HEALTH RISK ASSESSMENT OF HEAVY METALS IN VARIOUS TYPES OF COMMERCIAL TEA BY TOTAL METAL ANALYSIS AND INFUSION

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ABSTRACT

HEALTH RISK ASSESSMENT OF HEAVY METALS IN VARIOUS TYPES OF COMMERCIAL TEA BY TOTAL METAL ANALYSIS AND INFUSION

Most people simply drink tea frequently without knowing the presence of heavy metals in their beverages that might affect their health. The aims of this study are to determine and compare the heavy metals concentration of commercial tea in tea bag and loose tea and to investigate and compare the concentration of heavy metals between brands of tea. Three brands of black tea consist of loose tea and tea bag were bought at local market in Malaysia. The selected heavy metals studied are cadmium (Cd), chromium (Cr) and nickel (Ni). After digestion using dry ashing method and brewing tea, the sample were analyzed using by using PerkinElmer Graphite Furnace Atomic Absorption Spectrocopy (GFAAS). The highest concentration of the selected heavy metals are dominated by Cd (0.004 μg/g), followed by Ni (0.003 μg/g) and Cr (0.0023 μg/g). In tea bag also dominated by Cd (0.004 μg/g), followed by Cr (0.003 μg/g) and last is Ni (0.002 μg/g). In infusion method the amount of Cd in both types of tea are below detection limit. For Ni concentration in both type also below detection limit at certain brand. However Cr was detected at both type of tea and have lower concentration compared to Ni that present at certain brand of tea. Cr concentration in infusion powder tea is 0.01 μg/L, whereas in tea bag 0.13 μg/L. For Ni concentration in powder form is 0.86 μg/L and in tea bag is 0.45 μg/L. The Hazard Index (HI) calculated shows that brand M was found to have highest value of HI, but by consuming of heavy metals present in tea does not pose any risk to human health.