

Seasonal bioaccumulation of toxic trace elements in economically important fish species from the Caspian Sea using GFAAS

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Abstract

This study aimed to determine the concentrations of aluminium, cadmium, lead and nickel in edible muscle of three commercially valuable fish species (*Rutilus frisii kutum*, *Liza aurata* and *Cyprinus carpio*) from four fishing sites of Iranian coastal waters of the Caspian Sea during winter and summer. The samples were analyzed using graphite furnace atomic absorption spectrometry (GFAAS) after wet-ashing digestion. The results were expressed as $\mu\text{g/g}$ of wet weight. The resulted range of metals in fish species was between $0.89\text{--}2.26 \mu\text{g/g}$ for aluminium, $0.03\text{--}0.17 \mu\text{g/g}$ for cadmium, $0.21\text{--}0.38 \mu\text{g/g}$ for lead and $0.12\text{--}0.02 \mu\text{g/g}$ for nickel. Seasonal variation influenced concentration of the metals in fish samples of some fishing sites. The highest concentrations found were $2.67 \mu\text{g/g}$ for aluminium in winter and $0.82 \mu\text{g/g}$ for lead in summer in *Cyprinus carpio*; while cadmium ($0.29 \mu\text{g/g}$) and nickel ($0.12 \mu\text{g/g}$) were the highest in *Rutilus frisii kutum* in winter. This demonstrates that estimated daily and weekly intakes of aluminium, lead and nickel and estimated monthly intake of cadmium via consumption of fish flesh are below the established PTDI, PTWI and PTMI values.