

Arsenic levels in different rice types sold in the UK

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Rice is the staple food for more than half of the world's population, and it also an accumulator of inorganic arsenic (As_{io}), which is a class 1 non-threshold carcinogen. In the UK, rice consumption has increased by 450% since the 1970s. Though not produced in the UK, there are different rice types available which can be grouped based on cultivation type (organic or non-organically produced), grain types (wild, brown and white) and grain size (short, medium and long). The main objectives of this recent investigation were (1) to quantify and compare arsenic concentrations and species in rice marketed in the UK, and (2) to assess carcinogenic and non-carcinogenic risks to infant and adult populations of the UK.

Both total arsenic (As_t), and its species (inorganic and organic species), were determined using ICP-MS and coupled liquid chromatography-ICP-MS respectively. The carcinogenic (LCR = Lifetime Cancer Risk) and non-carcinogenic (THQ = Target Hazard Quotient) risks were calculated using EPA protocols.

The As_{io} concentrations were significantly greater in brown rice compared to white rice. Also, we found that As_{io} concentrations in medium grain rice were significantly lower than in short or long grain rice. Overall, there was no significant difference between organically and non-organically produced rice. The consumption of 22 rice samples that exceeded the As_{io} infant threshold limit stipulated by the EU (0.1 mg kg^{-1}) carries a greater risk for infants than for adults: the LCR for infants was 40 per 10,000 population compared to 4.31- 5.13 for adults.