

Title

Assessment of arsenic, cadmium, and lead levels in fresh oysters purchased from Hong Kong wet markets using inductively coupled plasma mass spectrometry.

Abstract

The present study evaluated the concentrations of arsenic (As), cadmium (Cd), and lead (Pb) in fresh oysters (*Crassostrea* sp.) purchased from local wet markets in Hong Kong (HK). The samples were categorized into two origin groups: imported oysters from Chaoshan/Fujian, and local oysters from Lau Fau Shan. Additionally, the samples were separated into three edible parts: the mantle, adductor muscle, and body (viscera, gills and gonad). Heavy metal contents were determined using microwave-assisted digestion followed by inductively coupled plasma mass spectrometry (ICP-MS). The results indicated that Lau Fau Shan oysters had significantly higher levels of Cd and Pb compared to imported samples ($p < 0.05$). Notably, two local samples exceeded the maximum permitted concentration (MPC) for Cd. Across both origins, the body (visceral) portion consistently showed the highest accumulation of heavy metals. Health risk assessments based on the target hazard quotient (THQ), total THQ (TTHQ), and carcinogenic risk (CR) revealed potential non-carcinogenic risks ($TTHQ > 1$) and carcinogenic risks ($CR > 10^{-4}$ for Cd) associated with lifelong oyster consumption, especially for Lau Fau Shan oysters. Although most samples complied with HK food safety standards, the presence of outliers exceeding regulatory limits emphasizes the need for ongoing monitoring. These findings highlight the importance of regulating oyster consumption in terms of both quantity and frequency, and suggest that further research should investigate seasonal and geographical variations in contamination.

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