Name(s)	Project Number
Kanan J. Best	**J1003**

Project Title

Estimating Gas Consumption at Drive-Thru Restaurants and Businesses in California

Abstract

Objectives/Goals

The objective is to determine how much gasoline is consumed by vehicles while idling at drive-thru restaurants in the state of California.

Methods/Materials

I collected data from 98 drive-thru restaurants throughout California. I took notes on how many vehicles were waiting in line, time of day, location, type of restaurant, and vehicle size. I also collected continuous information from the McDonalds in Arcata over the period the restaurant was open. I used these data to interpolate continuous data for the state observations. I did an experiment to determine the gas consumption rate for idling vehicles. I used the Internet to research the number of drive-thru restaurants and yearly gas consumption by vehicles. Rate of gas consumption was determined using average line length, number of restaurants, and idle gas consumption rate.

Results

Gas-consumption rates for idling vehicles ranges from 0.20 to 0.55 gal/hr. There are about 8500 drive-thru businesses in California. The average line length (averaged over a 24 hour period) is 1.6 vehicles.

Conclusions/Discussion

The average idle gas-consumption rate referenced in many studies is 1.0 gal/hr., and appears to be too high based on my results. About 32 million gallons of gas are consumed yearly by vehicles while idling at drive-thru businesses. However, California vehicles consume over 14.9 billion gallons per year, and consumption by idling vehicles represents only 0.2 percent of the total. Although this is a small portion, discouraging this, and other wasteful practices (such as idling at traffic lights), could collectively reduce energy consumption.

Summary Statement

My project shows how much gasoline is consumed by vehicles while idling at drive-thru businesses in California.

Help Received

My Mom took me to the Arcata McDonalds so that I could collect data throughout a 24 hour period. My dad showed me how to enter data into tables and create different graphs using Excel