CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY

Name(s)

Rebecca Drake; Elizabeth Mazeika

Project Number

S0613

Project Title

Pesticides, Produce, and People: Buying Organic: Is It Really Worth the Price?

Abstract

Objectives/Goals

Going green and organic is today's catch word. There is concern that we need to improve our overall health and well-being, but this comes at a higher price tag. The Federal Drug Administration and the Environmental Protection Agency have set standards for tolerable levels of toxins that consumers may encounter. For some, even a tolerable level of pesticides and other impurities in their food is too much and many are willing to pay a premium for organically grown food. However, is the amount of pesticide residues on produce sufficient to warrant the high cost of purchasing organically grown produce instead? We have chosen to test apples. Apples have been cited by the FDA as one of the most contaminated fruits containing pesticide residues. Many people attempt to clean the apples off by washing using just tap water or sometimes a wash, such as Trader Joe's wash "Environne". Since apples predominantly come from either Chile or the United States, we tested for two commonly used pesticides in Chile and the United States, which are azocyclotin and azinphos-methyl.

Methods/Materials

We used a High Performance Liquid Chromatography (HPLC) for analysis. We created our pesticide calibration curve by running a set of six known pesticide concentrations for each pesticide. We then tested our 68 samples, from our apples (organic and regular), by running them through the machine once. We used a sample of distilled water as our control to confirm that the machine was testing properly.

Results

Our results, however do not support our hypothesis. When tested for azinphos-methyl, the apples showed no traces of the pesticide. When tested for azocyclotin, the apples did test positive.

Conclusions/Discussion

However, due to our improper use of the product, "Environne," we are unable to say whether or not the product served its purpose correctly and how wide-spread the pesticide residue is in the different variety of apples. While it may be wise to purchase organic apples, our experiment did not reveal enough pesticides to cause harm to an indivdual person.

Summary Statement

Organic produce is very expensive, but do the lack of pesticides make it worth the price?

Help Received

Mrs. Mazeika stayed in the lab with my partner and me and purchased all the materials; We used the lad equiment at our high school TOHS under the supervision of Dr. Malhotra; Dr. Cauchon taught us how to use the HPLC machine and interpet our results.