CALIFORNIA STATE SCIENCE FAIR
2014 PROJECT SUMMARY

Name(s)

Mikayli A. Moore

Project Number

J0510

Project Title

The Effects of Growth Environment and Temperature on Carotene in Red Bell Peppers

Abstract

Objectives/Goals

The objective of this experiment was to determine if the Rf value of carotene in red bell peppers would be affected by either growth environment or temperature.

Methods/Materials

Paper chromatography was used to find out if the Rf value of carotene is consistent after growth environment and temperature effects on red bell pepper, using Whatman Grade I cellulose chromatography paper and acetone as the solvent. Carotene samples were extracted from random store bought peppers grown in the following environments: conventional, organic and hot house. Samples were extracted from peppers stored at room temperature, after frozen for 24 hours and microwaved for 1:30 minutes at 1250 watts.

Results

Overall three distinct chromatographic bands were isolated. Two bands appeared for conventional at room temperature, two again at microwaved, and three when frozen. For the organic, there was two bands at room temperature, and three when microwaved and frozen. For the hot house, there was three bands regardless of the temperature tested. Band One was determined to be lycopene and Bands 1.5 and Two carotenoids. The consistency of Band Two with a minimal averaged Rf value range of .98 to .99 carotene demonstrated that the presence carotene in the pepper will not be affected by growth environment or temperature.

Conclusions/Discussion

Carotene is a vital nutrient to the human body because it is converted to Vitamin A, which is known to benefit multiple systems and possibly fight against breast cancer. My hypothesis was partially correct. My results supported my hypothesis because I predicted that the Rf value of carotene would remain consistent after undergoing variations in the environment and temperature. This experiment demonstrated that regardless of growth environment or temperature, the presence of carotene remained in the red bell pepper, and therefore, consumers can buy the product of their choice without fear their health may be compromised.

Summary Statement

My project was to determine if the carotene content of red bell peppers would be affected by either growth environment or temperature.

Help Received

My science teacher, Mr. Vieira, who acted as a mentor and resource for general questions. My mom who helped me cite my sources APA style.