

Transfer of Arsenic in Food Chain Through Groundwater Irrigation: A Threat to Food Safety and Human Health

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Abstract

Background: This paper aims to provide a comprehensive review of the food toxicity caused by transfer of arsenic through groundwater irrigation as well as the associated health complications. The review focuses on various species of arsenic, food systems and irrigation practices. This article presents potential health risks of exposure to arsenic as well as the occurrence and consumption of arsenic in irrigated crops. Additionally, the potential toxicity of arsenic is discussed. **Design/methodology/approach:** Information and data regarding food toxicity from irrigation practices were collected from the scientific sources. **Findings:** In the present scenario, arsenic is available in the food system in the form of inorganic and organic arsenic species. The inorganic forms of arsenic are more toxic as compared to the organic arsenic and the arsenic is incorporated into various food products through different routes. Arsenic becomes exceptionally toxic even at low exposure levels because of its high water solubility and bioaccumulation tendency in different environmental matrices. Contaminated groundwater used for irrigation of crops such as rice and tomatoes, is a major source of exposure to arsenic. Fish and other seafood contain the most of less toxic organic arsenic. **Originality/value:** Prolonged arsenic toxicity leads to carcinogenic and non-carcinogenic health risks such as arsenicosis, cancers, hepatotoxicity, kidney failure, and skin disease. Numerous studies have demonstrated that the consumption of arsenic or arsenic contaminated products can also cause diabetes, anaemia and certain types of cancer. Creating awareness among consumers about the toxicity profile and carcinogenic properties of arsenic is crucial in order to minimize its detrimental effects.