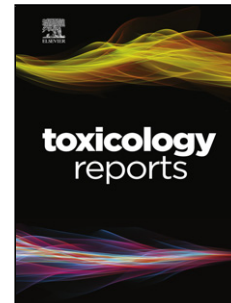


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Determination of Trace Metals in Fruit Juices in the Portuguese Market

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Highlights

- Validation process for the analysis of metals in fruit juices was implemented
- Cd, Cr, Pb, As, Ni and Mn were determined in fruit juices
- 62% of the samples had Ni above the maximum permissible values according with the Portuguese legislation
- All the samples had Mn above the Portuguese legislation limits
- A reduction of metal concentration in Portuguese juices is recommended

Abstract

Fruit juices are amongst the most non-alcoholic beverages appreciated and consumed in European countries, including Portugal. These beverages contain minerals, nutrients, trace elements, vitamins and phytochemicals, which are essential for a healthy life. However, fruit juices may also contain high levels of metals, posing a health risk to humans, especially to children, since they consume more fruit juice per body weight unit, and have a less varied diet than adults. Thus, in order to guarantee food safety and to make sound nutritional considerations, fruit juices require careful investigation. The main purpose of this study was to determine arsenic (As), cadmium (Cd), chromium (Cr), lead (Pb), manganese (Mn) and nickel (Ni) concentrations in 21 fruit juices from 4 different brands, previously selected by the ASAE (Portuguese Food and Economic Safety Authority), and available in the Portuguese market. Results obtained were compared with permissible levels set out by WHO (World Health Organization), USEPA (United States Environmental Protection Agency), by the Portuguese law, and with similar studies performed in other countries. A validation process, including linearity, range, analytical thresholds, precision, accuracy and specificity/selectivity was conducted in order to guarantee reliable analytical data. The results showed that As levels in four samples, Ni in thirteen samples and Mn in all the twenty-one samples, were above the maximal permissible values specified by Decree-Law 306/2007 from 27th August of the Portuguese Legislation. These data establish the need for reduction of metal concentrations in consumed juices.

Keywords: Fruit juices, Metal analysis, Atomic Absorption Spectroscopy

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