CALIFORNIA STATE SCIENCE FAIR
2013 PROJECT SUMMARY

Name(s)

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Project Number

J0509

Project Title

Take a Bite Out of the Myth: The Vitamin C Content of Genetically Engineered vs. Organic Papayas

Abstract

Objectives/Goals

The objective of my project is to determine if the genetically engineered papaya, has higher or lower Vitamin C content than that of its organically grown predecessor.

Methods/Materials

Fifteen genetically engineered papaya and fifteen organic papaya were purchased. The papayas were juiced shortly before each test. To measure the amount of Vitamin C in the papaya juice samples, I used the titration method. In my case titration was the use of iodine to measure the amount Vitamin C. The Vitamin C oxidizes the iodine therefore leaving the solution. Corn Starch was added to each of my juice samples as an indicator so that when the Vitamin C was completely gone from the juice, the iodine would react with the cornstarch turning a dark blue. Prior to my papaya testing I tested a reference sample of a pure Vitamin C tablet, using the same method. This test showed me how many drops of iodine it took to saturate twenty milligrams of Vitamin C. Based on this, I created an equation that would calculate the amount of Vitamin C per twenty milliliters of each juice sample. The levels of Vitamin C in the genetically engineered papayas were then compared to that of the organic papayas.

Results

On average, the genetically modified papaya had 16% more Vitamin C per twenty milliliters of juice than the organically grown papaya.

Conclusions/Discussion

The United States of America has the highest rates of genetically modifying food in comparison to any other nation. Genetically modifying is the latest advancement in biotechnology and uses molecular biology techniques. To genetically engineer a food, geneticists must sequence the genomes, isolate and extract the desired gene, then insert it into the food using a gene gun. Genetically engineered food is the source of much controversy. Genetically engineered food makers are often accused of seeking profit without concern for health consequences. Genetically engineered crops are often more reliable and can be made resistant to herbicides or disease. Based on my results one could also conclude that the genetically modified papayas have the health benefit of a higher Vitamin C content, but whether or not this true for other health aspects requires further investigations.

Summary Statement

My project compares the Vitamin C content of the genetically engineered papaya, to that of its organic predeccessor.

Help Received

My mother helped me cut and glue papers on to the poster board.