various mixtures of small amounts of petroleum and the plant oils to create a new fuel, burnable in car and truck engines.

Summary Statement
Testing fuels as alternatives for gas and biodiesel development

Help Received
Mother drove me to store to buy materials