Name(s)

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Project Number

S2111

Project Title

Detection and Removal of Pesticides Residues from Organic and Non-Organic Produce of the Salinas Valley

Abstract

Objectives

To determine if organic produce contains detectable amounts of pesticides, and to determine if there are options to remove pesticides from non-organic produce.

Methods

Organic and non-organic fresh produce grown in the Salinas Valley was obtained from local grocery stores. Strawberries and spinach were chosen because they are major crops grown in this area and require high amounts of pesticides to be grown non-organically. Organic and non-organic produce were soaked in deionized water and pesticide detection was accomplished using a lateral flow assay (NIDS ACE Rapid Pesticide Test, ANP Health, Inc, Newark, Delaware, USA). Different methods of removing pesticides from non-organic produce included rinsing with water, soaking in water of various temperatures and solutions (including a commercially available produce wash). Results were determined qualitatively as positive or negative. All tests were performed in duplicate. Unwashed non-organic produce was used as a positive control, and deionized water was used as a negative control.

Results

A total of five samples of organically grown strawberries and five samples of organically grown spinach were performed in duplicate, for a total of ten assays each. Nine of 10 (90%) organic strawberry samples were found to contain pesticides. Six of 10 (60%) organic spinach samples were found to contain pesticides. Five methods to remove pesticides from non-organic produce from strawberries and spinach were performed. A 30-second water rinse removed pesticide from 50% of strawberry and spinach samples. A 5-minute water soak, vinegar solution soak, and commercial produce wash removed pesticide from 50% of spinach samples, but not from strawberry samples.

Conclusions

Organic produce is popular because of the assumption that it contains no pesticides. However, in my study, pesticides were detected on 90% of samples of organic strawberries and spinach. It is possible that these pesticides are present as a result of water or soil contamination, or from overspray from the aerial application of pesticides. Attempts to remove pesticides from spinach were only partially effective, but was largely unsuccessful from strawberries. This may be due to pesticides being present within the strawberry rather than simply on the surface.

Most organic strawberries and spinach growth in the Salinas Valley contain detectable pesticides. Removing pesticides from non-organic produce is difficult for spinach, and nearly impossible for strawberries.

Summary Statement

My project is basically detecting and removing of pesticides residues from organic and non-organic produce of the Salinas Valley

Help Received

My father had helped purchase supplies and supervised the overall experiment.