

Analytical Determination of Terephthalic Acid and Isophthalic Acid Migration into Deep Fried Crispy Snacks through Adulterated Edible Oils – Method Development and Validation

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Non-branded deep fried manioc chips were evaluated by following a newly developed and validated method to determine the migration of Terephthalic acid (TPA) and Isophthalic acid (IPA) from the frying oils adulterated with PET bottles to make the snacks crisp and long last. Reporting method was comprised of Soxhlet extraction of oils from 400 deep fried manioc chip samples, solvent extraction of TPA and IPA using centrifuged oil samples, sample preparation for High Performance Liquid Chromatography (HPLC) analysis of samples along with the TPA and IPA standard series. The percentage recovery range for TPA and IPA was in between 80-120% for 20 manioc chip samples fried in edible oils incorporated with PET bottles. The results showed that the specific migration of TPA and IPA into the manioc chip samples conform to European Union legislation that identifies specific migration limits (SML). The intraday assays for TPA and IPA were expressed as Relative Standard Deviation (RSD) 5.123% and 2.015%, respectively while inter-day precision assays for TPA and IPA were expressed as RSD 2.089% and 2.105% respectively. Results highlighted that the data is tightly clustered around the mean with a good precision. Analytical curves for TPA and IPA were found to be linear over a wide concentration range (6 – 120 ppb) with a correlation coefficient of 0.998 for TPA and 0.999 for IPA. The lower limit of quantification was determined to be 6 ppb, with a RSD lower than 10%. TPA and IPA in sample are well separated from each other and from the background oil. The study shows that the method presented in the methodology can be used as a suitable method for analytical determination of TPA and IPA in deep fried crispy snacks like manioc chips with high precision and accuracy.

Keywords: Adulterated edible oils, Deep fried manioc chips, Isophthalic acid, Migration, Terphthalic acid