

Levels of manganese, iron, zinc and mercury in vegetarian foods

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The increasing popularity of vegetarian diet has induced science to better study this foods. As long as it includes the necessary intake of nutrients, such as minerals, can be beneficial to health. In addition, concern about food safety has increased in recent years, leading to studies to evaluate food contamination by toxic metals, regarding food poisoning prevention and public health improvement.

The purpose of this work was to quantify manganese, iron, zinc and mercury contents in different foods for a plant-based diet.

Mineral levels were determined by Inductive Plasma Coupled Optical Emission Spectrometry (ICP-OES). Total mercury content was determined by a thermal decomposition and amalgamation atomic absorption spectrophotometry (TDA/AAS).

Manganese level ranged from 0.10 mg/100g (<Limit of Quantification (LoQ)) in mushrooms, vegetable drinks and margarines to 22.6 mg/100g in seaweed Nori. Content of iron ranged from 0.22 mg/100g (<LoQ) in bamboo shoots mushrooms, brown mushrooms vegetable drinks, rice vegetable drink and margarines to 25.8 mg/100g in seaweed Nori. Level of zinc ranged from 0.22 mg/100g (<LoQ) in shoots, vegetable drinks and vegetable yogurt to 2.98 mg/100g in seaweed Nori.

Regarding mercury content, all samples presented levels below LoQ (1.1 µg/kg), with exception of pleurotus mushrooms, that presented a low but quantified value (8.9 µg/kg).

It was found that, in general, the analyzed foods presented mineral values below the Recommended Dietary Allowance (RDA) per 100 g of food, with exception of seaweed Nori, that exceed the RDA of manganese and iron, and chickpea that surpasses the RDA of manganese.

This study provides support for future studies regarding mineral content in vegetarian foods and supply the Portuguese Food Composition Table. As expected, vegetarian food samples presented low levels of studied minerals, with the exception of grain and seaweed. Since mercury is a contaminant, pleurotus mushrooms may require attention to its presence, despite there is no legislation for mercury levels in mushrooms. It is concluded, therefore, that the vegetarian dietary pattern must be well planned, taking into account the importance of a varied, balanced and complete diet, including adequate food choices, in order to supply the deficit and reduce exposure to toxic substances.