

**Assessing the human health risks from exposure of
inorganic arsenic through oyster (*Crassostrea gigas*)
consumption in Taiwan**

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摘要

Abstract

This study estimated the human health risk associated with ingesting inorganic arsenic through consumption of farmed oysters in Taiwan. Two hundred fifty-four samples of oyster (*Crassostrea gigas*) were collected from four townships in southwest coastal areas, where 90% of Taiwan's oysters are produced. The concentrations of total arsenic and arsenic species including As(V), As(III), monomethylarsonic acid (MMA) and dimethylarsinic acid (DMA) were analyzed. The analytical results reveal that the ratio of mean concentration among the four townships of inorganic As to total concentration of As in oysters is approximately 1.64%. The mean concentrations of As(III) and As(V) in oysters from the four townships range from 0.071 to 0.145 $\mu\text{g/g}$, and 0.032 to 0.062 $\mu\text{g/g}$ respectively. The estimated target cancer risks (TR), based on a 95% occurrence probability from ingesting inorganic As by consuming oysters at a rate of 18.6-56 g/day, range from 1.26×10^{-5} to 3.82×10^{-5} . The probabilities of TR fell within the range 10^{-6} - 10^{-4} , suggesting that inorganic As uptake from farmed oysters is associated with a potential cancer risk. Moreover, a target hazard quotient (THQ) was used to evaluate the non-carcinogenic risk associated with ingesting inorganic As through oyster consumption at a rate of 18.6-56 g/day. The THQ values based on a 95% probability of exposure range from 0.071 to 0.214. All THQ values are below unity, indicating that farmed oyster consumption contributes only a little to the non-carcinogenic risk. Based on the estimation of the TR model, an ingestion rate of 1.6 g/day is recommended to meet the 95th percentile of carcinogenic risk, 10^{-6} , for exposure to inorganic As through the consumption of oysters in Taiwan.