CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY

Name(s)
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Project Number
J0501

Project Title
Biomass to Biogas

Abstract

Objectives/Goals
The purpose of this experiment is to figure out which combination of food wastes creates the most biogas. My experiment will lead to making more biogas gasoline or electricity efficiently from biomass wastes in a reusable friendly way.

Methods/Materials
Five 2L bottles are filled with different biomass combinations and labeled. The bottles were stuffed with equal amounts of materials. Bottle A with 1L of cow manure only, bottle B with 1L of cow manure and 100g of food wastes, bottle C with 1L of soil and 100g of food wastes, bottle D with 1L of cow manure and 3 teaspoons of yeast, and bottle E with 1L soil and 3 teaspoons of yeast. These 5 bottles had balloons on the mouth of each bottle to see how much gas each bottle created. The diameter of the balloon was recorded in inches, and was recorded 2 times a day as two different experiments trials experiment 1 was done at 7:00am and experiment 2 was done at 4:00pm. The results were made into two graphs which was recorded for one week.

Results
For experiment 1, Bottle C had the highest average of gas creation. Bottle C seems to increase greatly at the second day and slowly decrease after that. Bottle C showed these results because when food waste is dry it creates more gas than when it is moist. So, for the first few days the waste was dry creating a lot gas, but due to the cold temperature, it created mist inside the bottle which made the soil moist leading to making less gas. For experiment 2, bottle D had the highest average of gas. Bottle D seems to increase slowly the whole time.

Conclusions/Discussion
In my hypothesis, I predicted that bottle D the one with cow manure and yeast will create the most gas because the manure that creates stinky gas and yeast that performs growth if there is food or water. So, if cow manure is food to the yeast, I thought bottle D would create the most gas. The result showed that bottle D had the highest average of gas creation out of two experiments. The yeast has contributed to the result as it needs food or water to perform growth. The yeast in bottle D got both materials to perform growth; water created from coldness and cow manure as food. However, temperatures during my experiments could have played a big role to receive these results. In the future, I would like to investigate how much energy each of these combinations produce and how we can apply in our lives.

Summary Statement
Figureing out which commbinations of materials and biomass makes the most biogas.

Help Received
Mother helped create poster board; little brother helped me cut; Dad helped me fix grammar