

Determination of heavy metals; mercury, cadmium, lead and arsenic in different types of canned tuna fish in Tehran

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Background and Aims: The aims of this study was to evaluate consumers health safety in terms of contamination of canned tuna fishes with heavy metals such as cadmium, lead, mercury and arsenic.

Methods: In this study 54 samples from 10 different brands were collected and prepared by Microwave Digestion method. Cadmium and lead concentrations were measured by Graphite Furnace Atomic Absorption Spectrometry. Arsenic concentrations were measured by Hydride Generation AAS after passing more digestion steps, in order to release resistant arsenic compounds and reduction of trivalent arsenic to pentavalent compounds. Mercury concentrations were directly determined using Direct Mercury Analyzer. Then the values obtained were compared with international and national standards.

Results: Average concentrations of Hg and As were 108.98 ± 87.27 and 636.8 ± 264.86 ppb, respectively. 90.74% of tuna cans had Pb concentrations below its LOD (<3 ppb) and average Pb concentration of other cans was 72.87 ± 58.77 ppb. Cd concentrations in 92.6% of tuna cans were below its LOD (<10 ppb) and average Cd concentration of other cans was 16.12 ± 15.66 ppb. The values obtained for these heavy metals in all samples were below the standard limits of Iran, Europe Union, Australia and the CODEX.

Conclusions: This study confirms that canned tuna that has been reviewed, were safe for society consumption, especially women and children; Who are more sensitive to toxins.

Keywords: Heavy metals; Canned tuna fish; AAS; DMA