

GIVE ME A BREAK - TRACE ELEMENTAL ANALYSIS OF KITKAT CHOCOLATE BARS AND WRAPPERS USING INDUCTIVELY COUPLED PLASMA MASS SPECTROMETRY (ICP-MS). **Aimee Williams**<sup>1</sup>, Adya Karthikeyan<sup>2</sup> and Nausheen Sadiq<sup>1</sup>. <sup>1</sup>Mount Royal University, Department of Chemistry and Physics, 4825 Mount Royal Gate SW, Calgary AB, T3E 6K6, Canada. <sup>2</sup>University of Ottawa, Department of Chemical and Biological Engineering, 161 Louis Pasteur Ave., Ottawa, ON K1N 6N5, Canada. (awill623@mtroyal.ca)

Who doesn't love a sweet treat? KitKat, valued at approximately 2.12 billion US dollars [1], produces a variety of candy bars, wrapped in foil packaging. Metals can leach out from materials, such as packaging by diffusion into the solids or liquids they are in contact with. This raises concerns on the composition of food packing materials, such as candy bar wrappers. Multiple scenarios were tested with KitKats, including different wrappers, increased storage temperature, as well as expired bars left in their wrappers for extended periods of time. Trace multi-elemental analysis was conducted using ICP-MS; and up to 3 ppm of aluminum was observed in the chocolate. Aluminum accumulation can lead to harmful impacts on bone metabolism and brain functions [2]. The risk is higher in younger populations, thus posing an even greater concern to children, who are the main consumers of chocolate products. Understanding the leaching of potentially toxic elements from food wrappers into consumable products will help in creating better safety standards in the packaging industry. X-ray photoelectron spectroscopy (XPS) will be explored to further examine the elemental content in wrappers.

[1] Kit Kat brand value 2022. Statista.

[2] Sedman, A. *Pediatr. Nephrol.* 6(4) (1992) 383-393