Total and inorganic arsenic in dietary supplements based on herbs, other botanicals and algae—a possible contributor to inorganic arsenic exposure

The content of total and inorganic arsenic was determined in 16 dietary supplements based on herbs, other botanicals and algae purchased on the Danish market. The dietary supplements originated from various regions, including Asia, Europe and USA. The contents of total and inorganic arsenic were determined by inductively coupled plasma mass spectrometry (ICP-MS) and anion exchange HPLC-ICP-MS, respectively, were in the range of 0.58 to 5.0 mg kg\(^{-1}\) and 0.03 to 3.2 mg kg\(^{-1}\), respectively, with a ratio between inorganic arsenic and total arsenic ranging between 5 and 100\%. Consumption of the recommended dose of the individual dietary supplement would lead to an exposure to inorganic arsenic within the range of 0.07 to 13 μg day\(^{-1}\). Such exposure from dietary supplements would in worst case constitute 62.4% of the range of benchmark dose lower confidence limit values (BMDL01 at 0.3 to 8 μg kg bw\(^{-1}\) kg\(^{-1}\) day\(^{-1}\)) put down by European Food Safety Authority (EFSA) in 2009, for cancers of the lung, skin and bladder, as well as skin lesions. Hence, the results demonstrate that consumption of certain dietary supplements could contribute significantly to the dietary exposure to inorganic arsenic at levels close to the toxicological limits established by EFSA.
Dietary supplements, Inorganic arsenic, Speciation analysis, HPLC-ICP-MS, Dietary exposure

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