CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY

Name(s)

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Project Number

34394

Project Title

Oil Options: A Sustainable Method of Reclaiming Kitchen Waste Oil and Grease

Abstract

Objectives/Goals

We created a kit that used a sustainable method of reclaiming waste oil and grease into biofuel and the byproducts into compost.

Methods/Materials

The kit includes: safety wear, oil collecting jar, filter, and the pre- measured chemicals you need for the process. Using approximately 1 liter of collected waste oil and grease, the first step is to heat and filter the oil in order to ensure a clean biodiesel. We had to try several different prototypes before we were satisfied with the effectiveness of the filter. Methoxide made from a titrated amount of sodium hydroxide and methanol is then mixed with the filtered oil and blended for about 20 minutes. Let settle for 24 hours resulting a product of biodiesel and glycerin byproduct.

Results

The kit yielded approximately 1 liter of fuel for each liter of grease or waste oil depending on the type of waste grease converted. For each biofuel trial, the fuel's output energy was tested in a calorimetry test. According to the National Institute of Standards and Technology, biodiesel (B100) has an output of 8629. cal/liter. The average calorie output of the biofuel made from waste turkey oil using this kit was just over 9,000 cal/liter. To assure that the product of the kit was completely sustainable, the glycerin byproduct was tested as a compostable substance and found that it completely broke down to make a quality compost for the garden, as seen by it#s dark color and moisture content.

Conclusions/Discussion

Our goal to be completely sustainable in reclaiming waste kitchen oil and grease was successful. With this kit, the average household can sustainably reuse waste grease and oil by creating the useable products of biofuel and compost.

Summary Statement

We created a kit that used a sustainable method of claiming waste oil and grease into biofuel and the bi products into compost

Help Received