Pesticide Residue On Organic Versus Conventional Produce and the Effect of Simple Washing Techniques

• This project investigates whether organic produce has less pesticides than conventional produce and whether simple washing techniques can remove any pesticide residue.

• Hypothesis: Organic produce will have less pesticide residue than conventional and simple washing techniques (tap water and liquid dish soap) can remove the pesticide residue from conventional produce.

• This project is a continuation from last year using a much more sophisticated assay, ELISA, which was used to examine the presence of pesticides on strawberries and spinach.

• Negative controls: Distilled and tap water

• Positive controls: Known organophosphates

• Conclusion: The results showed that the organic and most of the conventional produce had trivial amounts of pesticide residue, with the one exception easily washed off using tap water. If consumers wished to save money while avoiding pesticides, they could buy conventional produce (rinsing if desired) instead of paying more for organic produce.

Materials & Procedures

• 5 grams of organic strawberries and spinach were placed into 6 small containers.

• Both were tested in triplicate.

• All containers were soaked in 10 mL of distilled water for 1 minute.

• The soaked water was then poured into centrifuge tube & stored in refrigerator until shipping.

• 80 test tubes containing controls (distilled water, tap water, and Orthene) and the rinsed residue of organic and conventional strawberries and spinach as described above were sent to the Attogene Lab (Austin, TX) to be tested using ELISA (Enzyme-Linked Immunosorbent Assay).

• ELISA is an immunological assay utilizing antibodies specific for an antigen of interest (in this case, organophosphates).

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Conversion of color scale to parts per billion (ppb) under the equation $y = 359e^{-2.63x}$

Results

• The conventional strawberries showed an overall similar amount of pesticide residue as the organic, except for Driscoll’s strawberries.

• Washing the Driscoll’s with distilled water decreased these levels by 60%.

• Interestingly, washing with soap seemed to increase the amounts of residue somewhat.

• The conventional spinach also showed an overall similar amount of pesticide residue as the organic.

• Interestingly again, washing with soap seemed to increase the amounts of residue on Ocean Mist and particularly Pacific spinach.