Maleeka Singh – 3MT® Presentation

I remember the first day my family and I arrived to Canada. Our flight was an overnight flight and we arrived in Toronto in the very early morning. Canada greeted us with a breakfast of pancakes and warm maple syrup. What is more Canadian than maple syrup? But did you know that maple syrup is among the top 10 most adulterated foods globally? Maple syrup also known as Canada's liquid gold, is often adulterated with other sugar syrups. Adulteration or food fraud is a deliberate misrepresentation of food for economic gain. Which means that consumers pay more for a lower value product. However, the harm doesn't just stop at your pockets. This can have sever health risks, for example, in the case of maple syrup, adulteration with other sugar syrups may pose risks to individuals with sugar sensitivities, or introduce potential allergens. Conventional quality testing of maple syrup often looks at the amount of predominant sugar present or sucrose. However, this can be easy falsified. The more accurate method of protection, for example the separation and identification of the chemical compounds in the sample are often expensive, time consuming, and requires the skills of high trained personal. In the same way that our finger prints allow us to differentiate one person from the other. Fluorescent finger prints of food, can allow us to discriminate between products. Most foods contain naturally fluorescent and intrinsic compounds which means that they can glow in the dark. The amount and type of these glowing molecules can allow for discrimination. My research uses fluorescent finger prints to provide a unique, 3-D rendering of a samples composition. To detect key features that can be used for discrimination of pure maple syrup from adulterated syrup. I examined the adulteration of dark and amber maple syrup, with common maple syrup adulterants. Mainly beat, corn, and rice syrups. At values ranging from 1-50%. Distinct fluorescent finger prints were seen for each syrup and add mixture. Using the distinct features that I observed, I reposed alternative methods to improve the detection of maple syrup adulteration at 70-100%. Depending on weather I applied these features in a florescent racial index or applied them using machine learning. Therefore this approach if applied to the supply chain , could potentially improve the detection of maple syrup adulteration thereby ensuring the consumers receive safe and high quality foods, and that they are not cheated financially, all while protecting Canada's product image, internationally. For all Canadians and for families like mine. Thank you.