

ARSENIC DETERMINATION IN COMMERCIAL WHITE CHOCOLATE SAMPLES: IMPLICATIONS FOR FOOD SAFETY

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Theme Area – Ecotoxicology

INTRODUCTION: Arsenic is a chemical element classified as a semi-metal or metalloid, as it exhibits chemical characteristics of both metals and nonmetals. This element is widely distributed in the environment in both its organic and inorganic forms (the latter being more toxic), originating from natural and anthropogenic sources. Due to its extreme toxicity, arsenic is considered a major public health concern. Exposure to arsenic occurs through the ingestion of contaminated water and food. High-dose exposure can cause gastrointestinal, neurological, and dermal effects, while prolonged exposure to low concentrations may be carcinogenic. **OBJECTIVES:** To determine the presence and concentration of arsenic in five commercial samples of white chocolate. **MATERIALS AND METHODS:** Spectrophotometer; analytical balance; muffle furnace; U-tube flask; arsenic solutions; lead acetate; silver diethyldithiocarbamate; magnesium oxide; magnesium nitrate; stannous chloride; potassium iodide; zinc; and hydrochloric acid. Five white chocolate samples were analyzed in duplicate, obtained from different commercial establishments in Natal (RN), Brazil. The analytical method used was based on the procedure developed by Vasak and Sedivec (1953), consisting of three steps: dry-ashing mineralization, arsenic extraction, and determination by spectrophotometry. **RESULTS:** Samples I to V showed the following values, respectively: 0.195 mg/kg, 0.254 mg/kg, 0.362 mg/kg, 0.296 mg/kg, and 0.334 mg/kg. Considering that the Maximum Tolerable Limit (MTL) for chocolates with less than 40% cocoa content is 0.2 mg per kg, four out of the five commercial white chocolate samples exceeded the value considered safe. **CONCLUSION:** The results of this study show that four out of five white chocolate samples analyzed presented arsenic concentrations above the MTL according to RDC No. 722/2022. This finding reinforces concerns regarding food safety, as prolonged exposure to arsenic may lead to health damage. Arsenic concentrations above established limits highlight the need for greater oversight by regulatory agencies and the importance of preventive measures to reduce contamination throughout the production chain.

Keywords: Arsenic, white chocolate, toxicology.