Can We Authenticate Apple Juice Using New Novel Methodology?

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Abstract: The adulteration of food, particular fruit juices, is not a new concern for consumers. Dishonest suppliers will add cheaper ingredients to increase profits. Earlier methodology used to detect adulteration was costly, time consuming and not always reliable. Can recent methods provide quicker, accurate results which are less costly?

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The adulteration of commercial fruit juice is widespread and well-documented. As with any commodity, juice manufacturers and blenders can increase profits by extending their products with cheaper ingredients. The two most common types of ways of adulterating juice are:
1) Using cheaper ingredients, especially sugars
2) Blending cheaper juices into more expensive juices

As prices increase, the incentive for adulteration rises with it. Identification of adulterated juices is critical in protecting beverage manufacturers’ brand equity. For several decades, consumers have a growing interest in traceability and misrepresentation in the sources of food. The implication of unlabeled or undeclared ingredients can not only damage a company’s reputation, it puts the company at risk of fines and prison sentences for employees. Since infants and children are the largest group of juice consumers, there is urgency for to protect the juice they consume against fraud.

Traditional methods used for detecting adulteration in fruit juice include chromatographic techniques, isotope analysis, infrared spectroscopic analysis, and multivariate statistical methods. Each of these different techniques focus on specific characteristics of fruit juices. These methods can be costly, not sufficiently sensitive, and frequently require weeks for completion. New emerging methods used for detecting food adulteration are focusing on physiochemical/chemical fingerprints, proteins and DNA sequence. Can we authenticate apple juice concentrate using new novel methodology that is quicker and less costly to help alleviate concerns with adulteration?

Selected References